



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

P.O. BOX: 26385, DUBAI, U.A.E.
T +971 (4) 333-2692, F +971 (4) 333-2693
www.bell-wright.com

TEST REPORT FOR REACTION TO FIRE TEST (ASTM E84)

TEST SPONSOR:

Al Nasir Contracting WLL
Build 148, Rd. 2703, Adliya 327
P.O. Box 15858, Manama, Bahrain
T: +973 1 771 4609 F: +973 1 771 3247
E-mail: jalil@nasirconst.com

TESTED MATERIAL/ASSEMBLY:

Paladin Wall Thermal Insulation System

TEST STANDARD:

ASTM E84 – Standard Test Method For Surface Burning Characteristics of Building Materials



Test Date: 11-May-15
Issue Date: 18-May-15
Reference No: PD037



4439



NAL 008
17025



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Under ISO/IEC 17025:2005 General Requirements for the competence of testing and calibration laboratories.

For the following tests and standards:

EN 1363-1:2012	Fire resistance tests - Part 1: General requirements
EN 1363-2:1999	Fire resistance tests - Part 2: Alternative and additional procedures
EN 1364-1:1999	Fire resistance tests for non-loadbearing elements - Part 1: Walls
EN 1364-3:2006	Fire resistance tests for non-loadbearing elements - Part 3: Curtain Walling - Full Configuration (Complete Assembly)
EN 1364-4:2014	Fire resistance tests for non-loadbearing elements - Part 4: Curtain Walling - Part Configuration
EN 1634-1:2014	Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 1: Fire resistance tests for doors, shutters and openable windows.
BS 476-20:1987	Fire tests on building materials and structures - Part 20: Method for determination of the fire resistance of elements of construction (general principles)
BS 476-22:1987	Fire tests on building materials and structures - Part 22: Methods for determination of the fire resistance of non-loadbearing elements of construction
ISO 834-1:2012	Fire resistance tests - Elements of building construction - Part 1: General Requirements
ISO 834-8:2002	Fire resistance tests - Elements of building construction - Part 8: Specific requirements for non-loadbearing vertical separating elements
ISO 3008:2007	Fire resistance tests - Door and shutter assemblies
ISO 3009:2003	Fire resistance tests - Elements of building construction - Glazed elements

Opinions and interpretations expressed in this document are outside the scope of UKAS and ENAS accreditations.



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For the following tests and standards:

ASTM E119-14	Standard Test Method for Fire Tests of Building Construction and Materials
ASTM E2226-12	Standard Practice for Application of Hose Stream
UL 10B:2008	Fire Tests of Door Assemblies
UL 10C:2009	Positive Pressure Fire Tests of Door Assemblies
UL 263:2011	Fire Tests of Building Construction and Materials
UL 555:2006	Fire Dampers (Fire Test only)
NFPA 251:2006	Standard Methods of Tests of Fire Resistance of Building Construction and Materials
NFPA 252:2012	Standard Methods of Fire Tests of Door Assemblies
NFPA 257:2012	Standard Methods of Fire Tests for Window and Glass Block Assemblies
ASTM E814-14	Standard Test Method for Fire Tests of Penetration Firestop Systems
UL 1479, 3 rd Ed., 2003	Fire Tests of Through - Penetration Firestops
ASTM E84-14	Standard Test Method for Surface Burning Characteristics of Building Materials
UL 723, 10 th Ed., 2008	Test for Surface Burning Characteristics of Building Materials
IMO FTP Code 2010:2012 Edition	Fire Resistance Tests for "A", "B" and "F" Class Divisions
EN 13501-2:2007 +A1:2009	Fire classification using data from fire resistance tests, excluding ventilation services

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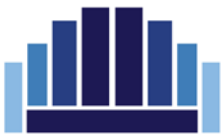


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1. INTRODUCTION

Determination of the flame spread index and the smoke developed index of External Thermal Insulation System as per ASTM E84; Standard Test Method for Surface Burning Characteristics of Building Materials.

2. SPONSOR(S)

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E-mail: jalil@nasirconst.com

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants
Address: 25b Street Ras Al Khor Industrial Area
P.O.Box 26385
Dubai, U.A.E.

4. DATE OF TEST

Sample received: 10-May-15
Test date: 11-May-15

The test has not been witnessed by the Sponsor.

5. SPECIMEN DESCRIPTION

Product Tested	External Thermal Insulation System
Product Name	Paladin Wall Thermal Insulation System
Fire side	Texture Top coat of Paladin Wall Thermal Insulation System
Product Description	Components 1. Insulation - 50mm thick Expanded polystyrene Foam (EPS) with density of 18kg/m ³ 2. 4mm thick Paladin Therm Adhesive & Base Coat reinforced with Paladin glass fiber mesh (160 g/m ²) 3. 1.5mm thick Textured top coat white in color (stated)
Dimensions per panel	1200 x 600 x 60mm (l x w x thk) (measured)
No. of panel	6 Nos.
Total dimension	7200 x 600 x 60mm (l x w x thk) (measured)
Specimen placement	6 nos. of Paladin Wall Thermal Insulation System were butt jointed end-to-end.

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 the test specimen

The test specimen consisted of 6 nos. of Paladin Wall Thermal Insulation System. The dimension per panel was 1200 x 600 x 60mm (l x w x thk.) and was butt jointed end-to-end. The total dimensions of the specimen were 7200 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 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 installed horizontally in the Steiner Tunnel and supported by the ledges. Texture top coat of Paladin Wall Thermal Insulation System (fire side) was exposed to a flaming exposure during 10 minutes.

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 10 May 2015, the specimen was stored in room temperature for 1 day prior to the test at 20.2-25.8°C and 45-55% relative humidity.



7. OBSERVATION

Test Data and Observation

Observations	
Ignition Time (min:sec)	2:00
Time to maximum flame front advance (min:sec)	8:56
Maximum flame spread (ft)	6.0
Time to end of tunnel reached (min:sec)	Not Reached
Maximum temp recorded at the exposed thermocouple located near the end of the tunnel (°F / °C)	593/312
Dripping (min:sec)	None
Flaming on the floor (min:sec)	None
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)	35.46
Smoke Area (%A*min)	66.72
Red Oak Smoke Area (%A*min)	85.8

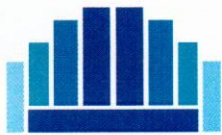
8. SUMMARY OF RESULTS

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)	80

Results are valid for the tested configuration only.



9. CLASSIFICATIONS

Flame Spread Index and Smoke Developed Index results from an ASTM E84 test are often used by code officials, regulatory agencies and authorities having jurisdiction in order to approve/accept interior finish materials for various application. An example of classification is given in the International Building Code 2012, Section 803.1.1 Interior wall and ceiling finish materials. 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.

The above Classification applies only for Interior Wall and Ceiling Finish Materials, and may not be applicable for materials used in other areas of a building as other requirements in regards to results of flame spread and smoke developed index may apply.

10. LIMITATION

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 By:

Fredilyn Paragoso
Fire Testing Engineer

Reviewed By:

Azel Joquino
Fire Testing Engineer

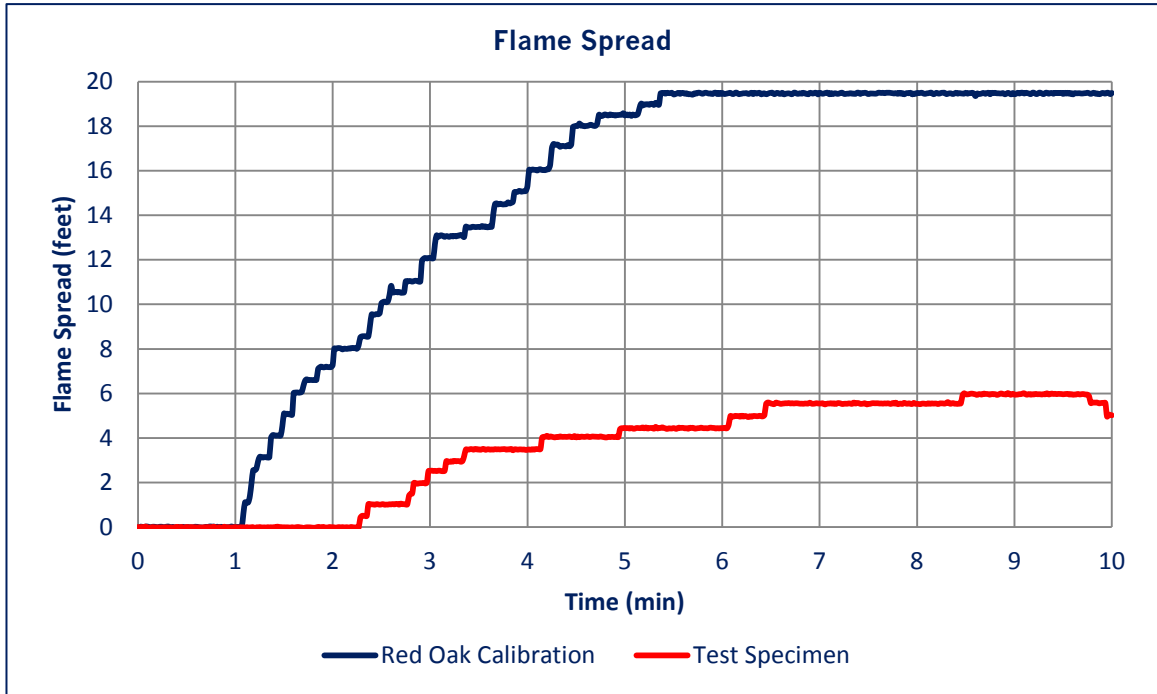
Approved By:

David Campbell, GFireE
Regional Director of Fire Compliance

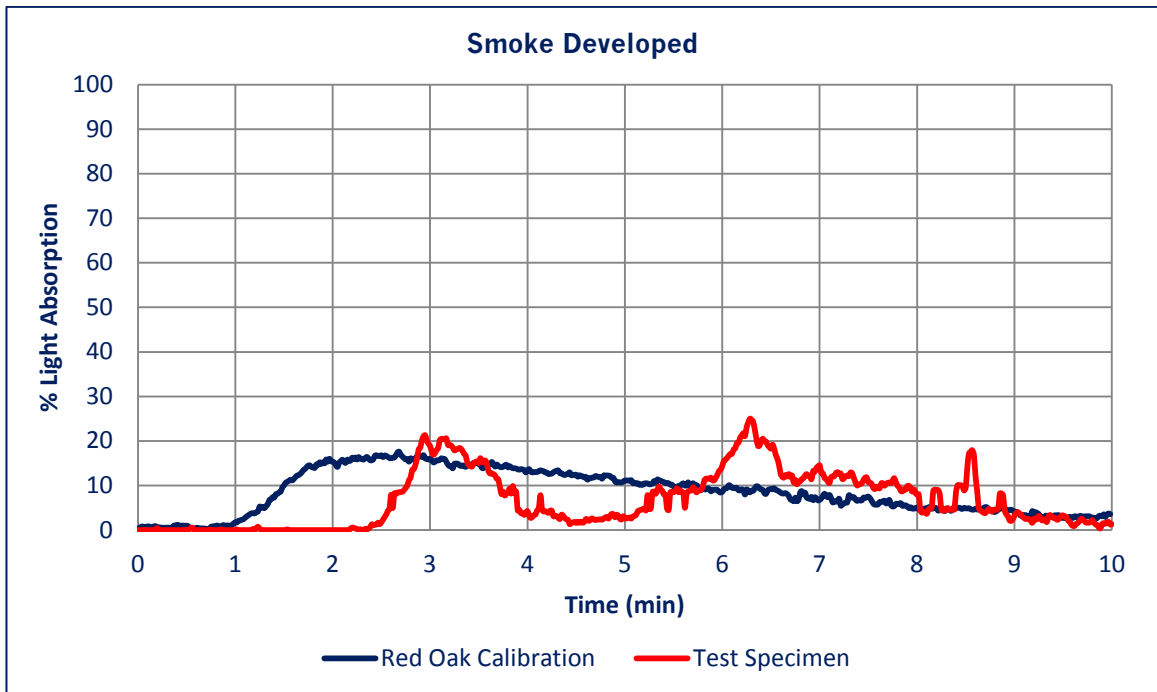




11. APPENDIX 1 – GRAPHS



Graph 1 – Flame Spread



Graph 2 – Smoke Developed



12. APPENDIX 2 – PICTURES



Picture 1 – Specimen before the test.



Picture 2 – Specimen after the test.

---End of test report---