

TEST REPORT

REACTION TO FIRE TEST

Test Sponsor:

Jadara Building Materials Co.
Dammam Industrial Area 2
Kingdom of Saudi Arabia
T: +966 55 502 9208
Website: www.deltasaudi.com

Test Assembly:

4mm thick Delta Aluminium Composite Panel

Test Standard

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



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

Test Date: 31-Mar-23
Issue Date: 22-May-23
Test Reference No: WL072-2

PO BOX 26385, DUBAI UAE

T +971 (0)4 821 5777

fire@bell-wright.com

www.bell-wright.com

DUBAI

DOHA

RIYADH



Accreditation

Testing

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



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 under the accreditations of **ISO 17025 UKAS**.



Table of Contents

1. INTRODUCTION.....	4
2. SPONSOR.....	4
3. TESTING LABORATORY.....	4
4. DATE OF TEST.....	4
5. SPECIMEN DESCRIPTION.....	5
6. SPECIMEN DRAWING.....	6
7. SPECIMEN VERIFICATION.....	8
8. METHOD OF TEST.....	8
8.1. Test Procedure.....	8
8.2. Conditioning.....	8
9. OBSERVATION.....	8
10. SUMMARY OF RESULTS.....	9
11. LIMITATION.....	10
12. APPENDIX 1- GRAPHS.....	11
13. APPENDIX 2- PHOTOGRAPHS.....	15



1. INTRODUCTION

Determination of Reaction to fire performance of building products excluding floorings when exposed to thermal attack by a Single Burning Item (SBI) (a sand-box burner supplied with propane) in accordance with BS EN 13823:2020.

2. SPONSOR

Name: Jadara Building Materials Co.
Address: Dammam Industrial Area 2
Kingdom of Saudi Arabia
T: +966 55 502 9208
Website: www.deltasaudi.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 (0)4 821 5777
Website: www.bell-wright.com

4. DATE OF TEST

Sample received: 22-Mar-23
Test date: 31-Mar-23

The test was not witnessed by the sponsor



5. SPECIMEN DESCRIPTION

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 result. All information that could not be verified will be indicated by an asterisk () mark.*

Product Description		4mm thick Delta Aluminium Composite Panel*	
Product Reference		Delta Aluminium Composite Panels*	
Manufacturer		Jadara Building Materials Co.*	
Mass per unit area		7.16 kg/m ² (measured by TBWIC)	
Thickness		4mm (measured by TBWIC)	
Color		White (observed by TBWIC)	
Product Details	Top Coat (fireside)	Product Name	Delta*
		Manufacturer	Jadara Building Materials Co.*
		Thickness	27 µm* (stated)
		Density	2.70 g/cm ³ * (stated)
	Top Aluminium skin	Product Name	Aluminium Top Coil*
		Manufacturer	
		Thickness	0.28mm* (stated)
		Mass per unit area	0.83 kg/m ² * (stated)
	Adhesive	Product Name	Adhesive Film*
		Manufacturer	
		Thickness	0.05mm* (stated)
		Mass per unit area	0.092 kg/m ² * (stated)
	Fire Retardant Core	Product Name	Fire Retardant Core*
		Manufacturer	
		Thickness	4mm* (stated)
		Mass per unit area	5.10 kg/m ² * (stated)
	Adhesive	Product Name	Adhesive Film*
		Manufacturer	
		Thickness	0.08mm* (stated)
		Mass per unit area	0.092 kg/m ² * (stated)
	Back Aluminium skin	Product Name	Aluminium Back Coil*
		Manufacturer	
		Thickness	0.28mm* (stated)
		Mass per unit area	0.79 kg/m ² * (stated)
Back Coat	Product Name	Delta*	
	Manufacturer	Jadara Building Materials Co.*	
	Thickness	31 µm* (stated)	

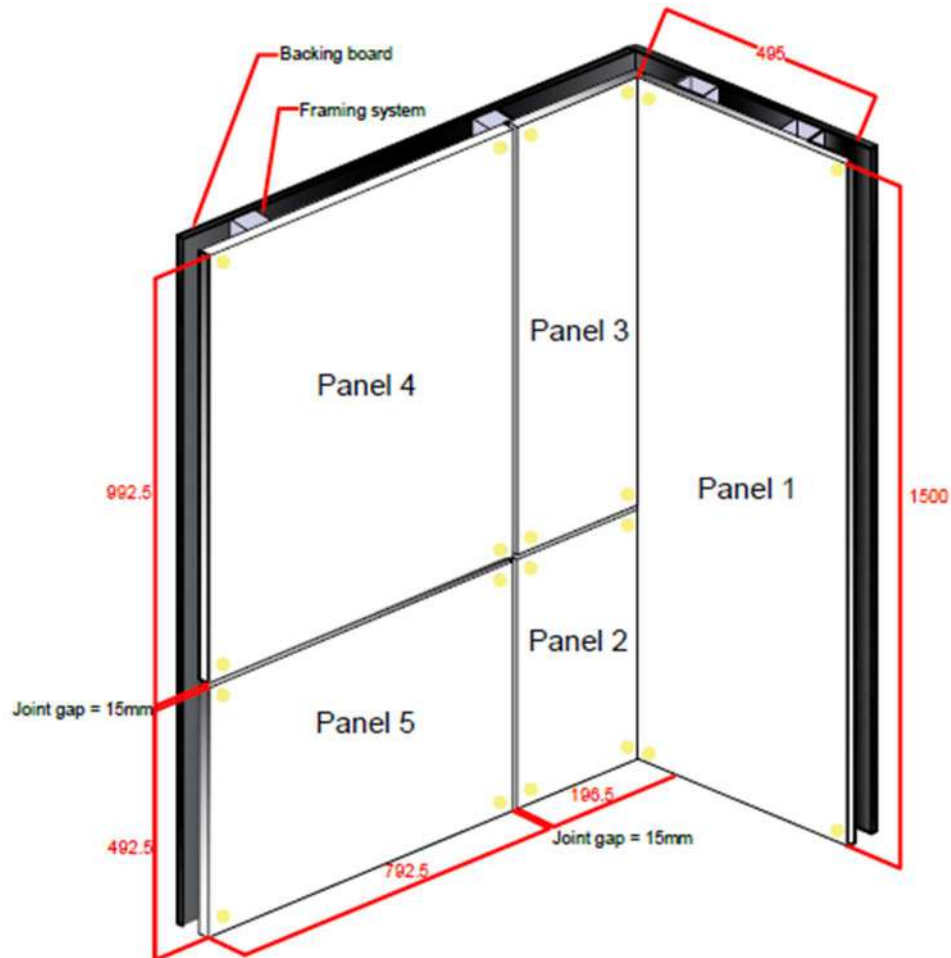


	Density	2.70 g/cm ³ * (stated)
Backing Board	Material	Calcium Silicate Board (verified by TBWIC)
	Density	900 kg/m ³ (measured by TBWIC)
	Thickness	9mm (measured by TBWIC)
	Classification	A2-s1, d0 as per EN 13501-1:2018 (verified by TBWIC)
Type of joint	<p>1. Vertical Joints: 15mm open joint at 200 mm from the corner line to the center of the joint, measured when the wings are mounted.</p> <p>2. Horizontal Joints: 15mm open joint at 500 mm from the specimen bottom to the center of the joint, measured when the wings are mounted.</p>	
Specimen Dimensions	<p>Small Wing: Panel 1 – 495 x 1500 mm (w x h) (Measured)</p> <p>Long Wing: Panel 2 – 196.5 x 492.5 mm (w x h) (Measured)</p> <p>Panel 3 – 196.5 x 992.5 mm (w x h) (Measured)</p> <p>Panel 4 – 792.5 x 992.5 mm (w x h) (Measured)</p> <p>Panel 5 – 792.5 x 492.5 mm (w x h) (Measured)</p> <p>Refer to Drawing No.1 for more information/details.</p>	
Specimen Placement	<p>The 4mm thick Delta Aluminium Composite Panel was prepared according to section 5.2.2 of BS EN 13823:2020. It was mounted mechanically using 3.5 x 25mm drywall screws and washers on a calcium silicate board substrate. The long wing specimen and backing board were placed on the trolley using mechanical clamps, with the side edge of the backing board of the small wing and the bottom edge of the specimen against the long U-profile on the trolley floor.</p> <p>Refer to Drawing No. 1 & 2 for more details.</p>	

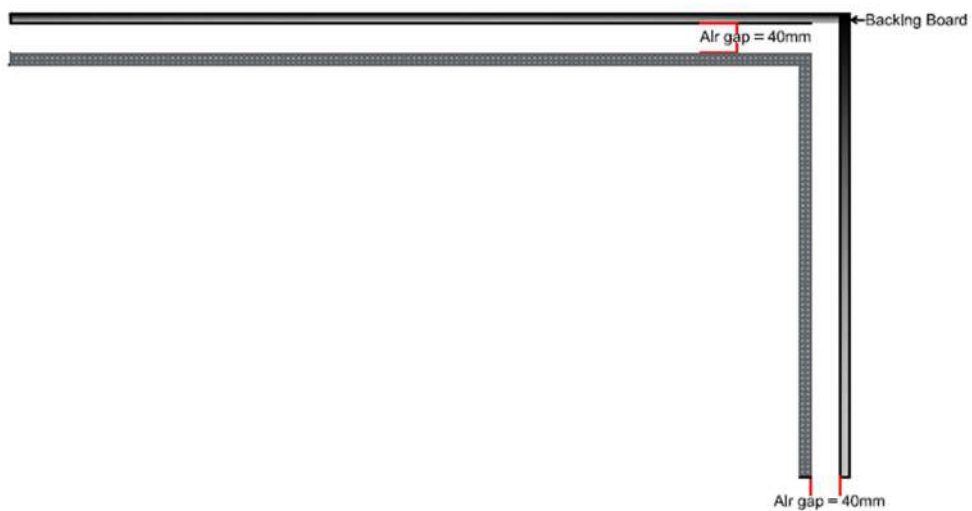
Note: The sponsor has declared that the sample submitted for testing has been selected by Jadara Building Materials Co., for the requirement given in Section 6.7 of SASO 2752/2019 (Aluminum Composite Panel for External Cladding and Internal Finish) standard.



6. SPECIMEN DRAWING



Drawing 1: Dimensions of the long and short wing of the test specimen.
All dimensions are in millimeters (mm).



Drawing 2: Top view of the mounted specimen with airgap.
All dimensions are in millimeters (mm)



7. SPECIMEN VERIFICATION

The choice and design and the definition of the specimen have been made by Jadara Building Materials Co., and TBWIC Testing Laboratory has not been involved in the selection or design of the specimen. The results of the test apply only 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.

8. METHOD OF TEST

8.1. Test Procedure

The test was performed in accordance with the requirements of BS EN 13823:2020 “Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by the single burning item”.

8.2. Conditioning

After delivery on 22-Mar-23, the specimens were conditioned to constant weight at 21 to 25 °C and 45 to 55% relative humidity as per BS EN 13238:2010 “Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates”.

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

9. OBSERVATION

Test Data and Observation

Observations			
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 600s	Nil	Nil	Nil
Burning droplets/particles ≥ 10 s within the first 600s	Nil	Nil	Nil
End of test, s	1560	1560	1560



10. SUMMARY OF RESULTS

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

Deviations: If any deviations from the test method.

The complete test results for the specimen are:

TEST PARAMETERS	TEST RESULTS			Average
	Specimen 1	Specimen 2	Specimen 3	
FIGRA _{0.2MJ} (W/s)	22	33	38	31
FIGRA _{0.4MJ} (W/s)	22	33	38	31
THR _{600s} , MJ	1.5	3.3	3.6	2.8
SMOGRA, m ² /s ² <small>Note 1</small>	0	0	0	0
TSP _{600s} , m ² <small>Note 1</small>	19	12	6	12
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 600s	Nil	Nil	Nil	Nil
Burning droplets/particles ≤10 s within the first 600s	Nil	Nil	Nil	Nil

Note 1: Corrected value as per ANNEX A, Clause A.6.1.2 of BS EN 13823:2020.



11. LIMITATION

“The test results relate to the behavior of the test specimens of a product under the particular conditions of the test; they are not intended to be sole criterion for assessing the potential fire hazard of the product in use”- Clause 10q, BS EN 13823:2020.

Results are valid for the tested configuration only.

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

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

Prepared by:

Reviewed and Authorized by:




Malak Megly
 Junior Fire Testing Engineer

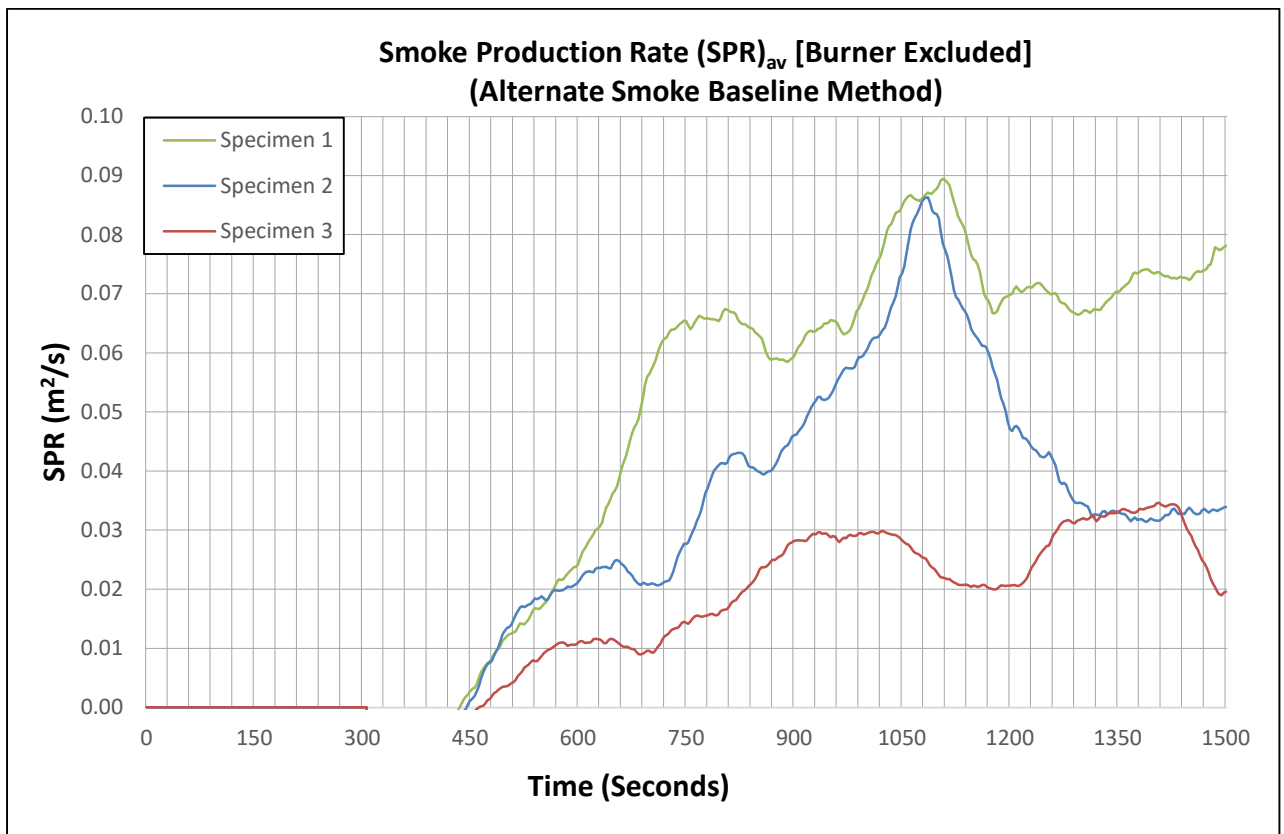
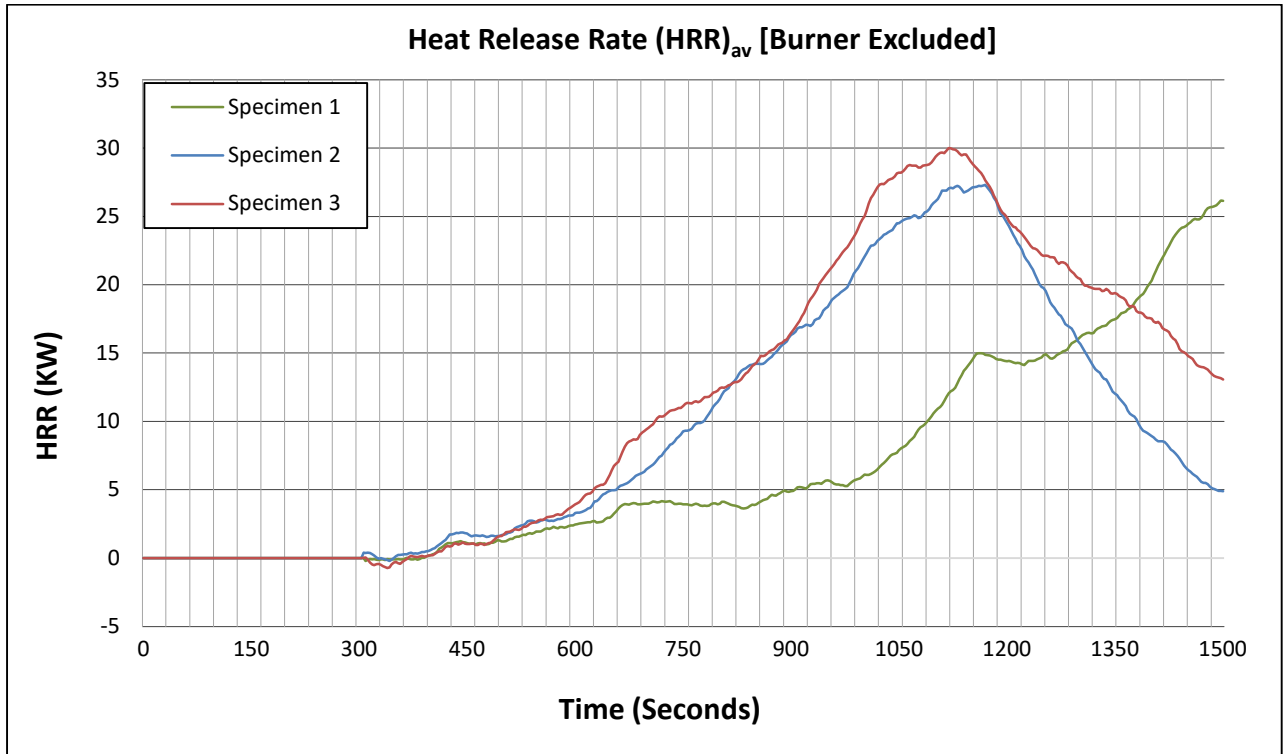


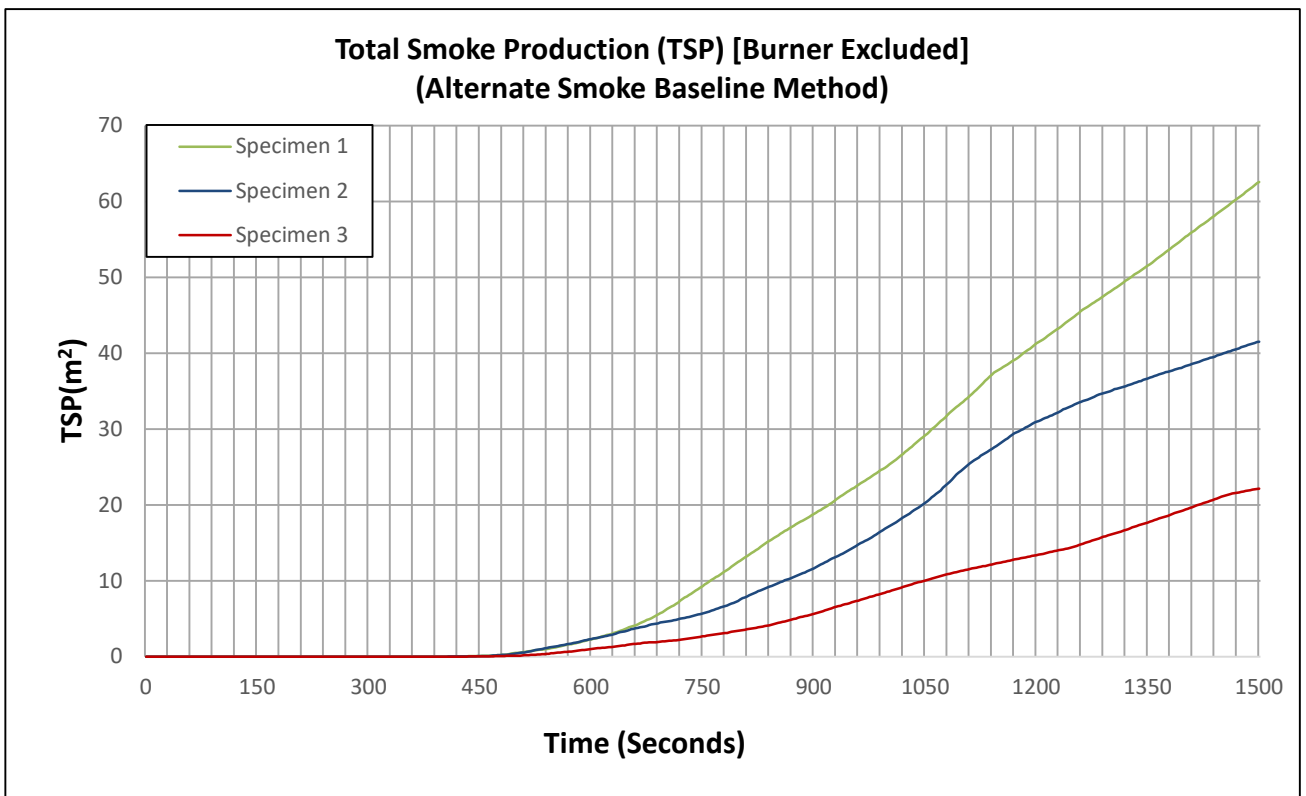
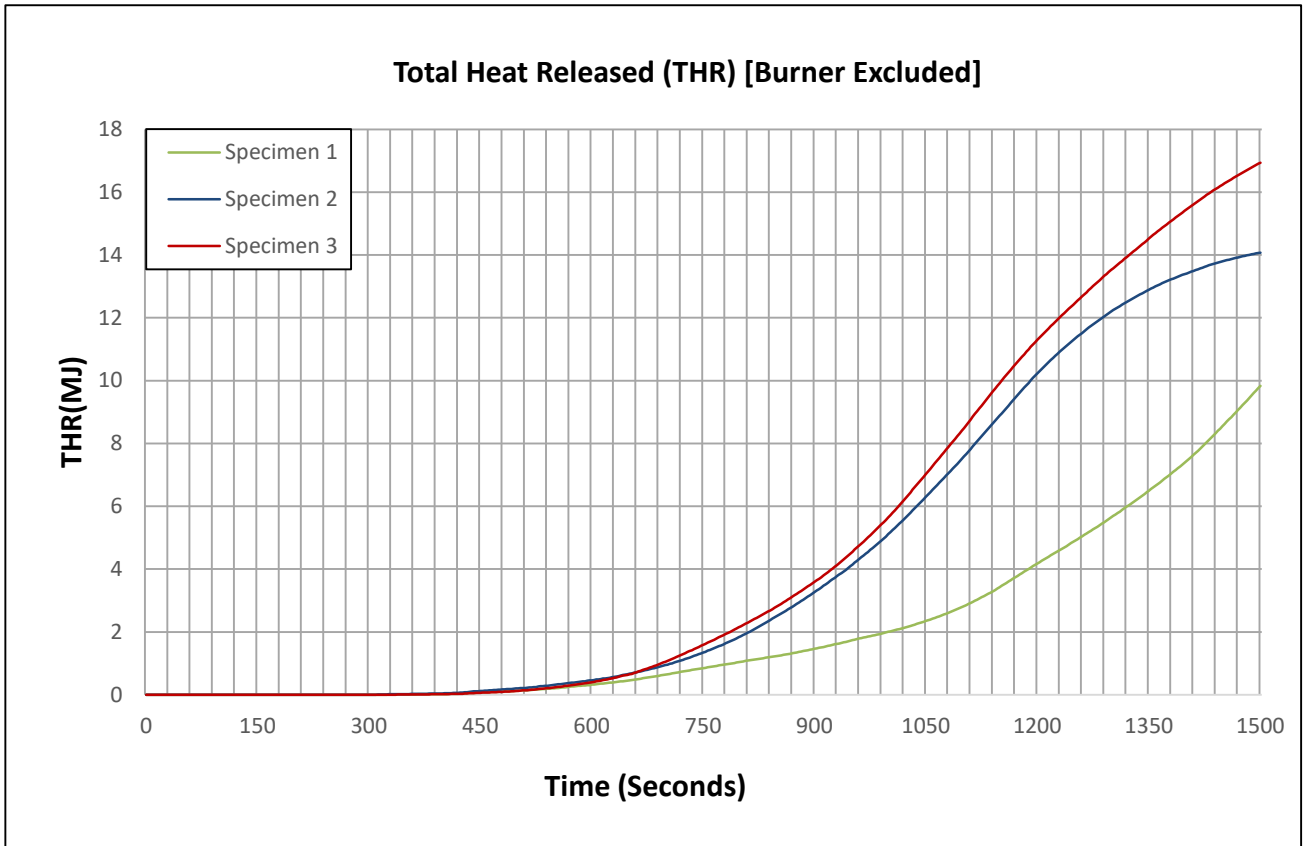
Suketa Tyagi
 Manager – Reaction to Fire

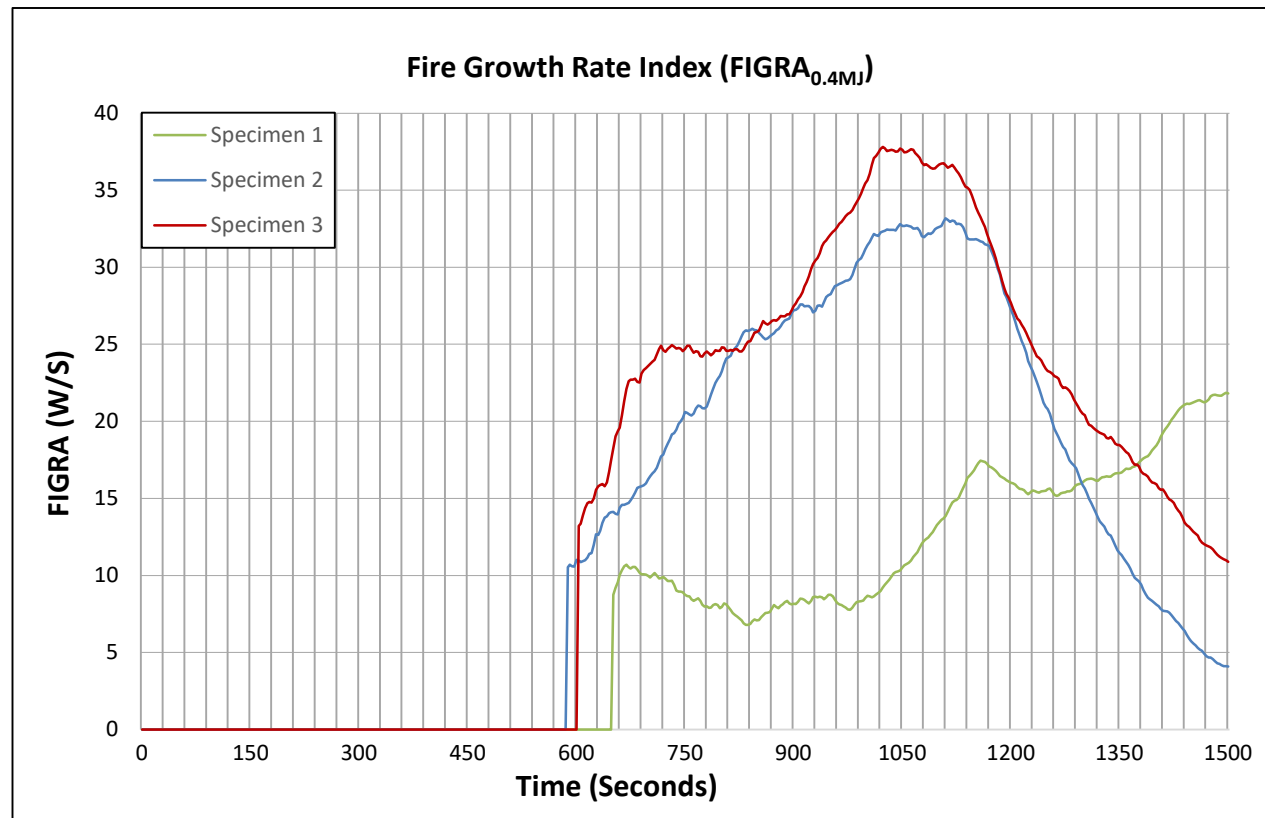
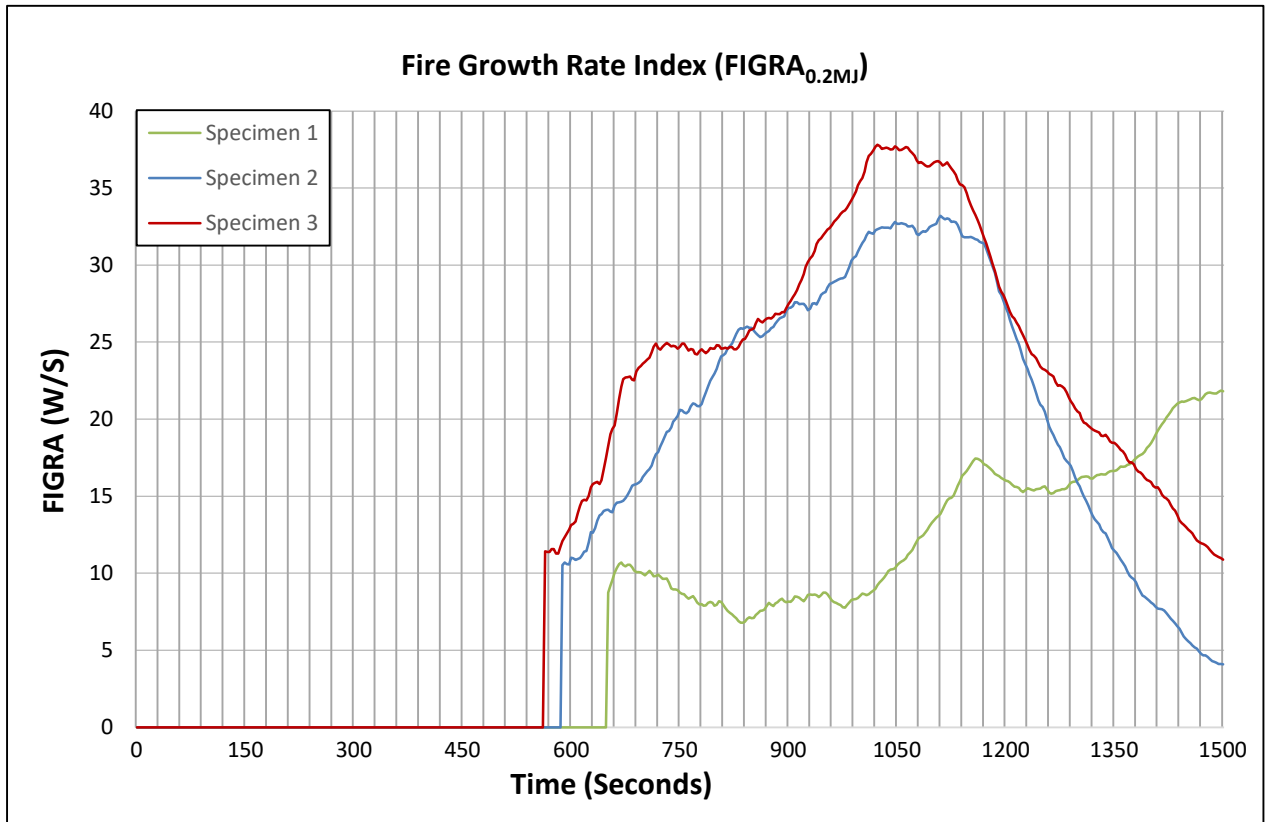
Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	22-May-23	This is the first issue of the report. No revisions are included.

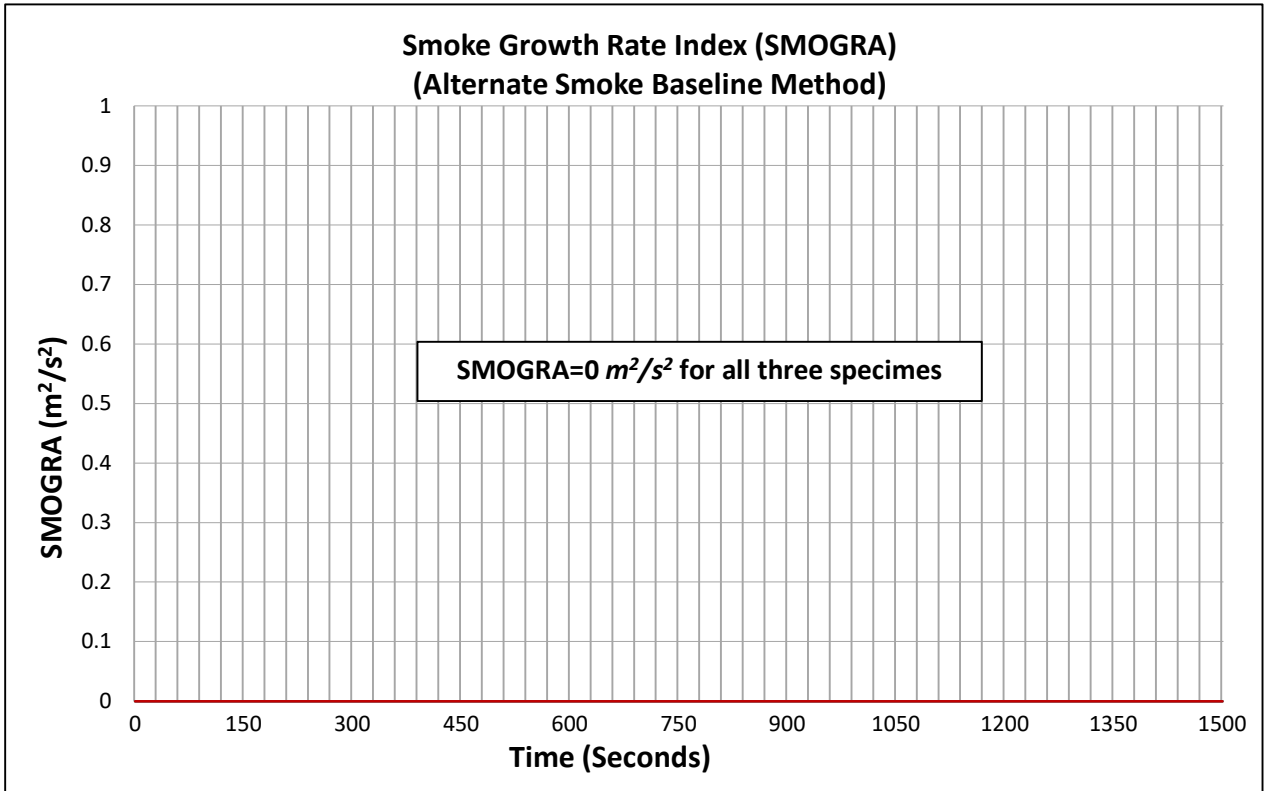


12. APPENDIX 1- GRAPHS











13. APPENDIX 2- PHOTOGRAPHS



Specimen before the test



Specimen after the test

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

TEST REPORT

REACTION TO FIRE TEST

Test Sponsor:

Jadara Building Materials Co.
Dammam Industrial Area 2
Kingdom of Saudi Arabia
T: +966 55 502 9208
Website: www.deltasaudi.com

Test Assembly:

4mm thick Delta Plus Aluminium Composite Panel

Test Standard

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



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Date: 3-Apr-23
Issue Date: 22-May-23
Test Reference No: WL072-6

PO BOX 26385, DUBAI UAE

T +971 (0)4 821 5777

fire@bell-wright.com

www.bell-wright.com

DUBAI

DOHA

RIYADH



Accreditation

Testing

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



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 under the accreditations of **ISO 17025 UKAS**.



Table of Contents

1. INTRODUCTION.....	4
2. SPONSOR.....	4
3. TESTING LABORATORY.....	4
4. DATE OF TEST.....	4
5. SPECIMEN DESCRIPTION.....	5
6. SPECIMEN DRAWING.....	6
7. SPECIMEN VERIFICATION.....	8
8. METHOD OF TEST.....	8
8.1. Test Procedure.....	8
8.2. Conditioning.....	8
9. OBSERVATION.....	8
10. SUMMARY OF RESULTS.....	9
11. LIMITATION.....	10
12. APPENDIX 1- GRAPHS.....	11
13. APPENDIX 2- PHOTOGRAPHS.....	15



1. INTRODUCTION

Determination of Reaction to fire performance of building products excluding floorings when exposed to thermal attack by a Single Burning Item (SBI) (a sand-box burner supplied with propane) in accordance with BS EN 13823:2020.

2. SPONSOR

Name: Jadara Building Materials Co.
Address: Dammam Industrial Area 2
Kingdom of Saudi Arabia
T: +966 55 502 9208
Website: www.deltasaudi.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 (0)4 821 5777
Website: www.bell-wright.com

4. DATE OF TEST

Sample received: 22-Mar-23
Test date: 03-Apr-23

The test was not witnessed by the sponsor



5. SPECIMEN DESCRIPTION

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 result. All information that could not be verified will be indicated by an asterisk () mark.*

Product Description		4mm thick Delta Plus Aluminium Composite Panel*	
Product Reference		Delta Aluminium Composite Panels*	
Manufacturer		Jadara Building Materials Co.*	
Mass per unit area		7.79 kg/m ² (measured by TBWIC)	
Thickness		4mm (measured by TBWIC)	
Color		White (observed by TBWIC)	
Product Details	Top Coat (fireside)	Product Name	Delta Plus*
		Manufacturer	Jadara Building Materials Co.*
		Thickness	38 µm* (stated)
		Density	2.70 g/cm ³ * (stated)
	Top Aluminium skin	Product Name	Aluminium Top Coil*
		Manufacturer	-
		Thickness	0.45mm* (stated)
		Mass per unit area	1.328 kg/m ² * (stated)
	Adhesive	Product Name	Adhesive Film*
		Manufacturer	-
		Thickness	0.05mm* (stated)
		Mass per unit area	0.092 kg/m ² * (stated)
	Fire Retardant Core	Product Name	Fire Retardant Core*
		Manufacturer	-
		Thickness	4mm* (stated)
		Mass per unit area	5.10 kg/m ² * (stated)
	Adhesive	Product Name	Adhesive Film*
		Manufacturer	-
		Thickness	0.08mm* (stated)
		Mass per unit area	0.092 kg/m ² * (stated)
	Back Aluminium skin	Product Name	Aluminium Back Coil*
		Manufacturer	-
		Thickness	0.45mm* (stated)
		Mass per unit area	1.264 kg/m ² * (stated)
Back Coat	Product Name	Delta Plus*	
	Manufacturer	Jadara Building Materials Co.*	
	Thickness	36 µm* (stated)	

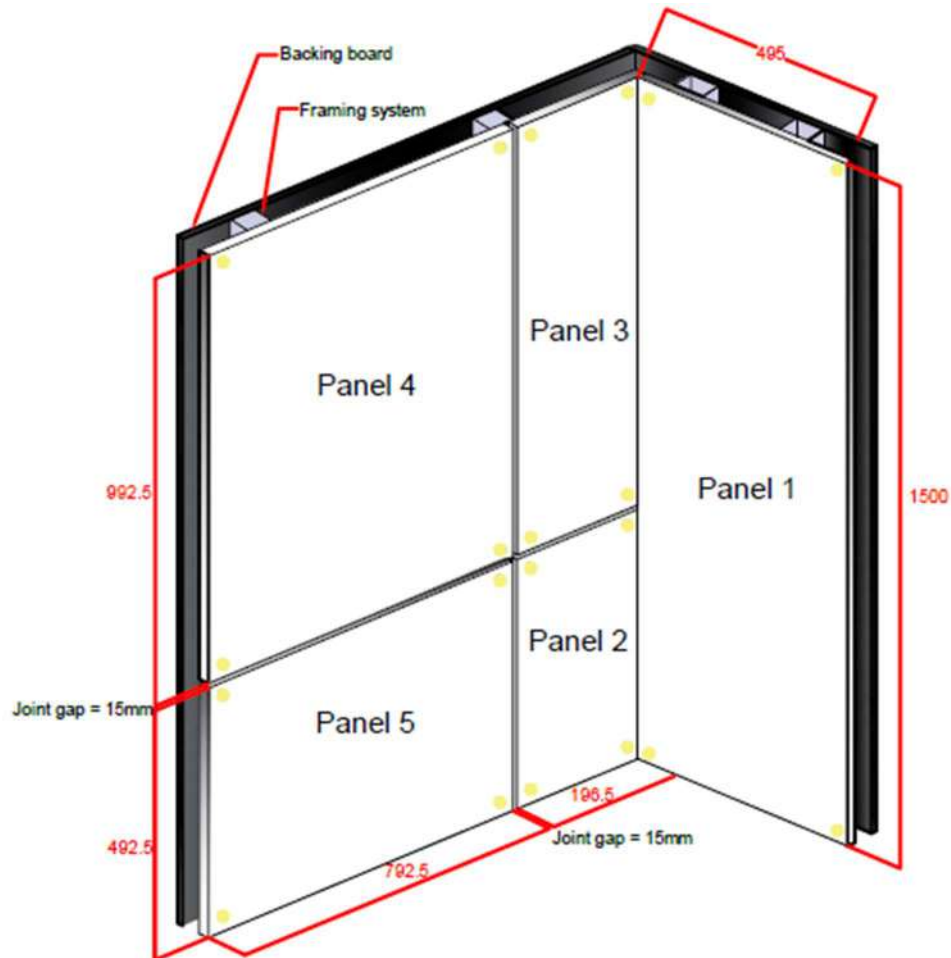


	Density	2.70 g/cm ³ * (stated)
Backing Board	Material	Calcium Silicate Board (verified by TBWIC)
	Density	900 kg/m ³ (measured by TBWIC)
	Thickness	9mm (measured by TBWIC)
	Classification	A2-s1, d0 as per EN 13501-1:2018 (verified by TBWIC)
Type of joint	<p>1. Vertical Joints: 15mm open joint at 200 mm from the corner line to the center of the joint, measured when the wings are mounted.</p> <p>2. Horizontal Joints: 15mm open joint at 500 mm from the specimen bottom to the center of the joint, measured when the wings are mounted.</p>	
Specimen Dimensions	<p>Small Wing: Panel 1 – 495 x 1500 mm (w x h) (Measured)</p> <p>Long Wing: Panel 2 – 196.5 x 492.5 mm (w x h) (Measured)</p> <p>Panel 3 – 196.5 x 992.5 mm (w x h) (Measured)</p> <p>Panel 4 – 792.5 x 992.5 mm (w x h) (Measured)</p> <p>Panel 5 – 792.5 x 492.5 mm (w x h) (Measured)</p> <p>Refer to Drawing No.1 for more information/details.</p>	
Specimen Placement	<p>The 4mm thick Delta Plus Aluminium Composite Panel was prepared according to section 5.2.2 of BS EN 13823:2020. It was mounted mechanically using 3.5 x 25mm drywall screws and washers on a calcium silicate board substrate. The long wing specimen and backing board were placed on the trolley using mechanical clamps, with the side edge of the backing board of the small wing and the bottom edge of the specimen against the long U-profile on the trolley floor.</p> <p>Refer to Drawing No. 1 & 2 for more details.</p>	

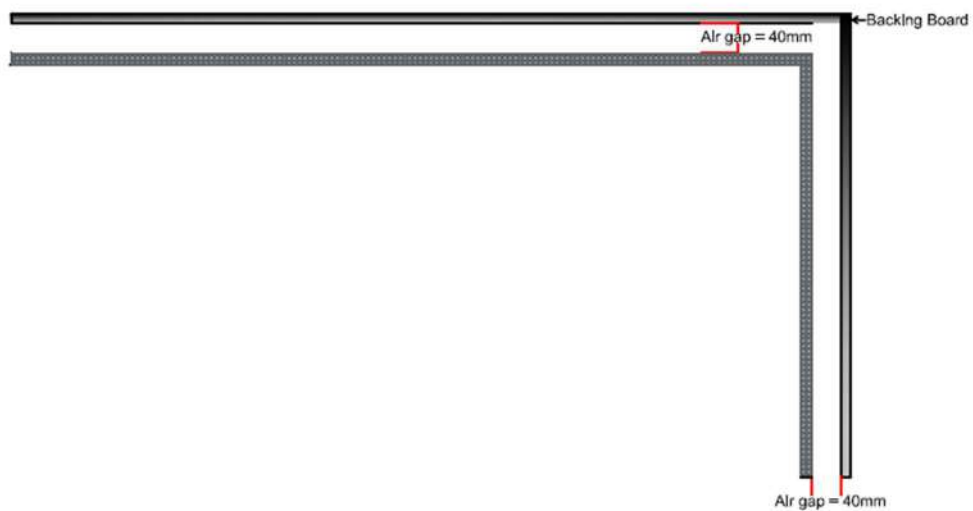
Note: The sponsor has declared that the sample submitted for testing has been selected by Jadara Building Materials Co., for the requirement given in Section 6.7 of SASO 2752/2019 (Aluminum Composite Panel for External Cladding and Internal Finish) standard.



6. SPECIMEN DRAWING



Drawing 1: Dimensions of the long and short wing of the test specimen.
All dimensions are in millimeters (mm).



Drawing 2: Top view of the mounted specimen with airgap.
All dimensions are in millimeters (mm)



7. SPECIMEN VERIFICATION

The choice and design and the definition of the specimen have been made by Jadara Building Materials Co., and TBWIC Testing Laboratory has not been involved in the selection or design of the specimen. The results of the test apply only 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.

8. METHOD OF TEST

8.1. Test Procedure

The test was performed in accordance with the requirements of BS EN 13823:2020 “Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by the single burning item”.

8.2. Conditioning

After delivery on 22-Mar-23, the specimens were conditioned to constant weight at 21 to 25 °C and 45 to 55% relative humidity as per BS EN 13238:2010 “Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates”.

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

9. OBSERVATION

Test Data and Observation

Observations			
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 600s	Nil	Nil	Nil
Burning droplets/particles ≥ 10 s within the first 600s	Nil	Nil	Nil
End of test, s	1560	1560	1560



10. SUMMARY OF RESULTS

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

Deviations: If any deviations from the test method.

The complete test results for the specimen are:

TEST PARAMETERS	TEST RESULTS			Average
	Specimen 1	Specimen 2	Specimen 3	
FIGRA _{0.2MJ} (W/s)	19	6	20	15
FIGRA _{0.4MJ} (W/s)	19	6	20	15
THR _{600s} , MJ	1.4	0.7	0.6	0.9
SMOGR _A , m ² /s ² <small>Note 1</small>	0	0	1	0
TSP _{600s} , m ² <small>Note 1</small>	13	10	8	10
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 600s	Nil	Nil	Nil	Nil
Burning droplets/particles ≤ 10 s within the first 600s	Nil	Nil	Nil	Nil

Note 1: Corrected value as per ANNEX A, Clause A.6.1.2 of BS EN 13823:2020.



11. LIMITATION

“The test results relate to the behavior of the test specimens of a product under the particular conditions of the test; they are not intended to be sole criterion for assessing the potential fire hazard of the product in use”- Clause 10q, BS EN 13823:2020.

Results are valid for the tested configuration only.

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

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

Prepared by:

Reviewed and Authorized by:


 Malak Megly
 Junior Fire Testing Engineer

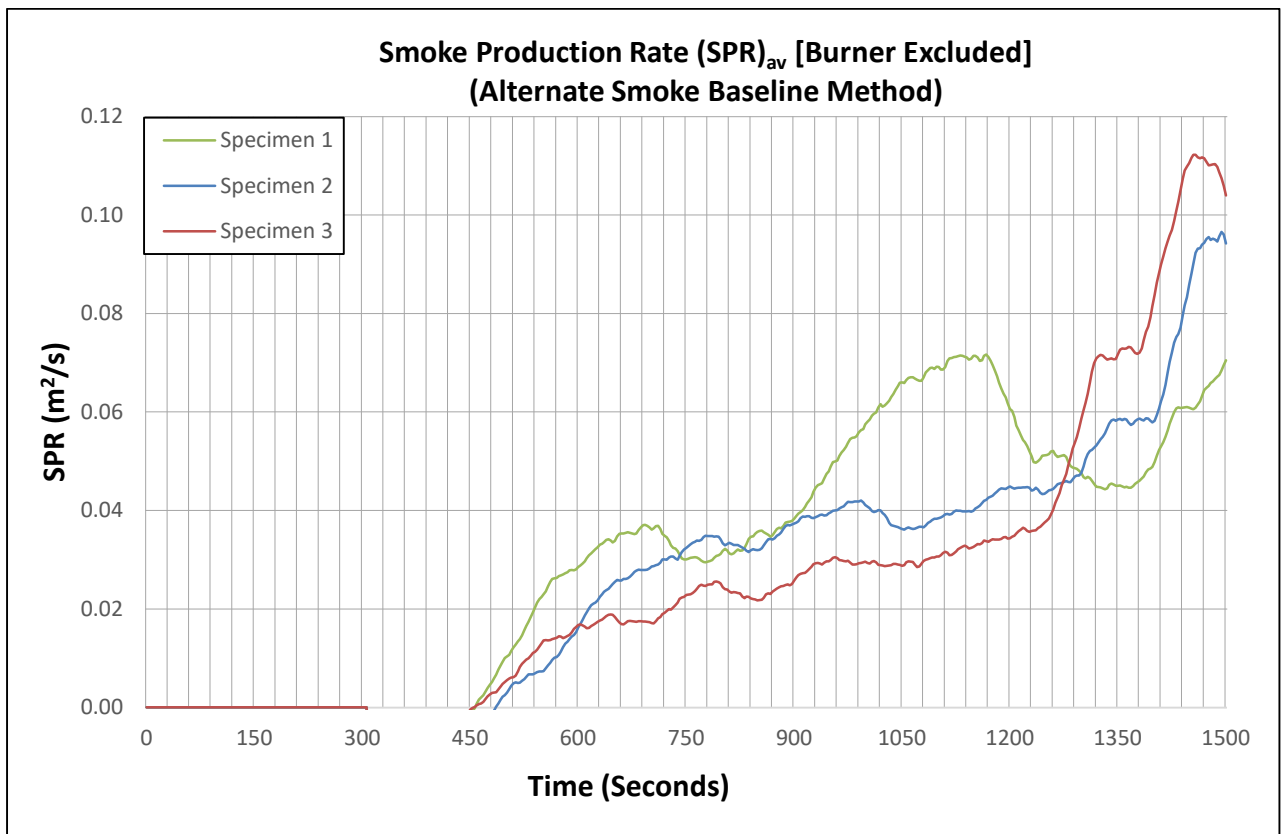
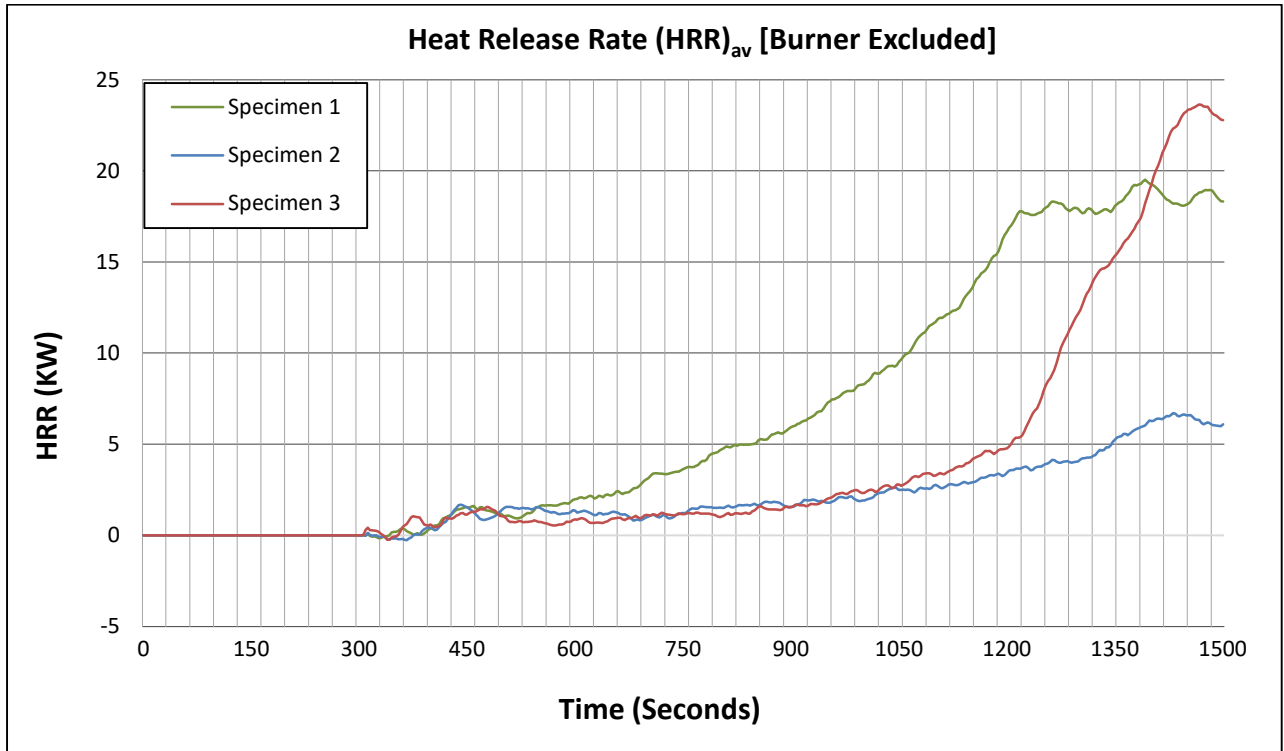


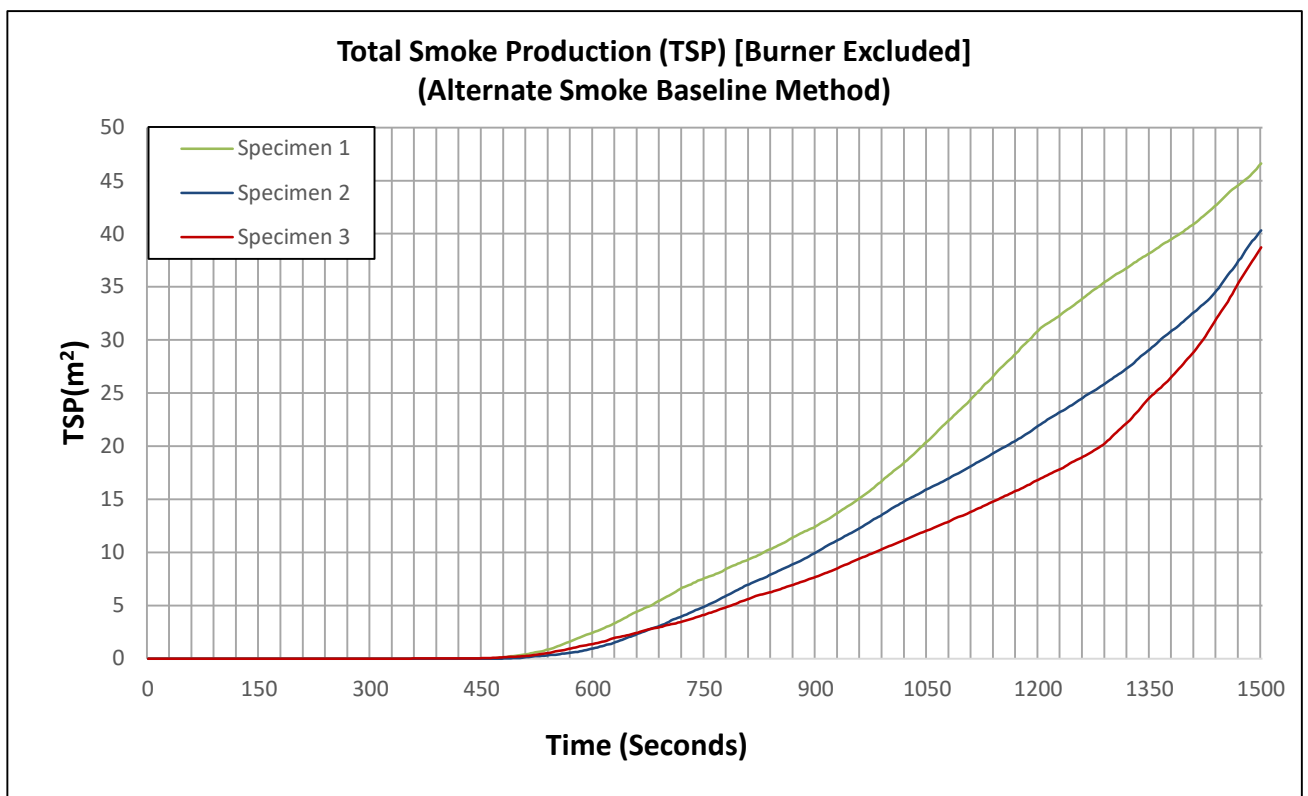
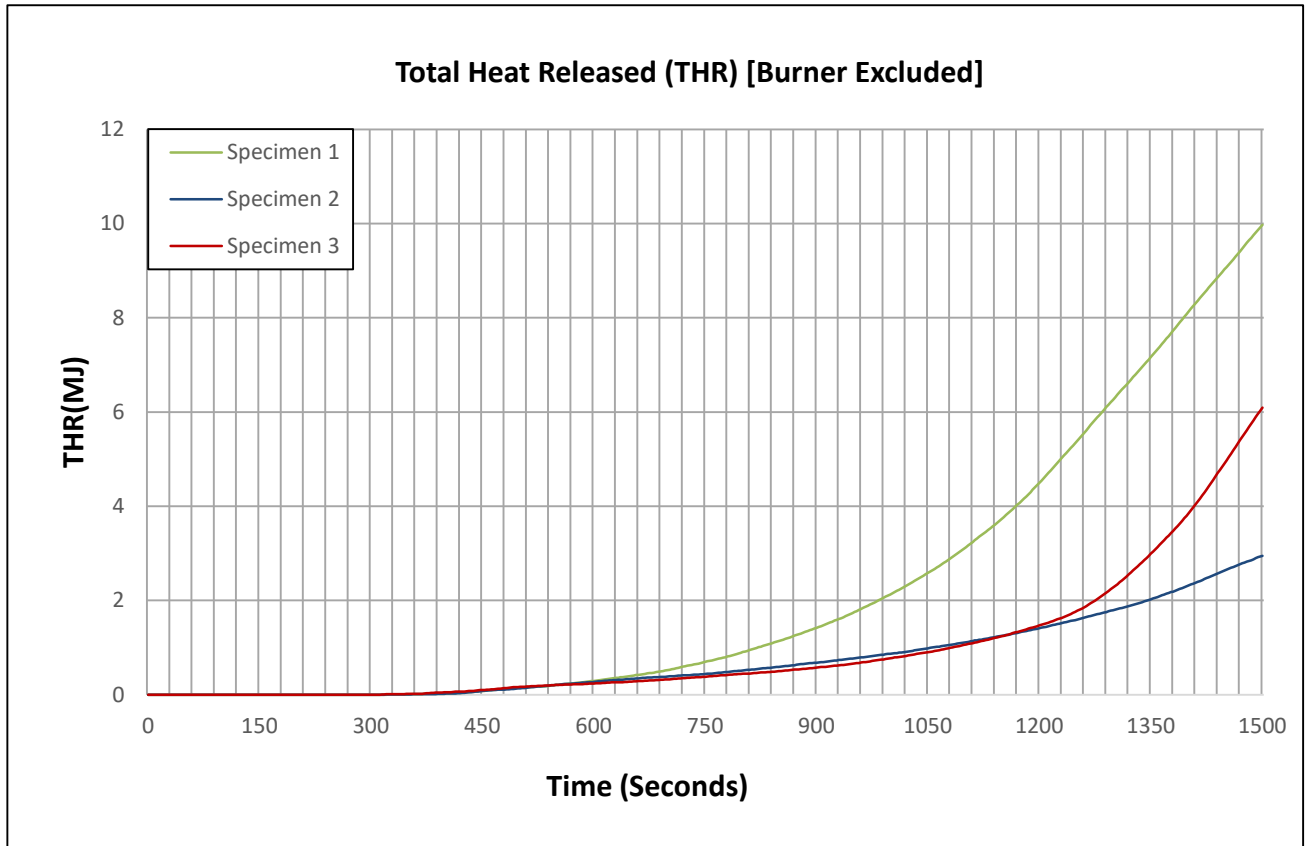

 Suketa Tyagi
 Manager – Reaction to Fire

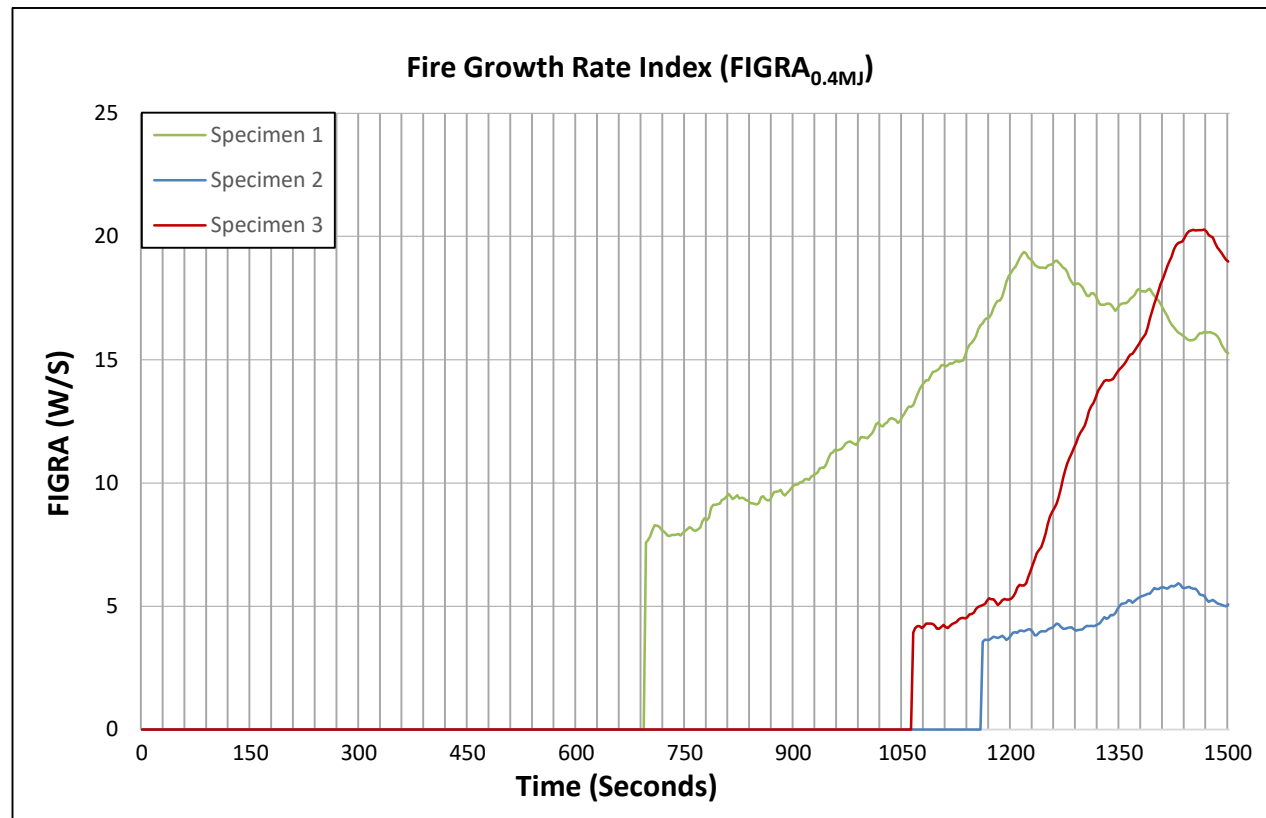
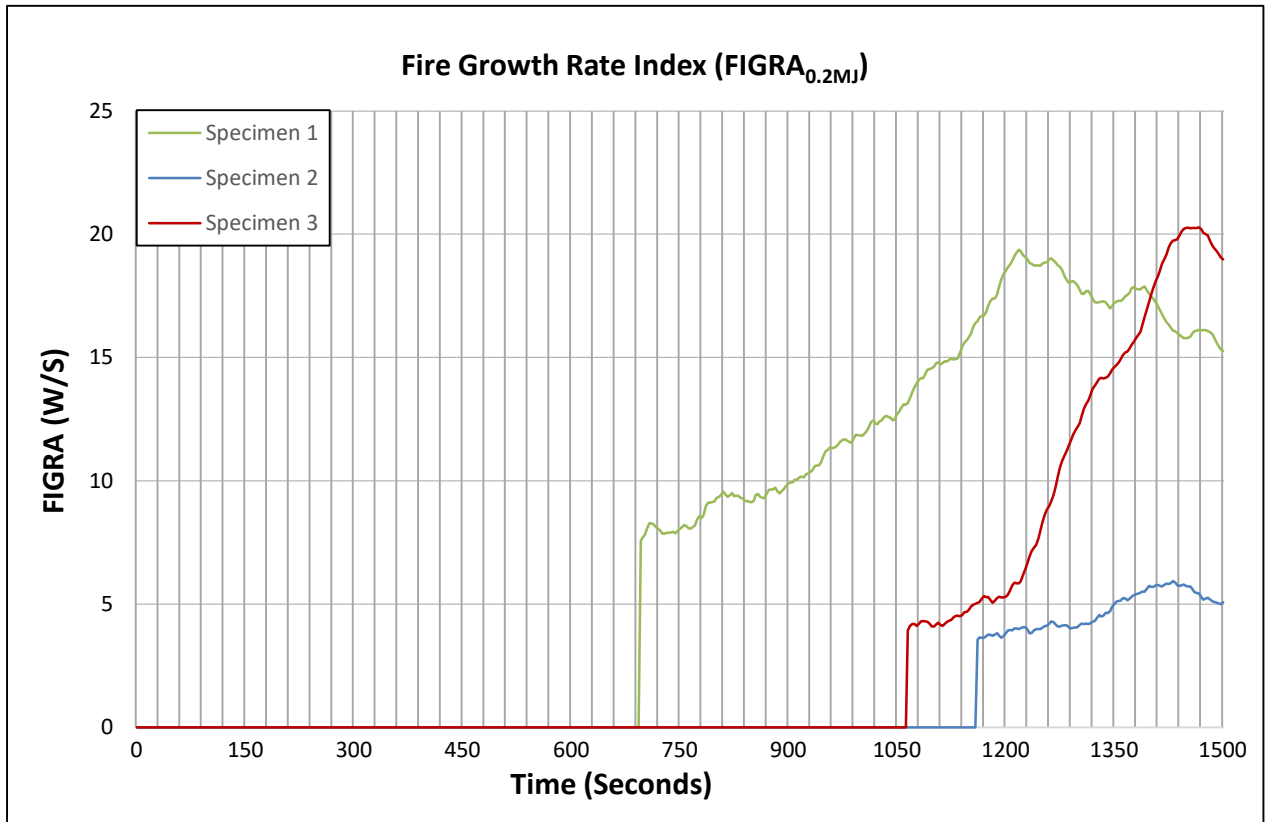
Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	22-May-23	This is the first issue of the report. No revisions are included.

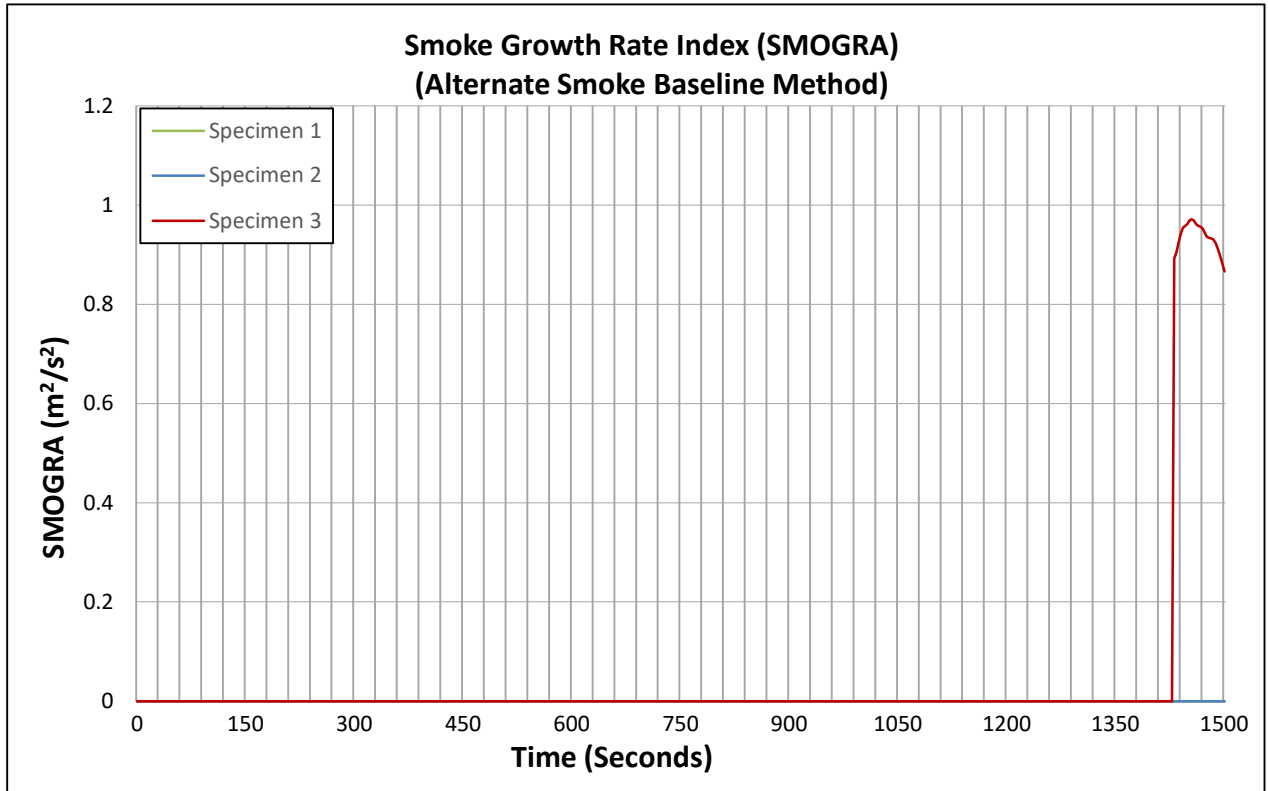


12. APPENDIX 1- GRAPHS











13. APPENDIX 2- PHOTOGRAPHS



Specimen before the test



Specimen after the test

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