



File R38238

Project 4786564016

Issued: April 30, 2015

REPORT

on

FIRE RETARDANT COATINGS (BMQX / BMQXC)

UNDER THE

CLASSIFICATION AND LISTING PROGRAMS

International Coatings Group Inc
Fort Lauderdale, FL, USA

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DESCRIPTION

PRODUCT COVERED:

The product covered by this Report is a fire retardant coating designated as "ICG Fire Barrier Latex-100" or abbreviated as "ICG FBL-100".

The product is Classified and Listed as to Surface Burning Characteristics only.

USE:

The product is intended for use as a building material as permitted by local authorities having jurisdiction.

TEST RECORD NO. 1

GENERAL:

This test record describes an investigation undertaken to determine the comparative burning characteristics of International Coatings Group Inc.'s fire retardant coating by evaluating the flame spread and smoke developed over its surface when exposed to a test fire. The tests were conducted at ULC's test facility in Toronto, Ontario on March 25th, 2015 in accordance with the Standard, CAN/ULC-S102-10, *STANDARD METHOD OF TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS AND ASSEMBLIES*, 7th Edition.

This method defines the relative surface burning characteristics under specific test conditions. Although the procedure is applicable to materials, products and assemblies used in building construction for development of comparative surface spread of flame data, test results may not reflect the relative surface burning characteristics of tested materials under all building fire conditions. Test results relate only to the items tested.

EXAMINATION OF MATERIALS:

The test samples evaluated in this investigation were produced under the observation of a representative of UL.

The fire tests were supplemented by various physical and chemical tests, and examinations intended to furnish information concerning the properties of the test samples and the materials employed in the test samples.

Information on the production of the test samples, materials employed in the test assemblies and the results of the supplemental tests are considered proprietary in nature and were used in establishing specifications for use in the factory Follow-Up Service Program, which is on file at UL.

SURFACE BURNING CHARACTERISTICS:

SAMPLES

Douglas Fir decks each measuring 2438 mm long by 537 mm wide were constructed for the investigation from tongued and grooved lumber. Seven 80 mm wide by 18 mm thick pieces of Douglas Fir lumber were placed side-by-side and fastened together on the unexposed surface with three 80 mm wide by 18 mm thick nailing strips spaced 914 mm apart. Three decks were butted end-to-end to create a 7314 mm long test specimen. Four test specimens were prepared and conditioned to constant mass at a temperature of $23 \pm 3^\circ\text{C}$ and a relative humidity of $50 \pm 5\%$ prior to the application of the fire retardant coating.

A fire retardant coating designated as "ICG FBL-100" was submitted for the investigation. One coat of "ICG FBL-100" was applied to the Douglas Fir substrate at a rate of $1.88 \text{ m}^2/\text{L}$ using a paint brush. Three of the four Douglas Fir test specimens were coated then set aside to cure for 30 days.

All test specimens were conditioned to constant mass at a temperature of $23 \pm 3^\circ\text{C}$ and a relative humidity of $50 \pm 5\%$ prior to testing. The average moisture content of the uncoated Douglas Fir decks was determined to be 10% immediately before testing.

Due to the rigidity of the test samples, supplementary means of support was not required. The test specimens were installed on the ceiling of the tunnel furnace with the coated side exposed to the gas burners. A 350 mm long by 560 mm wide by 1.6 mm thick, uncoated, steel plate was placed on the specimen mounting ledge in front of and under the specimen at the fire end of the tunnel furnace "upstream" from the gas burners to complete the 7620 mm chamber length. An airtight water seal was maintained around the furnace lid during the test.

METHOD

The tests were conducted in accordance with the Standard CAN/ULC-S102-10, *STANDARD METHOD OF TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS AND ASSEMBLIES*, 7th Edition.

RESULTS

Observations of the burning characteristics are provided in the following tabulations. Additionally, during all tests the "ICG FBL-100" coating charred and swelled, and small pieces of char fell to the furnace floor. No other significant observations were made. Graphical plots of flame spread versus time and smoke developed versus time are also provided as part of the Test Record. The test results relate only to the actual samples tested.

SURFACE BURNING CHARACTERISTICS: (Cont'd)

FLAME SPREAD RATING

The position of the flame front was determined through visual observation and recorded with time throughout the test to produce a graphical plot of flame spread versus time. The total area (A_T) under the flame spread time-distance curve was determined disregarding any flame front recession.

The Flame Spread Value (FSV) of the material was calculated using one of the calculation methods described below.

1. If the total area (A_T) is less than or equal to 29.7 m-min, the FSV shall be 1.85 times the total area (A_T):

$$FSV = 1.85 \times A_T$$

2. If the total area (A_T) is greater than 29.7 m-min, the FSV is to be 1640 divided by 59.4 minus the total area (A_T):

$$FSV = \frac{1640}{59.4 - A_T}$$

The Flame Spread Rating (FSR) is the numerical average of not less than three individual Flame Spread Values (FSV) rounded to the nearest multiple of 5 points.

The Flame Spread Values that were achieved during this investigation appear in Table 1.

Table 1: Summary of individual flame spread test results.

TEST NO.	SAMPLE DESCRIPTION	TIME OF SURFACE IGNITION [min:s]	MAXIMUM FLAME TRAVEL [m (ft)]	TIME OF MAXIMUM FLAME TRAVEL [min:s]	FLAME SPREAD VALUE (FSV)
1	Douglas Fir, uncoated, with an average moisture content of 10%	0:49	5.9 (19.5)	8:28	81.4
2*	"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat) to Douglas Fir	8:15	0.2 (0.5)	9:27	0.2
3*	"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat) to Douglas Fir	5:58	0.2 (0.5)	9:10	0.2
4*	"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat) to Douglas Fir	7:04	0.2 (0.5)	8:41	0.4
*Average of Individual Flame Spread Values					0.3
Flame Spread Rating (FSR)					0

SURFACE BURNING CHARACTERISTICS: (Cont'd)

SMOKE DEVELOPED CLASSIFICATION

The Smoke Developed Classification (SDC) is the numerical average of not less than three individual Smoke Developed Values (SDV) rounded to the nearest multiple of 5 points.

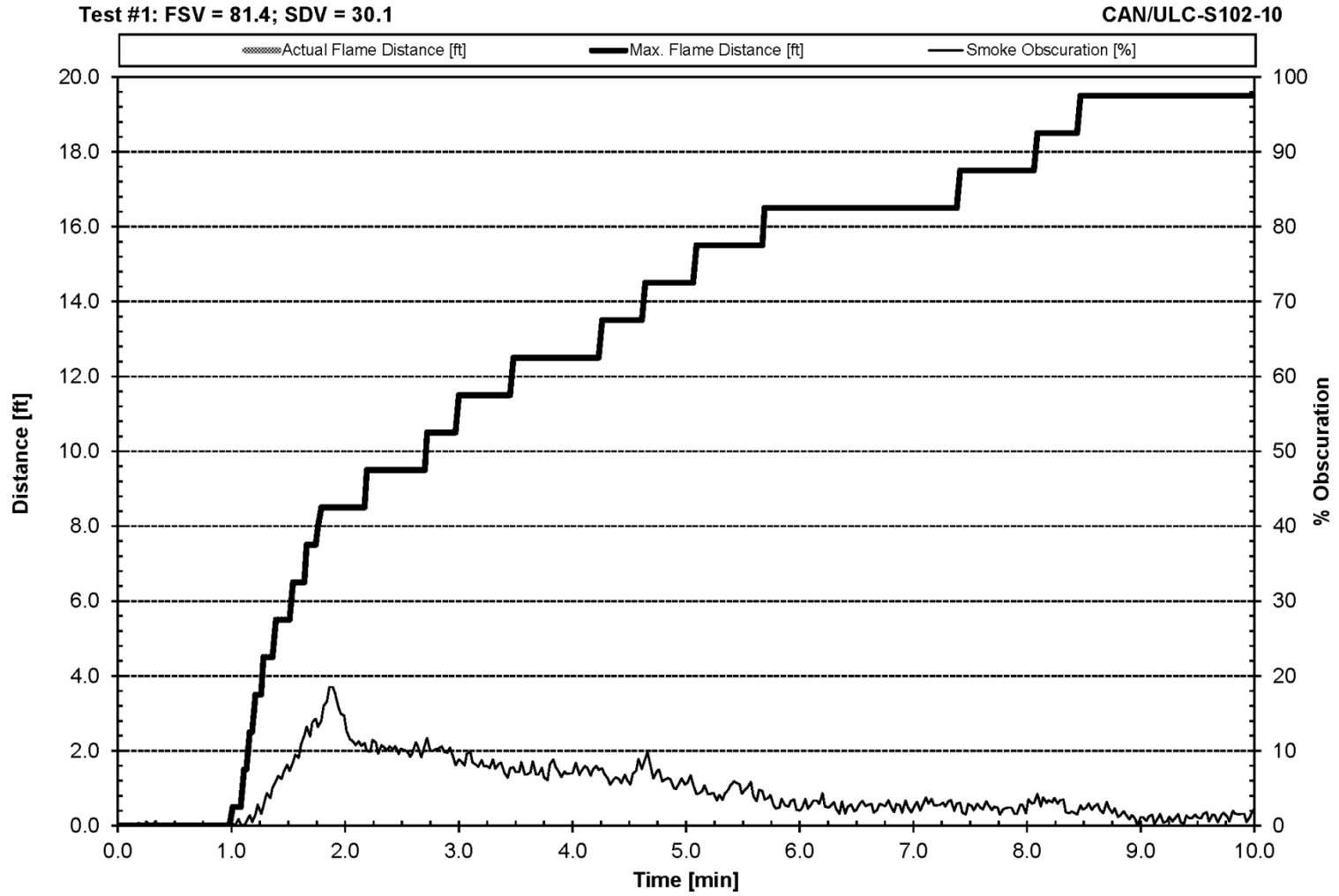
The Smoke Developed Value (SDV) is determined by plotting the output of a photoelectric circuit, which measures the light absorption across the furnace flue pipe, against time. The area under the curve of the test material obtained during the fire test (A_U) is divided by the area under the curve for Red Oak (A_{RO}) and multiplied by 100 to establish a numerical index by which the performance of the material is to be compared with that of inorganic cement board and select-grade Red Oak flooring which have been arbitrarily established by the standard as 0 and 100, respectively.

The Smoke Developed Values that were achieved during this investigation appear in Table 2.

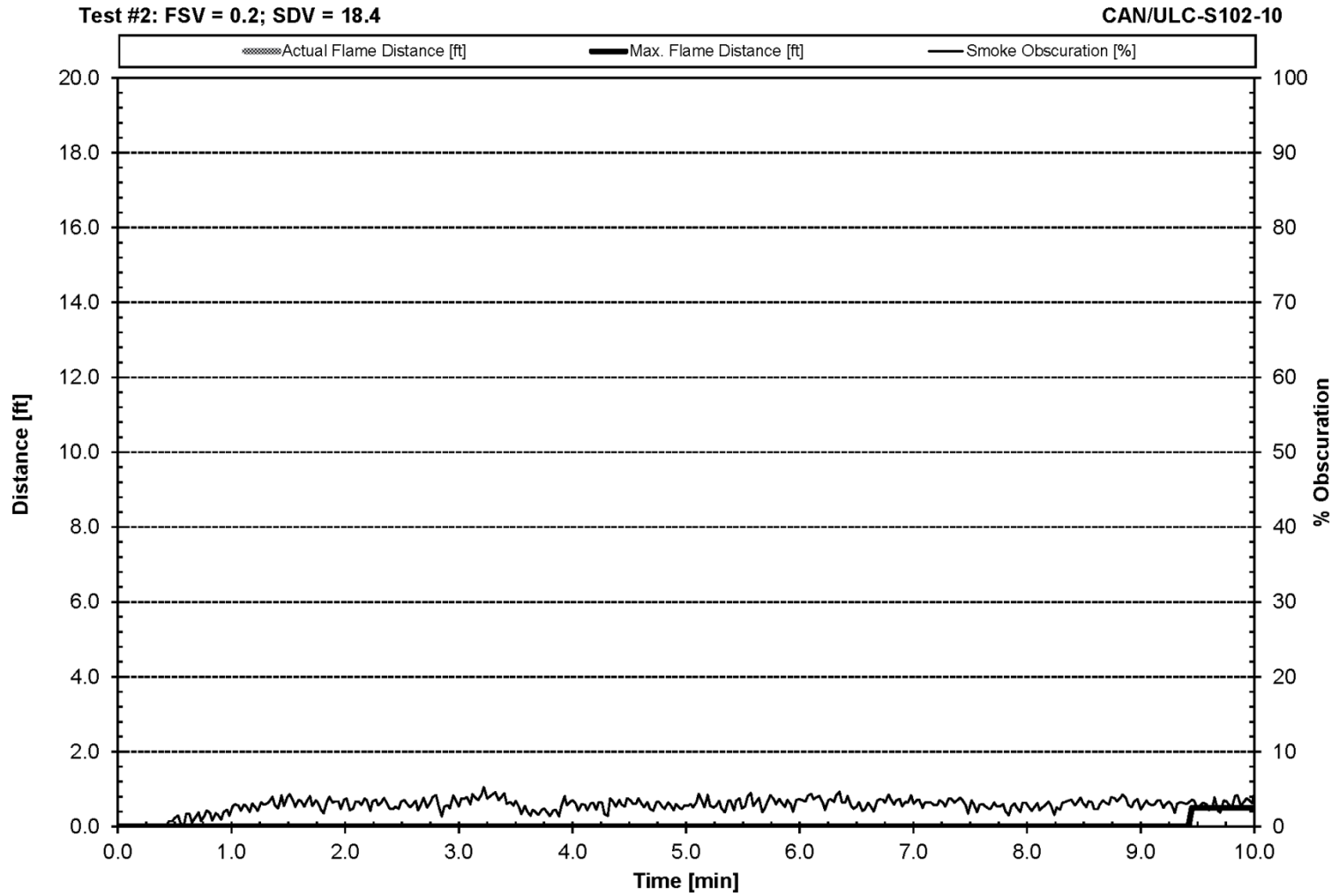
Table 2: Summary of individual smoke developed test results.

TEST NO.	SAMPLE DESCRIPTION	MAXIMUM SMOKE OBSCURATION [%]	TIME OF MAXIMUM SMOKE OBSCURATION [min:s]	SMOKE DEVELOPED VALUE (SDV)
1	Douglas Fir, uncoated, with an average moisture content of 10%	18.5	1:53	30.1
2*	"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat) to Douglas Fir	5.2	3:13	18.5
3*	"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat) to Douglas Fir	3.5	1:17	7.4
4*	"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat) to Douglas Fir	3.9	1:49	14.0
*Average of Individual Smoke Developed Values				13.3
Smoke Developed Classification (SDC)				15

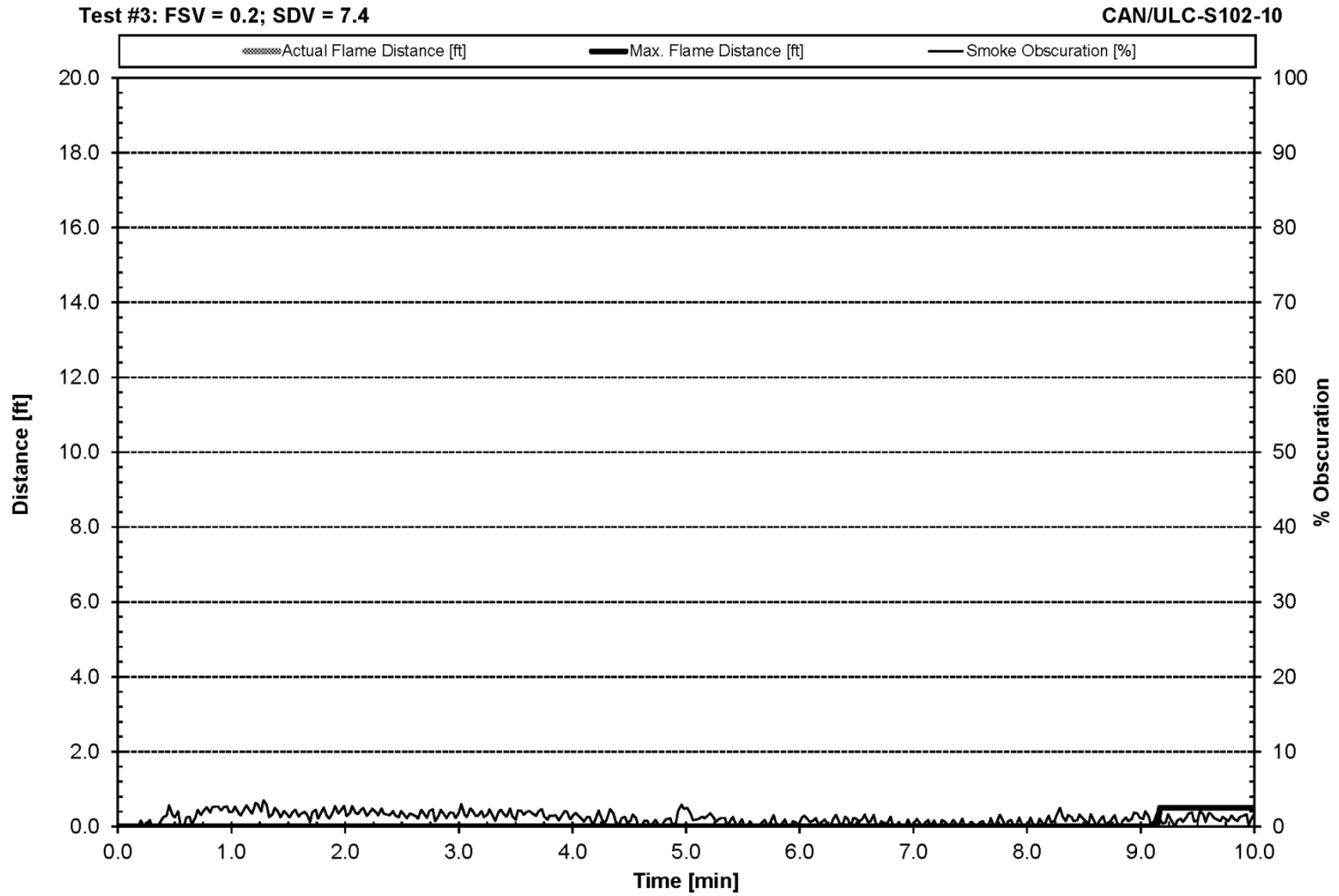
**SURFACE BURNING CHARACTERISTICS
INTERNATIONAL COATINGS GROUP INC.
Douglas Fir, uncoated**



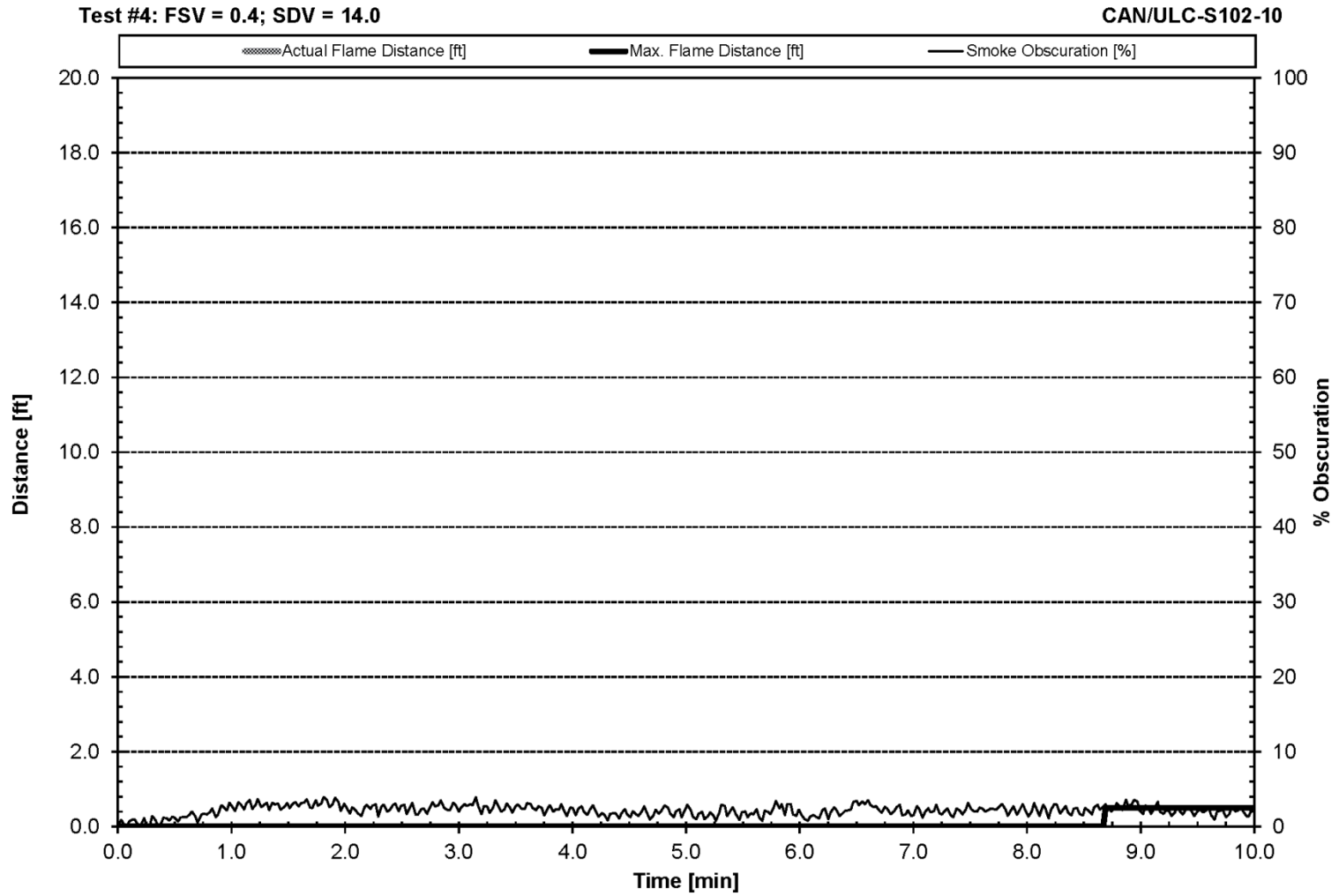
SURFACE BURNING CHARACTERISTICS
INTERNATIONAL COATINGS GROUP INC.
"ICG FBL-100" applied in one coat at 1.88 m²/L to Douglas Fir



SURFACE BURNING CHARACTERISTICS
INTERNATIONAL COATINGS GROUP INC.
"ICG FBL-100" applied in one coat at 1.88 m²/L to Douglas Fir



SURFACE BURNING CHARACTERISTICS
INTERNATIONAL COATINGS GROUP INC.
"ICG FBL-100" applied in one coat at 1.88 m²/L to Douglas Fir




TEST RECORD SUMMARY:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements of the Standard CAN/ULC-S102-10, *STANDARD METHOD OF TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS AND ASSEMBLIES*, 7th Edition and, therefore, such products are judged to be eligible to bear ULC's Mark as described below and on the Conclusion Page of this Report.

ULC LISTING MARK:

The surface burning characteristics of the fire retardant coating described herein warrants the assignment of the rating or classification shown below in the Listing Mark in comparison to untreated red oak as 100 and inorganic reinforced cement board as 0. This represents the judgement of Underwriters Laboratories of Canada based upon the results of the examination and tests presented in this Report.

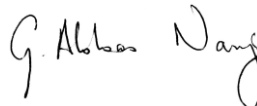
		
FIRE RETARDANT COATINGS <Control No.>		
Listed in accordance with CAN/ULC-S102		
	Classification or Rating (When applied to Douglas Fir)	
Coating System Details	Flame Spread	Smoke Developed
"ICG FBL-100" (Base Coat) applied in one coat at 1.88 m ² /L (No Primer, No Top Coat)	0	15
Flash Point of Liquid Coatings: (Closed Cup) No flash to boiling.		

Test Record by:



STANIS YU
 Project Handler
 Building & Life Safety Technologies

Reviewed by:



G. ABBAS NANJI
 Senior Staff Engineer
 Building & Life Safety Technologies

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TEST RECORD NO. 2

GENERAL:

Test results relate only to the items tested.

EXAMINATION OF MATERIALS:

The materials used in this investigation were produced under the observation of a representative of UL, in a ready-to-use form. The composition of the finished material is of proprietary nature. Data on the composition is on file at UL for use in the Follow-Up Service Program.

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

SURFACE BURNING CHARACTERISTICS:

SAMPLES

The samples consisted of a fire retardant coating designated "ICG FBL-100" applied to Red Oak decks in one coat, at 80 ft²/gal.

Each test sample consisted of three coated 8 by 2 ft. wide boards butted end-to-end to form the required 24 ft. long surface.

For each test a piece of 1 ft. long by 22 in. wide by 1/16 in. thick uncoated steel plate was placed at the fire end of the tunnel furnace "upstream" from the gas burners to complete the 25 ft. chamber length.

The test samples were allowed to condition at a temperature of 73 ± 4°F and a relative humidity of 50 ± 5 percent prior to testing.

METHOD

The tests were conducted in accordance with Standard ANSI/UL723, Tenth Edition, dated September 10, 2008 with revisions through August 12, 2013, "Test for Surface Burning Characteristics of Building Materials", (ASTM E84-13A).

RESULTS

Data on flame spread and smoke developed appears in the following tabulations. Graphs of flame spread versus time and smoke developed versus time are also provided as part of the Test Record.

Flame Spread Index

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 Index (FSI) of the material is determined by rounding the Calculated Flame Spread (CFS) as described in UL 723. The CFS is derived by calculating the area under the flame spread 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 (A_T) is less than or equal to 97.5 min-ft, the CFS shall be 0.515 times the total area ($FSI=0.515 A_T$).

2. If the total area (A_T) is greater than 97.5 min-ft, the CFS is to be 4900 divided by 195 minus the total area ($FSI=4900/(195-A_T)$).

Table 1: Flame Spread Summary

Test No.	Sample Description	Maximum Flame Spread (ft)	Time of Maximum Flame Spread (min:s)	Calculated Flame Spread (CFS)
1	ICG FBL-100 Fire Barrier coated to Red Oak	1.0	9:26	1.73
2	ICG FBL-100 Fire Barrier coated to Red Oak	1.0	7:46	2.11
3	ICG FBL-100 Fire Barrier coated to Red Oak	0.5	4:40	1.44

Flame Spread Index	0
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Smoke Developed Index

The smoke Developed Index is determined by rounding the Calculated Smoke Developed (CSD) as described in UL 723. The CSD is determined by the output of a photoelectric circuit operating across the furnace flue pipe. A curve is developed by plotting values of light absorption (decrease in cell output) against time. The CSD 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.

The CSD is expressed as:

$$\text{CSD} = (A_M / A_{ro}) \times 100$$

Where:

CSD=Calculated Smoke Developed

A_M = The area under the curve for the test material

A_{ro} = The area under the curve for untreated red oak

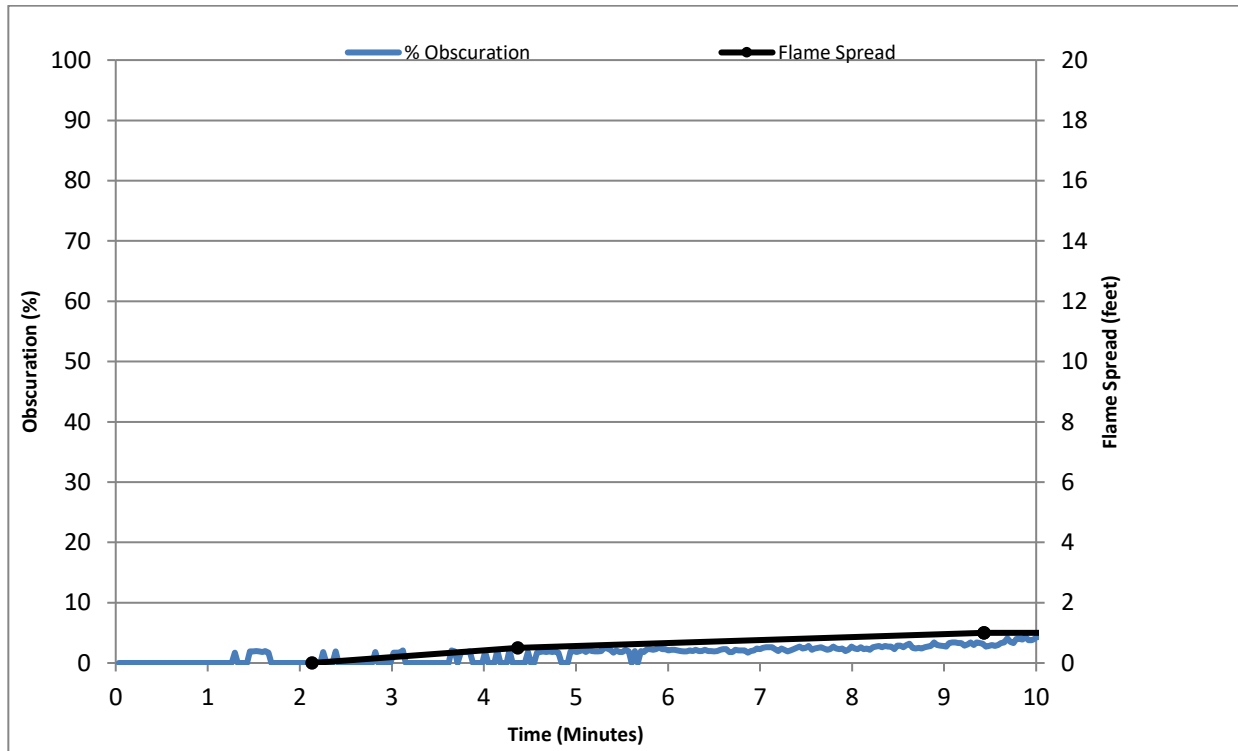
Table 2: Smoke Developed Summary

Test No.	Sample Description	CSD Calculated Smoke Developed
1	ICG FBL-100 Fire Barrier coated to Red Oak	17.4
2	ICG FBL-100 Fire Barrier coated to Red Oak	12.1
3	ICG FBL-100 Fire Barrier coated to Red Oak	10.5

Smoke Developed Index	15
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Flame Spread / Smoke Results

**International Coatings Group Inc.
ICG FBL-100 Fire Barrier coated to Red Oak**

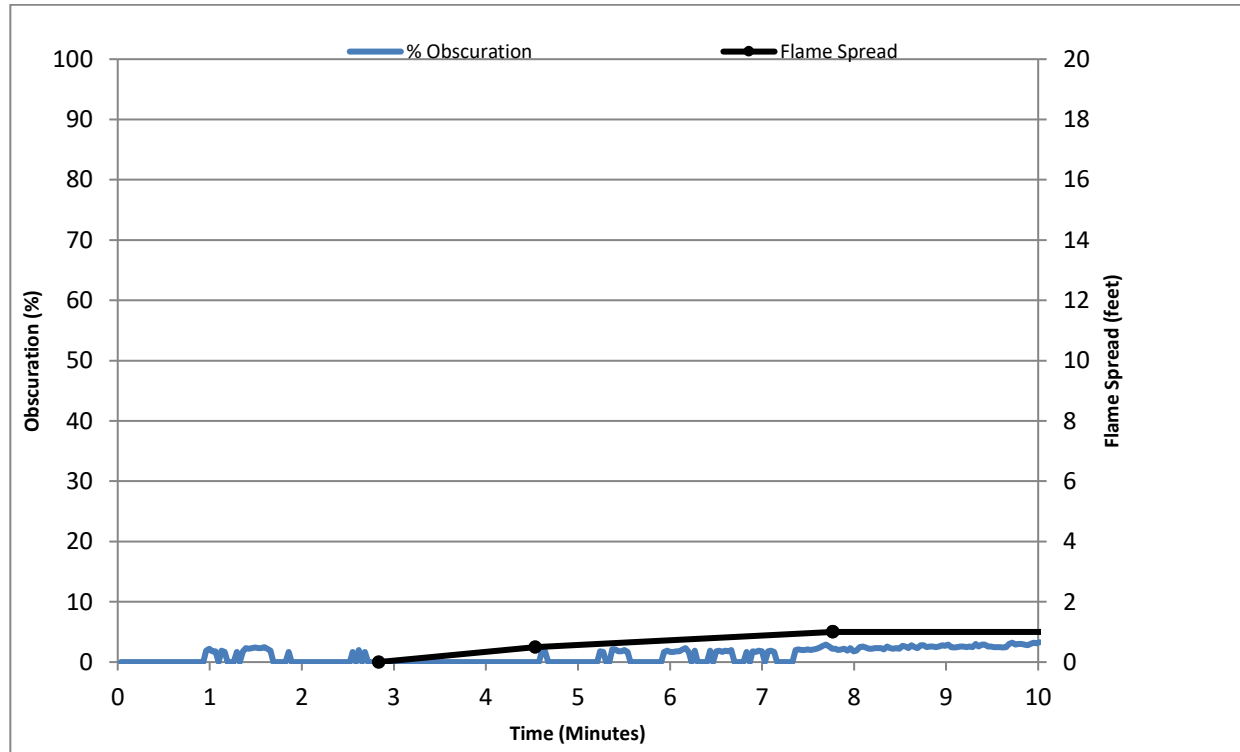


Test Num.: 1
R38238 / 4786564016
04021515

Flame Spread Index: 0
Smoke Developed Index: 15
Max. Flame Spread (ft.): 1.0

Flame Spread / Smoke Results

International Coatings Group Inc. ICG FBL-100 Fire Barrier coated to Red Oak

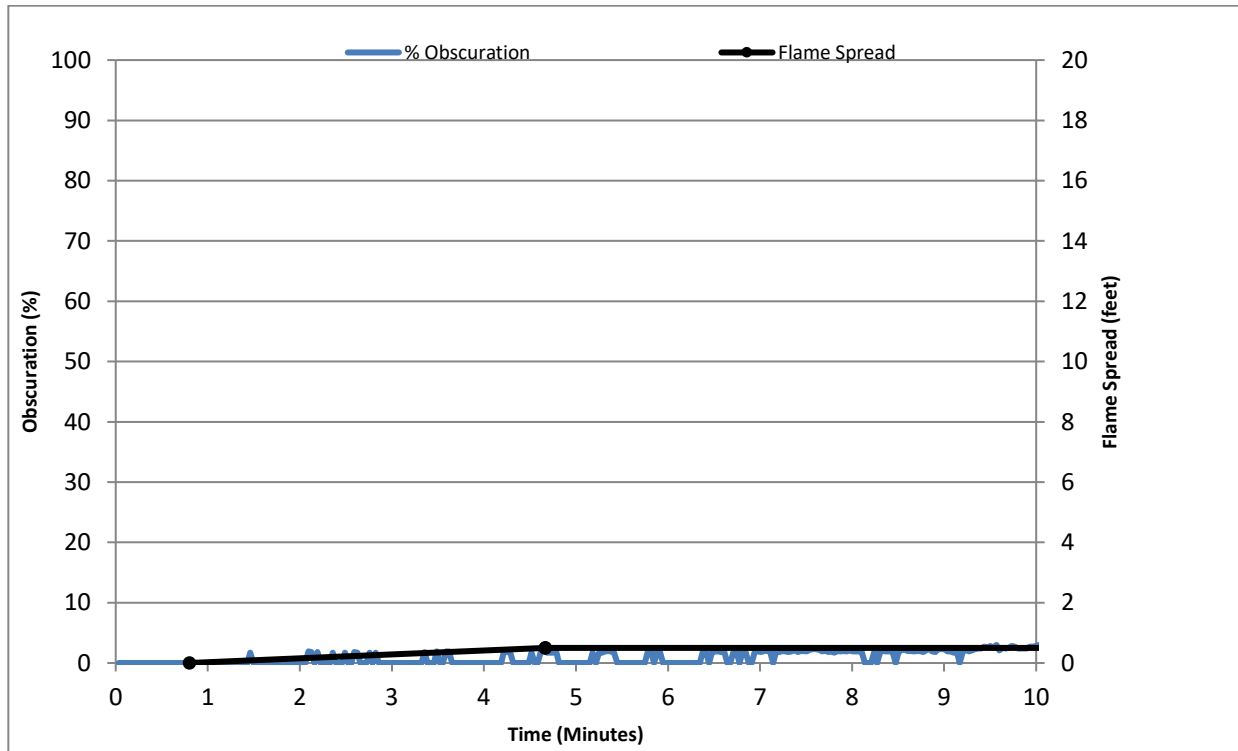


Test Num.: 2
R38238 / 4786564016
04021516

Flame Spread Index: 0
Smoke Developed Index: 10
Max. Flame Spread (ft.): 1.0

Flame Spread / Smoke Results

International Coatings Group Inc.
ICG FBL-100 Fire Barrier coated to Red Oak



Test Num.: 3
R38238 / 4786564016
04021517

Flame Spread Index: 0
Smoke Developed Index: 10
Max. Flame Spread (ft.): 0.5

TEST RECORD NO. 2 SUMMARY:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the Standard for Surface Burning Characteristics for Building Materials, UL723, Tenth Edition (dated September 10, 2008 with revisions through August 12, 2013) and, therefore, such products are judged eligible to bear UL's Mark as described below and on the Conclusion Page of this Report.

CLASSIFICATION MARKING:

The surface Burning Characteristics as shown below in the Classification Marking represent the judgment of UL based upon the results of the examination and tests presented in this Report.



Fire Retardant Coatings
Control No.
SURFACE BURNING CHARACTERISTICS

ICG FBL-100	Applied to Red Oak
Flame Spread	0
Smoke Developed	15
Rate Per Coat (ft ² /gal)	80
Number of Coats	1

Flash point of liquid coating (closed cup): No flash to boiling.

Test Record No.2 by:

Reviewed by:

A handwritten signature in black ink, appearing to read "Scott Knighton".

A handwritten signature in black ink, appearing to read "James Smith".

Scott Knighton (ext. 41967)
Project Handler
Fire Protection Division

James Smith (ext. 42666)
Staff Engineering Associate
Fire Protection Division

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CONCLUSION

A sample of the product covered by this Report has been found to comply with the requirements covering the category and the product is found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the sample(s) investigated by UL and does not signify UL certification or that the product(s) described are covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the UL & ULC Mark on such products which comply with UL's Follow-Up Service Procedure and any other application requirements of UL. The Mark of UL & ULC on the product, or the UL & ULC symbol on the product and the Mark on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Listing and Follow-Up Service.

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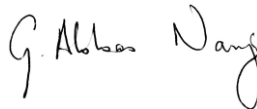
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Report by:



STANIS YU
Project Handler
Building & Life Safety Technologies

Reviewed by:



G. ABBAS NANJI
Senior Staff Engineer
Building & Life Safety Technologies