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# ASTM E 84 Surface Burning Characteristics of "Digitally Printed Aluminum Siding"

A Report To:	<b>DiZal inc.</b> 1020 rue Bouvier, Suite 400 Québec, QC G2K 0K9
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Submitted by:	Exova Warringtonfire North America
Report No.	16-002-517(A) 4 Pages
Date:	September 23, 2016

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

### **SPECIFICATIONS OF ORDER**

Determine the Flame Spread and Smoke Developed Indices based upon a single test conducted in accordance with ASTM E 84-16, as per DiZal inc. reference Purchase Order No. 218R1 and Exova Warringtonfire North America Quotation No. 16-002-418420RV2 dated September 7, 2016.

**SAMPLE IDENTIFICATION** (Exova sample identification number 16-002-S0517)

Coated aluminum 6" profile material, approximately 0.08" (2 mm) in thickness, described as, "Aluminum, primer, ink jet printed texture and clear", identified as:  
"Digitally Printed Aluminum Siding"

### **TEST PROCEDURE**

The method, designated as ASTM E 84-16 "Standard Method of Test for Surface Burning Characteristics of Building Materials", is designed to determine the relative surface burning characteristics of materials under specific test conditions. Results are expressed in terms of Flame Spread Index (FSI) and Smoke Developed (SD).

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 test specimen consisted of a total of 6 sections of material, each approximately 0.08 inches (2 mm) in thickness by 6.75 inches (171 mm) in width by 144 inches (3658 mm) in length. The sections were supported on 0.25 inch (6 mm) diameter steel rods placed across the width of the tunnel, and spaced at nominal 24 inch (610 mm) intervals. The sections were butted together side-by-side and end-to-end to form the requisite specimen area (3 wide and 2 long). Prior to testing, the specimen was conditioned to constant constant weight at a temperature of  $73 \pm 5^\circ\text{F}$  ( $23 \pm 3^\circ\text{C}$ ) and a relative humidity of  $50 \pm 5\%$ . During testing, the coated (coloured) surface was exposed to the test flame.

The testing was performed on: 2016-09-15

### **SUMMARY OF TEST PROCEDURE**

The tunnel is preheated to  $150 \pm 5^\circ\text{F}$  ( $66 \pm 2.8^\circ\text{C}$ ), as measured by the floor-embedded thermocouple located 23.25 feet (7087 mm) downstream of the burner ports, and allowed to cool to  $105 \pm 5^\circ\text{F}$  ( $40.5 \pm 2.8^\circ\text{C}$ ), as measured by the floor-embedded thermocouple located 13 feet (3962 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 24 feet (7315 mm) long, 12 inches (305 mm) above the floor. Three 8 foot (2438 mm) sections of 0.25 inch (6 mm) cement board are then placed on the back side of the sample end-to-end, to protect the tunnel lid, and 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 Flame Spread Index (FSI) is determined by calculating the total area under the curve for the test sample. If the area under the curve (A) is less than or equal to 97.5 min·ft, then  $FSI = 0.515 \cdot A$ ; if greater,  $FSI = 4900 / (195 - A)$ . FSI is then rounded to the nearest multiple of 5.

Smoke Developed (SD) is determined by dividing the total area under the obscuration curve by that of red oak, and multiplying by 100. SD is then rounded to the nearest multiple of 5 if less than 200. SD values over 200 are rounded to the nearest multiple of 50.

**TEST RESULTS**

<u>SAMPLE</u>	<u>Flame Spread Index (FSI)</u>	<u>Smoke Developed Index (SDI)</u>
"Digitally Printed Aluminum Siding"	0	0

**Observations of Burning Characteristics**

- The specimen ignited approximately 44 seconds after exposure to the test flame. Partial collapse in the test burner impingement area was observed.
- The flame front propagated to a maximum distance of 0.5 feet (0.2 metres) at approximately 71 seconds.

**Authorities having jurisdiction usually refer to these categories:**

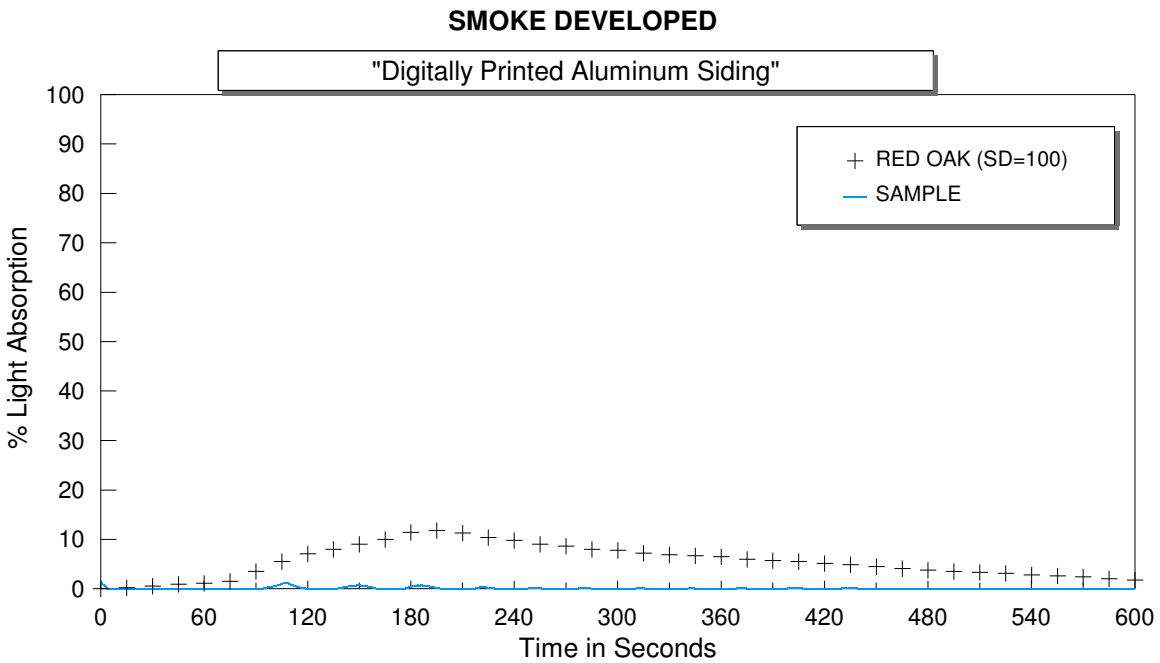
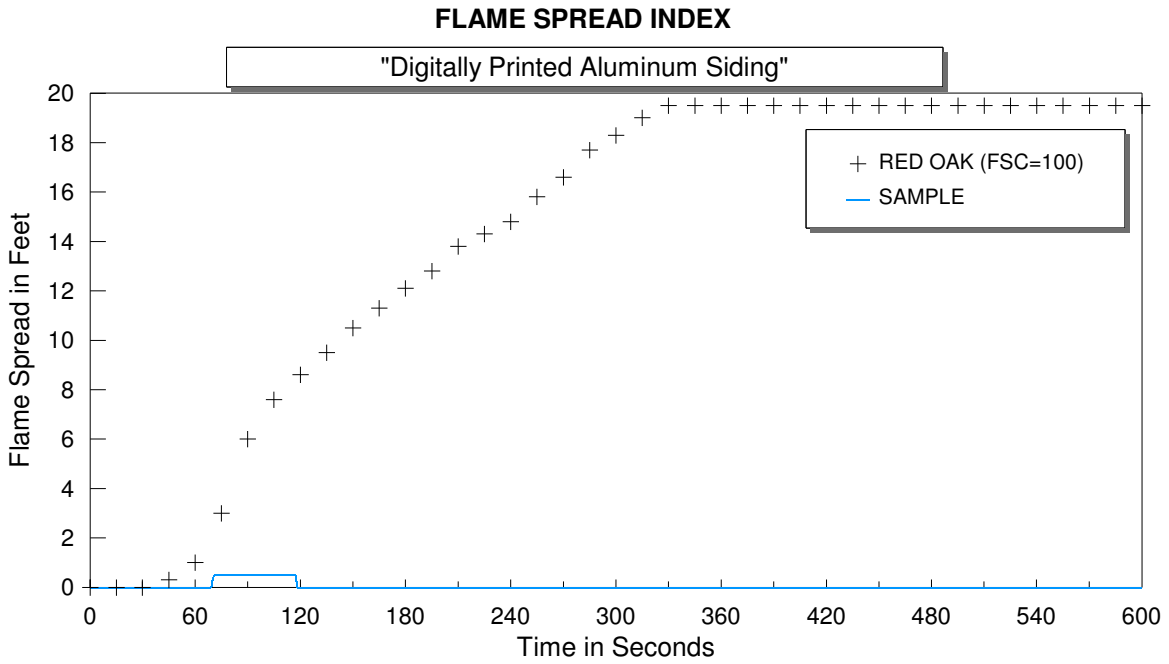
	<u>Flame-Spread Index</u>	<u>Smoke Development</u>
Class 1 or A	0 - 25	450 Maximum
Class 2 or B	26 - 75	450 Maximum
Class 3 or C	76 - 200	450 Maximum

**Note: This is an uncontrolled electronic copy of the report. Signatures are on file with the original.**

Robert A. Carleton,  
Technologist.

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**Flame Spread  
Index (FSI)**

0

**Smoke Developed  
Index (SDI)**

0

**Maximum Air  
Temperature (°F)**

510