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Bellaterra: December 20th, 2023

File number: **23/32307306**

Petitioner: **SAUDI RUBBER PRODUCTS FACTORY**
First Industrial City,
Al Qassim
Saudi Arabia

TEST REPORT

Date Sample Received: 2023-10-26

Date Testing Performed: 2023-12-08

1. PURPOSE OF TEST

Determination of the flame spread index and smoke developed index of 17 mm thick NBR/PVC Rubber Insulation (Reference: SRPFLEX) as per ASTM E84-22: «Standard Test Method for Surface Burning Characteristics of Building Materials».

The test is conducted by a partner laboratory. This test report is a transcription of the original test report nº XI068-1 (Rev.01) from the collaborator laboratory, issued on December 20th 2023. The original test report remains in possession of Applus+ Laboratories.

2. ACCREDITATION

Outsourced tests covered by the accreditation:

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories with:

- United Kingdom Accreditation Service (UKAS), Testing Laboratory: **4439**
- GCC Accreditation Center (GAC) – Testing Laboratory: **ATL-0017**

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)

Address: Corner of 46th and 47th streets, Jebel Ali Industrial Area 1
P.O. Box 26385, Dubai, U.A.E.
T: +971 (0) 4 821 5777
www.bell-wright.com

4. SPECIMEN DESCRIPTION

Some samples were received from the petitioner and with the following indications according to the technical specifications provided by the petitioner:

Product Tested	17 mm thick NBR/PVC Rubber Insulation (Reference: SRPFLEX) *
Trade Name	SRPFLEX *
Manufacturer	Saudi Rubber Products Factory *
Colour Reference	Black
Area Weight	0.94 kg/m^2 (measured by TBWIC)
Density	55.56 kg/m^3 (measured by TBWIC)
Quantity of Panels	3 nos.
Dimensions per Panel	2400 x 600 x 17 mm (l x w x t) (measured by TBWIC)
Total Dimension	7200 x 600 x 17 mm (l x w x t) (measured by TBWIC)
Specimen Placement	The test specimen consisted of three (3) nos. of 17 mm thick NBR/PVC Rubber Insulation (Reference: SRPFLEX) and has been mounted on a 6 mm thick fiber cement board substrate using sticks pins placed at two longitudinal rows centered across the width of the test specimen at 600 interval and were butt jointed end-to-end. The test specimen was placed directly to the tunnel ledges with the top surface (fire side) towards the flame source.

Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test results. All information that could not be verified will be indicated by an asterisk (*) mark.

5. SPECIMEN VERIFICATION

The choice and design and the definition of the specimen have been made by SAUDI RUBBER PRODUCTS FACTORY, and TBWIC testing laboratory has not been involved in the selection or design of the specimen. The results apply to the samples as received.

Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWIC bears no liability for the legitimacy of the submitted information.

6. Test Method

6.1 Placing of test specimen

The test specimen consisted of three (3) panels of 17 mm thick NBR/PVC Rubber Insulation (Reference: SRPFLEX). The dimensions per panel were 2400 x 600 x 17 mm (l x w x t) and were butt jointed end-to-end. The total dimension of the specimen was 7200 x 600 x 17mm (l x w x t).

Several sections of cement board butt jointed end-to-end with overall dimensions of 7350 x 600 mm (l x w), were placed at the back of the sample to protect the furnace lid assembly.

6.2 Test Method

The specimen was placed in the ceiling position, supported horizontally on the ledges of the Steiner Tunnel. The top surface (fire side) was exposed face down to the ignition source during the 10-minute test duration.

Flame Spread and Smoke Density were measured, and the results were compared against standard calibration materials (fiber-cement board, heptane and red oak flooring).

6.3 Conditioning

After delivery on 26-Oct-23, the specimen was placed in a conditioned space where temperature and humidity were maintained between 23 ± 2.8°C and 50 ± 5% respectively, until constant weight was attained.

Note: There were deviations observed in the temperature and relative humidity in 4 separate probes of thermos-hygrometer in our conditioning room, however the average values were within the limit.

7. OBSERVATION

Test data and observation:

Observations	Result
Ignition Time (min:sec)	1:56
Time to maximum flame front advance (min:sec)	2:46
Maximum flame spread (ft)	19.5
Time to end of tunnel reached (min:sec)	2:46
Maximum temp recorded at the exposed thermocouple located near the end of the tunnel (ºF / ºC)	866/463
Flaming droplets (min:sec)	2:07
Flaming on the floor (min:sec)	2:21
After flame on the top (min:sec)	None
After flame on the floor (min:sec)	None
Delamination (min:sec)	None
Sagging (min:sec)	None
Blistering (min:sec)	None
Shrinkage (min:sec)	None
Fallout (min:sec)	None

FS x Time Area (ft x min)	152.34
Smoke Area (%A x min)	603.72
Heptane Smoke Area (%A x min)	86.4

8. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with ASTM E84-22; Standard Test Method for Surface Burning Characteristics of Building Materials.

The test results are:

FLAME SPREAD INDEX (FSI)	115
SMOKE DEVELOPED INDEX (SDI)	700

Results are valid for the tested configuration only.

9. CLASSIFICATIONS

The following information is designed to help put these test results into context. Flame Spread Index and Smoke Developed Index results from an ASTM E84 test are often used by regulatory agencies to approve materials for various applications. For example, the International Building Code (IBC) 2021, Section 803.1.2 requires that:

Interior wall and ceiling finish materials shall be classified in accordance with ASTM E84 or UL 723-11th Ed. 2021. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

CLASS	Flame Spread Index	Smoke-Development Index
Class A	0 – 25	0 – 450
Class B	26 – 75	0 – 450
Class C	76 - 200	0 – 450

Note that the above example is the IBC requirement for interior wall and ceiling finishes only; the application of the tested specimen may differ.

10. LIMITATIONS

Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by the testing materials that remain in place.

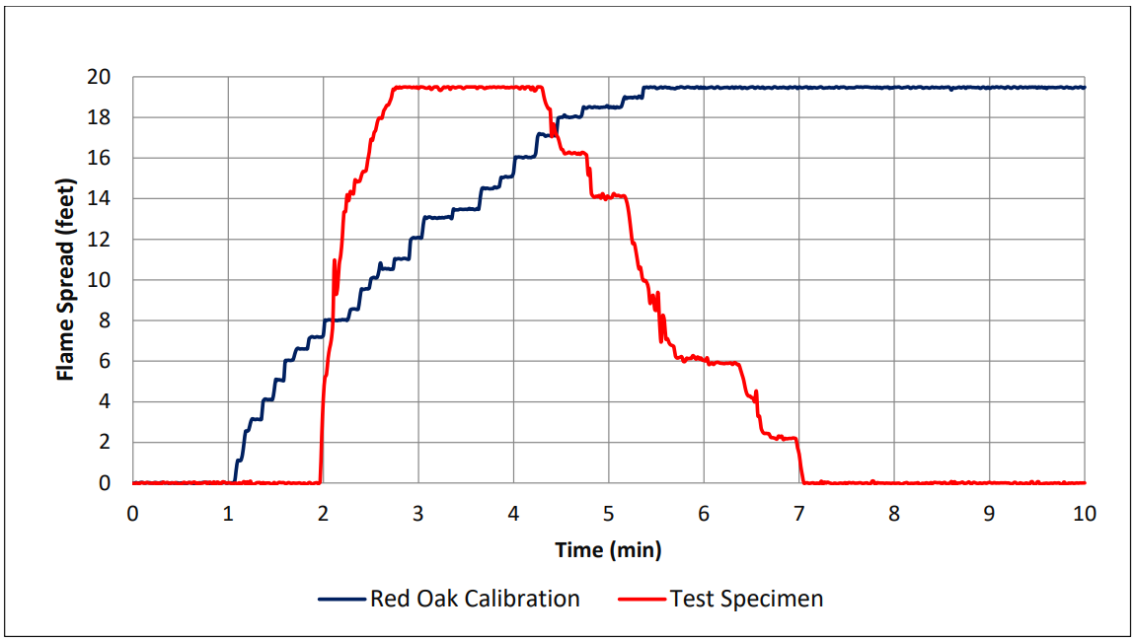
Digitally signed by
Salvador Suñol Gálvez

Laboratory Manager
LGAI Technological Center S.A. (APPLUS)

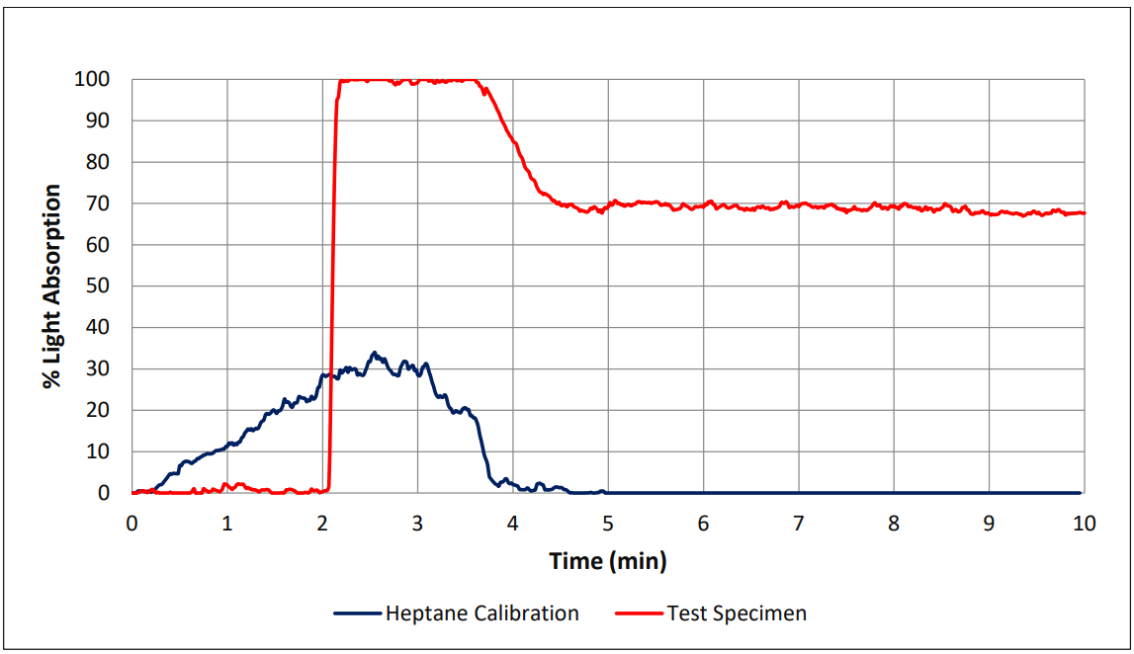
Digitally signed by
Marta Feliu Torné

Responsible of Reaction to Fire
LGAI Technological Center S.A. (APPLUS)

APPENDIX 1 - GRAPHS



Graph 1: Flame Spread Index (FSI)



Graph 2: Smoke Developed Index (SDI)

APPENDIX 2 - PICTURES

Photo 1: Specimen before the test.
(Non-Fire Side)

Photo 2: Specimen before the test.
(Fire Side)

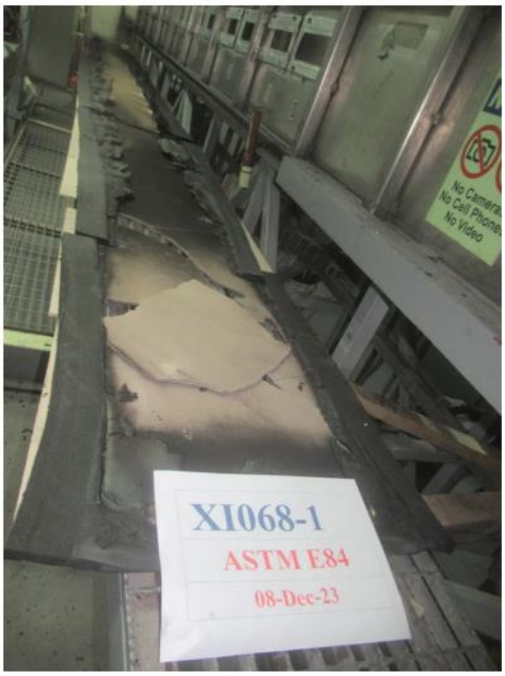


Photo 3: Specimen after the test.
(As seen from the fire-end)

Photo 4: Specimen after the test.
(As seen from the exhaust end)