

TEST REPORT

REACTION TO FIRE TEST

TEST SPONSOR:

STYRO Insulation Material Ind. LLC

P.O. Box: 29272, Industrial Area 11

Sharjah, United Arab Emirates

T: +971 6 534 4504; F: +971 6 534 4506

Website: www.styrouae.com

Test Material/Assembly:

50mm thick Expanded Polystyrene with One Side Cement Board

Test Standard:

ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

Test Date: 5-Feb-18
Issue Date: 8-Feb-18
Test Reference No: SA020

PO BOX 26385, DUBAI UAE

T +971 (0)4 821 5777

fire@bell-wright.com

www.bell-wright.com

DUBAI

ABU DHABI

DOHA



Accreditation

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

United Kingdom Accreditation Service (UKAS) - Testing Laboratory: **4439**
www.ukas.com



GCC Accreditation Center (GAC) – Testing Laboratory: **ATL-0017**
www.GCC-accreditation.org



Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification

www.egolf.org.uk

Member of International Trade Council

www.thetradecouncil.com

Member of Association for Specialist Fire Protection

www.asfp.org.uk

Member of Centre for Window and Cladding Technology

www.cwct.co.uk



The work which is the subject of this report falls wholly or partly under the accreditations of **ISO 17025 UKAS and ISO 17025 GAC**.



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1. INTRODUCTION

Determination of the flame spread index and the smoke developed index of Expanded Polystyrene with one side cement board as per ASTM E84; Standard Test Method for Surface Burning Characteristics of Building Materials.

2. SPONSOR

Name: STYRO Insulation Material Ind. LLC
Address: P.O. Box: 29272, Industrial Area 11
Sharjah, United Arab Emirates
T: +971 6 534 4504; F: +971 6 534 4506
Website: www.styrouae.com

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th Streets,
Jebel Ali Industrial Area 1
Dubai, United Arab Emirates
T: +971 4 821 5777
F: +971 4 333 2693
Website: www.bell-wright.com

4. DATE OF TEST

Sample received: 4-Feb-18
Test date: 5-Feb-18

The test has not been witnessed by the Sponsor.



5. SPECIMEN DESCRIPTION

The description of the specimen given below has been prepared from information provided by the Sponsor.

Product Tested	Expanded Polystyrene (EPS) with one side cement board		
Product Name	STYRO Graypor 180		
Manufacturer	STYRO Insulation Material Industries L.L.C.		
Fire side	Foam surface		
Product Description	STYRO Expanded Polystyrene		
Product Details	Foam (Fire side)	Product Name	STYRO Graypor 180
		Product Reference	STYRO Expanded Polystyrene
		Manufacturer	STYRO Insulation Material Industries L.L.C.
		Colour Reference	Grey
		Thickness	50 mm
		Density	15-18 kg/m ³
	Adhesive	Product Name	Styrofix
		Product Reference	75420
		Manufacturer	Terraco
		Colour Reference	Grey
		Coverage Rate	4-5 kg/m ²
		Thickness	4mm
	Substrate	Density	1750 kg/m ³
		Product Name	Cement Board
		Manufacturer	S.R.R BUILDING MATERIAL
		Colour Reference	Grey
		Thickness	6mm
	Density	1300 kg/m ³	
Dimensions per panel	1830 x 600 x 60mm (l x w x thk.) as stated		
No. of panels	4		
Total dimension	7320 x 600 x 60mm (l x w x thk.) as stated		
Specimen placement	Four (4) sections of EPS with one side cement board were butt jointed end-to-end. The test specimen was placed directly to the tunnel ledges with the exposed foam surface towards the flame source.		

The test specimen was submitted by the client and TBWIC has not been involved in the selection and configuration of the specimen.



6. METHOD OF TEST

6.1. Placing of test specimen

The test specimen consisted of four (4) sections of Expanded Polystyrene with one side cement board. The dimensions of the panels were 1830 x 600 x 60 mm (l x w x thk). The total dimensions of the specimen were 7320 x 600 x 60mm (l x w x thk).

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

6.2. Test Method

The specimen was installed horizontally in the Steiner Tunnel and supported by the ledges. The foam surface of the specimen was exposed to a flaming exposure during the 10 minute test duration.

Flame spread and density of the smoke are measured and recorded while the results are computed against the standard calibration materials (cement board and red oak flooring).

6.3. Conditioning

After delivery on 4-Feb-18, the specimen was stored in room temperature for 1 day prior to the test ranging from 20.2 to 25.8°C and 45 to 55% relative humidity.



7. OBSERVATION

Test Data and Observation

Observations	
Ignition Time (min:sec)	0:05
Time to maximum flame front advance (min:sec)	6:43
Maximum flame spread (ft)	6.2
Time to end of tunnel reached (min:sec)	6:43
Maximum temp recorded at the exposed thermocouple located near the end of the tunnel (°F / °C)	575/302
Dripping (min:sec)	0:28
Flaming on the floor (min:sec)	3:31
After flame on the top (min:sec)	None
After flame on the floor (min:sec)	None
Delamination (min:sec)	None
Sagging (min:sec)	None
Shrinkage (min:sec)	None
Fallout (min:sec)	None
FS*Time Area (ft*min)	36.21
Smoke Area (%A*min)	324.53
Red Oak Smoke Area (%A*min)	87.8

8. SUMMARY OF RESULTS

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

The test results are:

FLAME SPREAD INDEX (FSI)	20
SMOKE DEVELOPED INDEX (SDI)	350

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 2015, Section 803.1.1 requires that:

Interior wall and ceiling finish materials shall be classified in accordance with ASTM E84 or UL 723-10th Ed. 2008. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

Class A: Flame spread index 0 - 25; smoke-developed index 0 - 450.

Class B: Flame spread index 26 - 75; smoke-developed index 0 - 450.

Class C: Flame spread index 76 - 200; smoke-developed index 0 - 450.

Note that the above example is the IBC requirement for interior wall and ceiling finishes only; your application may be different.



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

Thomas Bell-Wright International Consultants recommend that the relevance of test reports should be considered after a period of five years.

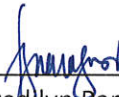
This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Prepared/Tested By:

Reviewed By:



Rachel Marie Novelo
Fire Testing Engineer



Fredlyn Paragoso
Fire Testing Support Engineer

Approved By:

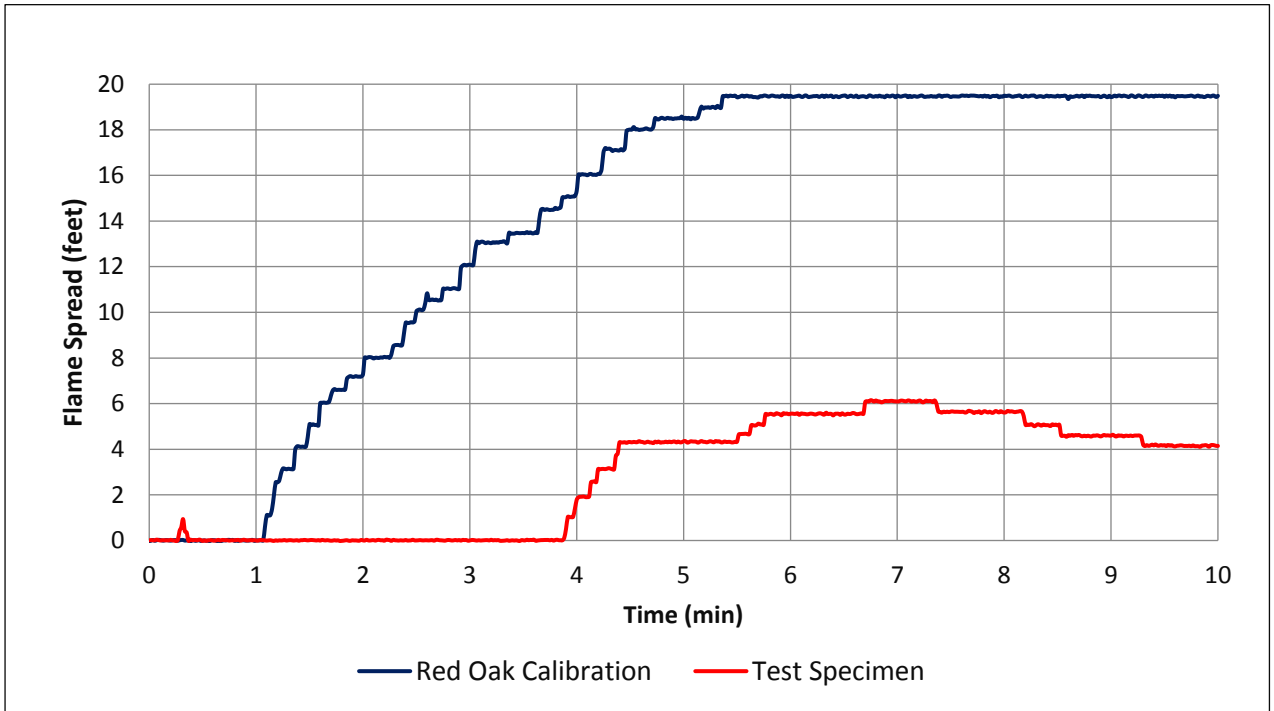


Suketa Tyagi
Reaction to Fire - Manager

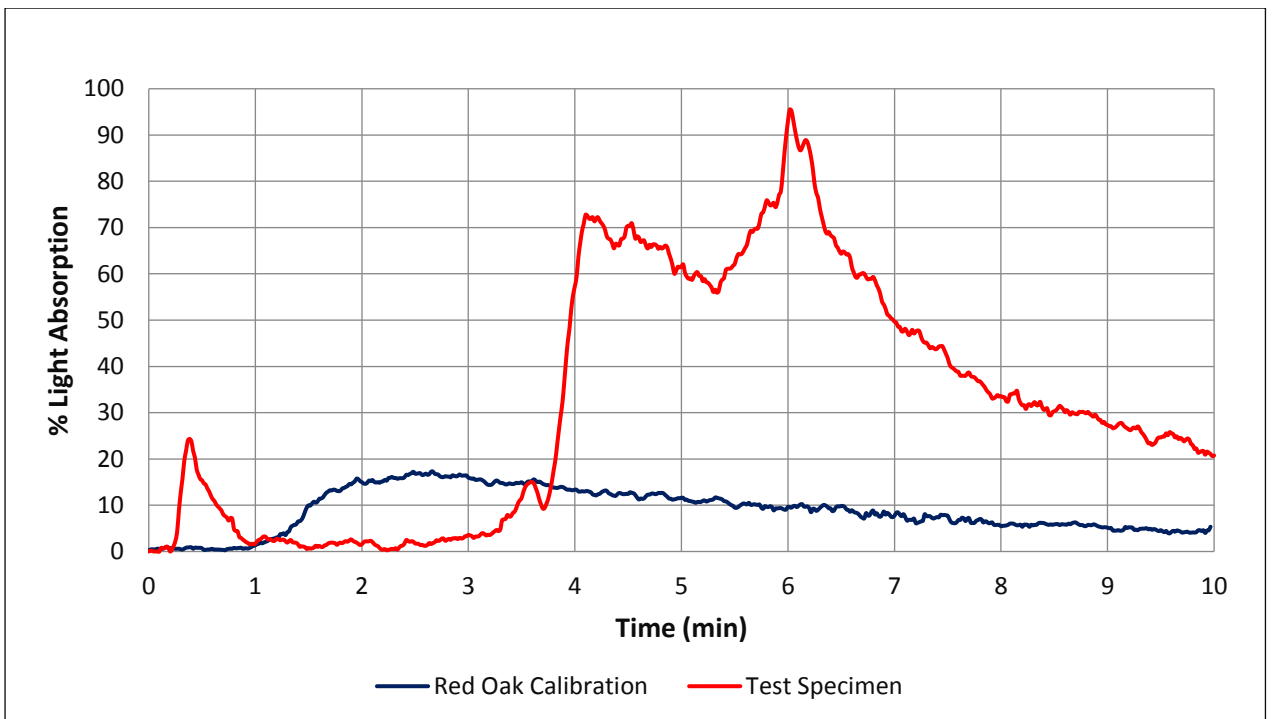




11. APPENDIX 1- GRAPHS



Graph 1: Flame Spread Index (FSI)



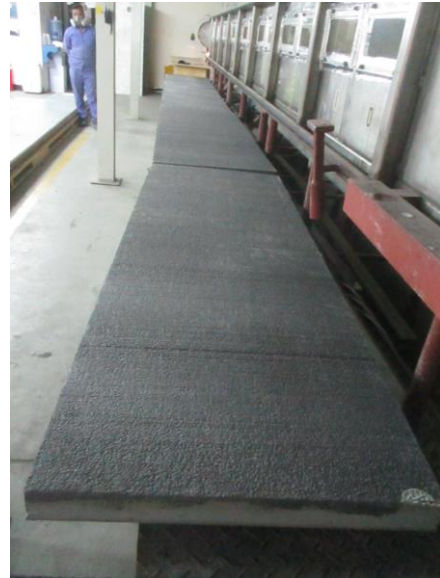
Graph 2: Smoke Developed Index (SDI)



12. 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)**

---End of Test Report---