

## Test Report Nr 19119A

### Sponsor

3A COMPOSITES GmbH  
Alusingenplatz 1  
78224 SINGEN  
GERMANY

### Construction product and trade name

Composite panels "DIBOND FR"

### Nature of the test

Full-scale room test for surface products according to ISO 9705 – 1<sup>st</sup> edition  
1993

### Summary of the results

FIGR <sub>RC</sub> (W/s)	0.73
THR <sub>RC</sub> (MJ)	126.8
SMOGR <sub>RC</sub> (m <sup>2</sup> /s <sup>2</sup> )	3.1
TSP <sub>RC</sub> (m <sup>2</sup> )	936.3
Time to flash over (s)	955

PREPARED BY

APPROVED BY

**This report consists of 16 pages including 7 annexes**

ISO9705:1993 WG E1\*

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## 1. TEST MATERIAL

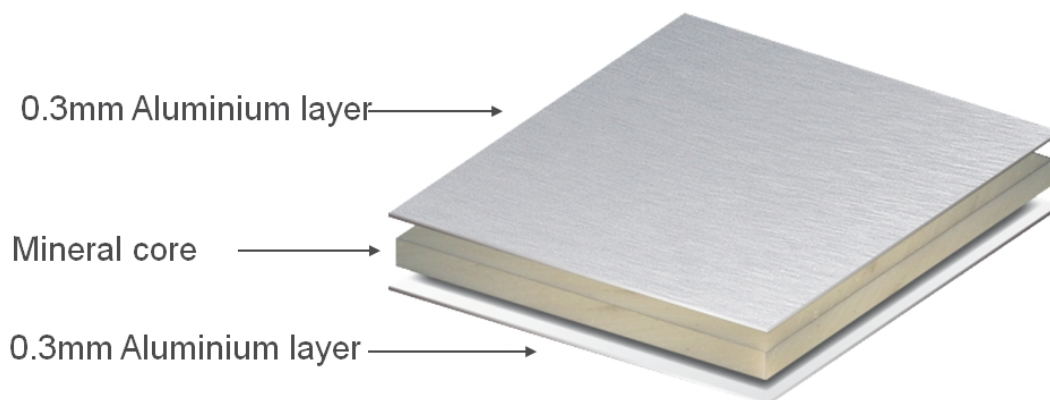
The firm 3A COMPOSITES GmbH, Alusingenplatz 1, 78224 SINGEN, GERMANY, provided the laboratory with composite panels "DIBOND FR" intended for a full-scale room test for surface products. The panels have been conditioned according to the specifications of the standard mentioned above.

Reception of the specimen : 2018-05-18

Sampling : by the sponsor

Description of the material:

	Nominal value
Material	The tested product consists of composite panels aluminium substrate outside, lacquered on both sides; mineral filled core inside bonded with polyolefin based medium. See details on next page.
Trade name	DIBOND FR
Manufacturer / Supplier	3A COMPOSITES GmbH
Thickness (mm)	3
Panel weight (g/m <sup>2</sup> )	5400
Flame retardants	No
Fixing method	Aluminium blind rivets on aluminium frame Mounting and fixing Details: see annex 1



Drawing of Dibond FR.

Detailed description of the components:

		Nominal values (*)
<b>Lacquering</b>		
Single coat based on polyester	Trade name	3A Composites Norm HC-816-ff
	Thickness	20 – 24 µm
	Surface mass	30 – 40 g/m <sup>2</sup>
	Application type	Coil coating
<b>Substrate (front and back side)</b>		
Aluminium layer (front and back side)	Trade name	AlMg1, AA 5005
	Thickness	0,3 mm
	Surface mass	0,8 kg/m <sup>2</sup>
<b>Adhesive film</b>		
polyolefin based medium	Thickness:	100 µm
	Surface mass:	93 ± 7,4 g/m <sup>2</sup>
<b>Core material</b>		
Mineral filler based core	Thickness:	2,8 mm
	Surface mass:	3,8 kg/m <sup>2</sup>

(\*) based on the information given by the sponsor.

## 2 DESCRIPTION OF THE TEST METHOD

The fire test is carried out according to the ISO 9705:1993.

The ISO 9705:1993 prescribes the following procedure:

- ✓ -2 – 0 minutes: Start registering data from the test
- ✓ 0 – 10 minutes: heat output level of the burner: 100 kW
- ✓ 10 – 20 minutes: heat output level of the burner: 300 kW
- ✓ 20 minutes: extinction of the burner

## 3 TEST CONDITIONS

Date of the test : 2018 - 05 - 24  
 Ambient temperature : 24 °C  
 Ambient pressure : 101500 Pa  
 Relative humidity : 58 %

### 3 CALIBRATION RESULTS

Latest calibration date : 2018 - 05 - 15  
Calibration results : see annex 3

### 4. OBSERVATIONS AND MEASUREMENTS DURING THE TEST

#### 4.1 Visual observations

Time (min :s)	Observations
-02:00	Start of data acquisition system
00:00	Ignition of the burner to the level 100 kW
02:50	Smoke emerging from the doorway opening
04:35	Falling down of small pieces
05:00	Ignition of the ceiling
10:00	Burner level increased to 300 kW
10:03	Falling down of large pieces
10:03	Burning droplets
10:26	Flame spread back wall
11:40	Flame spread back wall right upper corner
15:52	Flames emerging from the doorway opening
15:55	Flashover according to the criteria of the test standard
17:00	Flashover according to visual observations
20:00	End of the test

Pictures of the test: see annex 2

With the values measured during the test, the following results are calculated:

#### 4.2 Volume flow in exhaust duct

Graphs: see annex 4

#### 4.3 Rate of heat release and Smoke production

FIGR <sub>RC</sub> (W/s)	0.73
Maximum RHR (kW)	700
At time (s)	955
THR <sub>RC</sub> (MJ)	126.8
SMOGR <sub>RC</sub> (m <sup>2</sup> /s <sup>2</sup> )	3.1
Maximum SPR (m <sup>2</sup> /s)	2.0
TSP <sub>RC</sub> (m <sup>2</sup> )	936.3

Calculations according to § 6.2 of the SP report 1998:11 "Results and Analysis from Fire Tests of Building Products in ISO 9705, the Room/Corner Test – The SBI Research Programme" by *B. Sundström, P. van Hees and P. Thureson*.

Graphs: see annex 5

#### 4.4 Temperature measurements in the test room

No temperature measurements were done during the test.

- Annexe 4 : gives the volume flow and the temperature of the gases in the exhaust duct in function of time
- Annexe 4 : gives the oxygen concentration in the exhaust duct in function of time
- Annexe 4 : gives the concentration and production of carbon dioxide in the exhaust duct at reference temperature and pressure in function of time
- Annexe 5 : gives the rate of heat release and the total heat release during the test in function of time.
- Annexe 5 : gives the production and the total of light-obscuring smoke during the test in function of time.

## 6. REMARKS

The following deviation to the standard is made: None

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

## 6. REMARKS

This report assesses the fire hazard properties assigned to the product '**Dibond FR**' in accordance with the NCC 2015 Building Code of Australia - Volume One and the New Zealand Building Code (NZBC) Clause C3.4(a) and defines the group number in accordance the procedures given in with the draft standard AS 5637.1:2015 (Determination of fire hazard properties - Part 1: Wall and ceiling linings).

The product '**Dibond FR**' in relation to its reaction to fire behavior for wall and ceiling linings is assessed as:

**Flash over at 955s**  
**Australian Group Number according to AS 5637.1:2015**

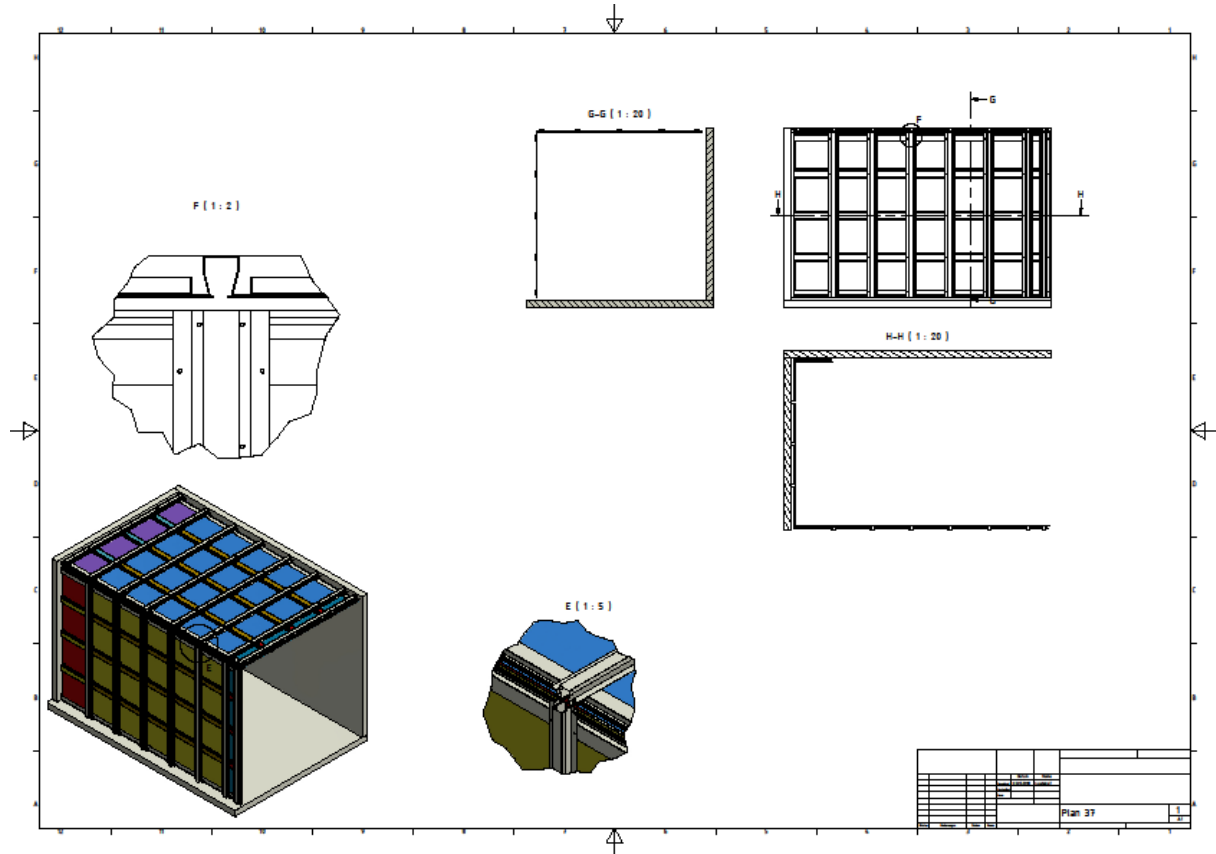
Fire behavior Group number
2

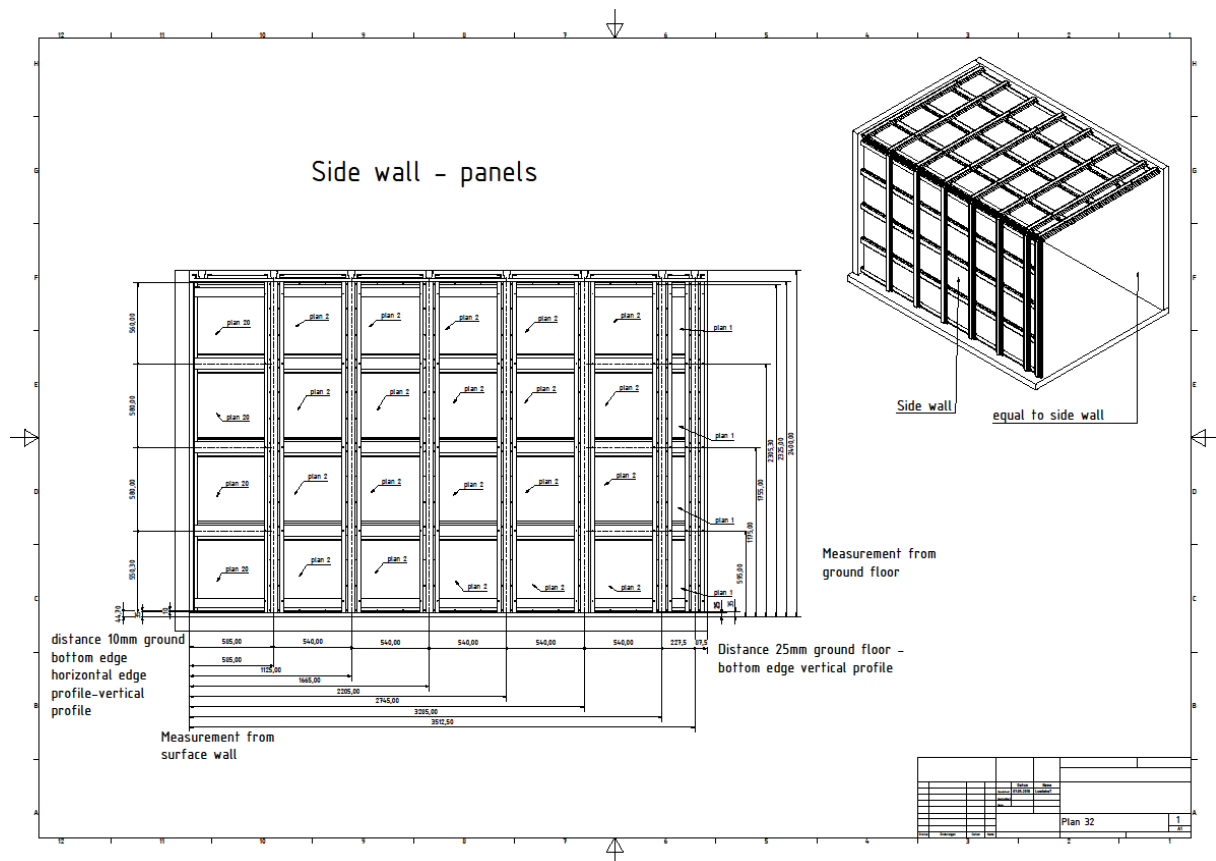
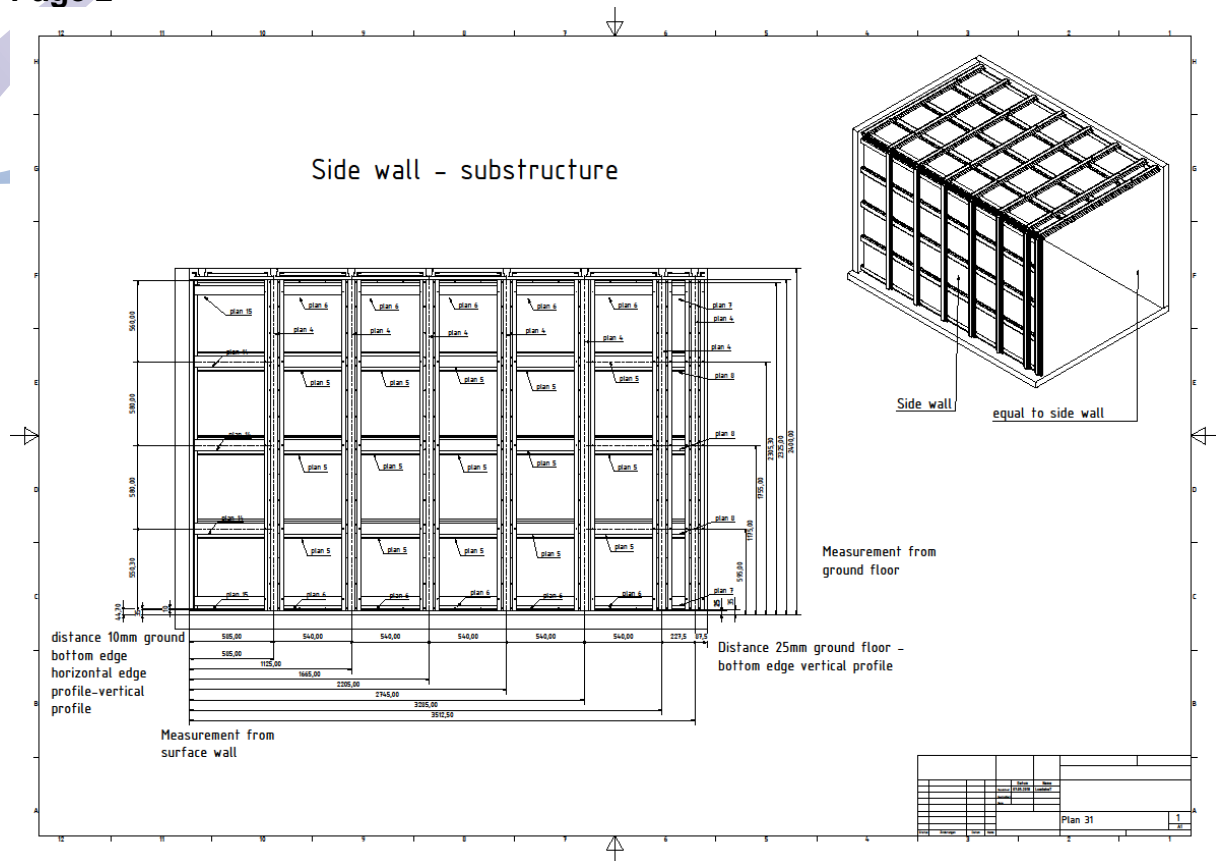
### **Criteria Australian Group Numbers according to AS 5637.1:2015, based on AS ISO 9705:2003 (identical to ISO 9705:1993)**

Group 1	does not reach flashover when exposed to 100kW for 600s followed by exposure to 300 kW for 600s.
Group 2	reaches flashover following exposure to 300kW within 600s after not reaching flashover when exposed to 100kW for 600s.
Group 3	reaches flashover in more than 120s but within 600s when exposed to 100kW.
Group 4	reaches flashover within 120s when exposed to 100kW.

### Mounting and fixing details

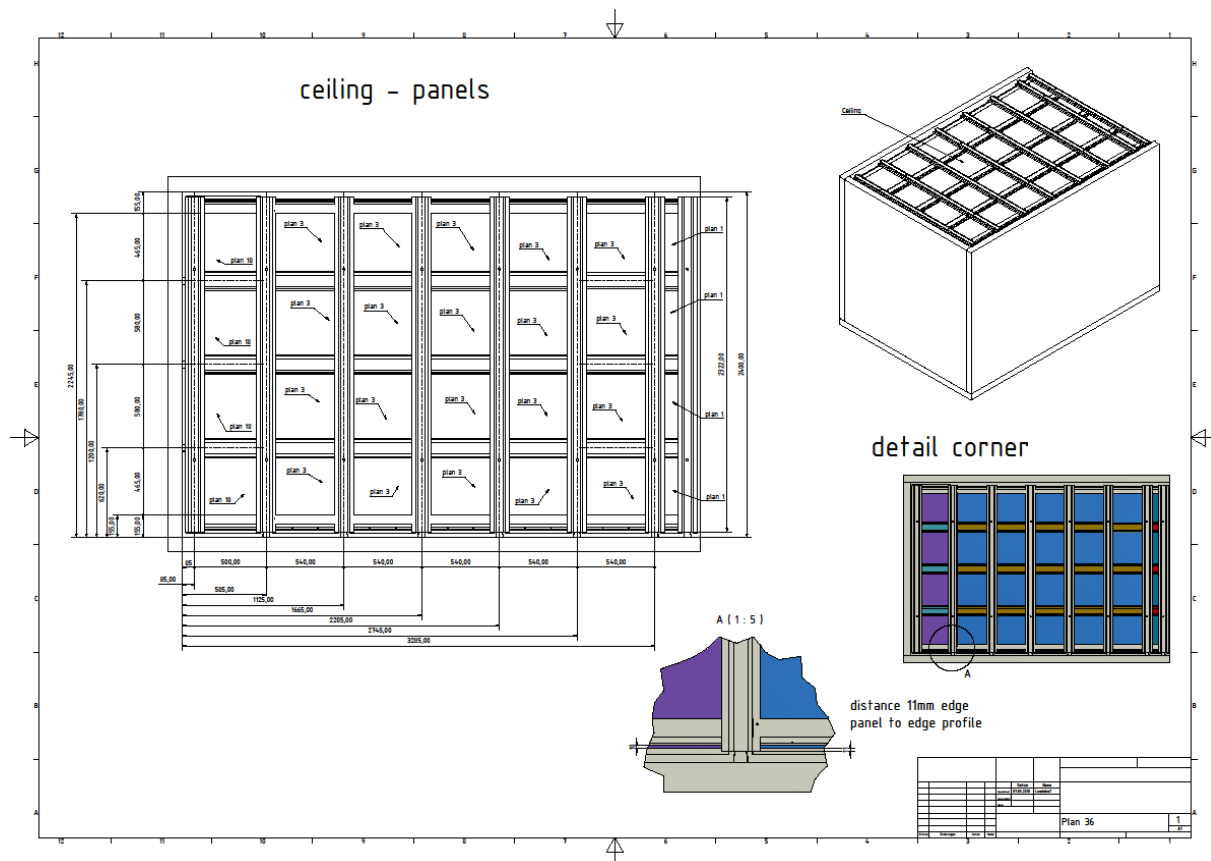
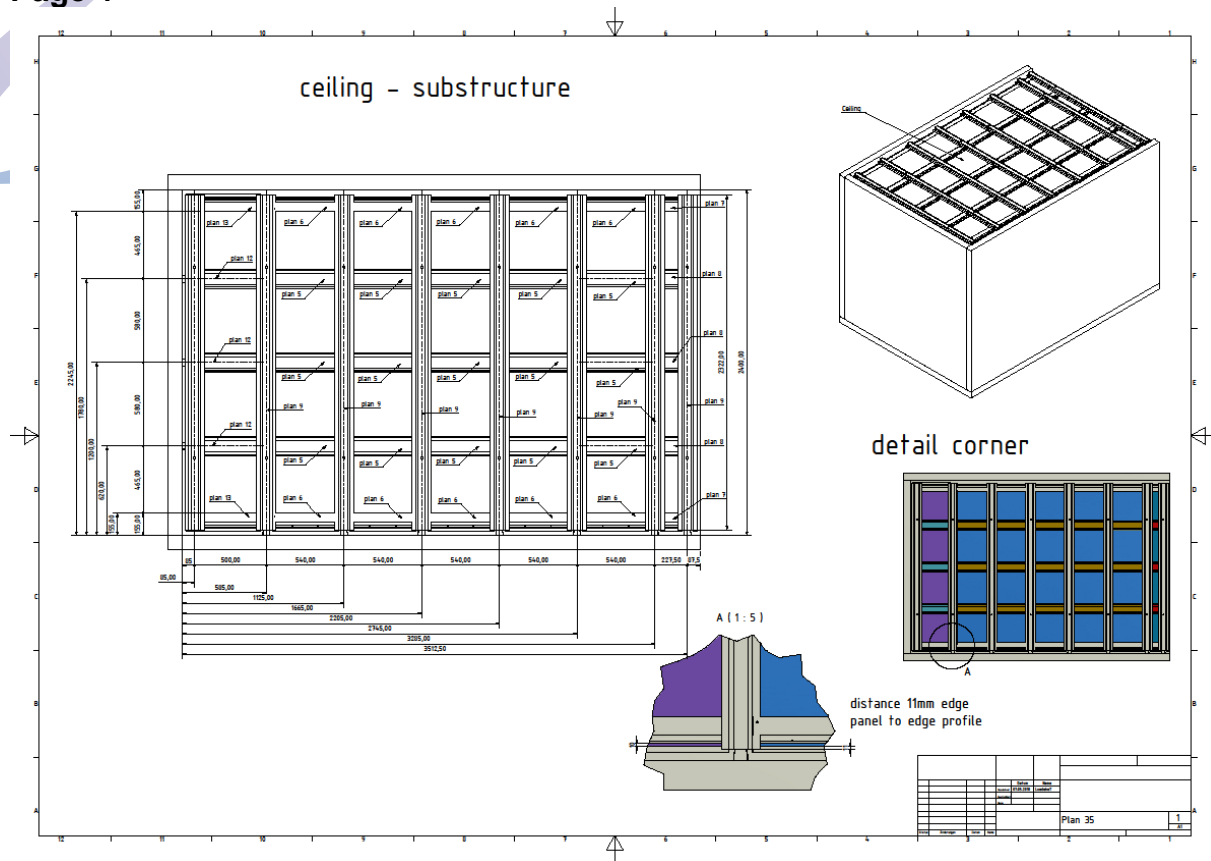
The panels were fixed by means of steel rivets on an aluminium frame, composed of horizontal and vertical profiles, as shown in the below mentioned drawings. A joint of 20 mm was applied between the panels.









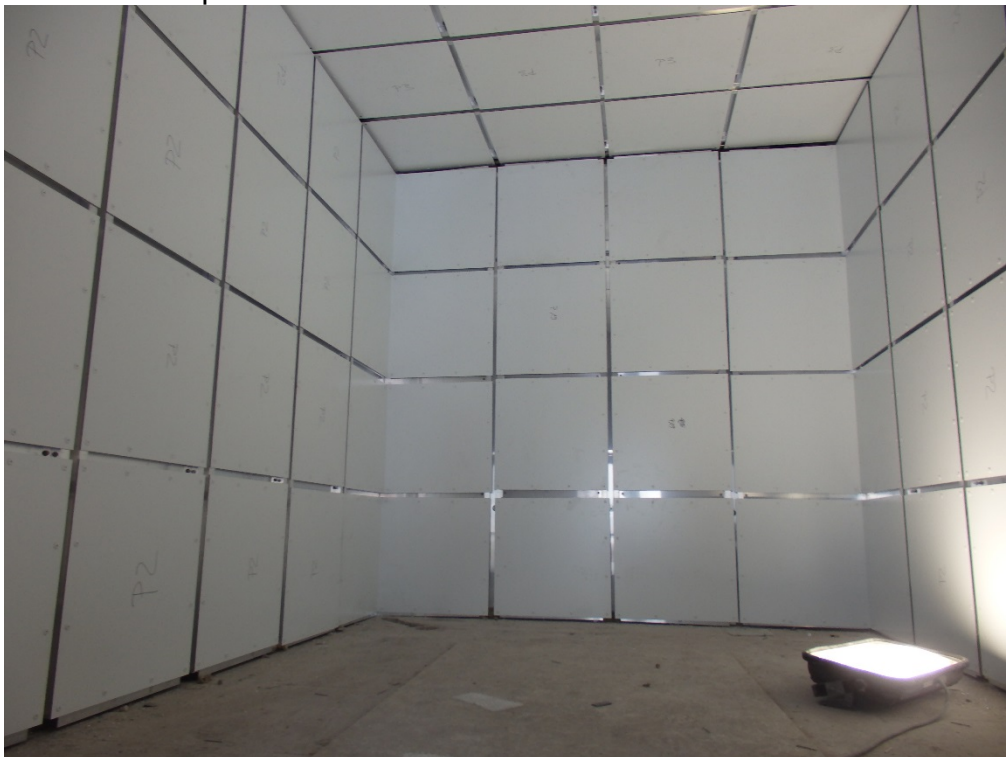


**Photo of the test specimen before the test**

Aluminium frame for the fixation of the composite panels



The mounted product before the test





**Photo of the test specimen during the test**

Flame spread over wall and ceiling



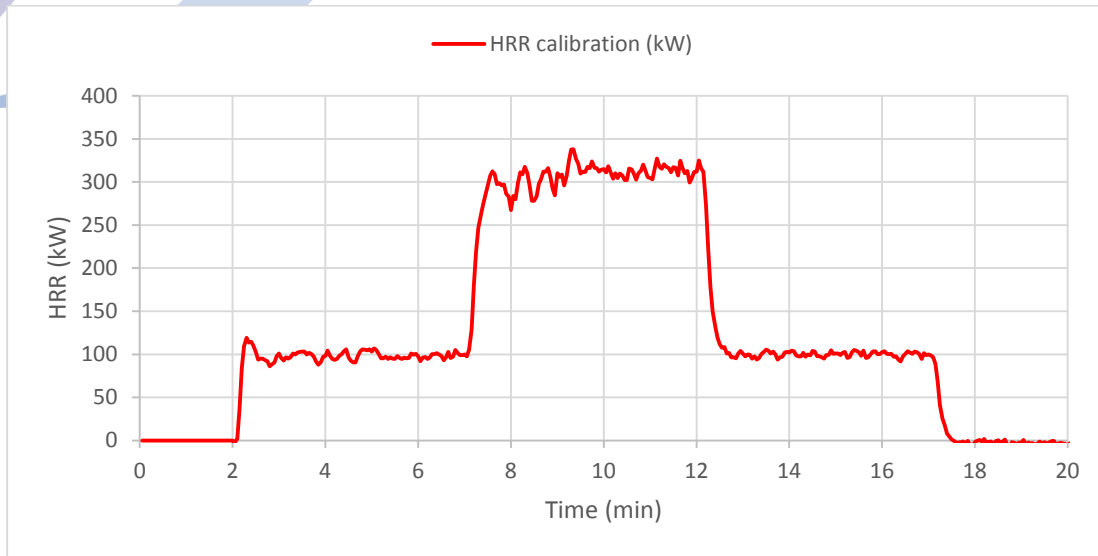
Flashover



Photo of the test specimen after the test

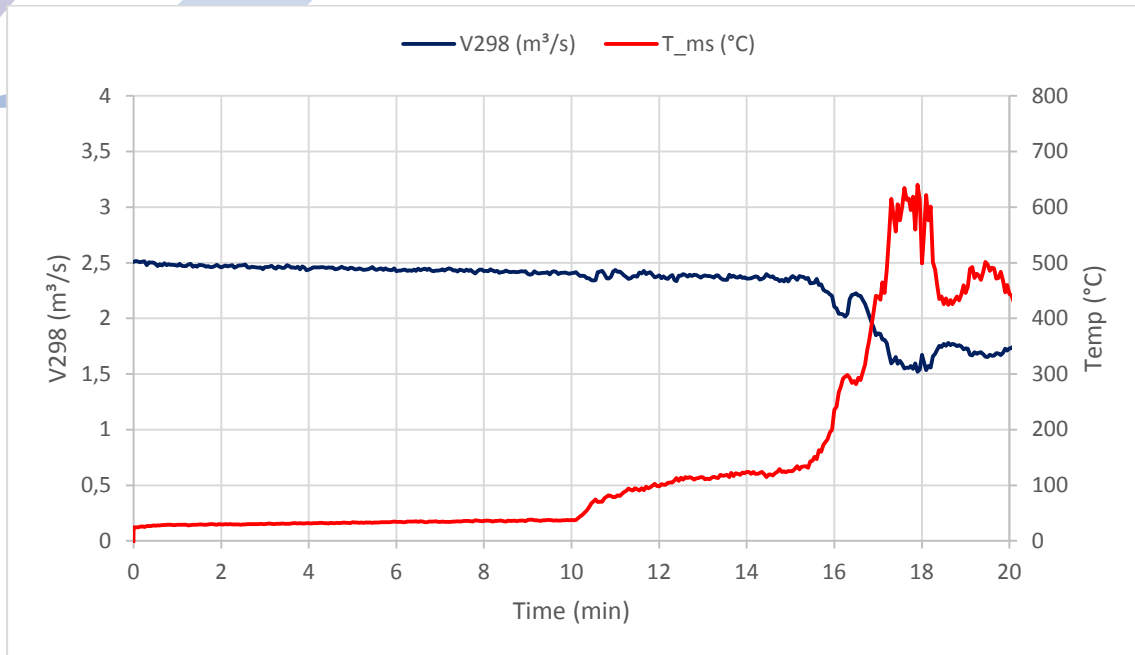


**Calibration results**

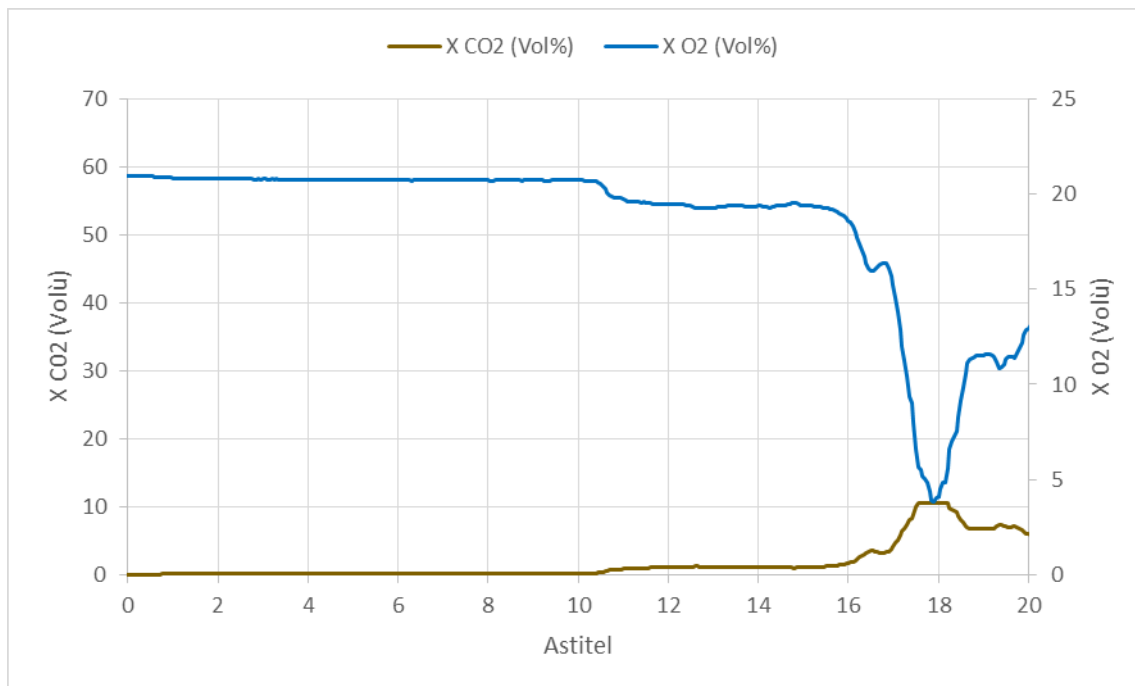




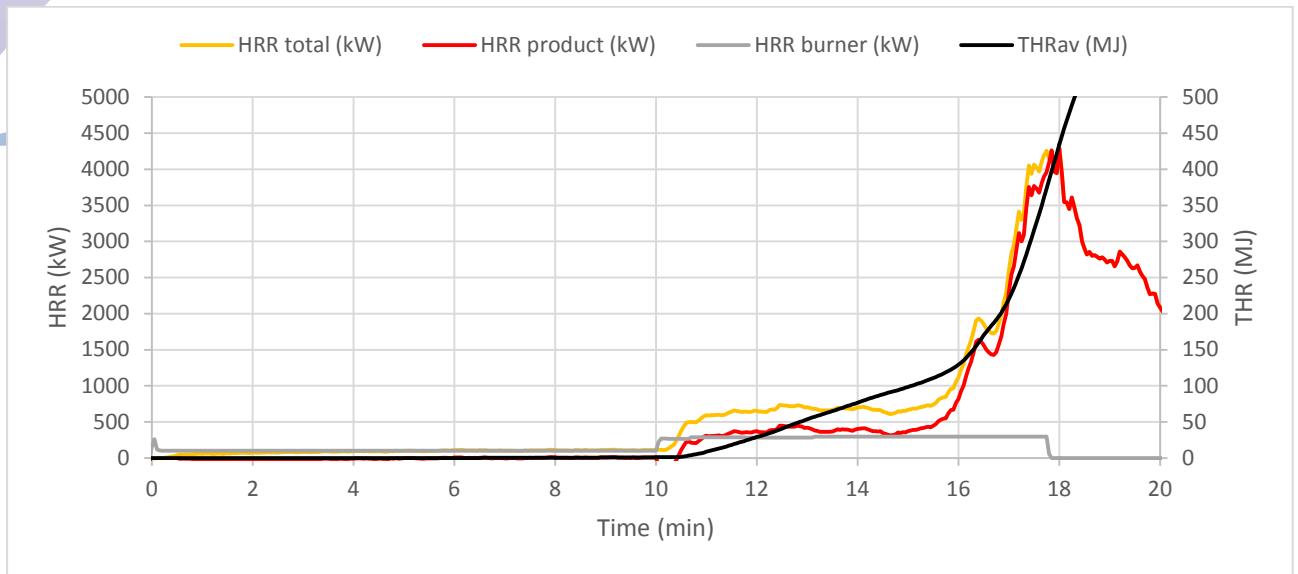
**Volume flow (m<sup>3</sup>/s<sup>2</sup>) and temperature (°C) in exhaust duct**



**Oxygen concentration in the exhaust duct in function of time**



**Rate of heat release (HRR)**



**Smoke production (TSP) of the test specimen**

