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**CAN/ULC-S102 Surface Burning Characteristics
of "T11/ Clear Frosted Membrane"**

A Report To:	Newmat USA Ltd. 81 Mahan Street W. Babylon, NY 11704 USA
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Submitted by:	Exova Warringtonfire North America
Report No.	16-002-645(A) 4 Pages
Date:	November 24, 2016

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

SPECIFICATIONS OF ORDER

Determine the Flame Spread Rating and Smoke Developed Classification based upon triplicate testing conducted in accordance with CAN/ULC-S102-10, as per Newmat USA Ltd. reference Purchase Order No. EX-16-01 and Exova Warringtonfire North America Quotation No. 16-002-463301 RV1 dated November 10, 2016.

SAMPLE IDENTIFICATION (Exova sample identification number 16-002-S0645-1)

PVC film material described as "Flexible PVC film for light diffusion", identified as:
"T11/ Clear Frosted Membrane"

TEST PROCEDURE

The method, designated as CAN/ULC-S102-10, "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

Each test specimen consisted of 1 continuous section of material approximately 0.16 mm in measured thickness by 560 mm in width by 7315 mm in length. Prior to testing, each specimen was conditioned to constant mass at a temperature of $23 \pm 3^\circ\text{C}$ and a relative humidity of $50 \pm 5\%$. During testing, each specimen was supported over its entire length by 50 mm hexagonal wire mesh and was further supported across its width by 6 mm steel rods spaced nominally at 610 mm intervals.

The testing was performed on: Test #1: 2016-11-21 Test #2: 2016-11-21 Test #3: 2016-11-21

SUMMARY OF TEST PROCEDURE

The tunnel is preheated to 85°C , as measured by the backwall-embedded thermocouple located 7090 mm downstream of the burner ports, and allowed to cool to 40°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, $FSV = 1640 / (59.4 - AT)$.

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

TEST RESULTS

SAMPLE		Flame Spread Value (FSV)	Smoke Developed Value (SDV)
"T11/ Clear Frosted Membrane"	Test #1	10	190
	Test #2	11	188
	Test #3	<u>14</u>	<u>193</u>
	Average:	12	191

Rounded Average Flame Spread Rating (FSR): **10**

Rounded Average Smoke Developed Classification (SDC): **190**

Observations of Burning Characteristics

- The specimens ignited approximately 6 to 7 seconds after exposure to the test flame. Melting, and shrinking behavior was observed prior to ignition.
- The flame fronts advanced to maximum distances of 0.5, 0.6, and 0.8 metres at approximately 23, 17, and 28 seconds into each respective test.

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

Curtis Lavigne,
Technician.

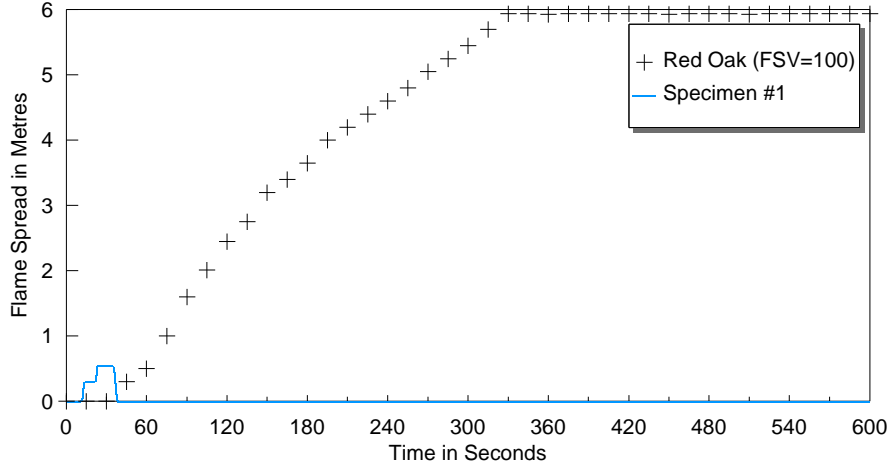
Ian Smith,
Technical Manager.

Note: This report and service are covered under Exova Canada Inc. Standard Terms and Conditions of Contract which may be found on the Exova website (www.exova.com), or by calling 1-866-263-9268.

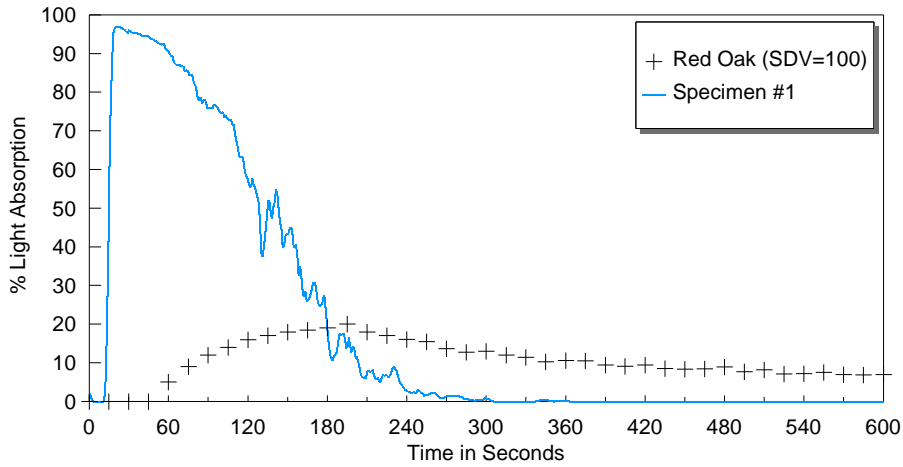
Sample: "T11/ Clear Frosted Membrane"

Test #1 of 3

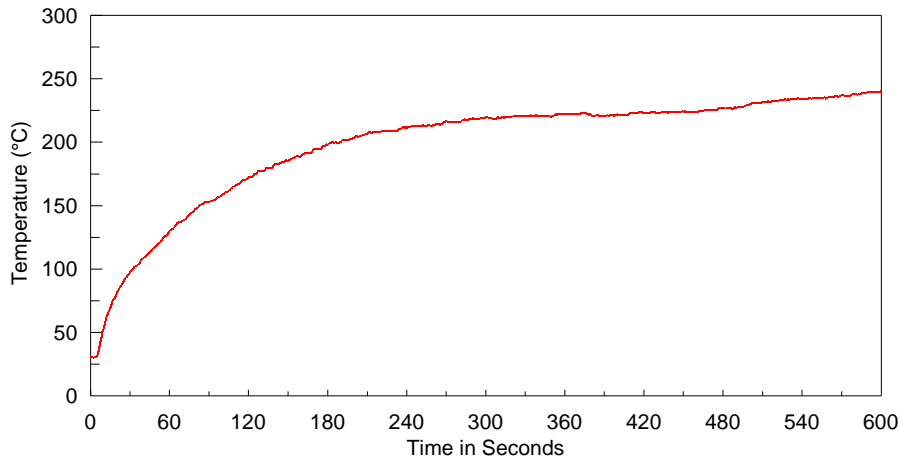
FLAME SPREAD



SMOKE DEVELOPED



TEMPERATURE



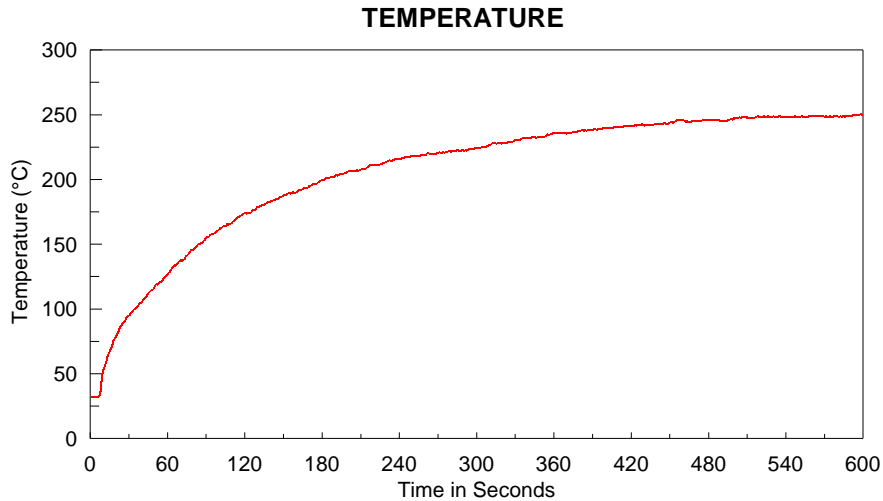
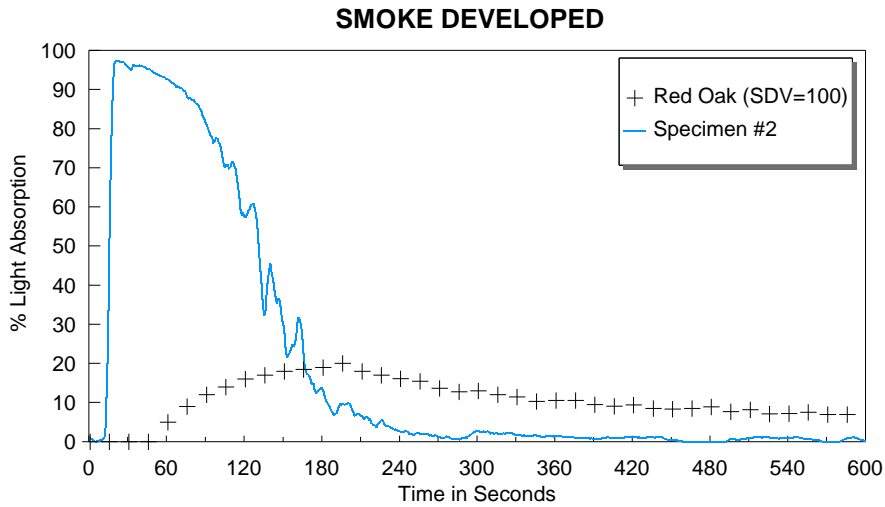
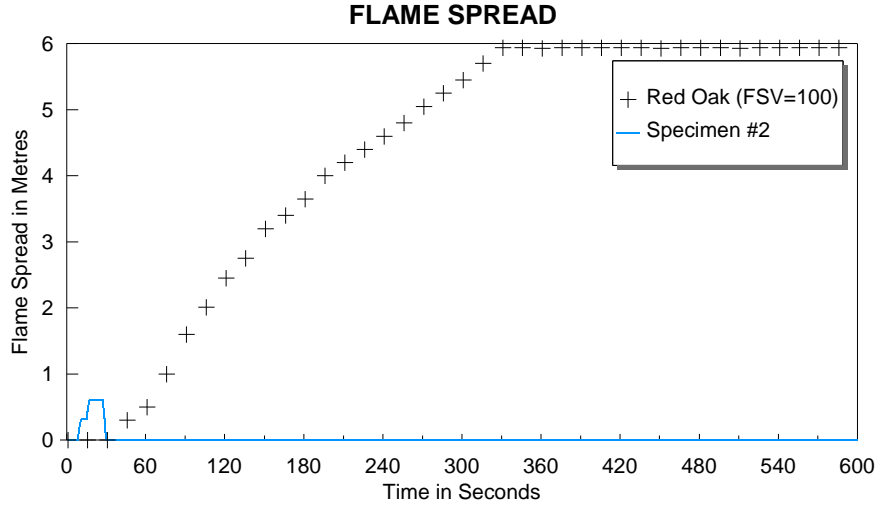
FSV
10

SDV
190

Max. Temp. (°C)
240

Sample: "T11/ Clear Frosted Membrane"

Test #2 of 3



FSV
11

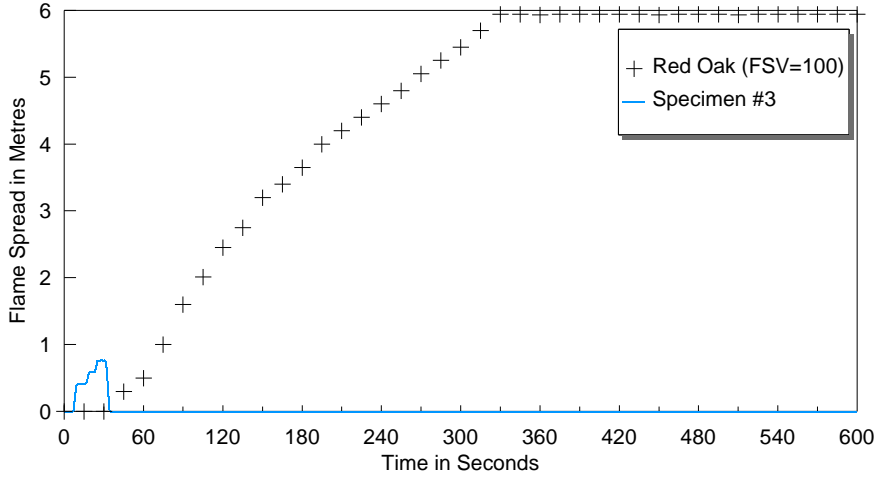
SDV
188

Max. Temp. (°C)
251

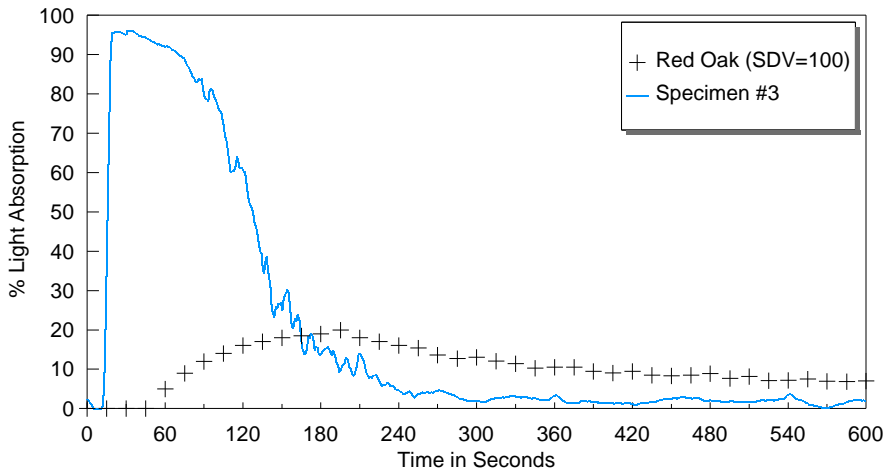
Sample: "T11/ Clear Frosted Membrane"

Test #3 of 3

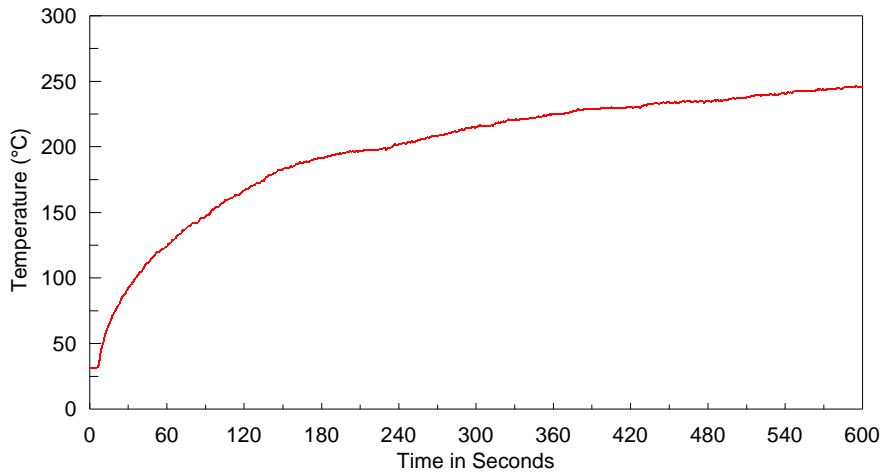
FLAME SPREAD



SMOKE DEVELOPED



TEMPERATURE



FSV

14

SDV

193

Max. Temp. (°C)

246