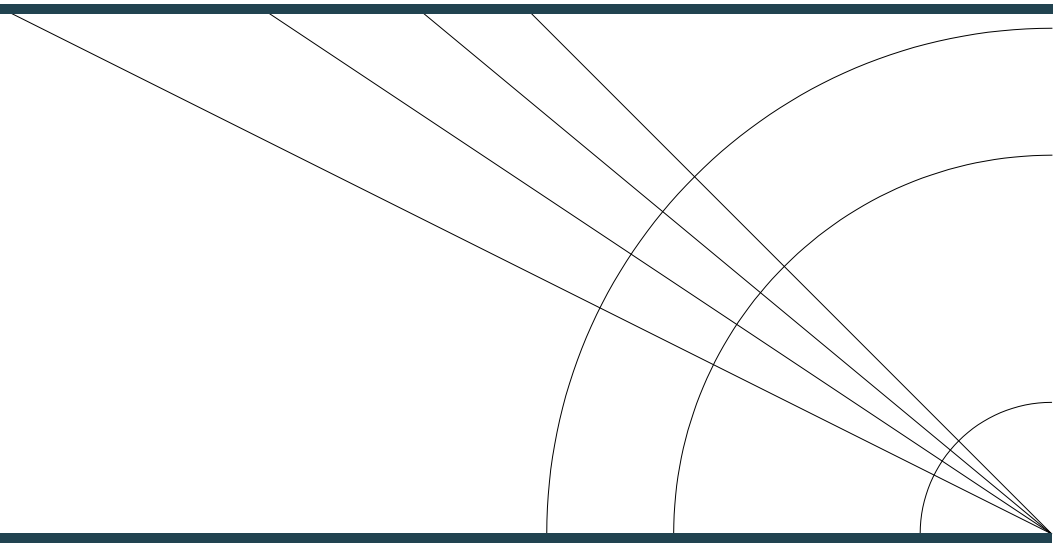
DBI
FIRE AND SECURITY

CLASSIFICATION REPORT
LOADBEARING WALL

Name of sponsor:	**Realdania By og Byg A/S**		
Product name:	Loadbearing wall		
File no.:	PCA10972A	**Revision No:**	0
Date:	10-07-2024		
Pages:	6	**Encl.:**	NA
Ref:	CHD / CHB		



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Notified Body no. 0845

ilac-MRA DANAK
TEST Reg.no.0012

Client information

Client: Realdania By og Byg A/S

Address: Jarmers Plads 2

1551 København V

Denmark

The results relate only to the items tested. The classification report should only be reproduced in extenso – in extracts only with a written agreement with this institute.

Content

Introduction

This classification report defines the classification assigned to the product in accordance with the procedures given in EN 13501-2:2023.

This classification report includes the direct field of application of the test results.

Details of classified product

General

Producer of product: Poroton

The product was designated: Poroton Planziegel T1.2-175, Maxit mur 900 D

The classification is valid for the following end use application: Loadbearing element with fire separating function.

Product description

The product is a loadbearing wall consisting of 175 mm Poroton blocks with Poroton mortar in between.

The test specimen was symmetrical.

Blocks designation:	Poroton Planziegel T1.2-175, with a nominal density of 1110 kg/m^3, and a thickness of 175 mm.
Mortar designation:	Maxit mur 900 D, with a density of 900 kg/m^3, and the thickness of the mortar layer is 1 mm.
Size of the test product:	3000 x 2950 x 175 mm (Height x Width x Thickness)

The details of the product are described in DBI test report PGA12453A.

Reports in support of the classification

Test report

The product was successfully tested in accordance with EN 1365-1:2020. The evidence for this is given in the test report listed below:

Reference test:				
Name of Laboratory	Name of sponsor	Test report file no.	Test method	Date of test
Danish Institute of Fire and Security Technology	Realdania By og Byg A/S	PGA12453A dated 04-07-2024	EN 1365-1:2012	15-02-2024

Test results

DBI test report PGA12453A concerns a fire test of the loadbearing wall with the fire on the interior side.

Test Duration	Parameter	Test results
240 minutes	**Load-bearing capacity**	
	- Failure: The load could not be maintained	No failure
	- Failure of vertical axial contraction:	No failure
	- Failure of vertical axial contraction rate:	No failure
	Integrity	
	- Failure of insulation due to failure of load-bearing capacity:	No failure
	- Time of ignition of cotton pad:	No failure
	- Time of occurrence of sustained flaming:	No failure
	- Time of failure of gap gauge criteria:	No failure
	Insulation	
	- Failure of insulation due to failure of integrity or load-bearing capacity:	No failure
	- Time of failure of measured average temperature rise:	No failure
	- Failure of maximum measured temperature rise:	No failure
	- Maximum average temperature rise on the unexposed surface during the test:	113 °C
	- Maximum temperature rise on the unexposed surface during the test:	164 °C

Classification and field of application

Reference

This classification has been carried out in accordance with clause 7.3.2 of EN 13501-2:2023.

Classification

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: **REI 240**

The classification is valid for fire resistance from either side.

Field of application

The classification is valid for the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

- With decrease in height of the construction. Maximum height 3000 mm.
- With increase in the thickness of the wall. Minimum thickness 175 mm.
- With increase in the thickness of component materials.
- With decrease in the linear dimensions of the blocks but not the thickness. Maximum block dimension is 249 mm x 373 mm (height and width)
- With increase in the number of horizontal joints of the tested.
- With increase in the number of vertical joints of the tested.
- With increase in the width of the construction.
- With decrease in the applied load. The load should be applied centrally on the top of the construction with a maximum of 133.07 kN/m.
- All other details should be as in test report PGA12453A.

Limitations

This document does not represent type approval or certification of the element.

Danish Institute of Fire and Security Technology

Chunyang Dong

Chunyang Dong
M.Sc. (Safety Eng.)

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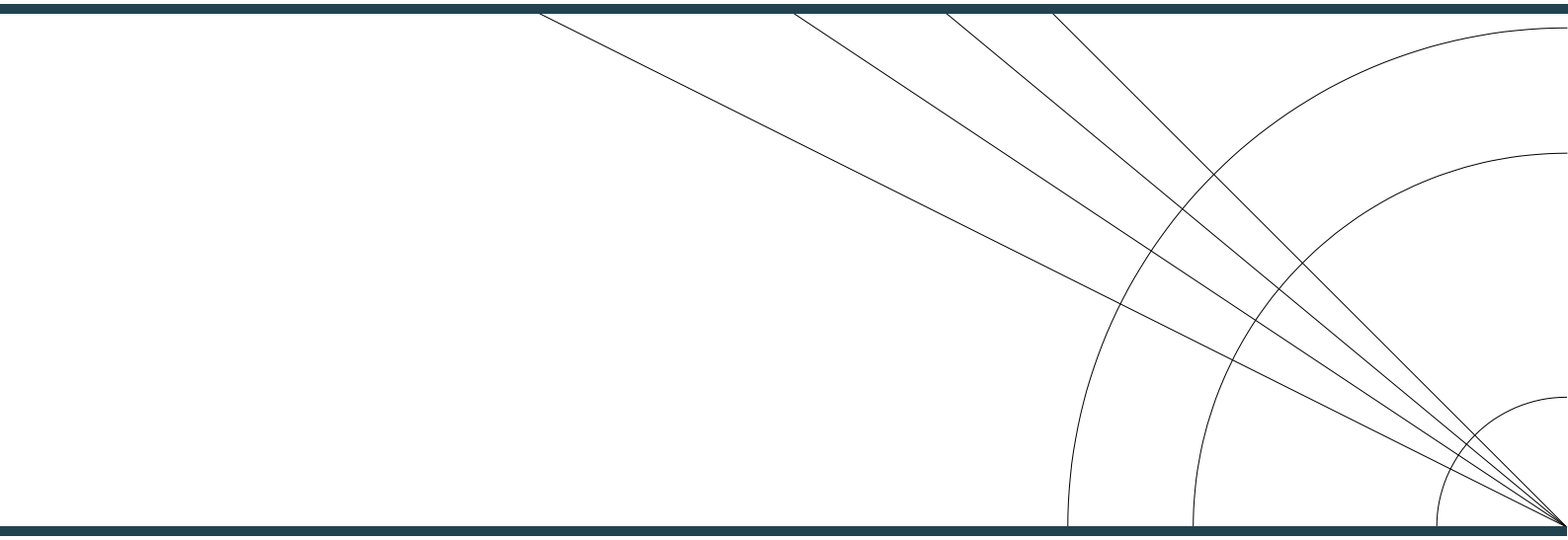
DBI
FIRE AND SECURITY

CLASSIFICATION REPORT
LOADBEARING WALL

Name of sponsor:	Realdania By og Byg A/S		
Product name:	Loadbearing wall		
File no.:	PCA10973A	**Revision No:**	0
Date:	25-09-2024		
Pages:	6	**Encl.:**	NA
Ref:	CHD / CHB		



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Client information

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Content

Introduction

This classification report defines the classification assigned to the product in accordance with the procedures given in EN 13501-2:2023.

This classification report includes the direct field of application of the test results.

Details of classified product

General

Producer of product: Poroton

The product was designated: Poroton S8 425, Maxit mur 900 D

The classification is valid for the following end use application: Loadbearing element with fire separating function.

Product description

The product is a Loadbearing wall consisting of 425 mm Poroton blocks with Proton mortar in between.

The test specimen was placed 32 mm eccentrically away from the fire side.

Blocks designation:	Poroton S8 425, with a nominal density of 715 kg/m^3, and a thickness of 425 mm.
Mortar designation:	Maxit mur 900 D, with a density of 900 kg/m^3, and the thickness of the mortar layer was 1 mm.
Size of the test product:	3000 x 2975 x 425 mm (Height x Width x Thickness)

The details of the product are described in DBI test report PGA12460A.

Reports in support of the classification

Test report

The product was successfully tested in accordance with EN 1365-1:2012. The evidence for this is given in the test report listed below:

Reference test:				
Name of Laboratory	Name of sponsor	Test report file no.	Test method	Date of test
Danish Institute of Fire and Security Technology	Realdania By og Byg A/S	PGA12460A dated 25-09-2024	EN 1365-1:2012	27-03-2024

Test results

DBI test report PGA12460A concerns a concern the fire test of the loadbearing wall with the fire on the exposed side

Test Duration	Parameter	Test results
240 minutes	**Load-bearing capacity**	
	- Failure: The load could not be maintained	No failure
	- Failure of vertical axial contraction:	No failure
	- Failure of vertical axial contraction rate:	No failure
	Integrity	
	- Failure of insulation due to failure of load-bearing capacity:	No failure
	- Time of ignition of cotton pad:	No failure
	- Time of occurrence of sustained flaming:	No failure
	- Time of failure of gap gauge criteria:	No failure
	Insulation	
	- Failure of insulation due to failure of integrity or load-bearing capacity:	No failure
	- Time of failure of measured average temperature rise:	No failure
	- Failure of maximum measured temperature rise:	No failure
	- Maximum average temperature rise on the unexposed surface during the test:	17 °C
	- Maximum temperature rise on the unexposed surface during the test:	48 °C

Classification and field of application

Reference

This classification has been carried out in accordance with clause 7.3.2 of EN 13501-2:2023.

Classification

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: **REI 240**

This classification is valid for fire resistance from the exposed side only.

Field of application

The classification is valid for the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

- With decrease in height of the construction. Maximum height 3000 mm.
- With increase in the thickness of the wall. Minimum thickness 425 mm.
- With increase in the thickness of component materials.
- With decrease in the linear dimensions of the blocks but not the thickness. Maximum block dimension is 249 mm x 248 mm (height and width)
- With increase in the number of horizontal joints of the tested.
- With increase in the number of vertical joints of the tested.
- With increase in the width of the construction.
- With decrease in the applied load. The load should be applied 32mm eccentrically towards the exposed side on the top of the construction with a maximum of 133.07 kN/m.
- All other details should be as in test report PGA12460A.

Limitations

This document does not represent type approval or certification of the element.

Danish Institute of Fire and Security Technology

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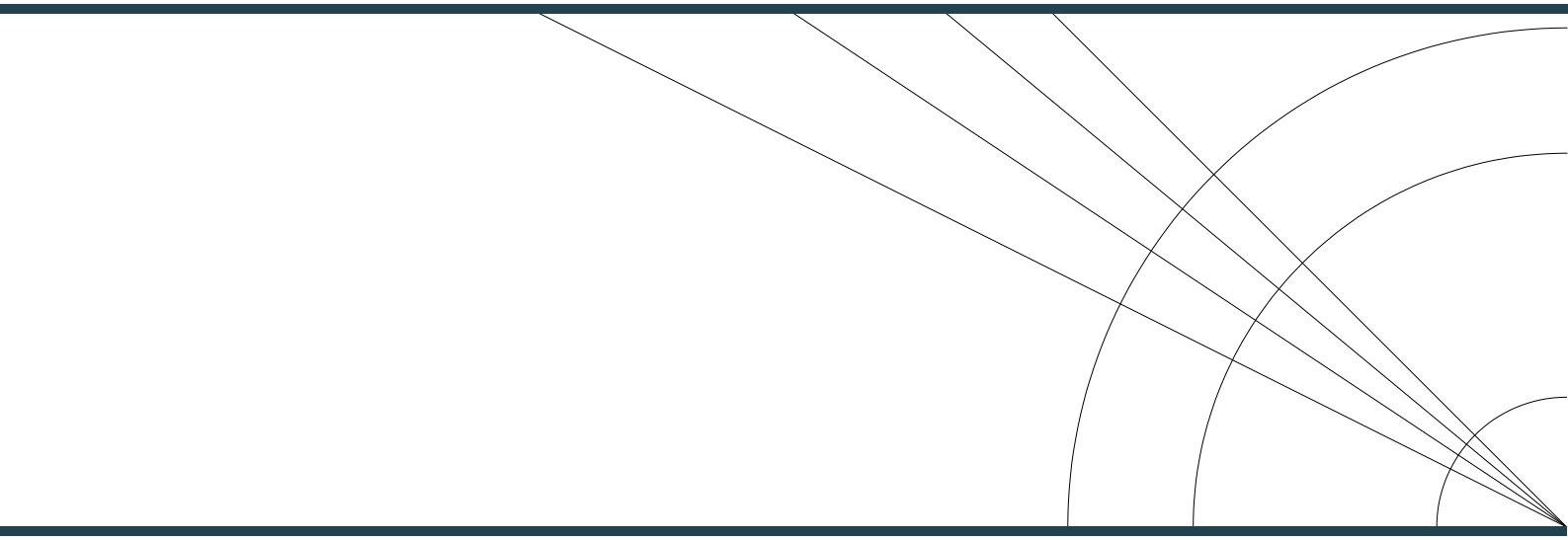
TEST REPORT
LOADBEARING WALL

Name of sponsor:	Realdania By og Byg A/S		
Product name:	Loadbearing wall		
File no.:	PGA12453A	**Revision no.:**	1
Test date:	15-02-2024	**Date:**	04-07-2024
Pages:	9	**Encl.:**	35
Ref:	MMN / CHB		



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TEST Reg.no.0012

Client information

Client: Realdania By og Byg A/S

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Revision chronology				
Rev. no.	Date	Description	Author	Approved
0	10-04-2024	Original	MMN	KTO
1	04-07-2024	Changed loading section	MMN	CHB

Content

Date of test

The test was conducted on 15-02-2024.

Purpose of test

Examination of the fire-resistance of one Loadbearing wall

The test specimen has been subjected to a standard fire test in accordance with the following standards:

DS/EN 1363-1:2020 Fire resistance tests – General requirements

in conjunction with

EN 1365-1:2012 Fire resistance tests for loadbearing elements — Part 1: Walls

Test specimen

The trade name and sponsors identification mark is stated below:

Trade name:	Maxit mur 900 D
Identification mark:	None

The components for the test specimen were delivered and mounted by the sponsor.

Drawings and description

Details of the construction are shown in the enclosed documentation as stated below:

Type	Drawing No.	Dated	Subject
Drawing	A351	05-02-2024	MC2_DBI_175mmvæg REVA

The documentation is supplied by the sponsor and it is stamped by DBI - Danish Institute of Fire and Security Technology

Description

The test specimen consisted of the components described in the following. DBI inspected the components during mounting, the test and after the test.

The sponsor carried out the selection of the products for the test specimen as well as the mounting.

Test specimen

External measures: Height: 3000 mm Width: 2950 mm Thickness: 175 mm

Loadbearing wall consisting of Poroton blocks with Proton mortar in between.

The test specimen was symmetrical.

Construction

Blocks: The Poroton block, with a nominal density on 1110 kg/m^3, were mounted on each other, with groove and tongue principle. They were fastened to each other by laying Poroton mortar in between, with a density on 900 kg/m^3, before placing the blocks.
The blocks were placed staggered on top of each other. The mortar was only placed on top of the blocks. The thickness of the mortar layer was 1 mm. There wasn't placed any mortar in the bottom of the frame before placing the blocks.

Measured by DBI

Product		Poroton mortar	175mm Poroton block
Density	kg/m³	921	1007
Thickness	mm		175 mm
Moisture content	%	16.3	0.03
Sampling method		Extra material	Extra material
Drying temperature	°C	105	105

Test conditions

Conditioning

The test specimen was delivered on the 12-01-2024 to the DBI laboratory and stored under room temperature. On the day of the fire testing the condition of the test specimen was similar with respect to its moisture content as the test specimen would be in normal service.

Mounting

The test specimen was mounted simple supported in a test frame suitable for loaded tests with a clear opening of 3000 x 3030 mm.

Free edge was established along both vertical edges of the test specimen (2 x 25 mm stone wool with alu-foil in each side) to allow for unrestrained deformation of the test specimen.

Loading

The test specimen was loaded with a total applied load of 392.56 kN (40.000 kg) during the test, corresponding to a load of 131.07 kN/m.

The wall was loaded with a dead load of 900 kg from the loading equipment. The applied load was 13033 kg from each of the three hydraulic jacks.

The load was applied centrally on the top of the wll, e.g. there was no eccentricity in the loading conditions.

The loading conditions correspond to example b) in figure 1 in EN 1365-1:2012. The figure describes the load transfer system at head with loading from above. The wall was simple supported at the bottom.

The load was applied in 10 steps prior to the fire test. The fire test was commenced approx. 30 minutes after reaching the final load on the test specimen.

Fire test

Observations were made during the test on the general behavior of the test specimen.

Temperature observations were taken continually during the entire testing time.

The surface temperatures were measured on the unexposed surface of the test specimen as indicated on DBI drawing no. 1.0.

The furnace temperature was determined by means of plate thermocouples uniformly distributed at approximately 100 mm from the exposed side of the test specimen. The furnace temperature was continuously controlled to follow the standard time temperature curve within the accuracy specified in EN 1363-1:2020.

The thermocouples were constructed according to the description in EN 1363-1:2020.

The pressure was controlled at 20 pa at the top of the test specimen. The pressure was measured 1.08 m above the bottom of the test specimen, resulting in a pressure of 3.68 pa.

Test results

Duration of the test was 240 minutes.

Measurements

The enclosed graphs and tables show:

Enclosures 2.0 and 2.1	Furnace temperatures The actual minimum-, average- and maximum furnace temperature in relation to the standard temperature. The table also shows the area under the actual time-temperature curve as well as the area under the standard time-temperature curve
Enclosures 3.0 and 3.1	Vertical furnace pressure The differential pressure in the furnace during the test, measured 1,5 m above notional floor level
Enclosures 4.0 and 4.1	Ambient temperature The ambient temperature in the laboratory during the test
Enclosures 5.0 and 5.1	Average temperature rise Measured with 5 thermocouples on the unexposed side
Enclosures 6.0 and 6.1	Maximum temperature rise Maximum temperatures on the unexposed side
Enclosures 7.0 and 7.1	Horizontal deformation Negative values indicate movement towards the furnace
Enclosures 8.0 and 8.1	Vertical deformation Positive values indicate downwards movement
Enclosures 9.0 and 9.1	Vertical deformation rate
Enclosures 10.0 and 10.1	Load per cylinder Load per cylinder during test
Enclosures 11.0 and 11.1	Horizontal deformation Negative values indicate movement towards the furnace
Enclosures 12.0 and 12.1	Vertical deformation Negative values indicate downwards movement
Enclosures 13.0 and 13.1	Load per cylinder Load per cylinder during test

Visual observations:

Time / Minutes	Visual observations:	U = Unexposed side E = Exposed side
0	Test commences	

15	No changes	U
22	Cracking sounds from the test specimen	U
24	Smoke from the block joint near Thermocouple 1.2	U
40	No changes	U
60	No changes	U
66	Cracking sounds from the test specimen	U
71	Cracking sounds from the test specimen continues	U
72	Cracking sounds from the test specimen continues	U
80	Cracking sounds from the test specimen continues	U
98	Cracking sounds from the test specimen continues	U
120	No visible changes occurred	U
150	No visible changes occurred	U
177	Cotton pad test shows nothing	U
238	Cotton pad test shows nothing	U
241	Test stopped by sponsor	

The photographs on the attached photo sheets show the test specimen during the mounting, testing and after the test. See the description at each photo.

After the test: The exposed side had a red glow while it was hot and was whitened when cooled.

Conclusion

Fire resistance testing according to EN 1365-1:2012 of the construction described in this test report showed that failure according to the performance criteria stated in the test method occurred at the following time:

Load-bearing capacity (R): 240 minutes

- The load on the test specimen was maintained during the entire test.
- The measured vertical deflection did not exceed the criteria of C = h/100 = 30 mm during the test.
- The measured rate of vertical deflection did not exceed the criteria of dC/dt = 3h/1000 = 9 mm/min during the test.

Integrity (E): 240 minutes

- Sustained flaming did not occur during the test.
- The cotton pad was not ignited during the test.
- No through-going openings in the test specimen were created during the test.

Insulation (I):	**240 minutes**

- Failure of insulation did not occur during testing.
- The average temperature rise on the unexposed surface of the test specimen did not exceed 140°C during the test.
- The maximum temperature rise on the unexposed surface of the test specimen did not exceed 180°C during the test.

Remarks

The field of direct application of the test results appears from EN 1365-1:2012, clause 13.

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 EN 1363-1:2020, 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 test method is not covered by this report.

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.

This report has only been printed in a pdf-version. DBI has not issued a hard copy version.

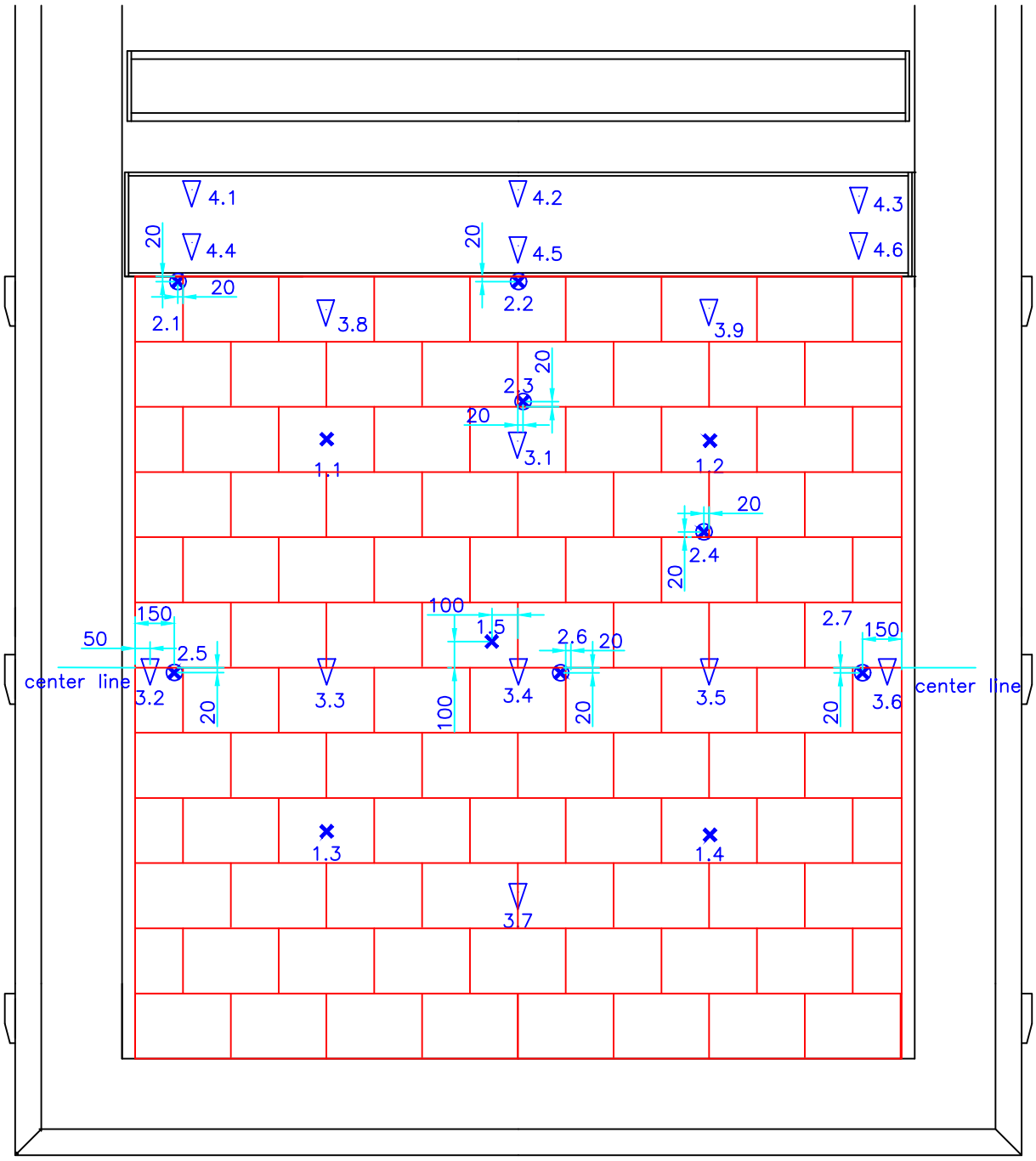
All values mentioned in this report are nominal values, production tolerances are not considered.

Danish Institute of Fire and Security Technology

Mads Møllgren
Resistance to fire engineer

Christian Basbøll
Resistance to fire engineer

Realdania By og Byg A/S	**Enclosures:**	**35**
Jarmers Plads 2	DBI drawings:	1
1551 København V	DBI graphs and tables:	24
Denmark	Photo sheets:	9
	Sponsors drawings:	1



✖ Thermocouple placed on the unexposed surface (Average)

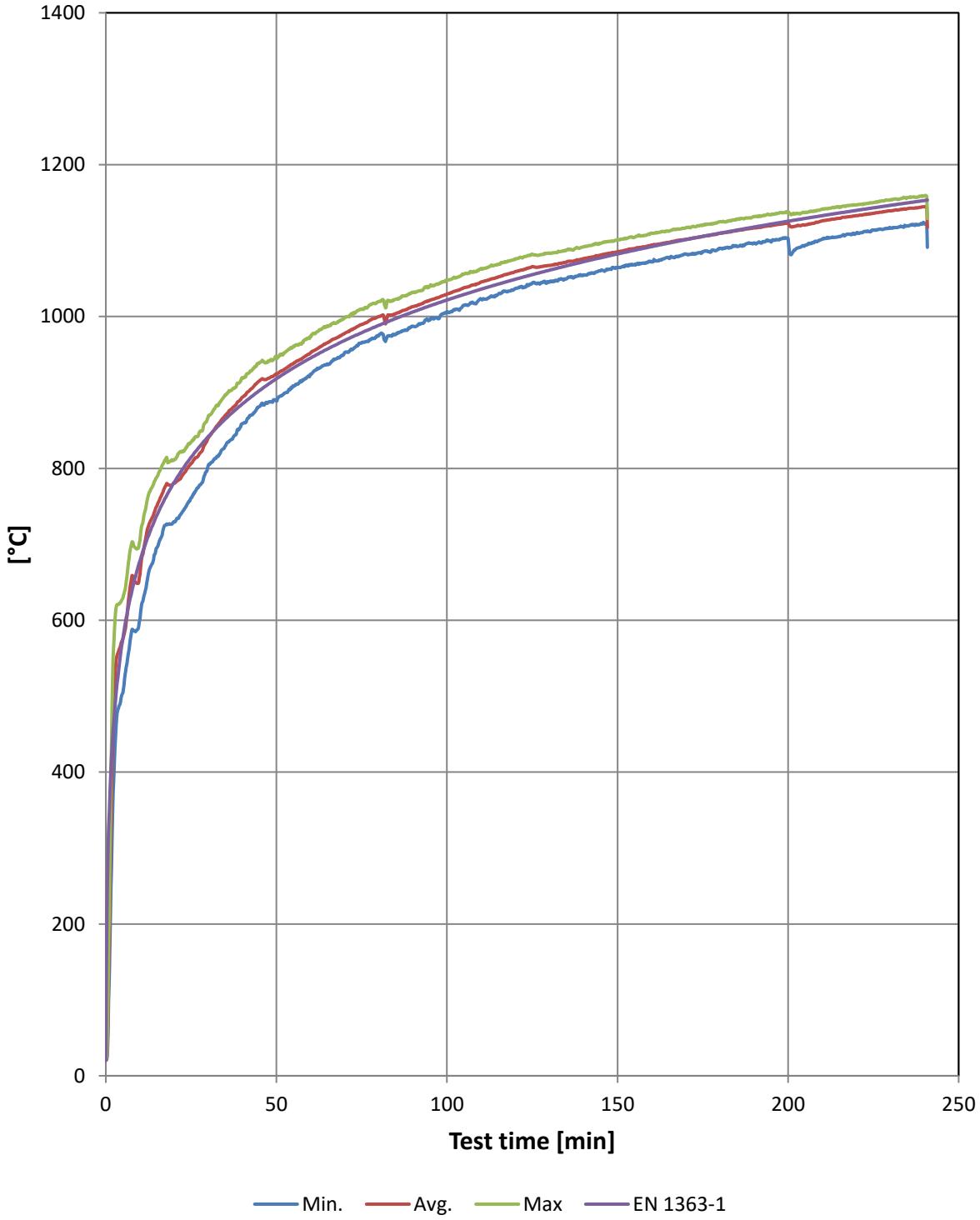
⊗ Thermocouple placed on the unexposed surface (Maximum)

▽ Deflection measuring point

All measurements are in mm

Furnace temperature

Furnace temperature



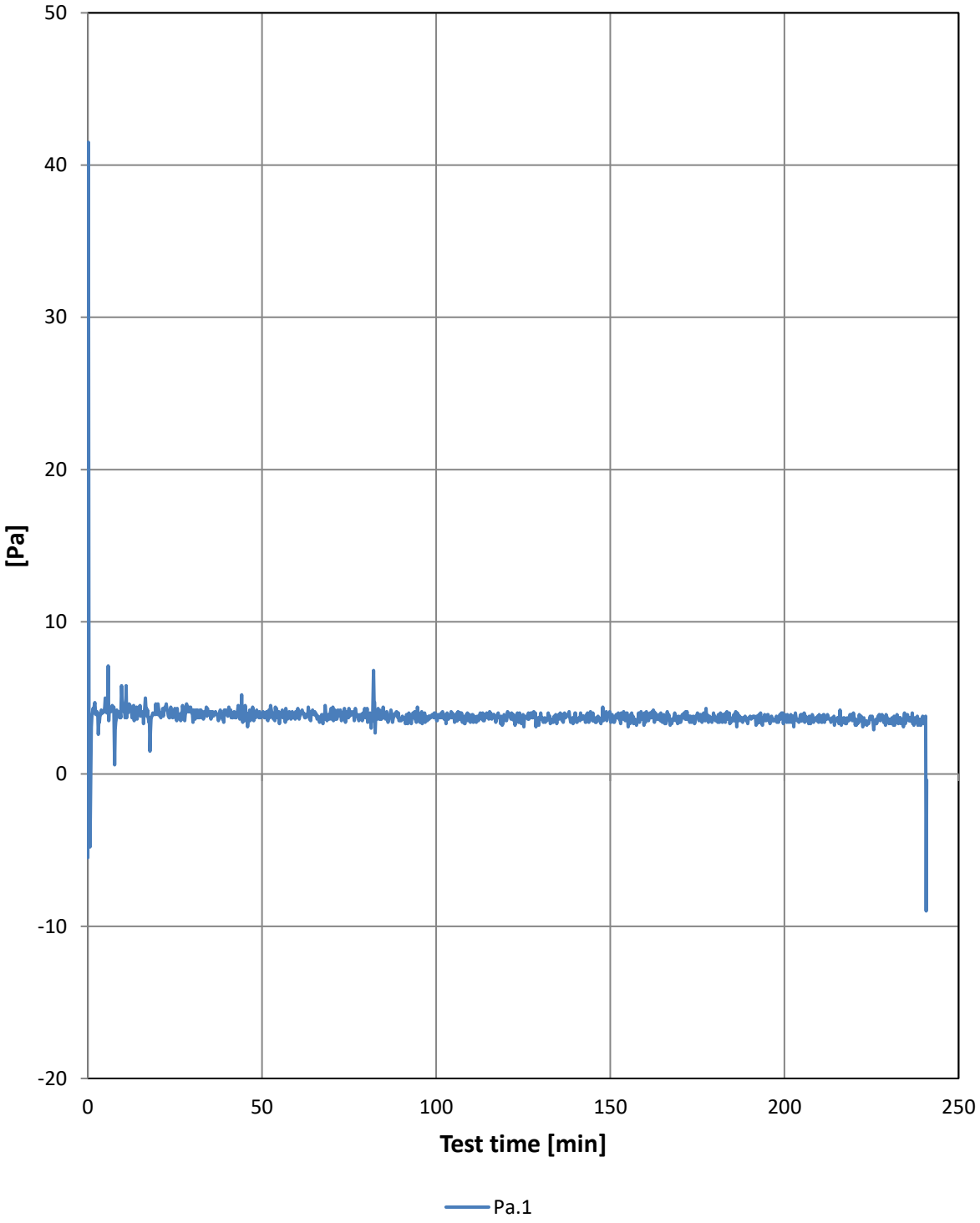
Furnace temperature

Furnace temperature

Time	Measured			Norm	Area under curve			
Minutes	Minimum	Average	Maximum	EN 1363-1	Measured	EN 1363-1	Dev. [%]	Limit [%]
0	20	21	21	20	0	0	0.0	
15	696	751	789	739	8753	8918	-1.9	13
30	803	840	868	842	20673	20859	-0.9	5
45	881	915	939	902	33878	33971	-0.3	4
60	924	952	975	945	47855	47844	0.0	3
75	965	990	1010	979	62428	62283	0.2	3
90	987	1013	1032	1006	77446	77175	0.4	3
105	1015	1038	1056	1029	92825	92442	0.4	3
120	1037	1059	1076	1049	108552	108031	0.5	3
135	1050	1072	1087	1067	124538	123901	0.5	3
150	1065	1085	1101	1082	140716	140022	0.5	3
165	1077	1098	1112	1097	157091	156367	0.5	3
180	1090	1110	1125	1110	173646	172917	0.4	3
195	1098	1120	1134	1122	190368	189654	0.4	3
210	1102	1126	1142	1133	207189	206564	0.3	3
225	1114	1136	1150	1143	224156	223635	0.2	3
240	1123	1145	1159	1153	241264	240855	0.2	3

Vertical furnace pressure

The differential pressure in the furnace during the test, measured 1,16 m above notional floor level



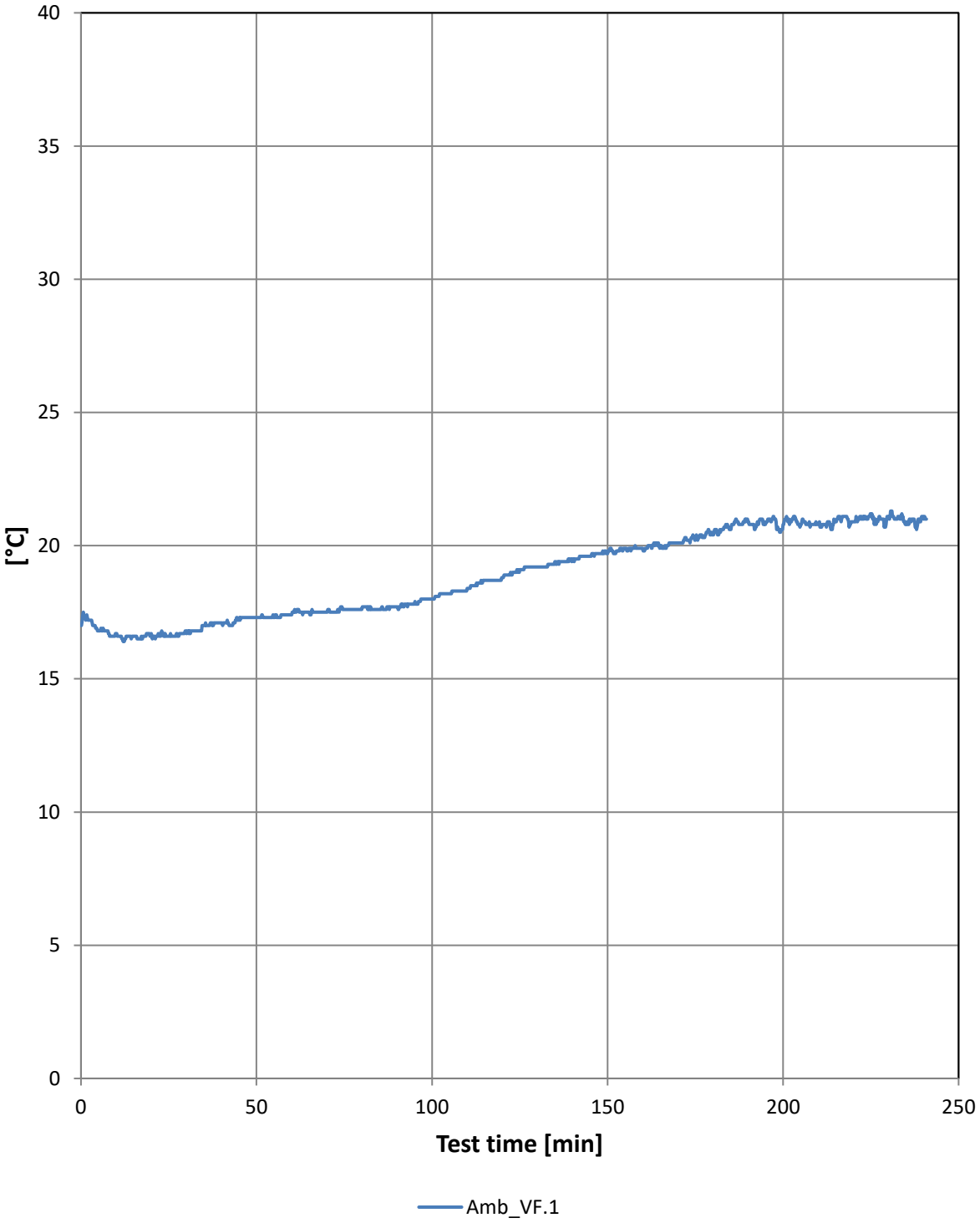
Vertical furnace pressure

The differential pressure in the furnace during the test, measured 1,16 m above notional floor level

Min. / Pa	Pa.1
0	-5.5
15	4.5
30	4.2
45	3.5
60	3.7
75	4.3
90	3.5
105	3.7
120	3.6
135	3.7
150	3.9
165	3.4
180	3.8
195	3.8
210	3.9
225	3.7
240	3.3

Ambient temperature

The ambient temperature in the laboratory during the test



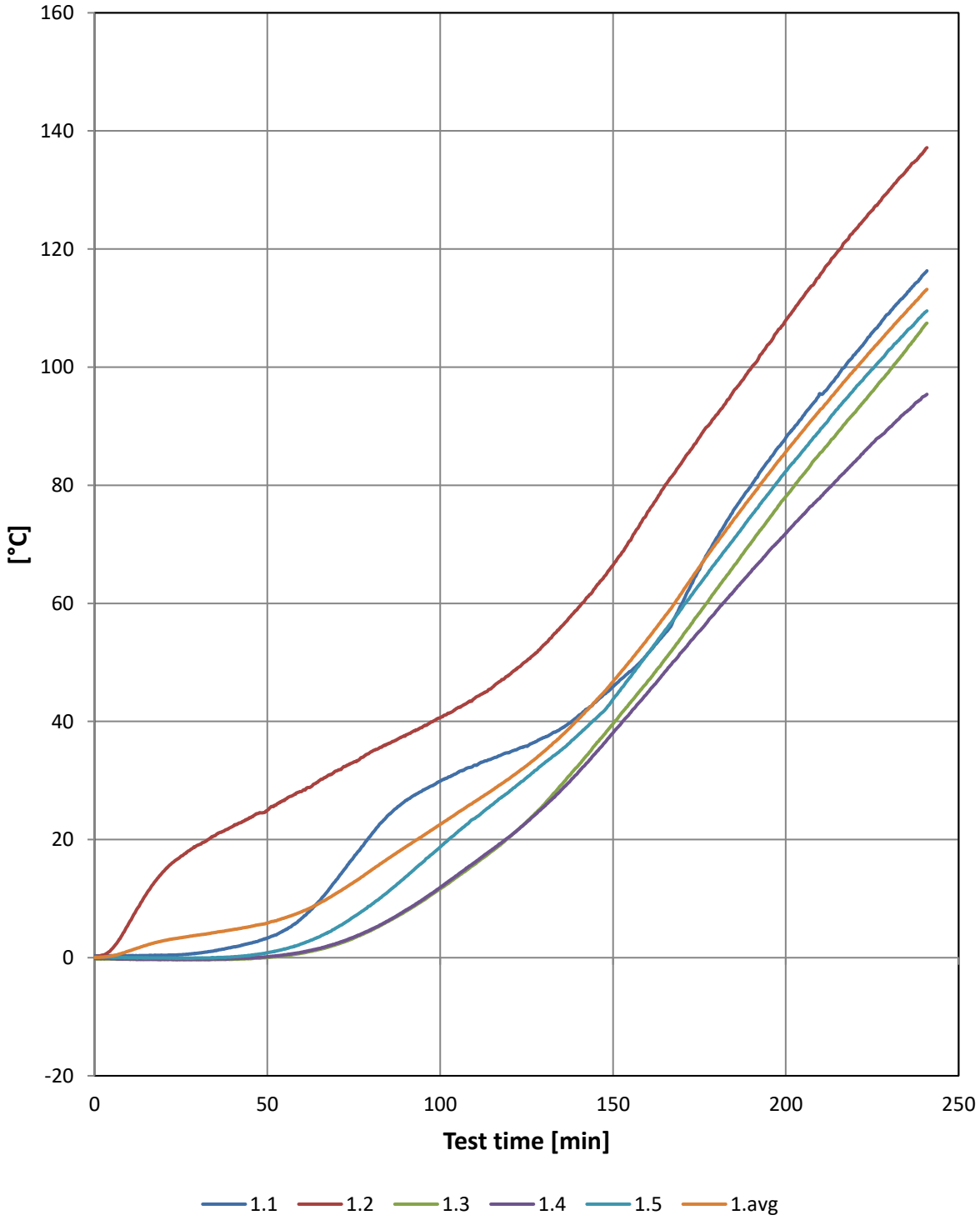
Ambient temperature

The ambient temperature in the laboratory during the test

Min. / °C	Amb_VF.1
0	17.0
15	16.6
30	16.7
45	17.2
60	17.4
75	17.6
90	17.7
105	18.2
120	18.8
135	19.4
150	19.7
165	20.0
180	20.4
195	20.8
210	20.8
225	21.2
240	21.0

Average temperature rise

Measured with 5 thermocouples on the unexposed side



Average temperature rise

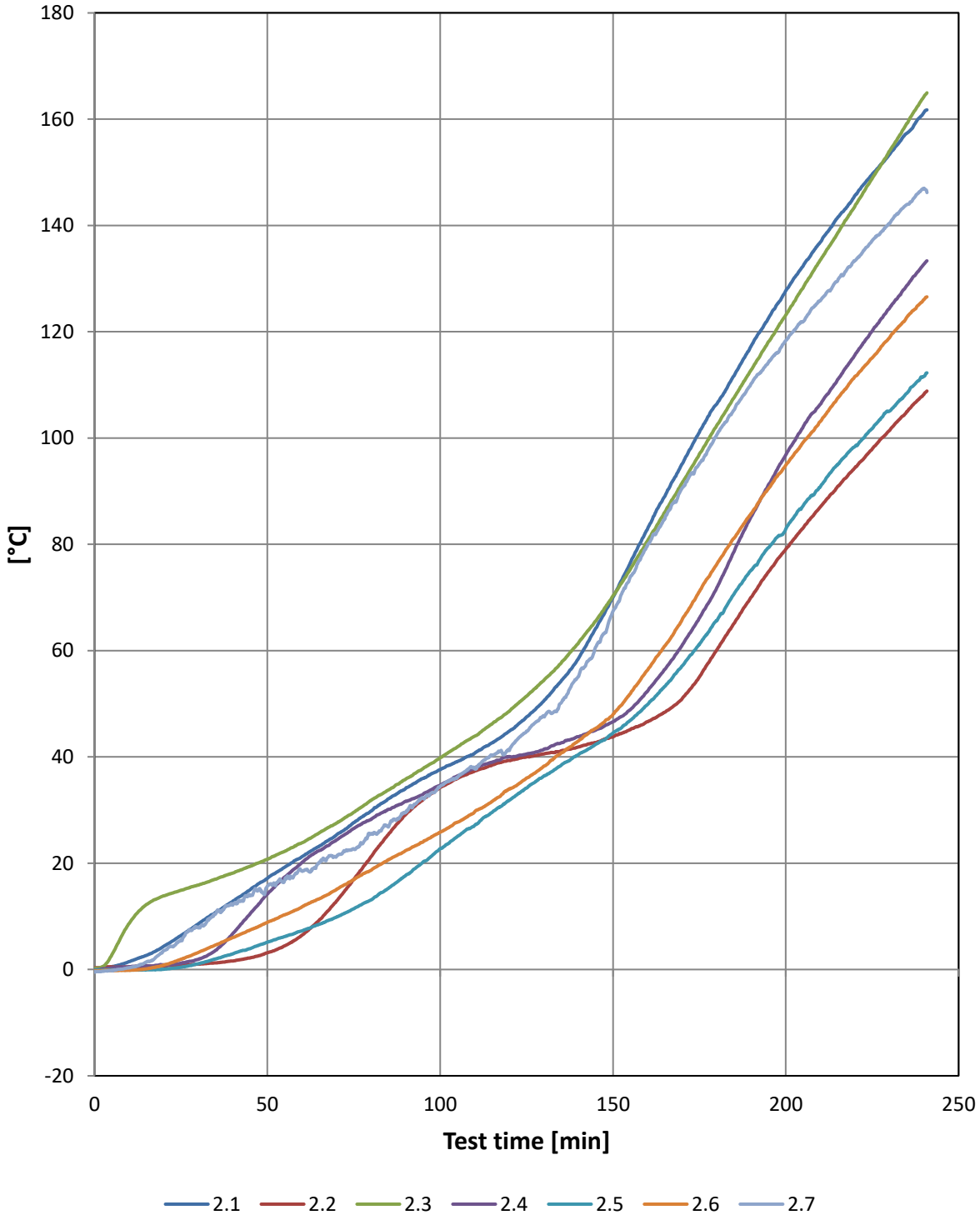
Measured with 5 thermocouples on the unexposed side

Min. / °C	1.1	1.2	1.3	1.4	1.5	1.Avg	1.Max
0	0	0	0	0	0	0	0
15	0	11	0	0	0	2	11
30	1	19	0	0	0	4	19
45	2	24	0	0	0	5	24
60	7	28	1	1	2	8	28
75	17	33	3	3	7	13	33
90	27	38	8	8	14	19	38
105	31	42	14	14	21	25	42
120	35	48	20	20	28	30	48
135	39	56	29	28	35	38	56
150	46	66	40	38	44	47	66
165	55	80	50	48	55	58	80
180	71	92	62	59	67	70	92
195	84	104	74	69	79	82	104
210	95	116	86	78	89	93	116
225	106	127	96	87	100	103	127
240	116	137	107	95	109	113	137

Failure [min]	-	-	-	-	-	-	-
Failure°C	180	180	180	180	180	140	180

Maximum temperature rise

Maximum temperatures on the unexposed side



Maximum temperature rise

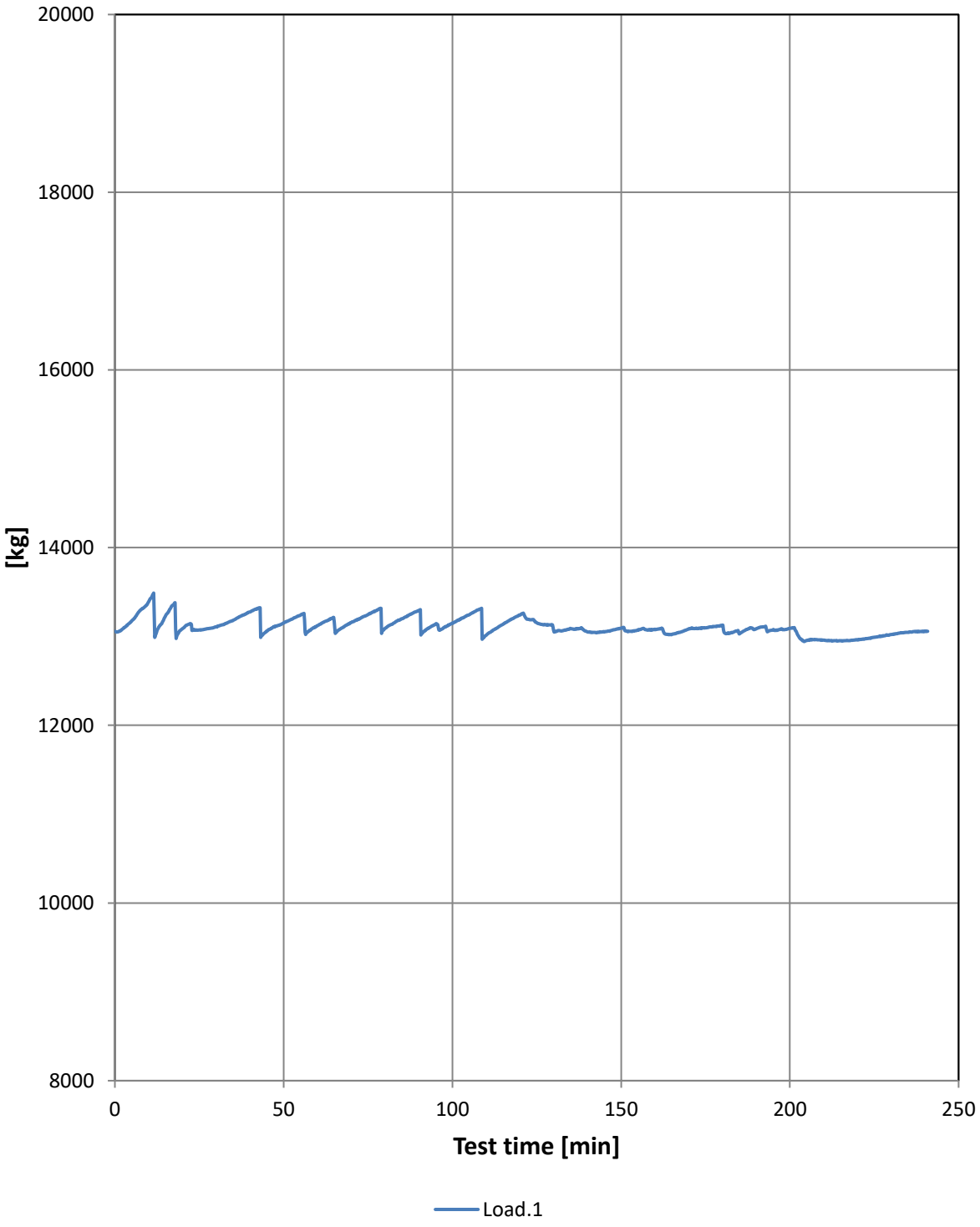
Maximum temperatures on the unexposed side

Min. / °C	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.Max
0	0	0	0	0	0	0	0	0
15	3	1	12	1	0	0	1	12
30	9	1	16	2	1	3	8	16
45	15	2	19	10	4	7	14	19
60	21	6	24	20	7	12	18	24
75	28	17	30	27	11	17	23	30
90	34	29	36	32	18	22	30	36
105	39	36	42	36	25	28	36	42
120	45	39	49	40	32	34	41	49
135	54	41	58	43	38	41	50	58
150	70	44	70	47	44	48	67	70
165	89	48	86	56	53	61	85	89
180	106	60	102	72	66	76	101	106
195	123	75	118	91	79	90	114	123
210	137	87	134	106	91	103	126	137
225	150	98	149	120	102	115	137	150
240	161	108	164	133	112	126	147	164

Failure [min]	-	-	-	-	-	-	-	-
Failure°C	180	180	180	180	180	180	180	180

Load per cylinder

Load per cylinder during test



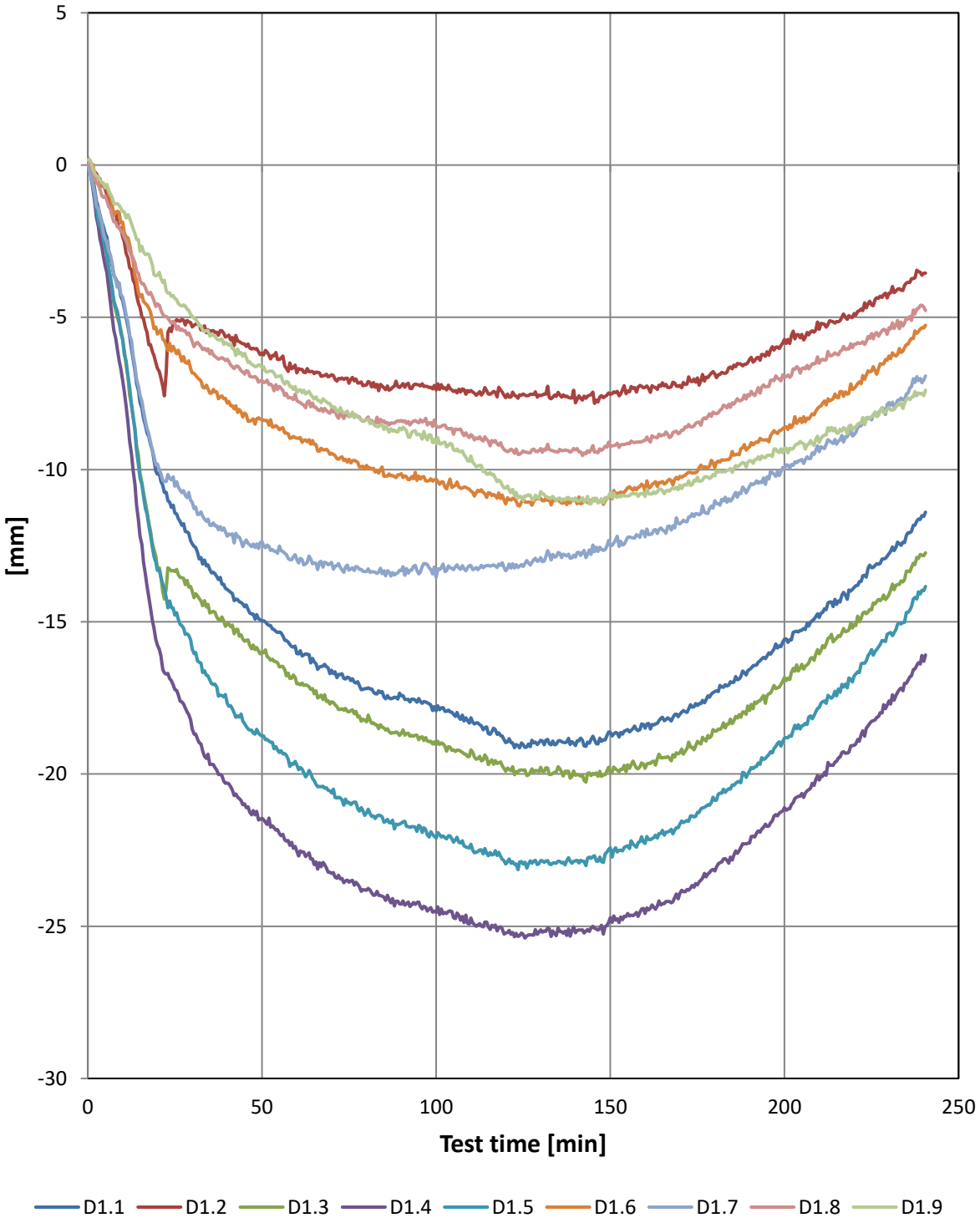
Load per cylinder

Load per cylinder during test

Min. / kg	Load.1
0	13058
15	13229
30	13107
45	13058
60	13122
75	13244
90	13288
105	13244
120	13243
135	13093
150	13095
165	13021
180	13127
195	13073
210	12960
225	12991
240	13057

Horizontal deformation

Negative values indicate movement towards the furnace



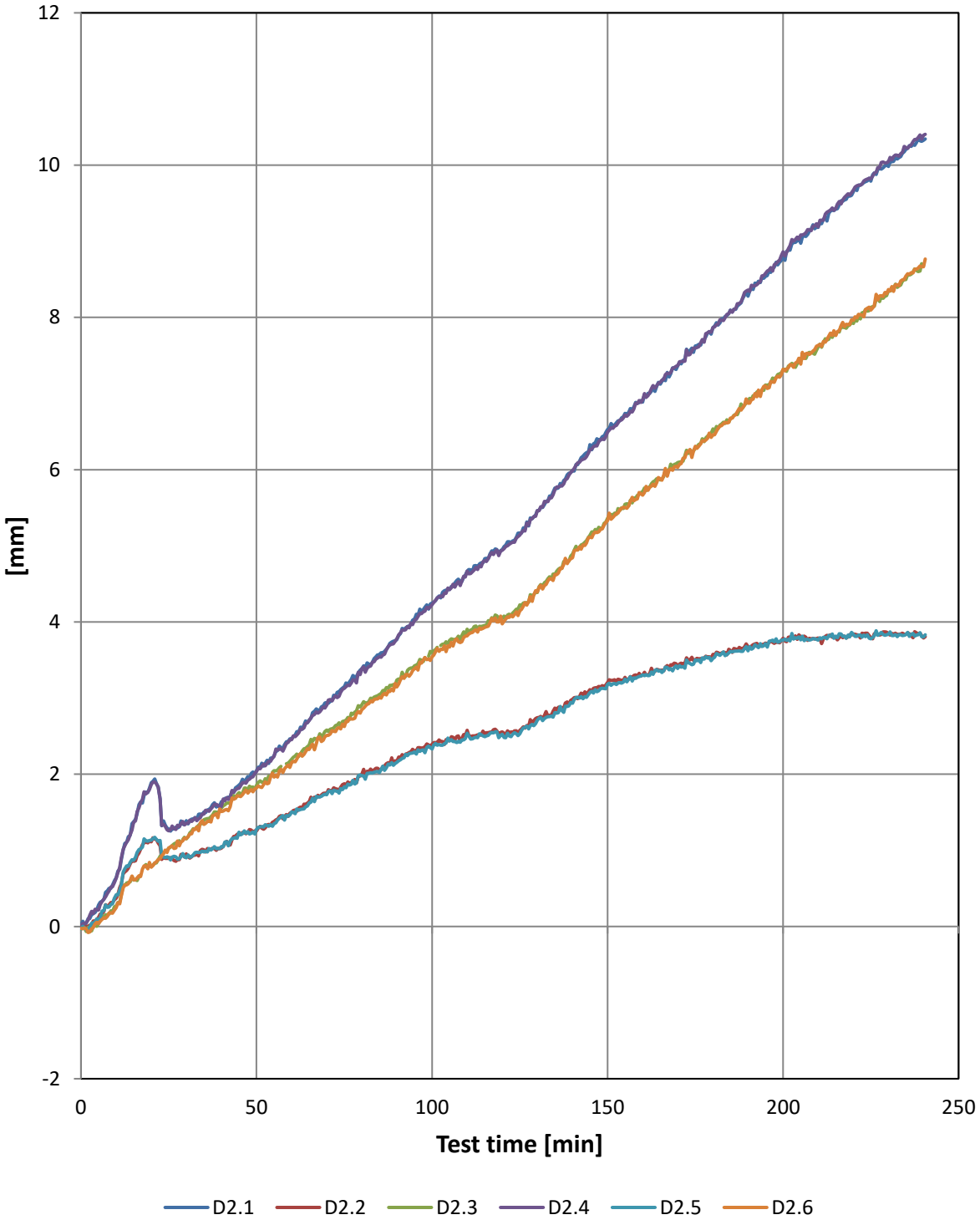
Horizontal deformation

Negative values indicate movement towards the furnace

Min. / mm	D1.1	D1.2	D1.3	D1.4	D1.5	D1.6	D1.7	D1.8	D1.9
0	0.2	0.2	0.2	0.2	0.1	0.2	0.0	0.1	0.2
15	-7.8	-4.7	-10.1	-12.2	-10.3	-4.3	-7.6	-3.8	-2.8
30	-12.4	-5.3	-14.0	-18.5	-15.9	-6.8	-11.1	-5.8	-5.0
45	-14.5	-5.9	-15.6	-21.0	-18.3	-8.1	-12.4	-6.9	-6.2
60	-16.0	-6.8	-17.0	-22.5	-19.7	-9.0	-13.0	-7.7	-7.5
75	-16.8	-7.2	-18.0	-23.6	-20.9	-9.7	-13.3	-8.3	-8.2
90	-17.4	-7.2	-18.7	-24.3	-21.6	-10.1	-13.3	-8.4	-8.7
105	-18.0	-7.4	-19.2	-24.7	-22.2	-10.5	-13.3	-8.8	-9.4
120	-19.0	-7.6	-19.9	-25.2	-23.0	-11.1	-13.3	-9.4	-10.6
135	-18.9	-7.5	-19.8	-25.1	-22.9	-11.0	-12.7	-9.4	-10.9
150	-18.6	-7.5	-19.9	-24.7	-22.4	-10.9	-12.5	-9.2	-10.8
165	-18.1	-7.2	-19.5	-24.3	-21.8	-10.4	-12.0	-8.9	-10.7
180	-17.3	-6.9	-18.6	-23.2	-20.9	-9.9	-11.0	-8.2	-10.2
195	-16.1	-6.1	-17.4	-21.7	-19.4	-9.0	-10.2	-7.3	-9.5
210	-14.9	-5.4	-16.1	-20.2	-17.8	-7.9	-9.4	-6.5	-9.1
225	-13.2	-4.6	-14.6	-18.3	-15.9	-6.8	-8.4	-5.5	-8.3
240	-11.5	-3.5	-12.8	-16.3	-14.0	-5.3	-7.1	-4.7	-7.6

Vertical deformation

Possitive values indicate downwards movement



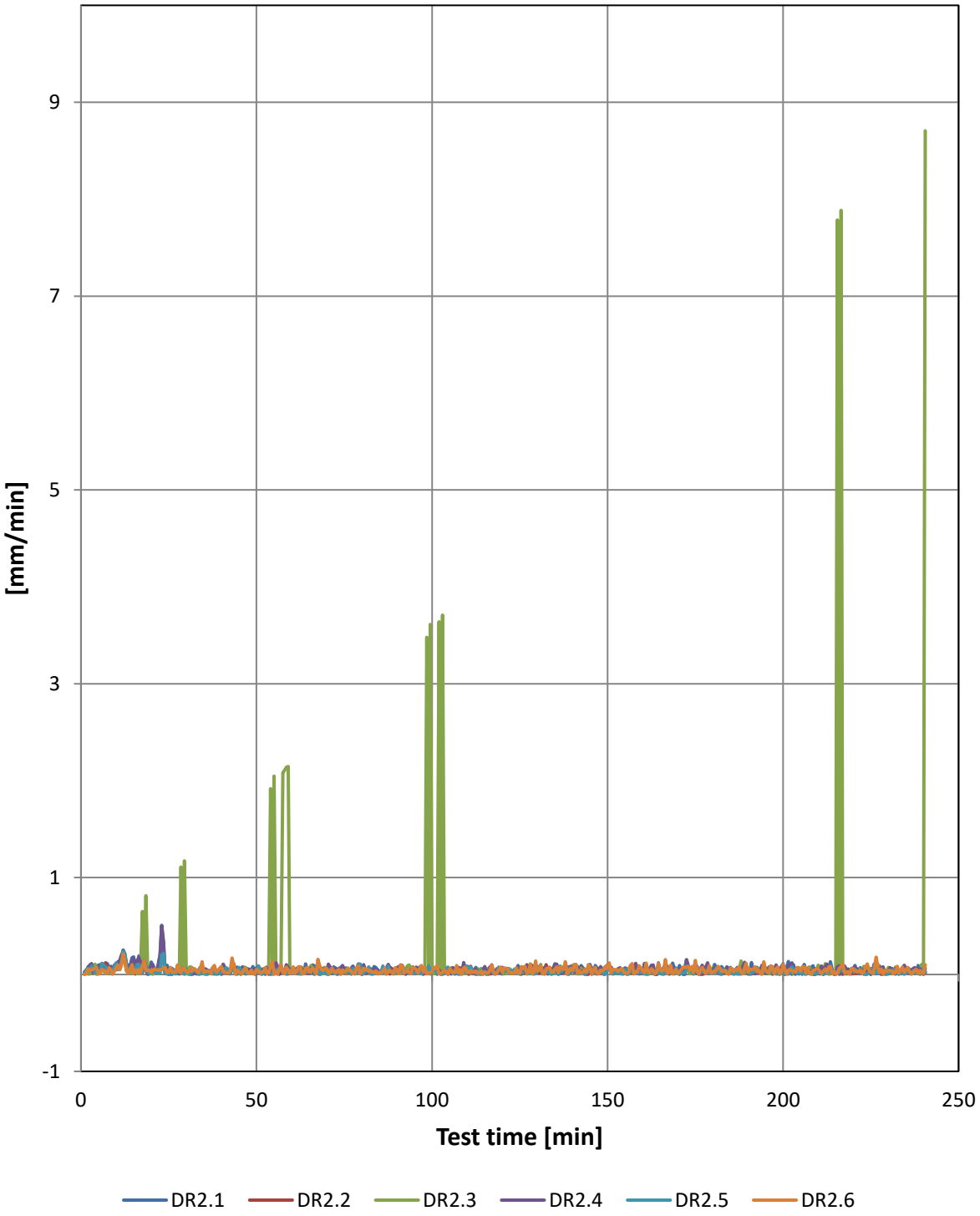
Vertical deformation

Possitive values indicate downwards movement

Min. / mm	D2.1	D2.2	D2.3	D2.4	D2.5	D2.6	D2.Max
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	1.4	0.9	0.6	1.4	0.9	0.6	1.4
30	1.4	1.0	1.2	1.4	0.9	1.2	1.4
45	1.9	1.2	1.8	1.8	1.2	1.7	1.9
60	2.5	1.5	2.2	2.5	1.5	2.2	2.5
75	3.2	1.9	2.7	3.1	1.8	2.6	3.2
90	3.8	2.2	3.2	3.8	2.2	3.1	3.8
105	4.4	2.4	3.8	4.4	2.4	3.7	4.4
120	4.9	2.6	4.0	4.9	2.5	4.0	4.9
135	5.8	2.9	4.6	5.7	2.8	4.6	5.8
150	6.5	3.2	5.4	6.5	3.2	5.3	6.5
165	7.1	3.4	5.9	7.1	3.4	5.9	7.1
180	7.9	3.6	6.5	7.9	3.5	6.5	7.9
195	8.5	3.7	7.1	8.6	3.7	7.1	8.6
210	9.2	3.8	7.6	9.2	3.8	7.6	9.2
225	9.8	3.8	8.1	9.8	3.8	8.1	9.8
240	10.3	3.8	8.7	10.4	3.8	8.7	10.4

Failure [min]	-	-	-	-	-	-	-
Failuremm	30.0	30.0	30.0	30.0	30.0	30.0	30.0

Vertical deformation rate



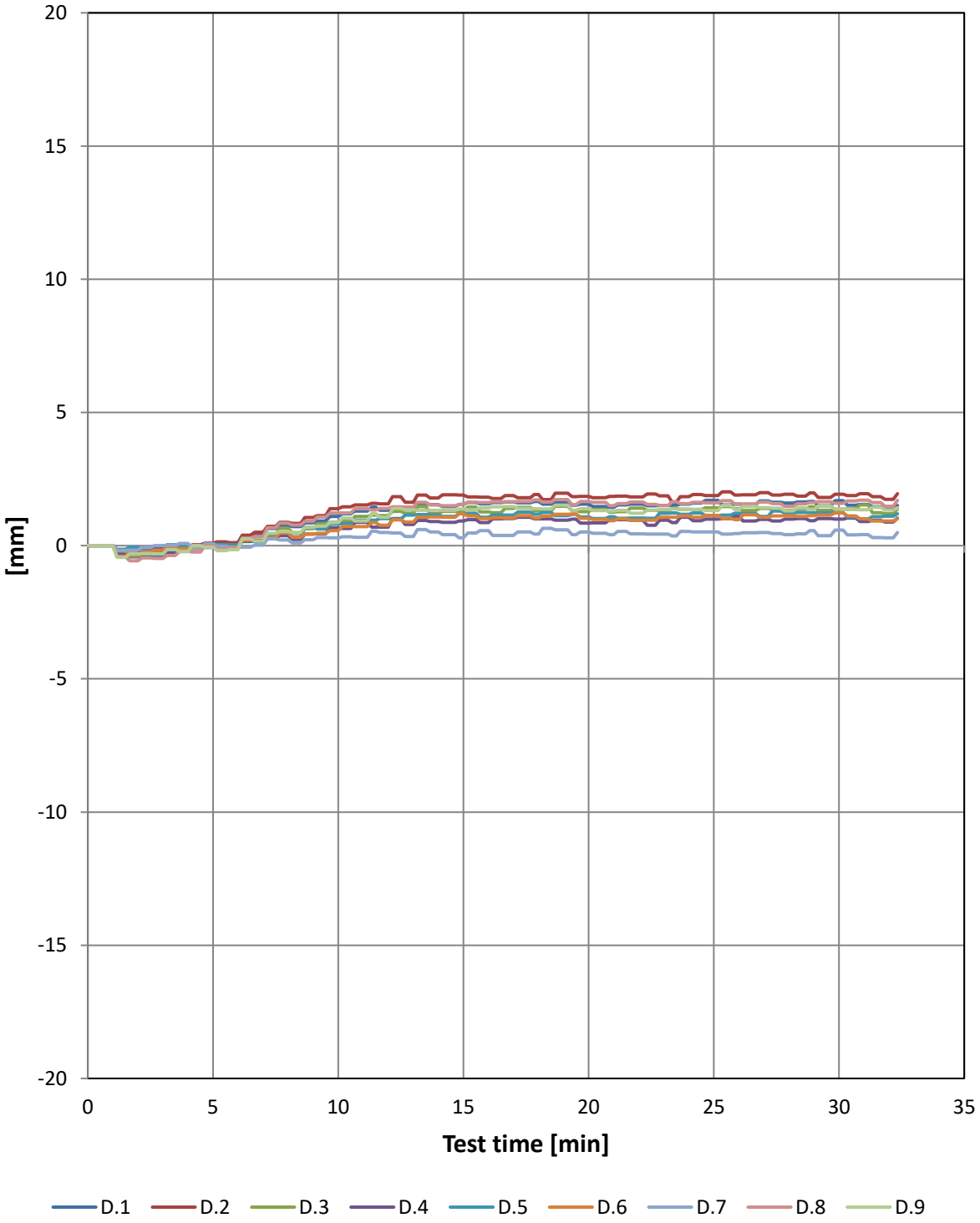
Vertical deformation rate

Min. / mm/min	DR2.1	DR2.2	DR2.3	DR2.4	DR2.5	DR2.6	DR2.Max
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.18	0.04	0.02	0.16	0.03	0.01	0.18
30	0.05	0.01	0.01	0.03	0.06	0.03	0.06
45	0.04	0.03	0.07	0.02	0.07	0.03	0.07
60	0.04	0.05	0.05	0.03	0.06	0.03	0.06
75	0.04	0.04	0.05	0.05	0.03	0.03	0.05
90	0.02	0.02	0.06	0.07	0.04	0.05	0.07
105	0.01	0.01	0.02	0.05	0.03	0.06	0.06
120	0.06	0.04	0.00	0.07	0.05	0.02	0.07
135	0.11	0.09	0.06	0.11	0.05	0.06	0.11
150	0.09	0.05	0.07	0.10	0.06	0.06	0.10
165	0.02	0.01	0.02	0.04	0.01	0.04	0.04
180	0.06	0.03	0.07	0.05	0.01	0.02	0.07
195	0.01	0.02	0.06	0.03	0.04	0.05	0.06
210	0.02	0.01	0.09	0.01	0.02	0.06	0.09
225	0.00	0.06	0.05	0.00	0.05	0.02	0.06
240	0.00	0.07	0.07	0.00	0.06	0.01	0.07

Failure [min]	-	-	-	-	-	-	-
Failuremm/mi	9.00	9.00	9.00	9.00	9.00	9.00	9.00

Horizontal deformation during the loading phrase

Negative values indicate movement towards the furnace



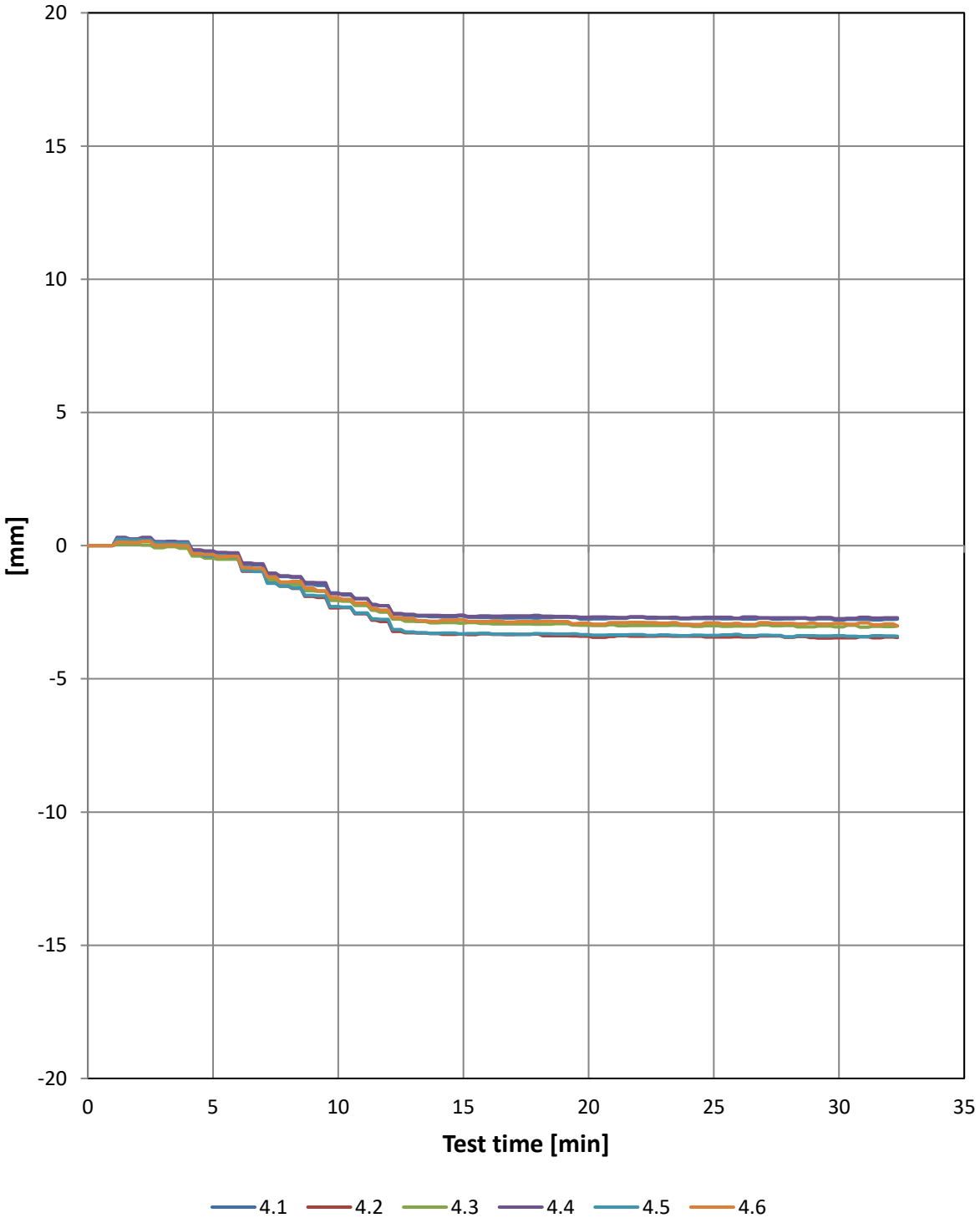
Horizontal deformation during the loading phrase

Negative values indicate movement towards the furnace

Min. / mm	D.1	D.2	D.3	D.4	D.5	D.6	D.7	D.8	D.9
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	-0.4	-0.3	-0.4	-0.3	-0.1	-0.4	-0.2	-0.6	-0.3
3	-0.4	-0.2	-0.2	-0.1	-0.2	-0.2	0.0	-0.5	-0.3
4	-0.2	-0.1	-0.1	0.0	0.0	-0.1	0.1	-0.2	-0.2
5	-0.1	0.1	0.0	-0.1	0.1	0.1	0.1	0.0	-0.1
6	-0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2
7	0.4	0.5	0.2	0.2	0.1	0.3	0.0	0.3	0.2
8	0.8	0.9	0.7	0.4	0.5	0.5	0.2	0.9	0.5
9	0.9	1.1	0.6	0.4	0.7	0.4	0.2	0.9	0.7
10	1.1	1.4	0.9	0.7	0.8	0.6	0.3	1.2	0.9
11	1.3	1.5	1.1	0.9	1.0	0.7	0.3	1.4	0.9
12	1.3	1.6	1.1	0.7	1.0	0.8	0.5	1.4	1.1
13	1.4	1.6	1.2	0.8	1.2	0.9	0.3	1.5	1.4
14	1.5	1.8	1.2	0.9	1.2	1.1	0.5	1.5	1.3
15	1.6	1.9	1.3	0.9	1.2	1.2	0.3	1.6	1.4
16	1.6	1.8	1.3	0.9	1.1	1.0	0.6	1.6	1.4
17	1.6	1.9	1.4	1.0	1.2	1.0	0.4	1.7	1.5
18	1.7	1.9	1.3	1.0	1.2	1.0	0.4	1.7	1.4
19	1.6	2.0	1.5	1.0	1.1	1.2	0.6	1.7	1.5
20	1.6	1.9	1.3	0.9	1.1	1.0	0.5	1.7	1.4
21	1.4	1.9	1.3	1.0	1.1	0.9	0.4	1.5	1.3
22	1.6	1.8	1.4	1.0	1.0	1.0	0.4	1.6	1.2
23	1.5	1.9	1.3	1.0	1.2	1.1	0.4	1.5	1.4
24	1.6	1.8	1.4	1.1	1.2	1.1	0.5	1.6	1.4
25	1.7	1.9	1.4	1.0	1.1	1.1	0.5	1.6	1.3
26	1.6	1.9	1.4	1.1	1.2	1.0	0.5	1.6	1.4
27	1.7	2.0	1.4	1.0	1.1	1.1	0.5	1.6	1.4
28	1.6	1.9	1.3	1.0	1.2	1.1	0.4	1.5	1.3
29	1.7	2.0	1.5	0.9	1.2	1.1	0.6	1.6	1.4
30	1.7	1.9	1.4	1.0	1.2	1.2	0.6	1.6	1.4
31	1.6	2.0	1.5	0.9	1.0	1.0	0.4	1.7	1.4
32	1.5	1.7	1.2	0.9	1.1	0.9	0.3	1.5	1.3

Vertical deformation during the loading phrase

Negative values indicate downwards movement



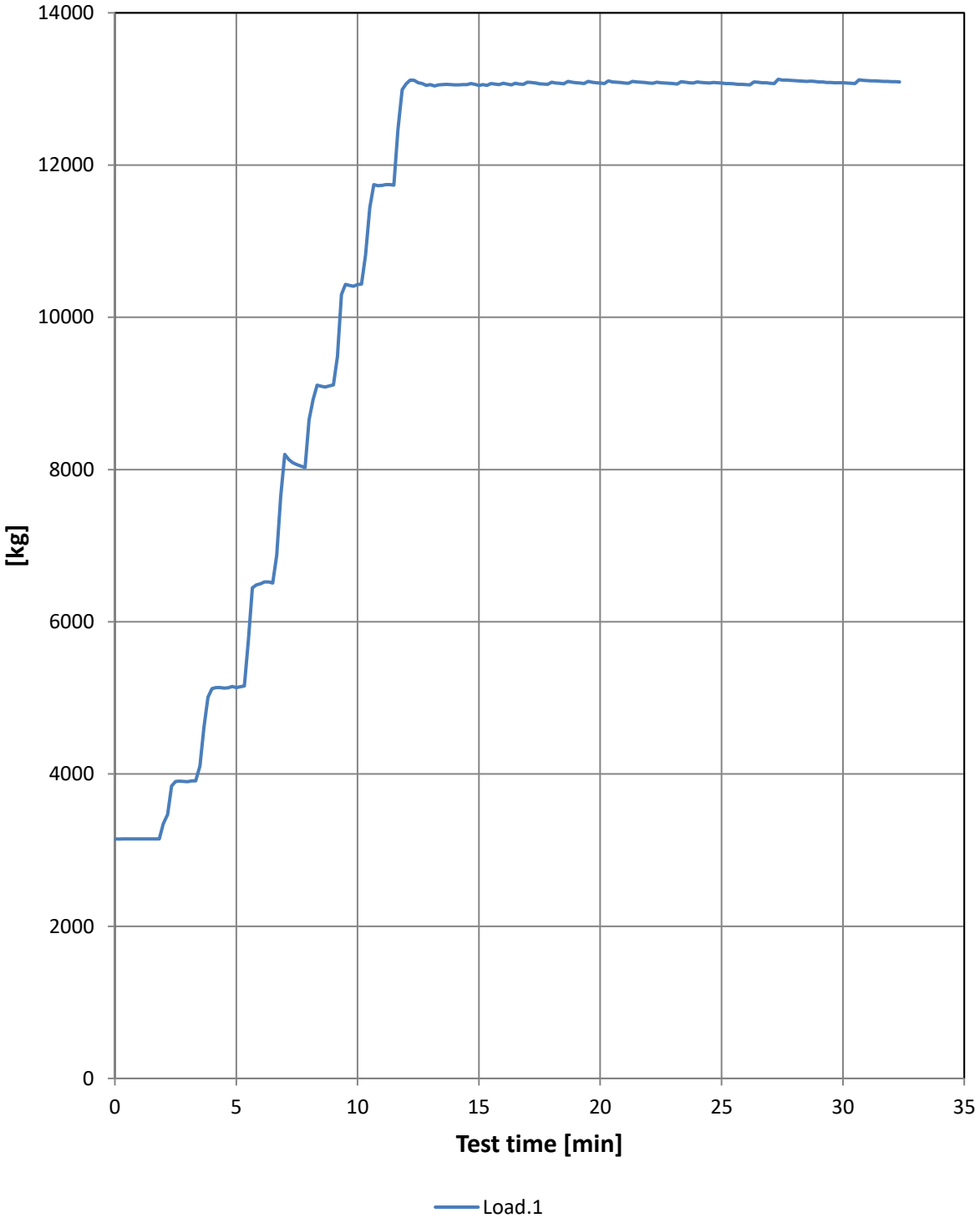
Vertical deformation during the loading phrase

Negative values indicate downwards movement

Min. / mm	4.1	4.2	4.3	4.4	4.5	4.6
0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.2	0.2	0.1	0.3	0.2	0.1
3	0.1	0.0	-0.1	0.2	0.1	0.0
4	0.1	0.1	-0.1	0.1	0.1	0.0
5	-0.3	-0.4	-0.5	-0.2	-0.4	-0.3
6	-0.3	-0.5	-0.5	-0.3	-0.4	-0.4
7	-0.7	-1.0	-0.9	-0.7	-1.0	-0.9
8	-1.2	-1.5	-1.4	-1.1	-1.5	-1.4
9	-1.5	-1.9	-1.7	-1.4	-1.9	-1.6
10	-1.8	-2.3	-2.1	-1.8	-2.3	-1.9
11	-2.0	-2.6	-2.3	-2.0	-2.5	-2.2
12	-2.3	-2.9	-2.5	-2.3	-2.8	-2.4
13	-2.6	-3.3	-2.8	-2.6	-3.2	-2.7
14	-2.7	-3.3	-2.9	-2.6	-3.3	-2.8
15	-2.6	-3.3	-2.9	-2.6	-3.3	-2.8
16	-2.7	-3.3	-2.9	-2.6	-3.3	-2.9
17	-2.7	-3.3	-2.9	-2.6	-3.3	-2.9
18	-2.7	-3.3	-3.0	-2.6	-3.3	-2.9
19	-2.7	-3.4	-2.9	-2.7	-3.3	-2.9
20	-2.8	-3.4	-3.0	-2.7	-3.3	-2.9
21	-2.7	-3.4	-3.0	-2.7	-3.4	-2.9
22	-2.7	-3.4	-3.0	-2.7	-3.3	-2.9
23	-2.7	-3.4	-3.0	-2.7	-3.4	-2.9
24	-2.8	-3.4	-3.0	-2.7	-3.4	-3.0
25	-2.7	-3.4	-3.0	-2.7	-3.4	-2.9
26	-2.7	-3.4	-3.0	-2.7	-3.3	-2.9
27	-2.7	-3.4	-3.0	-2.7	-3.4	-2.9
28	-2.8	-3.4	-3.0	-2.7	-3.4	-2.9
29	-2.8	-3.5	-3.1	-2.7	-3.4	-2.9
30	-2.8	-3.5	-3.1	-2.7	-3.4	-2.9
31	-2.8	-3.4	-3.1	-2.7	-3.4	-2.9
32	-2.8	-3.4	-3.0	-2.7	-3.4	-2.9

Load per cylinder during the loading phrase

Load per cylinder during test



Load per cylinder during the loading phrase

Load per cylinder during test

Min. / kg	Load.1
0	3147
1	3146
2	3347
3	3898
4	5121
5	5135
6	6497
7	8199
8	8655
9	9113
10	10431
11	11733
12	13066
13	13057
14	13054
15	13047
16	13073
17	13090
18	13089
19	13082
20	13079
21	13079
22	13079
23	13072
24	13093
25	13079
26	13058
27	13073
28	13109
29	13094
30	13082
31	13110
32	13097

Photo No. 1 Mounting of the first layer in the bottom of the wall.

Photo No. 2 Close up on the block from the bottom layer.

Photo No. 3 Three layers of the wall mounted to the bottom.

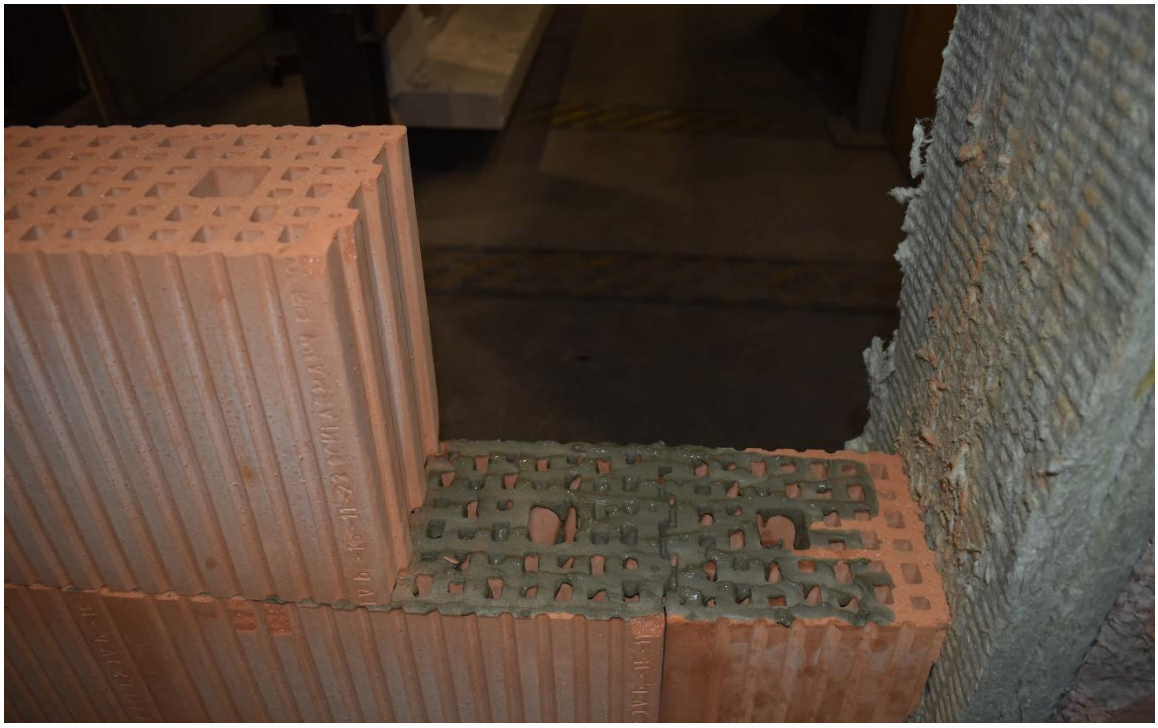


Photo No. 4 Mortar on top of the blocks for placing the next layer of blocks.

Photo No. 5 Mounting of wall continued.

Photo No. 6 Wall drying with thermocouples mounted to it.

Photo No. 7 Test started

Photo No. 8 15 minutes of testing

Photo No. 9 One hour of testing

Photo No. 10 2 hours and 54 minutes of testing

Photo No. 11 4 hours of testing

Photo No. 12 4 hours and 2 minutes of testing. Test stopped ad specimen pulled away from oven.

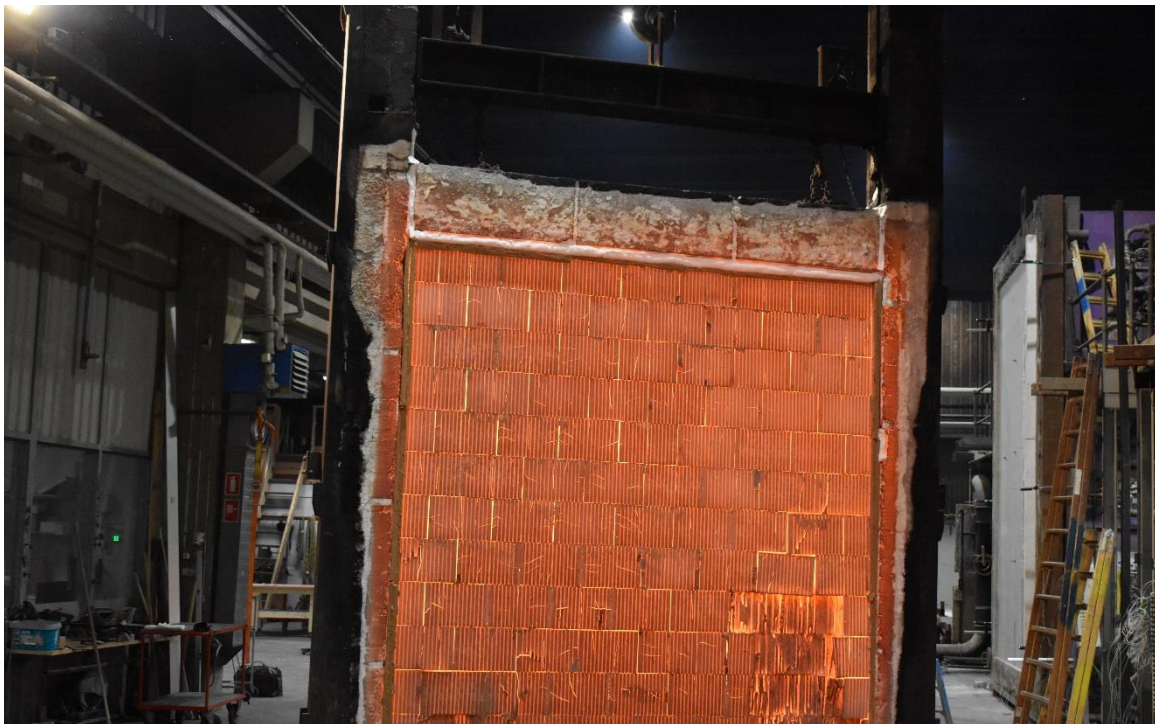


Photo No. 13 Blocks was glowing red from the heat.

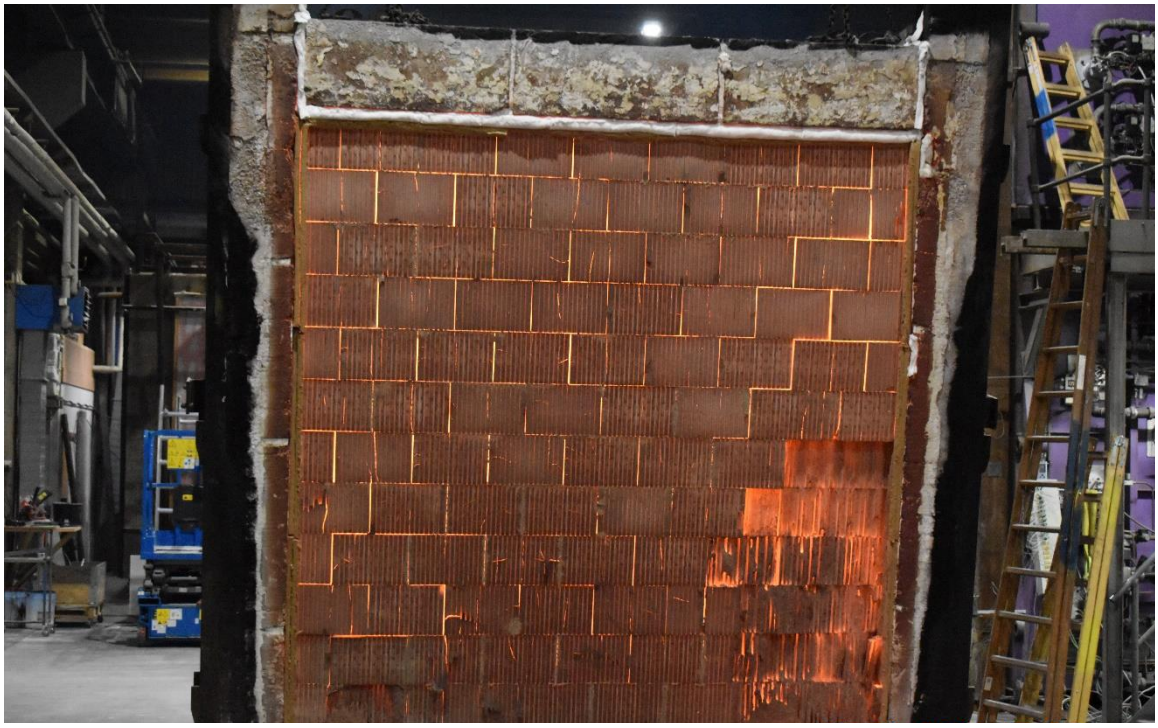


Photo No. 14 Blocks are whitened after the heat reduces.

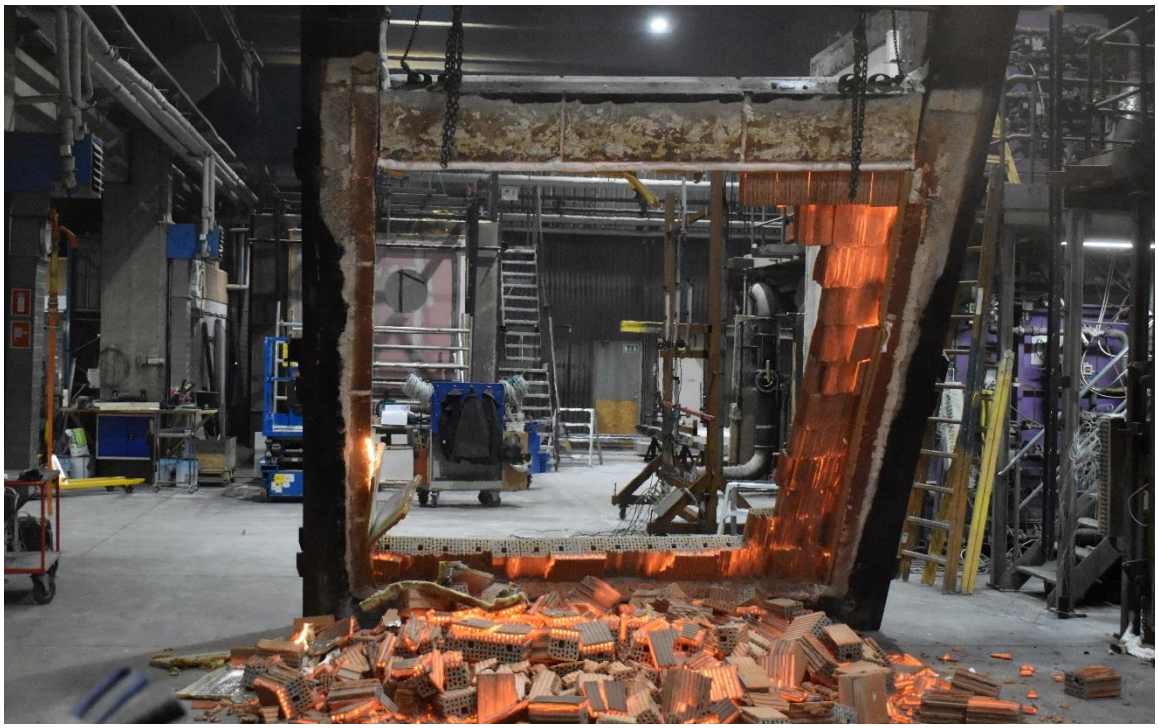
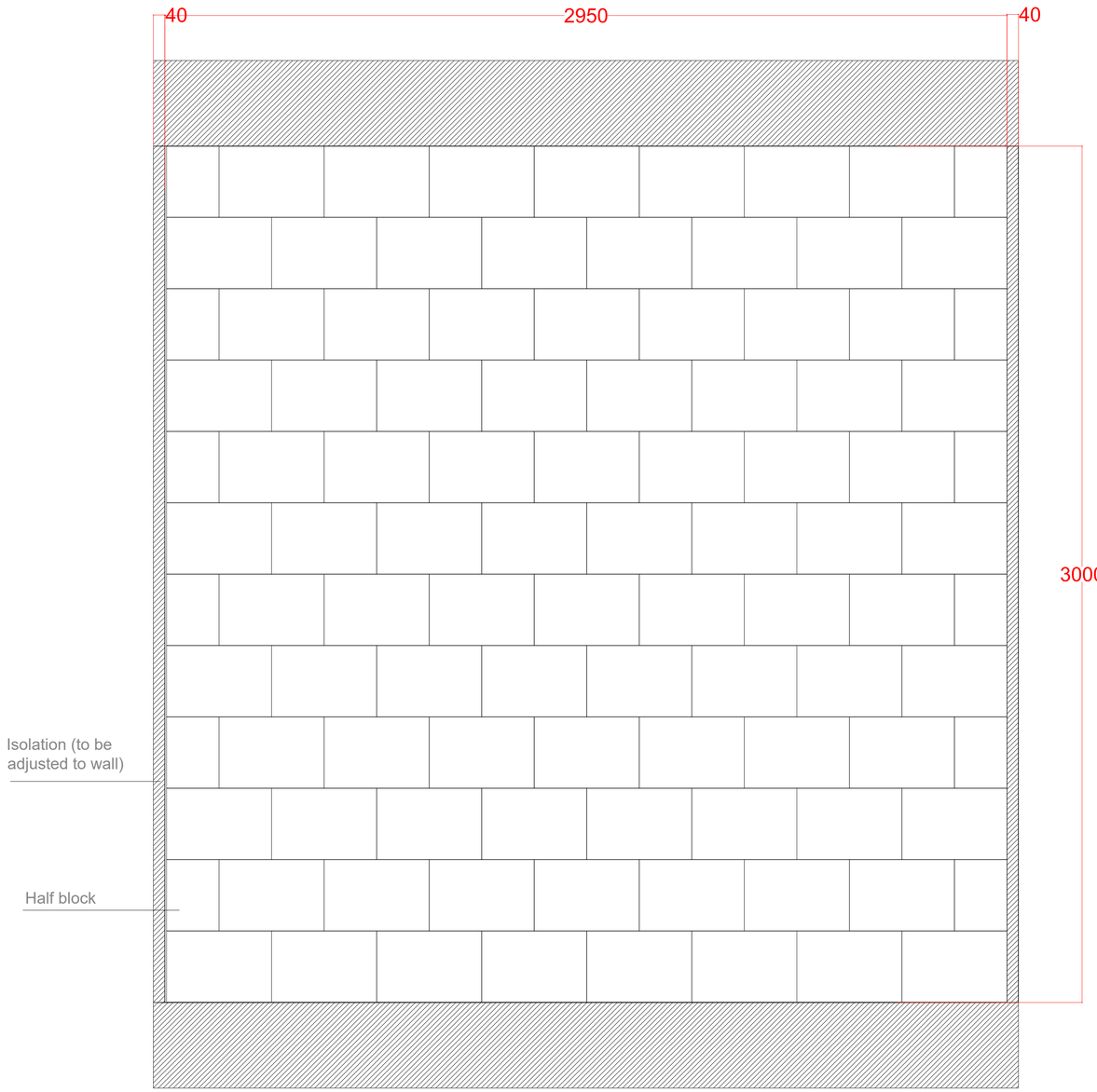


Photo No. 15 Block wall teared down, so costumer can see the bricks inside.

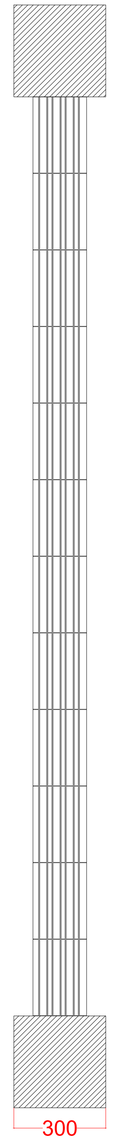
Photo No. 16 Wall seen from behind after it was teared down.

Photo No. 17 Rest of the specimen scraped together

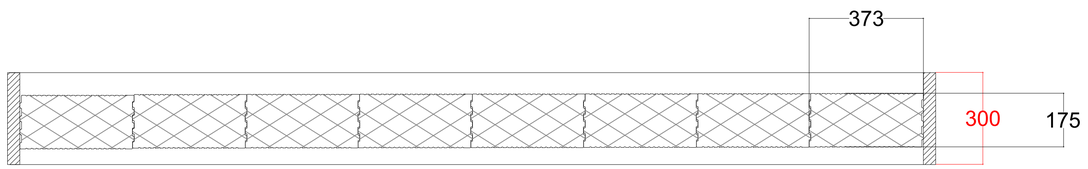
Photo No. 18 Rest of the specimen scraped together



Opstalt



Snit



Plan

NOTES:

revision date amendment

N

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- Do not scale from this drawing
- All dimensions to be checked on site by the Contractor
- And such dimensions to be their responsibility
- Report all drawing errors and omissions to the Architect
- All dimensions in millimeters unless noted otherwise
- If in doubt ask Contract Administrator

DBI PGA124534

job title
MiniCO2 Tegl

drawing title / location
MC2_DBI_175mmvæg REVA

status Skitse

date 05.02.2024 checked

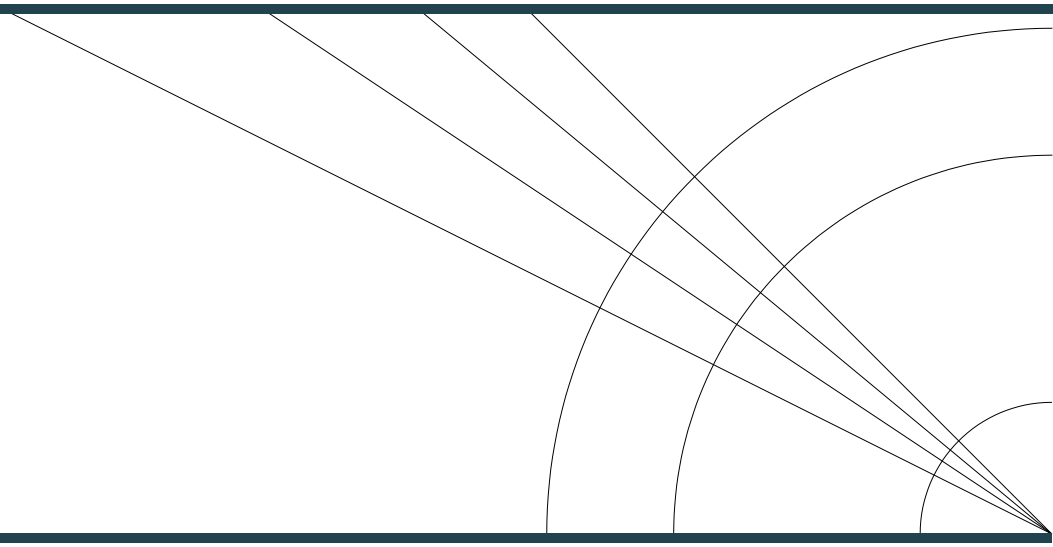
scale 1:10@A1 authorised

job no	originator	volume	level	type	role	drawing no	revision
A351	MCO				A		

DBI
FIRE AND SECURITY

TEST REPORT
LOADBEARING WALL

Name of sponsor:	Realdania By og Byg A/S		
Product name:	Loadbearing wall		
File no.:	PGA12460A	**Revision no.:**	2
Test date:	2024-03-27	**Date:**	2024-09-25
Pages:	9	**Encl.:**	34
Ref:	MMN / CHB		



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ilac-MRA DANAK
TEST Reg.no.0012

Client information

Client: Realdania By og Byg A/S

Address: Jarmers Plads 2

1551 København V

Denmark

Revision chronology				
Rev. no.	Date	Description	Author	Approved
0	28-05-2024	Original	MMN	KTO
1	05-07-2024	Changed loading section	MMN	CHB
2	25-09-2024	Changed conclusion section	CHD	CHB

Content

Date of test

The test was conducted on 2024-03-27

Purpose of test

Examination of the fire-resistance of one Loadbearing wall

The test specimen has been subjected to a standard fire test in accordance with the following standards:

EN 1363-1:2020 Fire resistance tests – General requirements

in conjunction with

EN 1365-1:2012 Fire resistance tests for loadbearing elements — Part 1: Walls

Test specimen

The trade name and sponsors identification mark are stated below:

Trade name:	None
Identification mark:	None

The components for the test specimen were delivered and mounted by the sponsor.

Drawings and description

Details of the construction are shown in the enclosed documentation as stated below:

Type	Drawing No.	Dated	Subject
Drawing	MC2_425_mmvæg	05-03-2024	MiniCO2 Tegl

The documentation is supplied by the sponsor and stamped by DBI - Danish Institute of Fire and Security Technology

Description

The test specimen consisted of the components described in the following. DBI inspected the components during mounting and test and after the test.

The sponsor carried out the selection of the products for the test specimen as well as the mounting.

Test specimen

External measures: Height: 3000 mm Width: 2975 mm Thickness: 425 mm

A loadbearing wall consisting of “Poroton S8 425” blocks with Proton mortar in between. The wall was placed 32mm away from the fire exposed side.

The test specimen was symmetrical.

Construction

Blocks: The Poroton block, with a nominal density of 715 kg/m^3, were mounted with groove and tongue principle and fixed with Poroton mortar, with a nominal density of 900 kg/m^3. The blocks were placed staggered on top of each other. The mortar was placed with a thickness of approx. 1 mm on top of the blocks. Mortar was placed at the bottom of the frame before installing.

Measured by DBI

Product		Poroton mortar	425 mm Poroton block overall	425 mm Poroton block only clay	Insualtion of 425 mm Poroton block
Density	kg/m³	921	770	1491	63
Thickness	mm	-	-	-	-
Moisture content	%	16,2	-	0,2	0,9
Organic content	%	-	-	-	-
Sampling method		Extra material	Extra material	Extra material	Extra material
Drying temperature	°C	105	105	105	105

Test conditions

Conditioning

The test specimen was delivered on the 26-02-2024 to the DBI laboratory and stored under room temperature. On the day of the fire testing the condition of the test specimen was similar with respect to its moisture content as the test specimen would be in normal service.

Mounting

The test specimen was mounted simply supported in a test frame suitable for loaded tests with a clear opening of 3000 x 3000 mm.

Free edge was established along both vertical edges of the test specimen (2 x 25 mm stone wool with alu-foil in each side) to allow for unrestrained deformation of the test specimen.

Loading

The test specimen was loaded with a total applied load of 392.56 kN (40.000 kg) during the test, corresponding to a load of 131.07 kN/m.

The wall was loaded with a dead load of 900 kg from the loading equipment. The applied load was 13033 kg from each of the three hydraulic jacks.

The load was applied in the center of the test specimen with eccentricity of 32 mm towards the exposed side.

The loading conditions correspond to example a) in figure 1 in EN 1365-1:2012. The figure describes the load transfer system at head with loading from above. The wall was simply supported at the bottom.

The load was applied in 10 steps prior to the fire test. The fire test commenced approx. 30 minutes after reaching the final load on the test specimen.

Fire test

Observations were made during the test on the general behavior of the test specimen.

Temperature observations were taken continually during the entire testing time.

The surface temperatures were measured on the unexposed surface of the test specimen as indicated on DBI drawing no. 1.0.

The furnace temperature was determined by means of plate thermocouples uniformly distributed at approximately 100 mm from the exposed side of the test specimen. The furnace temperature was continuously controlled to follow the standard time temperature curve within the accuracy specified in EN 1363-1:2020.

The thermocouples were constructed according to the description in EN 1363-1:2020.

The pressure was controlled at 20 pa at the top of the test specimen. The pressure was measured 1.06 m above the bottom of the test specimen, resulting in a pressure of 3.51 pa.

Test results

Duration of the test was 240 minutes.

Measurements

The enclosed graphs and tables show:

Enclosures 2.0 and 2.1	Furnace temperatures The actual minimum-, average- and maximum furnace temperature in relation to the standard temperature. The table also shows the area under the actual time-temperature curve as well as the area under the standard time-temperature curve
Enclosures 3.0 and 3.1	Vertical furnace pressure The differential pressure in the furnace during the test, measured 1,16 m above notional floor level
Enclosures 4.0 and 4.1	Ambient temperature The ambient temperature in the laboratory during the test
Enclosures 5.0 and 5.1	Average temperature rise Measured with 5 thermocouples on the unexposed side
Enclosures 6.0 and 6.1	Maximum temperature rise Maximum temperatures on the unexposed side
Enclosures 7.0 and 7.1	Vertical deformation Negative values indicate downwards movement
Enclosures 8.0 and 8.1	Horizontal deformation Negative values indicate movement towards the furnace
Enclosures 9.0 and 9.1	Load per cylinder Load per cylinder during test
Enclosures 10.0 and 10.1	Load per cylinder Load per cylinder during test

Visual observations:

Time / Minutes	Visual observations:	U = Unexposed side E = Exposed side
0	Test commences	
7	Loud sound from the oven	U
9	Cracking sounds appeared from inside the oven	U
10	The blocks began to sprawl	E
14	Cracking sounds continued	U
17	Continuation of sprawling	E
21	Approx. 70% of the surface had sprawled	E

30	Continuation of sprawling	E
54	Sprawling continued at the free edge	E
54	The rate of sprawling slowed down	E
72	No changes had appeared at the unexposed side	U
72	Continuation of sprawling in a slow rate	E
90	No changes had appeared at the unexposed side	U
91	Continuation of sprawling in a slow rate	E
110	No changes had appeared at the unexposed side	U
120	Sprawling had decreased significantly	E
125	Moisture from the joints	U
163	Increased moisture from most of the joints	U
192	Sounds like sprawling appeared from the oven.	E
240	Test stopped	

The photographs on the attached photo sheets show the test specimen during the mounting, testing and after the test. See the description at each photo.

Conclusion

Fire resistance testing according to EN 1365-1:2012 of the construction described in this test report showed that failure according to the performance criteria stated in the test method occurred at the following time:

Load-bearing capacity (R): 240 minutes

- The load on the test specimen was maintained during the entire test.
- The measured vertical deflection did not exceed the criteria of C = h/100 = 30 mm during the test.
- The measured rate of vertical deflection did not exceed the criteria of dC/dt = 3h/1000 = 9 mm/min during the test.

Integrity (E): 240 minutes

- Sustained flaming did not occur during the test.
- The cotton pad was not ignited during the test.
- No through-going openings in the test specimen were created during the test.

Insulation (I): 240 minutes

- Failure of insulation did not occur during testing.
- The average temperature rise on the unexposed surface of the test specimen did not exceed 140°C during the test.

- The maximum temperature rise on the unexposed surface of the test specimen did not exceed 180°C during the test.

Remarks

The field of direct application of the test results appears from EN 1365-1:2012, clause 13.

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 EN 1363-1:2020, 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 test method is not covered by this report.

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.

This report has only been printed in a pdf-version. DBI has not issued a hard copy version.

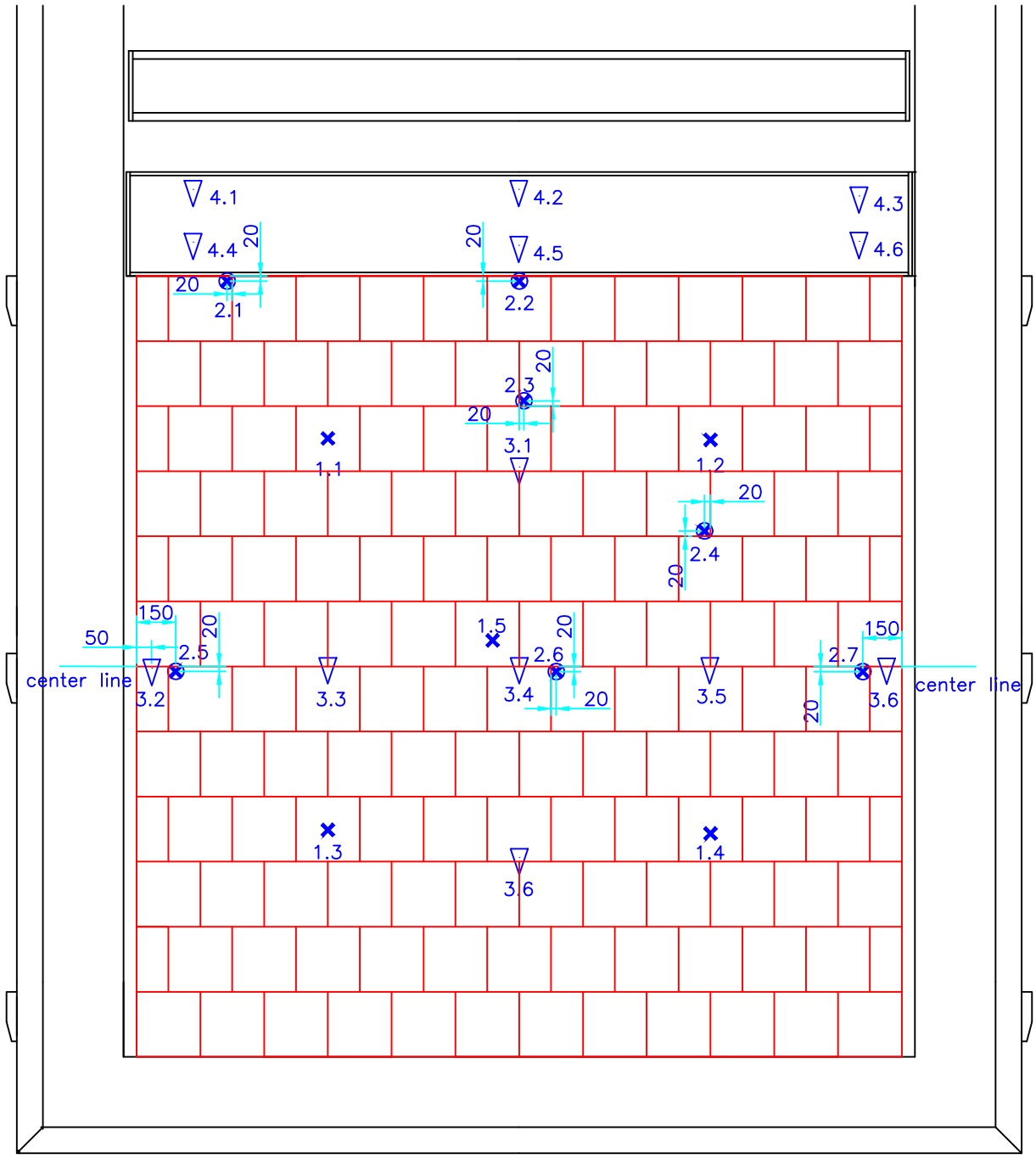
All values mentioned in this report are nominal values, production tolerances are not considered.

Danish Institute of Fire and Security Technology

Mads Møllgren
Resistance to fire engineer

Christian Basbøll
Resistance to fire engineer

Realdania By og Byg A/S	**Enclosures:**	**34**
Jarmers Plads 2	DBI drawings:	1
1551 København V	DBI graphs and tables:	18
Denmark	Photo sheets:	14
	Sponsors drawings:	1



✖ Thermocouple placed on the unexposed surface (Average)

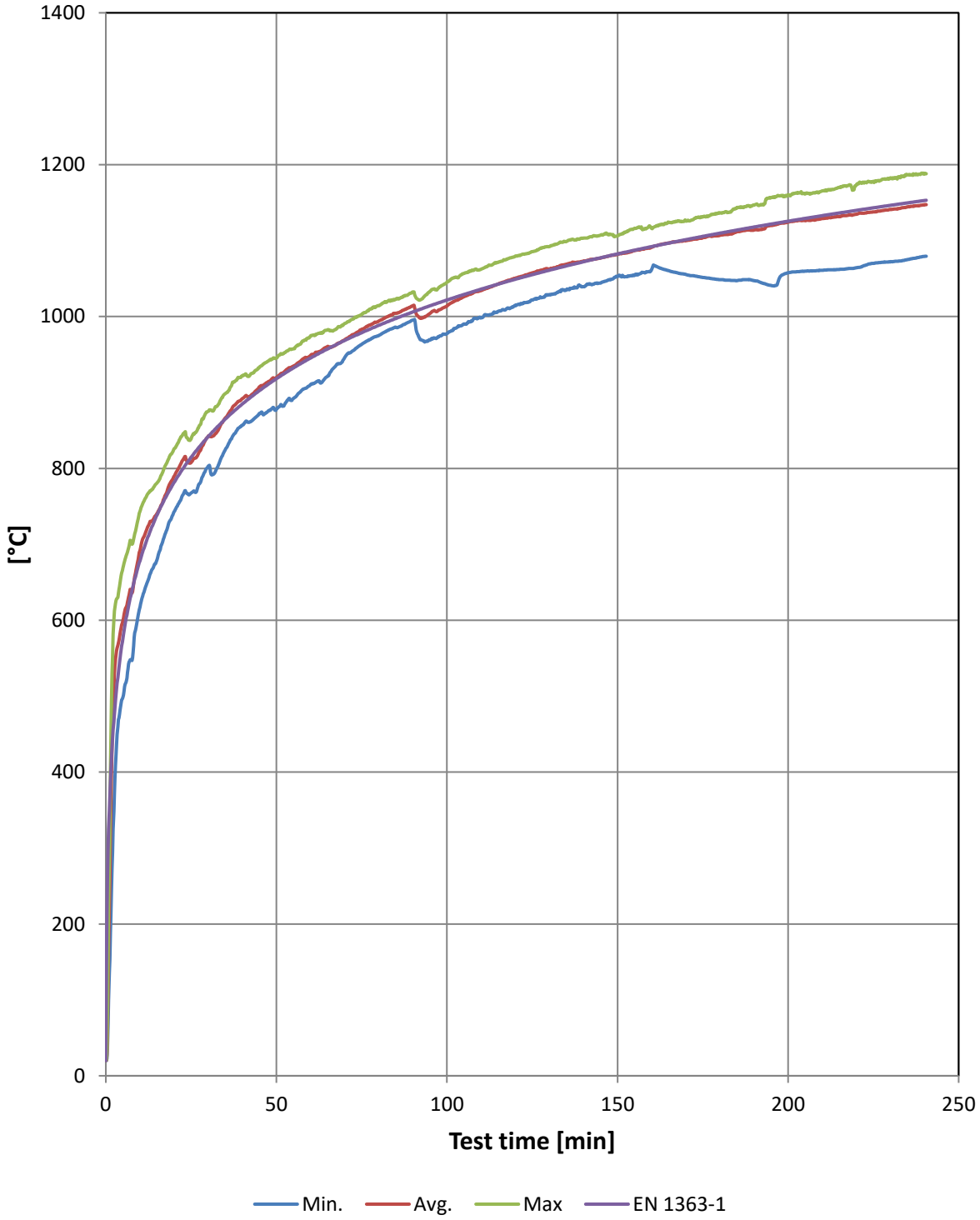
⊗ Thermocouple placed on the unexposed surface (Maximum)

▽ Deflection measuring point

All measurements are in mm

Furnace temperature

Furnace temperature



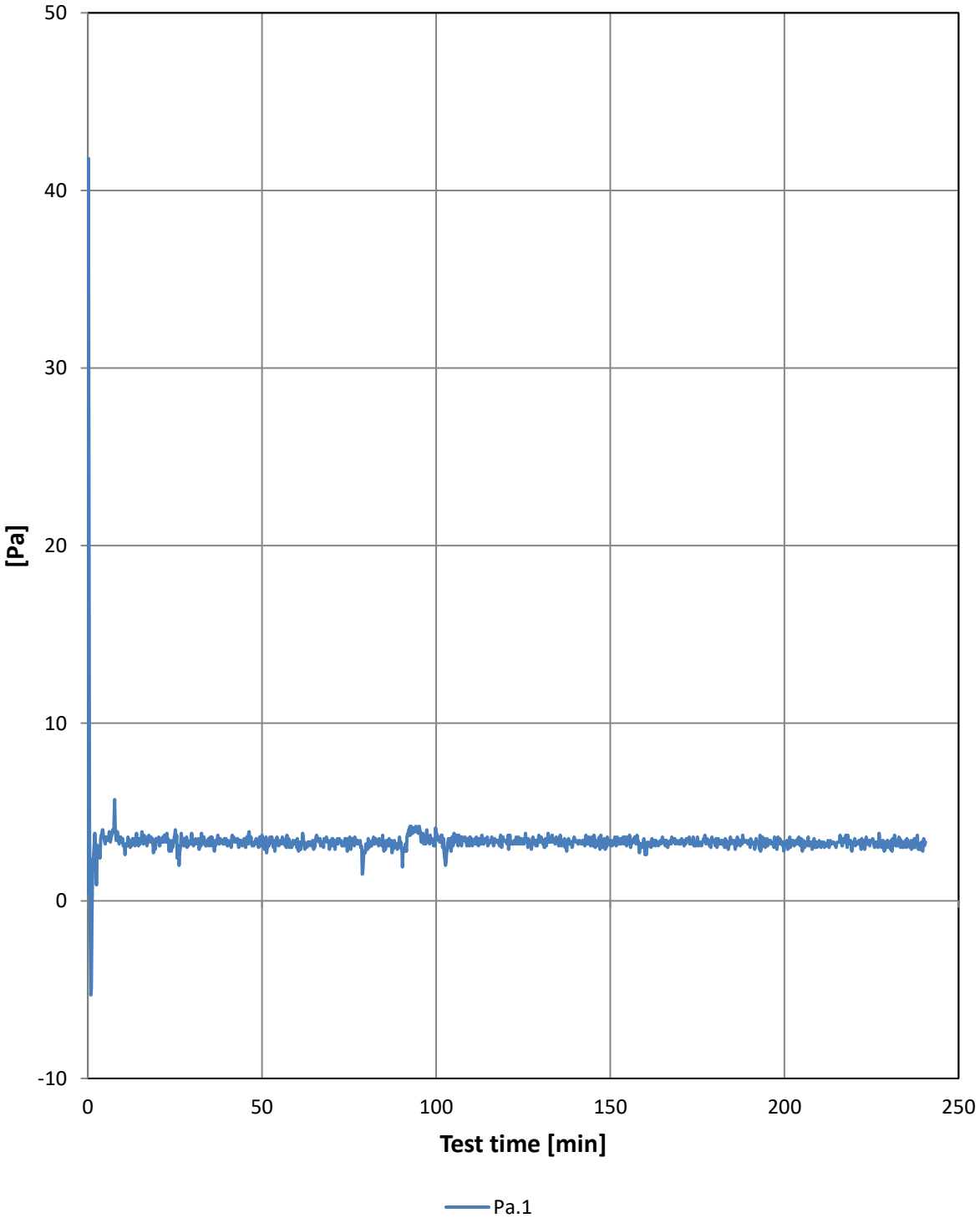
Furnace temperature

Furnace temperature

Time	Measured			Norm	Area under curve			
Minutes	Minimum	Average	Maximum	EN 1363-1	Measured	EN 1363-1	Dev. [%]	Limit [%]
0	20	20	20	20	0	0	0,0	
15	680	741	781	739	8935	8918	0,2	13
30	803	842	875	842	20905	20859	0,2	5
45	872	907	933	902	34049	33971	0,2	4
60	910	949	975	945	47969	47844	0,3	3
75	964	983	1003	979	62438	62283	0,2	3
90	995	1014	1032	1006	77425	77175	0,3	3
105	990	1026	1057	1029	92583	92442	0,2	3
120	1015	1050	1079	1049	108163	108031	0,1	3
135	1035	1069	1099	1067	124064	123901	0,1	3
150	1053	1082	1106	1082	140193	140022	0,1	3
165	1060	1097	1124	1097	156530	156367	0,1	3
180	1049	1107	1137	1110	173060	172917	0,1	3
195	1041	1120	1157	1122	189750	189654	0,1	3
210	1061	1129	1166	1133	206628	206564	0,0	3
225	1070	1138	1178	1143	223629	223635	0,0	3
240	1079	1147	1189	1153	240767	240855	0,0	3

Vertical furnace pressure

The differential pressure in the furnace during the test, measured 1,16 m above notional floor level



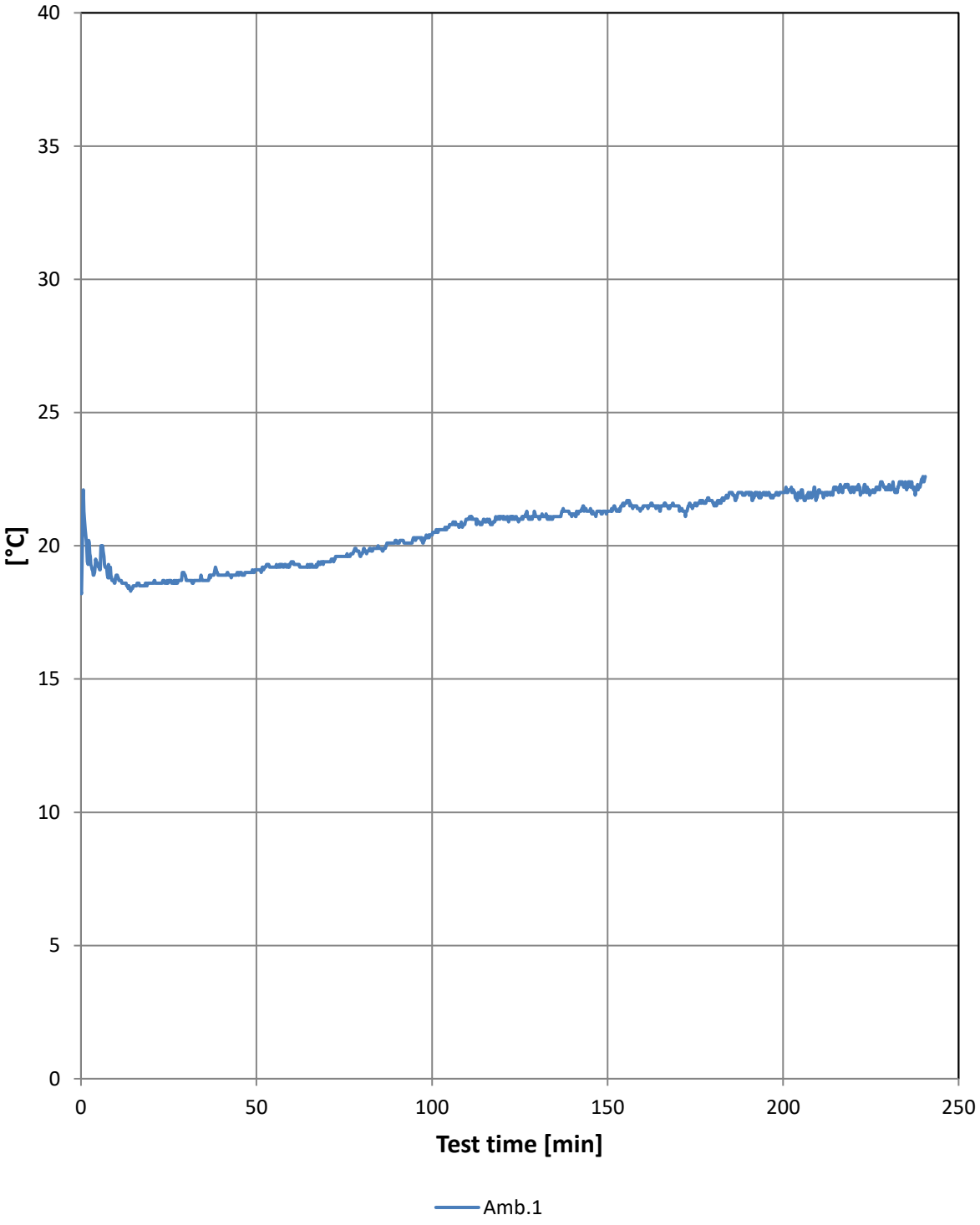
Vertical furnace pressure

The differential pressure in the furnace during the test, measured 1,16 m above notional floor level

Min. / Pa	Pa.1
0	0,5
15	3,2
30	3,5
45	3,3
60	3,0
75	3,4
90	2,9
105	3,2
120	3,3
135	3,3
150	3,1
165	3,6
180	3,2
195	3,5
210	3,4
225	3,4
240	3,5

Ambient temperature

The ambient temperature in the laboratory during the test



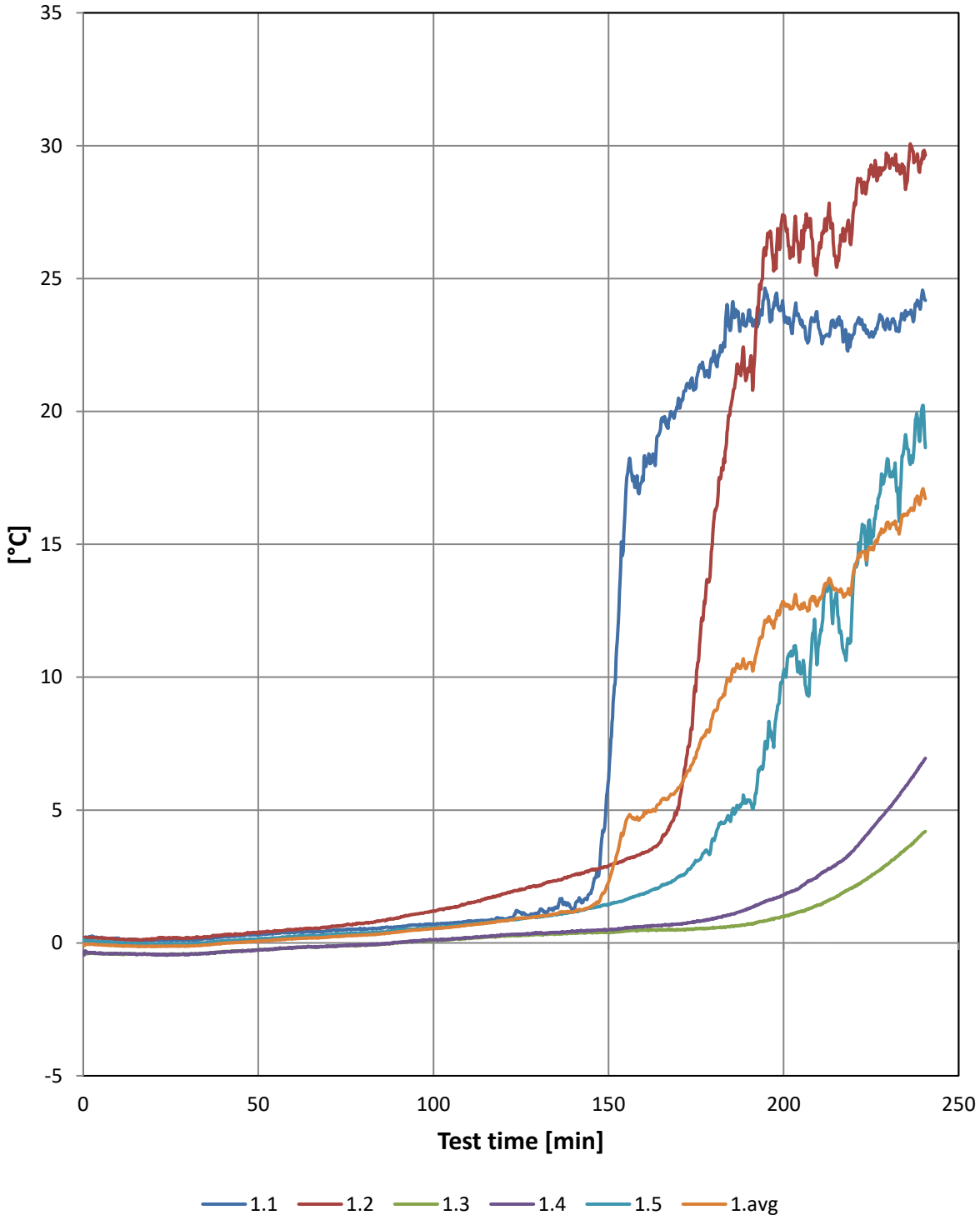
Ambient temperature

The ambient temperature in the laboratory during the test

Min. /	Amb.1
0	18,30
15	18,50
30	18,70
45	18,90
60	19,40
75	19,60
90	20,10
105	20,80
120	21,10
135	21,10
150	21,30
165	21,30
180	21,60
195	21,90
210	22,00
225	22,00
240	22,50

Average temperature rise

Measured with 5 thermocouples on the unexposed side



Average temperature rise

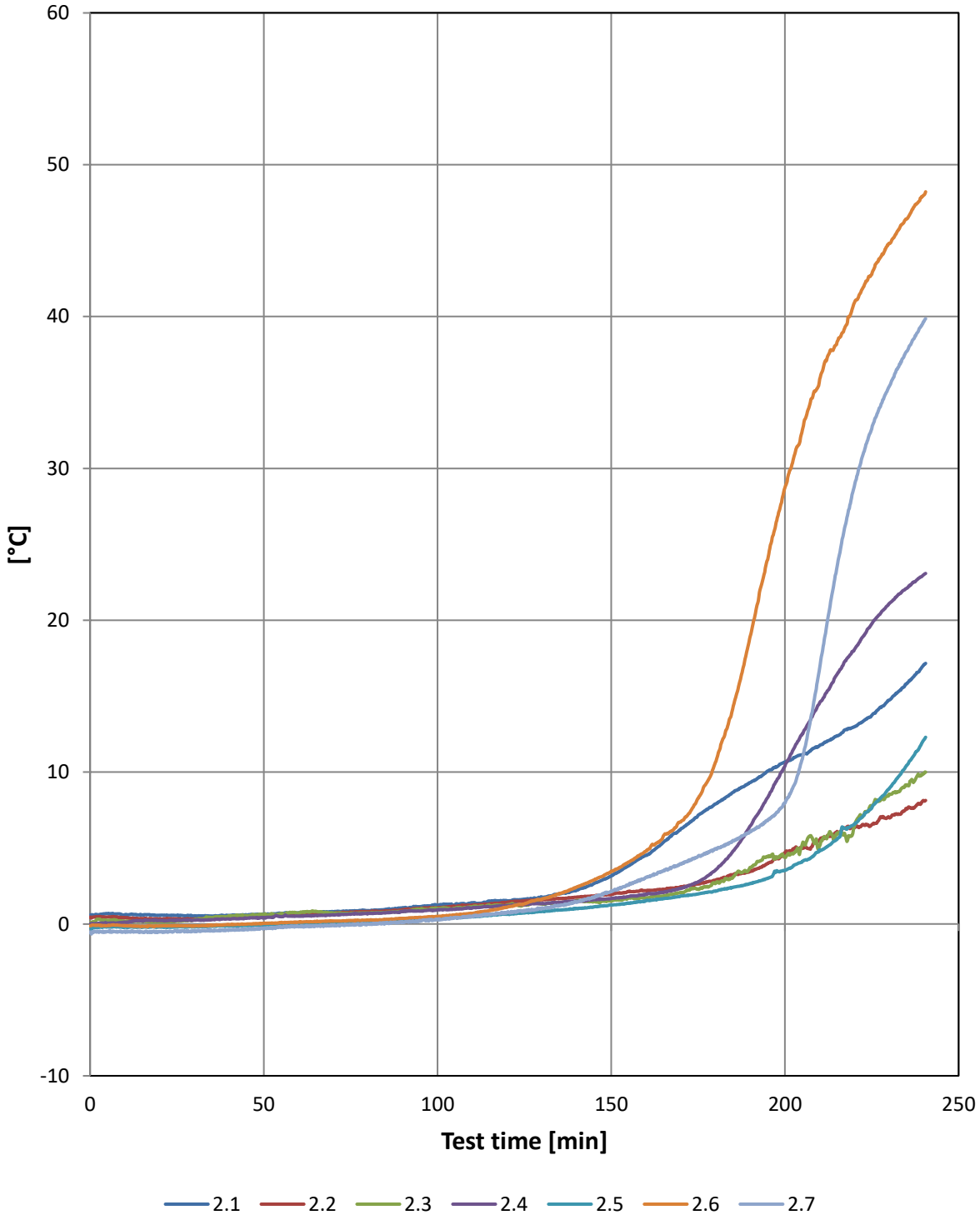
Measured with 5 thermocouples on the unexposed side

Min. / °C	1.1	1.2	1.3	1.4	1.5	1.Avg	1.Max
0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
75	1	1	0	0	0	0	1
90	1	1	0	0	1	0	1
105	1	1	0	0	1	1	1
120	1	2	0	0	1	1	2
135	1	2	0	0	1	1	2
150	6	3	0	1	1	2	6
165	20	4	1	1	2	5	20
180	22	16	1	1	4	9	22
195	25	26	1	2	7	12	26
210	23	26	1	3	11	13	26
225	23	29	3	4	15	15	29
240	24	30	4	7	20	17	30

Failure [min]	-	-	-	-	-	-	-
Failure°C	180	180	180	180	180	140	180

Maximum temperature rise

Maximum temperatures on the unexposed side



Maximum temperature rise

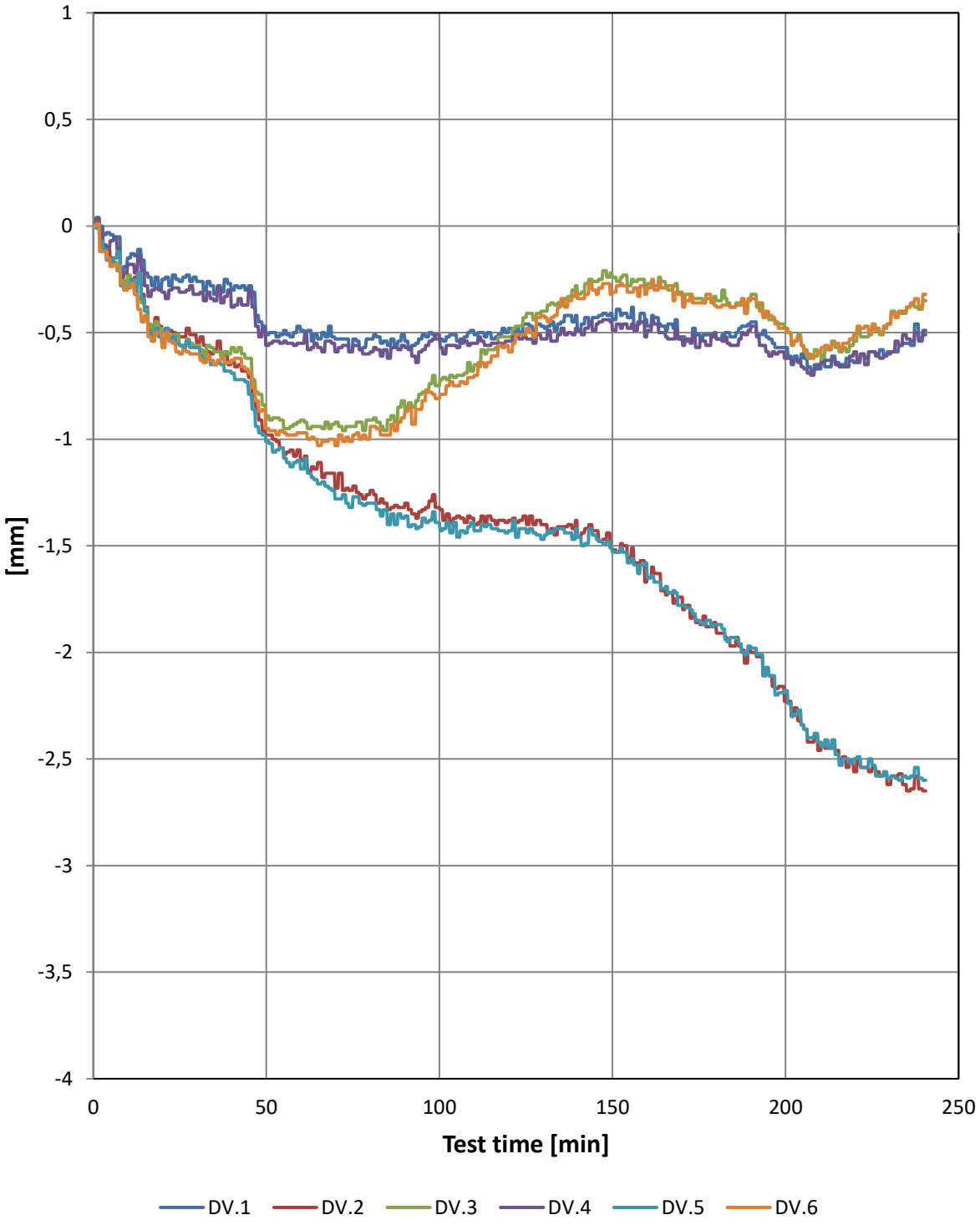
Maximum temperatures on the unexposed side

Min. / °C	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.Max
0	1	0	0	0	0	0	-1	1
15	1	0	0	0	0	0	-1	1
30	1	0	0	0	0	0	0	1
45	1	0	1	0	0	0	0	1
60	1	1	1	1	0	0	0	1
75	1	1	1	1	0	0	0	1
90	1	1	1	1	0	0	0	1
105	1	1	1	1	0	1	0	1
120	2	1	1	1	1	1	1	2
135	2	2	1	1	1	2	1	2
150	3	2	2	2	1	3	2	3
165	5	2	2	2	2	6	3	6
180	8	3	3	4	2	11	5	11
195	10	4	4	8	3	24	7	24
210	12	6	5	15	5	36	17	36
225	14	7	8	20	8	43	33	43
240	17	8	10	23	12	48	40	48

Failure [min]	-	-	-	-	-	-	-	-
Failure°C	180	180	180	180	180	180	180	180

Vertical deformation

Negative values indicate downwards movement



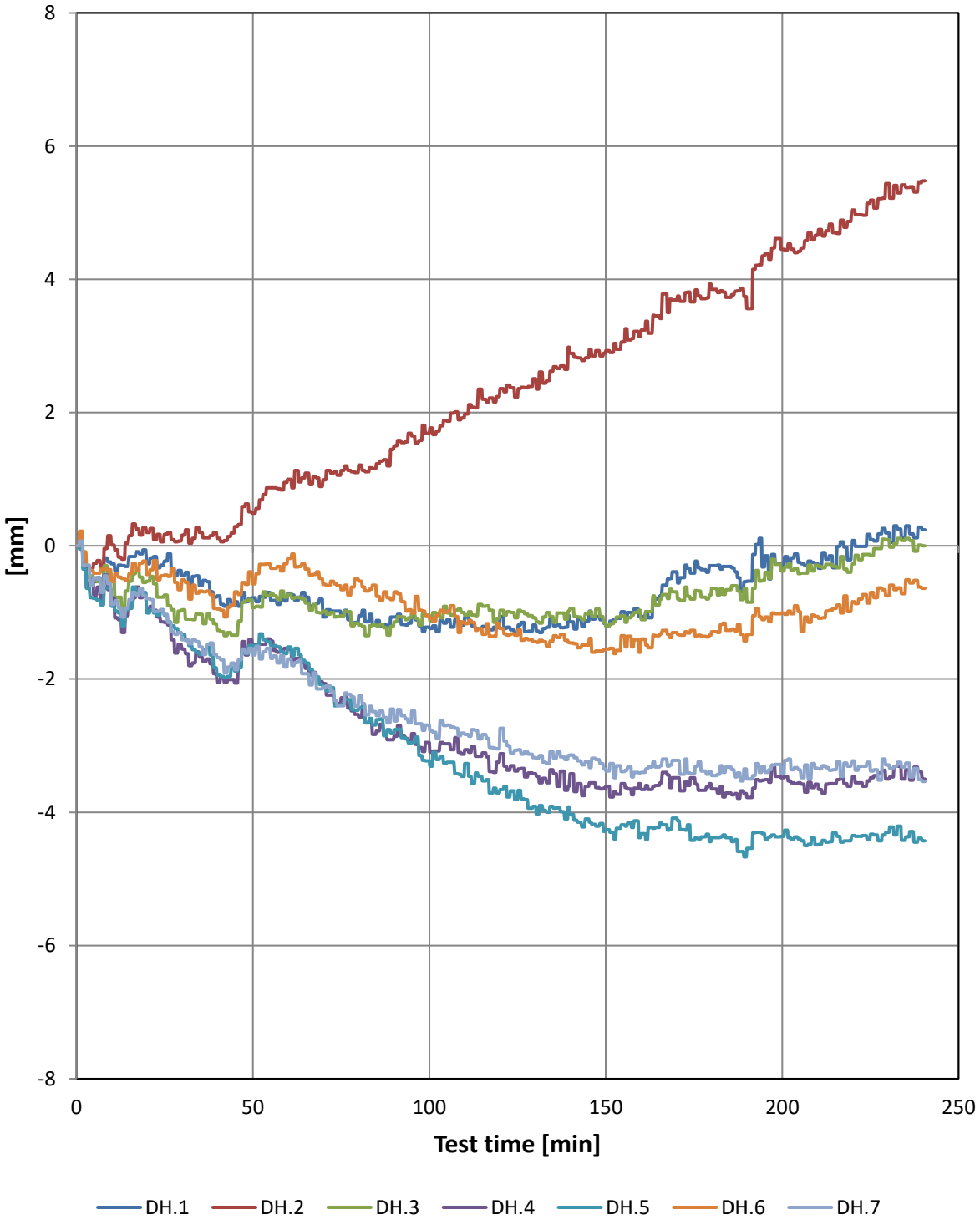
Vertical deformation

Negative values indicate downwards movement

Min. / mm	DV.1	DV.2	DV.3	DV.4	DV.5	DV.6
0	0,0	0,0	0,0	0,0	0,0	0,0
15	-0,2	-0,4	-0,4	-0,3	-0,4	-0,4
30	-0,3	-0,6	-0,6	-0,3	-0,6	-0,6
45	-0,3	-0,7	-0,6	-0,3	-0,8	-0,7
60	-0,5	-1,1	-0,9	-0,6	-1,1	-1,0
75	-0,5	-1,2	-0,9	-0,6	-1,3	-1,0
90	-0,5	-1,3	-0,9	-0,6	-1,4	-0,9
105	-0,5	-1,4	-0,7	-0,6	-1,5	-0,8
120	-0,5	-1,4	-0,5	-0,5	-1,4	-0,6
135	-0,5	-1,4	-0,4	-0,5	-1,4	-0,4
150	-0,4	-1,5	-0,2	-0,5	-1,5	-0,3
165	-0,5	-1,7	-0,3	-0,5	-1,7	-0,3
180	-0,5	-1,9	-0,4	-0,5	-1,9	-0,4
195	-0,5	-2,1	-0,4	-0,6	-2,1	-0,4
210	-0,7	-2,5	-0,6	-0,7	-2,4	-0,6
225	-0,6	-2,5	-0,5	-0,6	-2,5	-0,5
240	-0,5	-2,7	-0,4	-0,5	-2,6	-0,3

Horizontal deformation

Negative values indicate movement towards the furnace



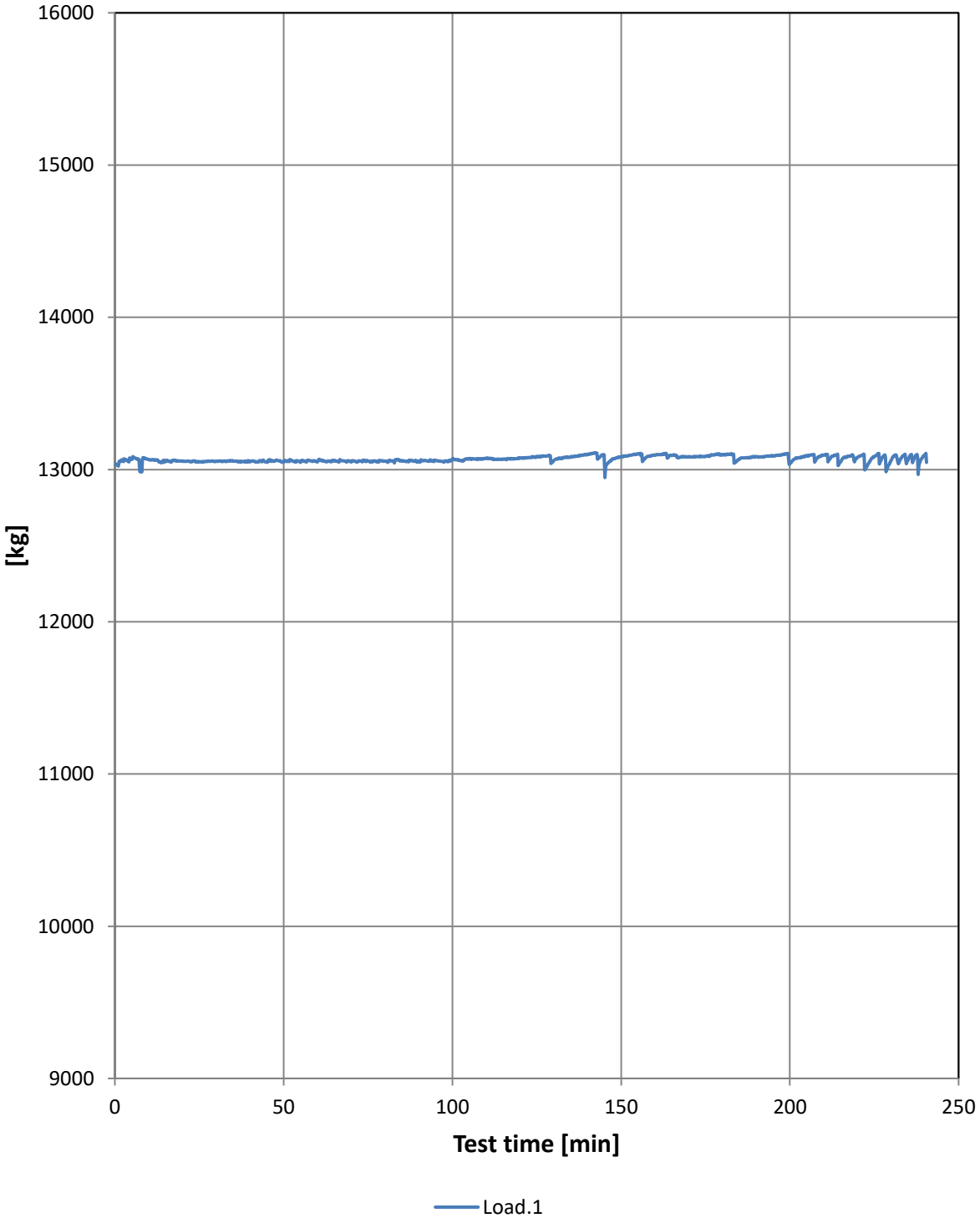
Horizontal deformation

Negative values indicate movement towards the furnace

Min. / mm	DH.1	DH.2	DH.3	DH.4	DH.5	DH.6	DH.7
0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
15	-0,2	0,2	-0,5	-0,9	-0,9	-0,4	-0,8
30	-0,5	0,2	-1,0	-1,6	-1,3	-0,5	-1,4
45	-0,8	0,3	-1,3	-2,1	-1,9	-0,7	-1,9
60	-0,7	1,0	-0,7	-1,6	-1,5	-0,2	-1,7
75	-1,1	1,1	-1,1	-2,3	-2,4	-0,7	-2,4
90	-1,1	1,5	-1,1	-2,9	-2,8	-0,7	-2,6
105	-1,1	1,9	-1,0	-3,0	-3,3	-1,0	-2,7
120	-1,1	2,4	-1,0	-3,1	-3,7	-1,2	-2,7
135	-1,1	2,6	-1,1	-3,4	-3,9	-1,4	-3,1
150	-1,2	2,9	-1,2	-3,6	-4,3	-1,6	-3,4
165	-0,8	3,5	-0,9	-3,6	-4,2	-1,4	-3,3
180	-0,3	3,9	-0,6	-3,7	-4,4	-1,3	-3,5
195	-0,3	4,4	-0,5	-3,5	-4,3	-1,1	-3,3
210	-0,3	4,7	-0,3	-3,6	-4,5	-1,1	-3,3
225	0,1	5,2	-0,2	-3,5	-4,3	-0,7	-3,4
240	0,2	5,5	0,0	-3,5	-4,4	-0,6	-3,5

Load per cylinder

Load per cylinder during test



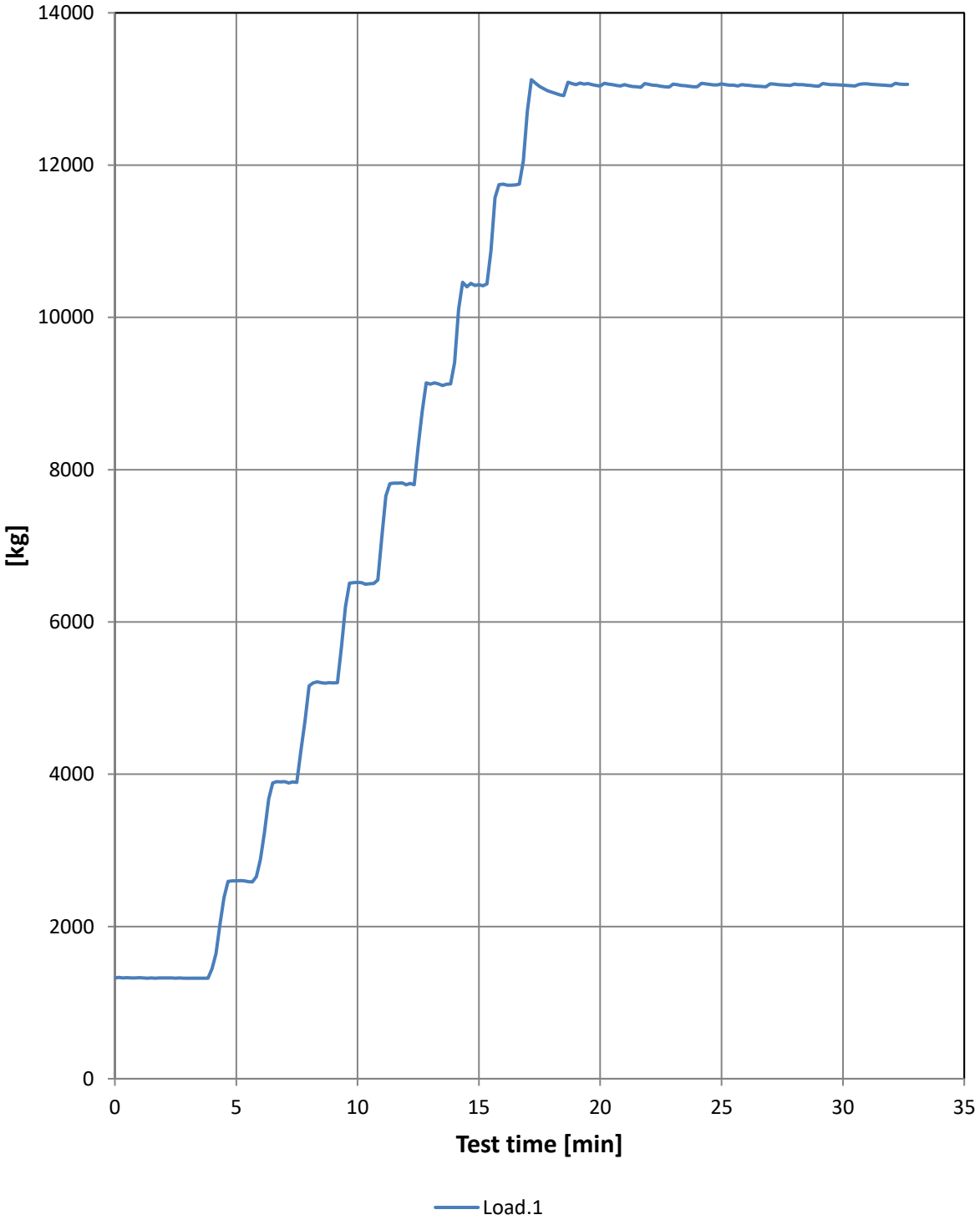
Load per cylinder

Load per cylinder during test

Min. / kg	Load.1
0	13039
15	13055
30	13055
45	13050
60	13050
75	13055
90	13053
105	13071
120	13075
135	13081
150	13083
165	13092
180	13096
195	13091
210	13095
225	13085
240	13098

Load per cylinder

Load per cylinder during loading phase



Load per cylinder

Load per cylinder during loading phase

Min. / kg	Load.1
0	1325
1	1328
2	1322
3	1320
4	1445
5	2599
6	2880
7	3902
8	5158
9	5199
10	6518
11	7116
12	7803
13	9123
14	9407
15	10428
16	11749
17	12710
18	12958
19	13057
20	13039
21	13058
22	13060
23	13063
24	13028
25	13069
26	13049
27	13069
28	13063
29	13037
30	13049
31	13067
32	13042

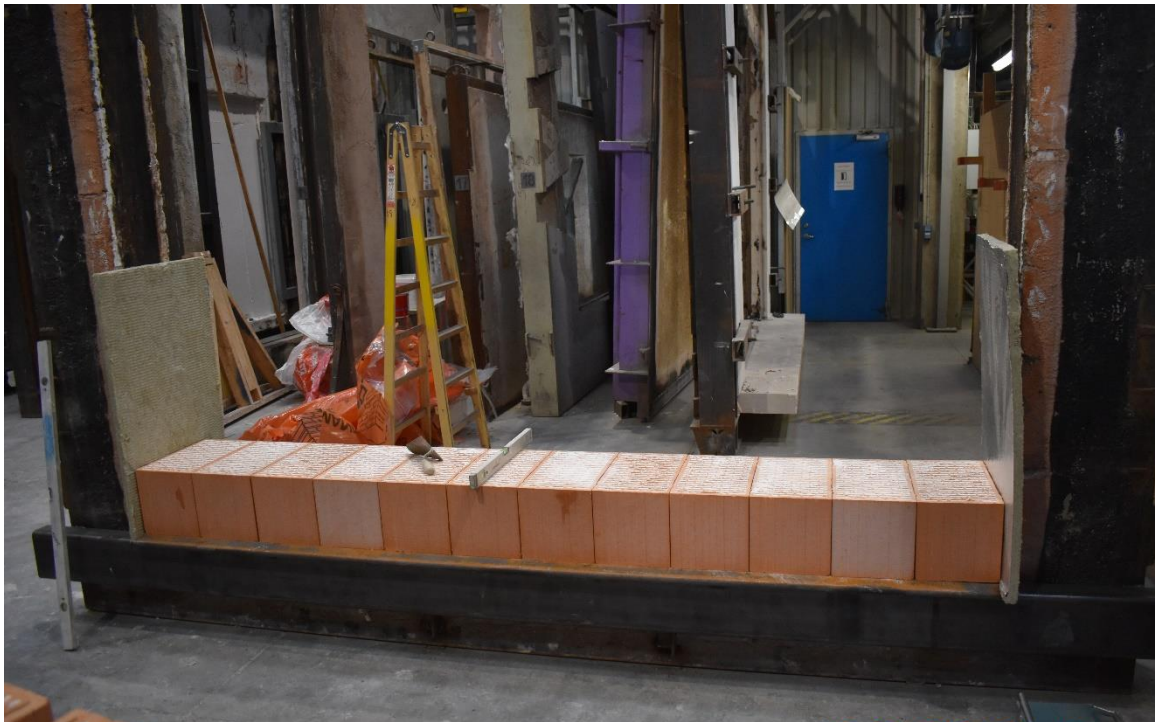


Photo No. 1 The first layer of the wall was built up with mortar before placing the blocks

Photo No. 2 Perspective of the blocks with insulation inside

Photo No. 3 The blocks were aligned before placing the next layer

Photo No. 4 Three layers was placed with mortar on top of them

Photo No. 5 Finishing the third layer

Photo No. 6 Continuation of the wall

Photo No. 7 Continuation of the wall where mortar in the joints are visible

Photo No. 8 Wall build up, seen from the left side

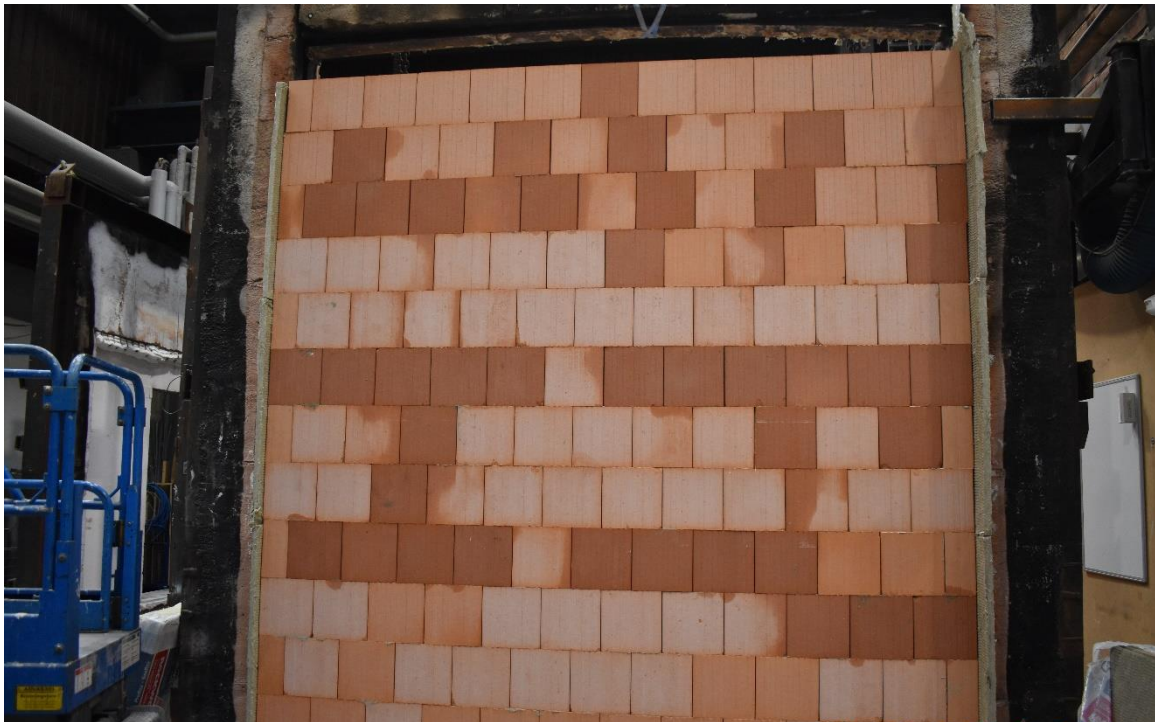


Photo No. 9 Build up before the last finish

Photo No. 10 Build up with the last finish of mortar put in between the joints

Photo No. 11 Wall finished and ready for thermocouples

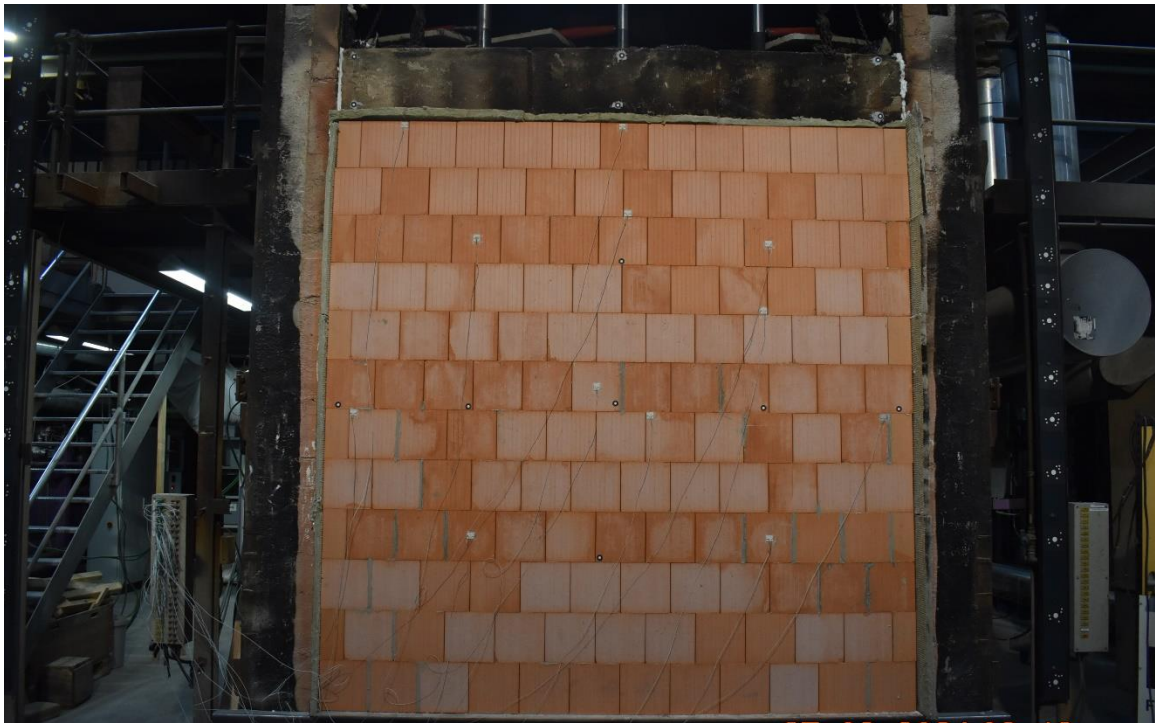


Photo No. 12 Thermocouples mounted on the wall

Photo No. 13 Test commenced

Photo No. 14 35 minutes in the test, with no visible changes

Photo No. 15 60 minutes in the test, with no visible changes

Photo No. 16 118 minutes in the test, with no visible changes

Photo No. 17 163 minutes in the test, with visible moisture from the joints

Photo No. 18 180 minutes in the test, with no visible changes

Photo No. 19 192 minutes in the test, with no visible changes

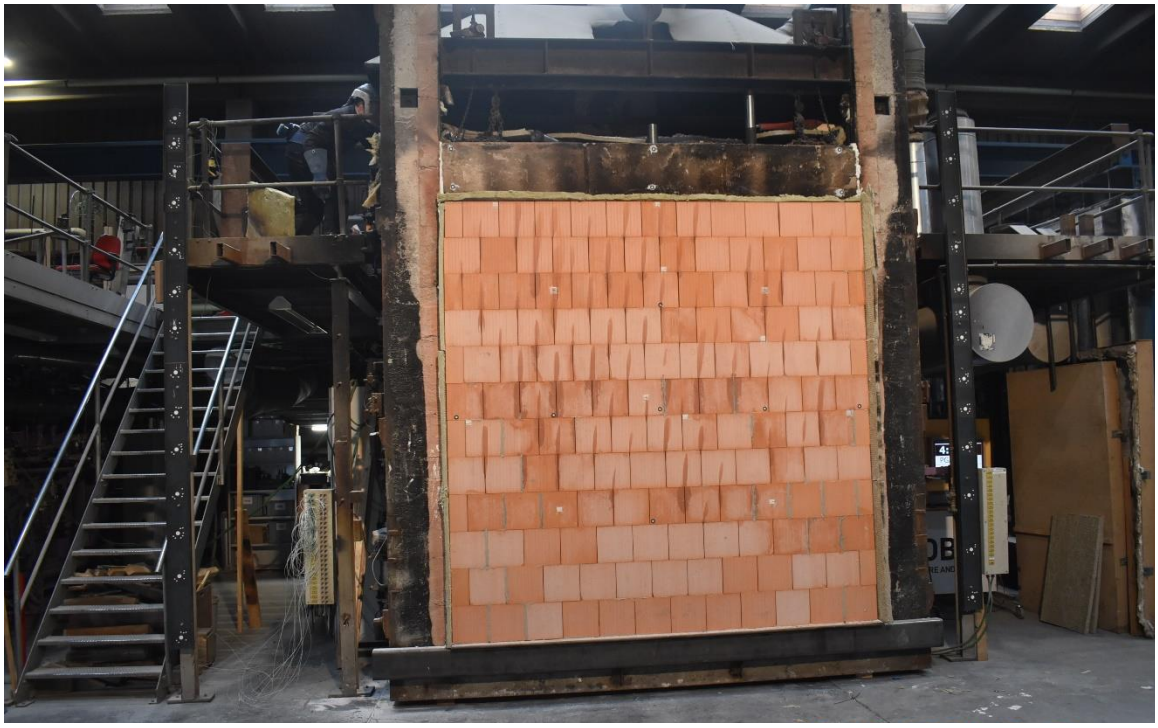


Photo No. 20 240 minutes in the test. Test stopped

Photo No. 21 Test specimen pulled off the oven

Photo No. 22 Test specimen after the test

Photo No. 23 Test specimen after the test

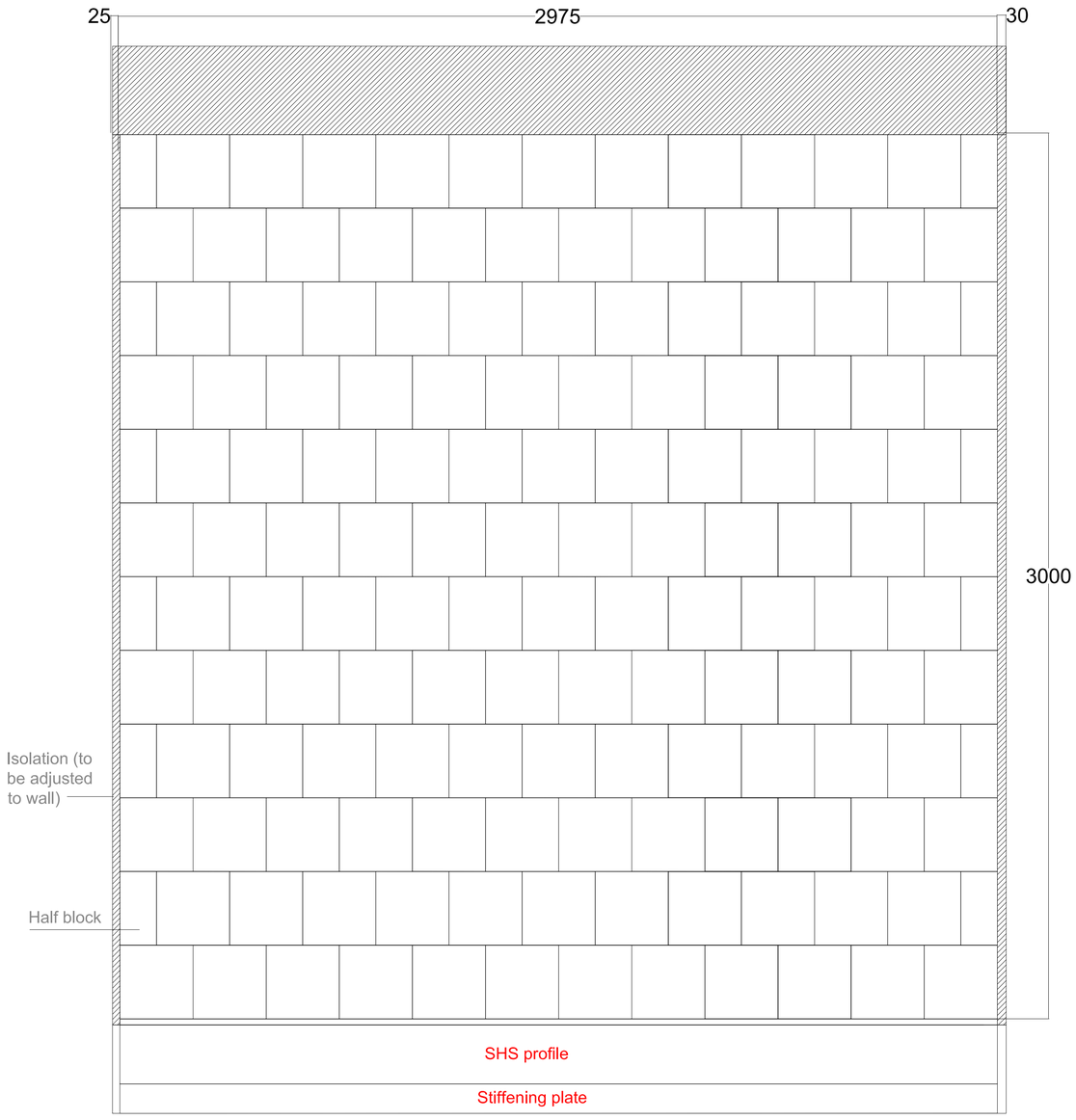
Photo No. 24 Test specimen after the test

Photo No. 25 Test specimen after the test

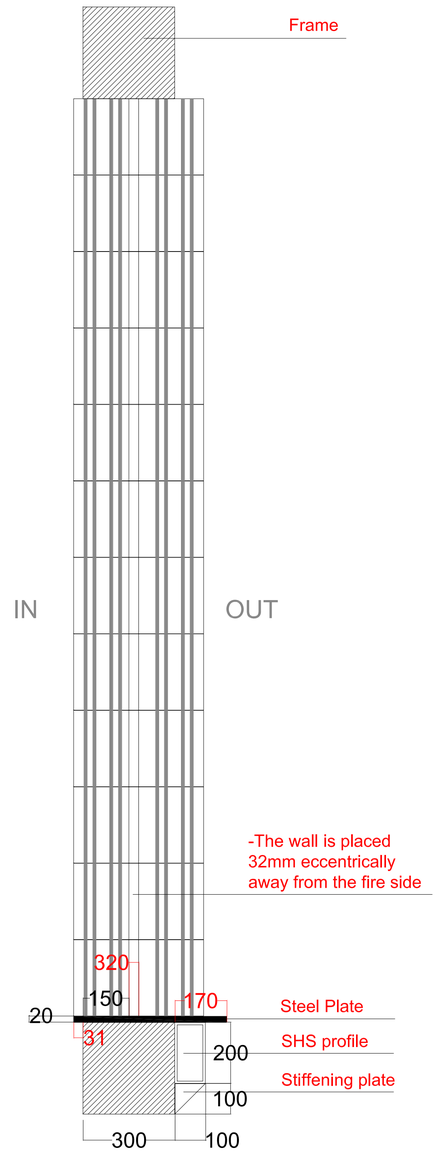
Photo No. 26 Test specimen after the test

Photo No. 27 Test specimen after the test

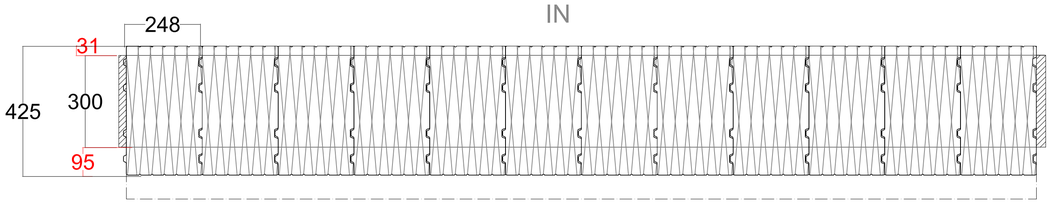
Photo No. 28 Test specimen after the test



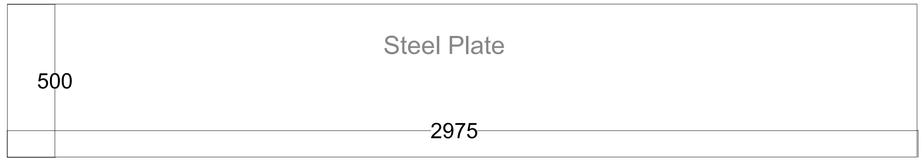
Opstalt



Snit



Plan



Specification to steel plate to meet WSP and DPIs requirements

NOTES:

revision date amendment

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- Do not scale from this drawing
- All dimensions to be checked on site by the Contractor
- And such dimensions to be their responsiblility
- Report all drawing errors and omissions to the Architect
- All dimensions in millimeters unless noted otherwise
- If in doubt ask Contract Administrator

DBI PGA124600A

job title
MiniCO2 Tegl

drawing title / location
MC2_DBI_425mmvæg

status Skitse

date 05.03.2024 checked

scale 1:10@A1 authorised

job no	originator	volume	level	type	role	drawing no	revision
A351	MCO				A		A