



# REPORT

issued by an Accredited Testing Laboratory

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Reference

4P07750-3

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Burnblock ApS  
Wilders Plads 8A  
DK-1401 Copenhagen K  
Denmark

## Fire test of covering

(11 appendices)

### Test method

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in the accredited methods:

- EN 14135:2004
- EN 1363-1:1999 and where appropriate EN 1363-2:1999.

Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

### Product

Covering without an air gap (cavity) behind it.

### Product designation

Spruce profile

### Sponsor

Burnblock ApS  
Wilders Plads 8A  
DK-1401 Copenhagen K  
Denmark

### Reference number of the test

4P07750-3

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## 1 Purpose of the test

The purpose of the test was to determine the fire protection ability of a covering. The test specimen provided for the purpose of determining the fire protection ability of the covering is described in chapter 2.

## 2 Test specimen

The covering consisted of spruce boarding impregnated with flame retardant liquid. The outer dimensions of the test specimen (width x length) were 2400 x 2900 mm.

### 2.1 Delivery of the test specimen

The materials were selected and delivered by the sponsor. The materials arrive at SP on December 16, 2014.

### 2.2 Description of the construction

The test specimen consisted of tongued and grooved spruce boarding. The dimensions of the boards were (width x thickness) 95 x 21 mm.

The boards are treated with fire retardant designated Burnblock, in accordance with appendix 2.

The boards were attached to the substrate with 41 mm long decking screws.

The test arrangement is shown in appendices 1-2. In case that the sponsor's drawings and specifications fail to correspond with the construction SP has crossed details or altered the drawings and specifications.

The following components were included in the test specimen:

<i>Component</i>	<i>Designation</i>	<i>Manufacturer</i>
Spruce boards with dimensions (width x thickness) 95 x 21 mm	Spruce profile	Burnblock ApS
Flame retardant impregnation	Burnblock	Burnblock ApS
Decking screw	Trallskruv 4,2x41 A4	V/S/B Västsvenska Byggskruv AB

## 2.3 Supporting construction and substrate

The substrate consisted of chipboards with a nominal thickness of 19 mm and a nominal density of 675 kg/m<sup>3</sup>. The substrate was mounted by SP on the lower side of a wooden frame work. The supporting construction was fabricated by SP.

## 2.4 Mounting of the test specimen

The covering was mounted against the lower side of the substrate. The covering was fixed to underlying boards with 41 mm decking screws. The dimensions of the screws were 4,2 x41 mm and the centre distance of the screws was approximately 600 mm.

The sponsor mounted the test specimen on January 12, 2015.

The supporting construction with the test specimen was, after the mounting, placed on SP's horizontal furnace.

## 2.5 Conditioning

The test specimen was stored in SP's furnace hall before the test. The temperature in the furnace hall was in average 17 °C and the relative humidity was in average 60 % during this time.

## 2.6 Verification

### 2.6.1 Verification of the test specimen

The assembling of the test specimen was monitored by SP's personnel on January 9, 2015 at SP. The test specimen corresponds with the drawings. Materials delivered to SP were picked out by SP for verification of included materials.

### 2.6.2 Properties of included materials

<i>Test specimen</i>	<i>Thickness (mm)</i>	<i>Density (kg/m<sup>3</sup>)</i>	<i>Moisture ratio <sup>1)</sup> (%)</i>
Spruce profile	20,5	545	13,1

1) Moisture ratio calculated from weight loss after being heated at 105 °C.

The verification was performed on January 21, 2015 on samples taken from the same batch of material as the material used for construction of the test specimen.

The purpose of the control is to verify and/or determine material data and dimensions of materials and components included in the test specimen. The extent of performed measurements and applied methodology can deviate from standardized method. The results shall therefore not be considered as formal material data.

### **3 Test procedure and test results**

The test was performed on January 20, 2015. The test lasted 10,0 minutes.

#### **3.1 Witness of test**

The test was witnessed by Paw Faelled and Jimmie V. Reé both from Burnblock ApS.

#### **3.2 Furnace control**

The furnace was controlled in accordance with SS-EN 1363-1:1999.

##### **3.2.1 Temperatures**

The furnace temperature was measured with 6 plate thermometers (PT1 – PT6). The measuring junctions were positioned approximately 100 mm from the fire exposed surface of the test specimen at the commencement of the test. The positioning is described in appendix 3.

The average temperature in the furnace in relation to the standard time-temperature curve is shown in appendix 4.

The temperature at each plate thermometer in relation to the standard time-temperature curve is shown in appendix 5.

The percent deviation of the area under the average furnace time-temperature curve from the area under the standard time-temperature curve and permitted deviation, are shown in appendix 6.

##### **3.2.2 Pressure**

The pressure in the furnace in relation to the ambient pressure in SP's furnace hall was measured 830 mm below the fire exposed surface of the test specimen.

The furnace was controlled so that an overpressure of approximately 20 Pa was kept 100 mm below the fire exposed surface of the test specimen.

The furnace pressure is shown in appendix 7.

#### **3.3 Ambient air temperature**

The ambient air temperature was measured with one thermocouple.

The ambient air temperature during the test is shown in appendix 8.

The ambient air temperature at the beginning of the test was 16 °C.

### 3.4 Measurements on the test specimen

#### 3.4.1 Temperatures

The temperature rise on the surface of the substrate was measured with 8 thermocouples (C1 – C8). The thermocouples were positioned as shown in appendix 9.

The temperature rise on the surface of the substrate is shown in appendix 10.

The average temperature of thermocouples C1 – C 8 prior to the start of the test was 17,7°C.

### 3.5 Observations

Photographs taken in connection with the test are shown in appendix 11.

#### 3.5.1 Observations during the test

<i>Time min:s</i>	<i>Observations (the observations refer to the exposed side if nothing else is stated)</i>
00:00	Test starts.
00:50	The surface of the covering is discoloured black. Pyrolytic gas burns over the surface of the covering.
01:10	The knots are glowing.
08:00	The surface is glowing and gaps are visible between the boards.
07:10	The boards are deformed in some places.
10:00	The fire exposed surface is on fire.
	Test terminates.

#### 3.5.2 Observations after the test

The test specimen was removed from the furnace directly after the termination of the test whereupon the following observations were made.

##### *Covering*

The fire exposed surface of the covering was charred to a depth of approximately 10 mm into the panel.

There was no burnt material, charred material, melted material or shrunk material at any point of the unexposed side of the covering.

##### *Substrate*

The substrate is discoloured behind the tongue and grooves and behind the longitude joints at some points. There is no burnt material, charred material, melted material or shrunk material at any point of the substrate.

## 4 Summary

The test specimen, described in chapter 2, has been fire tested according to EN 14135:2004 during 10,0 minutes. The following results were obtained:

- There was no collapse of the covering, or parts of the covering.
- The average temperature rise did not exceed 250 °C on the substrate.  
The maximum average temperature rise on the substrate was measured to 71°C (C1-C8).
- The maximum temperature rise did not exceed 270 °C on the substrate.  
The maximum temperature rise on the unexposed side of the covering was measured to 82°C (C1-C8).
- There were no signs of burnt material, charred material, melted material or shrunk material on the unexposed side of the covering.
- There were no signs of burnt material, charred material, melted material or shrunk material on the substrate.
- 
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## 5 Field of direct application of test results

The direct applicability of the test results to constructions similar to the construction described in this report is described in paragraph 10 of EN 14135:2004.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

### SP Technical Research Institute of Sweden Fire Research - Fire Resistance

Performed by

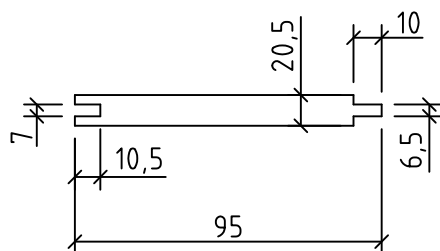
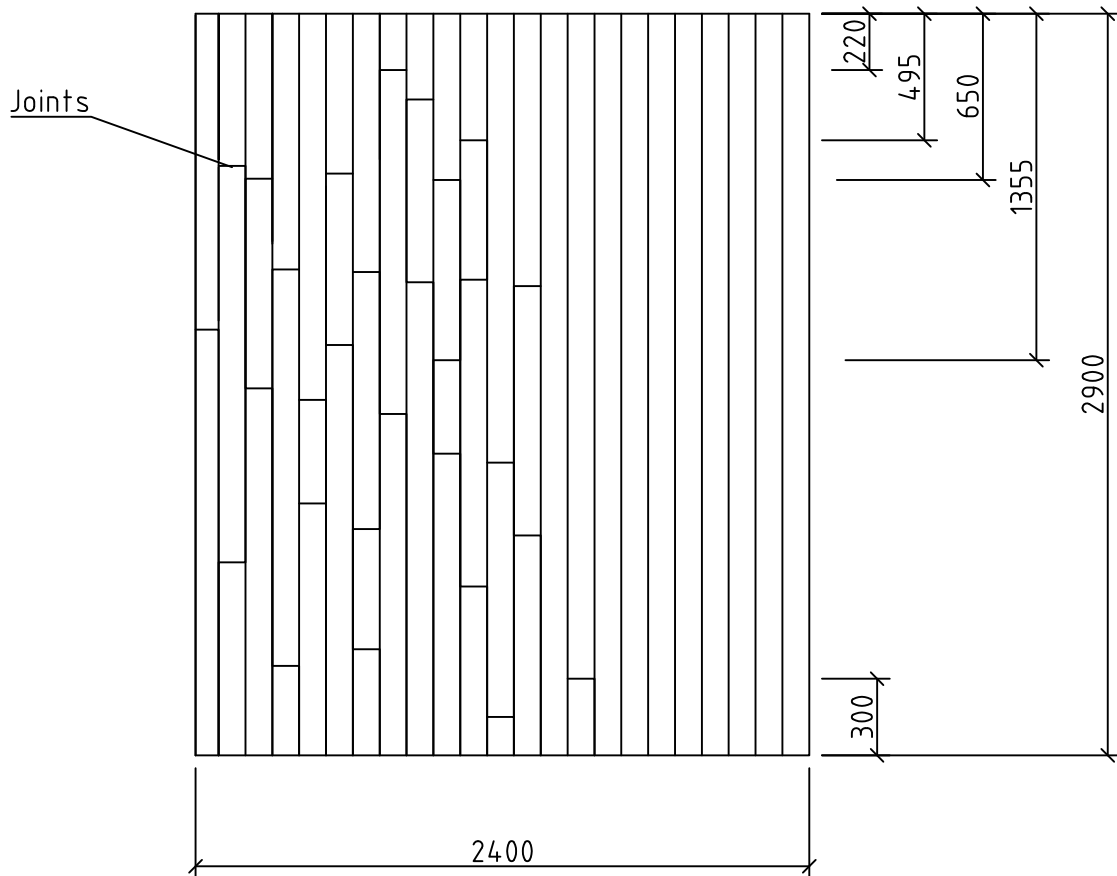
Examined by

Torben Ronstad

Patrik Johansson

**Appendices: 1-11 (one page per appendix)**

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**Client:**

**BURNBLOCK**

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DK-1401 Copenhagen K

Phone: (+45) 7023 2053

	REF: 4P07750-3
	APP: 2



**BURNBLOCK®** NATURAL & NON-TOXIC FIRE RETARDANT

**According to the client:**

~~Product called "FR Birch Plywood", consisting of several layers of Burnblock flame retardant pine veneer.~~

~~The nominal dry amount of added flame retardant (Burnblock) min. 32kg/m<sup>3</sup>.~~

~~The product has a nominal thickness of min 12 mm and a nominal density of 700 – 750 kg/m<sup>3</sup>.~~

~~The fire retardant is applied to the plywood in a vacuum-pressure impregnation process or by soaking each veneer separately prior to gluing.~~

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~~Product called "FR Pine Plywood", consisting of several layers of Burnblock flame retardant pine veneer. The nominal dry amount of added flame retardant (Burnblock) min. 47kg/m<sup>3</sup>.~~

~~The product has a nominal thickness of min 12 mm and a nominal density of 450 – 500 kg/m<sup>3</sup>.~~

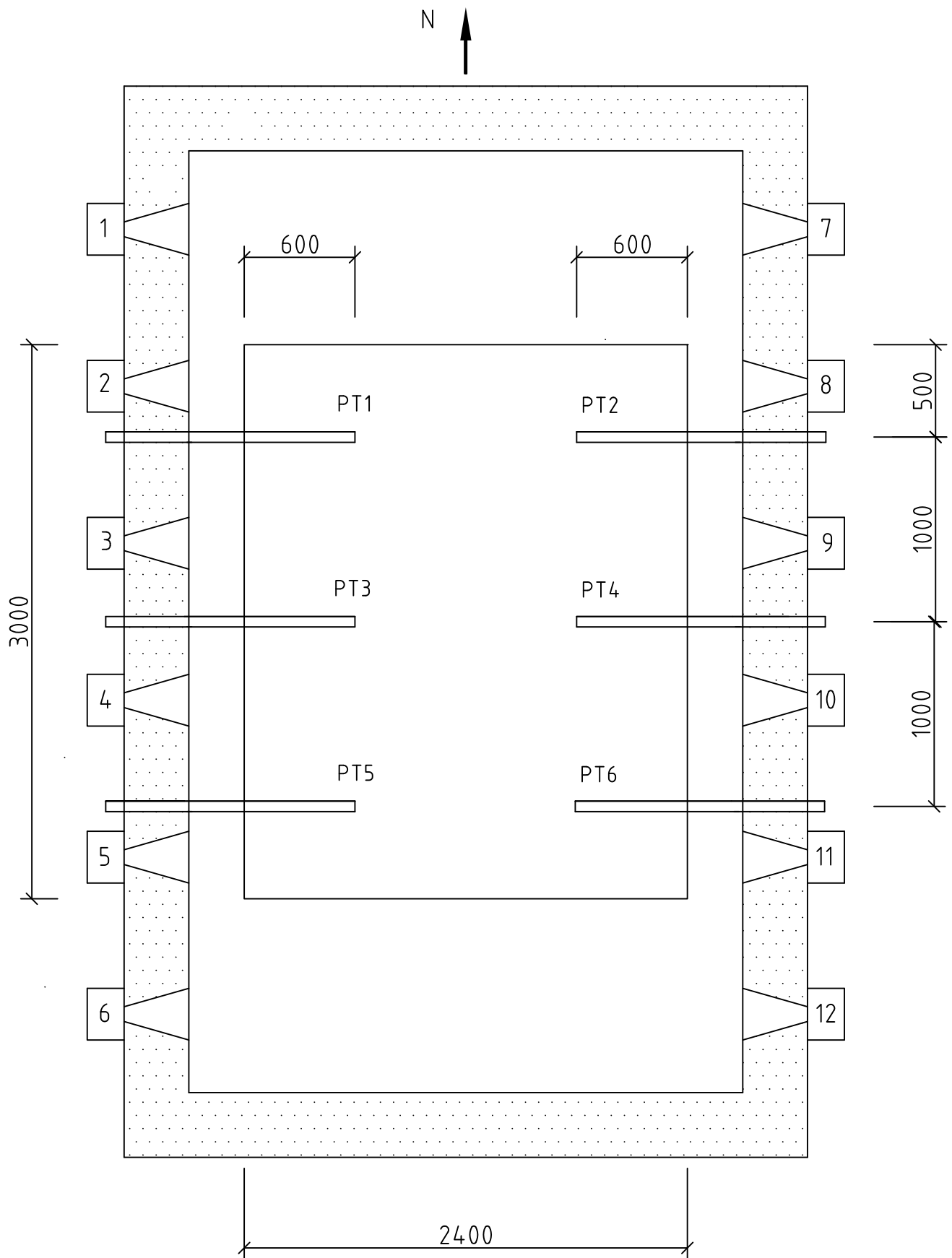
~~The fire retardant is applied to the plywood in a vacuum-pressure impregnation process or by soaking each veneer separately prior to gluing.~~

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Wood panel Called "Spruce profile" consisting of flame retardant spruce wood. The nominal amount of added flame retardant Burnblock min. 35 kg/m<sup>3</sup>. The product has a nominal density of 450 kg/m<sup>3</sup>, a nominal thickness of 21 mm and a nominal width of 120 mm.

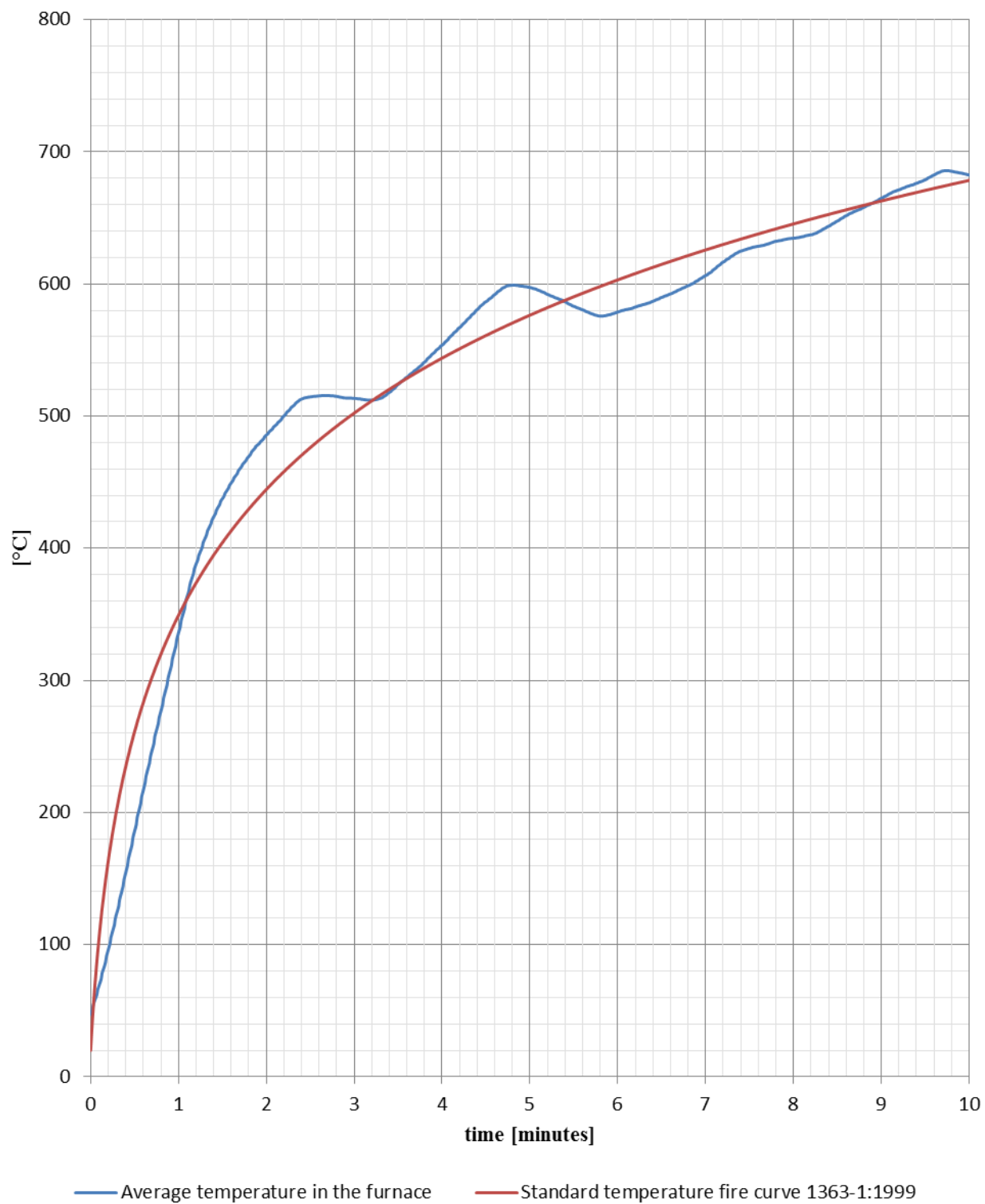
The fire retardant is applied to the panel in a vacuum-pressure impregnation process.



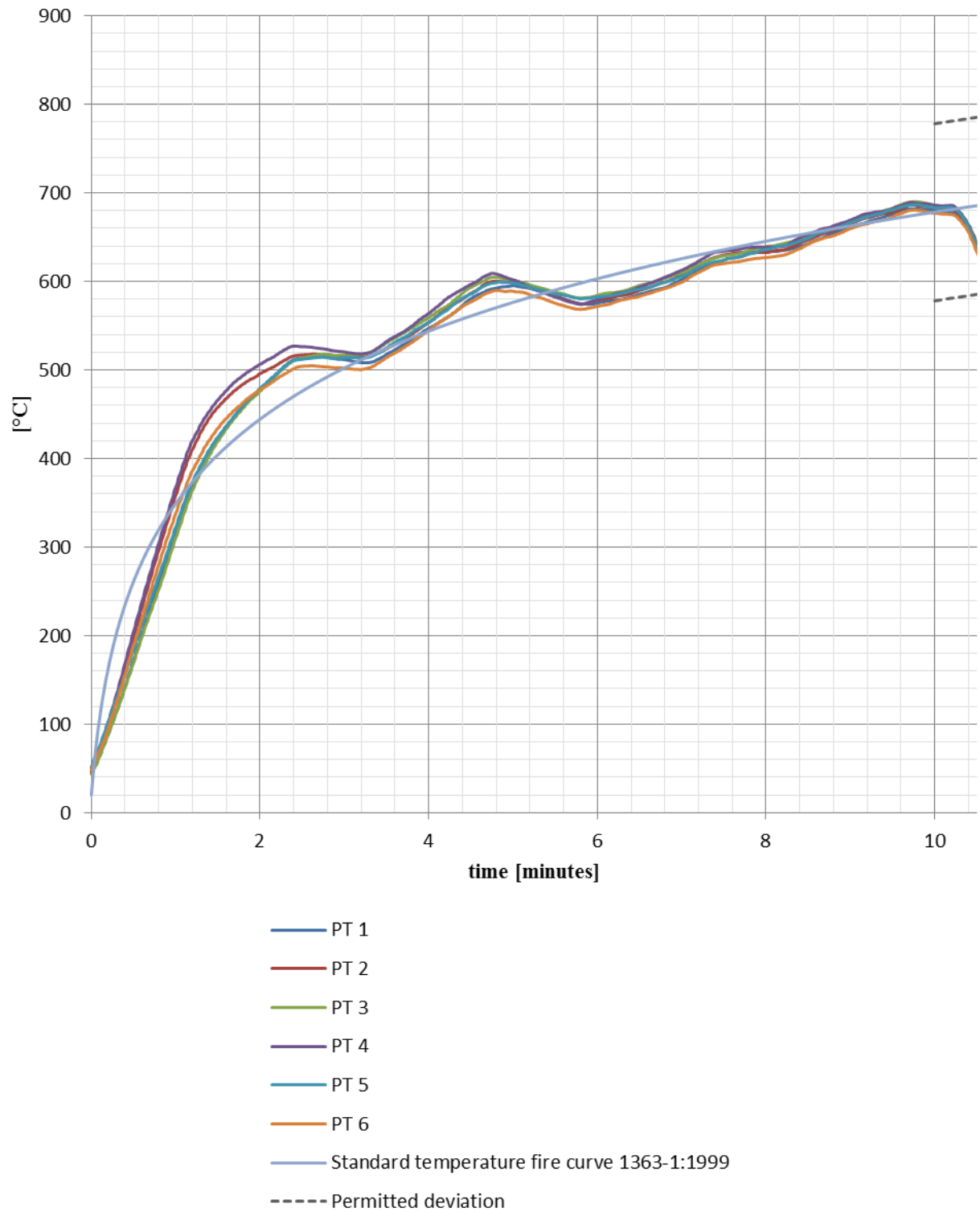


- PT: Plate thermocouples  
The plate thermocouples are placed 100 mm from the fire exposed side of the test specimen

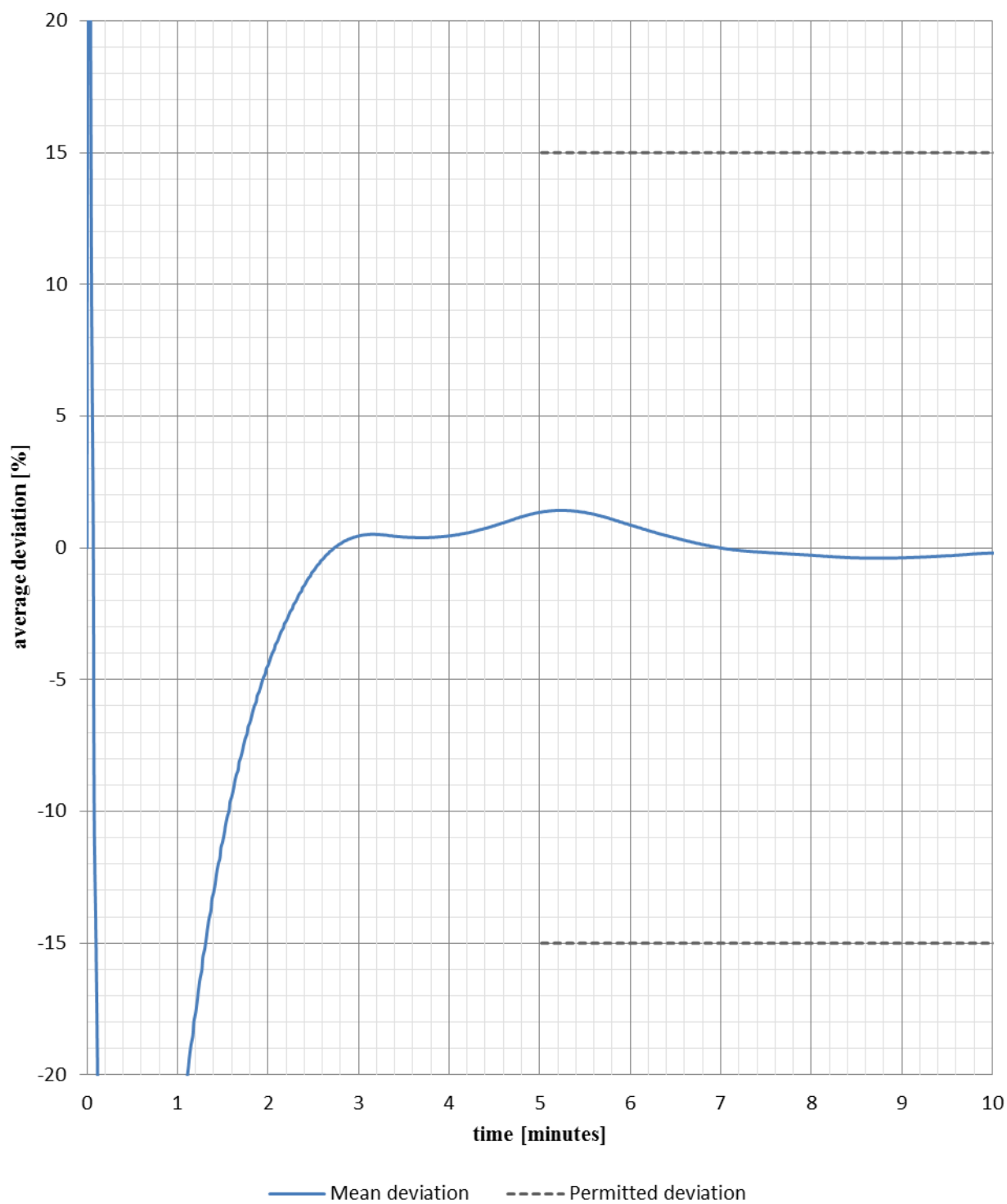
Average furnace temperature



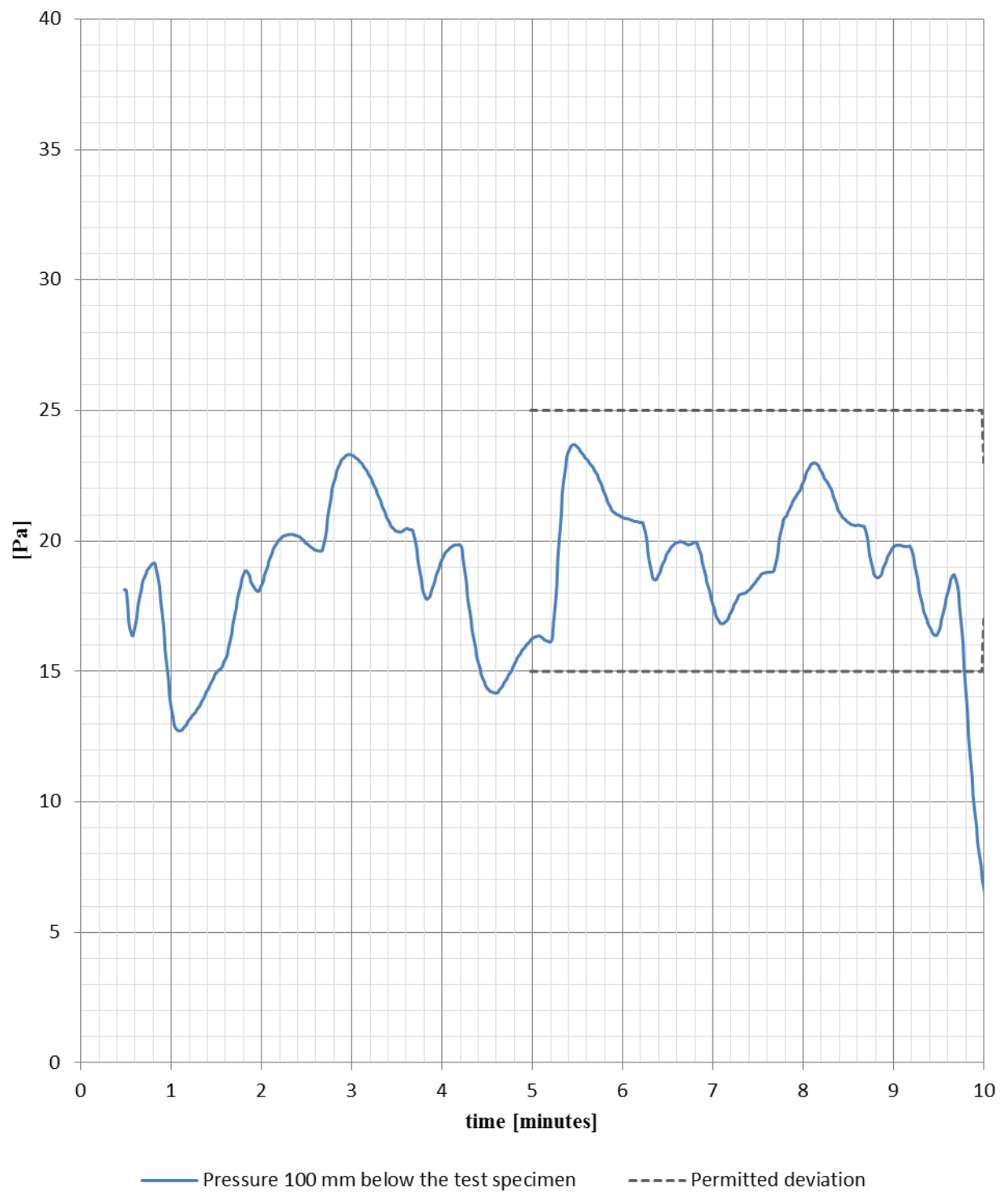
### Temperatures in the furnace



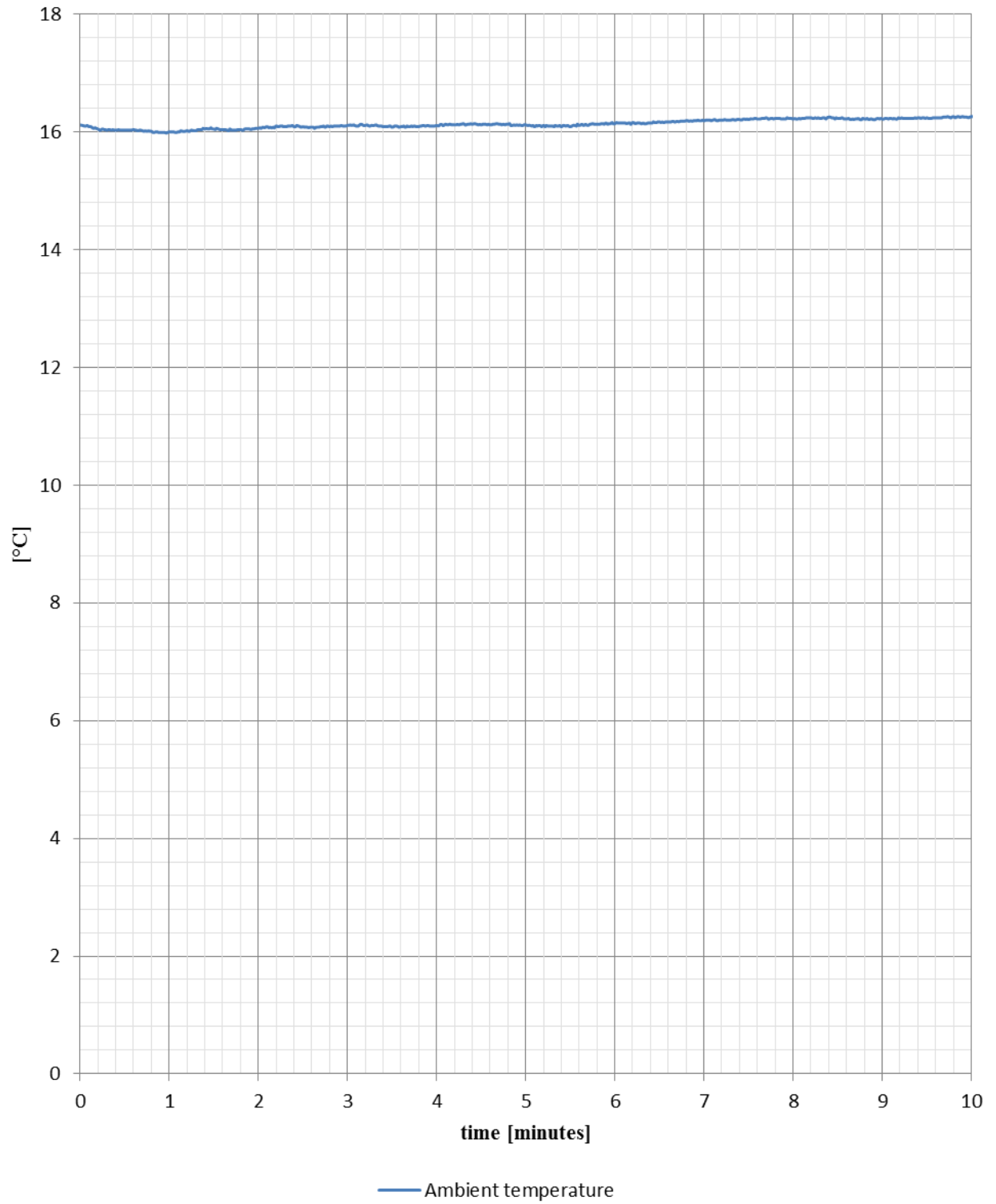
**Percent deviation of the average furnace temperatures from the standard  
time-temperature curve**



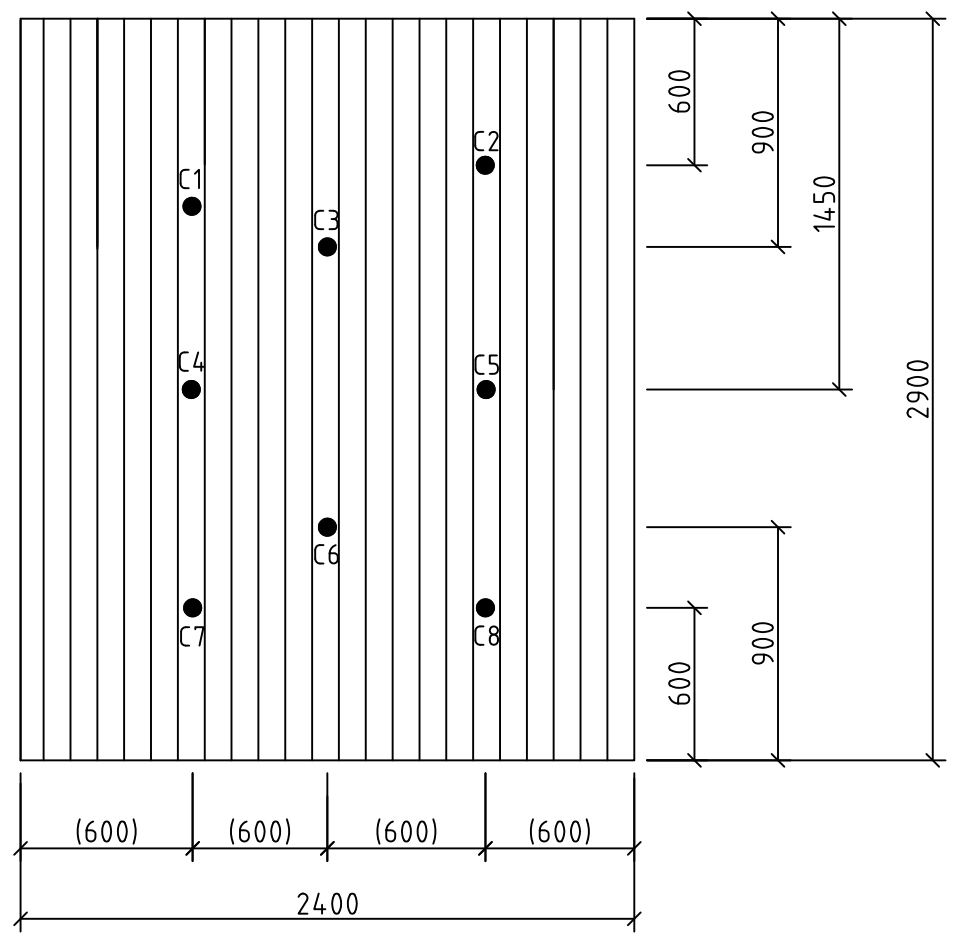
### Pressure in the furnace in relation to the ambient pressure in the laboratory



### Ambient temperature in the laboratory



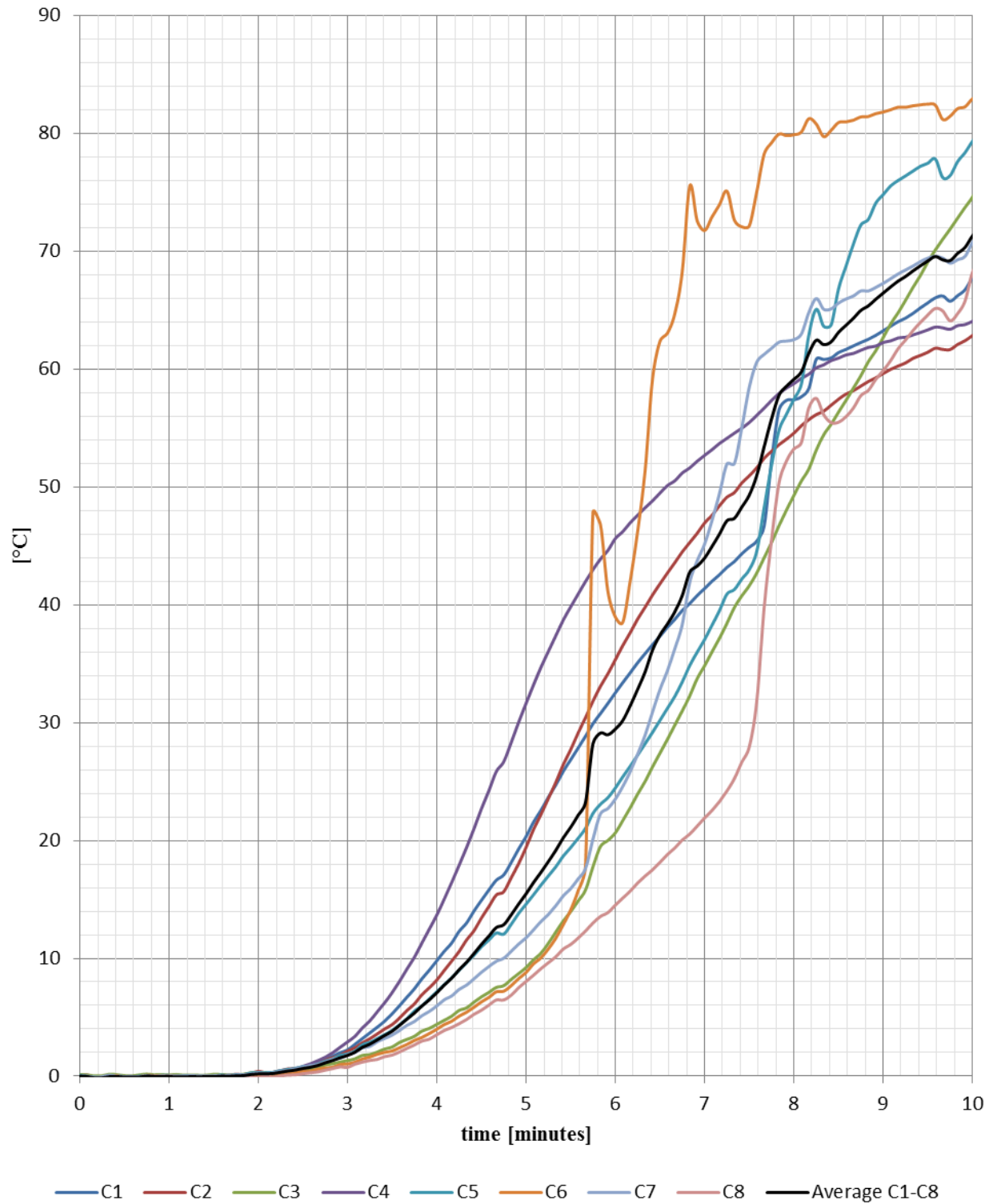
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● Thermocouple C1-C8 on the substrate

Approximate locations above. The thermocouples were mounted on half the width of each panel and 100 mm from any short-end joint.

### Unexposed face temperature rise







Appendix: 11

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Photo No: 1

The plywood board before  
of the test.



Photo No: 2

The test specimen  
directly after the test.



Photo No: 3

The substrate after the test.

