

May 15, 1994

REPORT  
on  
FLAME RETARDANT COATINGS

Fire Shield Products,  
Lewisville, TX

A not-for profit organization  
dedicated to public safety and  
committed to quality service.

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DESCRIPTION

PRODUCT COVERED :

The product covered by this Report is a fire retardant coating.

USE:

The coatings covered in this Report are intended for use as exterior coatings as permitted by the authorities having jurisdiction. The established Surface Burning Characteristics of the coatings are applicable only when the coating material is applied in the indicated number of coats, coverage rates, substrates, and overcoats and undercoats as specified in the published advises of Independent R. Laboratories Inc. and when the coating is maintained.

COATING TYPE:

This Report covers a fire retardant coating which was identified by the manufacturer as "FK-100".

TP/MTC/scl

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TEST RECORD NO.1

EXAMINATION OF MATERIAL:

The material used in this investigation was produced in a ready-to-use form under the observation of a representative of Independent R. Laboratories Inc. and was applied to the indicated test surfaces at the manufacturing location.

The composition of the coating material is of a proprietary nature and the formula involved is on file at the Laboratories for use in the Follow-Up Service Program.

Various chemical and physical tests were conducted on the finished material. The results developed from these tests were employed in establishing specifications for use in the Follow-Up Service Program.

SURFACE BURNING CHARACTERISTICS TESTS:  
SAMPLES

Substrate

Douglas Fir - The test decks were a nominal 22 in. wide and 8 ft. long, composed of 1 by 4 in. tongue-and-groove Douglas fir flooring fastened together on the unexposed surface with wood furring strips. Three such decks were butted together end to end to form the 24 ft. long test surface required to fill the Steiner Tunnel furnace.

Coatings

The coating material was applied to the test surfaces by a representative of the submitter under the observation of a staff member of Independent R. Laboratories Inc. The coating material was brush applied in one coat. The amount of coating applied was determined by weight.

One fire retardant coating was evaluated under this investigation and was identified by the manufacturer as "FK-100". The coating was applied at a rate of 210 sq. ft. per gallon.

The test samples were conditioned for 28 days at a temperature of  $70 \pm 5^\circ$  and relative humidity of 45 to 55 percent before testing.

METHOD

The tests were conducted in accordance with Underwriters Laboratories Inc.'s Standard "Test for Surface Burning Characteristics of Building Materials", UL 723.

RESULTS

Data on flame spread and smoke developed, results appear in the following tabulations and as shown on Ills. 1 through 8:

Flame Spread:

The maximum distance the flame spreads along the length of the sample from the end of the igniting flame is determined by observation.

The Flame Spread Classification of the material is derived by determining the area under the flame spreads distance (ft.) versus time (min.) curve, ignoring any flame front recession, and using one of the calculation methods as described below:

1. If the total area (At) is less than or equal to 97.5 min. -ft (meter-min. x 3.3), The Flame Spread Classification shall be 0.515 times the total area (FSC = 0.515 At).
2. If the total area (At) is greater than 97.5 min -ft (meter-min. x 3.3) The Flame Spread Classification is to be 4900 divided by 195 minus the total area (At). (FSC = 4900/(195-At)).

Test No.	Test Sample	Maximum Flame Spread (ft.)	Time of Maximum Flame Spread (min. : sec.)	Calculate Value For Flame Spread Classification
1	Blank Douglas Fir Decks	7.5	2:47	33.2
2	"FK-100"	3.0	9:47	6.2

3	"FK-100"	3.0	9:19	7.7
4	"FK-100"	2.5	9:29	6.8

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**Smoke Developed**

The smoke developed during the test is indicated by the output of a photoelectric circuit operating across the furnace flue pipe. A curve is developed by plotting values of light absorption (decreased cell output) against time. The calculated value for Smoke Developed Classification is derived by expressing the net area under the curve for this material as a percentage of the net area under the curve for untreated red oak.

Test No.	Test Sample	Calculated Value For Smoke Developed Classification
1	Blank Douglas Fir Decks	34.2
2	"FK-100"	18.6
3	"FK-100"	21.9
4	"FK-100"	23.1

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**C O N C L U S I O N**

The following conclusion s represent the judgment of Independent R. Laboratories Inc. based upon the results of an examination of tests presented in this Report as they relate to established principles in previously recorded data.

**SURFACE BURNING CHARACTERISTICS CLASSIFICATION:**

The following Surface Burning Characteristics are established for the products submitted.

"FK-100"

APPLIED TO DOUGLAS FIR +

Flame Spread 10  
Smoke Developed 30

(+)(-)Tested as applied at a coverage of 210 sq.ft./gallon. Flash point of finished adhesive, closed cup: No flash to boiling.

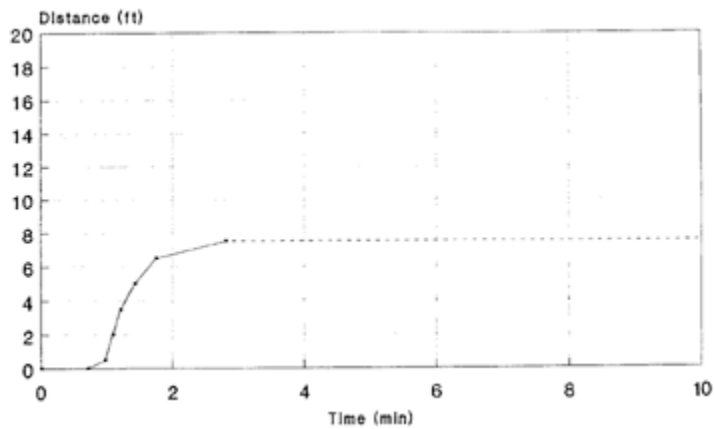
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**SURFACE BURNING CHARACTERISTICS OF APPLIED COATINGS**

	FK-100
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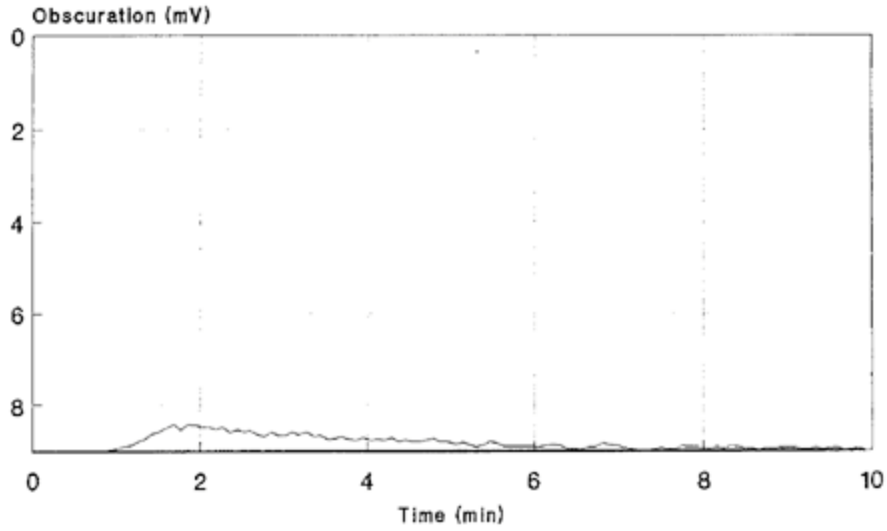
	Douglas Fir
Flame Spread	10
Smoke Developed	30
Number of preliminary coats	None
Rate per coat (sq. ft. per gallon)	-----
Number of fire retardant coats	2
Rate per coat (sq. ft. per gallon)	200
Number of overcoats	None
Rate per coat (sq. ft. per gallon)	----
Flash point of fire retardant coating: Closed cup, no flash	

Flame Travel Results  
Fire Shield # 01  
UNTREATED DOUGLAS FIR DECK



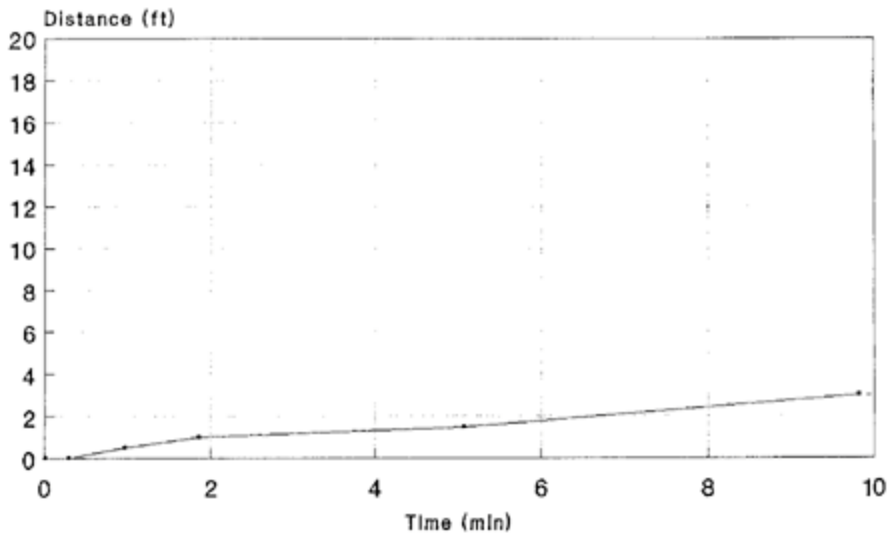
Flame Spread Index = 33.2  
Test Code = 04189401  
Project R16006-94RT5038

Smoke Results  
Fire Shield # 01  
UNTREATED DOUGLAS FIR DECK



Smoke Index = 34.2  
 Test Code = 04189401  
 Project R16006-94RT5038

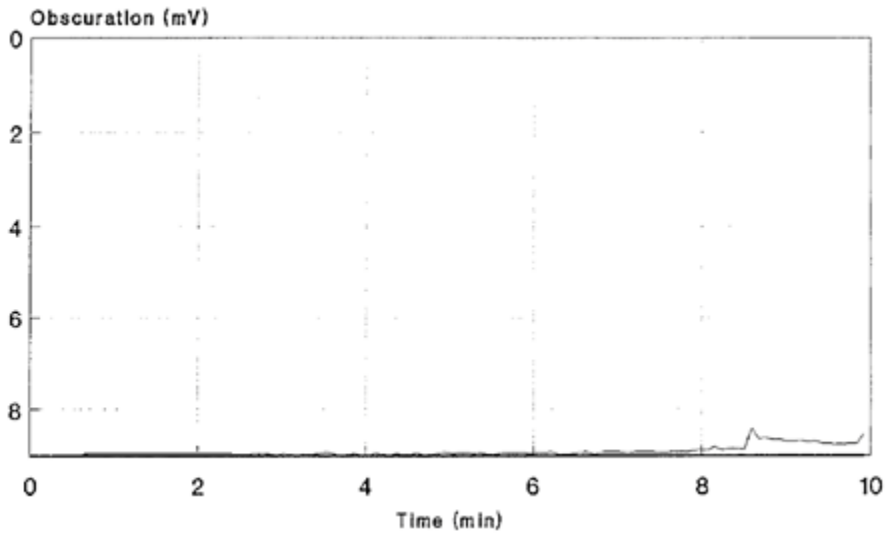
Flame Travel Results  
 Fire Shield # 02  
 COATED DOUGLAS FIR DECK



Flame Spread Index = 6.2  
 Test Code = 04189402  
 Project R16006-94RT5038

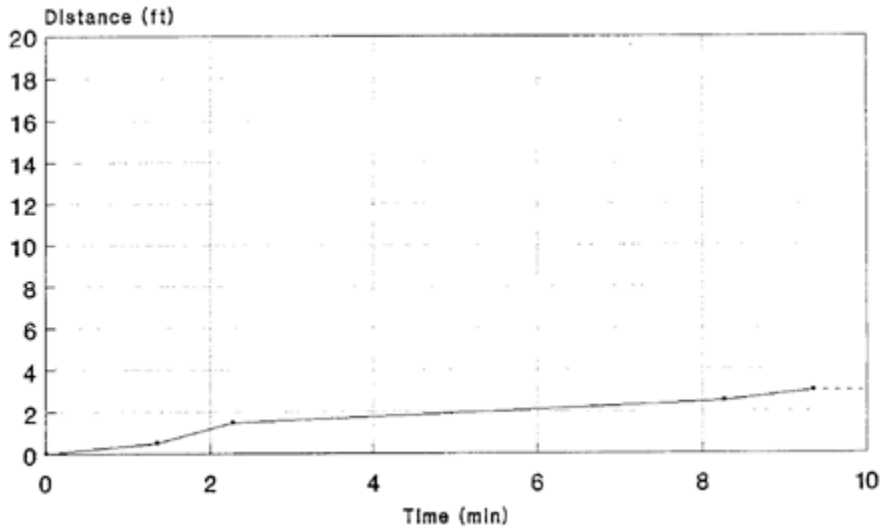
Smoke Results  
 Fire Shield #02

COATED DOUGLAS FIR DECK



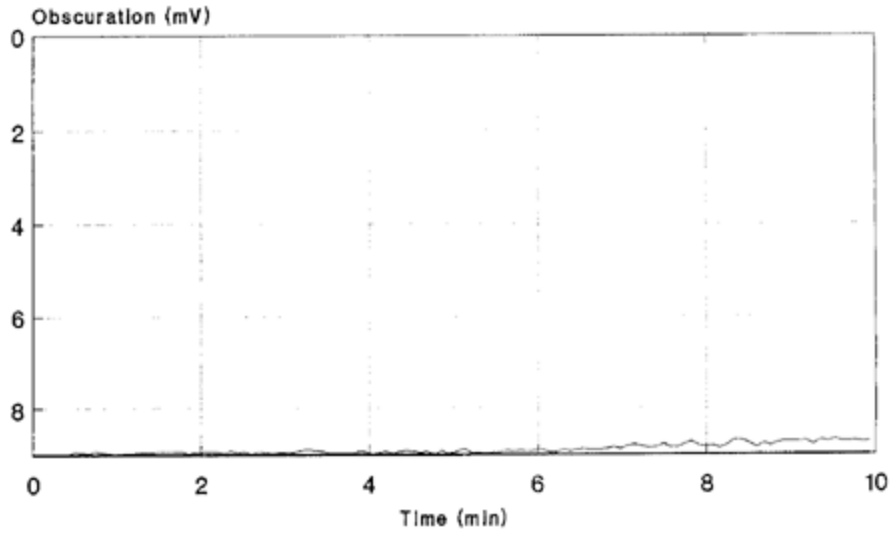
Smoke Index = 18.6  
Test Code = 04189402  
Project R16006-94RT5038

I11.5  
Flame Travel Results  
Fire Shield # 03  
COATED DOUGLAS FIR DECK



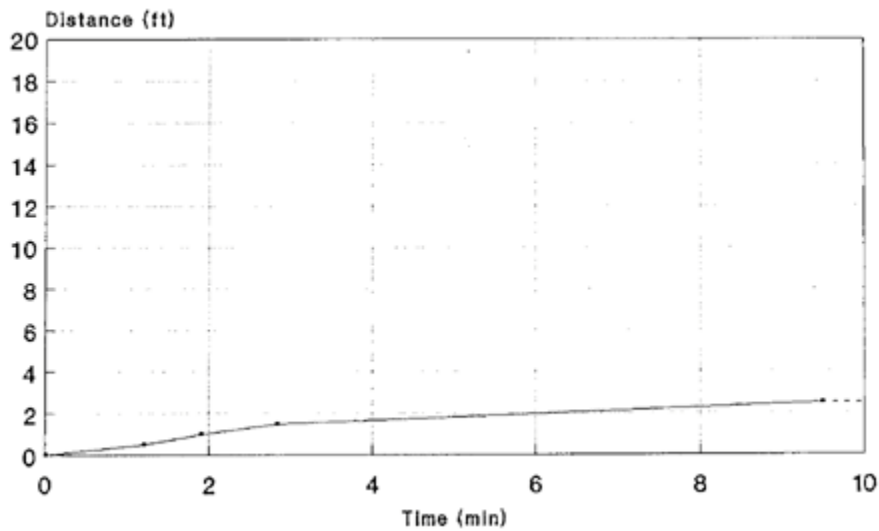
Flame Spread Index = 7.7  
Test Code = 04189404  
Project R16006-94RT5038

Smoke Results  
Fire Shield # 03  
COATED DOUGLAS FIR DECK



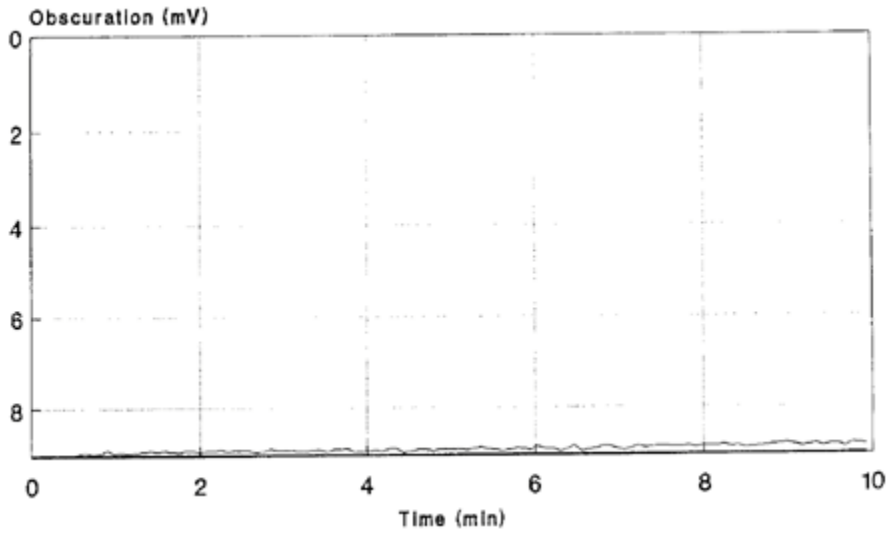
Smoke Index = 21.9  
Test Code = 04189404  
Project R16006-94RT5038

Flame Travel Results  
Fire Shield # 04  
COATED DOUGLAS FIR DECK



Flame Spread Index = 6.8  
Test Code = 04189415  
Project R16006-94RT5038

Smoke Results  
Fire Shield # 04  
COATED DOUGLAS FIR DECK



Smoke Index = 23.1  
Test Code = 04189415  
Project R16006-94RT5038