

FIRE TEST REPORT

Roofing Shingles Treated with Roof Maxx



Fire Test Report for Roofing Shingles Treated with Roof Maxx

Background

In April 2020, Intertek Building and Construction evaluated Roof Maxx, a shingle sealer–rejuvenator derived from soybean oil, to determine its resistance to flame. Roof Maxx, a USDA BioPreferred certified treatment, is spray-applied to asphalt-based roofing materials to re-saturate them, restoring pliability and flexibility and extending service life. The tests were conducted in accordance with ASTM E108-17, Class A. ASTM E108 is the international standards organization’s Standard Test Methods for Fire Tests of Roof Coverings, which is used to measure and describe the response of materials to heat and flame. According to ASTM, “Class A Tests are applicable to roof coverings that are effective against severe test exposure, afford a high degree of fire protection to the roof deck, do not slip from position, and do not present a flying brand hazard.”¹

The testing was conducted at the request of the Ohio Soybean Council, a Roof Maxx sponsor and co-developer, and took place at the Intertek facility in York, Pennsylvania. Intertek’s detailed reports, including photos, are provided as appendices to this summary report.

Process Summary

Identical tests were conducted on both shingles treated with Roof Maxx and untreated shingles. All shingles had been aged for approximately 12 years. The samples were provided by the Ohio Soybean Council.

Intertek conducted three types of ASTM E108 tests: the burning brand test, the intermittent flame exposure test, and the spread of flame test. There were multiple rounds of testing for a total of 16 tests (8 tests with treated shingles and 8 tests with untreated shingles), as shown below:

Deck/Test #	Type of Test	Classification
1	Burning brand	Class A
2	Burning brand	Class A
3	Burning brand	Class A
4	Burning brand	Class A
5	Intermittent flame	Class A
6	Intermittent flame	Class A
7	Spread of flame	Class A
8	Spread of flame	Class A

¹ “ASTM E108 - 00 Standard Test Methods for Fire Tests of Roof Coverings,” ASTM International website, accessed April 2020, <https://www.astm.org/DATABASE.CART/HISTORICAL/E108-00.htm>.

Researchers constructed 16 plywood decks, each overlaid with one layer of asphalt felt underlayment and sample shingles. The plywood was tested for an appropriate level of moisture content before assembly, and lab conditions were confirmed to be within ASTM testing parameters. Each deck was ignited, and changes to the condition of the deck—particularly the underside of the deck—were noted, along with the time elapsed since ignition.

Results Summary

The **coated shingles met the criteria** for an ASTM E108 Class A rating. The underdeck showed no signs of combustion during any of the tests, and the flame did not spread beyond one foot (the maximum spread accepted for Class A).

The **uncoated shingles did not meet the criteria** for an ASTM E108 Class A rating. The underdeck caught fire during the first burning brand test.

Appendix 1

Fire Test Report: Coated Shingles

OHIO SOYBEAN COUNCIL FIRE TEST REPORT

SCOPE OF WORK

ASTM E108 CLASS A TESTING ON ROOF ASSEMBLY CONTAINING COATED 3 TAB SHINGLES

REPORT NUMBER

K7496.02-121-24 R0

TEST DATE(S)

04/13/20 - 04/14/20

ISSUE DATE

04/16/20

RECORD RETENTION END DATE

04/14/24

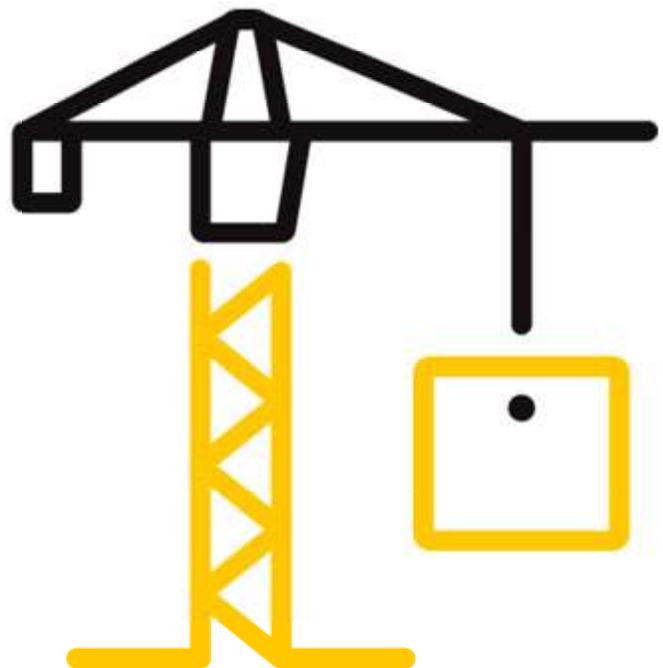
PAGES

33

DOCUMENT CONTROL NUMBER

RT-R-AMER-Test-2847 (03/07/18)

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TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

REPORT ISSUED TO

Ohio Soybean Council
918 Proprietors Road #A
Worthington, Ohio 43085

Contact: Barry McGraw
E-mail: bmcgraw@soyohio.org

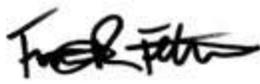
SECTION 1 SCOPE

Intertek Building & Construction (B&C) was contracted by Ohio Soybean Council 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. 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	REVIEWED BY:	Ethan Grove
TITLE:		TITLE:	
DEPARTMENT:	Technician – Fire Testing	DEPARTMENT:	Manager – Fire Testing
SIGNATURE:		SIGNATURE:	
DATE:	04/16/20	DATE:	04/16/20

TRF:ddr

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TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 3

TESTING AND EVALUATION METHODS

The samples were evaluated in accordance with the following:

ASTM E108-17, *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	10-28-2020
Anemometer	63192	03-09-21
Thermocouple	INT1651	08-13-2020
Thermocouple Reader	INT243	05-30-2020
Measuring Tape	65101	08-13-2020
Stopwatch	65100	08-07-2020
Moisture Meter	INT962	01-03-21

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, 2020 Edition, "*Standard Test Methods for Fire Tests of Roof Coverings.*" The test material was applied by Intertek technicians.

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 5 (Continued) SPECIMEN DESCRIPTION

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

DECK #	DECK TYPE	DECK SURFACE	SYSTEM Systems are described in assembly from wood deck to top surface.
1-4	Class A BB	15/32" AC grade plywood	Plywood, 1 layer of Tarco No. 15 asphalt felt underlayment, coated 3 tab shingles
5&6	Class A IF	15/32" AC grade plywood	Plywood, 1 layer of Tarco No. 15 asphalt felt underlayment, coated 3 tab shingles
7&8	Class A SOF	15/32" AC grade plywood	Plywood, 1 layer of Tarco No. 15 asphalt felt underlayment, coated 3 tab shingles

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7

TEST RESULTS

Calibration Information

TEST CONDITIONS (CLASS A)	
Test Date	04/13/2020
Air Velocity	1056 average fpm
Slope of Cal. Deck	5:12
Average Flame Temperature	1435°F
Ambient Air Temperature	69°F

TEST CONDITIONS (CLASS A)	
Test Date	04/14/2020
Air Velocity	1054 average fpm
Slope of Cal. Deck	5:12
Ambient Air Temperature	66°F

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

BURNING BRAND TESTS

Test Observations Deck: 1

Test Date	04/14/2020
Ambient Air Temperature	65°F
Brand Type	Class A, 4.3 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:51	Sample ignition
07:50	Smoke at horizontal plywood joint and vertical 2X4
09:58	Discoloration at horizontal plywood joint and vertical 2X4
10:09	Smoke at horizontal plywood joint
10:21	Smoke at horizontal plywood joint
12:08	Seeping at horizontal plywood joint
16:29	Plywood discoloration below horizontal plywood joint
21:11	Brand consumed
42:18	No signs of combustion; End of Test

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

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Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 2

Test Date	04/14/2020
Ambient Air Temperature	60°F
Brand Type	Class A, 4.4 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:36	Sample ignition
07:13	Smoke at horizontal plywood joint
07:27	Discoloration at horizontal plywood joint
07:58	Seeping at horizontal plywood joint
12:31	Smoke at horizontal plywood joint and vertical 2X4
13:33	Seeping at horizontal plywood joint and vertical 2X4
13:50	Dripping at horizontal plywood joint
14:45	Plywood discoloration below horizontal plywood joint
20:56	Brand consumed
51:17	No signs of combustion; End of Test

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 3

Test Date	04/14/2020
Ambient Air Temperature	61°F
Brand Type	Class A, 4.3 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:38	Sample ignition
05:47	Smoke at horizontal plywood joint
06:39	Smoke at horizontal plywood joint and vertical 2X4
07:03	Discoloration at horizontal plywood joint
08:16	Seeping at horizontal plywood joint
09:06	Seeping at horizontal plywood joint and vertical 2X4
11:34	Glowing at horizontal plywood joint
18:14	Plywood discoloration below horizontal plywood joint
21:39	Brand consumed
51:29	No signs of combustion; End of Test

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 4

Test Date	04/14/2020
Ambient Air Temperature	61°F
Brand Type	Class A, 4.4 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:36	Sample ignition
04:29	Smoke at horizontal plywood joint
10:31	Discoloration at horizontal plywood joint
11:47	Seeping at horizontal plywood joint
13:09	Seeping at horizontal plywood joint and vertical 2X4
14:12	Plywood discoloration below horizontal plywood joint
20:28	Brand consumed
35:51	Glowing at horizontal plywood joint
44:17	No signs of combustion; End of Test

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

INTERMITTENT FLAME TESTS

Test Observations Deck: 5

Test Date	04/13/2020
Ambient Air Temperature	70°F
Slope of Test Deck	5:12

CYCLE		Flame	
NO.	TIME.	ON/OFF	OBSERVATIONS/COMMENTS
1	00:43	ON	Smoke emitting from top of test assembly
XXX	60:00	XXX	All flame cycles complete; start observation period
XXX	70:28	XXX	No signs of combustion of the underdeck; End of Test

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 6

Test Date	04/13/2020
Ambient Air Temperature	69°F
Slope of Test Deck	5:12

CYCLE		Flame	
NO.	TIME.	ON/OFF	OBSERVATIONS/COMMENTS
1	00:51	ON	Smoke emitting from top of test assembly
4	14:29	OFF	Smoke at the leading edge of underdeck
15	57:04	ON	Discoloration at horizontal plywood joint and vertical 2X4
XXX	60:00	XXX	All flame cycles complete; start observation period
XXX	77:46	XXX	No signs of combustion of the underdeck; End of Test

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

SPREAD OF FLAME TESTS

Test Observations Deck: 7

Test Date	04/13/2020
Ambient Air Temperature	71°F
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS/COMMENTS
0:00	Burner ignited.
00:37	Smoke emitting from test assembly
02:05	Sample ignition
02:12	Flame spread to 1 ft.
10:00	Test stop.

Acceptance Level: Class A, maximum spread of flames is 1 ft.

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 8

Test Date	04/13/2020
Ambient Air Temperature	72°F
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS/COMMENTS
0:00	Burner ignited.
00:41	Smoke emitting from top of test assembly
02:17	Sample ignition
02:50	Flame spread to 1 ft.
10:00	Test stop.

Acceptance Level: Class A, maximum spread of flames is 1 ft.

SECTION 8

CONCLUSION

The Ohio Soybean Council coated 3 tab shingles in the system described in this test report **met** the criteria of ASTM E108 (2017) for a Class "A" rating at a 5:12 slope.

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 PHOTOGRAPHS

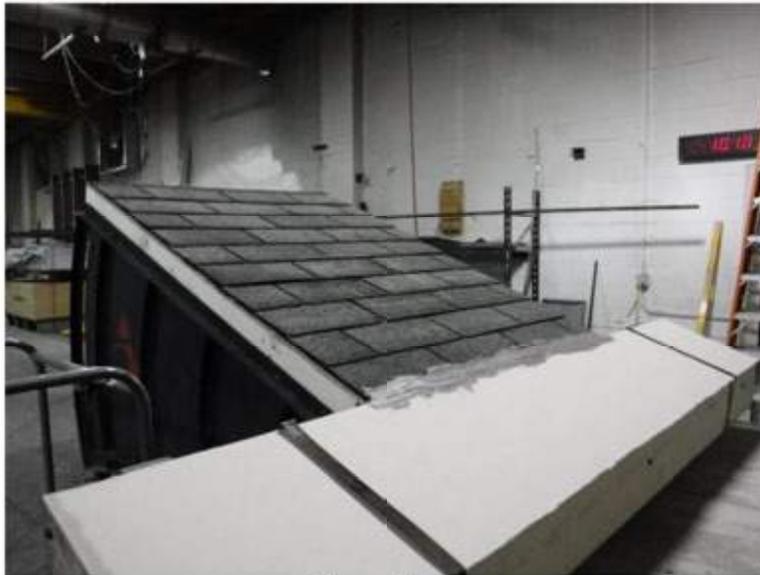


Photo No. 1
Test #1 Pre-test (TYP)



Photo No. 2
Test #1 Underdeck Pre-test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 3
Test #1 During Test



Photo No. 4
Test #1 Underdeck During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

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Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 5
Test #1 Post Test



Photo No. 6
Test #1 Underdeck Post Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

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Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 7
Test #2 Underdeck Pre-test



Photo No. 8
Test #2 During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 9
Test #2 Underdeck During Test



Photo No. 10
Test #2 Post Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 11
Test #2 Underdeck Post Test



Photo No. 12
Test #3 Underdeck Pre-test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 13
Test #3 During Test



Photo No. 14
Test #3 Underdeck During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 15
Test #3 Post Test



Photo No. 16
Test #3 Underdeck Post Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 17
Test #4 Underdeck Pre-test



Photo No. 18
Test #4 During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 19
Test #4 Underdeck During Test



Photo No. 20
Test #4 Post Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

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Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 21
Test #4 Underdeck Post Test



Photo No. 22
Test #5 Pre-test (TYP)

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 23
Test #5 Underdeck Pre-test



Photo No. 24
Test #5 During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 25
Test #5 Underdeck During Test



Photo No. 26
Test #5 Post Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 27
Test #5 Underdeck Post Test



Photo No. 28
Test #6 Underdeck Pre-test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 29
Test #6 During Test



Photo No. 30
Test #6 Underdeck During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 31
Test #6 Post Test



Photo No. 32
Test #6 Underdeck Post Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS

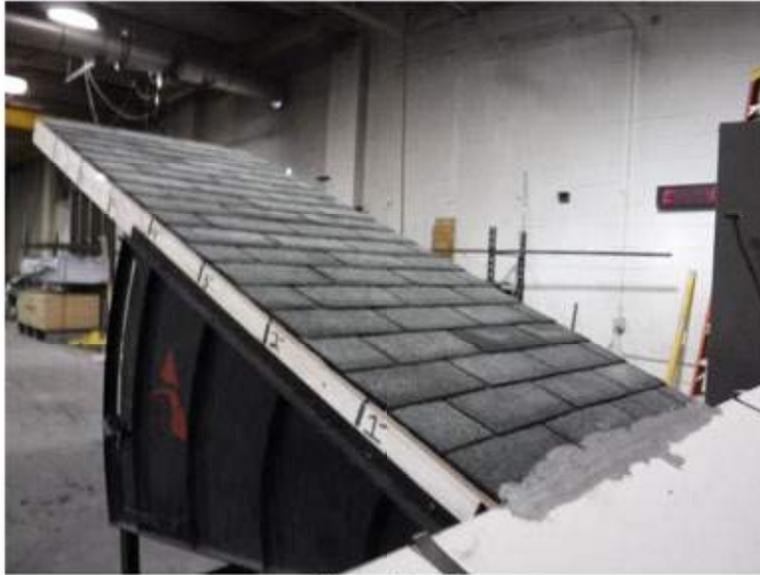


Photo No. 33
Test #7 Pre-test



Photo No. 34
Test #7 During Test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 35
Test #7 Post Test



Photo No. 36
Test #8 Pre-test

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 9 (Continued) PHOTOGRAPHS



Photo No. 37
Test #8 During Test



Photo No. 38
Test #8 Post Test



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TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.02-121-24 R0

Date: 04/16/20

SECTION 10

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	04/16/20	N/A	Original Report Issue

Appendix 2

Fire Test Report: **Uncoated Shingles**

OHIO SOYBEAN COUNCIL FIRE TEST REPORT

SCOPE OF WORK

ASTM E108 CLASS A TESTING ON ROOF ASSEMBLY CONTAINING UNCOATED 3 TAB SHINGLES

REPORT NUMBER

K7496.01-121-24 R0

TEST DATE(S)

04/02/20 - 04/03/20

ISSUE DATE

04/16/20

RECORD RETENTION END DATE

04/03/24

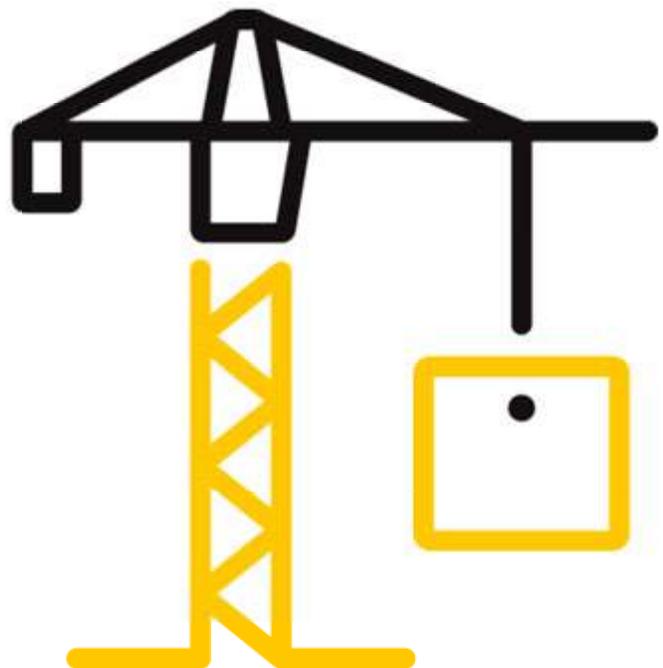
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TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.01-121-24 R0

Date: 04/16/20

REPORT ISSUED TO

Ohio Soybean Council
918 Proprietors Road #A
Worthington, Ohio 43085

Contact: Barry McGraw
E-mail: bmcgraw@soyohio.org

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Ohio Soybean Council 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. 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	Fail
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	REVIEWED BY:	Ethan Grove
TITLE:		TITLE:	
DEPARTMENT:	Technician – Fire Testing	DEPARTMENT:	Manager – Fire Testing
SIGNATURE:		SIGNATURE:	
DATE:	04/16/20	DATE:	04/16/20

TRF:ddr

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TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.01-121-24 R0

Date: 04/16/20

SECTION 3

TESTING AND EVALUATION METHODS

The samples were evaluated in accordance with the following:

ASTM E108-17, *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	10-28-2020
Anemometer	63192	03-09-21
Thermocouple	INT1651	08-13-2020
Thermocouple Reader	INT243	05-30-2020
Tape Measure	65101	08-13-2020
Stopwatch	65100	08-07-2020
Moisture Meter	INT962	01-03-21

SECTION 4

MATERIAL SOURCE/INSTALLATION

The test material was applied to the plywood decks by Intertek technicians. 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, 2020 Edition, "*Standard Test Methods for Fire Tests of Roof Coverings.*" The test material was applied by Intertek technicians.

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.01-121-24 R0

Date: 04/16/20

SECTION 5 (Continued) SPECIMEN DESCRIPTION

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

DECK #	DECK TYPE	DECK SURFACE	SYSTEM Systems are described in assembly from wood deck to top surface.
1-4	Class A BB	15/32" AC grade plywood	Plywood, Tarco No. 15 roofing felt, uncoated 3-tab shingles
5&6	Class A IF	15/32" AC grade plywood	Plywood, Tarco No. 15 roofing felt, uncoated 3-tab shingles
7&8	Class A SOF	15/32" AC grade plywood	Plywood, Tarco No. 15 roofing felt, uncoated 3-tab shingles

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

TEST REPORT FOR OHIO SOYBEAN COUNCIL

Report No.: K7496.01-121-24 R0

Date: 04/16/20

SECTION 7

TEST RESULTS

Calibration Information

TEST CONDITIONS (CLASS A)	
Test Date	04/02/2020
Air Velocity	1079 average fpm
Slope of Cal. Deck	5:12
Ambient Air Temperature	67°F

TEST CONDITIONS (CLASS A)	
Test Date	04/03/2020
Air Velocity	1065 average fpm
Slope of Cal. Deck	5:12
Average Flame Temperature	1402°F
Ambient Air Temperature	68°F

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TEST RESULTS

BURNING BRAND TESTS

Test Observations Deck: 1

Test Date	04/02/2020
Ambient Air Temperature	67°F
Brand Type	Class A, 4.3 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:32	Sample ignition
06:41	Smoke at horizontal plywood joint
07:47	Discoloration at horizontal plywood joint
09:42	Seeping at horizontal plywood joint
12:04	Smoke at horizontal plywood joint and vertical 2X4
12:14	Glowing at horizontal plywood joint
13:20	Seeping at horizontal plywood joint and vertical 2X4
16:06	Plywood discoloration below horizontal plywood joint
19:41	Brand consumed
30:45	Smoke at plywood below horizontal plywood joint
31:34	Glowing at plywood below horizontal plywood joint
32:16	Underdeck ignition at plywood below horizontal plywood joint; End of Test

Acceptance Level: Class None –Flaming occurred on the underside of the deck.

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TEST RESULTS

Test Observations Deck: 2

Test Date	04/02/2020
Ambient Air Temperature	64°F
Brand Type	Class A, 4.3 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:33	Sample ignition
06:27	Smoke at horizontal plywood joint and vertical 2X4
07:36	Discoloration at horizontal plywood joint and vertical 2X4
08:47	Smoke at horizontal plywood joint
08:59	Discoloration at horizontal plywood joint
09:10	Seeping at horizontal plywood joint
12:40	Seeping at horizontal plywood joint and vertical 2X4
14:58	Plywood discoloration at vertical 2X4 below horizontal plywood joint
17:49	Brand consumed
48:51	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	04/02/2020
Ambient Air Temperature	64°F
Brand Type	Class A, 4.3 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:33	Sample ignition
06:43	Smoke at horizontal plywood joint
08:52	Discoloration at horizontal plywood joint
09:59	Seeping at horizontal plywood joint
10:54	Discoloration at horizontal plywood joint and vertical 2X4
11:16	Seeping at horizontal plywood joint and vertical 2X4
12:34	Smoke at horizontal plywood joint and vertical 2X4
14:13	Glowing at horizontal plywood joint
19:12	Brand consumed
40:13	Smoke at plywood below horizontal plywood joint
46:09	Glowing at plywood below horizontal plywood joint
61:24	No signs of combustion; End of Test

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

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TEST RESULTS

Test Observations Deck: 4

Test Date	04/02/2020
Ambient Air Temperature	68°F
Brand Type	Class A, 4.3 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
00:34	Sample ignition
06:43	Smoke at horizontal plywood joint
08:52	Discoloration at horizontal plywood joint
09:59	Seeping at horizontal plywood joint
10:54	Discoloration at horizontal plywood joint and vertical 2X4
11:16	Discoloration at horizontal plywood joint and vertical 2X4
12:34	Discoloration at horizontal plywood joint and vertical 2X4
14:13	Glowing at horizontal plywood joint
14:24	Plywood discoloration below horizontal plywood joint
19:12	Brand consumed
40:13	Smoke at plywood below horizontal plywood joint
46:09	Glowing at plywood below horizontal plywood joint
61:24	No signs of combustion; End of Test

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

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TEST RESULTS

INTERMITTENT FLAME TESTS

Test Observations Deck: 5

Test Date	04/03/2020
Ambient Air Temperature	67°F
Slope of Test Deck	5:12

CYCLE		Flame	
NO.	TIME.	ON/OFF	OBSERVATIONS/COMMENTS
1	01:09	ON	Smoke emitting from test specimen
10	38:14	OFF	Smoke at horizontal plywood joint
13	51:15	OFF	Smoke at the leading edge of the underdeck
XXX	60:00	XXX	All flame cycles complete; start observation period
XXX	67:49	XXX	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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TEST RESULTS

Test Observations Deck: 6

Test Date	04/03/2020
Ambient Air Temperature	65°F
Slope of Test Deck	5:12

CYCLE		Flame	
NO.	TIME.	ON/OFF	OBSERVATIONS/COMMENTS
1	01:03	ON	Smoke emitting from test specimen
9	35:56	OFF	Smoke at leading edge of underdeck
12	44:36	ON	Dripping at leading edge of underdeck
XXX	60:00	XXX	All flame cycles complete; start observation period
XXX	64:50	XXX	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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TEST RESULTS

SPREAD OF FLAME TESTS

Test Observations Deck: 7

Test Date	04/03/2020
Ambient Air Temperature	70°F
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS/COMMENTS
00:00	Burner ignited.
00:43	Smoke emitting from test specimen
10:00	Test stop

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

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TEST RESULTS

Test Observations Deck: 6

Test Date	04/03/2020
Ambient Air Temperature	70°F
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS/COMMENTS
00:00	Burner ignited.
00:55	Smoke emitting from test specimen
10:00	Test stop.

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

SECTION 8

CONCLUSION

The Ohio Soybean Counsel uncoated 3-tab shingles in the system described in this test report **did not meet** the criteria of ASTM E108 (2017) for a Class "A" rating at a 5:12 slope.

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SECTION 9 PHOTOGRAPHS



Photo No. 1
Test #1 Pre-test (TYP)



Photo No. 2
Test #1 Underdeck Pre-test

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Photo No. 3
Test #1 During Test



Photo No. 4
Test #1 Underdeck During Test

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PHOTOGRAPHS



Photo No. 5
Test #1 Underdeck Ignition



Photo No. 6
Test #1 Post Test

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Photo No. 7
Test #2 Underdeck Pre-test



Photo No. 8
Test #2 During Test

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Photo No. 9
Test #2 Underdeck During Test



Photo No. 10
Test #2 Post Test

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Photo No. 11
Test #2 Underdeck Post Test



Photo No. 12
Test #3 Underdeck Pre-test

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Photo No. 13
Test #3 During Test



Photo No. 14
Test #3 Underdeck During Test

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Photo No. 15
Test #3 Post Test



Photo No. 16
Test #3 Underdeck Post Test

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PHOTOGRAPHS



Photo No. 17
Test #4 Underdeck Pre-test



Photo No. 18
Test #4 During Test

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Photo No. 19
Test #4 Underdeck During Test



Photo No. 20
Test #4 Post Test

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Photo No. 21
Test #4 Underdeck Post Test



Photo No. 22
Test #5 Pre-test (TYP)

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Photo No. 23
Test #5 Underdeck Pre-test



Photo No. 24
Test #5 During Test

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Photo No. 25
Test #5 Post Test



Photo No. 26
Test #5 Underdeck Post Test

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Photo No. 27
Test #6 Underdeck Pre-test



Photo No. 28
Test #6 During Test

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Photo No. 29
Test #6 Post Test



Photo No. 30
Test #6 Underdeck Post Test

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Photo No. 31
Test #7 Pre-test



Photo No. 32
Test #7 During Test

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PHOTOGRAPHS



Photo No. 33
Test #7 Post Test



Photo No. 34
Test #8 Pre-test

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Photo No. 35
Test #8 During Test



Photo No. 36
Test #8 Post Test



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SECTION 10

REVISION LOG

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