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## CAN/ULC-S102 Surface Burning Characteristics of "SURFORMA Laminates Fire Retardant"

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Submitted by: Element Fire Testing

Report No. 19-002-518(A)  
6 Pages

Date: September 19, 2019

**ACCREDITATION** To ISO/IEC 17025 for a defined Scope of Testing by the International Accreditation Service

### **SPECIFICATIONS OF ORDER**

Determine Flame Spread Rating and Smoke Developed Classification based upon triplicate testing conducted in accordance with CAN/ULC-S102-2018, as per reference Purchase Order No. 1100028714 and Element Quotation No. 19-002-594,988 dated March 7, 2019.

**SAMPLE IDENTIFICATION** (Element sample identification number 19-002-S0518)

Laminate panel material described as, "HPL FR", identified as:  
"SURFORMA Laminates Fire Retardant"

### **TEST PROCEDURE**

The method, designated as CAN/ULC-S102-2018, "*Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies*", is designed to determine the relative surface burning characteristics of materials under specific test conditions. Results of less than three identical specimens are expressed in terms of Flame Spread Value (FSV) and Smoke Developed Value (SDV). Results of three or more replicate tests on identical samples produce average values expressed as Flame Spread Rating (FSR) and Smoke Developed Classification (SDC).

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

### **SAMPLE PREPARATION**

The 0.90 mm laminate material was adhered to a 6 mm thick fiberglass reinforced cement board substrate using Contact Cement. Each test specimen consisted of a total of three prepared sections, each approximately 553 mm in width by 2438 mm in length. The sections were butted together to form the requisite specimen length. Prior to testing, the specimens were conditioned to constant mass at a temperature of  $23 \pm 3^{\circ}\text{C}$  and a relative humidity of  $50 \pm 5\%$ . At the time of test initiation, each specimen was self-supporting.

Testing was performed on: Test #1: 2019-09-17 Test #2: 2019-09-17 Test #3: 2019-09-18

### **SUMMARY OF TEST PROCEDURE**

The tunnel is preheated to  $85^{\circ}\text{C}$ , as measured by the backwall-embedded thermocouple located 7090 mm downstream of the burner ports, and allowed to cool to  $40^{\circ}\text{C}$ , as measured by the backwall-embedded thermocouple located 4000 mm from the burners. At this time the tunnel lid is raised and the test sample is placed along the ledges of the tunnel so as to form a continuous ceiling 7315 mm long, 305 mm above the floor. The lid is then lowered into place.

**SUMMARY OF TEST PROCEDURE (continued)**

Upon ignition of the gas burners, the flame spread distance is observed and recorded every second. Flame spread distance versus time is plotted. Calculations ignore all flame front recessions and the Flame Spread Values (FSV) are determined by calculating the total area under the curve for each test sample. If the total area under the curve (AT) is less than or equal to 29.7 m·min,  $FSV = 1.85 \cdot AT$ ; if greater,  $FSV = 1640 / (59.4 - AT)$ .

The Smoke Developed Value is determined by comparing the area under the obscuration curve for the test sample to that of inorganic reinforced cement board and red oak, established as 0 and 100, respectively. The Smoke Developed Value (SDV) is determined by dividing the total area under the obscuration curve by that of red oak and multiplying by 100.

**TEST RESULTS**
**SAMPLE: "SURFORMA Laminates Fire Retardant"**

Test	Approx. Time to Ignition (s)	Maximum Flame Front Distance (m)	Time to Maximum Flame Front (s)	Maximum Air Temperature (°C)	Flame Spread Value (FSV)	Smoke Developed Value (SDV)
1	39	1.28	86	293	21	49
2	40	0.76	127	291	13	8
3	21	1.37	85	333	23	21
Average:					19	26
Rounded Average Flame Spread Rating (FSR):					20	-
Rounded Average Smoke Developed Classification (SDC):					-	25

**Observations of Burning Characteristics**

The specimens ignited approximately 21 to 40 seconds after exposure to the test flame. Partial delamination was observed in all cases.

**Results Interpretation**

CAN/ULC-S102 contains no performance criteria of its own. The National Building Code of Canada (NBCC) or other jurisdictional documentation should be referenced to determine the FSR and/or SDC performance criteria that is applicable to the material, for the intended application. For general reference purposes only, for interior wall and ceiling finish materials, the NBCC most-typically specifies a maximum FSR of 150 and a maximum SDC of 300.



Lazarus Machado,  
Technician.



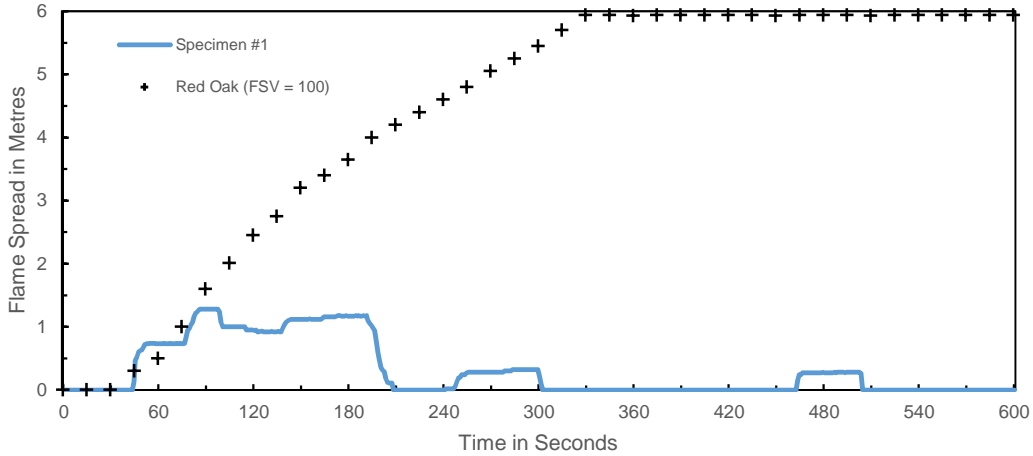
Ian Smith,  
Technical Manager.

Note: This report and service are covered under Element Materials Technology Canada Inc. Standard Terms and Conditions of Contract which may be found on our company's website at [www.element.com/terms/terms-and-conditions](http://www.element.com/terms/terms-and-conditions).

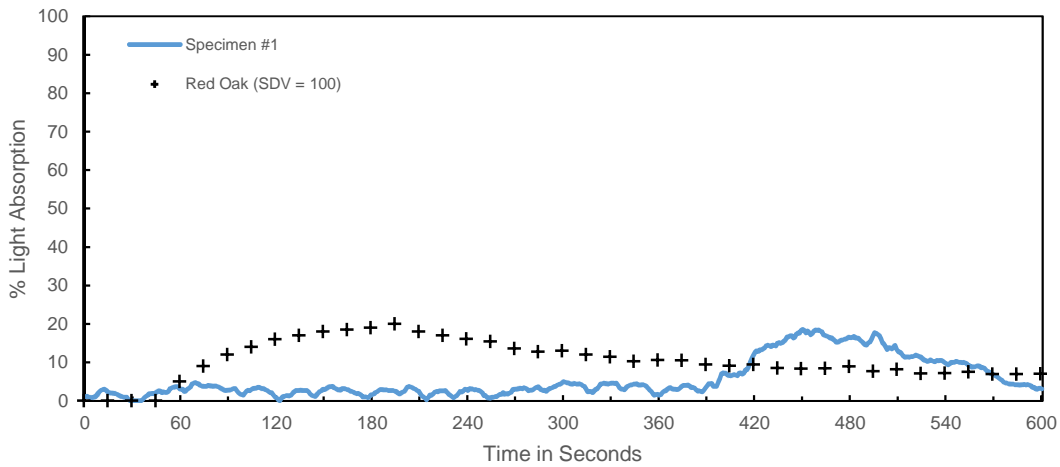
**Test 1 of 3**

**Sample: "SURFORMA Laminates Fire Retardant"**

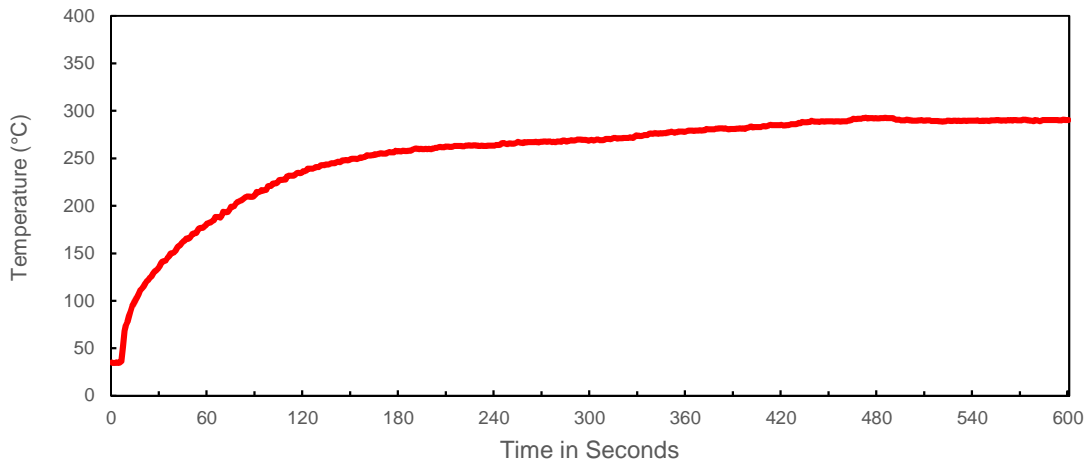
**Chart 1. FLAME SPREAD (Specimen #1)**



**Chart 2. SMOKE DEVELOPED (Specimen #1)**



**Chart 3. TEMPERATURE (Specimen #1)**



Flame Spread  
Value (FSV)

**21**

Smoke Developed  
Value (SDV)

**49**

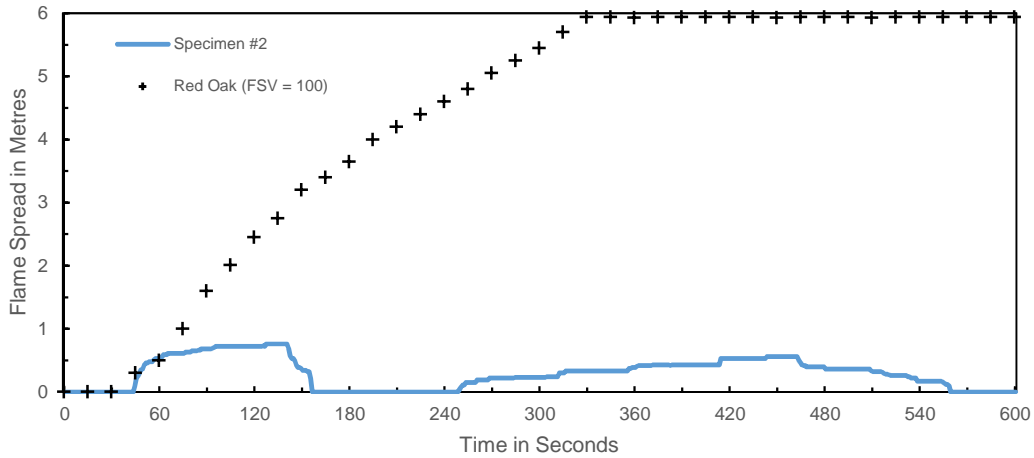
Maximum Air  
Temperature (°C)

**293**

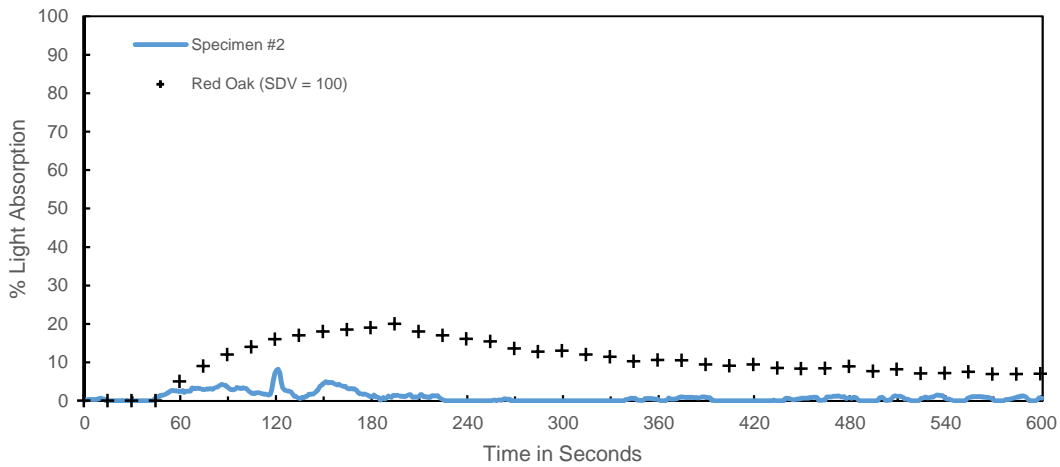
**Test 2 of 3**

**Sample: "SURFORMA Laminates Fire Retardant"**

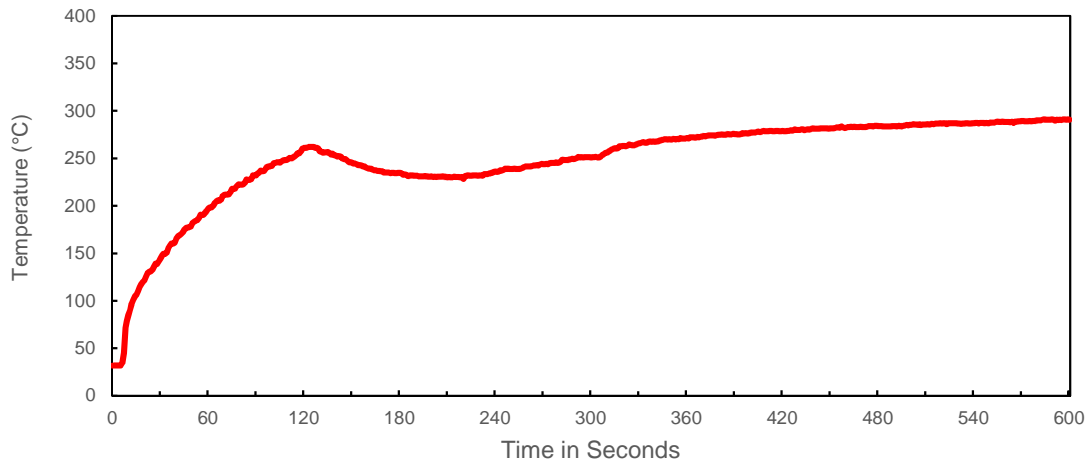
**Chart 4. FLAME SPREAD (Specimen #2)**



**Chart 5. SMOKE DEVELOPED (Specimen #2)**



**Chart 6. TEMPERATURE (Specimen #2)**



Flame Spread  
Value (FSV)

**13**

Smoke Developed  
Value (SDV)

**8**

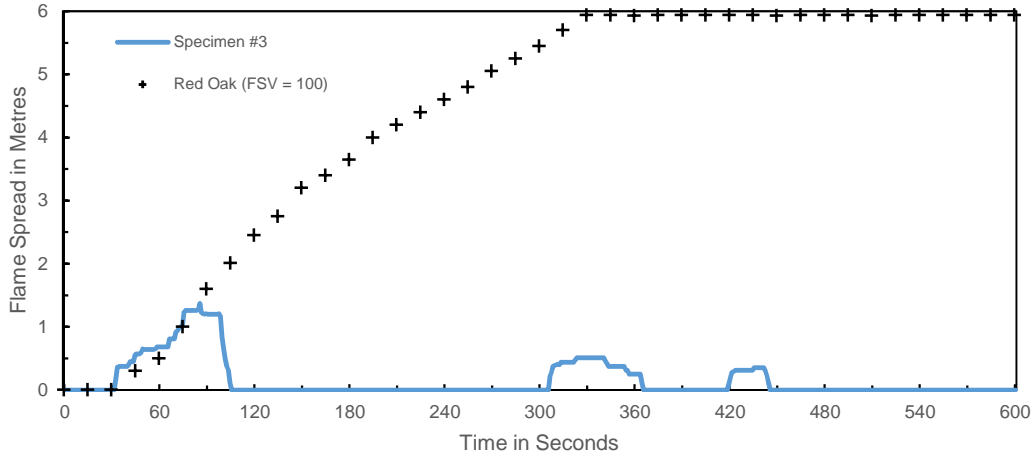
Maximum Air  
Temperature (°C)

**291**

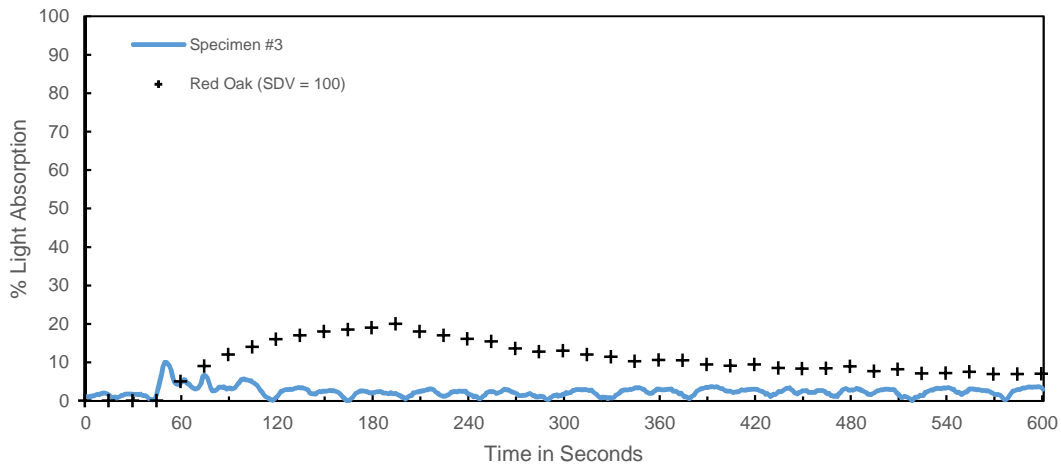
**Test 3 of 3**

**Sample: "SURFORMA Laminates Fire Retardant"**

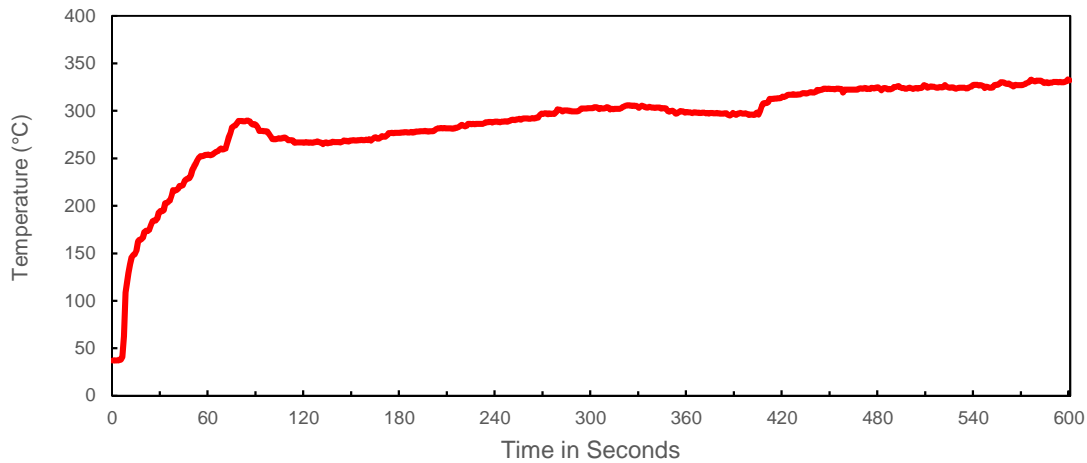
**Chart 7. FLAME SPREAD (Specimen #3)**



**Chart 8. SMOKE DEVELOPED (Specimen #3)**



**Chart 9. TEMPERATURE (Specimen #3)**



Flame Spread  
Value (FSV)

**23**

Smoke Developed  
Value (SDV)

**21**

Maximum Air  
Temperature (°C)

**333**