

TEST REPORT REACTION TO FIRE TEST

Test Sponsor:

Panel Technology Factory (Technopanel)
Al Mashael Riyadh, Saudi Arabia
T: +966 920 006 292
Website: www.technopanel.com.sa

Test Material / Assembly:

4mm thick Aluminium Composite Panel-FR 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: 02-Dec-22
Issue Date: 04-Jan-23
Test Reference No: WC029-7

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1. INTRODUCTION

Determination of the calorific potential of 4mm thick Aluminium Composite Panel-FR 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: Panel Technology Factory (Technopanel)

Address: Al Mashael Riyadh, Saudi Arabia

T: +966 920 006 292

Website: www.technopanel.com.sa

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)

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4. DATE OF TEST

Sample received: 30-Nov-22

Test date: 02-Dec-22

The test was not witnessed by the sponsor.

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 0.005647 MJ/K & Bomb 2 was 0.005636 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 30-Nov-22, 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

Gross Calorific Value of Each Layer

		TopCoat	Primer	Aluminium Skin	Adhesive	A2 Core	Back coat
	No. of Tests:	3	3	0	3	3	3
Test 1	Specimen weight (g)	0.1004	0.1005	-	0.1013	0.2001	0.1000
	Gross calorific value (MJ/kg)	19.6	17.1	-	44.8	1.3	15.8
Test 2	Specimen weight (g)	0.1005	0.1006	-	0.1014	0.2006	0.1000
	Gross calorific value (MJ/kg)	19.6	16.1	-	44.8	1.6	15.7
Test 3	Specimen weight (g)	0.1004	0.1013	-	0.1005	0.2017	0.1014
	Gross calorific value (MJ/kg)	19.4	17.3	-	44.0	1.2	15.2
Average Gross calorific value (QPCS) in MJ/kg		19.5	16.8	-	44.5	1.4	15.6
Area Weight (kg/m ²)		0.021*	0.015*	1.180*	0.080*	6.5*	0.014*
Average Gross calorific value in MJ/m ²		0.4	0.3	-	3.6	9.1	0.2



Gross Calorific Value of the Whole Product

Layer	Component		Thickness (mm)	Area density (kg/m ²)	Gross Heat of Combustion Q _{PCS} (MJ/kg)	Gross Heat of Combustion Q _{PCS} (MJ/m ²)	
1	Component 1 (External non-substantial layer)	Top coat	0.018*	0.021*	19.5	0.4	0.7
		Primer	0.013*	0.015*	16.8	0.3	
2	Component 2 (Substantial layer)	Aluminium Topskin	0.5*	1.180*	0.0	0.0	
3	Component 3 (Internal non-substantial layer)	Adhesive	0.08*	0.08*	44.5	3.6	
4	Component 4 (Substantial layer)	Core	3.2*	6.5*	1.4	9.1	
5	Component 3 (Internal non-substantial layer)	Adhesive	0.08*	0.08*	44.5	3.6	
6	Component 6 (Substantial layer)	Aluminium Bottom skin	0.5*	1.170*	0.0	0.0	
7	Component 7 (External non-substantial layer)	Back coat	0.012*	0.014*	15.6	0.2	
(A) Sum of calorific values, MJ/m ²						17.2	
(B) Sum of Area weights, kg/m ²						9.061*	
Gross heat of combustion of the whole product (PCS), in MJ/kg: Q_{PCS} (A/B)						1.9	

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 _{PCS} (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 _{PCS} (MJ/m ²) ^a	≤0.1 MJ/m ²	From any negative value to 4.1 MJ/m ²
	Within 5% of the average of the 3 results	From 4.1 MJ/m ² to 20 MJ/m ²
	Within 10% of the average of the 3 results	Greater than 20 MJ/m ²



^a For non-substantial components only.

10.1. Validity

The differences between the maximum and minimum Q_{PCS} 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:

Reviewed and Authorized by:


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Manager – Reaction to Fire

Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	04-Jan-23	This is the first issue of the report. No revisions are included.

--- End of Test Report ---