Instytut Techniki Budowlanej
(Institute of Building Technique)
RESEARCH LABORATORIES COMPLEX
accredited by the Polish Center for Accreditation
accreditation certificate no. AB 023

AB 023

FIRE TEST DEPARTMENT

FIRE TEST LABORATORY

TEST REPORT NO. LZP02-06097/18/R03NZP/B

This test report contains test results covered by the scope of accreditation.

This report was issued in three copies, two of which were received by the Client and one remained with ITB.

Client:	**VITRINTEC Sp z o.o.** (system provider)
Client address:	ul. Karola Olszewskiego 19 C 25-663 Kielce

INFORMATION REGARDING THE PRODUCT

Manufacturer (company name and address):	*VITRINTEC Sp z o. o.* *ul. Karola Olszewskiego 19 C* *25-663 Kielce*
Name and address of the Production Plant:	*VITRINTEC Sp z o. o.* *ul. Karola Olszewskiego 19 C* *25-663 Kielce*
Product name:	Aluminum profile wall, without muntins, in the PURE EI30 system by VITRINTEC, filled with Contraflam Structure 30 glass made by Vetrotech Saint-Gobain
Reference document for the product:	
Product information and the declared scope of use with the resulting system for assessing and verifying constancy of performance properties:	*non-load-bearing walls,* ***System 3***
Designation of the construction product type:	*The manufacturer did not provide a unique identification code for the product*

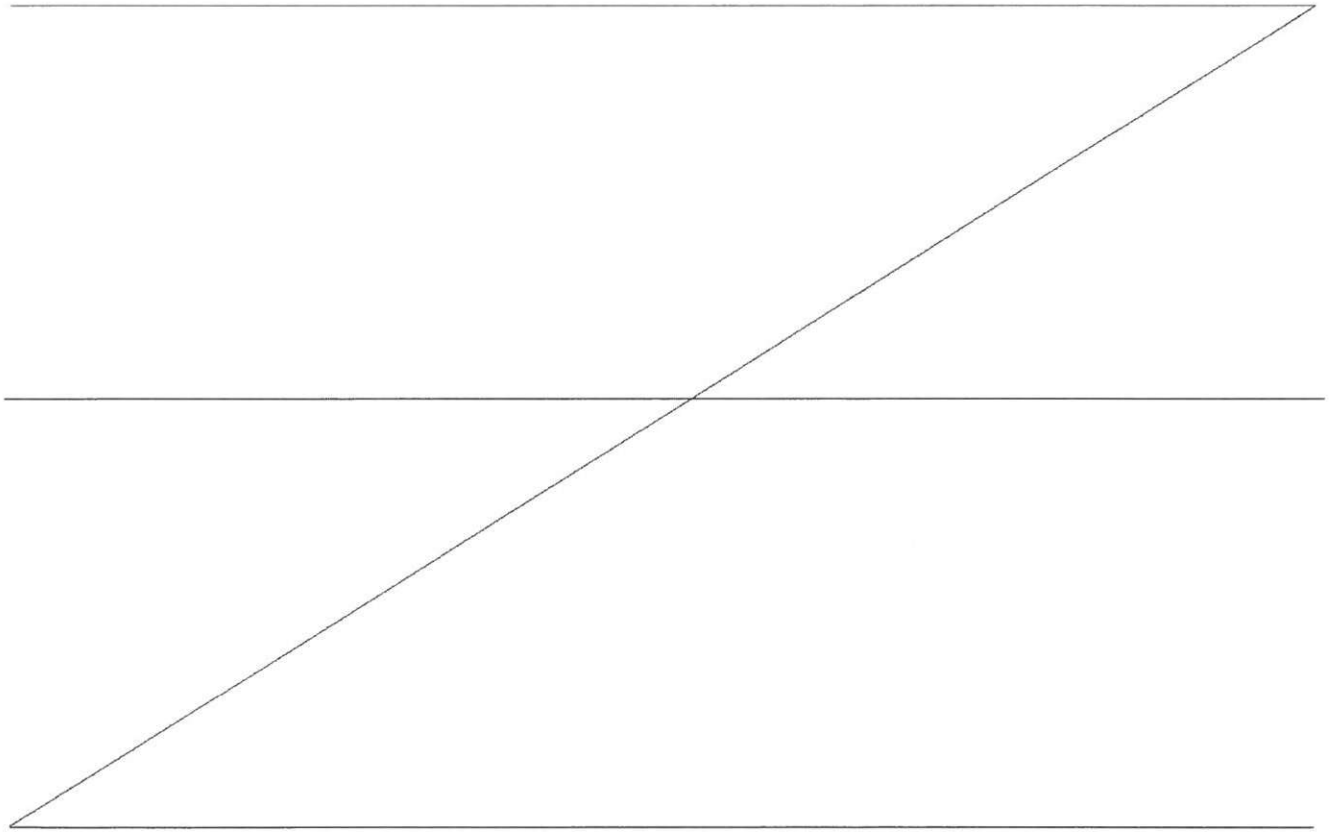
INFORMATION REGARDING THE RESEARCH SUBJECT

Research object:	*A detailed description and identification of the research object can be found*

description, condition and identification	*in point 1.4 of this report.* *Technical and drawing documentation can be found in Appendix No. 1 to this report.* *Photographic documentation illustrating the test object and the test procedure can be found in Appendix No. 3 to this report.* *Information regarding the test object obtained from the Client is included in the test object acceptance report no. LZP02- 06097/18/R03NZP (Appendix No. 4 to this report).*
Date of acceptance of the test object:	*2018-08-29*
Test object acceptance procedure, Test object acceptance protocol number:	*The object was admitted to the laboratory in accordance with Procedure PZ ZLB 18, admission protocol number: No. LZP02-06097/18/R03NZP (Appendix No. 4 to this report).*

RESEARCH INFORMATION

Research start date:	*2018-08-29*
Test completion date:	*2018-08-29*
Test method/procedure:	***PN-EN 1364-1:2015-08*** *Fire resistance tests of non-load-bearing elements* *Part 1: Walls.*



1. DESCRIPTION OF THE TEST ELEMENT

1.1. Size of the test element

The test element and all of its components were of actual dimensions. The dimensions of the front opening of the furnace did not limit the dimensions of the wall.

1.2. Number of test elements

The fire resistance test was carried out on one, asymmetrical test element. Heating from the side opposite to MI001 glazing beads.

1.3. Verification of test elements

Before and after the fire resistance test, the compliance of the data (to the extent possible) contained in the documentation provided by the Ordering Party with the delivered test element was checked. The technical description of the test element below contains the nominal values declared by the Ordering Party. If the nominal values declared by the Ordering Party differ significantly from the values measured by the Laboratory, the technical description includes the nominal values declared by the Client marked as (D) and/or the values measured by the Laboratory marked as (M).

1.4. Description of the test element

A test element, a non-load-bearing partition wall without mullions of the PURE EI30 system, was made and installed from the PURE EI30 system elements by VITRINTEC Sp z o. o. ul. Karola Olszewskiego 19 C, 25-663 Kielce. The structure of the tested wall is shown in Fig. 1 ÷ 4 in Appendix No. 1.

The test element had the following dimensions: 3024 x 3000 mm (width x height).

The structure of the test element was made of aluminum profiles with the following catalog numbers:

- PI001 - frame profile (vertical and bottom edge),
- PI002 - frame profile (upper edge),
- MI001 - glazing bead attached to PI001 profiles,

Aluminum profiles with a construction depth of 40 mm and a height of 30 mm were used, made of aluminum alloy EN AW 6063, in accordance with PN-EN 573-3 and PN-EN 515, with thermal inlays made of polyamide reinforced with glass fiber (PA 66 GF 25) with cat. no. AEI01 clamped in the profile axis.

Perimeter frame sections with cat. no. PI001 and PI002 were filled, in accordance with Figures 2 and 3 in Appendix No. 1, with insulating inserts made of plasterboard with cat. no. KG0614 with cross-section dimensions 6 x 1 4 mm.

The wall was filled with Contraflam Structure 30 glass panes from Vetrotech Saint - Gobain, 23 mm thick, with dimensions (numbering according to Fig. 3 in Appendix No. 1; width x height):

- Glass no. 1: 750 x 2970 mm,
- Glass no. 2: 1500 x 2970 mm,
- Glass no. 3: 750 x 2970 mm.

Contraflam Structure 30 glass was mounted on hardwood under-glass blocks (cat. no. KXI2204), with dimensions of (width x length x thickness) 22 x 80 x 4 mm, two blocks for each glass. The under-glass blocks were placed at a distance of approx. 100 mm from the corners of the glass.

The glass was attached by inserting the glass into closed profiles (upper, cat. no. PI002) and then into the bottom and side ones (PI001), and clamping the glazing beads with cat. no. MI001. Depth of insertion of the glass into the profiles: 16 mm for the lower profiles, 14 mm for the upper side profiles. Seals made of TPE thermoplastic elastomer with the addition of non-flammable material, type KB-101, manufactured by AIB Sp. z o.o., are used between the glass and aluminum profiles, cat. no. KUI010.

Vertical joints of glass panes with a width of 4 mm were made using silicone, type (DC) 895, from Dow Corning and the Kerafix FXL 200 intumescent material with a cross-section 2 x 1 3 m m by Rolf Kuhn, cat. no. KF0213.

On the side and top profiles, along their entire length on the glazing side, strips of FXL 200 intumescent tape from Rolf Kuhn were glued, with cross-section dimensions of 20 x 1 mm, cat. no. KF0120.

1.5. Selection of test elements

The laboratory participated in the selection of the test element.

2. INSTALLATION OF THE TEST ELEMENT

The test element was installed in a mounting structure made of aerated concrete blocks with a density of 650 kg/m^3 and 120 mm thick with a reinforced concrete lintel made of ordinary concrete (density 2200 kg/m^3) with a cross-section of 120 x 180 mm (width x height).

The aluminum frame was attached to the reinforced concrete lintel and to the brick wall along the upper, lower and right vertical edges (looking from the unheated side) using

galvanized steel screws type AMO III, 72 mm long, with spacing according to Fig. 1 in Appendix No. 1. The left edge of the wall was left unattached (free edge).

The 20 mm wide gap between the frame and the mounting structure was tightly filled with mineral wool with a density of 80 kg/m^3.

The left edge of the wall was left unattached (free edge). The space between the mounting structure and the glass pane, approximately 60 mm wide, was filled with mineral wool with a density of approximately 80 kg/m^3

The method of mounting the test element in the mounting structure is shown in Fig. 2, 3 in Appendix No. 1.

3. PREPARATION OF SAMPLE ELEMENT, SEASONING, VERIFICATION

The mounting structure was made 24 days before the test (with the reinforced concrete lintel being made three months before the test), and the test element was prepared by the Ordering Party at the Fire Test Laboratory in the Masovian Branch of ITB in Pionki 8 days before the test.

Seasoning took place at an ambient air temperature of 17 to 26 °C and a relative humidity of the ambient air of 35 to 65%.

4. TEST CONDITIONS

4.1. Ambient temperature and relative humidity

Ambient air temperature before the test, measured using a thermohygrometer installed in the test room: 23.5°C. Relative humidity of the ambient air before the test, measured using a thermohygrometer installed in the test room: 43%.

4.2. Temperature in the furnace

The temperature in the furnace was measured using 16 plate thermometers, arranged in accordance with PN-EN 1363-1:2012. The heating temperature chart is shown in Fig. 1 in Appendix No. 2. The heating accuracy chart is shown in Fig. 2 in Appendix No. 2.

4.3. Pressure in the furnace

The pressure in the furnace was measured at a height of 0.34 m above the top edge of the test element and was maintained at 22.9 Pa, which corresponded to a pressure of 20 Pa at the reference point. The pressure chart in the furnace is shown in Fig. 11 in Appendix No. 2.

4.4. Temperature of the unheated surface of the element

The temperature of the unheated surface of the test element was measured using 23 surface thermocouples, the arrangement and numbering of which is shown in Fig. 3 in Appendix No. 2.

4.5. Ambient temperature

The ambient temperature during the test, measured with the device according to PN-EN 1363-1:2012, is shown in Fig. 10 in Appendix No. 2.

5. RESEARCH RESULTS

The test lasted 32 minutes and 37 seconds.

5.1. Temperature on the unheated surface of the test element

Results of temperature measurements on the unheated surface of the test element in Fig. 4 ÷ 9 in Appendix No. 2.

5.2. Fire insulation, fire tightness

The result, expressed as the time, in whole minutes, that elapsed between the start of heating and the moment when the appropriate criteria were exceeded, is presented in the table below:

	Fire tightness criterion	**Time [min]**	**Location**
1.	Occurrence of sustained flame	32 without loss	-
2.	Cotton tampon catches fire	32 without loss	-
3.	eler gauges: 6 mm feeler gauge, 25 mm feeler gauge		
		32 without loss	-
		32 without loss	-
	Fire insulation criterion	**Time**	**Location**
4.	Average temperature increase by 140 °C above the initial average temperature	32 without loss	-
5.	Maximum temperature increase by 180 °C above the initial average temperature	25	The center of the height of glass no. 2 at the vertical edge on the side of glass no. 1 (TE 12)

6.	Maximum temperature increase by 180 °C above the initial temperature (other fixed thermocouples, if used, or movable thermocouple)	25	The center of the height of glass no. 2 at the vertical edge on the side of glass no. 1 (measurement above TE 12)

5.3. Displacements

The places of measurement of wall displacements in the direction perpendicular to their surface are shown in Fig. 3 in Appendix No. 2, and the values of the measured displacements are presented in the Table below:

Time [min]	**Displacement measurement [mm]**				
	A	**B**	**C**	**D**	**E**
0'	0	0	0	0	0
10'	+23	+24	+23	+15	+2
20'	+27	+30	+33	+27	+3
25'	+35	+39	+40	+33	+4
30'	¨	¨	¨	¨	¨

the "+" sign means a displacement towards the inside of the furnace“
the "-" sign means a displacement towards the outside of the furnace
the “**” sign means no measurement due to the safety of personnel.

6. OBSERVATIONS

0' - start of the test,

2'06" - the inner layer of the glass pane in the glass no. 2 is detached (glass according to Fig. 3, Appendix 2);

2'24" - the inner layer of the glass pane in glass no. 3 is detaching;

2'43" - the inner layer of the glass pane in glass no. 1 is detaching;

4'38" - the inner layer of the glass pane in glass no. 3 breaks and falls into the furnace;

5'56" - the inner layer of the glass pane in glass no. 2 breaks and falls into the furnace;

6'29" - the inner layer of the glass pane in glass no. 1 breaks and falls into the furnace; opaque glass;

8'33" - smoke in the upper left corner of glass no. 1

9’47’’ - discoloration of the glass (probably gel jam) on glass no. 2 above thermocouple No. 6;

18' - discoloration of glass no. 1 to the right of thermocouple no. 1;

22'09" - placing a movable thermocouple in the place of gel jam on glass no. 1.

Measured actual temperature 174°C;

25'26" placing the movable thermocouple in the place where the gel is jammed on glass no. 2.

Measured actual temperature 212°C;

26'29" - placing the movable thermocouple in the place where the gel is jammed on glass no. 1.

Measured actual temperature 216°C;

28'55" - a flame appears for about 2 seconds at the right, vertical edge of glass no. 3;

31'10" - intense smoke along the upper, horizontal edge of glass no. 2;

32'37" - **end of test** in consultation with the Client.

7. PHOTOGRAPHIC DOCUMENTATION

The view of the wall before the test is illustrated in Photo 1, during the test in Photo 2 ÷ 5, and after the test in Photo 6 in Appendix No. 3.

8. SCOPE OF APPLICATION OF THE RESULTS

The scope of application of the fire resistance test results of the tested element described in this Report according to point 13 of the PN-EN 1364-1:2015-08 standard.

9. FINAL REMARKS

This report provides the method of construction, test conditions and results obtained when a specific element of the described design has been tested in accordance with the procedure set out in EN 1363-1 and, where appropriate, with EN 1363-2. Any material change in size, construction details, loads, stresses, boundary conditions or conditions at the ends, other than that permitted by the immediate scope of application in the particular test method, is not covered by this report.

Due to the nature of the fire resistance test and the resulting difficulty in quantifying the uncertainty of the fire resistance measurement, it is not possible to determine a fixed level of accuracy for the results.

10. ATTACHMENTS

- No. 1 Technical documentation,
- No. 2 Charts of temperature increases with the distribution of thermocouples, pressure chart, locations of displacement measurement,
- • No. 3 Photographic documentation,
- • No. 4 Protocol of accepting the object for testing.

Responsible for the study: M.Sc. Eng. Jacek

Name and position

Signature

The person authorizing the report, M.Sc. Eng.

Name and position held

Signature

The Test Laboratory declares that the test results refer only to the tested object. Without the written consent of the Research Laboratory, the Report may not be reproduced except in full. The test report does not replace the documents required for placing construction products on the market and making them available.

MANAGER of the Fire Research Laboratory,

Ph.D., Eng. Bartłomiej Papis

Name and position held i

Warsaw, May 21, 2019

This test report replaces the test report no. LZP02-06097/18/R03NZP/

Appendix No. 1

to Report No. LZP02-06097/18/R03NZP/B

Technical Documentation

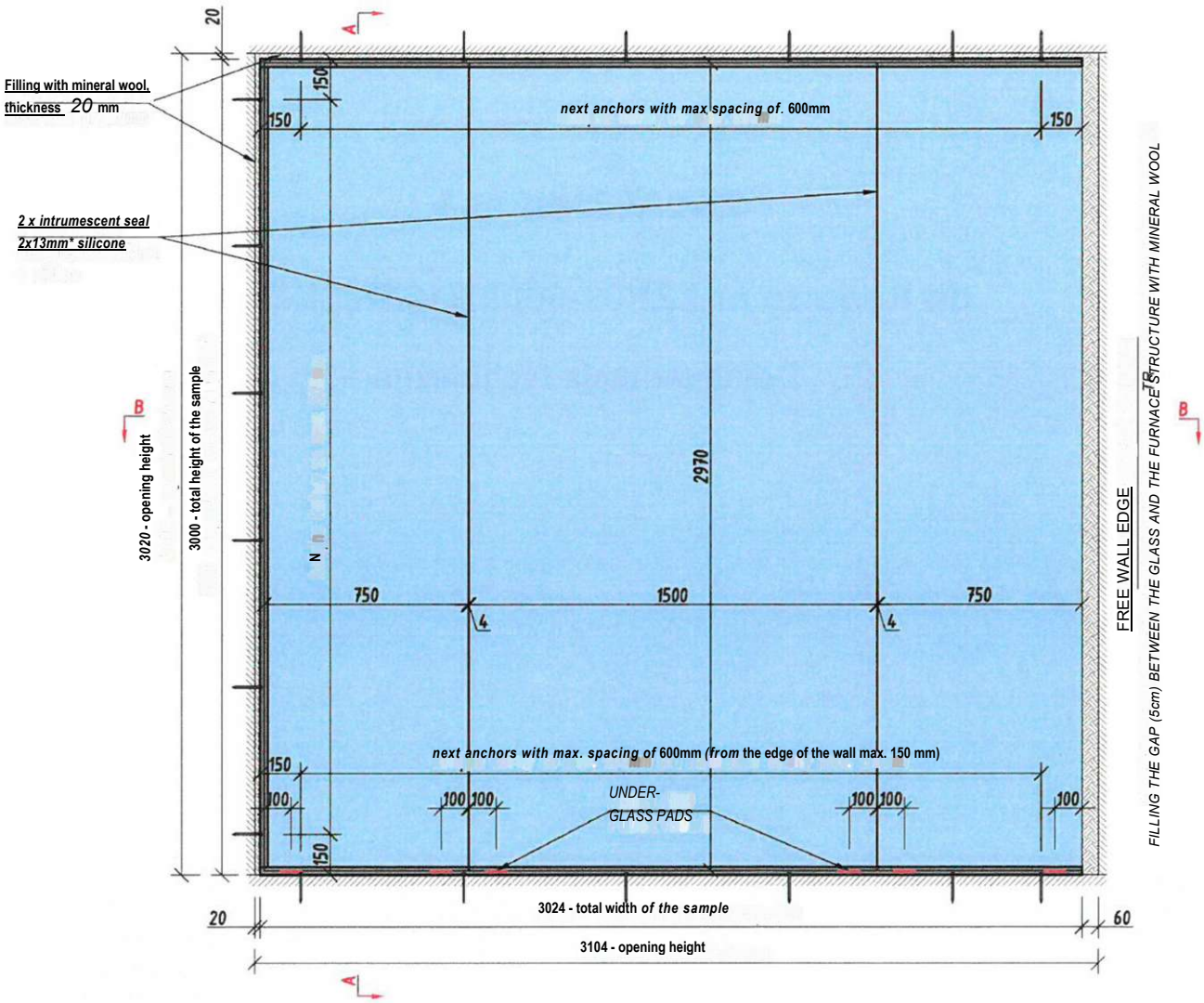


Fig. 1. General view of the test element from the non-heated side. Designation of cross-sections and attachment points

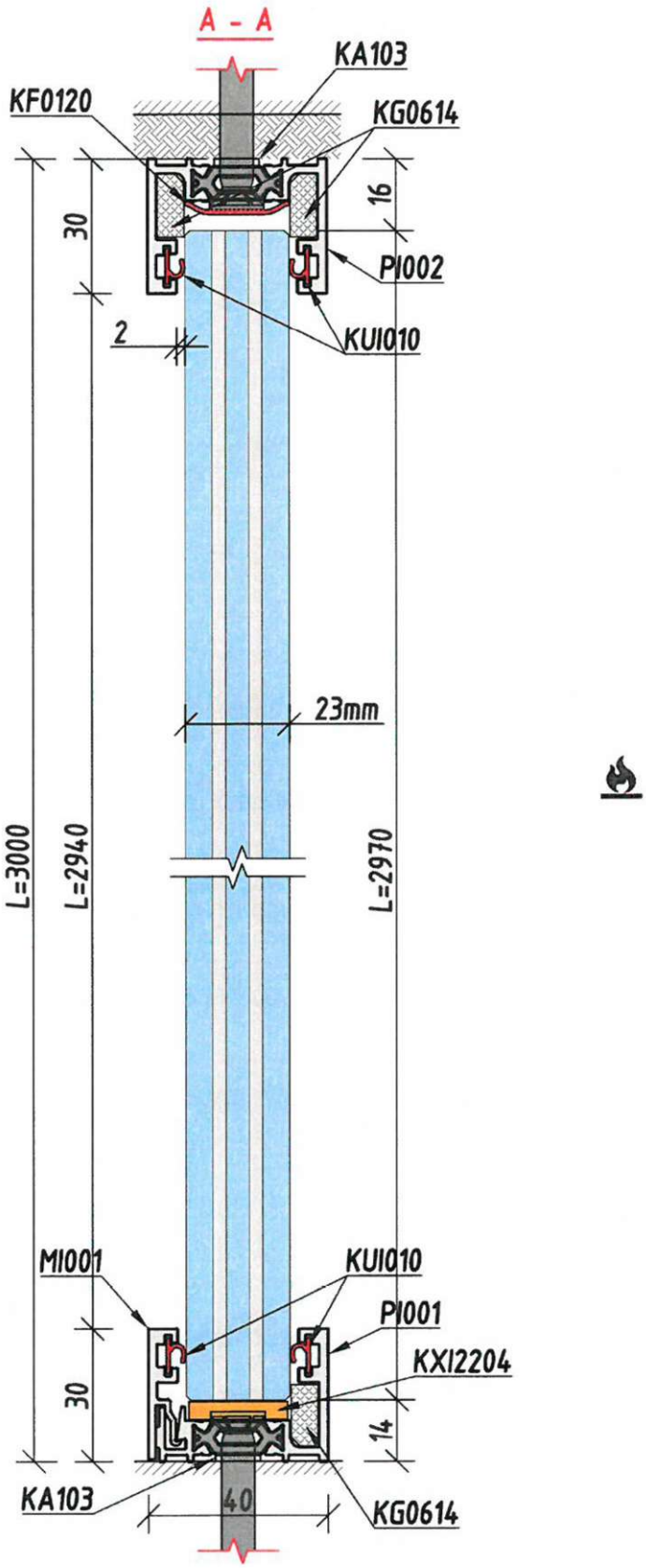


Fig. 2. Section A - A

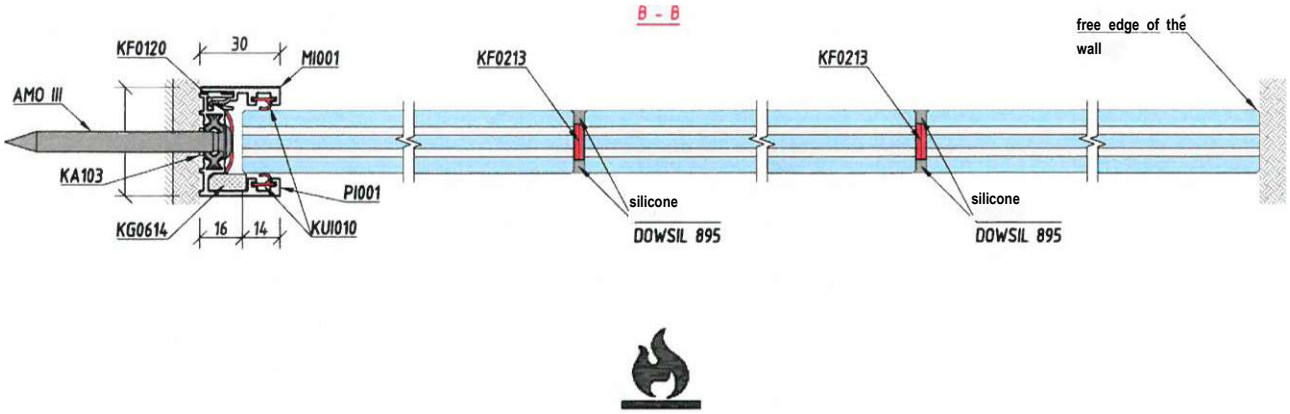


Fig. 3. Section B - B

LEGEND:

INTRUMESCENT GASKET ALONG THE ENTIRE LENGTH

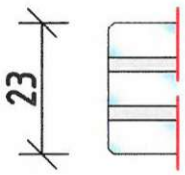
ACOUSTIC GASKET ALONG THE ENTIRE LENGTH

HARDWOOD GLASS PAD PLACED POINTLY UNDER THE GLASS

PLASTERBOARD ALONG THE ENTIRE PROFILE

POLYAMIDE PAD CLAMPED ALONG THE PROFILES

AMO III SCREW



CONTRAFLAM STRUCTURE 30 GLASS (6/5/6+2x3mm)

Fig. 4. Legend of markings

Appendix No. 2 to Report No. LZP02-06097/18/R03NZP/B

Temperature increase charts with the distribution of thermocouples and places of deformation measurement, pressure chart

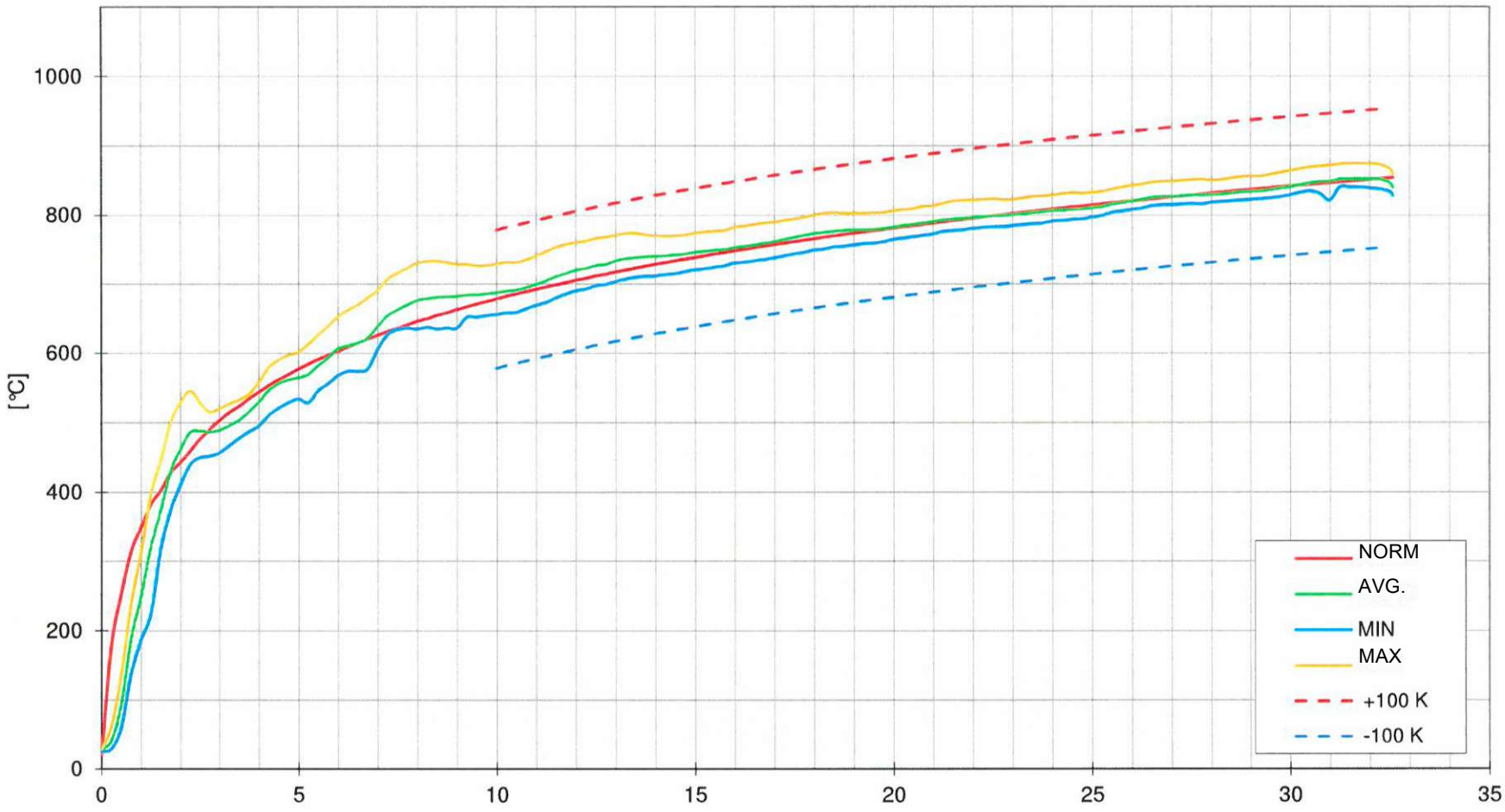


Fig. 1 Heating temperature chart of the test element

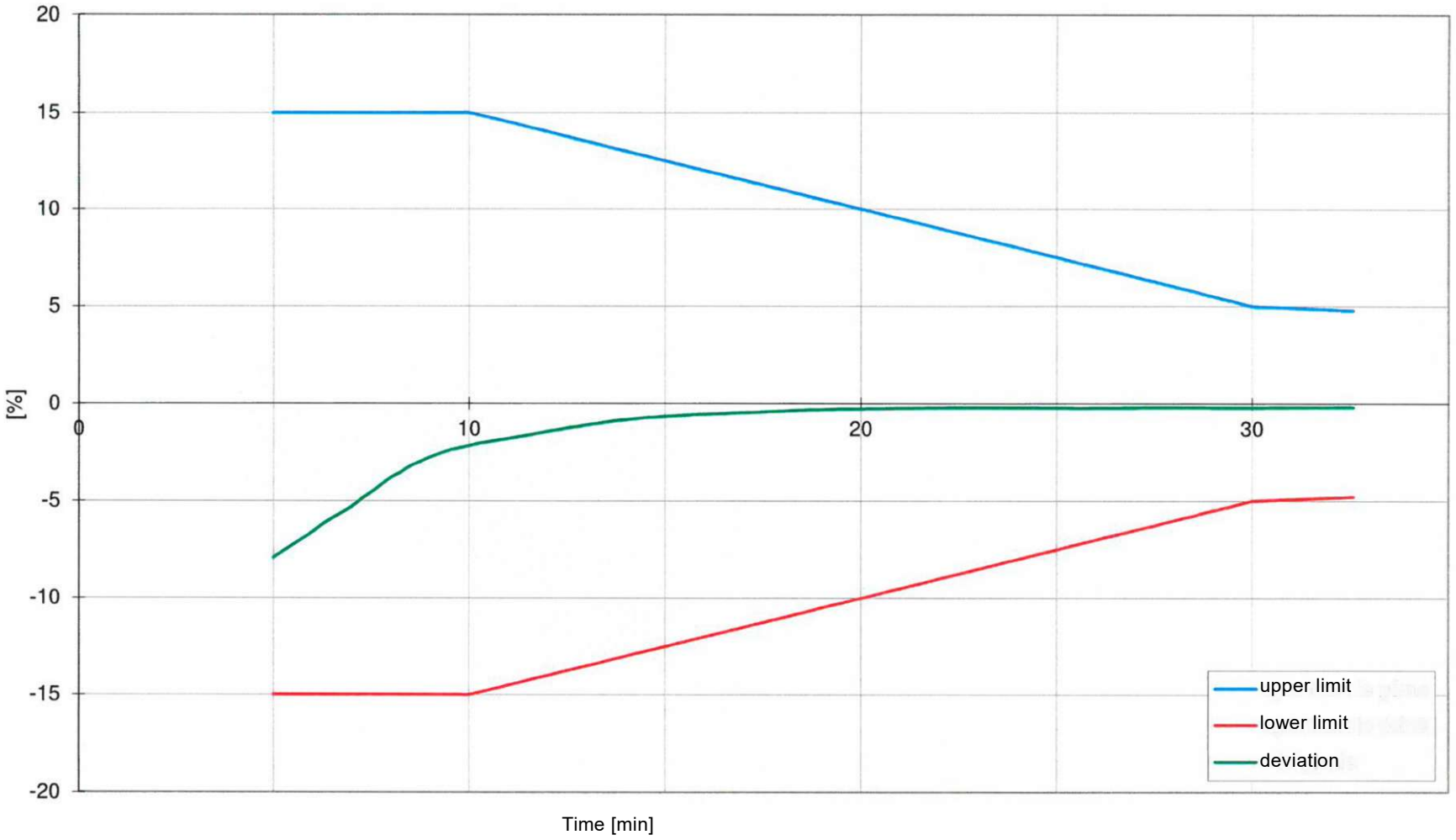


Fig. 2 Heating accuracy chart

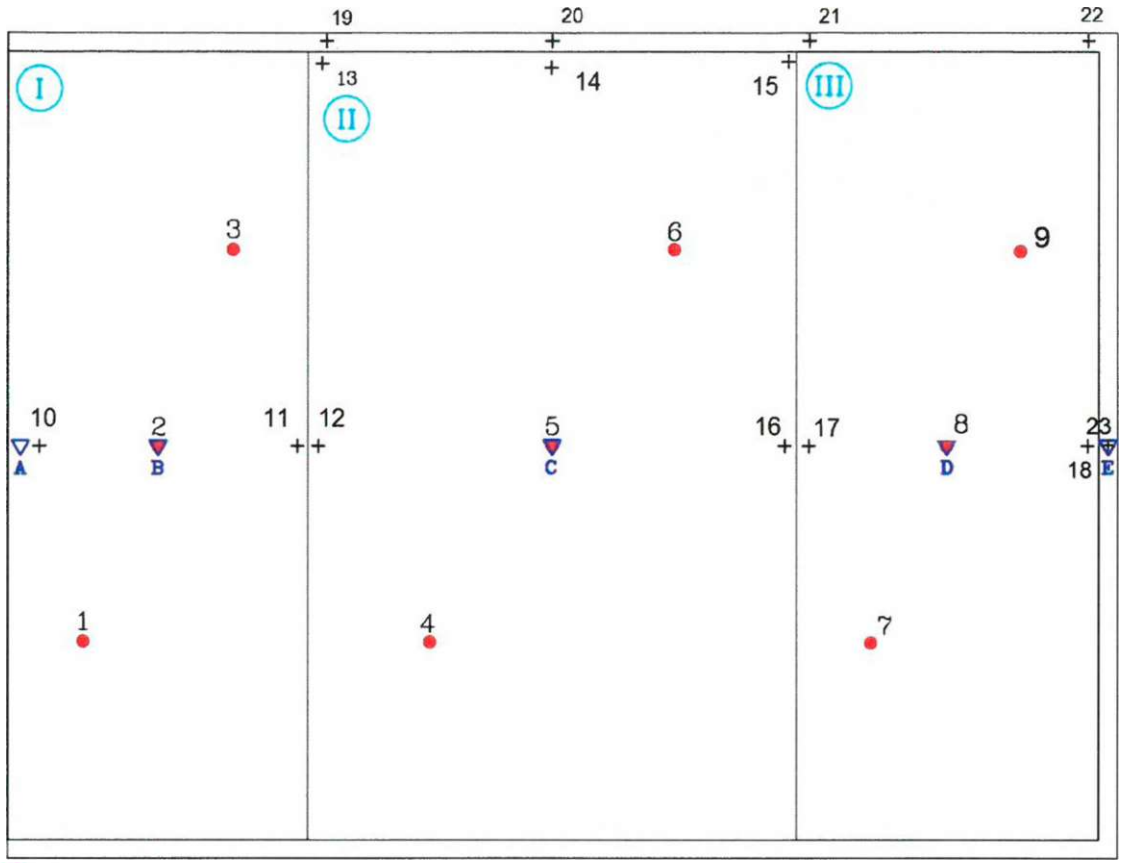


Fig. 3. Distribution of thermocouples on the unheated surface of the test element, numbering of glass panes and places of deformation measurement

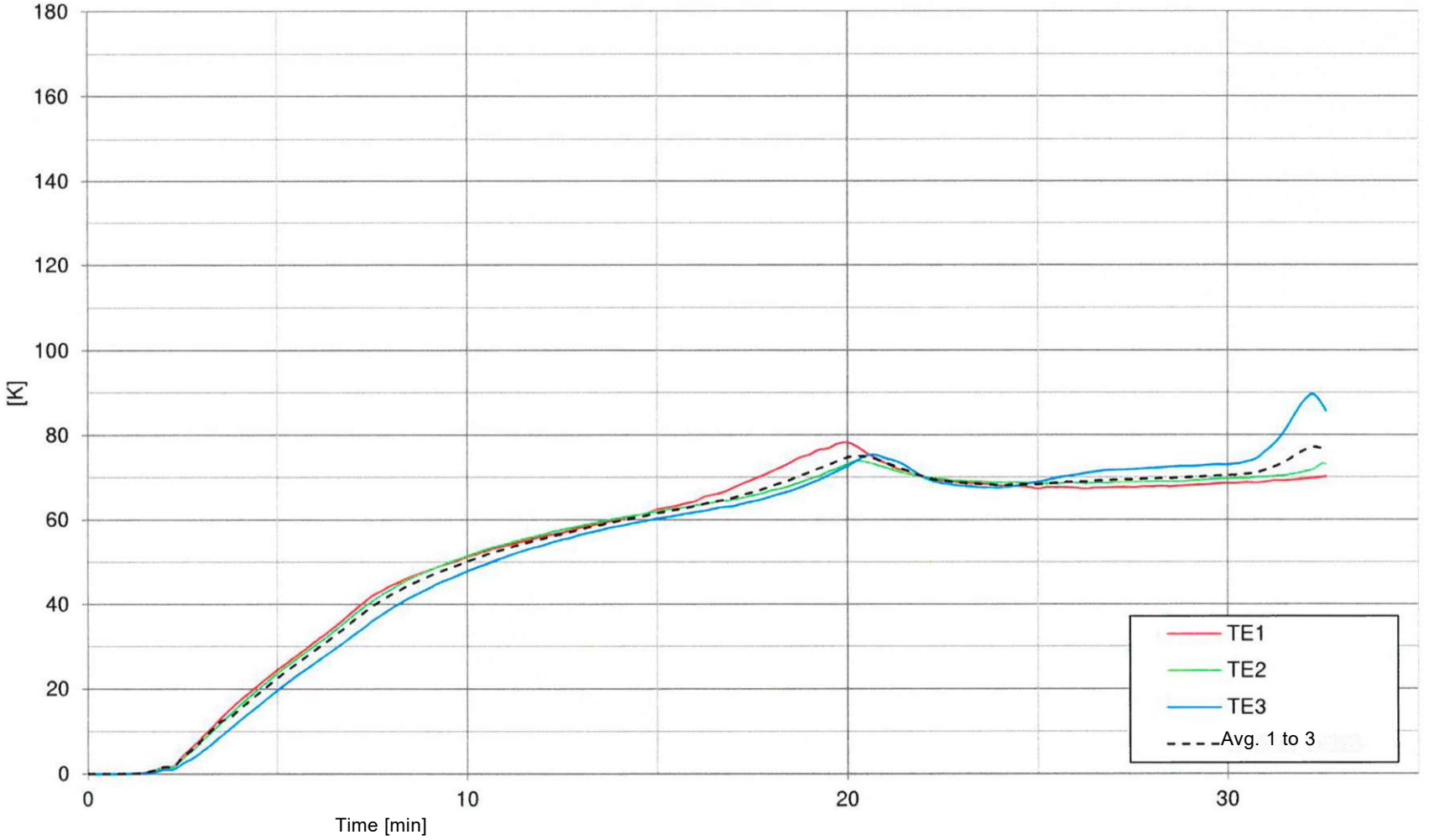


Fig. 4 Chart of temperature increase on the non-heated surface of the test element – indications from thermocouples for the average (maximum) temperature measurement

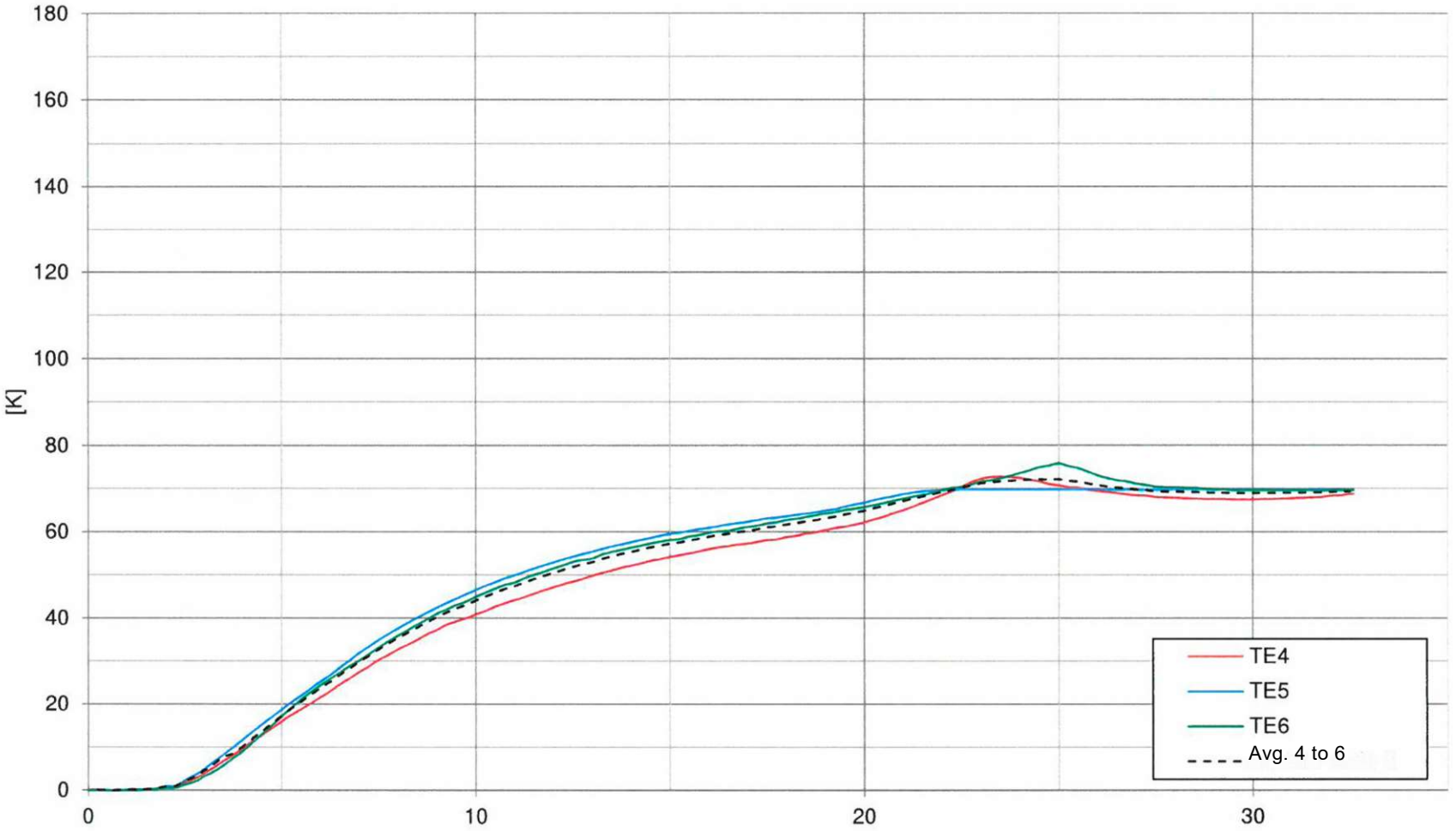


Fig. 5 Chart of temperature increase on the non-heated surface of the test element – indications from thermocouples for the average (maximum) temperature measurement

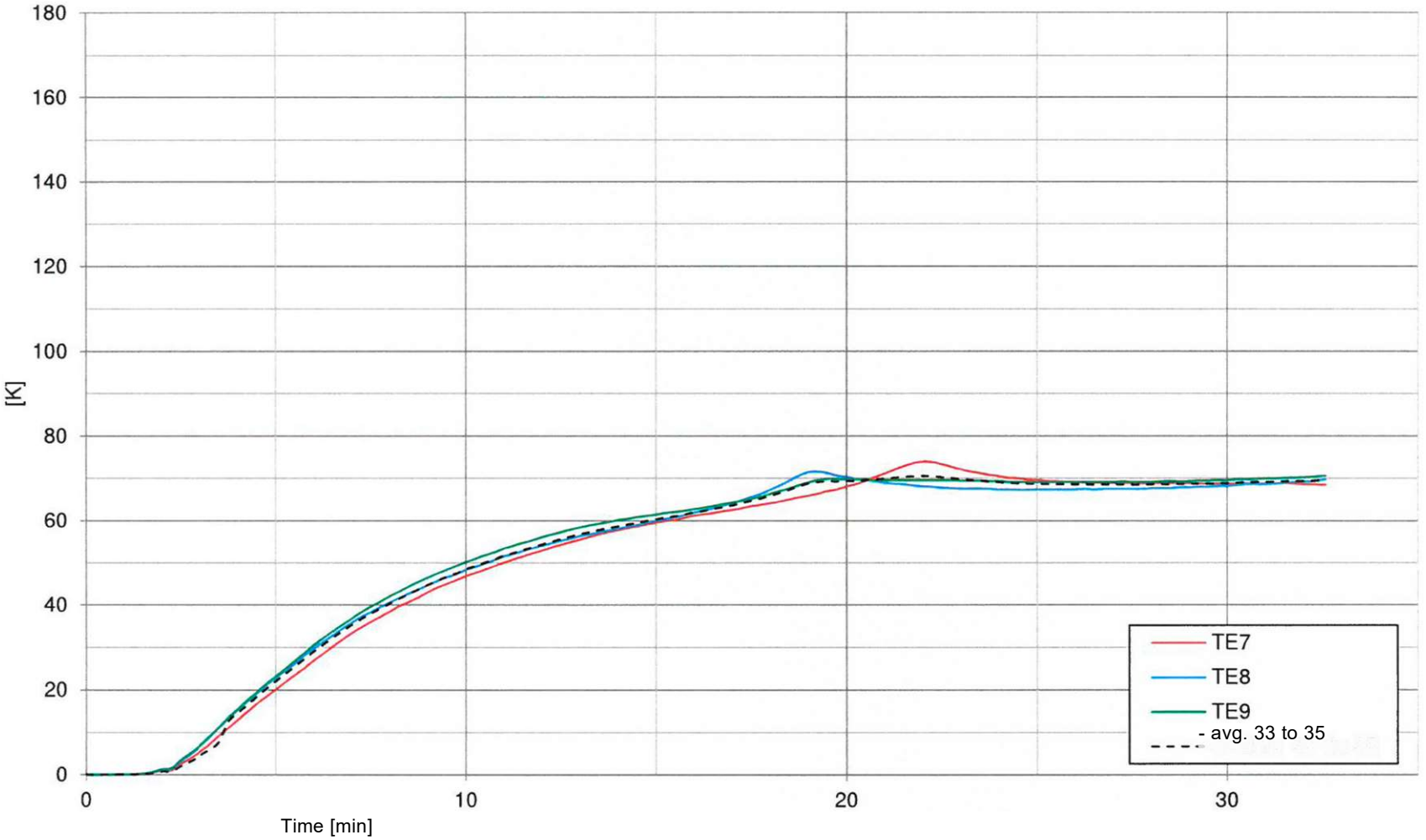


Fig. 6. Chart of temperature increase on the non-heated surface of the test element – indications from thermocouples for the average (maximum) temperature measurement

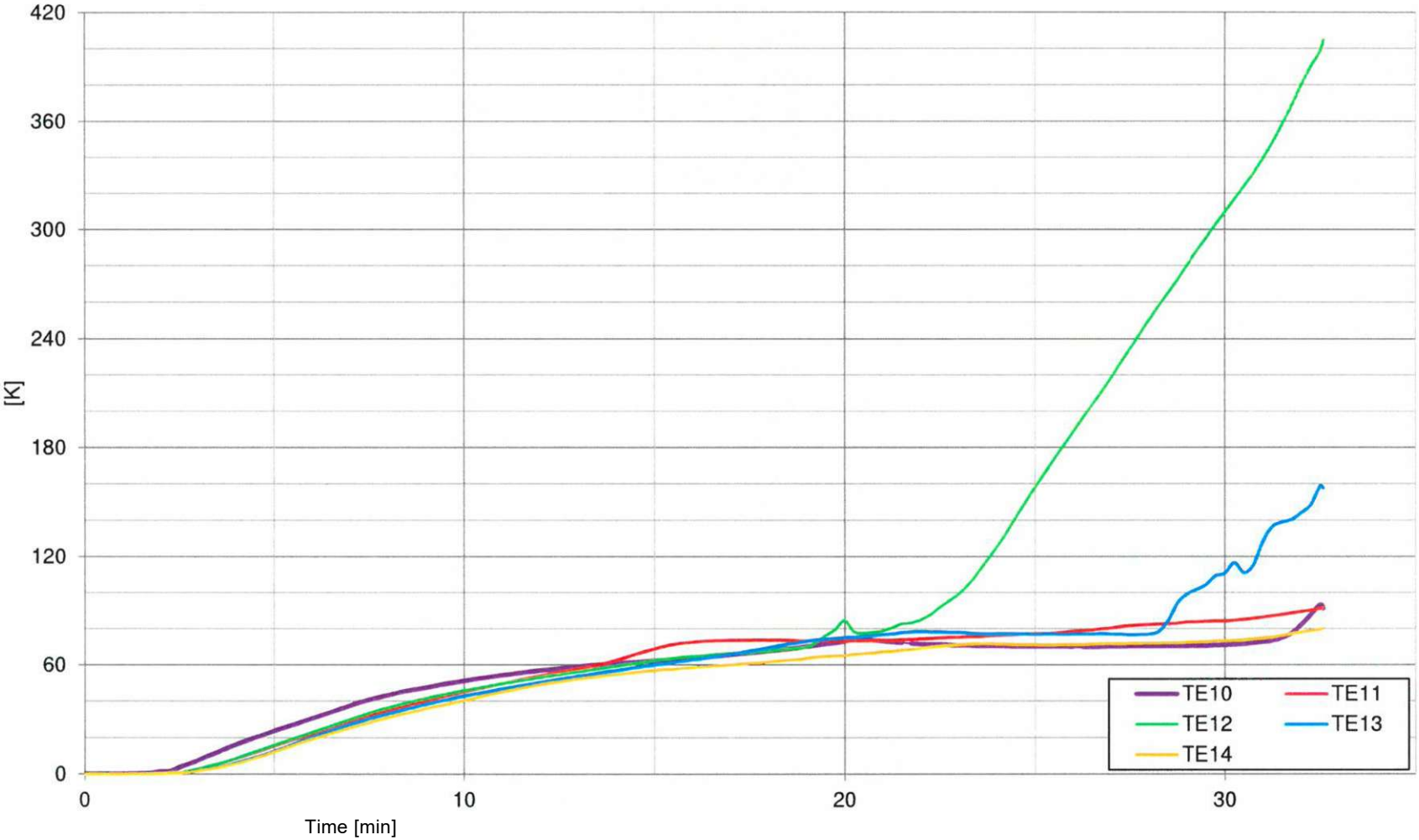


Fig. 7. Chart of temperature increase on the non-heated surface of the test element – indications from thermocouples for the maximum temperature measurement

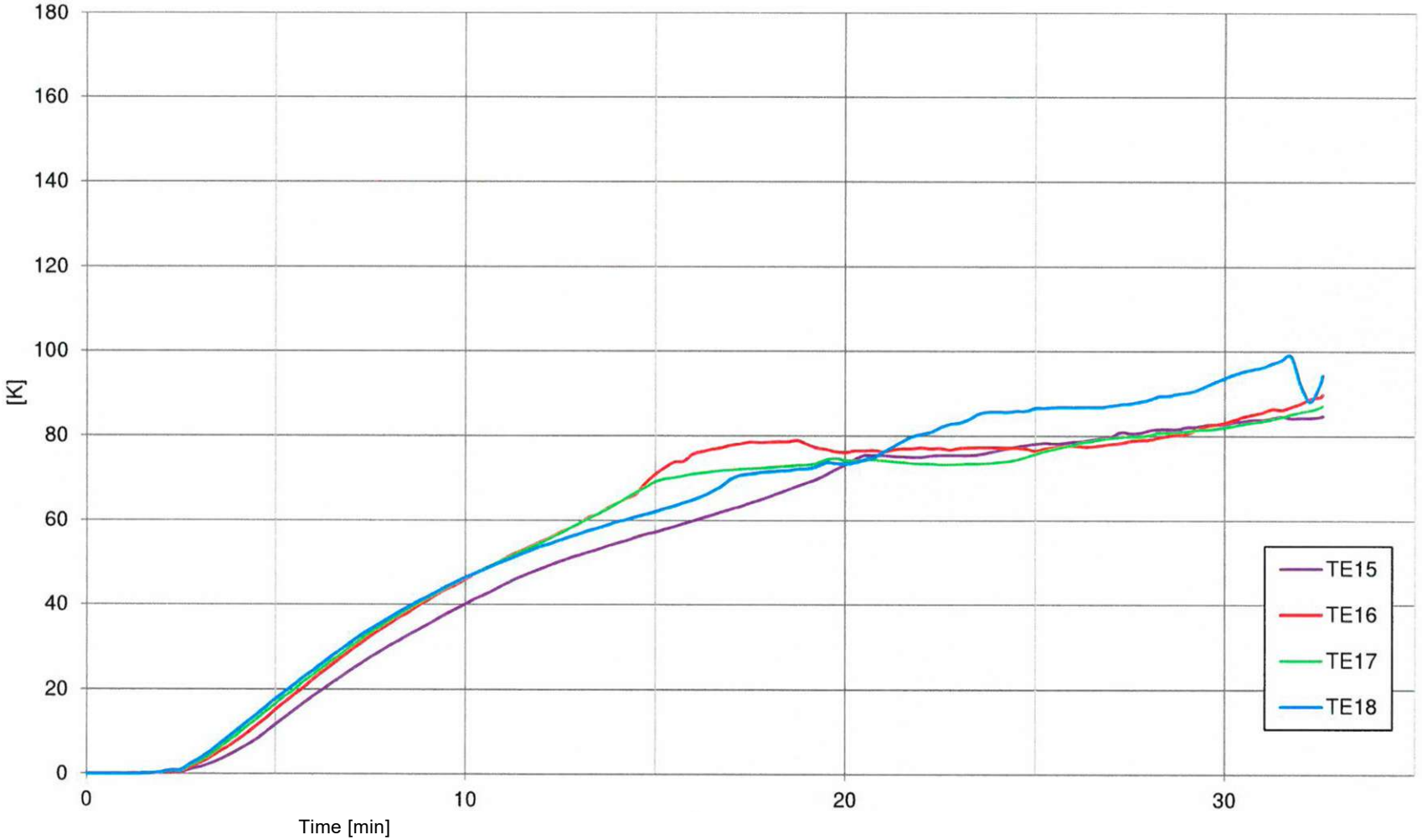


Fig. 8. Chart of temperature increase on the non-heated surface of the test element – indications from thermocouples for the maximum temperature measurement

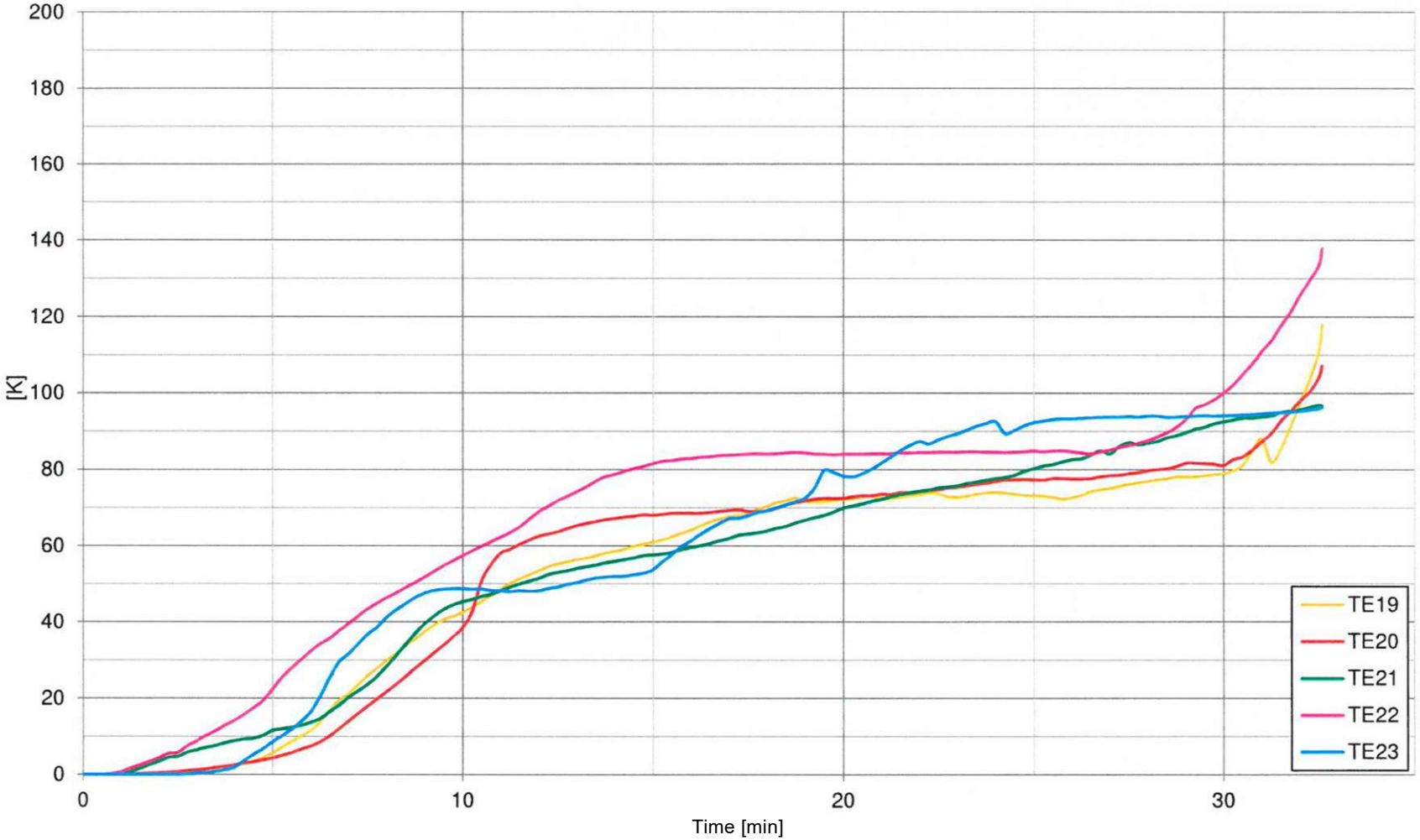


Fig. 9. Chart of temperature increase on the non-heated surface of the test element – indications from thermocouples for the maximum temperature measurement on the window frame (for information only)

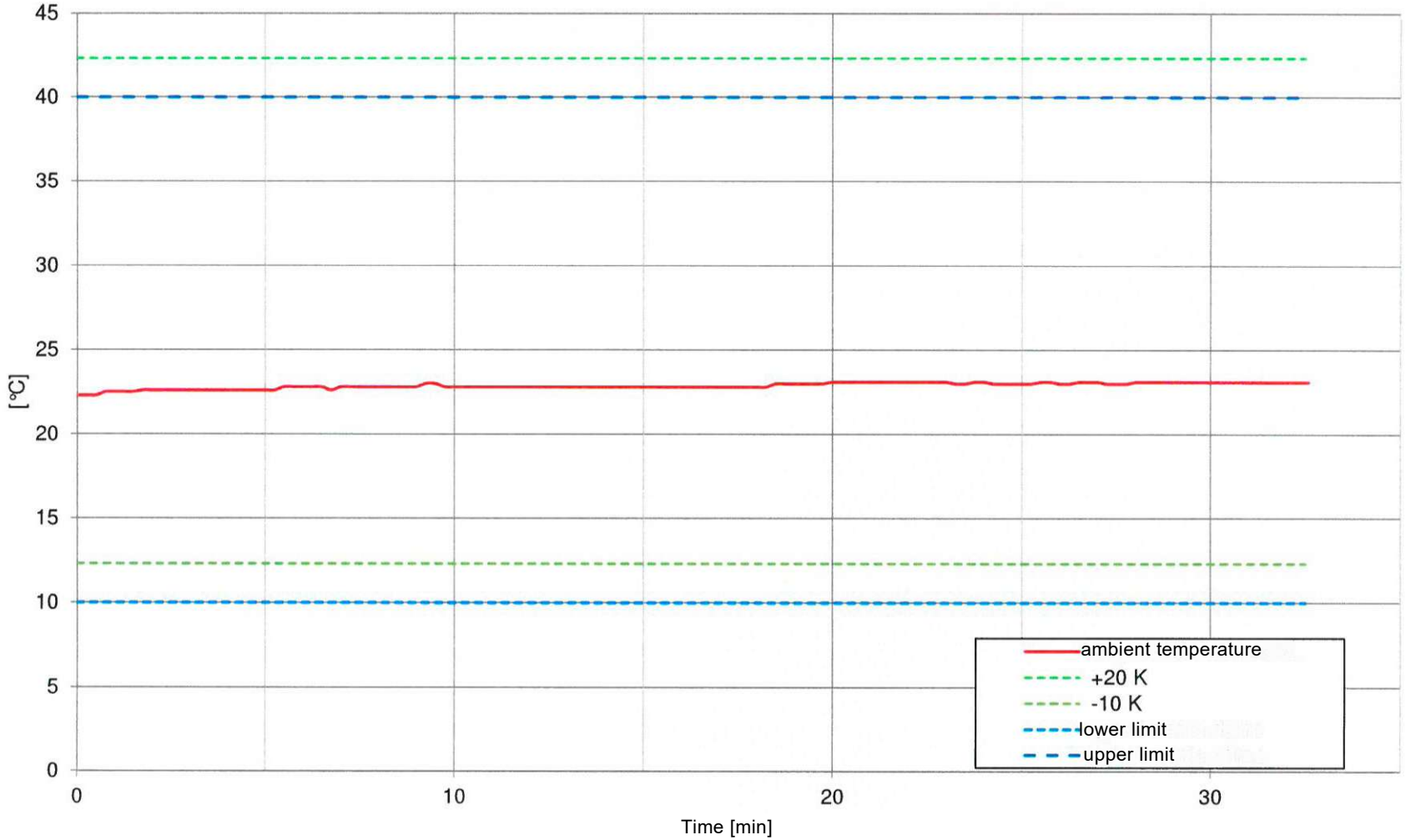


Fig. 10. Ambient temperature

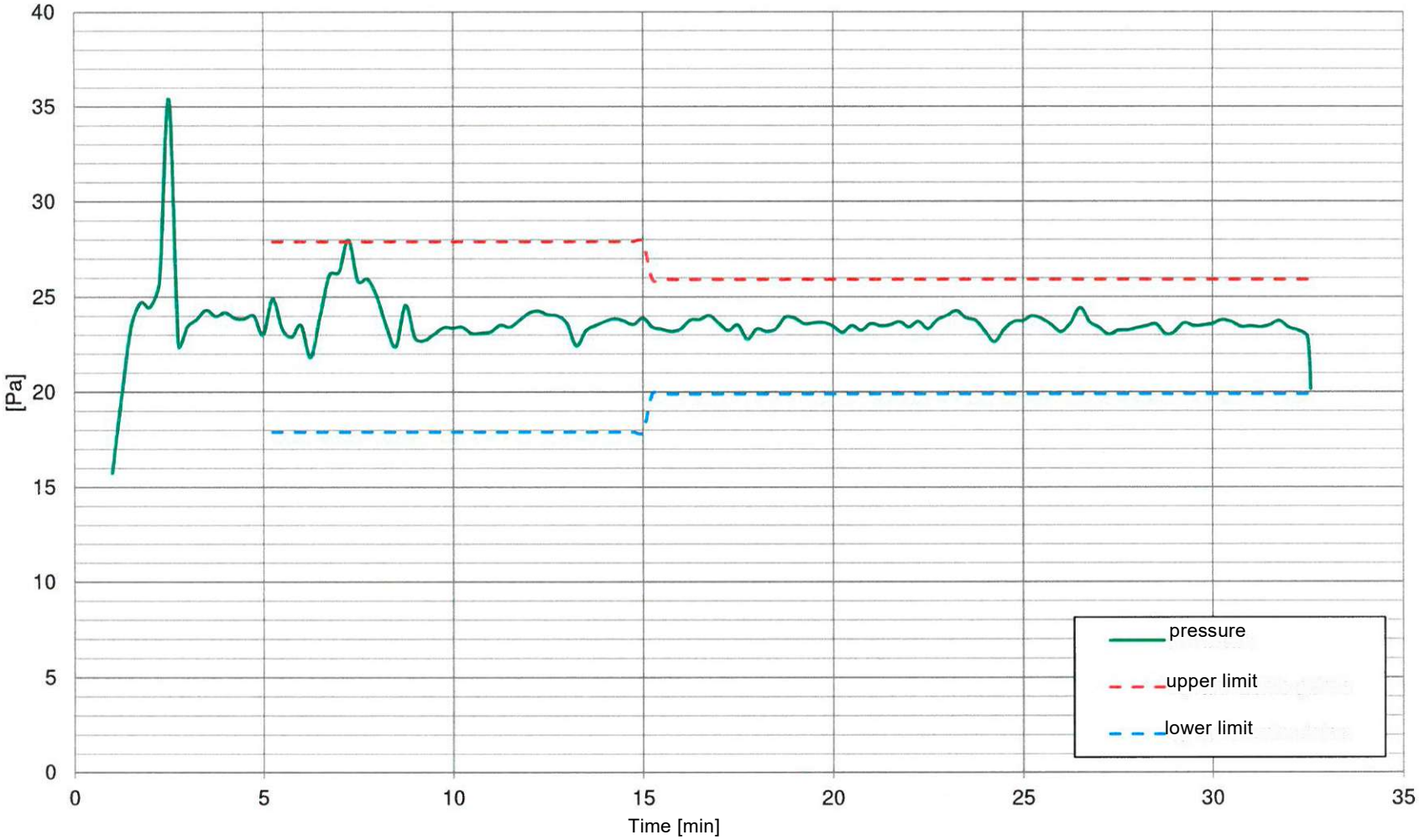


Fig. 11. Graph of pressure in the furnace during the test

Appendix No. 3 to Report No. LZP02-06097/18/R03NZP/B

Photographic documentation

Photo 1. View of the non-heated surface of the test element before testing

Photo 2. View of the heated surface of the test element in the 8th minute of the test

Photo 3. View of the non-heated surface of the test element at 16 minutes of the test

Photo 4. View of the non-heated surface of the test element at 21 minutes of the test

Photo 5. View of the portion of the test element unheated surface in the 27th minute of the test

Photo 6. View of the non-heated surface of the test element after the test

Appendix No. 4 to Report No. LZP02-06097/18/R03NZP/B

Acceptance protocol

Institute of Building Technique (Instytut Techniki Budowlanej)
Research Laboratories COMPLEX

PROTOCOL OF ACCEPTANCE OF THE SPECIMEN FOR TEST NO. LZP01- 06097/18/R03NZP

Number of the contract of the incoming document (or other number identifying the test object and the order): 06097/18/R03NZP

1 Object (name, type) accepted for testing by the Laboratory */text illegible/*,
PURE EI30 WALL
Ia. Appropriate number of the standard for the product: -

2. Method of packaging samples of the test object (based on visual inspection): /text illegible/

3. External condition/characteristics of samples of the test object
Very good

The condition and size of the sample/number of elements delivered (etc.) enable tests to be performed in accordance with the specifications

YES X NO

**) If NO, the laboratory should not proceed with the tests. Please contact the ordering party

4. Labeling of samples of the test object by manufacturer: -

4a. Information about the test object
- the manufacturer's name: *VITRINTEC SP. Z O.O.*
place of production (name and address of production plant) *Olszewskiego 19C, Kielce*
place of sampling -
- production line -
batch: no.: - size 3024 x 3000 mm
production date: 08.2019
- type, kind and variety of product: non-load-bearing wall
number/weight of samples 1
Other information: /text illegible/
Or***)
As in**. Appendix No. 1 from test report** which constitutes an annex to this Protocol

5. CLIENT (Name, address):
5a X Manufacturer
□ Authorized representative
□ Importer

6. Other information regarding the acceptance of samples of the test object: Assembly by the Client

Supplier /	Recipient
/Text illegible/	*/Text illegible/*
First name and last name.	First name and last name
Signature	Signature

Pionki, 27/07/2018

* - if applicable
** - If information from point 4a are included in the collection protocol or another document signed by the ordering party, you can include this document without having to copy the information)