

TEST REPORT

FOR

Sun Fire Defense, Inc.
4300 Promenade Way #116
Marina Del Rey, CA 90292

**Standard Test Method for
Extended Duration Surface Burning Characteristics of
Building Materials (30 min Tunnel Test)
ASTM E2768-11**

Test Report No: FH-2675


Assignment No: H-1235

Test Date: 08/05/2016

Report Date: 08/15/2016

Subject Material: Sun FireDefense SFP3000 Clear Spray

Prepared by: _____



Michael J. Rizzo
Senior Test Engineer

Reviewed by: _____



Robert J. Menchetti
Director, Laboratory Facilities and Testing Services

The results reported in this document apply to specific samples submitted for measurement. No responsibility is assumed for the performance of any other specimen. The laboratory's test report in no way constitutes or implies product certification, approval or endorsement by this laboratory. This report may not be reproduced, except in full, without the written approval of the laboratory.

TEST REPORT REVISION HISTORY:

DATE	SUMMARY
August 15, 2016	Original issue date. Original NGCTS report FH-2675.

INTRODUCTION:

This report presents the results of a specimen tested in accordance with the requirements of ASTM E2768-11 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test).

The purpose of this test method is to evaluate the ability of a product to limit the surface spread of flame when evaluated for 30 minutes. This standard uses the apparatus and procedure of Test Method ASTM E84 with the total test period extended to 30 minutes.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled laboratory conditions. It should not alone be used for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

TEST SPECIMEN:

The test specimen was submitted for testing directly to NGC Testing Services (NGCTS) by the client, Sun Fire Defense, Inc. The submitted test specimen consisted of six (6), pre-assembled decks, made from nominal 2x6 dimensional lumber, coated with a fire retardant coating. The fire retardant coating was identified by the client as:

Sun FireDefense SPF3000 Clear Spray

Each test specimen deck, which was constructed using four, 4 ft. long 2x6 boards, measured nominally 1.5 in. thick by 22 in. wide by 48 in. long. Upon receipt, the test specimen decks were placed in a conditioning room where they remained in an atmosphere of 73.4 ± 5°F and 50 ± 5% relative humidity for 3 days prior to testing.

Immediately prior to testing, the average moisture content of the test specimen decks was determined to be 10.4%, as measured directly with an electrical resistance, pin-type meter (Delmhorst BD-2100).

MOUNTING METHOD:

The (6) test specimen decks were placed end-to-end, directly on the tunnel ledges, and butted tightly together to achieve the required specimen length. No additional support was required.

Non-combustible, fiber-reinforced cement board (1/4 in. thick) was placed over the test specimen decks as lid protection.

CONDITIONS OF CLASSIFICATION:

The test method has the following conditions of classification for a material or product to be classified as meeting the requirements of this standard:

- The flame spread index shall be 25 or less as determined for the initial 10 minute test period.
- The flame front shall not progress more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the 30 minute test period. This is considered evidence of no significant progressive combustion in this test method.

TEST RESULTS:

The test results, computed on the basis of observed flame front advance and electronic smoke density measurements are presented in the following tables.

The reported flame spread and smoke developed indices are the computed comparison to the standard calibration materials – mineral fiber-reinforced cement board and select grade red oak flooring. The cement board is used to establish relative 0 values for flame spread and smoke developed; the red oak flooring is used to establish relative 100 values for flame spread and smoke developed.

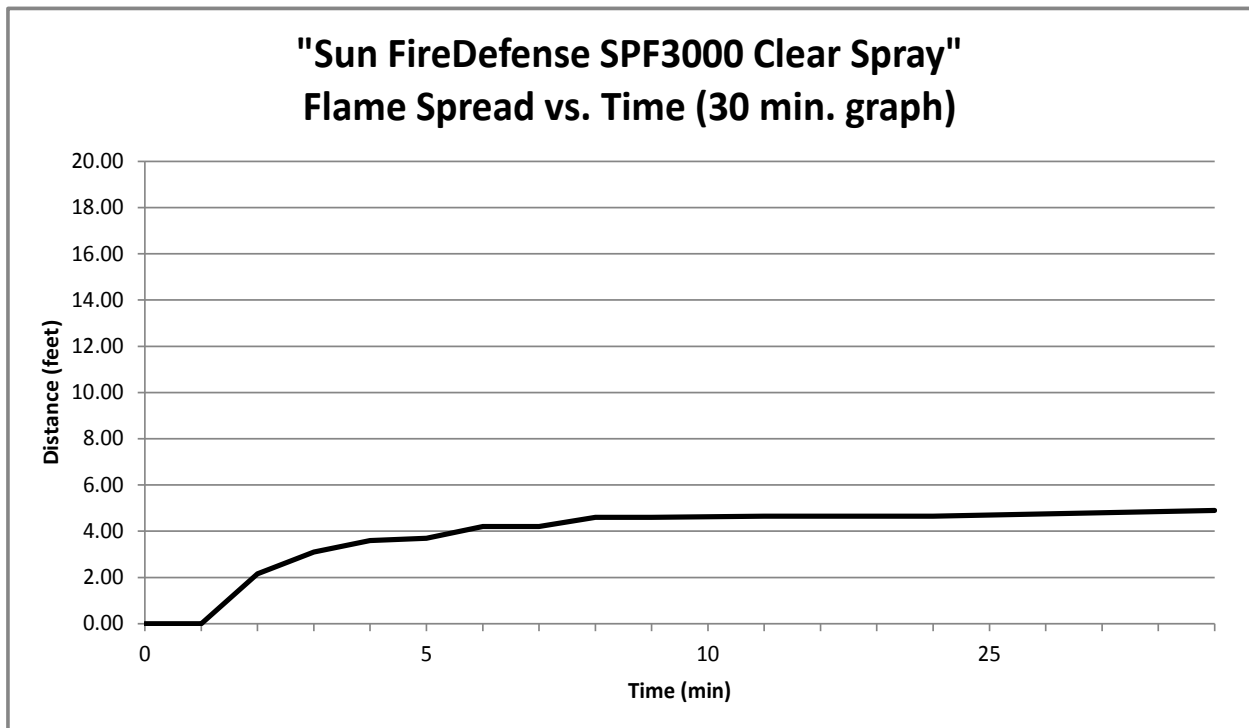
<u>TEST NO.</u>	<u>MATERIAL TESTED</u>	<u>SIDE EXPOSED</u>	<u>SUPPORT</u>	<u>CALCULATED FLAME SPREAD</u>	<u>CALCULATED SMOKE DEVELOPED</u>	
1	Sun FireDefense SPF3000 Clear Spray (applied to 2x6 lumber)	Coated	Self-Supporting	17.02	85.26	
FLAME SPREAD INDEX * SMOKE DEVELOPED INDEX*						
	<u>MATERIAL TESTED</u>	<u>SIDE EXPOSED</u>	<u>SUPPORT</u>	<u>FLAME SPREAD INDEX *</u>	<u>SMOKE DEVELOPED INDEX*</u>	
	RED OAK FLOORING	FINISHED	SELF-SUPPORTING	100	100	
	REINFORCED CEMENT BOARD	SYMMETRICAL	SELF-SUPPORTING	0	0	
1	Sun FireDefense SPF3000 Clear Spray (applied to 2x6 lumber)	Coated	Self-Supporting	15	85	
				<u>CLASSIFICATION</u>	<u>FSI</u>	<u>SDI</u>
* Flame Spread / Smoke Developed Index is the result (or the average of the results of multiple tests), rounded to the nearest multiple of 5. Smoke developed results in excess of 200 are rounded to the nearest multiple of 50.				CLASS A or I	0 - 25	0 - 450
				CLASS B or II	26 - 75	0 - 450
				CLASS C or III	76 - 200	0 - 450

Test Specimen	Flame Spread Index*	Smoke Developed Index*	Maximum Flame Front (ft.)*
Sun FireDefense SPF3000 Clear Spray (applied to 2x6 lumber)	15	85	9.4

**Note: The Flame Spread Index and Smoke Developed Index are based on the initial 10 minutes of the test which represents the standard ASTM E84 test period. The Maximum Flame Front is based on the 30 minute test period and is measured from the centerline of the burners to a point where flame travels stops or up to a maximum of 24 feet.*

The following graph shows the maximum flame front travel for the entire 30 minute duration of the test. The origin of the distance axis of the graph is +4.5 feet beyond burner centerline. Therefore, the maximum flame front travel distance required in this standard shall be the recorded distance plus 4.5 feet.

Example: If the graph shows a maximum flame spread of 5.2 feet, then the maximum flame front from the burner centerline is 5.2 feet plus 4.5 feet (9.7 feet).



The test specimen met the conditions of classification per ASTM E2768-11. For the initial 10 minute test period, the test specimen's flame spread index was less than 25. The flame front did not progress more than 10.5 feet beyond the centerline of the burners at any time during the 30 minute test period, showing no evidence of significant progressive combustion.

ADC DRAFT (IN. H2O) 0.080
 GAS PRESS. (IN. H2O) 0.283
 GAS VOL (CF) 148.78
 BTU/cf 1001
 SHUTTER (IN.) 3.00
 TEMP. 13' BURIED 105 F

Flame Spread: 17.02
 Area under Flame Curve (ft-min): 33.05

TEST#: FH-2675 DATE: 8/5/2016

TEST METHOD: ASTM-2768-11

CLIENT: SUN FIRE DEFENSE, INC.

PROJECT#: H-1235

SAMPLE: SUN FireDefense SPF3000 CLEAR
 SPRAY ON 2"X6" PLANKS

MATERIAL: 2"X22.5"X48" WOOD PLANKS BUILT
 INTO DECKS

SUPPORT: SELF SUPPORTING

REMARKS: Ignition Time: 0:48

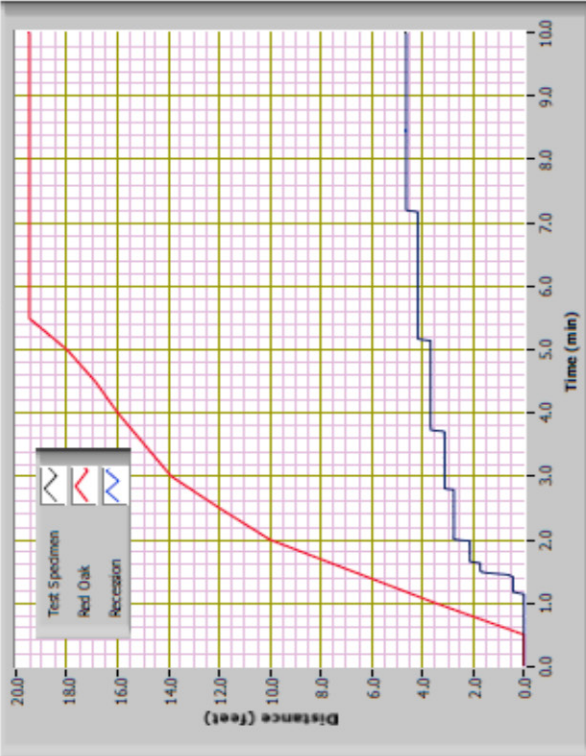
Max Flame Front: 4.62 FT. @ 9:55

Flame did not surpass the 5 FT. mark at 30
 Minutes

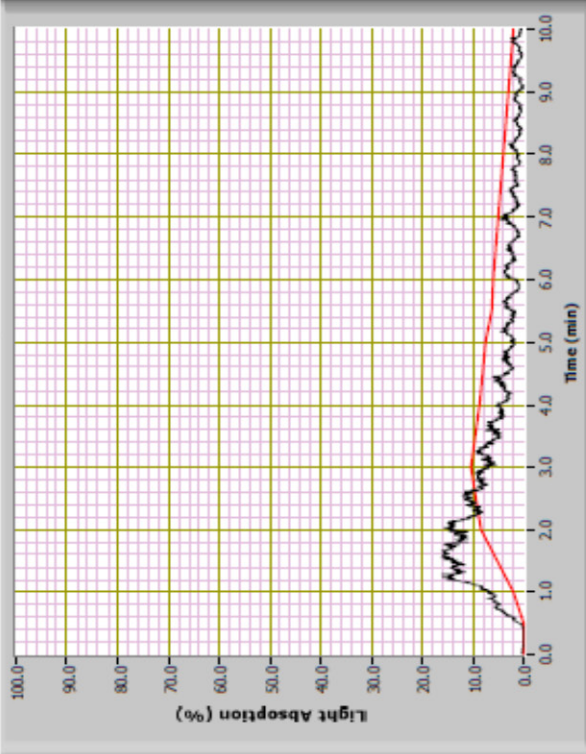
Smoke Developed: 85.26

Area under Smoke Curve (%A-min): 43.81

Flame Spread



Smoke Developed



The following data sheet is an actual printout (for the initial 10 minutes of the test only) of the computerized data system which monitors the tunnel furnace. The sheet contains all calibration and specimen data needed to calculate the test results.