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ASTM E 84 Surface Burning Characteristics of "TTM ISOLPAK ALU"

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Submitted by:	Exova Warringtonfire North America
Report No.	13-002-330
	4 Pages
Date:	June 12, 2013

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 84-12c, as per TTM Plastics GmbH Purchase Order No. 130513-ISOLPAK and Exova Warringtonfire North America Quotation No. 13-002-190,373 dated May 10, 2013.

SAMPLE IDENTIFICATION (Exova sample identification number 13-002-S0330)

Multi-Layer Insulation Cladding Material, identified as: **"TTM SOLPAK ALU"**

TEST PROCEDURE

The method, designated as ASTM E 84-12c "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 sample consisted of 3 sections of material, each approximately 0.014 inches (0.35 mm) in thickness by 21 inches (533 mm) in width by 96 inches (2438 mm) in length. The sections were butted together to form the requisite specimen length. Prior to testing, the sample was conditioned to constant weight at a temperature of 73 ± 5°F (23 ± 3°C) and a relative humidity of 50 ± 5%. During testing the sample was supported over its entire length by 2 inch (50 mm) hexagonal wire mesh and was further supported across its width by 0.25 inch (6 mm) steel rods spaced nominally at 24 inch (610 mm) intervals.

The testing was performed on: 2013-06-06

SUMMARY OF TEST PROCEDURE

The tunnel is preheated to 150 ± 5°F (66 ± 2.8°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 ± 5°F (40.5 ± 2.8°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·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. Section 5.1.9.1 of ASTM E 84-12c could be interpreted to specify a single combination of lamp and photocell to create the requisite optical system. It is anticipated that the section will be clarified to permit alternative, equivalent systems in future revisions of the test standard. In May 2012, the Exova tunnel was modified to include a specially-designed optical measurement system that is utilized by many other tunnel systems worldwide. Although an improvement to performance and reliability is realized, as of this date the new system may not be specifically recognized by ASTM E 84 so this may represent a deviation to the test protocol.

TEST RESULTS

SAMPLE	Flame Spread Index (FSI)	Smoke Developed (SD)
"TTM ISOLPAK ALU"	10	50

Observations of Burning Characteristics

- The sample ignited approximately 22 seconds after exposure to the test flame.
- The flame front propagated to a maximum distance of 2 feet (0.6 metres) at approximately 28 seconds.

Authorities having jurisdiction usually refer to these categories:

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

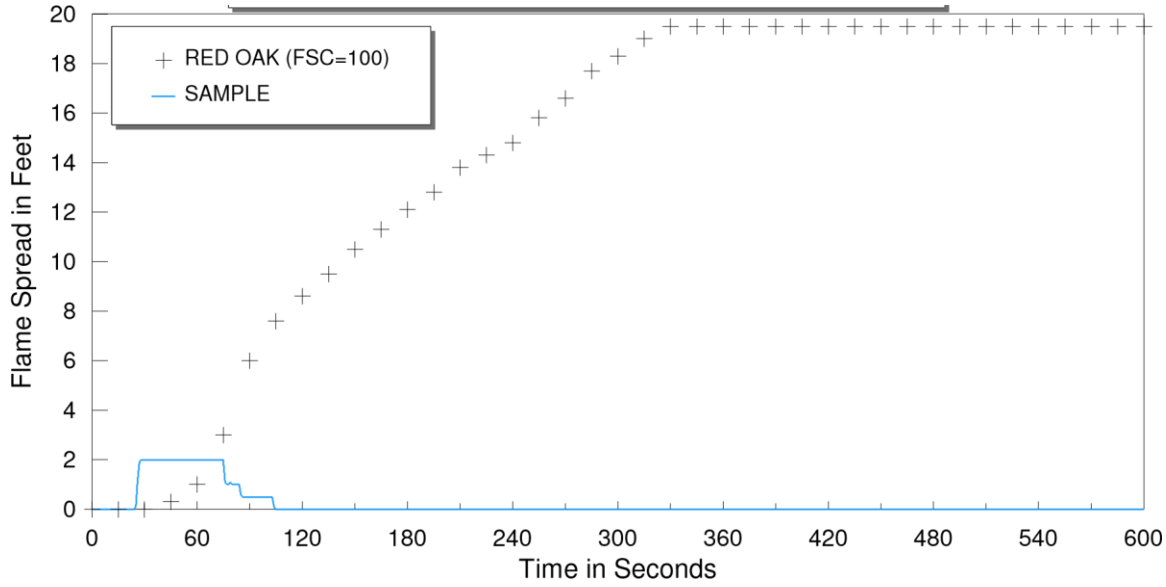
Note: This is an electronic copy of the report. Signatures are on file with the original report.

Robert A. Carleton,
Technologist.

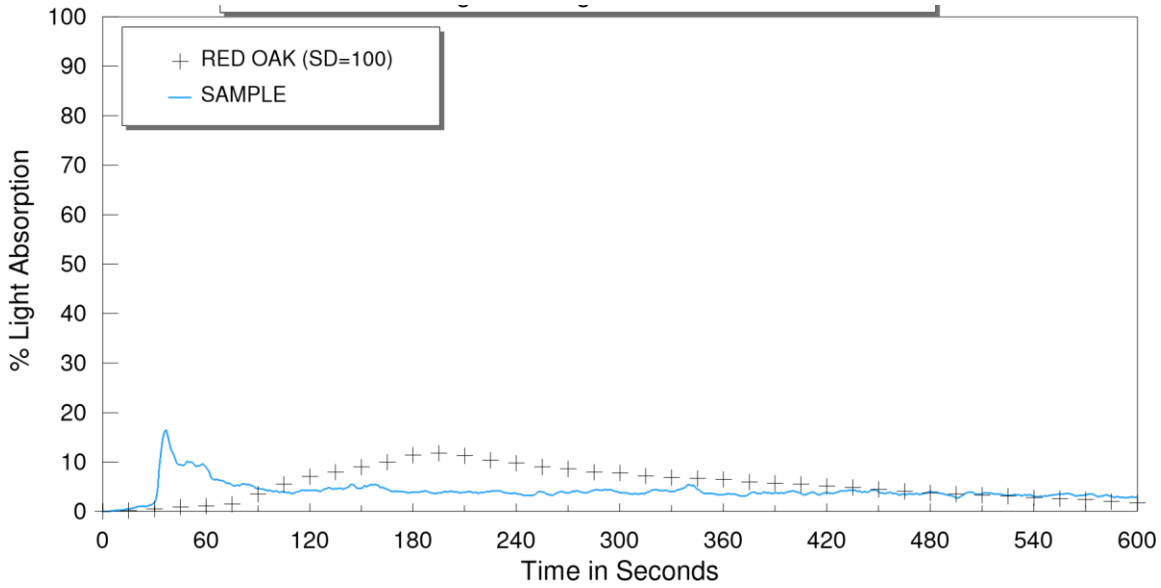
Ian Smith,
Technical Manager.

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.

FLAME SPREAD INDEX



SMOKE SPREAD INDEX



Flame Spread Index (FSI)	Smoke Developed (SD)
10	50