QAI LABORATORIES
CERTIFICATION TESTING INSPECTION

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CLIENT: **MB Technology**
188 S. Teilman
Fresno, CA 93706

Test Report Number :	**RJ8548F-2**	**Date:**	**June 30, 2022**

SAMPLE ID: The client identified the following test material as:
TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment

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

DATE OF RECEIPT: Samples were received at QAI facilities on: June 22, 2022

TESTING PERIOD: June 22, 2022, thru June 24, 2022.

AUTHORIZATION: Testing was authorized by Ray Fetcher for proposal 22MB03292R3 signed March 29, 2022

TEST REQUESTED: Evaluate the client's roof system in accordance to ASTM E 108-20a which outlines testing to be conducted using the procedures and methods outlined in ASTM E 108-20a "Standard Test Methods for Fire Tests of Roof Coverings".

TEST RESULTS: The TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment applied with composition shingles, when tested at a 5:12 test slope, ***has met*** the performance requirements of Class A Burning Brand, and Class A Intermittent Flame per ASTM E 108 when tested and evaluated to the requirements outlined in ASTM E 108-20a – UL 790.

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 MB Technology roof system evaluated by QAI.Laboratories

COMPONENT	SUPPLIER	COMMENT
Framing Type / Species	Lowes	Moisture Content: 8-12%
Douglas Fir No.1		
Sheathing Type / Grade	Lowes	AC Exterior Grade Plywood
AC Exterior 15/32"		
Underlayment 1: Grade / Type:	MB Technology	Roofing Underlayment was supplied by the client.
TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment		
Roof Covering Material 1 / Grade:	Lowes	shingles were supplied by QAI Laboratories
Composition Roofing Shingles		

Table No. 1: Details of the MB Technology 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 indoor at temperatures not lower than 60 ºF (16 ºC) nor higher than 90 ºF (32 ºC) for the period of time necessary to cure the assemblies and 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:	15/32" AC Exterior grade plywood, moisture content not greater than 8%.
Underlayment:	TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment was installed in accordance to the manufactures installation instructions. Each test was installed with a single layer of Underlayment and was mechanically fastened to the test deck 18” inches on center and incorporated a 2” overlap.
Roof Covering:	The ASTM D3462 Composition shingles were installed in accordance to the manufactures installation instructions. The Composition Shingles were fastened to the test deck using four 1 1/4" roofing nail per shingle. Each course of shingles was layered down in a manner as to leave 6" of the previous layer exposed.

Test Procedure

Burning Brand

Four test decks were constructed in accordance with Section 4 of UL790 and Section 6 of ASTM E108 with final measurements of 40-inch wide by 52-inch long and were individually mounted onto the test chamber compliant with Section 5 of ASTM E108 and UL 790. The burning brand was ignited following the sequence outlined in the method and the test was performed in accordance to Section 8 of UL790 and Section 10 of ASTM E108. Observations were made and recoded during a 90 minute test period and recorded on the individual test data sheets in the Appendix A of this report.

Intermittent Flame

Two test deck were constructed in accordance with Section 4 of UL790 and Section 6 of ASTM E108 with final measurements of 40-inch wide by 52-inch long and were individually mounted onto the test chamber compliant with Section 5 of ASTM E108 and UL 790. The 90-minute Intermittent Flame test was performed in accordance to Section 6 of UL790 and Section 8 of ASTM E108 on the roof deck assembly's exposed roofing surface with 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 8 feet for Class A.

6 There shall be 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 MB Technology TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment roof when tested to ASTM E 108-20a.

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Version / Publication of Method:	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes				
Spread of Flame	No				
Roofing Class	A				

Sample ID: TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment

Test Conditions	Class A Requirement	Average Recorded
Wind Speed (ft/min)	1012 – 1100 ft/min	1059 (ft/min)
Flame Temperature (°F)	1400 ± 50 (°F)	1389 (°F)
Burning Brand Weight (grams)	2000 ± 150 (grams)	1990.5 (grams)

Conclusion:

The TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment applied with composition shingles, when tested at a 5:12 test slope, ***has met*** the performance requirements of Class A Burning Brand, and Class A Intermittent Flame per ASTM E 108 when tested and evaluated to the requirements outlined in ASTM E 108-20a – UL 790.

Burning Brand Test

Test Date	Test Assembly	Brand Weight (g)	Sustained Under Deck Ignition Time (MM:SS)	Test Termination (MM:SS)	Condition @ Start of Test		Result:
					Temp. (°F)	RH (%)	
2022-06-22	1	1997.00	0:00:00	1:00:00	90.0	32	Pass
2022-06-22	2	1984.00	0:00:00	1:00:00	90.0	32	Pass
2022-06-22	3	1980.00	0:00:00	1:00:00	85.0	28	Pass
2022-06-22	4	2001.00	0:00:00	1:00:00	84.0	27	Pass

Intermittent Flame Test

Test Date	Test Assembly	Sustained Under Deck Ignition Time (MM:SS)	Test Termination (MM:SS)	Condition @ Start of Test		Result:
				Temp. (°F)	RH (%)	
2022-06-24	1	0:00:00	1:10:00	85	14	Pass
2022-06-24	2	0:00:00	1:10:00	85	14	Pass

Appendix A: Burning Brand-Test Specimen #1

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Version / Publication of	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes			Test Temperature (°F)	90
Spread of Flame	No			Test Humidity (%)	32
Roofing Class	A			Test Date	6-22-2022

Sample Id: TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment Burning Brand - Specimen #1

Critical Standard Observations	
Test Duration	1:00:00
Sustained Flaming on Underside of Roof Deck	0:00:00
Production of Flaming Brands of roof covering material	0:00:00
Production of Glowing Brands of roof covering material	0:00:00
Displacement of the Test Sample	0:00:00
Exposure of Portions of the deck	0:00:00
Falling away of portions of the deck	0:00:00
Result	Pass

General Test Observations	
Surface Ignition	0:01:15
smoking at the seam	0:08:50
charring at the seam	0:13:01
burning brand stopped flaming	0:16:55
burning brand stopped glowing	0:30:24
Test Terminated	1:00:00

Brand #	Brand Weight (grams)	Correct?	CC Number
1	1997.00	Yes	19
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2022-06-15	2023-06-15
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2021-07-26	2022-07-26
TU8124	Digitial Thermometer	-328°F - 2498°F	2022-06-15	2023-06-15
RP0072	Calibrated Tape Measure	0-25 Feet	2021-09-03	2022-09-03
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2022-06-15	2023-06-15
RE0039	Digital Angle Gauge	0° to 90°	2022-04-30	2023-04-30
RF0031	UL790 Test Chamber	AS PER UL790	2022-06-22	Per USE

Appendix A: Burning Brand-Test Specimen #2

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Version / Publication of	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes			Test Temperature (°F)	**90**
Spread of Flame	No			Test Humidity (%)	**32**
Roofing Class	A			Test Date	**6-22-2022**

Sample Id: **TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment Burning Brand - Specimen #2**

Critical Standard Observations	
Test Duration	**1:00:00**
Sustained Flaming on Underside of Roof Deck	**0:00:00**
Production of Flaming Brands of roof covering material	**0:00:00**
Production of Glowing Brands of roof covering material	**0:00:00**
Displacement of the Test Sample	**0:00:00**
Exposure of Portions of the deck	**0:00:00**
Falling away of portions of the deck	**0:00:00**
Result	**Pass**

General Test Observations	
Surface Ignition	**0:01:00**
smoking at the seam	**0:05:40**
charring at the seam	**0:10:30**
burning brand stopped flaming	**0:16:05**
burning brand stopped glowing	**0:24:30**
Test Terminated	**1:00:00**

Brand #	Brand Weight (grams)	Correct?	CC Number
1	1984.00	Yes	20
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2022-06-15	2023-06-15
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2021-07-26	2022-07-26
TU8124	Digitial Thermometer	-328°F - 2498°F	2022-06-15	2023-06-15
RP0072	Calibrated Tape Measure	0-25 Feet	2021-09-03	2022-09-03
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2022-06-15	2023-06-15
RE0039	Digital Angle Gauge	0° to 90°	2022-04-30	2023-04-30
RF0031	UL790 Test Chamber	AS PER UL790	2022-06-22	Per USE

Appendix A: Burning Brand-Test Specimen #3

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Publication of	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes			Test Temperature (°F)	85
Spread of Flame	No			Test Humidity (%)	28
Roofing Class	A			Test Date	6-22-2022

Sample Id: TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment Burning Brand - Specimen #3

Critical Standard Observations	
Test Duration	1:00:00
Sustained Flaming on Underside of Roof Deck	0:00:00
Production of Flaming Brands of roof covering material	0:00:00
Production of Glowing Brands of roof covering material	0:00:00
Displacement of the Test Sample	0:00:00
Exposure of Portions of the deck	0:00:00
Falling away of portions of the deck	0:00:00
Result	Pass

General Test Observations	
Surface Ignition	0:01:20
smoking at the seam	0:08:37
charring at the seam	0:12:08
burning brand stopped flaming	0:19:09
burning brand stopped glowing	0:23:50
Test Terminated	1:00:00

Brand #	Brand Weight (grams)	Correct?	CC Number
1	1980.00	Yes	21
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2022-06-15	2023-06-15
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2021-07-26	2022-07-26
TU8124	Digitial Thermometer	-328°F - 2498°F	2022-06-15	2023-06-15
RP0072	Calibrated Tape Measure	0-25 Feet	2021-09-03	2022-09-03
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2022-06-15	2023-06-15
RE0039	Digital Angle Gauge	0° to 90°	2022-04-30	2023-04-30
RF0031	UL790 Test Chamber	AS PER UL790	2022-06-22	Per USE

Appendix A: Burning Brand-Test Specimen #4

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Publication of	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes			Test Temperature (°F)	84
Spread of Flame	No			Test Humidity (%)	27
Roofing Class	A			Test Date	6-22-2022

Sample Id: TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment Burning Brand - Specimen #4

Critical Standard Observations	
Test Duration	1:00:00
Sustained Flaming on Underside of Roof Deck	0:00:00
Production of Flaming Brands of roof covering material	0:00:00
Production of Glowing Brands of roof covering material	0:00:00
Displacement of the Test Sample	0:00:00
Exposure of Portions of the deck	0:00:00
Falling away of portions of the deck	0:00:00
Result	Pass

General Test Observations	
Surface Ignition	0:01:22
smoking at the seam	0:06:45
charring at the seam	0:10:00
burning brand stopped flaming	0:16:30
burning brand stopped glowing	0:25:35
Test Terminated	1:00:00

Brand #	Brand Weight (grams)	Correct?	CC Number
1	2001.00	Yes	22
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		
	0.00		

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2022-06-15	2023-06-15
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2021-07-26	2022-07-26
TU8124	Digitial Thermometer	-328°F - 2498°F	2022-06-15	2023-06-15
RP0072	Calibrated Tape Measure	0-25 Feet	2021-09-03	2022-09-03
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2022-06-15	2023-06-15
RE0039	Digital Angle Gauge	0° to 90°	2022-04-30	2023-04-30
RF0031	UL790 Test Chamber	AS PER UL790	2022-06-22	Per USE

Appendix A: Intermittent Flame-Test Specimen #1

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Publication of Method:	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes			Test Temperature (°F)	85
Spread of Flame	No			Test Humidity (%)	14
Roofing Class	A			Test Date	6-24-2022

Sample Id: TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment Intermittent Flame - Specimen #1

Critical Standard Observations	
Test Duration	1:10:00
Sustained Flaming on Underside of Roof Deck	0:00:00
Production of Flaming Brands of roof covering material	0:00:00
Production of Glowing Brands of roof covering material	0:00:00
Displacement of the Test Sample	0:00:00
Exposure of Portions of the deck	0:00:00
Falling away of portions of the deck	0:00:00

Test Flame Application for Class A

Flame On (Min)	Flame Off (Min)	Number of Cycles (#)
2	2	15

Result	**Pass**

Cycle	Time	Observations	Cycle	Time	Observations
1	0-2 min. On	*	9	32-34 min. On	*
	2-4 min. Off	*		34-36 min. Off	*
2	4-6 min. On	*	10	36-38 min. On	*
	6-8 min. Off	*		38-40 min. Off	*
3	8-10 min. On	*	11	40-42 min. On	*
	10-12 min. Off	*		42-44 min. Off	*
4	12-14 min. On	*	12	44-46 min. On	*
	14-16 min. Off	*		46-48 min. Off	*
5	16-18 min. On	*	13	48-50 min. On	*
	18-20 min. Off	*		50-52 min. Off	*
6	20-22 min. On	*	14	52-54 min. On	*
	22-24 min. Off	*		54-56 min. Off	*
7	24-26 min. On	*	15	56-58 min. On	*
	26-28 min. Off	*		58-60 min. Off	*
8	28-30 min On	*			
	30-32 min. Off	*			

Abbreviations: IG = Ignition, SE = Self Extinguished, SF = Sustained Flaming on Roof Deck

Note:

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2022-06-15	2023-06-15
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2021-07-26	2022-07-26
TU8124	Digitial Thermometer	-328°F - 2498°F	2022-06-15	2023-06-15
RP0072	Calibrated Tape Measure	0-25 Feet	2021-09-03	2022-09-03
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2022-06-15	2023-06-15
RE0039	Digital Angle Gauge	0° to 90°	2022-04-30	2023-04-30
RF0031	UL790 Test Chamber	AS PER UL790	2022-06-24	Per USE

Appendix A: Intermittent Flame-Test Specimen #2

Client Name:	MB Technology	Criteria:	ASTM E 108	Framing Type / Species	Douglas Fir No.1
Job No.:	RJ8548F-2	Criteria Version:	20a	Sheathing Type / Grade	AC Exterior 15/32"
Test Method:	ASTM E 108			Underlayment 1: Grade / Type:	TU 43 Layfast SBS Asphalt Roofing Underlayment
Publication of Method:	20a				
System Type	roof				
Test Slope	5:12				
Test Degree	22.62°			Roof Covering Material 1 / Grade:	Composition Roofing Shingles
Burning Brand	Yes			Roof Covering Material 2 / Grade:	
Intermittant Flame	Yes			Test Temperature (°F)	85
Spread of Flame	No			Test Humidity (%)	14
Roofing Class	A			Test Date	6-24-2022

Sample Id: TU 43 Layfast SBS Elastomeric Modified Asphalt Roofing Underlayment Intermittent Flame - Specimen #2

Critical Standard Observations	
Test Duration	1:10:00
Sustained Flaming on Underside of Roof Deck	0:00:00
Production of Flaming Brands of roof covering material	0:00:00
Production of Glowing Brands of roof covering material	0:00:00
Displacement of the Test Sample	0:00:00
Exposure of Portions of the deck	0:00:00
Falling away of portions of the deck	0:00:00

Test Flame Application for Class A		
Flame On	**Flame Off**	**Number of Cycles**
(Min)	**(Min)**	**(#)**
2	2	15

Result	**Pass**

Cycle	Time	Observations	Cycle	Time	Observations
1	0-2 min. On	*	9	32-34 min. On	*
	2-4 min. Off	*		34-36 min. Off	*
2	4-6 min. On	*	10	36-38 min. On	*
	6-8 min. Off	*		38-40 min. Off	*
3	8-10 min. On	*	11	40-42 min. On	*
	10-12 min. Off	*		42-44 min. Off	*
4	12-14 min. On	*	12	44-46 min. On	*
	14-16 min. Off	*		46-48 min. Off	*
5	16-18 min. On	*	13	48-50 min. On	*
	18-20 min. Off	*		50-52 min. Off	*
6	20-22 min. On	*	14	52-54 min. On	*
	22-24 min. Off	*		54-56 min. Off	*
7	24-26 min. On	*	15	56-58 min. On	*
	26-28 min. Off	*		58-60 min. Off	*
8	28-30 min On	*			
	30-32 min. Off	*			

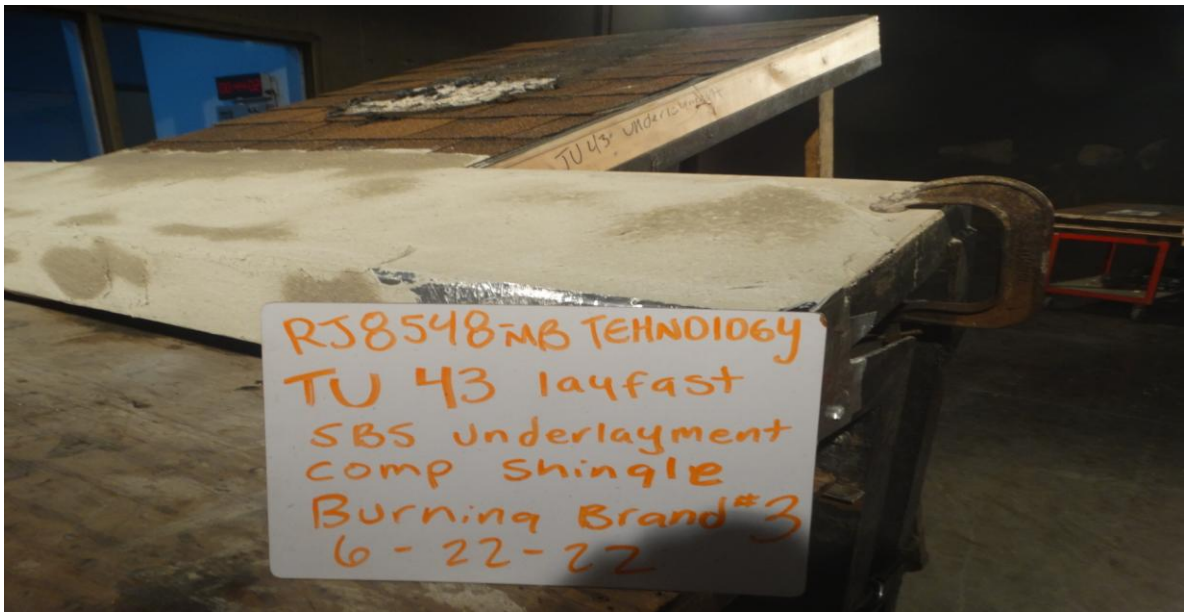
Abbreviations: IG = Ignition, SE = Self Extinguished, SF = Sustained Flaming on Roof Deck

Note:

Asset Number	Description	Equipment Functional Range	Calibration Date	Calibration Due Date
RP0241	Stop Watch	N/A	2022-06-15	2023-06-15
RF0005	Anemometer	30 FPM to 5000 FPM +14/-	2021-07-26	2022-07-26
TU8124	Digitial Thermometer	-328°F - 2498°F	2022-06-15	2023-06-15
RP0072	Calibrated Tape Measure	0-25 Feet	2021-09-03	2022-09-03
RP0038	Temperature and Humidity Data Logger	-4°F to 158°F +/-0.8°F / 60	2022-06-15	2023-06-15
RE0039	Digital Angle Gauge	0° to 90°	2022-04-30	2023-04-30
RF0031	UL790 Test Chamber	AS PER UL790	2022-06-24	Per USE

Appendix B: Photographs

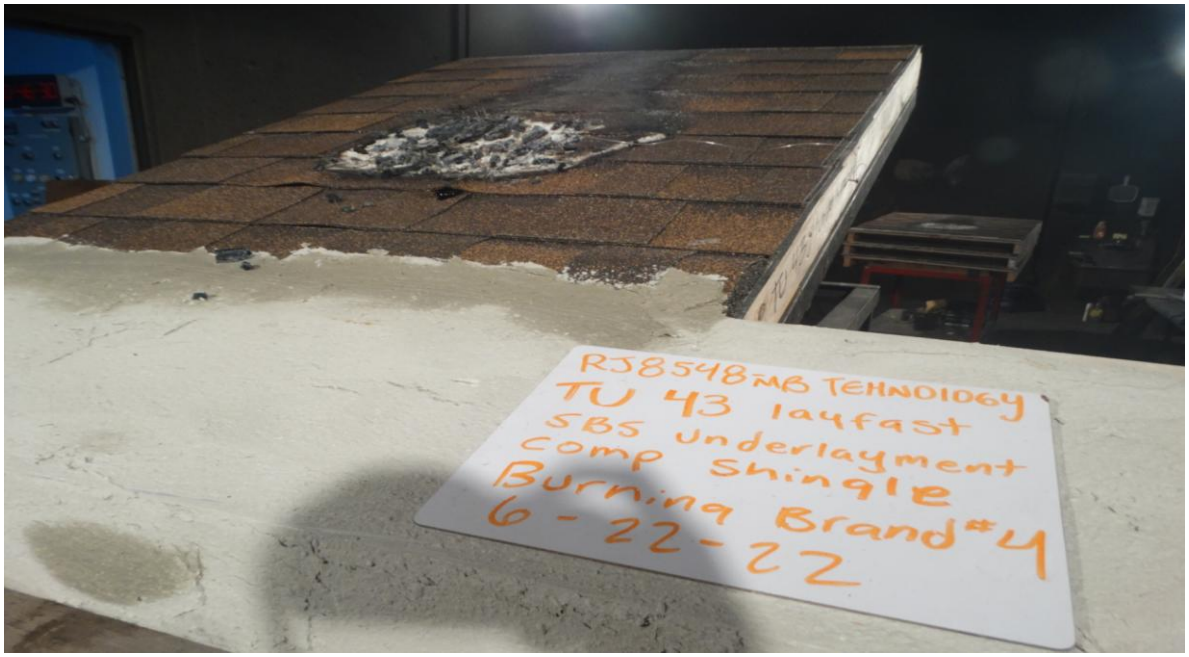
Photograph 1:
Comp. Shingles w/ TU 43 Layfast SBS Underlayment Burning Brand - Specimen #3



Photograph 2:
Class A Burning Brand test deck assembly #3 from the top.

Appendix B: Photographs (Continued)

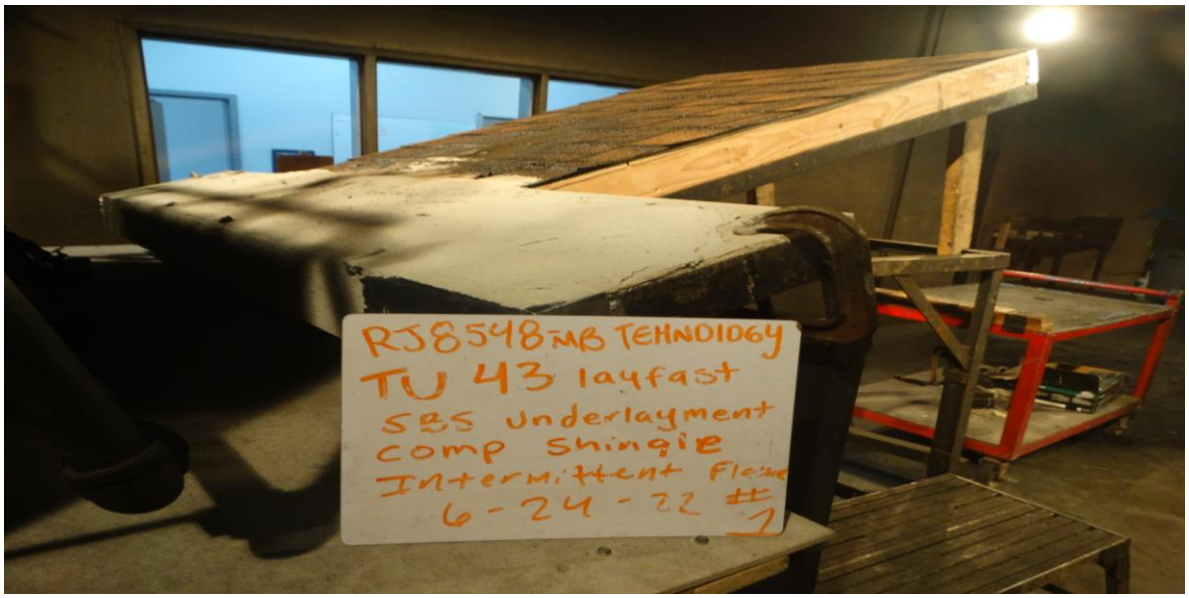
Photograph 3:
Comp. Shingles w/ TU 43 Layfast SBS Underlayment Burning Brand - Specimen #4



Photograph 4:
Class A Burning Brand test deck assembly #4 from the top.

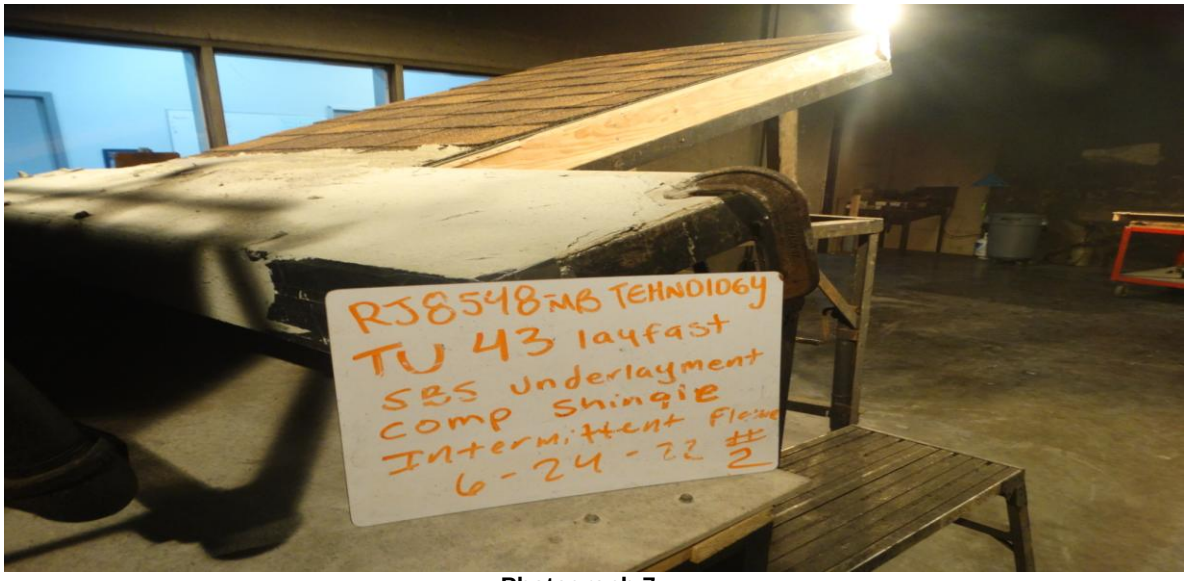
Appendix B: Photographs (Continued)

Photograph 5:
Comp. Shingles w/ TU 43 Layfast SBS Underlayment Intermittent Flame - Specimen #1



Photograph 6:
Class A Intermittent Flame test deck assembly #1 from the top.

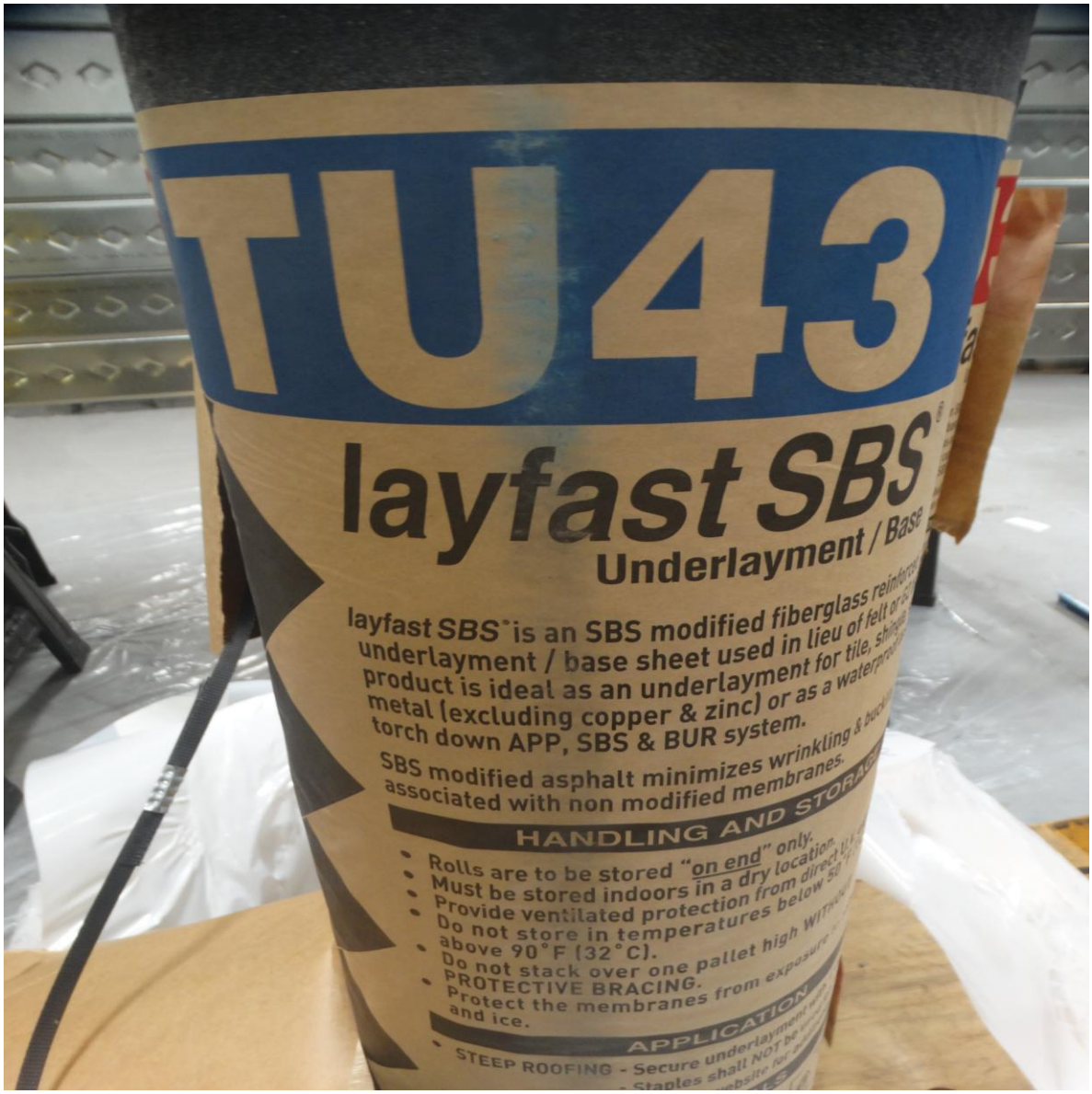
Appendix B: Photographs (Continued)



Photograph 7:
Comp. Shingles w/ TU 43 Layfast SBS Underlayment Intermittent Flame - Specimen #2

Photograph 8:
Class A Intermittent Flame test deck assembly from the top.

Appendix B: Photographs (Continued)



Photograph 9:
TU 43 Layfast SBS Underlayment used for testing.

*****<<<END OF REPORT>>>*****