

TEST REPORT FOR REACTION TO FIRE

Test Sponsor:

Modern Industrial Co. Ltd
Sudair Industrial & Business City,
Sudair, Riyadh,
Kingdom of Saudi Arabia
T: +966 920005774
Website: www.unibond.sa

Test Specimen:

4 mm thick "Unibond" FR-A2 Aluminium Composite Panel

Test Standard:

BS EN 13823:2020+A1:2022 – Reaction to Fire Tests for Building Products — Building Products excluding Floorings exposed to the Thermal Attack by a Single Burning Item



Test Reference No.: YI069-9
Test Date: 23-Jul-25
Issue Date: 13-Oct-25

Thomas Bell-Wright International Consultants (Dubai Branch)

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Accreditation

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

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



Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification
www.egolf.org.uk

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 within the scope of the listed ISO/IEC 17025 accreditation above.

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1. INTRODUCTION

This report outlines the determination of Reaction to Fire Performance of 4 mm thick “Unibond” FR-A2 Aluminium Composite Panel when exposed to thermal attack by a Single Burning Item (SBI) in accordance with:

BS EN 13823:2020+A1:2022 – Reaction to Fire Tests for Building Products — Building Products excluding Floorings exposed to the Thermal Attack by a Single Burning Item.

Throughout this report, reference will be made to BS EN 13823 in short form, but it is understood that it is with reference to the 2020+A1:2022 version, unless otherwise specified.

2. SPONSOR

Name: Modern Industrial Co. Ltd
Address: Sudair Industrial & Business City,
Sudair, Riyadh,
Kingdom of Saudi Arabia
T: +966 920005774
Website: www.unibond.sa

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, F: +971 (0) 4 333 26 93
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4. DATE OF TEST & WITNESSES

The test was conducted on 23-Jul-25 and was not witnessed by the sponsor.

5. TEST SAMPLES

5.1. Product Details

Product Description		4 mm thick “Unibond” FR-A2 Aluminium Composite Panel*	
Product Reference		“Unibond” FR-A2*	
Manufacturer		Modern Industrial Co. Ltd*	
Overall Thickness		4.15 mm (measured by TBWIC)	
		4 ± 2 mm (stated)	
Overall Area Weight		8.61 kg/m ² (measured by TBWIC)	
		8.35 kg/m ² (stated)	
Density		2178 kg/m ³ (stated)	
Product Details	1 st Layer (Fire Side)	Product Name	PVDF Topcoat*
		Reference	CF101 PVDF Ultramar Bright Silver., SI – G1545*
		Manufacturer	Spectrum Industries LLC*
		Colour	Bright Silver*
		No. of coats	2*
		Total Thickness, DFT	19 - 21 microns*
		Specific Gravity	1.12 - 1.18*
	2 nd Layer	Product Name	Primer*

		Type	Polyester*
		Reference	CP445, Yellow*
		Manufacturer	Spectrum Industries LLC*
		Thickness, DFT	5 - 8 microns*
		Specific Gravity	1.122*
	3 rd Layer	Reference	Aluminium top skin*
		Alloy & Temper	3003H46*
		Manufacturer	Good Luck Decorative Materials Manufacturer L.L.C.*
		Coated Thickness	0.5 ± 0.02 mm*
		Area Weight	1.355 kg/m ² *
		Density	2710 kg/m ³ *
	4 th Layer	Reference	Adhesive Film*
		Manufacturer	Rixin Plastic Industries LLC*
		Thickness	Stated: 0.1 mm Measured: 0.08 mm
		Area Weight	Stated: 0.093 kg/m ² Measured: 0.073 kg/m ²
		Density	926 kg/m ³ *
	5 th Layer	Reference	FR A2 (Fire Retardant A2) core*
		Manufacturer	Jiangsu Beike Decoration Materials Technology Co., Ltd.*
		Thickness	3.2 mm*
		Area Weight	5.92 kg/m ² *
		Density	Stated: 1700 – 1850 kg/m ³ Measured: 1734 kg/m ³
	6 th Layer	Reference	Adhesive Film*
		Manufacturer	Rixin Plastic Industries LLC*
		Thickness	Stated: 0.1 mm Measured: 0.08 mm
		Area Weight	Stated: 0.093 kg/m ² Measured: 0.073 kg/m ²
		Density	926 kg/m ³ *
	7 th Layer	Reference	Aluminium top skin*
		Alloy & Temper	3003H46*
		Manufacturer	Good Luck Decorative Materials Manufacturer L.L.C.*
		Coated Thickness	0.5 ± 0.02 mm*
		Area Weight	1.355 kg/m ² *
		Density	2710 kg/m ³ *
	8 th Layer	Reference	Back coat*
		Type	PE*
		Manufacturer	Spectrum Industries LLC*
		Colour	Grey*
		No. of coats	1*
Thickness, DFT		6 – 12 microns*	
Specific Gravity		1.22 – 1.30	
Backing Boards	Material	Calcium Silicate Board (verified by TBWIC)	
	Thickness	11 mm (measured by TBWIC)	
	Density	890 kg/m ³ (measured by TBWIC)	
	Classification	A2-s1, d0 as per EN 13501-1:2018 (verified by TBWIC)	
Note: the testing laboratory does not hold responsibility for information that has been provided by the sponsor and which could not be verified by the testing laboratory. As this could affect the validity of the tests results, any and all such information which could not be verified has been marked with an asterisk (*).			

5.2. Standard Specific Conditions

In accordance with §5.1.1 of BS EN 13823, the specimen consisted of two wings, a short and long, with respective dimensions of 500 mm x 1500 mm (w x h) and 1004 mm x 1500 mm (w x h). The dimensions of each panel unit which comprise the specimen are provided in §10 *Appendix 1 – Drawings* of this report.

In accordance with §5.1.3 of BS EN 13823, and to allow for observation of lateral flame spread, two horizontal lines were drawn on the front side of the long wing near the edge of the specimen farthest from the corner at a height of 500 ± 3 mm and 1000 ± 3 mm above the bottom edge of the specimen.

In accordance with §5.2.2(a) of BS EN 13823, the panels were intended to be installed in end-use with a ventilated cavity behind them and, as such, were tested with a cavity of 40 mm behind them. Also, in accordance with §5.2.2 (a) of BS EN 13823, the sides of the cavity farthest away from the corner were left open.

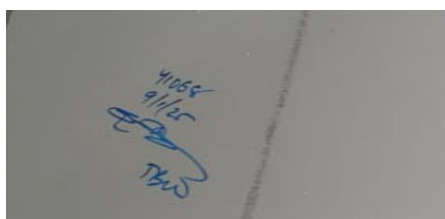
In accordance with §5.2.2 (e) of BS EN 13823, the specimen was tested with 15 mm thick open horizontal and vertical joints placed, respectively, at a height of 500 mm from the bottom of the specimen and 200 mm from the corner line as measured when the specimen was mounted and ready for testing. Refer to §10 *Appendix 1 – Drawings* for details.

In accordance with §5.4 of BS EN 13823, three (3) specimens were tested.

6. SPECIMEN DEFINITION & VERIFICATION

6.1. Specimen Definition & Verification of the Test Specimen

TBWIC testing laboratory has not been involved in the selection or design of the specimen. However, the materials were selected, marked, and signed by Mr. Suresh Kumar from TBWIC Certification (Certification Body) on 09-Jan-25 as shown below.



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. Similarly, the results of the test apply only to the samples as received.

6.2. Specimen Conditioning

The specimens were delivered on 14-Jul-25 and conditioned to constant mass at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity, in accordance with §6 of BS EN 13823 and as prescribed in EN 13238:2010 - *Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates*.

7. METHOD OF TEST

7.1. Test Procedure

The test was performed in accordance with the requirements of §8 of BS EN 13823:2020+A1:2022 - *Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by the single burning item*.

7.2. Performance Criteria

The BS EN 13823 test method does not itself provide a formal fire rating but instead produces a series of measurements and calculations to be reported. Actual fire classifications are the subject of a parent, classification standard, EN 13501-1, which is not a subject of this test report. A summary of measurements to be reported are as follows with definition from the indicated sections of BS EN 13823. Additional calculations using these measurements are also reported.

Metric	Definition
HRR _{av} (t)	Graphical representation of the average Heat Release Rate for the time interval $0 \leq t \leq 1500s$.
THR(t)	Graphical representation of the average Total Heat Release for the time interval $0 \leq t \leq 1500s$.
THR _{600s}	§3.4 Total heat release from the specimen on the first 600 seconds of exposure to the main (primary) burner flames.
FIGRA _{0.2 MJ}	§3.7 Maximum of the quotient of heat release rate from the specimen and the time of it's occurrence using a THR-threshold of 0.2MJ.
FIGRA _{0.4 MJ}	§3.8 Maximum of the quotient of heat release rate from the specimen and the time of it's occurrence using a THR threshold of 0.4 MJ.
TSP(t)	Graphical Representation of the Total Smoke Production for the time interval $0 \leq t \leq 1500s$.
TSP _{600s}	§3.7 total smoke production from the specimen in the first 600 seconds of exposure to the main (primary) burner flames.
SMOGRA	§3.9 Smoke Growth Rate: Maximum of the quotient of smoke production rate from the specimen and the time of it's occurrence.
Lateral Flame Spread	§3.5 Lateral from spread on the long specimen wing.
Flaming particles & Droplets	§8.3.4 (a) & (b) Occurrences of the fall of flaming droplets / particles, in the given time interval that remain flaming for both <i>not more</i> and <i>more than</i> 10 seconds after falling.

7.3. Method Variations

With respect to §6.2 *Specimen Conditioning* of this report, there were deviations observed in the consistency of the temperature and relative humidity in the four separate probes of monitoring equipment in the laboratory's conditioning room. However, the materials were still conditioned to constant mass, in accordance with the test standard, and it was agreed upon by both the laboratory and the sponsor to proceed with the test.

8. FIRE TEST

8.1. Observations & Measurements

OBSERVATIONS	SPECIMEN		
	1	2	3
Occurrence of sustained flames reaching the far edge of long wing specimen at any height between 500-1000mm at any time during the test - LFS	Nil	Nil	Nil
Flaming droplets/particles within the first 600 sec.	Nil	Nil	Nil
Burning droplets/particles ≥ 10 s within the first 600 sec.	Nil	Nil	Nil
End of test, sec.	1560	1560	1560

9. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with BS EN 13823:2020+A1:2022 - *Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by the single burning item.*

9.1. Test Results

OBSERVATIONS	SPECIMEN			Mean
	1	2	3	
FIGRA _{0.2MJ} (W/s)	14	0	15	10
FIGRA _{0.4MJ} (W/s)	14	0	15	10
THR _{600s} , MJ	1.6	0.4	1.8	1.3
SMOGR _A , m ² /s ² Note 1	0	0	0	0
TSP _{600s} , m ² Note 1	18	31	7	19
Occurrence of sustained flames reaching the far edge of long wing specimen at any height between 500-1000mm at any time during the test - LFS	Nil	Nil	Nil	Nil
Flaming droplets/particles ≥ 10s within the first 600 sec.	Nil	Nil	Nil	Nil
Burning droplets/particles ≤ 10 s within the first 600 sec.	Nil	Nil	Nil	Nil
Note 1: Resulting values were corrected in accordance with Annex A, §A.6.1.2 of BS EN 13823:2020+A1:2022				

9.2. Limitation

The test results relate only to the behaviour of the test specimen of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard for the product in use.

This report and all records of the test to which it relates may not be retained by TBWIC beyond 5 years from the date of testing.

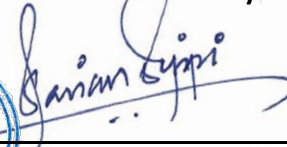
This test report is respectfully submitted by: Thomas Bell-Wright International Consultants.

Prepared By:



Esther Gitau
Fire Testing Engineer

Reviewed & Authorized By:

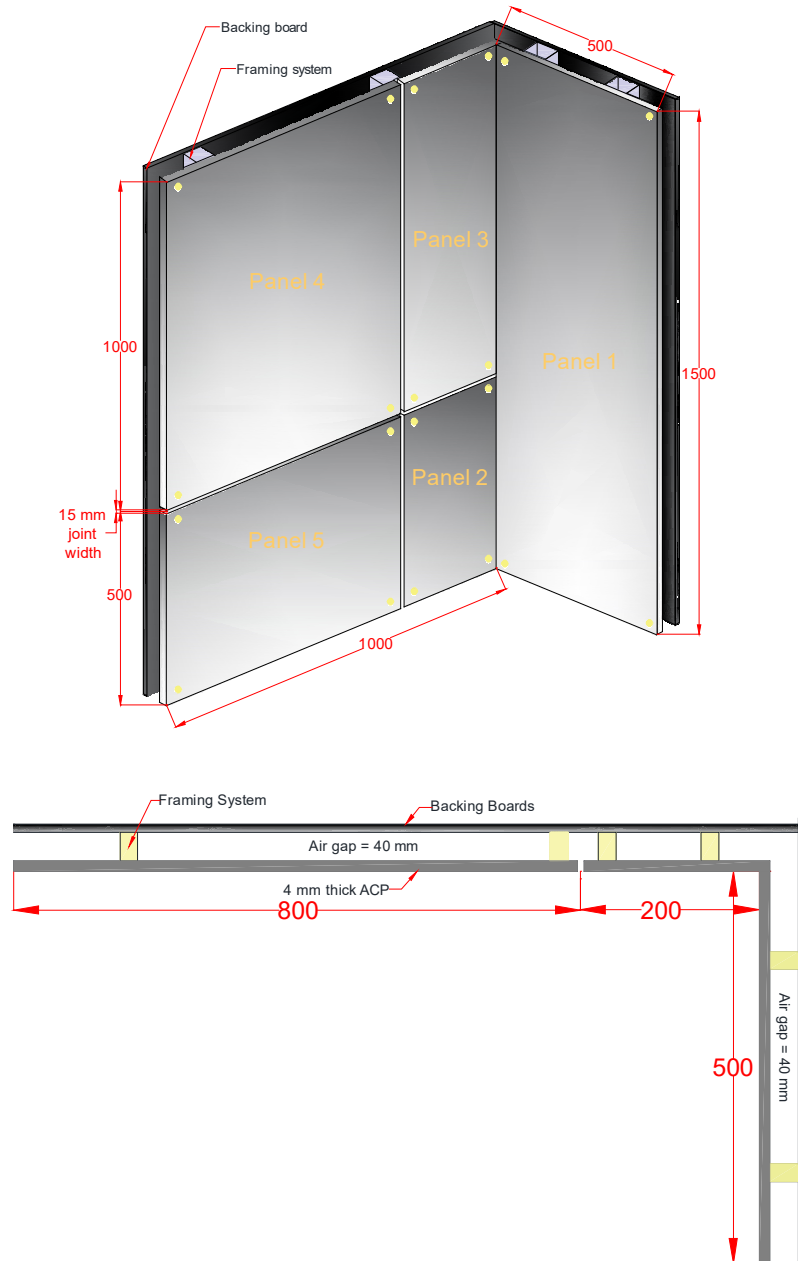


Daisan Dippi, AlFireE
Fire Testing Director



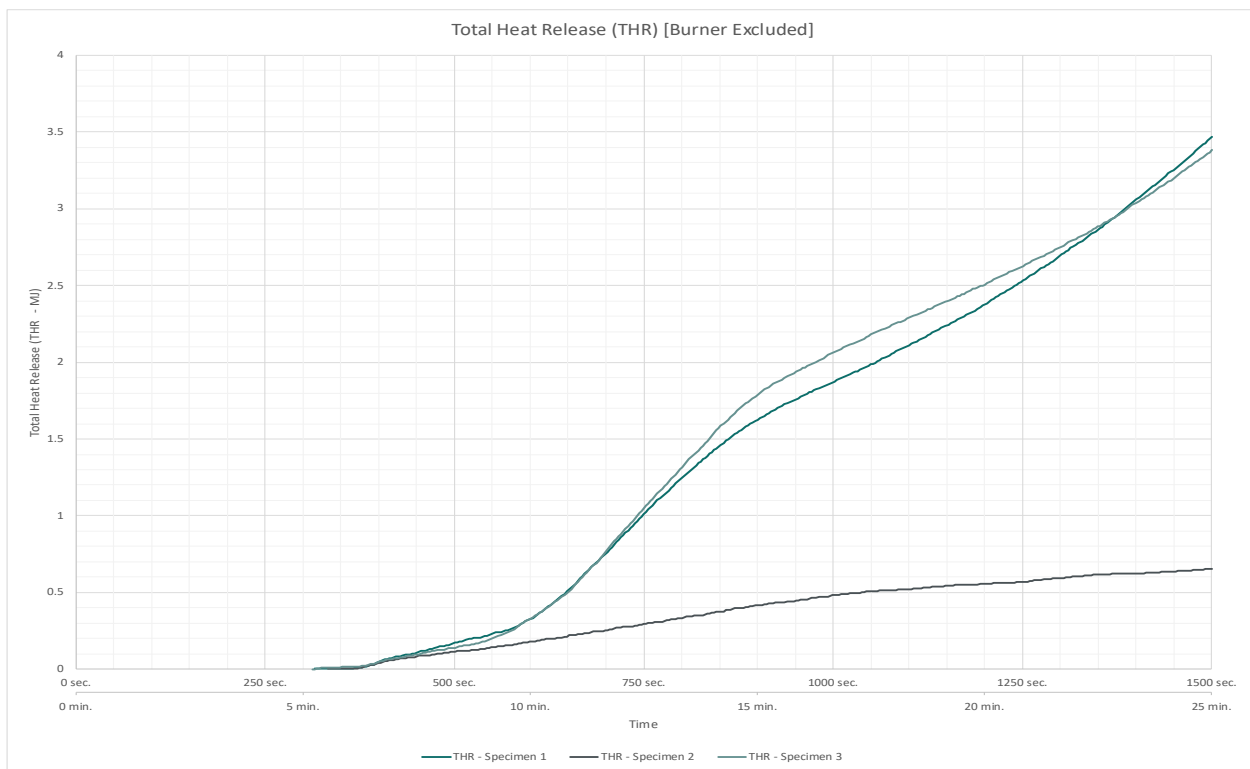
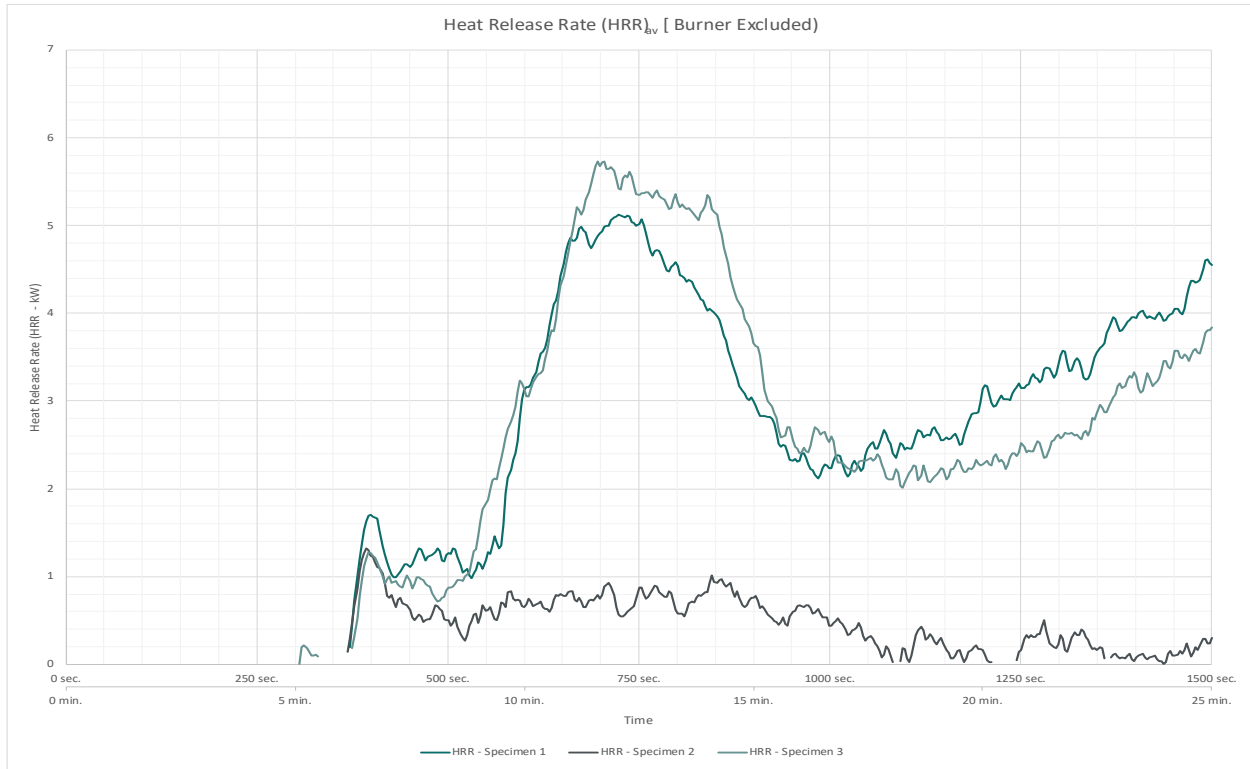
Report Revision Tracking		
Revision No.	Date	Notes & Amendments
Rev. 00	13-Oct-25	This is the first issue of the report. No revisions are included.

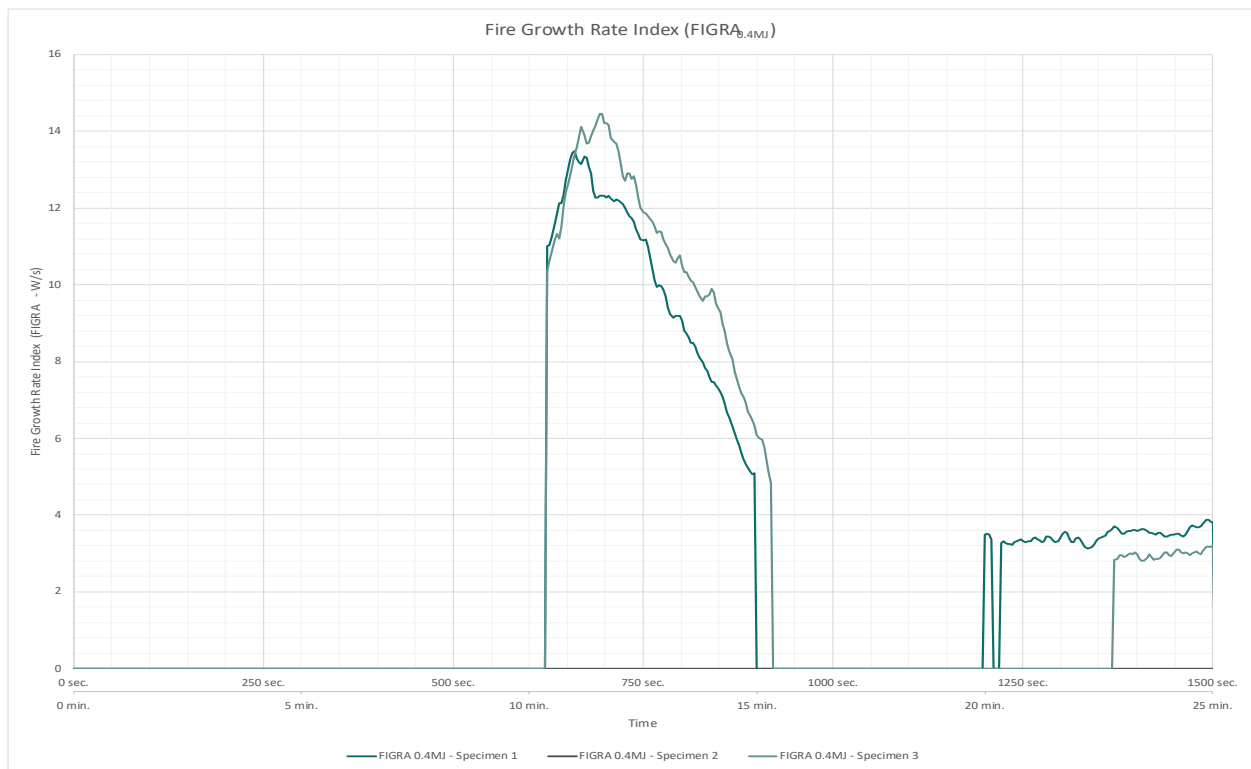
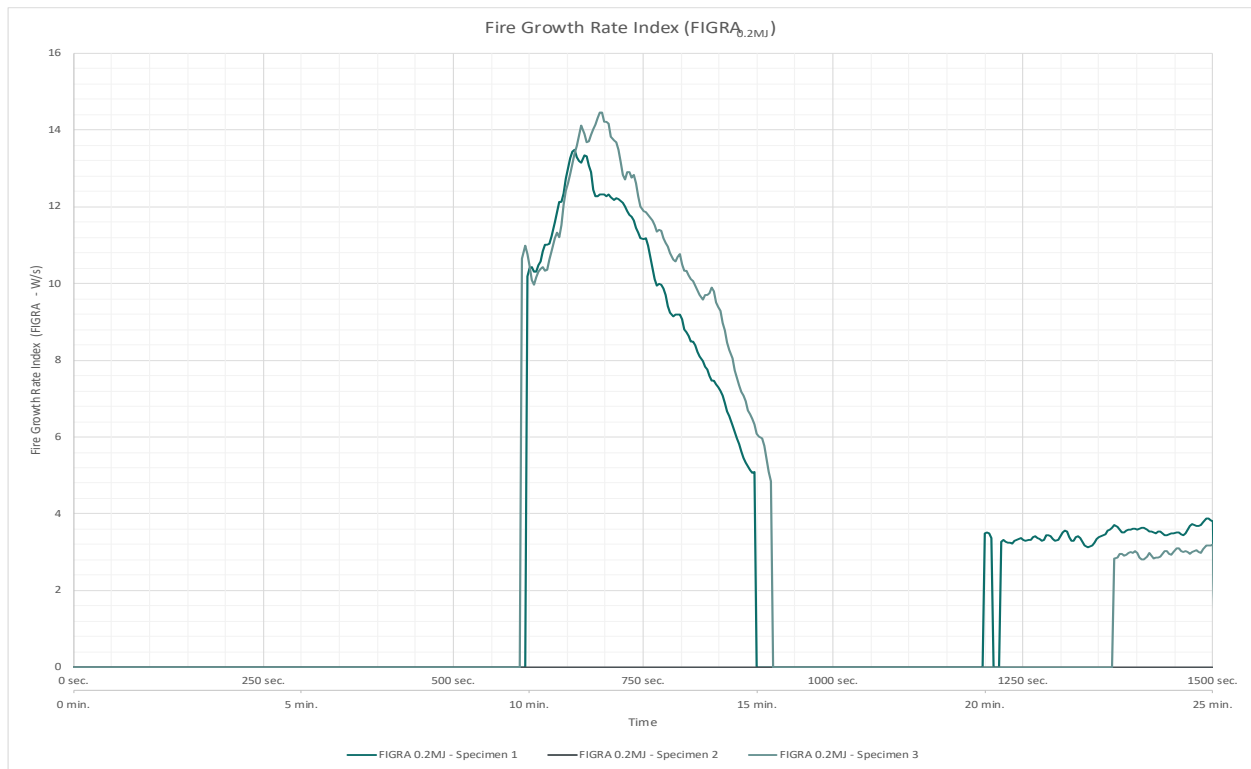
10. APPENDIX 1 – DRAWINGS

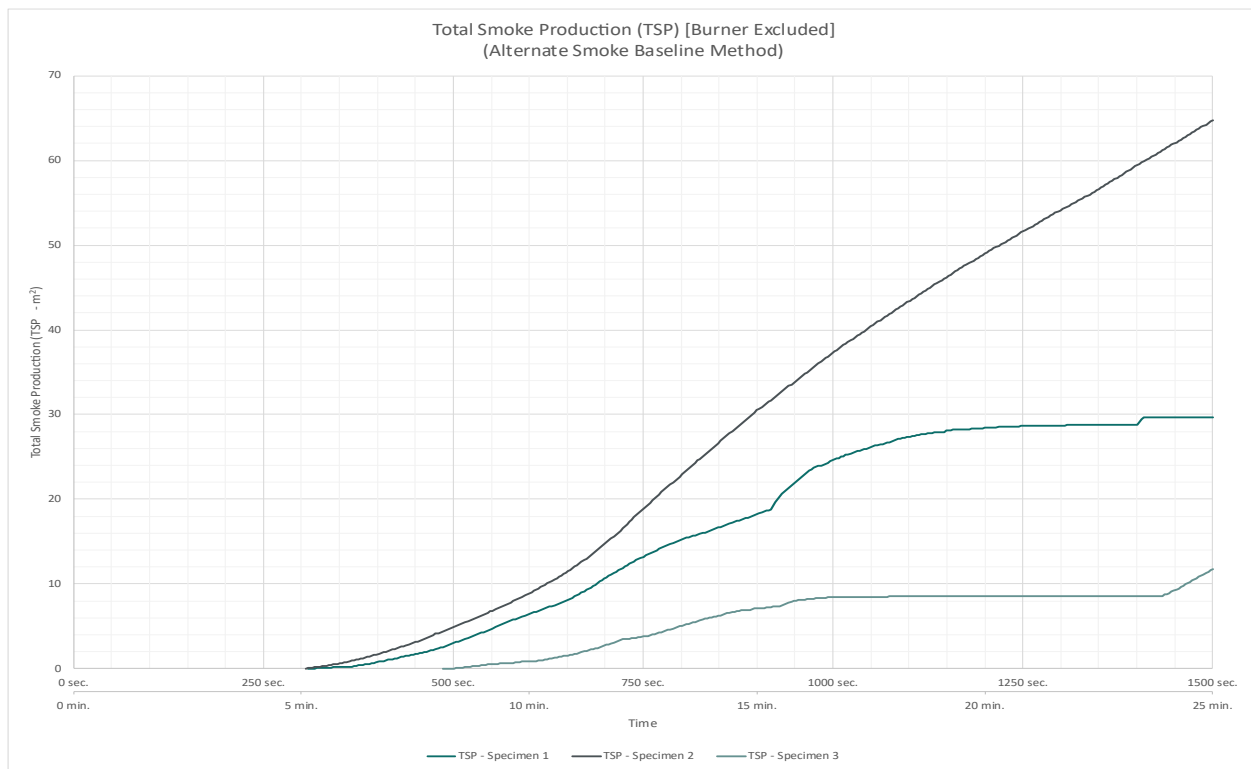
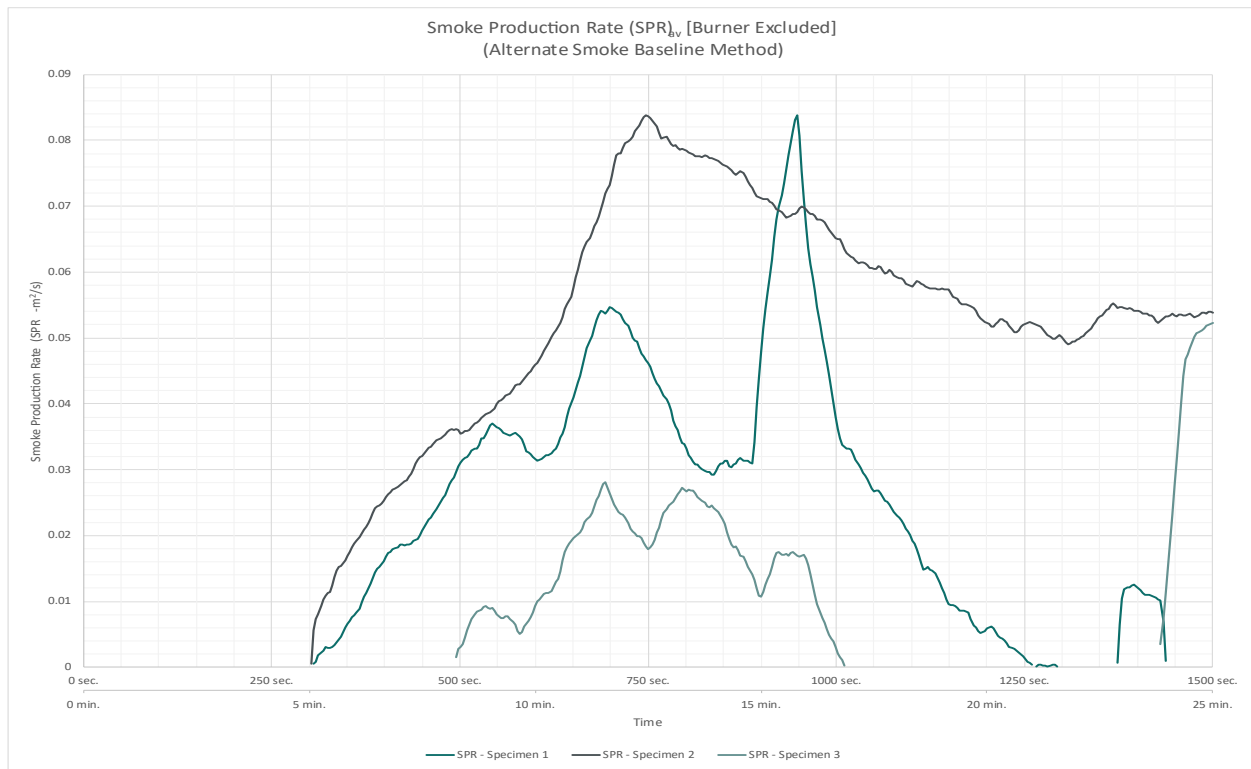


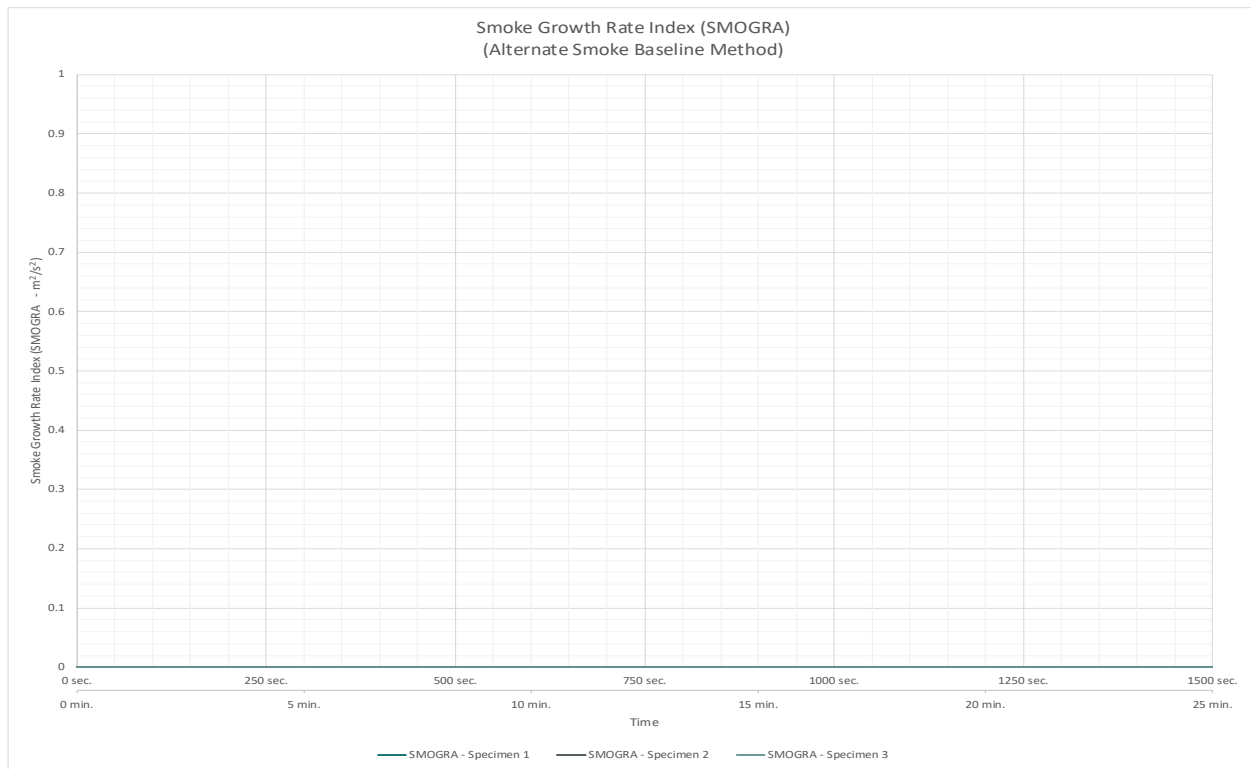
All dimensions are in mm

11. APPENDIX 2 – GRAPHS









12. APPENDIX 3 – TEST PHOTOS

		
Specimen 1		
Specimen 2		
Specimen 3		
Specimens before the test		
		
Specimen 1		
Specimen 2		
Specimen 3		
Specimens after the test		

----- End of Test Report -----