Intertek ETL SEMKO

TEST DATE: MAY 15 – 31, 2006 REPORT DATE: MAY 31, 2006

INTERTEK TEST REPORT NUMBER 3092220-001

INTERMITTENT FLAME AND BURNING BRAND TESTS CONDUCTED ON

NOVASEAL GENERATION II POLYMER WOVEN UNDERLAYMENT CLASS "A" APPLICATION

FOR:

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INTRODUCTION

Intertek Testing Services NA (Intertek) Fire Testing Laboratory in Middleton, Wisconsin conducted an investigation of the external fire resistance characteristics of NovaSeal Generation II polymer woven underlayment for a class “A” application. The samples were received at the laboratory April 28, 2006 in good condition.

The tests were conducted in accordance with the criteria in ICC-ES AC1888 *"Acceptance Criteria for Roof Underlayments"* section 3.3 referencing the Intermittent Flame and Burning Brand tests in accordance with ASTM E108 (2004) *“Standard Test Methods for Fire Tests of Roof Coverings”*, UL 790 (1997), and UBC 15-2 (1997).

TEST ASSEMBLY CONSTRUCTION

The plywood decks were constructed by Intertek employees according to the specifications of test standard ASTM E108 (2004) *“Standard Test Methods for Fire Tests of Roof Coverings”* with the exception of 3/8" thick plywood on the decks.

1. The test material was submitted by the client.

2. The test materials were applied by Intertek employees at the laboratory per the installation instructions of the materials manufacturers.

Deck Construction

Deck	Nominal 3/8” thick AC grade exterior plywood deck.
Underlayment	NovaSeal Generation II polymer woven underlayment.
Attachment	1" cap nails 6" OC around the perimeter and 12" OC in the field.
Surface	Three-tab asphalt shingles complying with ASTM D3018.

TEST OBSERVATIONS AND RESULTS

Test Deck #1 – Intermittent Flame (Class A)

Test Conditions

Test Date	5/15/2006
Air Velocity	1056 +/-44 fpm
Ambient Air Temperature	N/A
Slope of Test Deck	5:12
Surface Material	Three-tab asphalt shingles complying with ASTM D3018
Underlayment	NovaSeal Generation II polymer woven underlayment

Test Observations

Cycle		Time To:		Observations/Comments (Include Off Cycles)
No.	Min.	Ignition (min : sec)	Flame Out (min : sec)	
1	Start			No attached flame light smoking of the top surface of the deck.
2	4			No attached flame on the top surface of the deck.
3	8			No attached flame on the top surface of the deck.
4	12	13:40	14:10	Molten asphalt seeping through plywood joints on the underside of the deck. Top surface continues to smoke during the off cycle.
5	16	17:42	18:18	No change.
6	20	21:47	22:26	No change.
7	24	25:30	26:30	No change.
8	28	29:35	30:34	Slight discoloration of the underside of the deck underneath the flame pattern.
9	32	33:21	34:48	Small flame of the top surface at the leading edge of the deck. Darkening of the underside of the deck continues.
10	36	37:36	38:09	No change.
11	40	41:44	42:15	Darkening of the plywood on the underside of the deck continues.
12	44	45:36	46:42	Small flame on puddle molten asphalt material on the top surface of the deck.
13	48	49:45	50:12	Darkening of the underside of the deck continues.
14	52	53:42	54:10	Light smoke from the plywood joint on the underside of the deck.
15	56			No flaming of the top surface. 75:00 – No smoking, deck cool to the touch. 90:00 – End of test.

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

Test Deck #2 – Burning Brand (Class A)

Test Date	5/15/2006
Air Velocity	1056 +/-44 fpm
Ambient Air Temperature	67°F
Brand Type/Weight	Class A/4.12 lb
Slope of Test Deck	5:12 Inches
Surface Material	Three-tab asphalt shingles complying with ASTM D3018
Underlayment	NovaSeal Generation II polymer woven underlayment

Brand#	Time (min:sec)	Observations
1	00:00	Brand placed on deck.
	05:52	Smoke developing at the plywood joint on the underside of the deck.
	07:45	Approximately 50% of the brand consumed. Smoke increasing and asphalt seeping through the plywood joints on the underside of the deck.
	15:17	Flaming of the top surface of the deck ceased. Plywood on the underside of the deck darkening at the brand location. Smoke decreasing.
	20:06	All smoking and glowing of the top surface has ceased. Small glowing embers at the plywood joint on the underside of the deck. Smoking of the underside of the deck has ceased.
	30:00	Glowing embers decreasing on the underside of the deck.
	32:00	All glowing has ceased on the underside of the deck.
	40:00	Underside of the deck is warm to the touch beneath the brand location.
	45:00	Underside of the deck is cool to the touch beneath the brand location.
	60:00	End of test.

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

Test Deck #3 – Burning Brand (Class A)

Test Date	5/16/2006
Air Velocity	1056 +/-44 fpm
Ambient Air Temperature	67°F
Brand Type/Weight	Class A/4.59 lb
Slope of Test Deck	5:12 Inches
Surface Material	Three-tab asphalt shingles complying with ASTM D3018
Underlayment	NovaSeal Generation II polymer woven underlayment

Brand#	Time (min:sec)	Observations
1	00:00	Brand placed on deck.
	03:40	Light smoke at the plywood joint on the underside of the deck.
	06:20	Approximately 50% of the brand consumed.
	09:00	Light smoke on the underside of the deck continues.
	10:15	Approximately 75% of the brand consumed.
	11:20	Heavy smoking of the underside of the deck.
	15:50	Light smoking of the underside of the deck.
	17:40	Flaming of the top surface has ceased.
	20:30	Glowing of the top surface has ceased.
	21:00	Smoking of the underside of the deck has ceased.
	30:00	No change.
	45:00	No change, deck is cool to the touch.
	60:00	End of test.

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

Test Deck #4 – Intermittent Flame (Class A)

Test Conditions

Test Date	5/16/2006
Air Velocity	1056 +/-44 fpm
Ambient Air Temperature	N/A
Slope of Test Deck	5:12
Surface Material	Three-tab asphalt shingles complying with ASTM D3018
Underlayment	NovaSeal Generation II polymer woven underlayment

Test Observations

Cycle		Time To:		Observations/Comments (Include Off Cycles)
No.	Min.	Ignition (min : sec)	Flame Out (min : sec)	
1	Start			Smoking of the top surface of the deck.
2	4			Smoking of the top surface of the deck.
3	8	09:41	10:12	Attached flame at 09:41, top surface continues to smoke during the off cycle.
4	12			No attached flame, molten asphalt seeping at the plywood joint on the underside of the deck.
5	16	17:35	18:09	Molten asphalt dripping to the floor.
6	20	21:40	22:11	No change.
7	24	25:35	26:12	Slight darkening of the plywood on the underside of the deck beneath the flame pattern.
8	28	29:28	30:09	Plywood on the underside of the deck continues to darken.
9	32	33:37	34:09	Top surface and underside continue to smoke.
10	36	37:22	38:11	Plywood on the underside of the deck continues to darken beneath the flame pattern.
11	40			No change.
12	44	45:35	46:27	No change.
13	48	49:18	50:17	No change.
14	52	53:31	54:09	Plywood on the underside of the deck continues to darken beneath the flame pattern.
15	56	57:35	58:10	Plywood on the underside of the deck continues to darken beneath the flame pattern. 60:00 – No smoking of the top surface or underside of the deck. 85:00 – Deck surface is cool to the touch. 100:00 – End of test.

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

Test Deck #5 – Burning Brand (Class A)

Test Date	5/26/2006
Air Velocity	1056 +/-44 fpm
Ambient Air Temperature	79°F
Brand Type/Weight	Class A/4.20 lb
Slope of Test Deck	5:12 Inches
Surface Material	Three-tab asphalt shingles complying with ASTM D3018
Underlayment	NovaSeal Generation II polymer woven underlayment

Brand#	Time (min:sec)	Observations
1	00:00	Brand placed on deck.
	01:57	Flaming of the top surface of the deck.
	02:34	Moderate smoke on the underside of the deck.
	04:42	Molten asphalt seeping through the plywood joint on the underside of the deck (light).
	06:42	Heavy smoke and moderate seepage on the underside of the deck.
	13:00	Heavy scorching of the plywood on the underside of the deck.
	17:00	Flaming has ceased on the top surface of the deck, light smoke continues on the underside of the deck.
	27:00	All glowing embers have extinguished on the top surface of the deck.
	45:00	All flaming, glowing, and smoking have ceased on the top surface and underside of the deck. End of test.

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

Test Deck #6 – Burning Brand (Class A)

Test Date	5/31/2006
Air Velocity	1056 +/-44 fpm
Ambient Air Temperature	76°F
Brand Type/Weight	Class A/4.30 lb
Slope of Test Deck	5:12 Inches
Surface Material	Three-tab asphalt shingles complying with ASTM D3018
Underlayment	NovaSeal Generation II polymer woven underlayment

Brand#	Time (min:sec)	Observations
1	00:00	Brand placed on deck.
	02:00	Ignition of the top surface of the deck.
	06:37	Moderate smoke on the underside of the deck.
	07:33	Molten asphalt beginning to seep through the plywood joint on the underside of the deck.
	09:26	Heavy smoke on the underside of the deck.
	10:33	Light scorching of the plywood on the underside of the deck.
	12:07	Moderate scorching of the plywood on the underside of the deck.
	13:23	Heavy scorching and heavy smoke on the underside of the deck.
	17:33	Flaming of the top surface of the deck has ceased, moderate smoke continues on the underside of the deck.
	25:50	Glowing embers developing on the plywood on the underside of the deck. All glowing of the top surface of the deck has ceased.
	32:07	Light smoke on the underside of the deck.
	49:00	All flaming, glowing, and smoking have ceased on the top surface and underside of the deck. End of test.

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

SUMMARY

Test Deck #	Test	Acceptance Level
1	Intermittent Flame	Class "A"
2	Burning Brand	Class "A"
3	Burning Brand	Class "A"
4	Intermittent Flame	Class "A"
5	Burning Brand	Class "A"
6	Burning Brand	Class "A"

CONCLUSION

The NovaSeal Generation II polymer woven underlayment, as described herein, complied with the acceptance criteria of ICC-ES AC1888 *"Acceptance Criteria for Roof Underlayments"* section 3.3 referencing the Intermittent Flame and Burning Brand tests in accordance with ASTM E108 (2004) *"Standard Test Methods for Fire Tests of Roof Coverings"*, UL 790 (1997), and UBC 15-2 (1997) for a "Class A" rating.

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