Exova
2395 Speakman Dr.
Mississauga
Ontario
Canada
L5K 1B3

T : +1 (905) 822-4111
F : +1 (905) 823-1446
E : info@exova.com
W: www.exova.com

Testing, calibrating, advising

ASTM E 84 Surface Burning Characteristics of "WRAPTEC® IsoCover (Colour: Antracite)"

A Report To:	**Monier Roofing Components GmbH** Frankfurter Landstrasse 2-4 61440 Oberursel Germany
Phone:	+ 49 61 71 61 2665
E-mail:	wraptec@monier.com
Attention:	Dr. Clemens Aberle
Submitted by:	Exova Warringtonfire North America
Report No.	16-002-355(A) 4 Pages
Date:	July 22, 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 84-15a, as per Exova GmbH Order Number E04316000282 dated July 8, 2016.

SAMPLE IDENTIFICATION

(Exova sample identification number 16-002-S0355-1)

Polyisobutylene material, described as, "Cladding, jacketing and sealing material for HVAC ducts, pipes and technical insulations; Colour: Anthracite", adhered to a cement board substrate, identified as: "WRAPTEC® IsoCover (Colour: Anthracite)"

TEST PROCEDURE

The method, designated as ASTM E 84-15a "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 0.040 inch (1 mm) thick test material was adhered to a 0.25 inch (6 mm) thick, fiberglass reinforced cement board substrate using supplied Monier M-Glue (water-reacting). The substrate was pre-treated with water and then 0.2 inch (5 mm) beads of adhesive were applied to the boards, at approximately 2 inch (50 mm) spacing. The material was then applied to the adhesive and allowed to cure for a minimum period of 24 hours prior to testing. The test specimen consisted of a total of 3 sections of material, each approximately 21 inches (533 mm) in width. Due to insufficient material supplied, 2 sections were approximately 96 inches (2438 mm) in length and 1 section was approximately 48 inches (1219 mm) in length. The sections were butted together to create the specimen length. The short length could be considered as a deviation from the test protocol. Prior to testing, the specimen 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 specimen was self-supporting.

The testing was performed on: 2016-07-22

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.

TEST RESULTS

SAMPLE	Flame Spread Index (FSI)	Smoke Developed Index (SDI)
"WRAPTEC® IsoCover (Colour: Anthracite)"	60	95

Observations of Burning Characteristics

- The specimen ignited approximately 31 seconds after exposure to the test flame. Melting and flaming dripping behavior was observed. Material that dripped to the floor of the apparatus continued to burn.
- The flame front propagated to a maximum distance of 12.4 feet (3.8 metres) at approximately 87 seconds.

Authorities having jurisdiction usually refer to these categories:

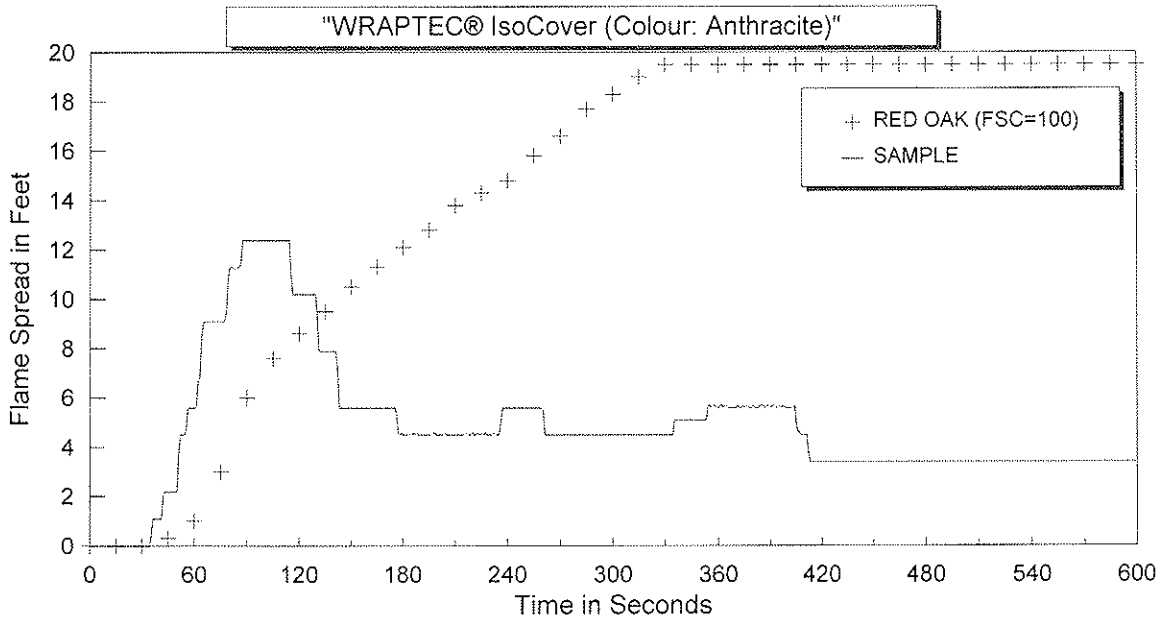
	Flame-Spread Index	Smoke Development
Class 1 or A	0 - 25	450 Maximum
Class 2 or B	26 - 75	450 Maximum
Class 3 or C	76 - 200	450 Maximum

Robert A. Carleton,
Technologist.

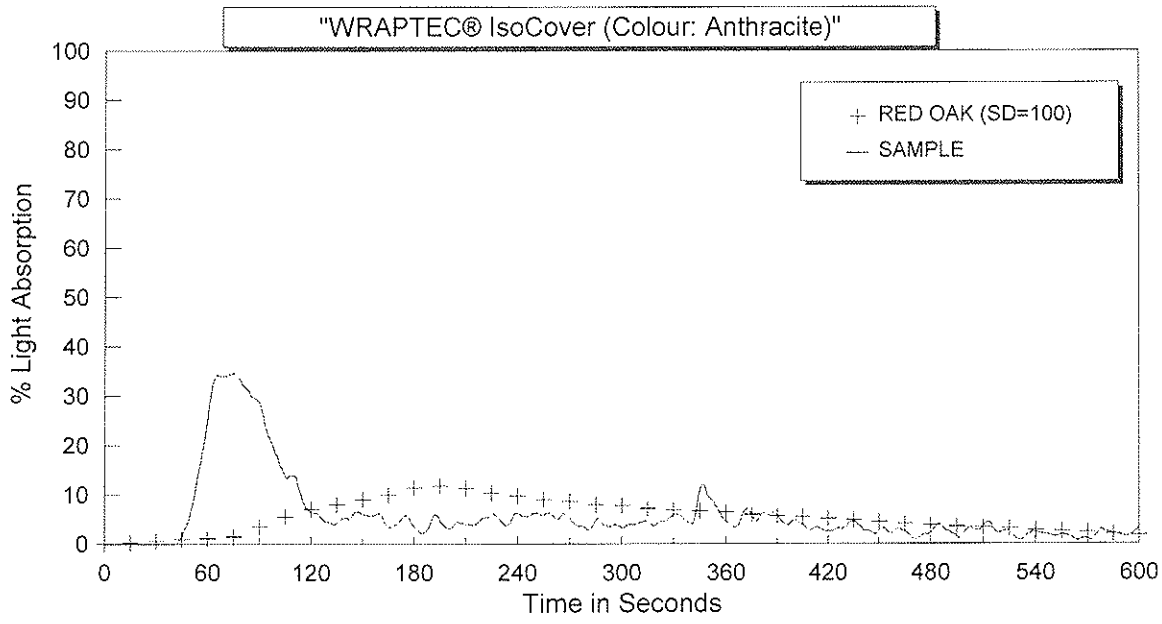
Ian Smith,
Technical Manager.

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 DEVELOPED



Flame Spread Index (FSI)	Smoke Developed Index (SDI)	Maximum Air Temperature (°F)
60	95	542