

# TEST REPORT

## REACTION TO FIRE TEST

### Test Sponsor:

Golden Sheet Factory  
7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

### Test Assembly:

MC-Bond FR class A2

### 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: 16-May-23  
Issue Date: 10-Aug-23  
Test Reference No: XA048-6

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## 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](http://www.ukas.com)



## Memberships

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

[www.egolf.org.uk](http://www.egolf.org.uk)

Member of Association for Specialist Fire Protection

[www.asfp.org.uk](http://www.asfp.org.uk)

Member of Centre for Window and Cladding Technology

[www.cwct.co.uk](http://www.cwct.co.uk)



The work which is the subject of this report falls under the accreditations of **ISO 17025 UKAS**.



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## 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: Golden Sheet Factory  
Address: 7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.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](http://www.bell-wright.com)

## 4. DATE OF TEST

Sample received: 2-May-23  
Test date: 16-May-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.*

<b>Product Tested</b>		MC-Bond FR class A2 *	
<b>Product Name</b>		MC-Bond*	
<b>Manufacturer</b>		Golden Sheet Factory*	
<b>Overall Thickness</b>		4mm (measured by TBWIC)	
<b>Overall Area Weight</b>		8.10 kg/m <sup>2</sup> (measured by TBWIC)	
<b>Color</b>		Grey (observed by TBWIC)	
<b>Product Details</b>	<b>Top skin Coating (fire side)</b>	Reference name	Becker PVDF*
		Manufacturer	Becker*
		Thickness	25-28 µm* (stated)
		Layers	2* (stated)
		Area Weight	26 g/m <sup>2</sup> * (stated)
	<b>Primer</b>	Reference name	CP-445*
		Manufacturer	Spectrum*
		Thickness	6-7 µm* (stated)
		Area Weight	16 g/m <sup>2</sup> * (stated)
	<b>Aluminium Top Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>FR-Core (A2)</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	3.2mm* (stated)
		Area Weight	6.2 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>Aluminium Back Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
Area Weight		1.09 kg/m <sup>2</sup> * (stated)	

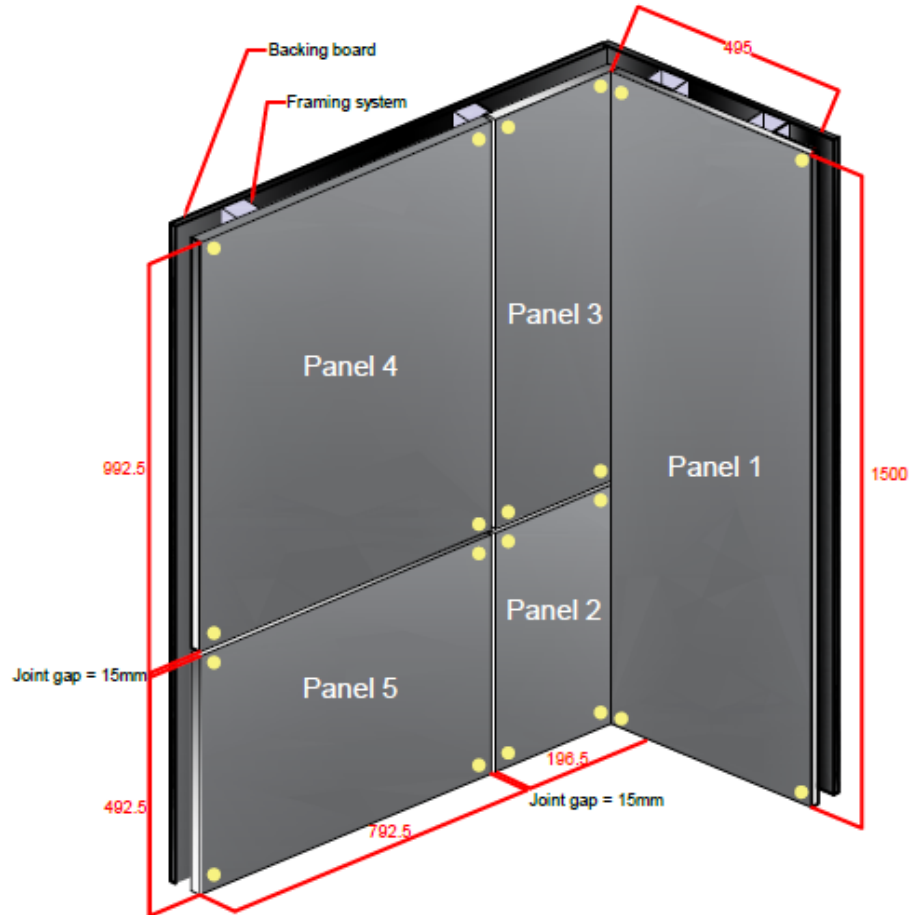


<b>Back Skin Coating</b>	Reference name	Becker Primer*
	Manufacturer	Becker*
	Thickness	5-7 $\mu\text{m}^*$ (stated)
	Layers	1* (stated)
	Area Weight	10 $\text{g}/\text{m}^2^*$ (stated)
	Density	1.3 $\text{kg}/\text{m}^3^*$ (stated)
<b>Backing Board</b>	Material	Calcium Silicate Board (verified by TBWIC)
	Density	900 $\text{kg}/\text{m}^3$ (measured by TBWIC)
	Thickness	9mm (measured by TBWIC)
	Classification	A2-s1, d0 as per EN 13501-1:2018 (verified by TBWIC)
<b>Type of joint</b>	<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>	
<b>Specimen Dimensions</b>	<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>	
<b>Specimen Placement</b>	<p>The MC-Bond FR class A2 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. Refer to Drawing No. 1 &amp; 2 for more details.</p>	

**Note 1:** the sponsor wishes not to disclose this information.



## 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 Golden Sheet Factory, 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 2-May-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

<b>Observations</b>			
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 <sub>0.2MJ</sub> (W/s)	0	0	3	1
FIGRA <sub>0.4MJ</sub> (W/s)	0	0	3	1
THR <sub>600s</sub> , MJ	0.4	0.6	0.8	0.6
SMOGRA, m <sup>2</sup> /s <sup>2</sup> <small>Note 1</small>	0	0	0	0
TSP <sub>600s</sub> , m <sup>2</sup> <small>Note 1</small>	19	22	15	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 600s	Nil	Nil	Nil	Nil
Burning droplets/particles ≤10 s within the first 600s	Nil	Nil	Nil	Nil

**Note 2:** 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*

*Suketa*

Malak Megly  
Fire Testing Engineer

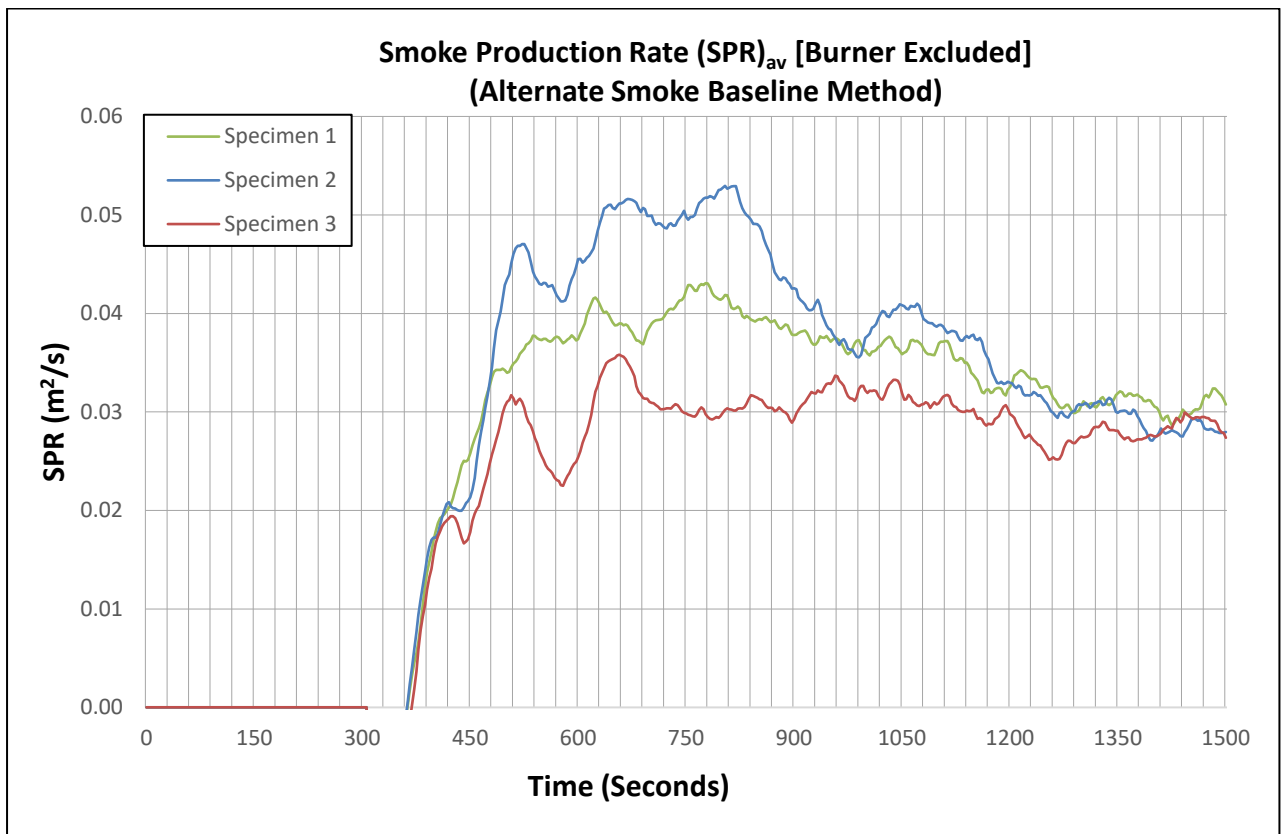
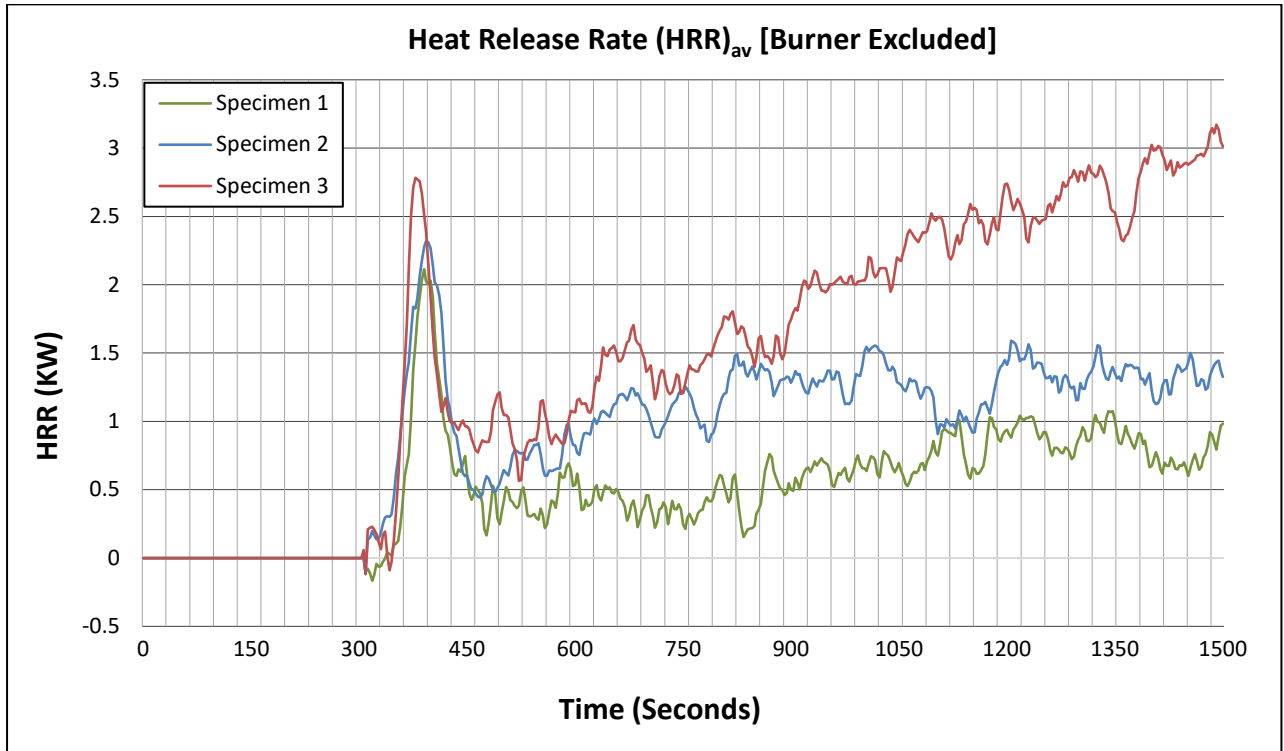


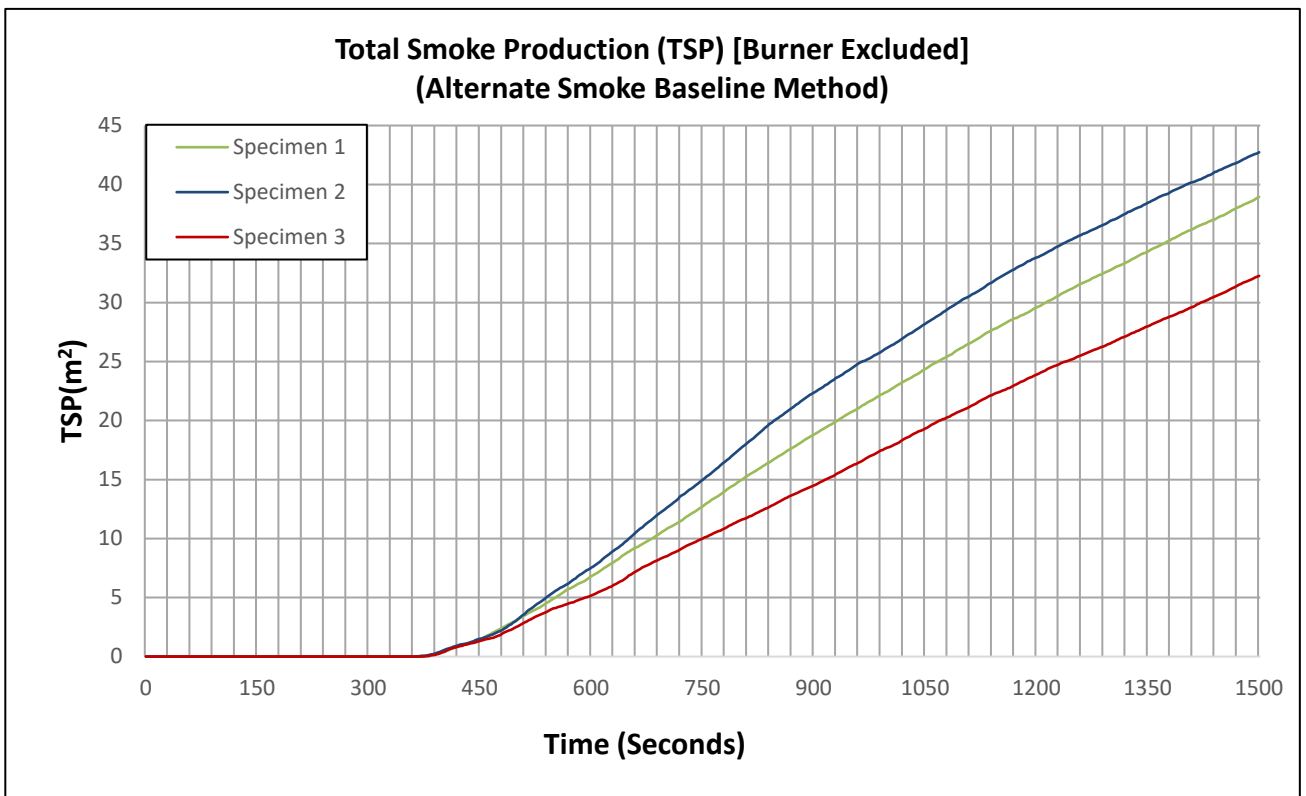
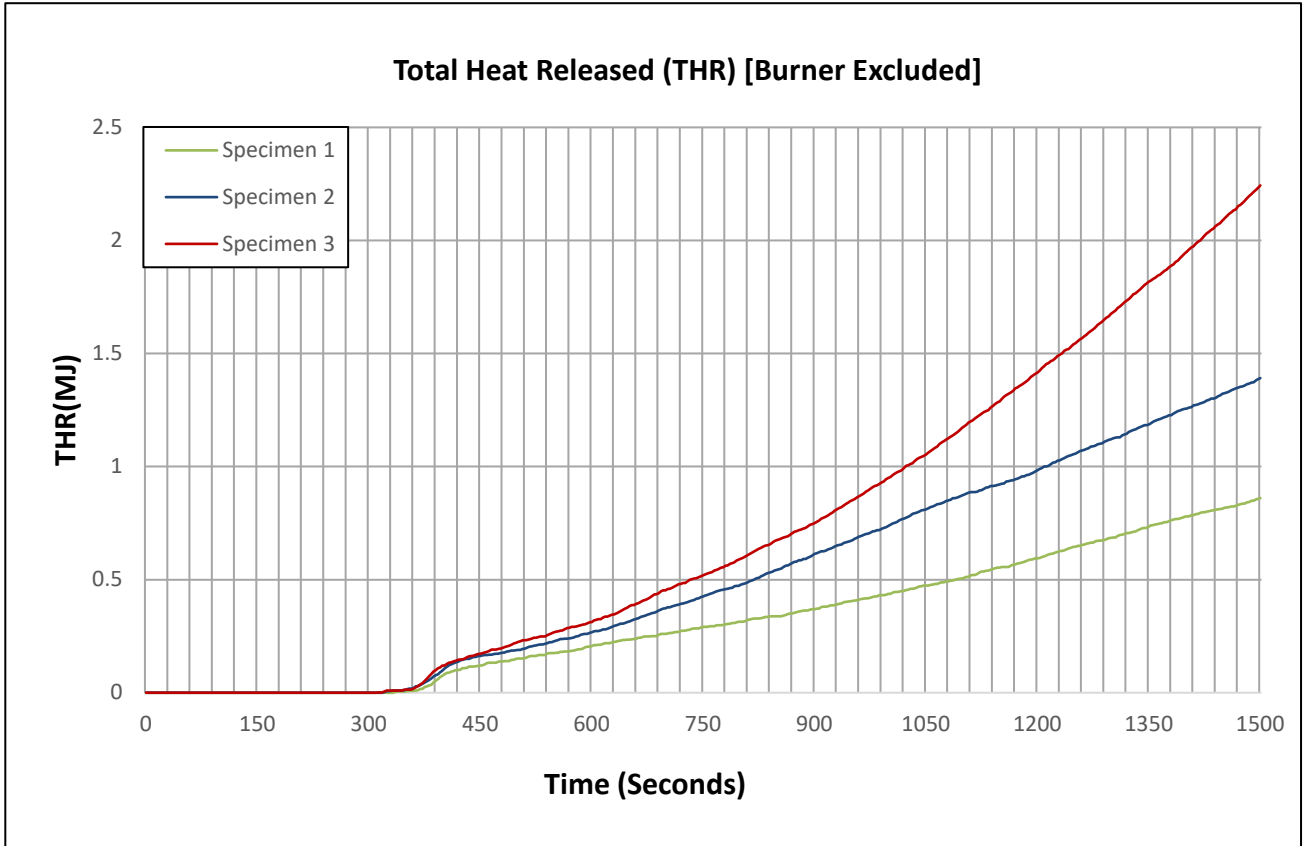
Suketa Tyagi  
Manager – Reaction to Fire

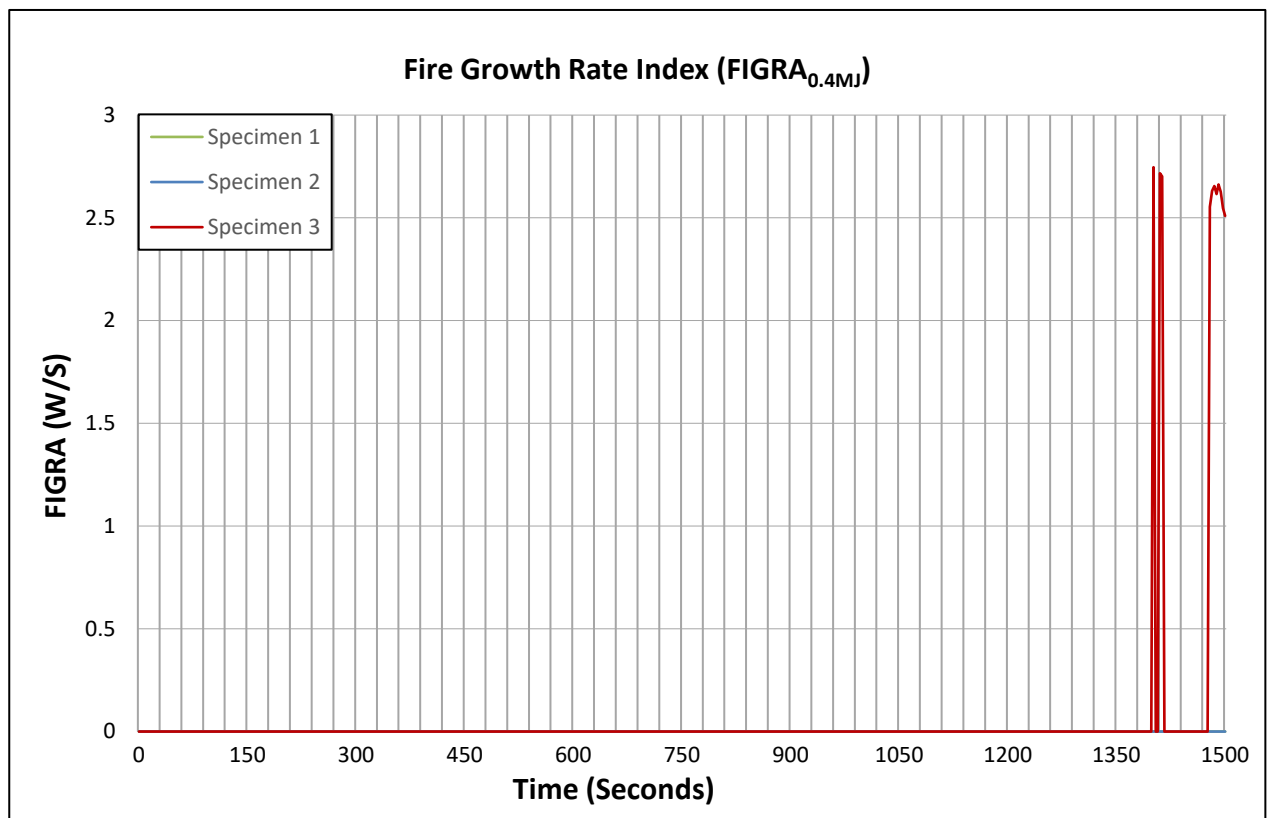
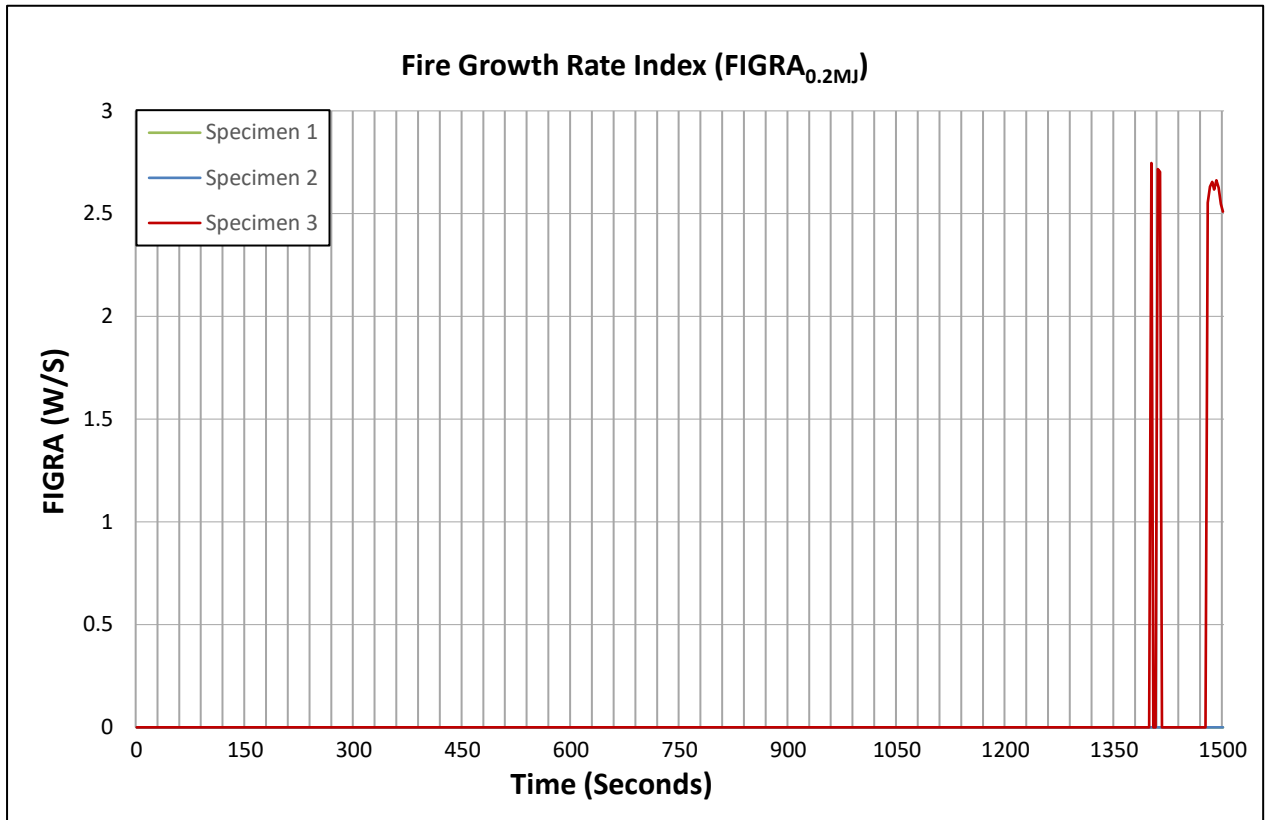
Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	10-Aug-23	This is the first issue of the report. No revisions are included.

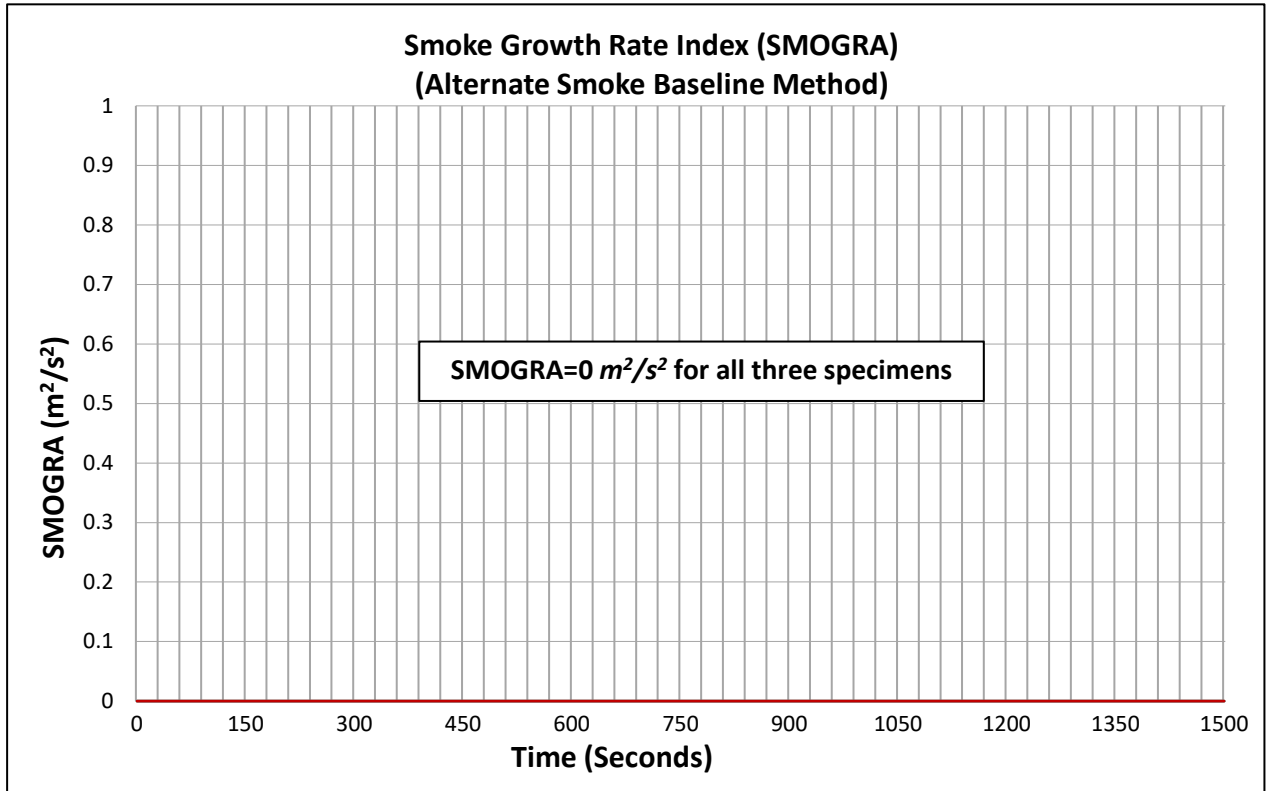


## 12. APPENDIX 1- GRAPHS











### 13. APPENDIX 2- PHOTOGRAPHS



**Specimen before the test**



**Specimen after the test**

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

# TEST REPORT REACTION TO FIRE TEST

## Test Sponsor:

Golden Sheet Factory  
7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

## Test Material / Assembly:

MC-Bond FR class A2

## Test Standard

BS EN ISO-1716:2018 Reaction to Fire Tests for Products - Determination of the Gross Heat of Combustion (Calorific Value)



**THOMAS BELL-WRIGHT  
INTERNATIONAL CONSULTANTS**

Test Date: 16-May-23  
Issue Date: 10-Aug-23  
Test Reference No: XA048-1

PO BOX 26385, DUBAI UAE    T +971 (0) 4 821 5777    [fire@bell-wright.com](mailto:fire@bell-wright.com)    [www.bell-wright.com](http://www.bell-wright.com)

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## 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](http://www.ukas.com)



## Memberships

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## 1. INTRODUCTION

Determination of the calorific potential of MC-Bond FR class A2 during combustion in accordance with BS EN ISO 1716:2018; Reaction to fire tests for products - Determination of the Gross Heat of Combustion (Calorific Value).

## 2. SPONSOR

Name: Golden Sheet Factory  
Address: 7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

## 3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)  
Address: Corner of 46<sup>th</sup> and 47<sup>th</sup> streets, Jebel Ali Industrial Area 1  
P.O. Box 26385, Dubai, U.A.E.  
T: +971 (0) 4 821 5777  
[www.bell-wright.com](http://www.bell-wright.com)

## 4. DATE OF TEST

Sample received: 08-Apr-23  
Test date: 16-May-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.*

<b>Product Tested</b>		MC-Bond FR class A2*	
<b>Product Name</b>		MC-Bond*	
<b>Manufacturer</b>		Golden Sheet Factory*	
<b>Overall Thickness</b>		4mm (measured by TBWIC)	
<b>Overall Area Weight</b>		8.10 kg/m <sup>2</sup> (measured by TBWIC)	
<b>Color</b>		Grey (observed by TBWIC)	
<b>Product Details</b>	<b>Top skin Coating (fire side)</b>	Reference name	Becker PVDF*
		Manufacturer	Becker*
		Thickness	25-28 µm* (stated)
		Layers	2* (stated)
		Area Weight	26 g/m <sup>2</sup> * (stated)
	<b>Primer</b>	Reference name	CP-445*
		Manufacturer	Spectrum*
		Thickness	6-7 µm* (stated)
		Area Weight	16 g/m <sup>2</sup> * (stated)
	<b>Aluminium Top Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>FR-Core (A2)</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	3.2mm* (stated)
		Area Weight	6.2 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
Area Weight		0.05 kg/m <sup>2</sup> * (stated)	
<b>Aluminium Back Skin</b>	Reference name	Note 1	
	Manufacturer	Note 1	
	Thickness	0.4mm* (stated)	



		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Back Skin Coating</b>	Reference name	Becker Primer*
		Manufacturer	Becker*
		Thickness	5-7 µm* (stated)
		Layers	1* (stated)
		Area Weight	10 g/m <sup>2</sup> * (stated)
		Density	1.3 kg/m <sup>3</sup> * (stated)
<b>Specimen Placement</b>	A minimum of three test specimens were tested using the crucible method in accordance with Clause 7.9 of BS EN ISO 1716:2018 test standard.		

**Note 1:** *the sponsor wishes not to disclose this information.*

## 6. SPECIMEN VERIFICATION

The choice, design and definition of the specimen have been made by Golden Sheet 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.*

## 7. SPECIMEN PREPARATION PROCEDURE

In accordance with section 7.2 of BS EN ISO 1716:2018, a minimum mass of 50g was taken from substantial components of the non-homogenous product. A minimum mass of 10g was taken from the non-substantial components of the non-homogeneous product.

The samples were prepared as per sections 7.2.3 of BS EN ISO 1716:2018. Samples were ground and reduced to small granules and treated as powder as per section 7.4 of BS EN ISO 1716:2018.

## 8. METHOD OF TEST

### 8.1. Test Procedure

The test was carried out using the crucible method in accordance with Clause 7.9 of BS EN ISO 1716:2018 test standard - *Reaction to fire tests for products - Determination of the Gross Heat of Combustion (Calorific Value)*.

The combustion was facilitated using a combustion aid, benzoic acid; an additional combustible substance of known and high calorific value. The water equivalent (E) of Bomb 1 was 0.005667 MJ/K & Bomb 2 was 0.005681 MJ/K, as per the latest calibration.

In accordance with section 8.3 of BS EN ISO 1716:2018, Aluminium or other metallic component of the product was not tested in the bomb calorimeter, as it carries the risk of serious injury to the operator due to overheating and/or overpressure causing the bomb calorimeter to explode.

### 8.2. Conditioning

After delivery on 08-Apr-23, the specimen was conditioned at 21 to 25 °C and 45 to 55% relative humidity in accordance with 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 standard limits.

## 9. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with BS EN ISO 1716:2018, *Reaction to fire tests for products - Determination of the Gross Heat of Combustion (Calorific Value)*.

Deviations: There were no deviations from the test standard.

### 9.1. Tabulated data

The test results are:

**Gross Calorific Value of Each Layer**

		Topcoat	Primer	Aluminium Skin	Adhesive	Mineral Core	Back coat
	No. of Tests:	3	3	0	3	3	3
Test 1	Specimen weight (g)	0.1008	0.1005	-	0.1006	0.1004	0.1003
	Gross calorific value (MJ/kg)	14.0	16.8	-	44.6	-0.1	15.8
Test 2	Specimen weight (g)	0.1007	0.1004	-	0.1007	0.1003	0.1009
	Gross calorific value (MJ/kg)	13.9	17.6	-	43.7	0.0	15.9
Test 3	Specimen weight (g)	0.1009	0.1005	-	0.1003	0.1008	0.1002
	Gross calorific value (MJ/kg)	13.9	18.6	-	43.8	-0.2	15.1
<b>Average Gross calorific value (QPCS) in MJ/kg</b>		13.9	17.7	0.0	44.0	-0.1	15.6
<b>Area Weight (kg/m<sup>2</sup>)</b>		0.026*	0.016*	1.090*	0.050*	6.20*	0.010*
<b>Average Gross calorific value in MJ/m<sup>2</sup></b>		0.4	0.3	0.0	2.2	0.0	0.2

**Gross Calorific Value of the Whole Product**

Layer	Component	Thickness (mm)	Area density (kg/m <sup>2</sup> )	Gross Heat of Combustion Q <sub>PCS</sub> (MJ/kg)	Gross Heat of Combustion Q <sub>PCS</sub> (MJ/m <sup>2</sup> )	
1	Component 1 (External non-substantial layer)	Top coat	0.025*	0.026*	13.9	0.4
		Primer	0.007*	0.016*	17.7	0.3
2	Component 2 (Substantial layer)	Aluminium Top skin	0.4*	1.090*	0.0	0.0
3	Component 3 (Internal non-substantial layer)	Adhesive	0.010*	0.050*	44.0	2.2



4	Component 4 (Substantial layer)	Core	3.2*	6.20*	0.0	0.0
5	Component 5 (Internal non-substantial layer)	Adhesive	0.010*	0.050*	44.0	2.2
6	Component 6 (Substantial layer)	Aluminium Bottom skin	0.4*	1.09*	0.0	0.0
7	Component 7 (External non-substantial layer)	Back coat	0.005*	0.010*	15.6	0.2
(A) Sum of calorific values, MJ/m <sup>2</sup>						5.3
(B) Sum of Area weights, kg/m <sup>2</sup>						8.10*
<b>Gross heat of combustion of the whole product (PCS), in MJ/kg: Q<sub>PCS</sub> (A/B)</b>						0.7

## 9.2. Observations

In accordance with Section 8.3.11 of BS EN ISO 1716:2018, specimens were observed to be completely combusted.

## 10. VALIDATION OF THE TEST RESULTS

To be validated, the test results shall comply with the criteria specified in Clause 11 of. The following criteria apply.

Gross heat of combustion	Acceptance criteria	Range of validity
Q <sub>PCS</sub> (MJ/kg)	≤0.2 MJ/kg	From any negative value to 3.2 MJ/kg
	Within 5% of the average of the 3 results	From 3.2 MJ/kg to 20.0 MJ/kg
	Within 10% of the average of the 3 results	Greater than 20.0 MJ/kg
Q <sub>PCS</sub> (MJ/m <sup>2</sup> ) <sup>a</sup>	≤0.1 MJ/m <sup>2</sup>	From any negative value to 4.1 MJ/m <sup>2</sup>
	Within 5% of the average of the 3 results	From 4.1 MJ/m <sup>2</sup> to 20 MJ/m <sup>2</sup>
	Within 10% of the average of the 3 results	Greater than 20 MJ/m <sup>2</sup>

<sup>a</sup> For non-substantial components only.

### 10.1. Validity

The differences between the maximum and minimum Q<sub>PCS</sub> values were within the range of validity specified in Clause 11 of BS EN ISO 1716:2018.



### 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 the sole criterion for assessing the potential fire hazard of the product in use.” - Clause 10q of BS EN ISO 1716:2018 test standard.

This report and all records of the test to which it relates may 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:

Malak Megly  
Fire Testing Engineer

Reviewed & Authorized by:



Suketa Tyagi  
Manager - Reaction to Fire

Report Revision Tracking		
Report Reference	Date Issued	Notes & Amendments
Rev. 00	10-Aug-23	This is the first issue of the report. No revisions are included.

--- End of Test Report ---





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.

## 8. OBSERVATION

### Test Data and Observation

Observations	Result
Ignition Time (min:sec)	1:19
Time to maximum flame front advance (min:sec)	1:41
Maximum flame spread (ft)	1.2
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)	563/295
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)	2:02
Sagging (min:sec)	None
Shrinkage (min:sec)	None
Fallout (min:sec)	None
FS*Time Area (ft*min)	10.06
Smoke Area (%A*min)	2.77
Heptane Smoke Area (%A*min)	85.7

## 9. 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:

<b>FLAME SPREAD INDEX (FSI)</b>	<b>5</b>
<b>SMOKE DEVELOPED INDEX (SDI)</b>	<b>5</b>

Results are valid for the tested configuration only.

# TEST REPORT REACTION TO FIRE TEST

## Test Sponsor:

Golden Sheet Factory  
7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

## Test Material / Assembly:

MC-Bond FR class A2

## Test Standard:

ASTM E84 – 22: Standard Test Method for Surface Burning Characteristics of Building Materials



**THOMAS BELL-WRIGHT  
INTERNATIONAL CONSULTANTS**

Test Date: 17-May-23  
Issue Date: 10-Aug-23  
Test Reference No: XA048-8

PO BOX 26385, DUBAI UAE    T +971 (0)4 821 5777    [fire@bell-wright.com](mailto:fire@bell-wright.com)    [www.bell-wright.com](http://www.bell-wright.com)

DUBAI

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## 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](http://www.ukas.com)



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



## Memberships

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

[www.egolf.org.uk](http://www.egolf.org.uk)

Member of Association for Specialist Fire Protection

[www.asfp.org.uk](http://www.asfp.org.uk)

Member of Centre for Window and Cladding Technology

[www.cwct.co.uk](http://www.cwct.co.uk)



The work which is the subject of this report falls 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 MC-Bond FR class A2 as per ASTM E84 – 22; Standard Test Method for Surface Burning Characteristics of Building Materials.

## 2. SPONSOR

Name: Golden Sheet Factory  
Address: 7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

## 3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)  
Address: Corner of 46<sup>th</sup> and 47<sup>th</sup> streets, Jebel Ali Industrial Area 1  
P.O. Box 26385, Dubai, U.A.E.  
T: +971 (0) 4 821 5777  
[www.bell-wright.com](http://www.bell-wright.com)

## 4. DATE OF TEST

Sample received: 7-Apr-23  
Test date: 17-May-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.*

<b>Product Tested</b>		MC-Bond FR class A2*	
<b>Product Name</b>		MC-Bond*	
<b>Manufacturer</b>		Golden Sheet Factory*	
<b>Overall Thickness</b>		4mm (measured by TBWIC)	
<b>Overall Area Weight</b>		8.09 kg/m <sup>2</sup> (measured by TBWIC)	
<b>Color</b>		Grey (observed by TBWIC)	
<b>Product Details</b>	<b>Top skin Coating (fire side)</b>	Reference name	Becker PVDF*
		Manufacturer	Becker*
		Thickness	25-28 µm* (stated)
		Layers	2* (stated)
		Area Weight	26 g/m <sup>2</sup> * (stated)
	<b>Primer</b>	Reference name	CP-445*
		Manufacturer	Spectrum*
		Thickness	6-7 µm* (stated)
		Area Weight	16 g/m <sup>2</sup> * (stated)
	<b>Aluminium Top Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>FR-Core (A2)</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	3.2mm* (stated)
		Area Weight	6.2 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
Area Weight		0.05 kg/m <sup>2</sup> * (stated)	
<b>Aluminium Back Skin</b>	Reference name	Note 1	
	Manufacturer	Note 1	
	Thickness	0.4mm* (stated)	
	Area Weight	1.09 kg/m <sup>2</sup> * (stated)	



	<b>Back Skin Coating</b>	Reference name	Becker Primer*
		Manufacturer	Becker*
		Thickness	5-7 $\mu\text{m}^*$ (stated)
		Layers	1* (stated)
		Area Weight	10 $\text{g}/\text{m}^2^*$ (stated)
		Density	1.3 $\text{kg}/\text{m}^3^*$ (stated)
<b>Dimensions per panel</b>		1220 x 600 x 4mm (l x w x t) (measured by TBWIC)	
<b>Quantity of panels</b>		6 Nos.	
<b>Total dimension</b>		7320 x 600 x 4mm (l x w x t) (measured by TBWIC)	
<b>Specimen placement</b>		The six (6) panels of MC-Bond FR class A2 were butt jointed end-to-end. The test specimen was placed directly to the tunnel ledges with the top side (fire side) towards the flame source.	

**Note 1:** the sponsor wishes not to disclose this information.

## 6. SPECIMEN VERIFICATION

The choice and design and the definition of the specimen have been made by Golden Sheet 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.*

## 7. METHOD OF TEST

### 7.1. Placing of test specimen

The test specimen consisted of six (6) panels of MC-Bond FR class A2. The dimension per panel was 1220 x 600 x 4.2mm (l x w x t) and was butt jointed end-to-end. The total dimension of the specimen was 7320 x 600 x 4.2mm (l x w x t).

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.

### 7.2. Test Method

The specimen was placed in the ceiling position, supported horizontally on the ledges of the Steiner Tunnel. The top side (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).

### 7.3. Conditioning

After delivery on 7-Apr-23, the specimen was placed in a conditioned space where temperature and humidity were maintained between  $23 \pm 2.8^\circ\text{C}$  and  $50 \pm 5\%$  respectively, until constant weight was attained.





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.

## 8. OBSERVATION

### Test Data and Observation

Observations	Result
Ignition Time (min:sec)	1:19
Time to maximum flame front advance (min:sec)	1:41
Maximum flame spread (ft)	1.2
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)	563/295
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)	2:02
Sagging (min:sec)	None
Shrinkage (min:sec)	None
Fallout (min:sec)	None
FS*Time Area (ft*min)	10.06
Smoke Area (%A*min)	2.77
Heptane Smoke Area (%A*min)	85.7

## 9. 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:

<b>FLAME SPREAD INDEX (FSI)</b>	<b>5</b>
<b>SMOKE DEVELOPED INDEX (SDI)</b>	<b>5</b>

Results are valid for the tested configuration only.





## 10. 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 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 indices.

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; the application of the tested specimen may differ.



## 11. 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.

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/Tested By:

Malak Megly  
Fire Testing Engineer

Reviewed By:

Fredilyn Paragoso  
Fire Testing Support Engineer

Authorized By:

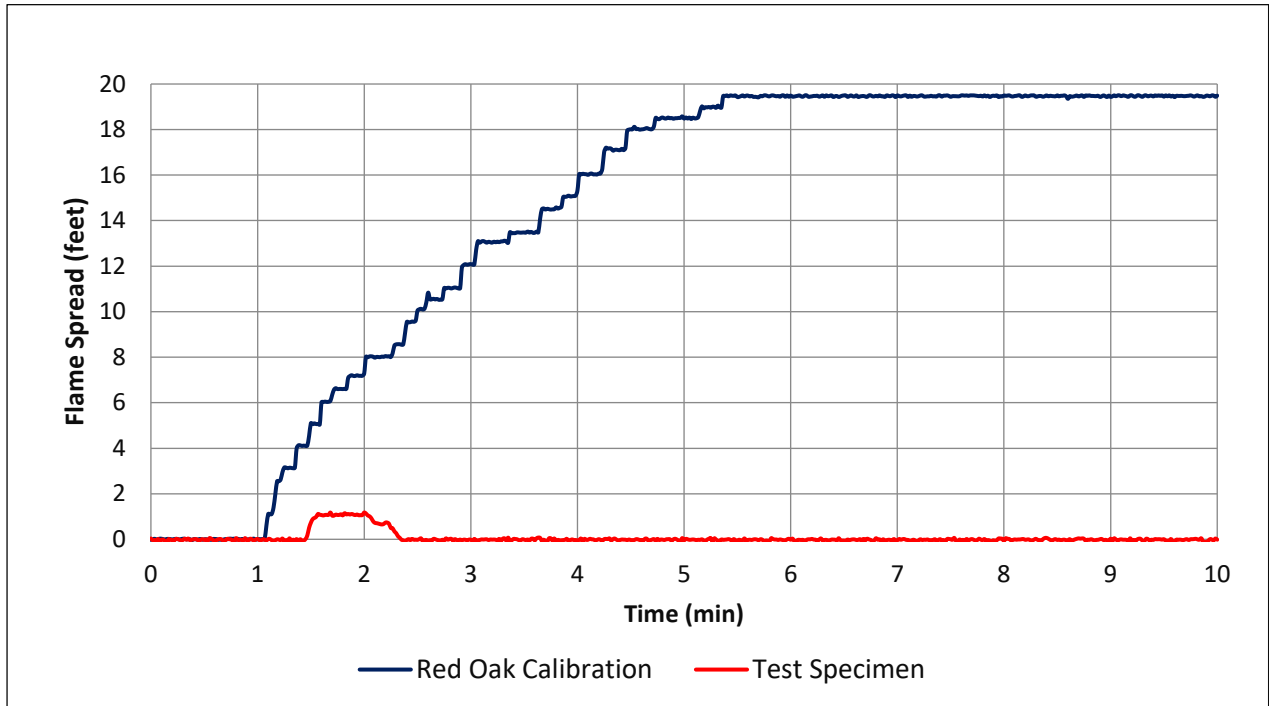
Suketa Tyagi  
Manager – Reaction to Fire



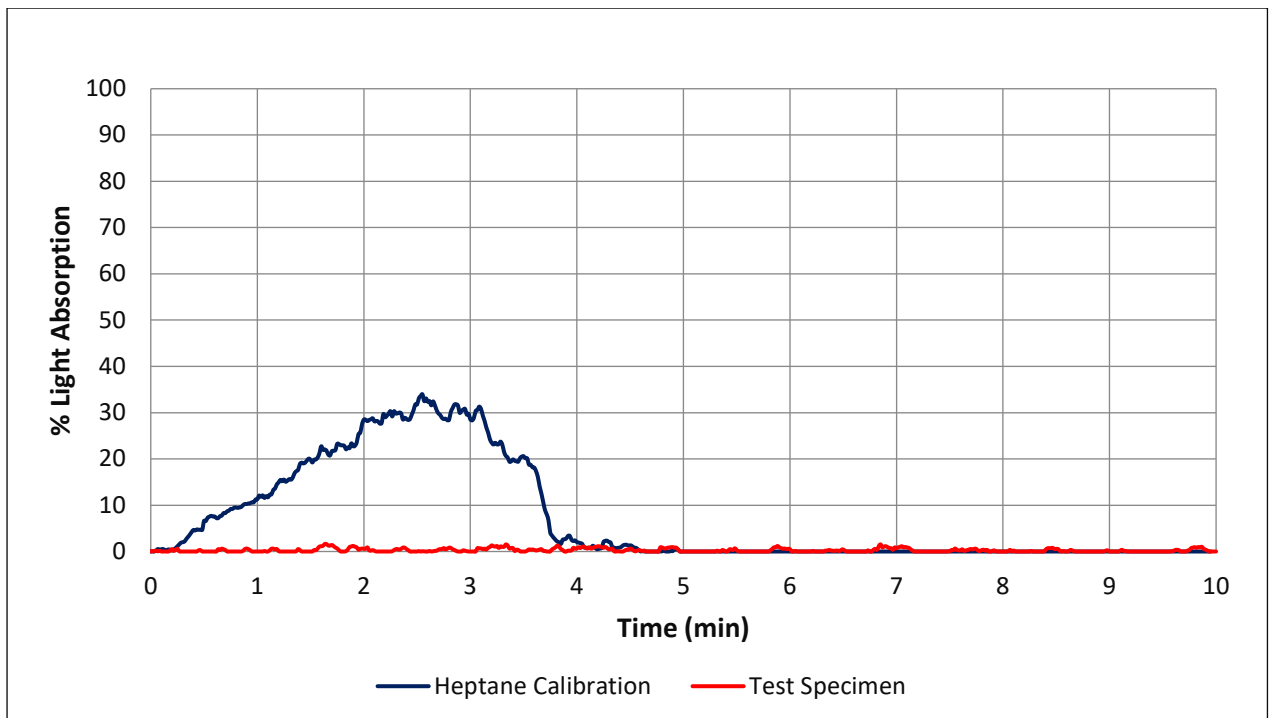
Report Revision Tracking		
Report Reference	Date Issued	Notes & Amendments
Rev. 00	10-Aug-23	This is the first issue of the report. No revisions are included.



## 12. APPENDIX 1 – GRAPHS



Graph 1: Flame Spread Index (FSI)



Graph 2: Smoke Developed Index (SDI)



### 13. 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 -----

# TEST REPORT

## REACTION TO FIRE TEST

### Test Sponsor:

Golden Sheet Factory  
7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

### Test Material / Assembly:

MC-Bond FR class A2

### Test Standard

ASTM D1929-20; Standard Test Method for Determining Ignition Temperature of Plastics.



**THOMAS BELL-WRIGHT  
INTERNATIONAL CONSULTANTS**

Test Date: 17-May-23  
Issue Date: 10-Aug-23  
Test Reference No: XA048-9

PO BOX 26385, DUBAI UAE    T +971 (0)4 821 5777    [fire@bell-wright.com](mailto:fire@bell-wright.com)    [www.bell-wright.com](http://www.bell-wright.com)

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## 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](http://www.ukas.com)



## Memberships

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

[www.egolf.org.uk](http://www.egolf.org.uk)

Member of Association for Specialist Fire Protection

[www.asfp.org.uk](http://www.asfp.org.uk)

Member of Centre for Window and Cladding Technology

[www.cwct.co.uk](http://www.cwct.co.uk)



The work which is the subject of this report falls under the accreditations of **ISO 17025 UKAS**.



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## **1. INTRODUCTION**

Determination of the flash ignition temperature and spontaneous ignition temperature of MC-Bond FR class A2 using hot-air ignition furnace as per ASTM D 1929-20; Standard Test Method for Determining Ignition Temperature of Plastics.

## **2. SPONSOR**

Name: Golden Sheet Factory  
Address: 7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

## **3. TESTING LABORATORY**

Name: Thomas Bell-Wright International Consultants (TBWIC)  
Address: Corner of 46<sup>th</sup> and 47<sup>th</sup> streets, Jebel Ali Industrial Area 1  
P.O. Box 26385, Dubai, U.A.E.  
T: +971 (0) 4 821 5777  
[www.bell-wright.com](http://www.bell-wright.com)

## **4. DATE OF TEST**

Sample received: 2-May-23  
Test date: 17-May-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.*

<b>Product Tested</b>		MC-Bond FR class A2*	
<b>Product Name</b>		MC-Bond*	
<b>Manufacturer</b>		Golden Sheet Factory*	
<b>Overall Thickness</b>		4mm (measured by TBWIC)	
<b>Overall Area Weight</b>		8.09 kg/m <sup>2</sup> (measured by TBWIC)	
<b>Color</b>		Grey (observed by TBWIC)	
<b>Product Details</b>	<b>Top skin Coating (fire side)</b>	Reference name	Becker PVDF*
		Manufacturer	Becker*
		Thickness	25-28 µm* (stated)
		Layers	2* (stated)
		Area Weight	26 g/m <sup>2</sup> * (stated)
	<b>Primer</b>	Reference name	CP-445*
		Manufacturer	Spectrum*
		Thickness	6-7 µm* (stated)
		Area Weight	16 g/m <sup>2</sup> * (stated)
	<b>Aluminium Top Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>FR-Core (A2)</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	3.2mm* (stated)
		Area Weight	6.2 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>Aluminium Back Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
Area Weight		1.09 kg/m <sup>2</sup> * (stated)	



	<b>Back Skin Coating</b>	Reference name	Becker Primer*
		Manufacturer	Becker*
		Thickness	5-7 $\mu\text{m}^*$ (stated)
		Layers	1* (stated)
		Area Weight	10 $\text{g}/\text{m}^2^*$ (stated)
		Density	1.3 $\text{kg}/\text{m}^3^*$ (stated)
<b>Form Tested</b>	Sheet (observed by TBWIC)		

**Note 1:** *the sponsor wishes not to disclose this information.*

## 6. SPECIMEN VERIFICATION

The choice and design and the definition of the specimen have been made by Golden Sheet Factory, 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.*

## 7. SPECIMEN PREPARATION PROCEDURE

In accordance with section 7.2 of ASTM D1929, the MC-Bond FR class A2 provided by the sponsor were cut into a mass of  $3.0 \pm 0.2$  g, as it had a density greater than  $100 \text{ kg}/\text{m}^3$ . Each sample was conditioned as per sections 7.4 of ASTM D1929.

## 8. METHOD OF TEST

### 8.1. Test Procedure

The test specimens were evaluated in accordance with ASTM D1929-20, *Standard Test Method for Determining Ignition Temperature of Plastics*.

Flash Ignition Temperature (FIT) and Spontaneous Ignition Temperature (SIT) was then determined.

Flash Ignition temperature (FIT)- the minimum temperature at which, under specified test conditions, sufficient flammable gases were emitted to ignite momentarily upon application of a small external pilot flame.

Spontaneous ignition temperature or self-ignition temperature (SIT)- the minimum temperature at which the self-heating properties of the specimen lead to ignition or ignition occurs of itself, under specified test conditions, in the absence of any additional flame ignition source.

### 8.2. Conditioning

After delivery on 2-May-23, the specimen was stored in room temperature for a minimum of 40 hours prior to the test ranging from 21 to 25°C and 45 to 55% relative humidity.

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. TEST OBSERVATIONS

Observations	Results
<b>1. Flash Ignition:</b>	
Specimen weight, g	3.2
Air flow rate, Q <sub>v</sub>	2.6
Flash Ignition at nozzle, min:sec	Not observed
Flaming combustion of the specimen, min:sec	7:16
Glowing combustion of the specimen, min:sec	Not observed
Explosion, min:sec	Not observed
Rapid rise in temperature T <sub>1</sub> above that of T <sub>2</sub>	Not observed
<b>Lowest Air Temperature, T<sub>2</sub>, at which flash observed, °C</b>	<b>472</b>
<b>2. Spontaneous Ignition:</b>	
Specimen weight, g	3.0
Air flow rate, Q <sub>v</sub>	2.6
Flaming combustion of the specimen, min:sec	5:02
Glowing combustion of the specimen, min:sec	Not observed
Rapid rise in temperature T <sub>1</sub> above that of T <sub>2</sub>	Not observed
<b>Lowest Air Temperature, T<sub>2</sub>, at which the specimen burns, °C</b>	<b>476</b>

## 10. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with ASTM D 1929-20: Standard Test Method for Determining Ignition Temperature of Plastics.

The test results are:

<b>Flash Ignition Temperature (FIT), °C</b>	<b>472</b>
<b>Spontaneous Ignition Temperature (SIT), °C</b>	<b>476</b>

Test results relate only to the specimen tested and there is no pass or fail criteria for ASTM D1929-20 standard.



## 11. LIMITATION

“These test results relate only to the behavior of test specimens under the particular conditions of the test. They are not intended to be used, and shall not be used, to assess the potential fire hazards of a material in use.” - Clause 9.1.10 of ASTM D1929-20.

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  
 Fire Testing Engineer


 Suketa Tyagi  
 Manager – Reaction to Fire

Report Revision Tracking		
Report Reference	Date Issued	Notes & Amendments
Rev. 00	10-Aug-23	This is the first issue of the report. No revisions are included.

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

# CLASSIFICATION OF REACTION TO FIRE PERFORMANCE IN ACCORDANCE WITH BS EN 13501-1:2018

## Test Sponsor:

Golden Sheet Factory  
7156 Tarib, Unit No.15, Duruma 19869 - 3972  
Riyadh, Saudi Arabia  
T: +966 53 630 3094  
Website: [www.mc-bond.com](http://www.mc-bond.com)

## Test Material / Assembly:

MC-Bond FR class A2



**THOMAS BELL-WRIGHT  
INTERNATIONAL CONSULTANTS**

Issue Date: 10-Aug-23

Classification Report Reference No: XA048-7

PO BOX 26385, DUBAI UAE

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## Memberships

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

[www.egolf.org.uk](http://www.egolf.org.uk)

**Member of Association for Specialist Fire Protection**

[www.asfp.org.uk](http://www.asfp.org.uk)

**Member of Centre for Window and Cladding Technology**

[www.cwct.co.uk](http://www.cwct.co.uk)





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## 1. INTRODUCTION

This classification report defines the classification assigned to MC-Bond FR class A2 in accordance with the procedures given in BS EN 13501-1:2018: Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests.

## 2. SPONSOR

Name: Golden Sheet Factory  
 Address: 7156 Tarib, Unit No.15, Duruma 19869 - 3972  
 Riyadh, Saudi Arabia  
 T: +966 53 630 3094  
 Website: www.mc-bond.com

## 3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)  
 Address: Corner of 46th and 47th Streets,  
 Jebel Ali Industrial Area 1  
 Dubai, UAE  
 T: T: +971 04 821 5777  
 Website: www.bell-wright.com

## 4. DETAILS OF CLASSIFIED PRODUCT

*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.*

<b>Product Tested</b>		MC-Bond FR class A2*	
<b>Product Name</b>		MC-Bond*	
<b>Manufacturer</b>		Golden Sheet Factory*	
<b>Overall Thickness</b>		4mm (measured by TBWIC)	
<b>Overall Area Weight</b>		8.10 kg/m <sup>2</sup> (measured by TBWIC)	
<b>Color</b>		Grey (observed by TBWIC)	
<b>Product Details</b>	<b>Top skin Coating (fire side)</b>	Reference name	Becker PVDF*
		Manufacturer	Becker*
		Thickness	25-28 µm* (stated)
		Layers	2* (stated)
		Area Weight	26 g/m <sup>2</sup> * (stated)
	<b>Primer</b>	Reference name	CP-445*
		Manufacturer	Spectrum*
		Thickness	6-7 µm* (stated)
		Area Weight	16 g/m <sup>2</sup> * (stated)
	<b>Aluminium Top Skin</b>	Reference name	Note 1
Manufacturer		Note 1	





		Thickness	0.4mm* (stated)
		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>FR-Core (A2)</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	3.2mm* (stated)
		Area Weight	6.2 kg/m <sup>2</sup> * (stated)
	<b>Adhesive</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.01mm* (stated)
		Area Weight	0.05 kg/m <sup>2</sup> * (stated)
	<b>Aluminium Back Skin</b>	Reference name	Note 1
		Manufacturer	Note 1
		Thickness	0.4mm* (stated)
		Area Weight	1.09 kg/m <sup>2</sup> * (stated)
	<b>Back Skin Coating</b>	Reference name	Becker Primer*
Manufacturer		Becker*	
Thickness		5-7 µm* (stated)	
Layers		1* (stated)	
Area Weight		10 g/m <sup>2</sup> * (stated)	
Density		1.3 kg/m <sup>3</sup> * (stated)	

**Note 1:** the sponsor wishes not to disclose this information.

## 5. SPECIMEN PREPARATION PROCEDURE

The choice and design and the definition of the specimen have been made by Golden Sheet Factory, 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.*



## 6. REPORT & TEST RESULTS IN SUPPORT OF THIS CLASSIFICATION

### 6.1. Reports

Name of Laboratory	Test Sponsor	Test Report No.	Test Method/Field of Application Rules
Thomas Bell-Wright International Consultants (TBWIC)	Golden Sheet Factory	XA048-1	BS EN ISO-1716:2018
		XA048-6	BS EN 13823:2020

### 6.2. Results

Test Method	Parameter			No. of tests	Results		
	Component type	Limits	Layers		Continuous parameter-mean (m)	Compliance parameters	
<i>BS EN ISO 1716:2018</i>	External Non-substantial	$PCS \leq 4.0 \text{ MJ/m}^2$	Top Coat	3	0.4	0.7	Compliant
			Primer	3	0.3		
	External Non-substantial	$PCS \leq 4.0 \text{ MJ/m}^2$	Bottom Coat	3	0.2	Compliant	
	Internal Non-substantial	$PCS \leq 4.0 \text{ MJ/m}^2$	Adhesive	3	2.2	Compliant	
	Substantial	$PCS \leq 3.0 \text{ MJ/kg}$	Aluminium Panel	0	0	Compliant	
			Core	0	0	Compliant	
Product as a Whole	$PCS \leq 3.0 \text{ MJ/kg}$	-	-	0.7	Compliant		

Test Method	Test Parameters	No. of tests	Results	
			Continuous parameter-mean (m)	Compliance parameters
<i>BS EN 13823:2020</i>	$FIGRA_{0.2MJ} \leq 120 \text{ W/s}$	3	1	Compliant
	$THR_{600s} \leq 7.5 \text{ MJ}$	3	0.6	Compliant
	Lateral Flame Spread < Edge of specimen	3	< Edge of specimen	Compliant



	<b>CRITERIA for subclass "s1"</b>			
	SMOGRA $\leq 30 \text{ m}^2/\text{s}^2$ <i>Note2</i>	3	0	Compliant
	TSP <sub>600s</sub> $\leq 50 \text{ m}^2$ <i>Note2</i>	3	19	Compliant
	<b>CRITERIA for subclass "d0"</b>			
	Flaming droplets/Particles within 600s	3	Nil	Compliant

**Note 2:** Corrected value as per Annex A, Clause A.6.1.2 of BS EN 13823:2020.

## 7. CLASSIFICATION & FIELD OF APPLICATION

### 7.1. Reference of classification

This classification has been carried out in accordance with clause 8 of EN 13501-1:2018.

### 7.2. Classification

The product, MC-Bond FR class A2, in relation to its reaction to fire behavior are classified;

Fire behavior		Smoke Production			Flaming droplets	
A2	-	s	1	,	d	0

**Reaction to fire classification: A2 – s1, d0**

### 7.3. Field of application

This classification is valid for the following end use applications:

- i. Construction applications

This classification is also valid for the following product parameters:

Overall Product Thickness	No variation allowed
Product Density	No variation allowed
Product Composition	No variation allowed
Product Construction	No variation allowed
Color	No variation allowed
Joints	Results are valid with or without vertical and horizontal joints $\leq 15\text{mm}$ .



## 8. LIMITATIONS


This document does not represent type approval or certification of the product. Similarly, the BS EN 13823 & BS EN ISO 1716 fire tests and related work which are a subject of this classification report have been conducted under Thomas Bell-Wright International Consultant’s ISO 17025 UKAS accreditation scheme and quality management system. However, pursuant to UKAS Technical Bulletin *BS EN 13501 & BR 135 Classification Documents (Dated 02-Feb-2022)*, classification documents are completed on an unaccredited basis because they are not themselves test procedures. As such, this document is prepared on an unaccredited basis.

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.

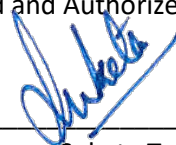
This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Prepared by:

Reviewed and Authorized by:

  
Malak Megly  
Fire Testing Engineer



  
Suketa Tyagi  
Manager – Reaction to Fire

Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	10-Aug-23	This is the first issue of the report. No revisions are included.



## 9. ANNEXURE A

Classes of reaction to fire performance for construction products excluding floorings and linear pipe thermal insulation products

Class	Test method(s)	Classification criteria	Additional classification
<b>A1</b>	EN ISO 1182 <sup>a</sup> and	$\Delta T \leq 30$ °C; and $\Delta m \leq 50$ %; and $t_f = 0$ (i.e. no sustained flaming)	-
	EN ISO 1716	$PCS \leq 2,0$ MJ/kg <sup>a</sup> and $PCS \leq 2,0$ MJ/kg <sup>b,c</sup> and $PCS \leq 1,4$ MJ/m <sup>2,d</sup> and $PCS \leq 2,0$ MJ/kg <sup>e</sup>	-
<b>A2</b>	EN ISO 1182 <sup>a</sup> or	$\Delta T \leq 50$ °C; and $\Delta m \leq 50$ %; and $t_f \leq 20$ s	-
	EN ISO 1716 and	$PCS \leq 3,0$ MJ/kg <sup>a</sup> and $PCS \leq 4,0$ MJ/m <sup>2,b</sup> and $PCS \leq 4,0$ MJ/m <sup>2,d</sup> and $PCS \leq 3,0$ MJ/kg <sup>e</sup>	-
	EN 13823	FIGRA $\leq 120$ W/s and LFS < edge of specimen and THR <sub>600s</sub> $\leq 7,5$ MJ	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
<b>B</b>	EN 13823 and	FIGRA $\leq 120$ W/s and LFS < edge of specimen and THR <sub>600s</sub> $\leq 7,5$ MJ	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
	EN ISO 11925-2 <sup>i</sup> : Exposure = 30 s	Fs $\leq 150$ mm within 60 s	
<b>C</b>	EN 13823 and	FIGRA $\leq 250$ W/s and LFS < edge of specimen and THR <sub>600s</sub> $\leq 15$ MJ	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
	EN ISO 11925-2 <sup>i</sup> : Exposure = 30 s	Fs $\leq 150$ mm within 60 s	
<b>D</b>	EN 13823 and	FIGRA $\leq 750$ W/s	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
	EN ISO 11925-2 <sup>i</sup> : Exposure = 30 s	Fs $\leq 150$ mm within 60 s	
<b>E</b>	EN ISO 11925-2 <sup>i</sup> : Exposure = 15 s	Fs $\leq 150$ mm within 20 s	Flaming droplets/particles <sup>h</sup>
<b>F</b>	EN ISO 11925-2 <sup>i</sup> : Exposure = 15 s	Fs > 150 mm within 20 s	-

<sup>a</sup> For homogeneous products and substantial components of non-homogeneous products.

<sup>b</sup> For any external non-substantial component of non-homogeneous products.

<sup>c</sup> Alternatively, any external non-substantial component having a  $PCS \leq 2,0$  MJ/m<sup>2</sup>, provided that the product satisfies the following criteria of EN 13823: FIGRA  $\leq 20$  W/s, and LFS < edge of specimen, and THR<sub>600s</sub>  $\leq 4,0$  MJ, and s1, and d0.

<sup>d</sup> For any internal non-substantial component of non-homogeneous products.



<sup>e</sup> For the product as a whole.

<sup>f</sup> In the last phase of the development of the test procedure, modifications of the smoke measurement system have been introduced, the effect of which needs further investigation. This may result in a modification of the limit values and/or parameters for the evaluation of the smoke production.

**s1** = SMOGRA  $\leq 30\text{m}^2/\text{s}^2$  and TSP<sub>600s</sub>  $\leq 50\text{m}^2$ ; **s2** = SMOGRA  $\leq 180\text{m}^2/\text{s}^2$  and TSP<sub>600s</sub>  $\leq 200\text{m}^2$ ; **s3** = not s1 or s2

<sup>g</sup> **d0** = No flaming droplets/ particles in EN 13823 within 600 s;

**d1** = no flaming droplets/ particles persisting longer than 10 s in EN 13823 within 600 s;

**d2** = not d0 or d1.

Ignition of the paper in EN ISO 11925-2 results in a d2 classification.

<sup>h</sup> Pass = no ignition of the paper (no classification);

Fail = ignition of the paper (d2 classification).

<sup>i</sup> Under conditions of surface flame attack and, if appropriate to the end-use application of the product, edge flame attack.

---- End of Classification Report ----