

PLY GEM ROOFING MIAMI-DADE TEST REPORT

SCOPE OF WORK

ASTM E108 CLASS A TESTING ON ENGINEERED SLATE SHINGLES

REPORT NUMBER

H6955.07-121-24 R3

TEST DATE(S)

11/01/17 - 11/09/17

ISSUE DATE

07/10/18

REVISION DATE

7/23/18

RECORD RETENTION END DATE

11/09/21

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ATI 18032

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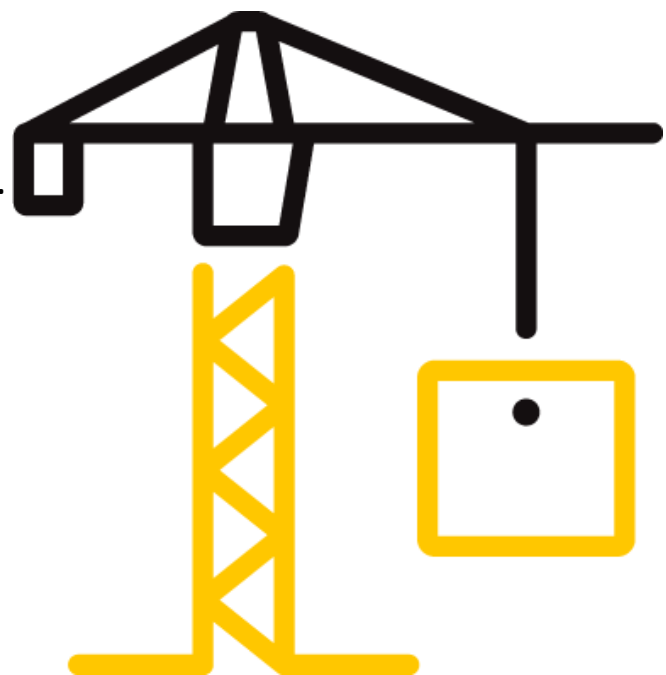
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TEST REPORT FOR PLY GEM ROOFING

Report No.: H6955.07-121-24 R3

Date: 07/23/18

REPORT ISSUED TO

Ply Gem Roofing

15159 Andrew Jackson Hwy 76 W

Fair Bluff, North Carolina 28439

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Ply Gem Roofing to evaluate the fire performance of the assemblies described in Section 6 of this report. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania. Results obtained are tested values and were secured by using the designated test method(s). 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

ASSEMBLY #	TYPE OF TEST	TEST #	SLOPE	CLASSIFICATION	RESULTS
Assembly #1	Intermittent Flame	Test #1	5:12	Class A	Pass
Assembly #2	Intermittent Flame	Test #1	5:12	Class A	Fail
Assembly #2	Intermittent Flame	Test #2	5:12	Class A	Fail
Assembly #2	Spread of Flame	Test #1	5:12	Class A	Fail
Assembly #2	Spread of Flame	Test #2	5:12	Class A	Fail
Assembly #2	Burning Brand	Test #1	5:12	Class A	Pass
Assembly #2	Burning Brand	Test #2	5:12	Class A	Pass
Assembly #2	Burning Brand	Test #3	5:12	Class A	Pass
Assembly #2	Burning Brand	Test #4	5:12	Class A	Pass

For INTERTEK B&C:

COMPLETED BY:	Timothy Feltman	REVIEWED BY:	Gary Hartman, P.E.
TITLE:	Technician – Fire Testing	TITLE:	Regional Laboratory Support Engineer
SIGNATURE:		SIGNATURE:	
DATE:	07/23/18	DATE:	07/23/18

TRF:ddr

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SECTION 3

TEST METHOD

The assemblies were evaluated in accordance with the following:

ASTM E108-17, *Standard Test Methods for Fire Tests of Roof Coverings*

SECTION 4

MATERIAL SOURCE/INSTALLATION

The sampled products were selected by Intertek B&C personnel. The specimen(s) was/were witnessed during production and tagged prior to shipment on 10/18/17, (Reference Intertek B&C Test Specimen Quote No. 193907R0 and Job No. H7094.01-117-38, dated 10/18/17).

SECTION 5

TEST PROCEDURE

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

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

Equipment Calibration: A Fire Test Apparatus as described in ASTM E108 was used to generate 12 ± 0.5 mph air current and flame temperature of 1400 ± 50 °F. Air speed and flame temperature of the Fire Test Apparatus were calibrated prior to testing.

Spread of Flame Procedure: After calibration of equipment, a test specimen described in Section 6 was placed into the steel framed holder for testing at a 5:12 slope. Refractory mortar was applied at the leading edge of the deck where it met the test apparatus. The fire test apparatus was turned on and the specimen was subjected to continuous flame and air current for duration of 10 minutes. This procedure was repeated for both test decks and observations were documented.

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SECTION 5 (Continued)

TEST PROCEDURE

Intermittent Flame Procedure: After calibration of equipment, a test specimen described in Section 6 was placed into the steel framed holder for testing at a 5:12 slope. Refractory mortar was applied at the leading edge of the deck where it met the test apparatus. The fire test apparatus was turned on and the specimen was subjected to 15 cycles of two-minute flame and air current and two minutes without flame. This procedure was repeated for both test decks and observations were documented.

Burning Brand Procedure: The test brands were oven conditioned at a verified temperature between 105 to 120°F for a minimum of 24 hours prior to testing. The weights were verified to be within 2000 ± 150 grams. A gas burner with flame temperature of $1630 \pm 50^\circ\text{F}$ was used to ignite the brands for testing. Each Class A brand consisted of three layers of twelve 1 inch by 1 inch by 12 inch strips of Douglas Fir forming a grid of 12 inch square by 2-1/4 inch thick. The brands were ignited by and exposed to the flame in accordance with Section 10.4.1 of the Test Method. Total duration of ignition exposure was 5 minutes. After the brands were ignited, they were placed onto the test specimen described in Section 6 at a 5:12 slope and secured in place with No. 18 soft iron wire. The Class A brand was centered laterally with respect to the vertical panel joint and with the upper edge of the brand 3 inches above the horizontal joint of the test deck. The Fire Test Apparatus, without flame but only air current, was turned on and the specimen was tested for 90 minutes or until the brands were completely consumed and the exposed and underside surface of the test deck did not exhibit signs of combustion. This procedure was repeated for all four test decks and observations were documented.

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SECTION 6

SPECIMEN DESCRIPTION

The Class A test decks for the Spread of Flame, Intermittent Flame, and Burning Brand tests were constructed of 2x4 dimensional #1 grade white pine lumber for the simulated framing and 15/32 inch thick Type AC grade plywood with face and back veneers of Douglas Fir for the test deck.

Intermittent Flame Test Deck Construction – Assembly #1

Test Deck – 40 inches wide by 52 inches long overall size with a 1/8 inch wide horizontal joint located 8 inches from the leading edge and a 1/8 inch wide vertical joint centered and on the test deck extending from the horizontal joint to the leading edge of the test deck.

Underlayment – Two layers, staggered, with a 2-inch overlap, of 30 LB. felt paper was applied directly to the top of the test deck and fastened using T50 3/8 inch staples.

Roof Covering – A single layer of Ply Gem Roofing Engineered Slate shingles was directly applied onto the underlayment and fastened using 1 1/4" roofing nails. Each shingle had an 8-inch reveal and was spaced 3/8 inch apart.

Intermittent Flame Test Deck Construction – Assembly #2

Test Deck – 40 inches wide by 52 inches long overall size with a 1/8 inch wide horizontal joint located 8 inches from the leading edge and a 1/8 inch wide vertical joint centered and on the test deck extending from the horizontal joint to the leading edge of the test deck.

Underlayment – A single layer with a 2-inch overlap of 30 LB. felt paper was applied directly to the top of the test deck and fastened using T50 3/8 inch staples.

Roof Covering – A single layer of Ply Gem Roofing Engineered Slate shingles was directly applied onto the underlayment and fastened using 1 1/4" roofing nails. Each shingle had an 8-inch reveal and was spaced 3/8 inch apart.

Spread of Flame Test Deck Construction – Assembly #2

Test Deck – 40 inches wide by 96 inches long overall size with a 1/8 inch wide by 40 inches long horizontal joint located 8 inches from the leading edge of the deck.

Underlayment – A single layer with a 2-inch overlap of 30 LB. felt paper was applied directly to the top of the test deck and fastened using T50 3/8 inch staples.

Roof Covering – A single layer of Ply Gem Roofing Engineered Slate shingles was directly applied onto the underlayment and fastened using 1 1/4" roofing nails. Each shingle had an 8-inch reveal and was spaced 3/8 inch apart.

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SECTION 6 (Continued)

SPECIMEN DESCRIPTION

Burning Brand Test Deck Construction – Assembly #2

Test Deck – 40 inches wide by 52 inches long overall size with a 1/8 inch wide horizontal joint located 22-1/2 inches from the leading edge of the deck and a 1/8 inch wide vertical joint centered at 26-1/2 inches and located on the far side of the deck during exposure.

Underlayment – A single layer with a 2-inch overlap of 30 LB. felt paper was applied directly to the top of the test deck and fastened using T50 3/8 inch staples.

Roof Covering – A single layer of Ply Gem Roofing Engineered Slate shingles was directly applied onto the underlayment and fastened using 1 1/4" roofing nails. Each shingle had an 8-inch reveal and was spaced 3/8 inch apart.

SECTION 7

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Timothy Feltman	Intertek B&C
Mark Dluzeski	Intertek B&C

SECTION 8

TEST RESULTS

Calibration Information

11/01/17

Average Wind Speed: 12 mph

Ambient Temperature: 65°F

Ambient Relative Humidity: 32%

Average Flame Temperature: 1383°F

Calibration Information

11/03/17

Average Wind Speed: 12 mph

Ambient Temperature: 69°F

Ambient Relative Humidity: 68%

Average Flame Temperature: 1439°F

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SECTION 8 (Continued)

TEST RESULTS

Calibration Information

11/09/17

Average Wind Speed: 12 mph

Ambient Temperature: 66°F

Ambient Relative Humidity: 38%

Average Flame Temperature: 1423°F

Intermittent Flame Assembly #1 – Test #1 11/03/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Burner Ignited. Start of test.
01:25	Sample ignition
54:07	Discoloration at horizontal plywood joint.
67:48	Sample self-extinguished.
84:52	Smoke at horizontal plywood joint.
109:37	Glowing at horizontal plywood joint.
120:00	No signs of combustion; End of test

Intermittent Flame Assembly #2 – Test #1 11/01/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Burner Ignited. Start of test.
01:10	Sample ignition.
57:47	Discoloration at horizontal plywood joint.
64:13	Smoke at horizontal plywood joint.
65:32	Sample self-extinguished.
78:02	Glowing at horizontal plywood joint.
80:10	Underdeck combustion at horizontal plywood joint; End of Test.

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SECTION 8 (Continued)**TEST RESULTS****Intermittent Flame Assembly #1 – Test #2 11/09/17**

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Burner Ignited. Start of test.
01:04	Sample ignition.
18:44	Smoke at the leading edge.
51:01	Discoloration at horizontal plywood joint.
60:50	Smoke at horizontal plywood joint.
83:14	Discoloration at horizontal 2X4.
84:41	Glowing at horizontal plywood joint.
87:38	Underdeck combustion at horizontal plywood joint; End of Test.

Spread of Flame Assembly #2 – Test #1 11/09/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Burner Ignited. Start of test.
01:12	Sample ignition.
01:21	Flame spread to 1 ft.
01:53	Flame spread to 2 ft.
02:33	Flame spread to 3 ft.
03:22	Flame spread to 4 ft.
04:55	Flame spread to 5 ft.
09:12	Flame spread to 6 ft.
09:59	Flame spread verified to be 76 in. from leading edge of the test deck.
10:00	Maximum flame spread exceeded 6 ft.; End of test

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SECTION 8 (Continued)

TEST RESULTS

Spread of Flame Assembly #2 – Test #2 11/09/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Burner Ignited. Start of test.
01:10	Sample ignition
01:17	Flame spread to 1 ft.
01:46	Flame spread to 2 ft.
2:27	Flame spread to 3 ft.
03:31	Flame spread to 4 ft.
05:24	Flame spread to 5 ft.
09:01	Flame spread to 6 ft.
09:59	Flame spread verified to be 75 in. from leading edge of the test deck.
10:00	Maximum flame spread exceeded 6 ft.; End of test

Burning Brand Assembly #2 – Test #1 11/01/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Brand in Place. Start of test.
00:49	Sample ignition.
16:12	Sample self-extinguished.
24:27	Brand consumed.
54:07	No signs of combustion; End of Test.

Burning Brand Assembly #2 – Test #2 11/01/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Brand in Place. Start of test.
00:56	Sample ignition.
18:51	Sample self-extinguished.
23:26	Brand consumed.
50:11	No signs of combustion; End of test.

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SECTION 8 (Continued)

TEST RESULTS

Burning Brand Assembly #2 – Test #3 11/01/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Brand in Place. Start of test.
00:43	Sample ignition.
22:27	Sample self-extinguished.
26:10	Brand consumed.
59:23	No signs of combustion; End of test.

Burning Brand Assembly #2 – Test #4 11/01/17

TIME (Min:Sec)	OBSERVATIONS
Pre-test	Calibrated air current achieved.
00:01	Brand in Place. Start of test.
00:44	Sample ignition.
21:52	Sample self-extinguished.
24:46	Brand consumed
58:16	No signs of combustion; End of test

SECTION 9

CONCLUSION

The assemblies described in this test report **did not** meet the full conditions of acceptance of ASTM E108-17 Class A Intermittent Flame, Spread of Flame, and Burning Brand procedures at a 5:12 slope.

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SECTION 10 PHOTOGRAPHS



Photo No. 1
Assembly #1 Deck Construction (Typical)



Photo No. 2
Assembly #1 2-inch Overlap (Typical)

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Photo No. 3
Assembly #1 Intermittent Flame #1 (Typical)

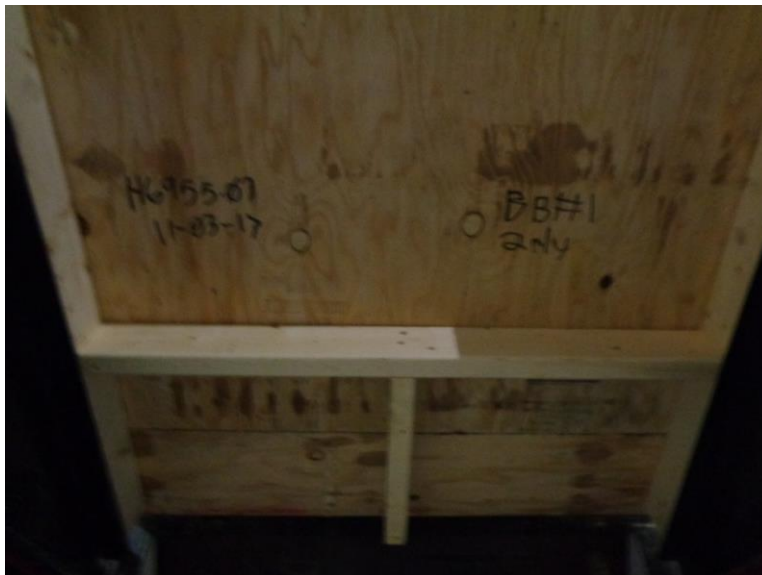


Photo No. 4
Assembly #1 Intermittent Flame #1 Underdeck (Typical)

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Photo No. 5
Assembly #1 Intermittent Flame #1 During Test



Photo No. 6
Assembly #1 Intermittent Flame #1 Underdeck During Test

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Photo No. 7

Assembly #1 Intermittent Flame #1 Post Test



Photo No. 8

Assembly #1 Intermittent Flame #1 Underdeck Post Test

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Photo No. 9
Assembly #1 Intermittent Flame #2 During Test



Photo No. 10
Assembly #1 Intermittent Flame #2 Underdeck During Test

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Photo No. 11

Assembly #1 Intermittent Flame #2 Underdeck Combustion



Photo No. 12

Assembly #1 Intermittent Flame #2 Post Test

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Photo No. 13

Assembly #1 Intermittent Flame #2 Underdeck Post Test



Photo No. 14

Assembly #2 Intermittent Flame #1 Deck Construction (Typical)

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Photo No. 15
Assembly #2 2-inch Overlap



Photo No. 16
Assembly #2 Intermittent Flame #1 During Test

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Photo No. 17

Assembly #2 Intermittent Flame #1 Underdeck During Test



Photo No. 18

Assembly #2 Intermittent Flame #1 Underdeck Combustion

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Photo No. 19

Assembly #2 Intermittent Flame #1 Post Test



Photo No. 20

Assembly #2 Intermittent Flame #1 Underdeck Post Test

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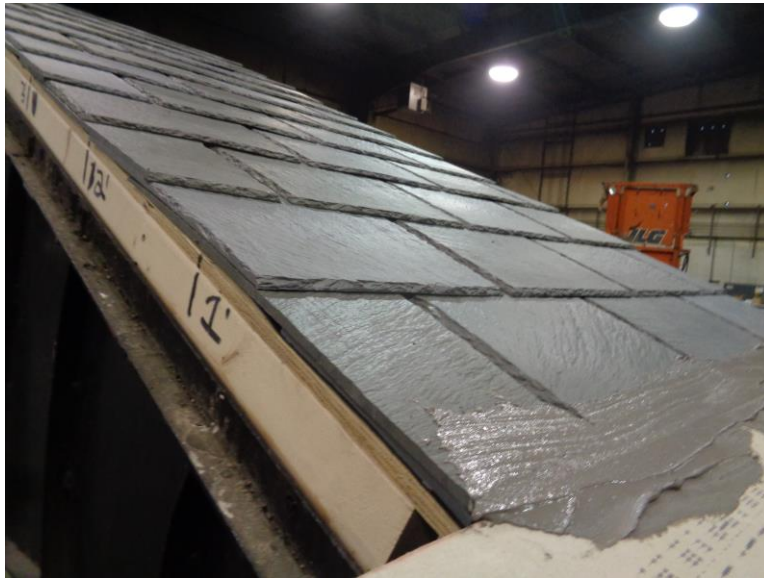


Photo No. 21
Assembly #2 Spread of Flame #1 Pre-test (Typical)



Photo No. 22
Assembly #2 Spread of Flame #1 During Test

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Photo No. 23

Assembly #2 Spread of Flame #1 Post Test



Photo No. 24

Assembly #2 Spread of Flame #1 Post Test

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Photo No. 25
Assembly #2 Spread of Flame #2 During Test



Photo No. 26
Assembly #2 Spread of Flame #2 Post Test

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Photo No. 27

Assembly #2 Spread of Flame #2 Post Test



Photo No. 28

Assembly #2 Burning Brand #1 Pre-test (Typical)

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Photo No. 29

Assembly #2 Burning Brand #1 Underdeck pre-test (Typical)



Photo No. 30

Assembly #2 Burning Brand #2 During Test

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Photo No. 31

Assembly #2 Burning Brand #1 Underdeck During Test (Typical)



Photo No. 32

Assembly #1 Burning Brand #1 Post Test

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Photo No. 33

Assembly #2 Burning Brand #1 Underdeck Post Test



Photo No. 34

Assembly #2 Burning Brand #2 During Test

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Photo No. 35

Assembly #2 Burning Brand #2 Post Test



Photo No. 36

Assembly #2 Burning Brand #2 Underdeck Post Test

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Photo No. 37
Assembly #2 Burning Brand #3 During Test



Photo No. 38
Assembly #2 Burning Brand #3 Post Test

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Photo No. 39

Assembly #2 Burning Brand #3 Underdeck Post Test



Photo No. 40

Assembly #2 Burning Brand #4 During Test

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Photo No. 41
Assembly #2 Burning Brand #4 Post Test



Photo No. 42
Assembly #2 Burning Brand #4 Underdeck Post Test

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REVISION #	DATE	PAGES	REVISION
0	07/10/18	N/A	Original Report Issue
1	11/30/17	1	Added revision date
1	11/30/17	2	Added Signature Date
2	7/10/18	2, 7, 8	Corrected Assembly designations
3	7/23/18	2-7, 8	Corrected Assembly designations