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## ELECTRONIC DRAFT COPY

### ASTM E 84 Surface Burning Characteristics of "Lenzing Jacketing Series 500"

A Report To: **Lenzing Plastics GmbH**  
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Attention: Hannes Marringer, Eng.

Submitted by: Exova Warringtonfire North America

Report No. 12-002-572(A)  
4 Pages

Date: August 31, 2012

**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 84-12, as per Lenzing Plastics GmbH Purchase Order No. 120719-JACKETING and Exova Warringtonfire North America Quotation No. 12-002-06759 dated July 17, 2012.

**SAMPLE IDENTIFICATION** (Exova sample identification number 12-002-S0572-1)

Multi-Layer Insulation Cladding material, identified as:  
"Lenzing Jacketing Series 500"

### **TEST PROCEDURE**

The method, designated as ASTM E 84-12 "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 4 sections of material, each approximately 0.02 inches (0.5 mm) in thickness by 21 inches (533 mm) in width by 72 inches (1219 mm) in length. The sections were butted together to create the requisite specimen length. Since no specific definition, procedure or criteria are provided in ASTM E 84-12 with regard to determining "constant weight" (as stated in section 6.4), the sample was conditioned at a temperature of  $73 \pm 5^{\circ}\text{F}$  ( $23 \pm 3^{\circ}\text{C}$ ) and a relative humidity of  $50 \pm 5\%$  for a minimum period of 24 hours prior to testing. 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: 2012-08-30

### **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 1 second. Flame spread distance versus time is plotted, ignoring any flame front recessions. Calculations are based on comparison with flame spread characteristics of select red oak, determined in calibration trials and arbitrarily established as 100. If the area under the curve (A) is less than or equal to 97.5 min-ft,  $FSI = 0.515 \cdot A$ ; if greater,  $FSI = 4900 / (195 - A)$ . Smoke Developed is determined by comparing the area under the obscuration curve for the test sample to that of inorganic reinforced cement board and red oak, arbitrarily established as 0 and 100, respectively. Section 5.1.9.1 of ASTM E 84-12 specifies a single combination of lamp and photocell to create the requisite photometer system. It is anticipated that alternative, verified photometer systems will be permitted in future revisions of the test standard. In May 2012, the Exova tunnel was modified to include a specially-designed, modern photometer system that is utilized by many other tunnel systems worldwide. Although an improvement to performance is realized, as of this date the new system is not specifically recognized by ASTM E 84 so this represents a deviation to the stated test protocol.

**TEST RESULTS**

<u>SAMPLE</u>	<u>Flame Spread Index (FSI)</u>	<u>Smoke Developed (SD)</u>
"Lenzing Jacketing Series 500"	5	85

**Observations of Burning Characteristics**

- The sample ignited approximately 38 seconds after exposure to the test flame.
- The flame front propagated to a maximum distance of 1.6 feet (0.5 metres) at approximately 2.2 minutes.

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

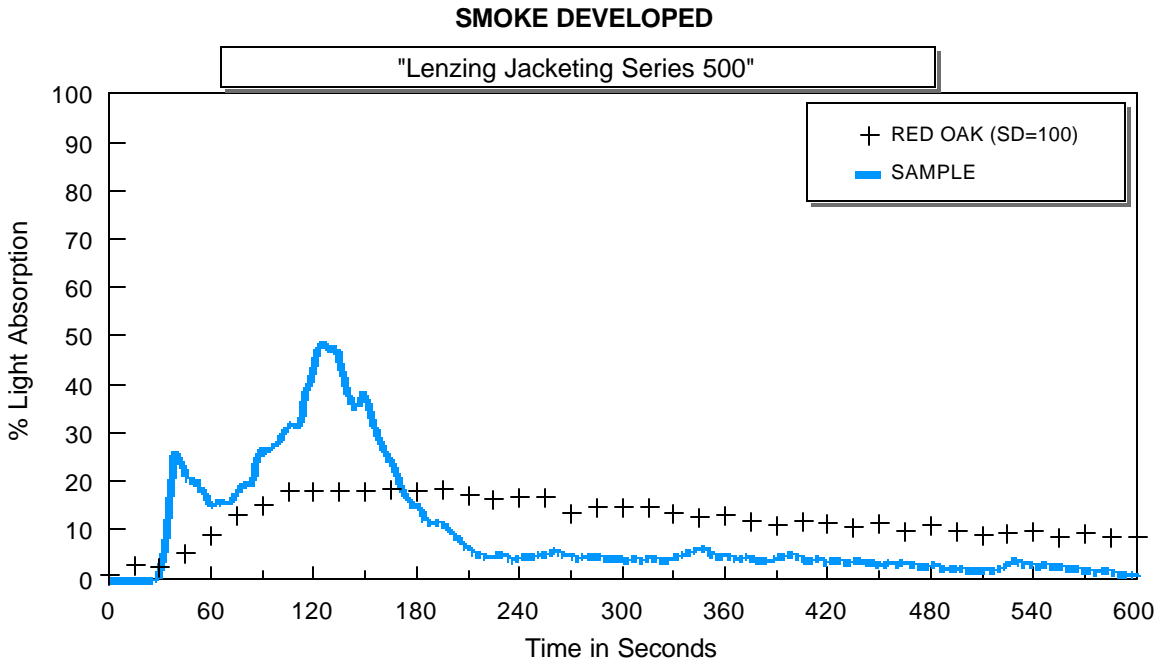
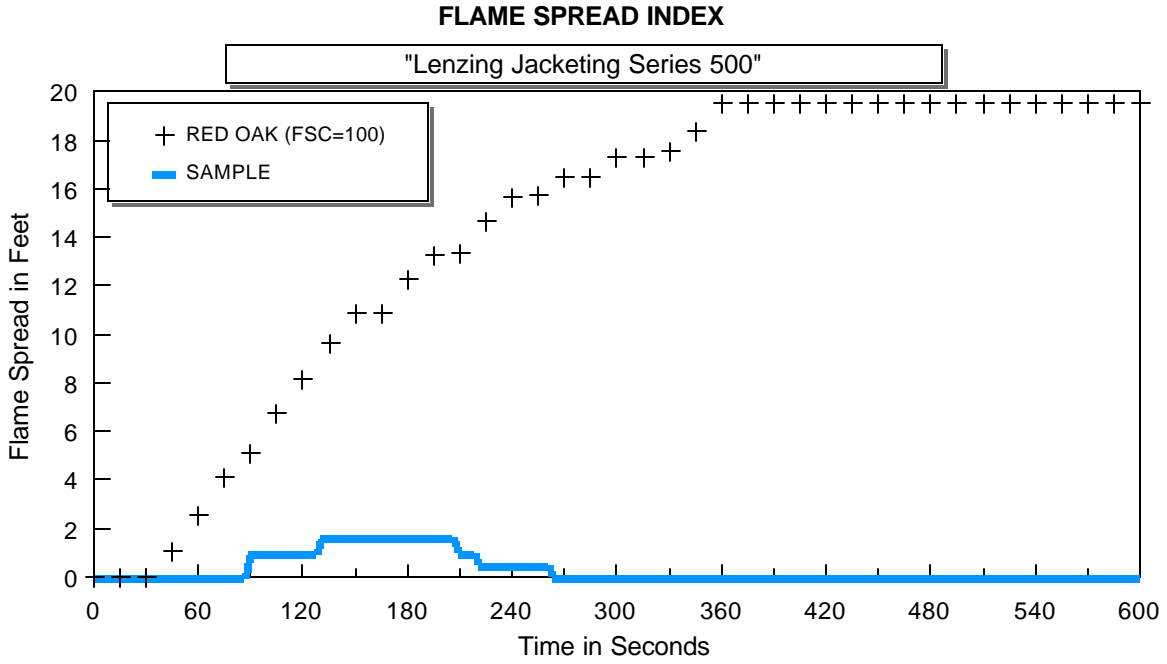
	<u>Flame-Spread Index</u>	<u>Smoke Development</u>
Class 1 or A	0 - 25	450 Maximum
Class 2 or B	26 - 75	450 Maximum
Class 3 or C	76 - 200	450 Maximum

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

Robert A. Carleton,  
Fire Testing.

Ian Smith,  
Fire Testing.

*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](http://www.exova.com)), or by calling 1-866-263-9268.*



**Flame Spread  
Index (FSI)**

5

**Smoke  
Developed (SD)**

85