



Test Results | THERMORY® White Ash

Fire Rating - Roof Deck Fire Resistance

Fire Rating
Roof Deck
Fire Resistance

TESTED

► Measured the surface spread of flame and the ability of the roof covering material to resist fire penetration from the exterior to the underside of a roof deck under the conditions of exposure in THERMORY® White Ash.

RESULTS

► ASTM E108 tests showed both 5/4 x 4" and 5/4 x 6" THERMORY® White Ash decking achieved a class "A" rating by not having the flame spread past 6 feet after 10 minutes.



THERMORY®
LEAVE A LASTING IMPACT

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CLIENT: **Thermory USA**
1213 Wilmette Avenue, Suite 208
Wilmette, IL 60091

Test Report Number : RJ9106F-1	Date: August 17, 2023
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SAMPLE ID: The client identified the following test material as:
Thermory Ash 5/4" x 4" standard decking.

SAMPLING DETAIL: Test Samples were submitted to the Laboratory directly by the client. No sampling or sample preparation were observed by QAI staff.

DATE OF RECEIPT: Samples were received at QAI facilities on: July 28, 2023

TESTING PERIOD: August 4, 2023

AUTHORIZATION: Testing was authorized by Jake Mingle for proposal 23DN0706-01 signed July 23, 2023

TEST REQUESTED: Evaluate the clients Roof Covering system in accordance to ASTM E 108-2020 Edition which outlines testing to be conducted using the procedures and methods outlined in ASTM E 108-20 "Standard Test Methods for Fire Tests of Roof Coverings" and CAN/ULC-S107-10 "Fire Tests of Roof Coverings".

TEST RESULTS: **Test #1, and #2:** The Thermory Ash 5/4" x 4" standard decking when installed at a 0:12 (flat) test slope and on a non-combustible surface **has met** the Class A Spread of Flame requirements of ASTM E108-20.

Detailed test results are provided on the subsequent pages of this report.

Prepared By



Victor A Peinado
Fire Lab Supervisor

**Signed for and on behalf of
QAI Laboratories, Inc.**



Jason Friedrich P.E.
Engineering Manager

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DETAILS OF THE TESTING

TEST SAMPLE DESCRIPTION

1.0 Description of Test Specimens

Table 1 outlines the Thermory USA Roof Covering system evaluated by QAI Laboratories

COMPONENT	SUPPLIER	COMMENT
Framing Type / Species	Lowes	Moisture Content: 8-12%
Douglas Fir No.1		
Sheathing Type / Grade	Lowes JH Research 1/4" hardie backer	Hardie-Backer Cement Board used as non-combustible sheathing.
non-combustible		
Roof Covering Material 1 / Grade:	Thermory USA	Sent directly by the client to QAI Laboratories
Thermory Ash 5/4" x 4" standard decking.		

Table No. 1: Details of the Thermory USA Roof Covering Test Specimens.

DETAILS OF THE TESTING

2.0 Test Set Up and Procedure:

Storage of Assembled Test Decks

All test deck assemblies were stored indoors at temperatures not lower than 60F (16C) nor higher than 90F (32C) for the period of time necessary to cure the assembly components prior to testing. The test decks were stored in such a manner to assure that each deck was surrounded by free circulating air.

A photograph of the assembled test deck is provided in Appendix B of this report.

Roof System and Deck Assembly Construction Details

Lumber:	Nominal 2" X 4" Douglas Fir, moisture content between 8-12%.
Deck:	Non-combustible deck.
Roof Covering:	The 5/4" x 4' were fastened down with a 1/4" gap between each board on top of the Non-combustible deck parallel to test frame.

Test Procedure

Spread of Flame

Two Test decks were constructed in accordance with Section 6 of ASTM E108 with final measurements of 40-inch wide by 8-feet long and were individually mounted onto the test chamber compliant with Section 5 of ASTM E108, CAN/ULC S107 and UL 790. The 10-minute Spread of Flame test was run in accordance to Section 7 of UL790, Section 6.3 of CAN/ULC S107 and Section 9 of ASTM E108 on the roof deck assembly's exposed roofing surface with observations of flame-spread distance and other significant observations recorded on the individual test data sheets in the Appendix A of this report.

2.1 Test Requirements

At no time during or after the intermittent flame, spread of flame or burning brand tests shall:

- 1 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, or
- 2 The roof deck be exposed, or
- 3 Portions of the roof deck fall away in the form of particles that continue to glow after reaching the chamber floor.
- 4 At no time during the Class A intermittent flame or burning brand tests shall there be sustained flaming of the underside of the test assembly deck.
- 5 At the conclusion of the spread of flame tests, the flaming shall not have spread beyond 6 feet for Class A.
- 6 There shall have been no significant lateral spread of flame from the path directly exposed to the test flame during spread of flame tests.

3.0 Test Results

The following summarizes testing conducted by QAI during testing of the Thermory USA Thermory Ash 5/4" x 4" standard decking. Roof Covering when tested to ASTM E 108-20.

Client Name:	Thermory USA	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ9106F-1	Criteria Version:	2020 Edition	Sheathing Type / Grade	non-combustible
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	N/A
Version / Publication of Method:	20			Underlayment 2: Grade / Type:	N/A
System Type	Roof			Joint Compound?	N/A
Test Slope	0:12	(flat)		Insulation Type / Grade	N/A
Test Degree	0			Roof Covering Material 1 / Grade:	Thermory Ash 5/4" x 4" standard decking.
Burning Brand	No			Thickness	1 in
Intermittant Flame	No				
Spread of Flame	Yes				
Roofing Class	A				

Sample ID:

Thermory Ash 5/4" x 4" standard decking.

Test Conditions	Class A Requirement	Average Recorded
Wind Speed (ft/min)	1012 – 1100 ft/min	1053 (ft/min)
Flame Temperature (°F)	1400 ± 50 (°F)	1382 (°F)

Conclusion:

The Thermory Ash 5/4" x 4" standard decking system when installed at a 0:12 (flat) test slope and on non-combustible surface **has met** the Class A Spread of Flame requirements of ASTM E108-20.

Spread of Flame Test							
Test Date	Test Assembly	Ignition Time (MM:SS)	Maximum Spread of Flame (ft)	Lateral Spread of Flame (ft)	Condition @ Start of Test		Result:
					Temp. (°F)	RH (%)	
2023-08-04	1	00:26	3.0	0	43	73	Pass
2023-08-04	2	00:35	3.0	0	43	73	Pass

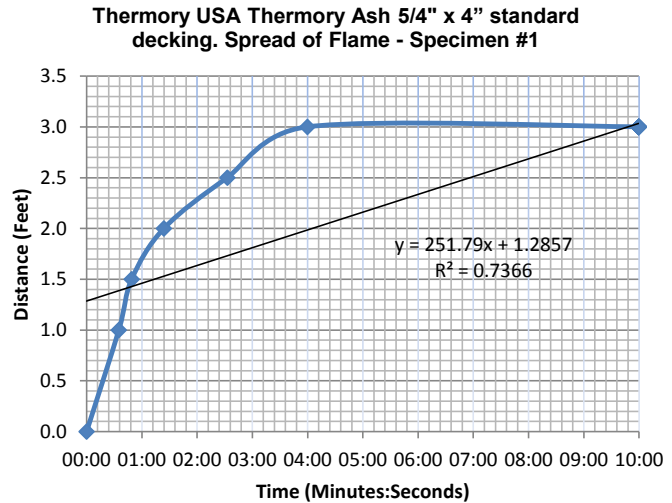
Appendix A: Spread of Flame-Test Specimen #1

Client Name:	Thermory USA	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ9106F-1	Criteria Version:	2020 Edition	Sheathing Type / Grade	non-combustible
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	N/A
Publication of	20			Underlayment 2: Grade / Type:	N/A
System Type	Roof Covering			Joint Compound?	N/A
Test Slope	0:12	(flat)		Insulation Type / Grade	N/A
Test Degree	0			Roof Covering Material 1 / Grade:	Thermory Ash 5/4" x 4" standard decking.
Burning Brand	No			Thickness	1 in
Intermittant Flame	No			Test Temperature (°F)	43
Spread of Flame	Yes			Test Humidity (%)	73
Roofing Class	A			Test Date	8-4-2023

Sample Id:

Thermory USA Thermory Ash 5/4" x 4" standard decking. Spread of Flame - Specimen #1

# of Feet	Time (mm : ss)	Half Foot	Time (mm : ss)
1	00:35	1.5	00:49
2	01:24	2.5	02:33
3	04:00	3.5	
4		4.5	
5		5.5	
6		6.5	
7		7.5	
8			



Test Duration (Minutes:Seconds) 10:00
Time of Ignition (Minutes:Seconds) 00:26
Maximum Spread of Flame (ft) 3.0
Time at Maximum Spread of Flame (ft) 04:00

Flame Front Recession (ft) 0
Lateral Flame Spread (ft) 0
Flame Spread Distance at Test End (ft) 3.0
Test Result for Class A Pass

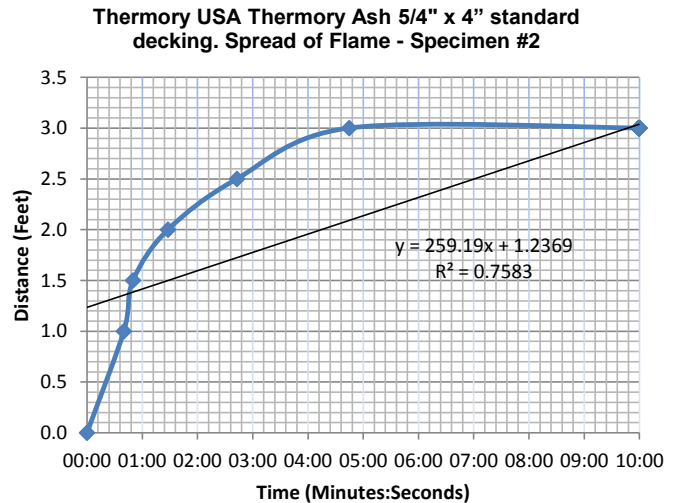
Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2023-06-30	2024-06-30
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2023-06-30	2024-06-30
TU8124	Digital Thermometer	-328°F - 2498°F	2023-06-30	2024-06-30
RP0072	Calibrated Tape Measure	0-25 Feet	2023-06-30	2024-06-30
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2023-06-30	2024-06-30
RE0039	Digital Angle Gauge	0° to 90°	2023-06-30	2024-06-30
RF0031	UL790 Test Chamber	AS PER UL790	2023-08-04	Per USE

Appendix A: Spread of Flame-Test Specimen #2

Client Name:	Thermory USA	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ9106F-1	Criteria Version:	2020 Edition	Sheathing Type / Grade	non-combustible
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	N/A
Publication of	20			Underlayment 2: Grade / Type:	N/A
System Type	Roof Covering			Joint Compound?	N/A
Test Slope	0:12	(flat)		Insulation Type / Grade	N/A
Test Degree	0			Roof Covering Material 1 / Grade:	Thermory Ash 5/4" x 4" standard decking.
Burning Brand	No			Thickness	1 in
Intermittant Flame	No			Test Temperature (°F)	43
Spread of Flame	Yes			Test Humidity (%)	73
Roofing Class	A			Test Date	8-4-2023

Sample Id: **Thermory USA Thermory Ash 5/4" x 4" standard decking. Spread of Flame - Specimen #2**

# of Feet	Time (mm : ss)	Half Foot	Time (mm : ss)
1	00:40	1.5	00:50
2	01:28	2.5	02:43
3	04:45	3.5	
4		4.5	
5		5.5	
6		6.5	
7		7.5	
8			



Test Duration (Minutes:Seconds)	10:00
Time of Ignition (Minutes:Seconds)	00:35
Maximum Spread of Flame (ft)	3.0
Time at Maximum Spread of Flame (ft)	04:45

Flame Front Recession (ft)	0
Lateral Flame Spread (ft)	0
Flame Spread Distance at Test End (ft)	3.0
Test Result for Class A	Pass

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2023-06-30	2024-06-30
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2023-06-30	2024-06-30
TU8124	Digital Thermometer	-328°F - 2498°F	2023-06-30	2024-06-30
RP0072	Calibrated Tape Measure	0-25 Feet	2023-06-30	2024-06-30
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2023-06-30	2024-06-30
RE0039	Digital Angle Gauge	0° to 90°	2023-06-30	2024-06-30
RF0031	UL790 Test Chamber	AS PER UL790	2023-08-04	Per USE

Appendix B: Photographs



Photograph 1: Spread of flame test Specimen prior to test.



Photograph 2: Post test, Spread of flame.

<<<END OF REPORT>>>

CLIENT: Thermory USA
1213 Wilmette Avenue, Suite 208
Wilmette, IL 60091

Test Report Number : RJ8258F-1	Date: October 25, 2021
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SAMPLE ID: The client identified the following test material as:
Thermory Ash 5/4" x 6" standard decking.

SAMPLING DETAIL: Test Samples were submitted to the Laboratory directly by the client. No sampling or sample preparation were observed by QAI staff.

DATE OF RECEIPT: Samples were received at QAI facilities on: October 12, 2021

TESTING PERIOD: October 22, 2021

AUTHORIZATION: Testing was authorized by Jake Mingle for proposal 21DN0825-02 signed September 2, 2021

TEST REQUESTED: Evaluate the clients Roof Covering system in accordance to ASTM E 108-2017 Edition which outlines testing to be conducted using the procedures and methods outlined in ASTM E 108-20 "Standard Test Methods for Fire Tests of Roof Coverings" and CAN/ULC-S107-10 "Fire Tests of Roof Coverings".

TEST RESULTS: **Test #1, and #2:** The Thermory Ash 5/4" x 6" standard decking when installed at a 0:12 (flat) test slope and on a non-combustible surface has met the Class A Spread of Flame requirements of ASTM E108-20.

Detailed test results are provided on the subsequent pages of this report.

Prepared By



Victor A Peinado
Senior Test Technician

**Signed for and on behalf of
QAI Laboratories, Inc.**



Jason Friedrich P.E.
Engineering Manager

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DETAILS OF THE TESTING

TEST SAMPLE DESCRIPTION

1.0 Description of Test Specimens

Table 1 outlines the Thermory USA Roof Covering system evaluated by QAI Laboratories

COMPONENT	SUPPLIER	COMMENT
Framing Type / Species	Lowes	Moisture Content: 8-12%
Douglas Fir No.1		
Sheathing Type / Grade		Hardie-Backer Cement Board used as non-combustible sheathing.
non-combustible	Lowes JH Research 1/4" hardie backer	
Roof Covering Material 1 / Grade:	Thermory USA	Sent directly by the client to QAI Laboratories
Thermory Ash 5/4" x 6" standard decking.		

Table No. 1: Details of the Thermory USA Roof Covering Test Specimens.

DETAILS OF THE TESTING

2.0 Test Set Up and Procedure:

Storage of Assembled Test Decks

All test deck assemblies were stored indoors at temperatures not lower than 60F (16C) nor higher than 90F (32C) for the period of time necessary to cure the assembly components prior to testing. The test decks were stored in such a manner to assure that each deck was surrounded by free circulating air.

A photograph of the assembled test deck is provided in Appendix B of this report.

Roof System and Deck Assembly Construction Details

Lumber:	Nominal 2" X 4" Douglas Fir, moisture content between 8-12%.
Deck:	Non-combustible deck.
Roof Covering:	The 5/4" x 6' were fastened down with a 1/4" gap between each board on top of the Non-combustible deck parallel to test frame.

Test Procedure**Spread of Flame**

Two Test decks were constructed in accordance with Section 6 of ASTM E108 with final measurements of 40-inch wide by 8-feet long and were individually mounted onto the test chamber compliant with Section 5 of ASTM E108, CAN/ULC S107 and UL 790. The 10-minute Spread of Flame test was run in accordance to Section 7 of UL790, Section 6.3 of CAN/ULC S107 and Section 9 of ASTM E108 on the roof deck assembly's exposed roofing surface with observations of flame-spread distance and other significant observations recorded on the individual test data sheets in the Appendix A of this report.

2.1 Test Requirements

At no time during or after the intermittent flame, spread of flame or burning brand tests shall:

- 1 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, or
- 2 The roof deck be exposed, or
- 3 Portions of the roof deck fall away in the form of particles that continue to glow after reaching the chamber floor.
- 4 At no time during the Class A intermittent flame or burning brand tests shall there be sustained flaming of the underside of the test assembly deck.
- 5 At the conclusion of the spread of flame tests, the flaming shall not have spread beyond 6 feet for Class A.
- 6 There shall have been no significant lateral spread of flame from the path directly exposed to the test flame during spread of flame tests.

3.0 Test Results

The following summarizes testing conducted by QAI during testing of the Thermory USA Thermory Ash 5/4" x 6" standard decking. Roof Covering when tested to ASTM E 108-20.

Client Name:	Thermory USA	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8258F-1	Criteria Version:	2017 Edition	Sheathing Type / Grade	non-combustible
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	N/A
Version / Publication of Method:	20			Underlayment 2: Grade / Type:	N/A
System Type	Covering			Joint Compound?	N/A
Test Slope	0:12	(flat)		Insulation Type / Grade	N/A
Test Degree	0			Roof Covering Material 1 / Grade:	Thermory Ash 5/4" x 6" standard decking.
Burning Brand	No			Thickness	1 in
Intermittant Flame	No				
Spread of Flame	Yes				
Roofing Class	A				

Sample ID:

Thermory Ash 5/4" x 6" standard decking.

Test Conditions	Class A Requirement	Average Recorded
Wind Speed (ft/min)	1012 – 1100 ft/min	1053 (ft/min)
Flame Temperature (°F)	1400 ± 50 (°F)	1382 (°F)

Conclusion:

The Thermory Ash 5/4" x 6" standard decking system when installed at a 0:12 (flat) test slope and on non-combustible surface has met the Class A Spread of Flame requirements of ASTM E 108-20.

Spread of Flame Test							
Test Date	Test Assembly	Ignition Time (MM:SS)	Maximum Spread of Flame (ft)	Lateral Spread of Flame (ft)	Condition @ Start of Test		Result:
					Temp. (°F)	RH (%)	
10/22/2021	1	01:08	2.5	0	58	72	Pass
10/22/2021	2	01:15	2.5	0	58	72	Pass

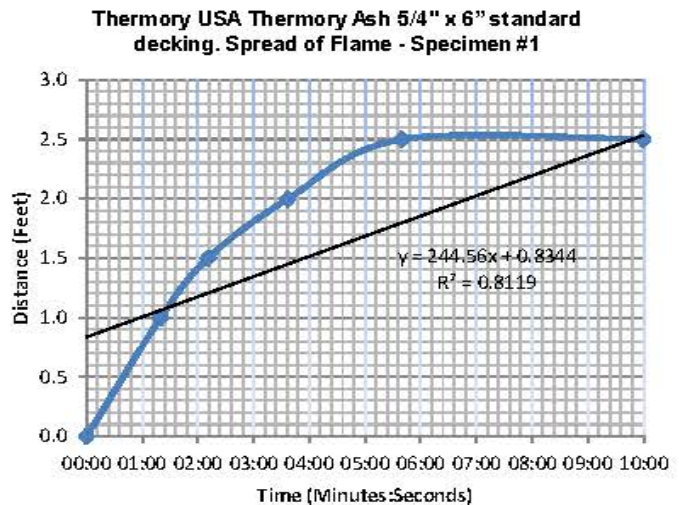
Appendix A: Spread of Flame-Test Specimen #1

Client Name:	Thermory USA	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8258F-1	Criteria Version:	2017 Edition	Sheathing Type / Grade	non-combustible
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	N/A
Publication of	20			Underlayment 2: Grade / Type:	N/A
System Type	Roof Covering			Joint Compound?	N/A
Test Slope	0:12	(flat)		Insulation Type / Grade	N/A
Test Degree	0			Roof Covering Material 1 / Grade:	Thermory Ash 5/4" x 6" standard decking...
Burning Brand	No			Thickness	1 in
Intermittant Flame	No			Test Temperature (°F)	58
Spread of Flame	Yes			Test Humidity (%)	72
Roofing Class	A			Test Date	10/22/2021

Sample Id:

Thermory USA Thermory Ash 5/4" x 6" standard decking. Spread of Flame - Specimen #1

# of Feet	Time (mm : ss)	Half Foot	Time (mm : ss)
1	01:20	1.5	02:11
2	03:37	2.5	05:40
3		3.5	
4		4.5	
5		5.5	
6		6.5	
7		7.5	
8			



Test Duration (Minutes:Seconds)	10:00
Time of Ignition (Minutes:Seconds)	01:08
Maximum Spread of Flame (ft)	2.5
Time at Maximum Spread of Flame (ft)	05:40

Flame Front Recession (ft)	0
Lateral Flame Spread (ft)	0
Flame Spread Distance at Test End (ft)	2.5
Test Result for Class A	Pass

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	6/30/2021	6/30/2022
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2/26/2021	2/26/2022
TU8124	Digital Thermometer	-328°F - 2498°F	6/30/2021	6/30/2022
RP0072	Calibrated Tape Measure	0-25 Feet	9/3/2021	9/3/2022
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	6/30/2021	6/30/2022
RE0039	Digital Angle Gauge	0° to 90°	5/15/2021	5/15/2022
RF0031	UL790 Test Chamber	AS PER UL790	10/22/2021	Per USE

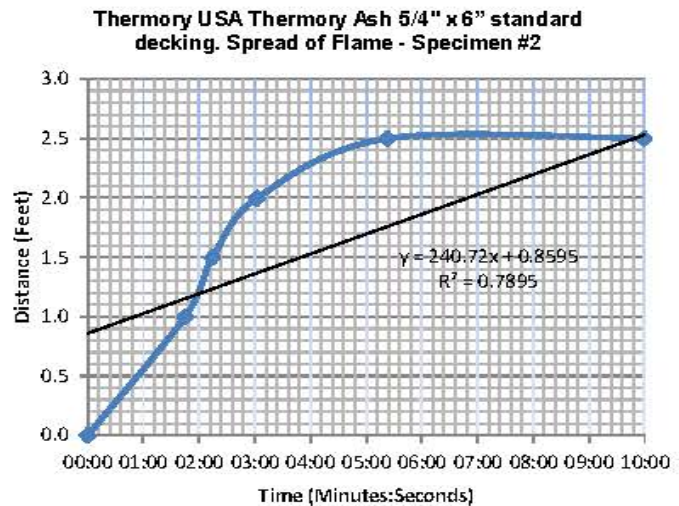
Appendix A: Spread of Flame-Test Specimen #2

Client Name:	Thermory USA	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8258F-1	Criteria Version:	2017 Edition	Sheathing Type / Grade	non-combustible
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	N/A
Publication of	20			Underlayment 2: Grade / Type:	N/A
System Type	Roof Covering			Joint Compound?	N/A
Test Slope	0.12	(flat)		Insulation Type / Grade	N/A
Test Degree	0			Roof Covering Material 1 / Grade:	Thermory Ash 5/4" x 6" standard decking
Burning Brand	No			Thickness	1 in
Intermittant Flame	No			Test Temperature (°F)	58
Spread of Flame	Yes			Test Humidity (%)	72
Roofing Class	A			Test Date	10/22/2021

Sample Id:

Thermory USA Thermory Ash 5/4" x 6" standard decking. Spread of Flame - Specimen #2

# of Feet	Time (mm : ss)	Half Foot	Time (mm : ss)
1	01:45	1.5	02:15
2	03:03	2.5	05:23
3		3.5	
4		4.5	
5		5.5	
6		6.5	
7		7.5	
8			



Test Duration (Minutes:Seconds) 10:00
 Time of Ignition (Minutes:Seconds) 01:15
 Maximum Spread of Flame (ft) 2.5
 Time at Maximum Spread of Flame (ft) 05:23

Flame Front Recession (ft) 0
 Lateral Flame Spread (ft) 0
 Flame Spread Distance at Test End (ft) 2.5
 Test Result for Class A Pass

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	6/30/2021	6/30/2022
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2/26/2021	2/26/2022
TU8124	Digital Thermometer	-328°F - 2498°F	6/30/2021	6/30/2022
RP0072	Calibrated Tape Measure	0-25 Feet	9/3/2021	9/3/2022
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	6/30/2021	6/30/2022
RE0039	Digital Angle Gauge	0° to 90°	5/15/2021	5/15/2022
RF0031	UL790 Test Chamber	AS PER UL790	10/22/2021	Per USE

Appendix B: Photographs



Photograph 1: First Spread of flame test Specimen prior to test.



Photograph 2: First Spread of flame, post test.

<<END OF REPORT>>