



REPORT NUMBER: 101831668MID-009
ORIGINAL ISSUE DATE: February 9, 2015

TEST REPORT

EVALUATION CENTER
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Middleton, WI 53562

RENDERED TO

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PRODUCT EVALUATED:
Coated Foam Tiles for Roofing Application

EVALUATION PROPERTY:
ASTM E108, "Standard Methods for Fire Tests of Roof Coverings"

Report of Testing Eterna Tile Inc's proprietary coated foam tiles for roofing tiles for compliance with the applicable requirements of ASTM E108 (2010) "Standard Test Methods for Fire Tests of Roof Coverings" and UL 790 (2004).

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2 Introduction

Intertek Testing Services NA (Intertek) Fire Testing Laboratory in Middleton, Wisconsin conducted an investigation of the external fire resistance characteristics of Eterna Tile Inc's coated roofing tile, for class "A" application. The samples were received at the laboratory October 16, 2014 and in January, 2015 in good condition.

The tests were conducted in accordance with ASTM E108 (2010) "*Standard Test Methods for Fire Tests of Roof Coverings*" and UL 790 (2004).

3 Test Samples

The plywood decks were constructed by Intertek technicians according to the specifications of test standard ASTM E108 (2010) "*Standard Test Methods for Fire Tests of Roof Coverings*".

1. The test material was submitted by the client.
2. Test samples were installed by Intertek technicians and the client.

The samples are described in more detail in the table below.

Deck#	Deck Type	Deck Material	System
1	Spread of Flames	15/32" AC Plywood	(1) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.
2	Spread of Flames	15/32" AC Plywood	(1) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.
3	Intermittent Flames	15/32" AC Plywood	(2) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.
4	Intermittent Flames	15/32" AC Plywood	(1) ply 30# felt underlayment, (2) ply MB Technologies TU-25 underlayment with Eterna Tile 3 tab tiles mechanically fastened with metal cap screws through top of panel.
5	Burning Brand	15/32" AC Plywood	(1) sheet Densdeck, (1) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.
6	Burning Brand	15/32" AC Plywood	(1) sheet Densdeck, (1) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.
7	Burning Brand	15/32" AC Plywood	(1) sheet Densdeck, (1) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.
8	Burning Brand	15/32" AC Plywood	(1) sheet Densdeck, (1) ply 30# felt underlayment with Eterna Tile PV tiles mechanically fastened with metal cap screws through top of panel.

4 Testing and Evaluation Methods

The tests were conducted in accordance with ASTM E108 (2010) "Standard Test Methods for Fire Tests of Roof Coverings" and UL 790 (2004)

5 Test Results

5.1. Calibration

Test Conditions (Class A)

Test Date	11/12/14
Air Velocity	1050.6 fpm
Slope of Cal. Deck	5:12
Average flame temp	1406°F
Ambient air temp.	76°F

Test Conditions (Class A)

Test Date	11/13/2014
Air Velocity	1055 fpm
Slope of Cal. Deck	5:12
Average flame temp	N/A
Ambient air temp.	67°F

Test Conditions (Class A)

Test Date	11/14/2014
Air Velocity	1053.6 fpm
Slope of Cal. Deck	5:12
Average flame temp	1387°F
Ambient air temp.	70°F

Test Conditions (Class A)

Test Date	12/09/2015
Air Velocity	1047 fpm
Slope of Cal. Deck	5:12
Average flame temp	N/A
Ambient air temp.	70°F

Test Conditions (Class A)

Test Date	02/03/2015
Air Velocity	1046.3 fpm
Slope of Cal. Deck	5:12
Average flame temp	1401°F
Ambient air temp.	72°F

5.2. Results and Observations

Spread of Flames Tests

Test Observations Deck: 1

Test Date	11/12/14
Slope of Test Deck	5:12
Ambient Temperature	75°F

Time (min:sec)	Distance (feet-inches)	Observations/Comments
00:00		Burner ignited.
00:43		Surface ignition.
01:17	1'	
03:23		Surface blistering and popping.
01:30		Test stop.

Acceptance Level: Class (A), maximum spread of flames 1'5".

Test Observations Deck: 2

Test Date	02/03/15
Slope of Test Deck	5:12
Ambient Temperature	75°F

Time (min:sec)	Distance (feet-inches)	Observations/Comments
00:00		Burner ignited.
00:55		Surface ignition.
01:40	1'	
02:29	2'	
03:30		Flame retreating.
10:00		Test stop.

Acceptance Level: Class (A), maximum spread of flames 2'8".

Intermittent Flame Tests

Test Observations Deck 3

Test Date	11/12/14
Ambient Air Temperature	80°F
Slope of Test Deck	5:12

Cycle		Time To:		Observations/Comments (Include Off Cycles)
No.	Min.	Ignition (min : sec)	Flame Out (min : sec)	
1	Start	00:48	02:42	
2	4	NI	NI	05:24 Surface blistering and popping.
3	8	NI	NI	
4	12	NI	NI	
5	16	NI	NI	
6	20	NI	NI	
7	24	NI	NI	
8	28	NI	NI	
9	32	NI	NI	
10	36	NI	NI	
11	40	NI	NI	
12	44	NI	NI	
13	48	NI	NI	
14	52	NI	NI	54:26 Large chunk of foam blows off.
15	56	56:18	64:44	70:00 – Test stop.

Acceptance Level: Class "A" – No flaming of the underside of the deck.
NI = No Ignition.

Test Observations Deck 4

Test Date	11/14/14
Ambient Air Temperature	73°F
Slope of Test Deck	5:12

Cycle		Time To:		Observations/Comments (Include Off Cycles)
No.	Min.	Ignition (min : sec)	Flame Out (min : sec)	
1	Start	00:42	03:08	
2	4	NI	NI	
3	8	NI	NI	
4	12	NI	NI	
5	16	NI	NI	
6	20	NI	NI	
7	24	25:18	26:00	
8	28	NI	NI	
9	32	NI	NI	
10	36	NI	NI	
11	40	NI	NI	
12	44	NI	NI	
13	48	NI	NI	
14	52	NI	NI	
15	56	56:18	64:44	63:33 Tile explodes, 59:16 Smoke from underside, 107:11 Glow at horizontal joint, 120:00 – Test stop.

Acceptance Level: Class "A" – No flaming of the underside of the deck.
NI = No Ignition.

Burning Brand Tests

Test Observations Deck 5

Test Date	01/09/15
Ambient Air Temperature	72°
Brand Type	Class A, 4.37lbs
Slope of Test Deck	5:12

Brand#	Time (min:sec) Brand placed on deck	Observations
1	00:00	Brand placed on deck.
	00:37	Surface ignition.
	05:41	Brand ¼ consumed.
	07:56	Brand ½ consumed.
	10:11	Brand ¾ consumed.
	28:42	Discoloring at horizontal joint, underside.
	90:00	Test Stop.

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

Test Observations Deck 6

Test Date	01/09/15
Ambient Air Temperature	70°
Brand Type	Class A, 4.66lbs
Slope of Test Deck	5:12

Brand#	Time (min:sec) Brand placed on deck	Observations
1	00:00	Brand placed on deck.
	00:59	Surface ignition.
	05:23	Brand ¼ consumed,
	08:30	Brand ½ consumed.
	13:18	Brand ¾ consumed.
	55:14	Smoke from horizontal joint, underside.
	61:28	Smoke out underside.
	68:04	Flame out topside, brand fully consumed.
	90:00	Test stop.

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

Test Observations Deck 7

Test Date	02/03/15
Ambient Air Temperature	70°
Brand Type	Class A, 4.45lbs
Slope of Test Deck	5:12

Brand#	Time (min:sec) Brand placed on deck	Observations
1	00:00	Brand placed on deck.
	00:39	Surface ignition.
	04:01	Brand ¼ consumed,
	05:21	Brand ½ consumed.
	08:12	Brand ¾ consumed.
	30:07	Flame out, glow out topside, brand fully consumed.
	50:00	Test stop.

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

Test Observations Deck 8

Test Date	02/03/15
Ambient Air Temperature	73°
Brand Type	Class A, 4.47lbs
Slope of Test Deck	5:12

Brand#	Time (min:sec) Brand placed on deck	Observations
1	00:00	Brand placed on deck.
	00:20	Surface ignition.
	04:11	Brand ¼ consumed,
	05:47	Brand ½ consumed.
	08:36	Brand ¾ consumed.
	48:23	Flame out glow out topside, brand fully consumed.
	50:27	Discoloration at horizontal joint, underside.
	90:00	Test stop.

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

6 Conclusion

The tests were conducted in accordance with ASTM E108 (2010) “*Standard Test Methods for Fire Tests of Roof Coverings*” and UL 790 (2004). Below is a summary of the test results.

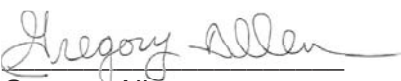
Sample #	Test	Results
1	Spread of Flames	Class “A”
2	Spread of Flames	Class “A”
3	Intermittent Flames	Class “A”
4	Intermittent Flames	Class “A”
5	Burning Brand	Class “A”
6	Burning Brand	Class “A”
7	Burning Brand	Class “A”
8	Burning Brand	Class “A”

Eterna Tile Inc’s proprietary coated foam roofing tiles, as described herein, met the criteria for Class ‘A’ applications at a 5:12 slope with minimum (1) layer of ½” DensDeck and (1) layer 30# felt underlayment applied beneath the tiles.

This report does not automatically imply product certification. Products must be under a certification program and bear the Warnock Hersey registered certification mark to demonstrate compliance.

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APPENDIX A

Photographs

PHOTOGRAPHS
Test 1



Test 2



Test 3



Test 4



Test 5



Test 6



Test 7



Test 8





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REVISION SUMMARY

DATE	SUMMARY
02/09/14	Initial report