DBI
FIRE AND SECURITY

TEST REPORT
LOADBEARING WALL

Name of sponsor:	Byggefirmaet Logik & Co. A/S		
Product name:	REI60 wall		
File no.:	PGA11985A	**Revision no.:**	0
Test date:	21-07-2021	**Date:**	10-08-2021
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ilac-MRA DANAK
TEST Reg.no.0012

Client information

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

Content

Date of test

The test was conducted on the 21-07-2021

Purpose of test

Examination of the fire-resistance of a load-bearing 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

In addition to the standards, EGOLF recommendation EGR 80:2014 was followed. EGR 80 states that the loadbearing parts should not be placed in the first 200mm from each free edge to avoid the edge effects.

Test specimen

The trade name and sponsors identification mark is 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	01	05.08.2021	Snit ydervæg REV E
Drawing	02	02.08.2021	Proces A REI 60 Skelet + indvendig REV A
Drawing	03	02.08.2021	Proces B REI60 Udvendig REV A
Drawing	04	02.08.2021	Proces C REI60 Indvendig REV A
Drawing	05	05.08.2021	Proces D REI60 Udvendig REV B

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: 2930 mm Thickness: 394 mm

The test specimen was a 3.0 m high loadbearing wall construction made of loadbearing wooden studs.

The exposed side was constructed of a layer of wood fibre board fixed to the loadbearing studs, a wooden stud to create an air gap and then finished with a chip board. The wall was insulated with wood fibre insulation and finished with a layer of OSB and 2 layers of fibre gypsum boards on the unexposed side.

The test specimen was asymmetrical. The test specimen was tested with the outside exposed to the fire.

Top and bottom profiles
Timber profiles:

The top, bottom and loadbearing stud profiles are dry graded C24 construction spruce wood with a nominal density of 450 kg/m³. One 45 x 295 mm C24 Dry graded construction timber is placed along the top of the test frame above the loadbearing studs and another is placed along the bottom of the test frame below the load bearing studs. The top and bottom profiles are fixed to the studs using two Eurotec TX 40, 8,0 x 160 mm screws.
See sponsor drawing no. 2.

Load bearing studs:

A total of 5 load bearing studs were used in the wall construction, all 2910 mm high. The studs are the same material as the top and bottom profiles. The load bearing studs were spaced c/c 600 mm. The first two load bearing studs were fixed 243 mm. away from the DBI-frame edges to avoid edge effects.
See sponsor drawing no. 2 and photo no. 1.

Materials between the load bearing studs
295 mm insulation

295 mm thick wood fibre insulation with a nominal density of 43 kg/m³ designated "Woodfibre AIR" was blown in between the loadbearing studs and top and bottom profiles. The insulation was blown in after the first layers on both sides of the studs were mounted. A hole was drilled in the OSB board approximately 1500 mm from the bottom. After the insulation was completed the wood from the hole was put back into place with designated Gul pro alpha vapor barrier tape.

See photo no. 2.

Inner layers (unexposed side)
OSB board

A 22 mm thick OSB3 board (nominal density 650 kg/m³, EN 13986:2004 + A1:2015) was mounted on the unexposed side to the load bearing studs with 2.8 x 75 mm strip nails, designated "TJEP GF Strip Nails 2.8 x 75 mm" at c/c approx. 150 mm. The OSB boards had the maximum dimensions of 2440 x 1220 mm.
See sponsor drawing no. 2 and photo no. 3.

Fibre gypsum boards

Two layers of 12.5 mm thick gypsum fibre boards designated "Fermacell Gypsum Fibreboard" (type EN 15283-2, ETA-03/0050) with a nominal density of 1150 kg/m³ were fixed with designated TJEP PZ 16 Staples 30 mm with glue, galvanized at a c/c of 400 mm through the gypsum board into the 22 mm OSB3 board for the first layer and for the second layer TJEP PZ 16 Staples 50 mm with glue, galvanized at a c/c of 200 mm. The staples were fixed 10 mm from the board edges and 50 mm from the board corners. A full-size board measured 900 x 1200 mm.
See sponsor drawing no. 4 and photos no. 4 - 5.

Outer layers (exposed side)
Wood fibre board

A 22 mm thick Wood fibre board, designated GUTEX Multiplex-top (nominal density 220 kg/m³, (type EN 13171:2012 + A1:2015) was mounted to the load bearing studs on the exposed side with chipboard screws designated Eurotech ruspert chipboard ph tx 5.0 x 80 mm with a minimum of 2 screws per stud per board. The wood fibre boards had the maximum dimensions of 750 x 2500 mm.
See sponsor drawing no. 3 and photo no. 6.

Wood studs/spacers

18 x 46 mm pine wood studs/spacers (nominal density 450 kg/m³) were fixed to exposed side on the wood fibre board and the load bearing studs. with 2.8 x 75 mm strip nails, designated "TJEP GF Strip Nails 2.8 x 75 mm" at c/c of 200 mm.
See sponsor drawing no. 3 and photo no. 7.

Chipboard

A 12 mm thick chip board, designated spånplade TG4 (nominal density 690 kg/m³, (type EN 13171:2012 + A1:2015) was mounted to the wooden studs/spacers and the load bearing studs on the exposed side with chipboard screws designated Eurotech ruspert chipboard ph tx 5.0 x 60 mm with a c/c of 200 mm. The chip boards had the maximum dimensions of 1220 x 2500 mm.
See sponsor drawing no. 5 and photo no. 8

Measured by DBI

Product		Timber profiles C24	OSB-3 TG2	Fermacell Fibre gypsum	Wood stud/spacer	Chipboard TG4 12 mm	Wood fibre AIR	Gutex Multiplex-Top
Density	kg/m³	420	558	1148	459	331	43	266
Thickness	mm	45,0	22,0	12,5	18,0	12,0	295,0	22,0
Moisture content	%	13,5	9,0	0,9	11,0	7,4	12,0	8,2
Organic content	%							
Sampling method		Extra material	Extra material	Extra material	Extra material	Extra material	Extra material	Extra material
Drying temperature	°C	105	105	55	105	105	105	105

Test conditions

Conditioning

The test specimen was delivered on the 16-07-2021 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 in a test frame suitable for loaded tests with a clear opening of 3000 x 3030 mm Height x Width.

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 5 kN per loadbearing stud or 8.33 kN/m at cc 600mm during the test, corresponding to a total load of 25 kN (2550 kg).

The load was applied centrally on the horizontal top beam, 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 a distance of approximately 100 mm from the exposed side of the test specimen. The furnace temperature was continuously controlled so as 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 in the top of the wall.

Test results

Duration of the test was 96 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	Load per cylinder Load per cylinder during test
Enclosures 8.0 and 8.1	Horizontal deformation Negative values indicate movement towards the furnace
Enclosures 9.0 and 9.1	Vertical deformation Negative values indicate downwards movement
Enclosures 10.0 and 10.1	Vertical deformation rate Deformation per minute
Enclosures 11.0 and 11.1	Horizontal deformation during the loading phase Negative values indicate movement towards the furnace
Enclosures 12.0 and 12.1	Vertical deformation during the loading phase Negative values indicate downwards movement
Enclosures 13.0 and 13.1	Load per cylinder during the loading phase

Visual observations:

Time / Minutes	Visual observations:	U = Unexposed side E = Exposed side
0	Test commences	
4	Smoke development from DBI-frame.	U
11	Continued smoke development from DBI-frame.	U
15	No changes.	U

23	No changes.	U
27	Visual insulation and cracks in boards.	E
30	No changes.	U
38	Less smoke development from DBI-frame	U
41	No changes.	U
47	Bigger cracks in board	E
53	No changes.	U
55	Smoke development from gypsum joint.	U
60	No changes.	U
74	No changes.	U
80	No changes.	U
88	Cracks in insulation.	E
90	No changes.	U
92	Smoke development from new gypsum joint.	U
96	The load is removed from the test specimen	
96	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): 96 minutes

- The load on the test specimen was maintained for 96 minutes.
- The measured vertical deflection did not exceed the criteria of C = h/100 = 30 mm during the test. The maximum vertical deflection during the test was 25.3 mm.
- The measured rate of vertical deflection did not exceed the criteria of dC/dt = 3h/1000 = 9 mm/min during the test. The maximum vertical deflection rate was 3.85 mm/min

Integrity (E): 96 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): 96 minutes

- 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

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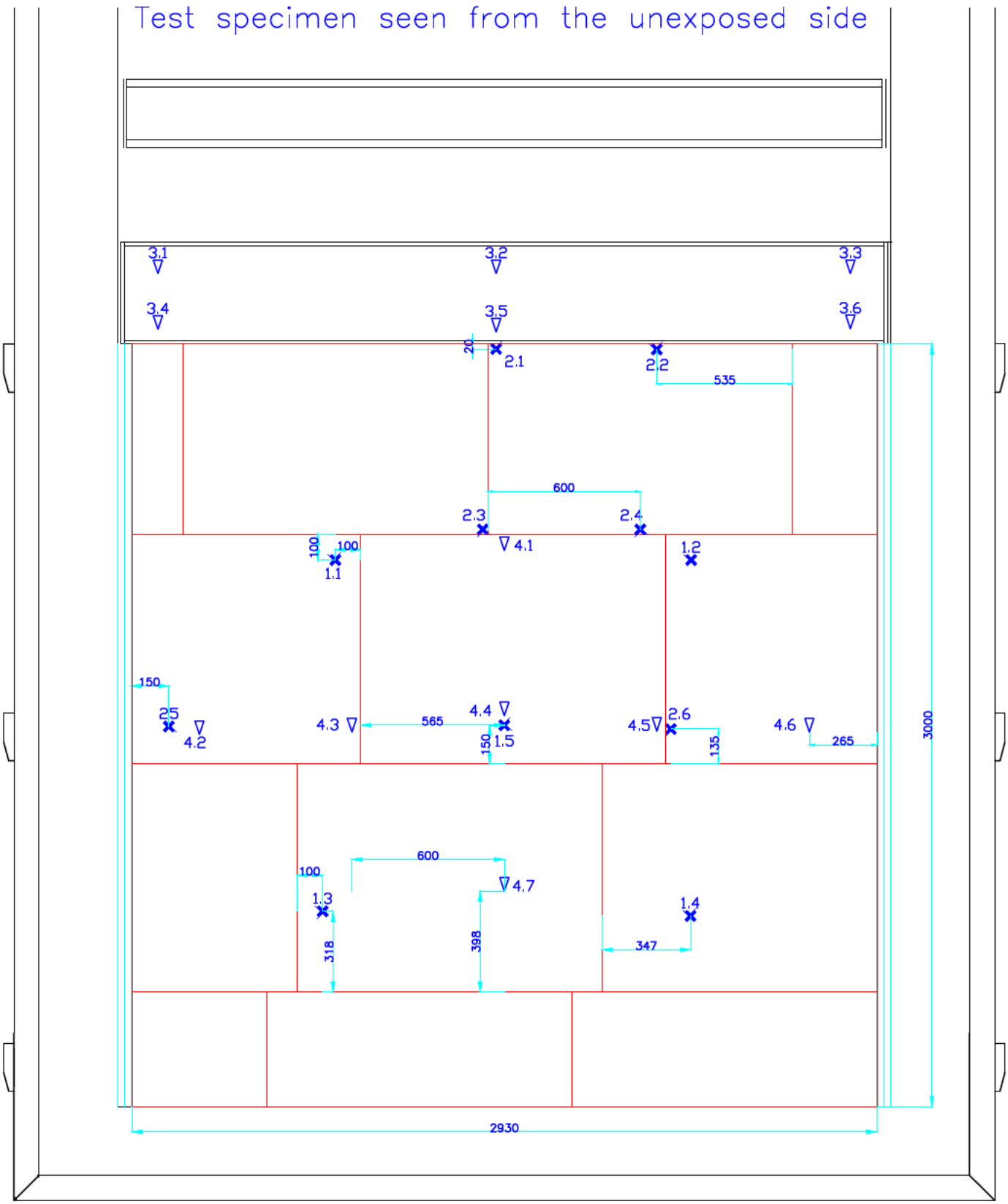
Byggefirmaet Logik & Co. A/S	**Enclosures:**	**40**
Ryesgade 23	DBI drawings:	1
2200 København N	DBI graphs and tables:	24
Denmark	Photo sheets:	10
	Sponsors drawings:	5



Load bearing studs

✖ Thermocouple placed on the unexposed surface (average)

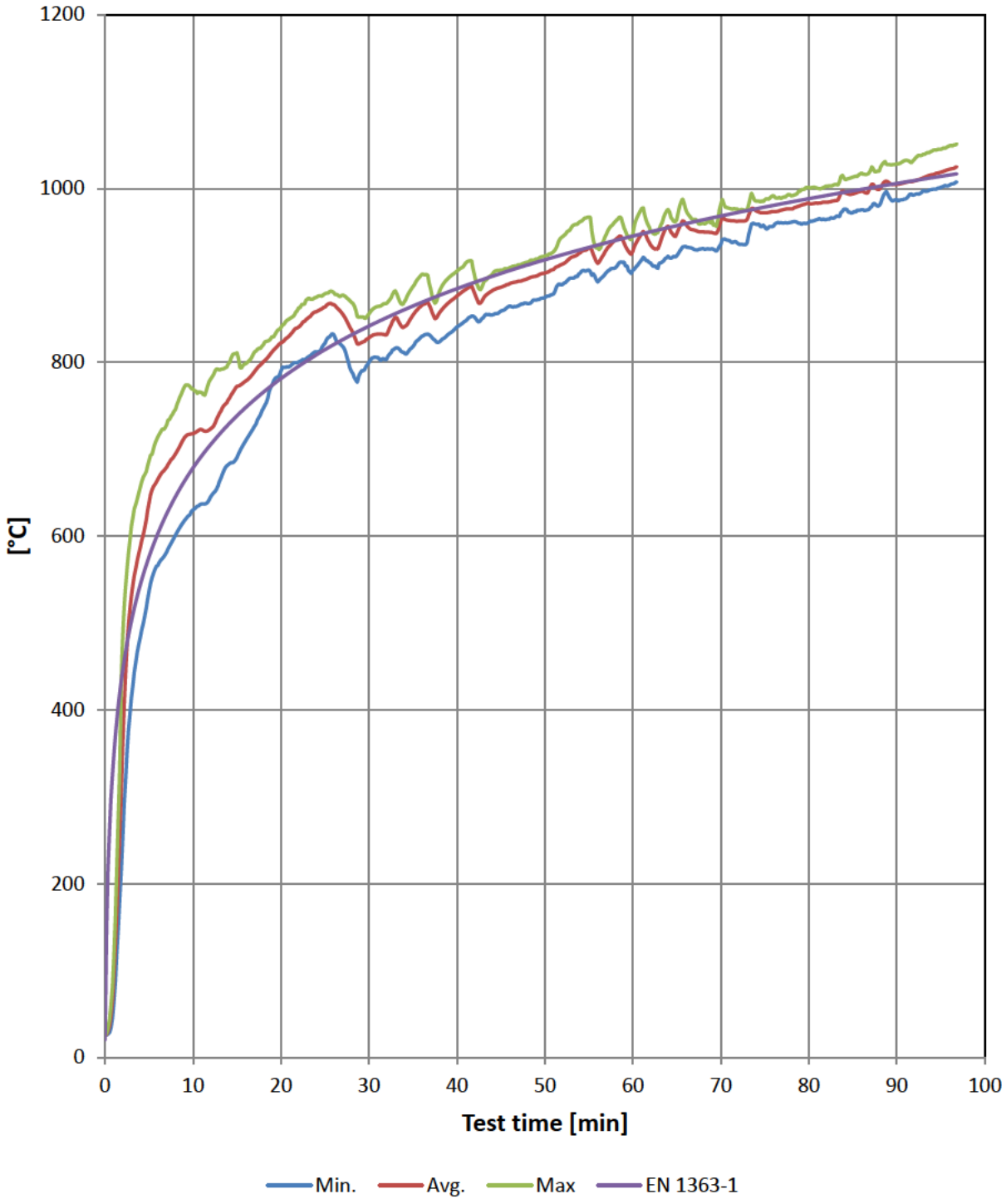
⊗ Thermocouple placed on the unexposed surface (maximum)

▽ Deflection measuring point

All measurements are in mm

Furnace temperature

Furnace temperature



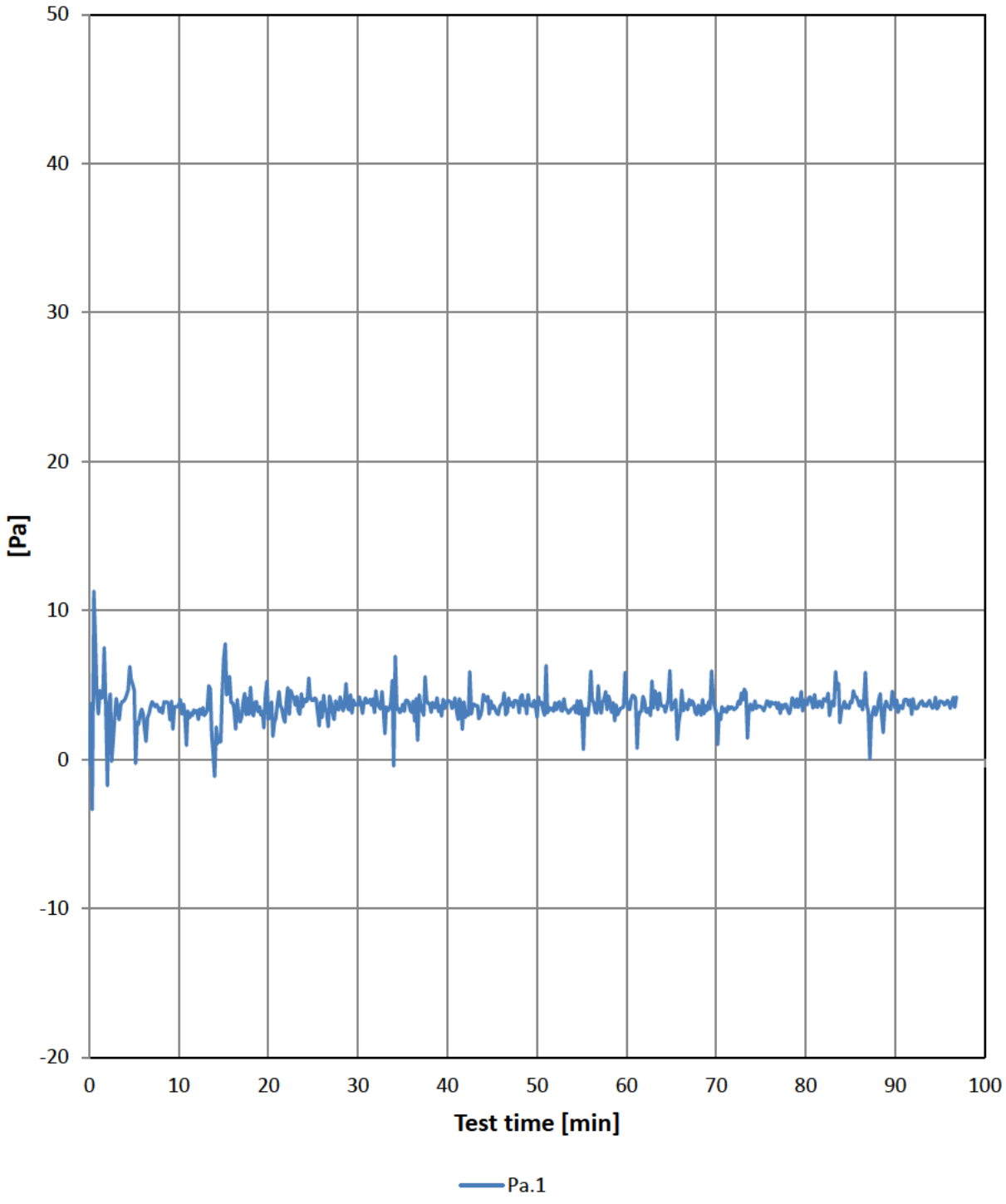
Furnace temperature

Furnace temperature

Time	Measured			Norm	Area under curve			
Minutes	Minimum	Average	Maximum	EN 1363-1	Measured	EN 1363-1	Dev. [%]	Limit [%]
0	26	26	26	20	0	0	0.0	
3	414	531	611	502	721	1115	-35.3	
6	567	665	714	603	2549	2790	-8.6	15
9	617	713	772	663	4613	4695	-1.7	15
12	645	723	781	705	6772	6750	0.3	14
15	690	772	811	739	9018	8918	1.1	13
18	747	801	820	766	11371	11176	1.8	11
21	796	831	851	789	13821	13508	2.3	10
24	812	858	875	809	16359	15904	2.9	8
27	818	856	877	826	18948	18357	3.2	7
30	800	828	856	842	21446	20859	2.8	5
33	816	852	882	856	23952	23406	2.3	5
36	830	866	901	869	26504	25994	2.0	5
39	832	868	897	881	29089	28619	1.6	4
42	852	880	900	892	31727	31279	1.4	4
45	859	886	906	902	34362	33971	1.2	4
48	868	896	915	912	37037	36692	0.9	4
51	879	907	928	921	39741	39442	0.8	3
54	903	926	962	930	42491	42218	0.6	3
57	904	930	948	938	45265	45019	0.5	3
60	906	928	948	945	48073	47844	0.5	3
63	914	934	954	953	50889	50691	0.4	3
66	934	959	977	960	53744	53559	0.3	3
69	931	949	964	966	56599	56448	0.3	3
72	936	962	975	973	59478	59356	0.2	3
75	956	972	987	979	62387	62283	0.2	3
78	961	976	992	985	65310	65228	0.1	3
81	964	983	1000	990	68254	68190	0.1	3
84	976	996	1013	996	71214	71169	0.1	3
87	978	1002	1021	1001	74200	74164	0.0	3
90	988	1005	1029	1006	77213	77175	0.0	3
93	998	1012	1039	1011	80237	80200	0.0	3
96	1004	1022	1049	1016	83289	83240	0.1	3

Vertical furnace pressure

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



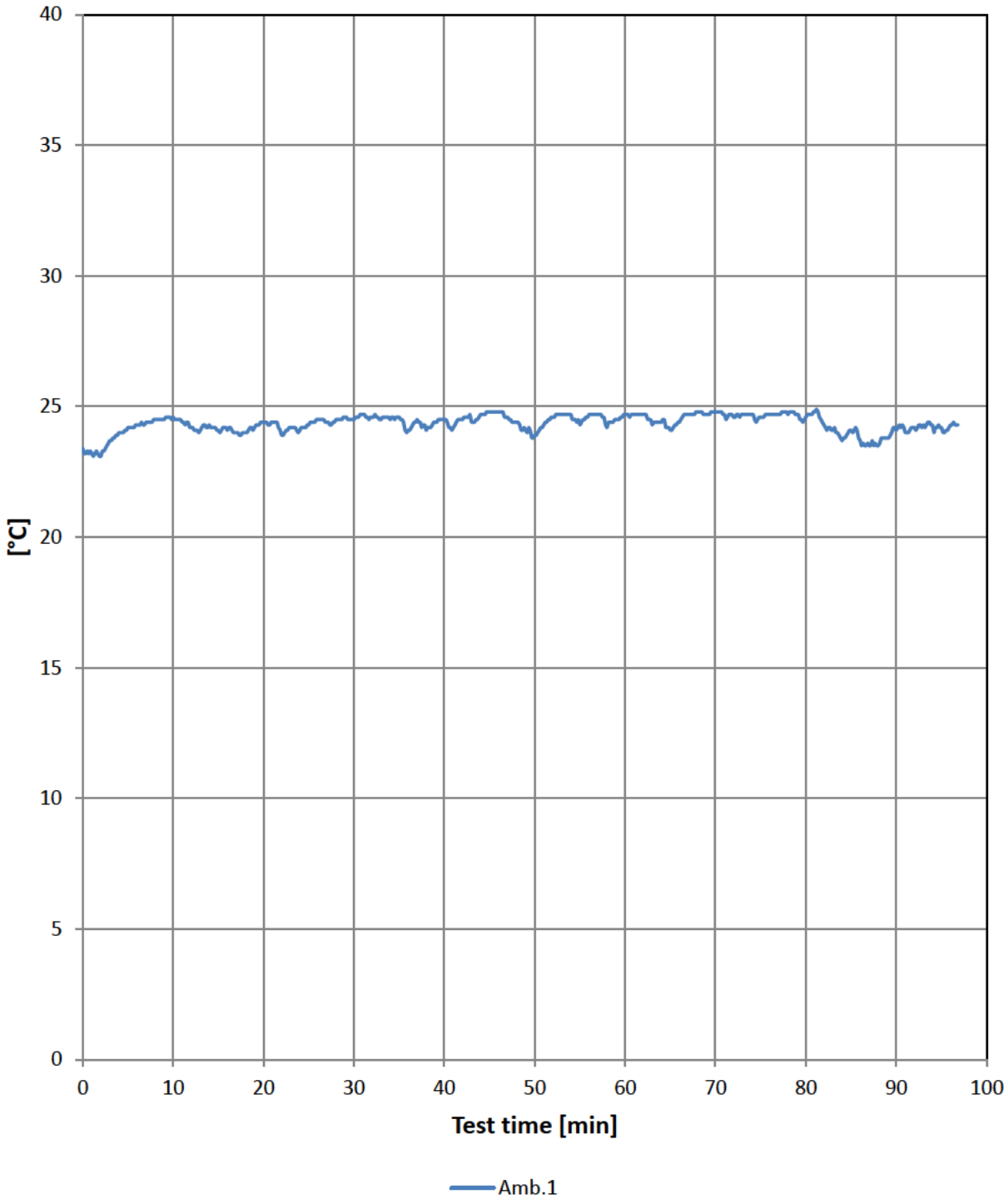
Vertical furnace pressure

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

Min. / Pa	Pa.1
0	-0.3
3	4.1
6	3.1
9	2.7
12	3.3
15	6.7
18	4.9
21	3.7
24	4.1
27	3.8
30	3.7
33	1.7
36	3.2
39	3.2
42	2.8
45	3.4
48	3.1
51	6.3
54	3.4
57	3.6
60	4.1
63	3.5
66	3.1
69	3.3
72	3.4
75	3.5
78	3.3
81	4.4
84	3.3
87	3.2
90	3.5
93	3.9
96	3.8

Ambient temperature

The ambient temperature in the laboratory during the test



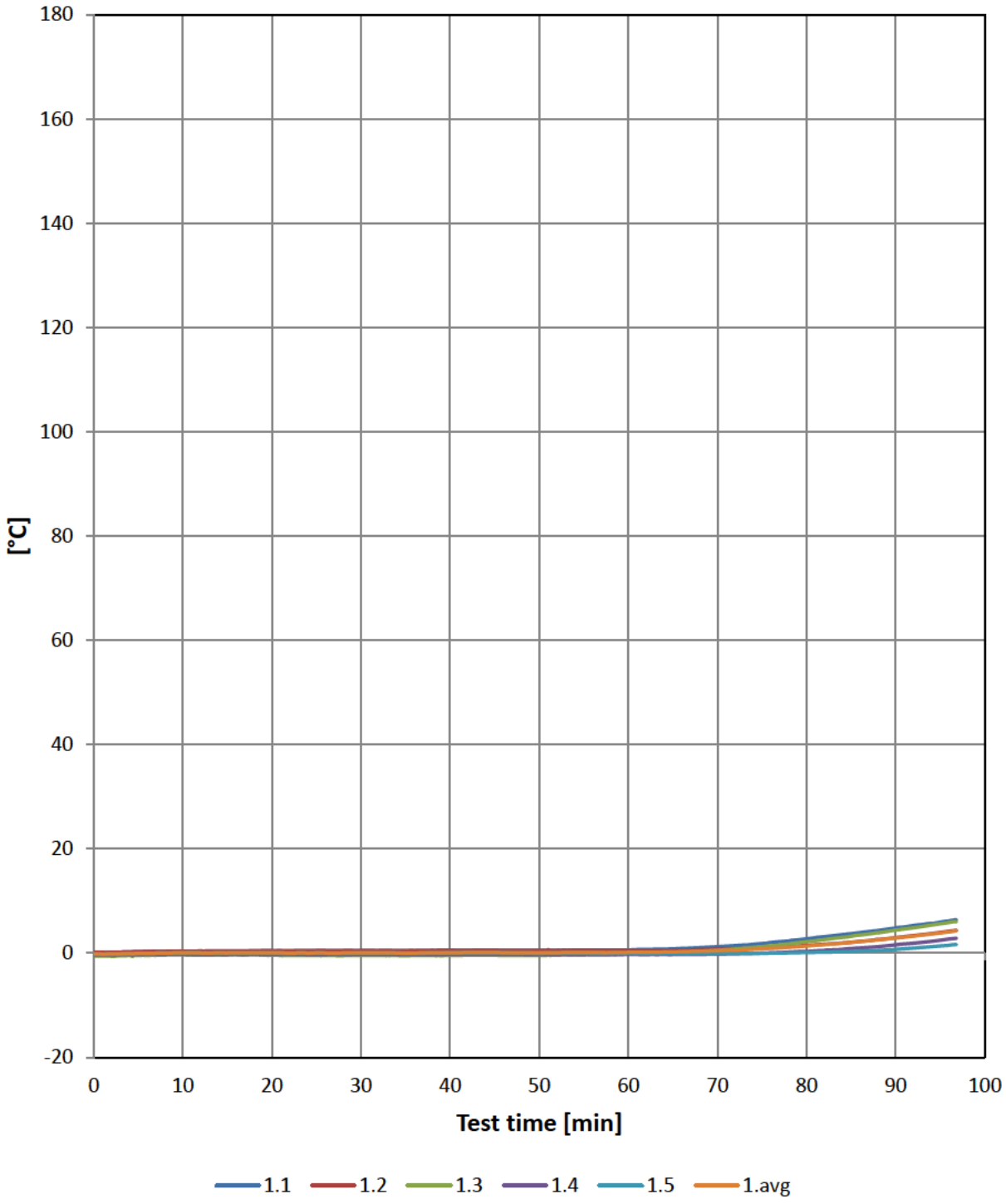
Ambient temperature

The ambient temperature in the laboratory during the test

Min. / °C	Amb.1
0	23.4
3	23.7
6	24.3
9	24.5
12	24.2
15	24.1
18	24.0
21	24.4
24	24.1
27	24.4
30	24.5
33	24.5
36	24.1
39	24.4
42	24.5
45	24.8
48	24.4
51	24.3
54	24.7
57	24.7
60	24.7
63	24.3
66	24.4
69	24.7
72	24.6
75	24.6
78	24.7
81	24.8
84	23.7
87	23.5
90	24.1
93	24.3
96	24.3

Average temperature rise

Measured with 5 thermocouples on the unexposed side



Average temperature rise

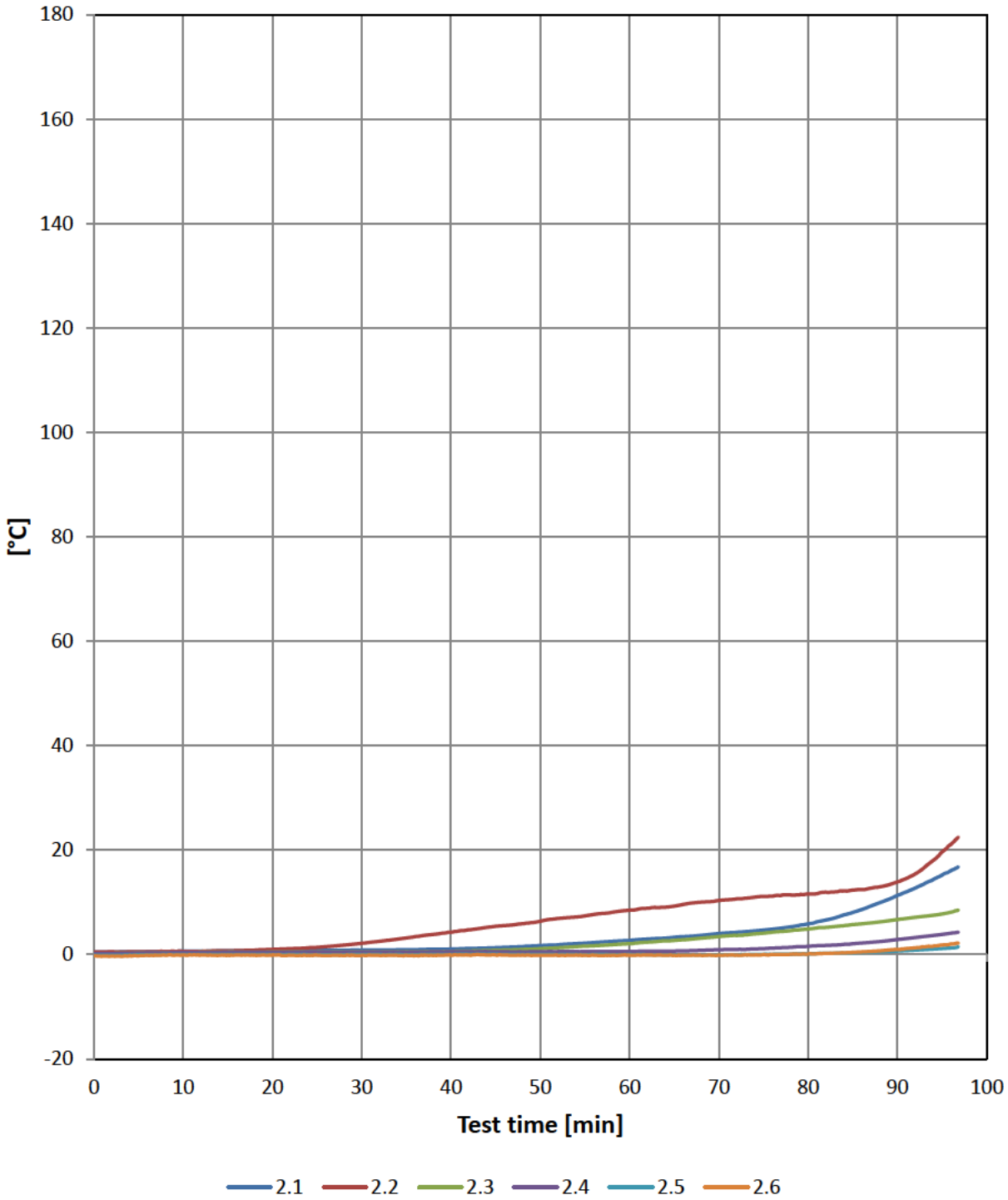
Measured with 5 thermocouples on the unexposed side

Min. / °C	1.1	1.2	1.3	1.4	1.5	1.Avg	1.Max
0	0	0	-1	0	0	0	0
3	0	0	-1	0	0	0	0
6	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
24	1	0	0	0	0	0	1
27	0	0	0	0	0	0	0
30	1	0	0	0	0	0	1
33	1	0	0	0	0	0	1
36	1	0	0	0	0	0	1
39	1	1	0	0	0	0	1
42	1	1	0	0	0	0	1
45	1	1	0	0	0	0	1
48	1	1	0	0	0	0	1
51	1	1	0	0	0	0	1
54	1	1	0	0	0	0	1
57	1	0	0	0	0	0	1
60	1	1	0	0	0	0	1
63	1	1	0	0	0	0	1
66	1	1	0	0	0	0	1
69	1	1	0	0	0	0	1
72	1	1	1	0	0	1	1
75	2	1	1	0	0	1	2
78	2	1	2	0	0	1	2
81	3	2	2	0	0	2	3
84	4	2	3	1	0	2	4
87	4	2	4	1	0	2	4
90	5	3	4	2	1	3	5
93	5	4	5	2	1	3	5
96	6	4	6	3	2	4	6

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

Maximum temperature rise

Maximum temperatures on the unexposed side



Maximum temperature rise

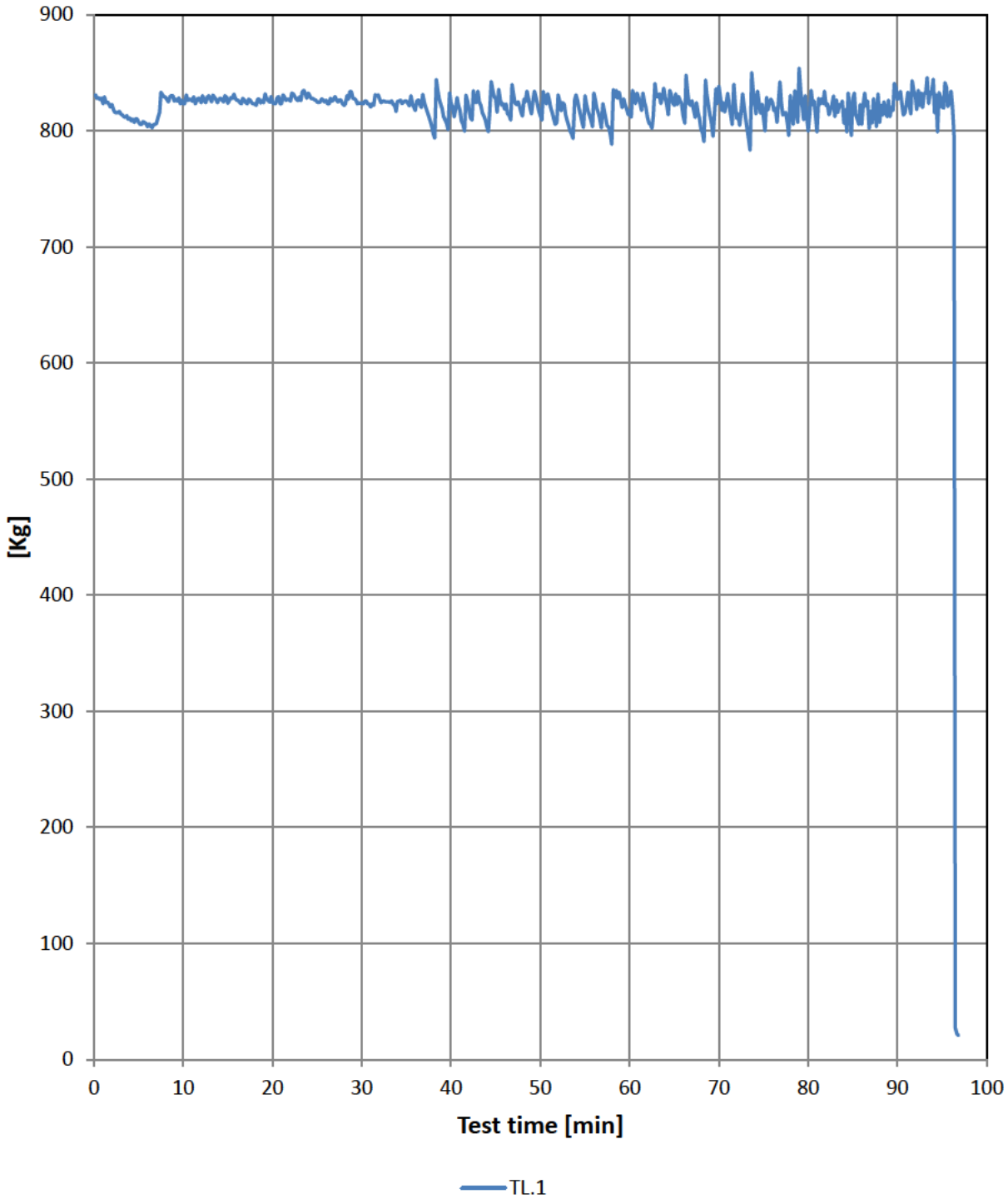
Maximum temperatures on the unexposed side

Min. / °C	2.1	2.2	2.3	2.4	2.5	2.6	2.Max
0	0	1	0	0	0	0	1
3	1	1	0	0	0	0	1
6	1	1	0	0	0	0	1
9	1	1	0	0	0	0	1
12	1	1	0	0	0	0	1
15	1	1	0	0	0	0	1
18	1	1	0	0	0	0	1
21	1	1	0	0	0	0	1
24	1	1	1	0	0	0	1
27	1	2	1	0	0	0	2
30	1	2	1	0	0	0	2
33	1	3	1	1	0	0	3
36	1	3	1	1	0	0	3
39	1	4	1	1	0	0	4
42	1	5	1	1	0	0	5
45	1	5	1	1	0	0	5
48	2	6	1	1	0	0	6
51	2	7	1	1	0	0	7
54	2	7	2	1	0	0	7
57	2	8	2	1	0	0	8
60	3	9	2	1	0	0	9
63	3	9	2	1	0	0	9
66	3	10	3	1	0	0	10
69	4	10	3	1	0	0	10
72	4	11	4	1	0	0	11
75	5	11	4	1	0	0	11
78	5	11	5	1	0	0	11
81	6	12	5	2	0	0	12
84	8	12	6	2	0	0	12
87	9	13	6	2	0	1	13
90	11	14	7	3	1	1	14
93	14	17	7	3	1	1	17
96	16	21	8	4	1	2	21

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

Load per cylinder

Load per cylinder during test



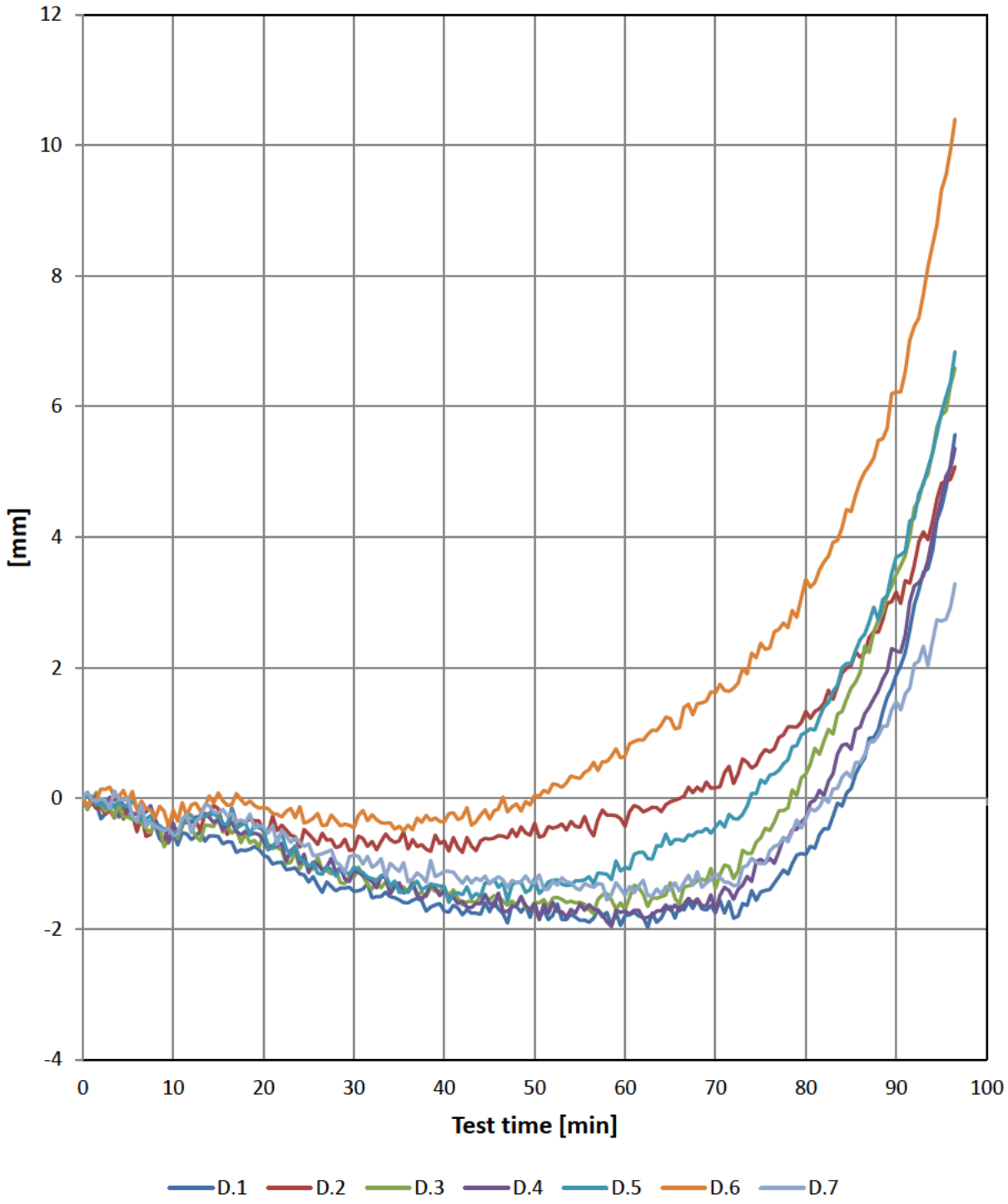
Load per cylinder

Load per cylinder during test

Min. / Kg	TL.1
0	830
3	815
6	804
9	826
12	824
15	824
18	823
21	823
24	833
27	830
30	824
33	825
36	818
39	819
42	820
45	827
48	813
51	826
54	831
57	823
60	818
63	830
66	813
69	815
72	811
75	812
78	831
81	799
84	807
87	817
90	827
93	833
96	834

Horizontal deformation

Negative values indicate movement towards the furnace



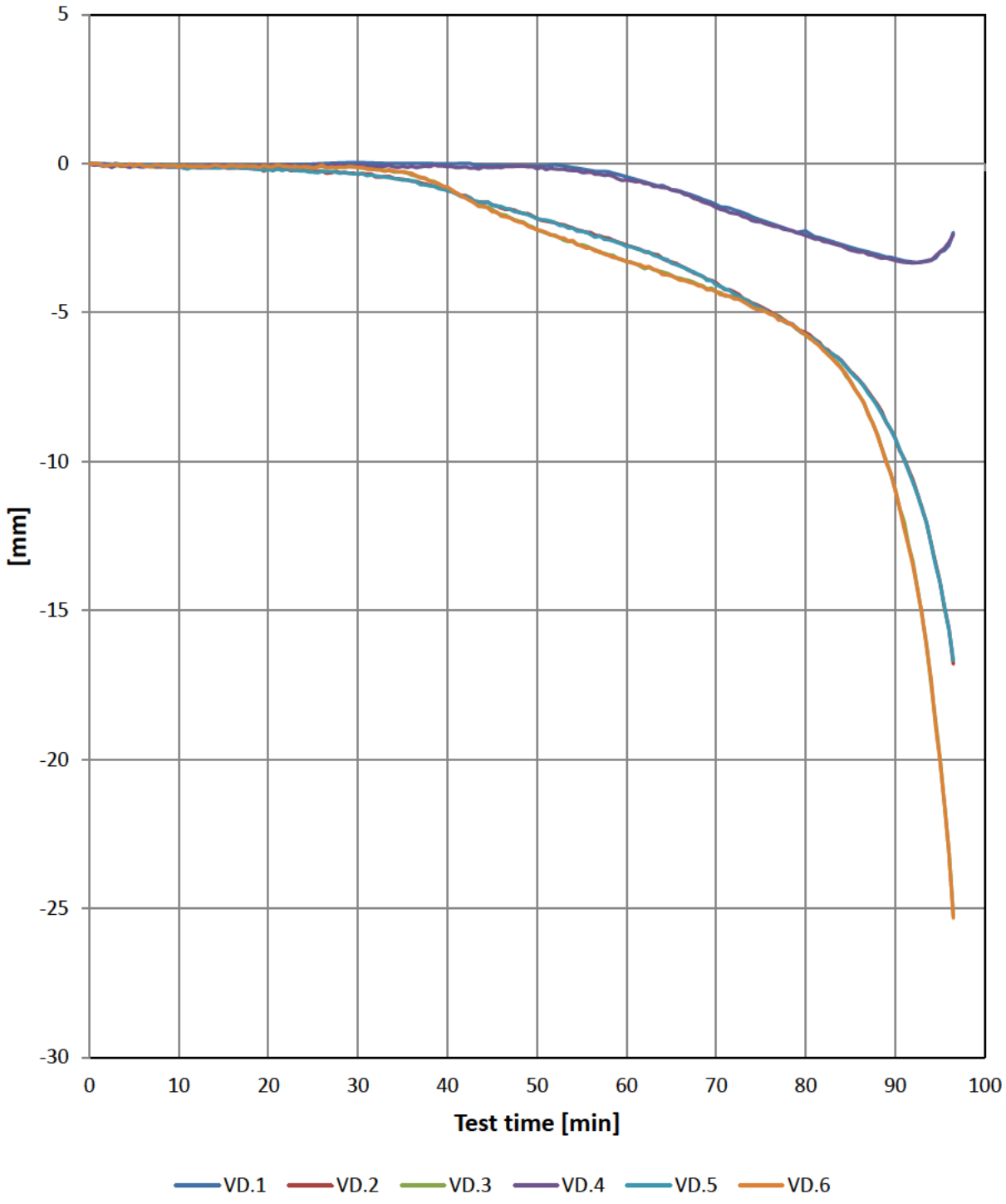
Horizontal deformation

Negative values indicate movement towards the furnace

Min. / mm	D.1	D.2	D.3	D.4	D.5	D.6	D.7
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	-0.1	-0.2	-0.1	0.0	-0.1	0.2	-0.1
6	-0.4	-0.5	-0.3	-0.2	-0.1	-0.2	-0.4
9	-0.7	-0.7	-0.7	-0.5	-0.5	-0.2	-0.5
12	-0.6	-0.4	-0.5	-0.4	-0.3	-0.1	-0.5
15	-0.6	-0.2	-0.3	-0.3	-0.3	0.1	-0.2
18	-0.8	-0.4	-0.5	-0.5	-0.4	-0.1	-0.4
21	-1.0	-0.3	-0.8	-0.7	-0.8	-0.2	-0.4
24	-1.2	-0.7	-1.1	-1.0	-0.9	-0.1	-0.7
27	-1.3	-0.6	-1.1	-1.1	-1.0	-0.4	-0.8
30	-1.4	-0.8	-1.2	-1.1	-1.1	-0.5	-0.9
33	-1.5	-0.7	-1.4	-1.2	-1.2	-0.4	-0.9
36	-1.6	-0.8	-1.4	-1.4	-1.4	-0.4	-1.3
39	-1.6	-0.6	-1.4	-1.4	-1.3	-0.3	-1.2
42	-1.8	-0.8	-1.6	-1.6	-1.5	-0.3	-1.3
45	-1.7	-0.6	-1.5	-1.6	-1.3	-0.3	-1.3
48	-1.7	-0.6	-1.6	-1.6	-1.3	-0.1	-1.3
51	-1.7	-0.6	-1.5	-1.6	-1.4	0.1	-1.4
54	-1.8	-0.4	-1.6	-1.7	-1.3	0.3	-1.3
57	-1.7	-0.3	-1.5	-1.7	-1.1	0.4	-1.3
60	-1.8	-0.4	-1.7	-1.7	-1.1	0.7	-1.5
63	-1.8	-0.1	-1.5	-1.8	-0.9	1.0	-1.5
66	-1.6	0.0	-1.6	-1.7	-0.6	1.1	-1.4
69	-1.7	0.3	-1.3	-1.6	-0.5	1.5	-1.3
72	-1.8	0.2	-1.2	-1.5	-0.3	1.7	-1.3
75	-1.4	0.7	-0.6	-0.9	0.3	2.4	-1.0
78	-1.2	1.1	-0.1	-0.6	0.6	2.6	-0.7
81	-0.8	1.3	0.8	0.0	1.0	3.3	-0.2
84	-0.1	1.9	1.3	0.8	2.0	4.2	0.3
87	0.9	2.5	2.2	1.4	2.7	5.1	0.9
90	1.9	3.2	3.4	2.3	3.7	6.2	1.5
93	3.5	4.1	4.8	3.4	4.8	7.7	2.3
96	5.1	4.9	6.3	5.1	6.4	9.9	2.9

Vertical deformation

Negative values indicate downwards movement



Vertical deformation

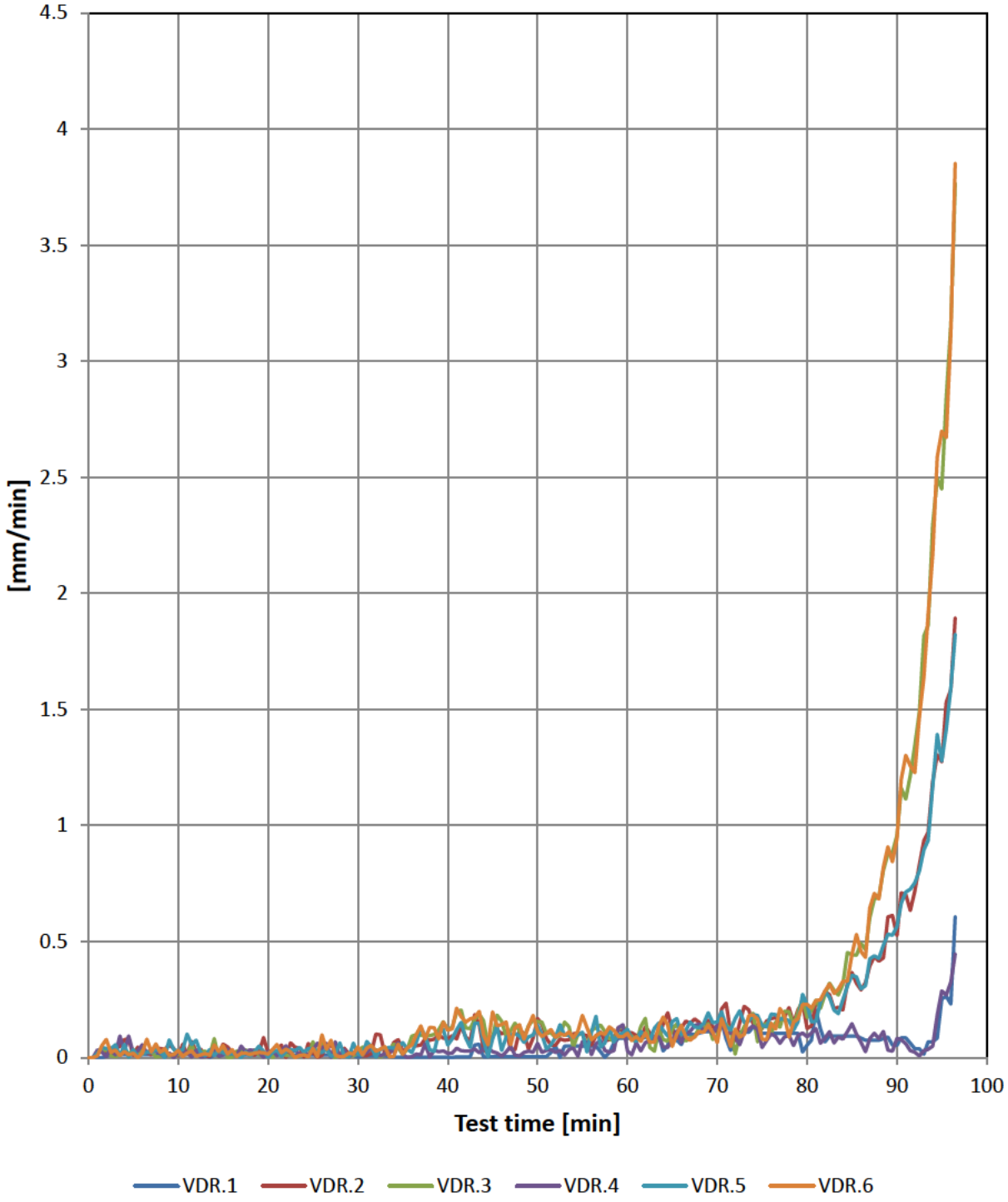
Negative values indicate downwards movement

Min. / mm	VD.1	VD.2	VD.3	VD.4	VD.5	VD.6	VD.Max
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
6	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
9	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
12	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
15	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	0.0
18	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
21	-0.1	-0.2	-0.1	-0.1	-0.2	0.0	0.0
24	0.0	-0.2	-0.1	-0.1	-0.2	-0.1	0.0
27	0.0	-0.3	-0.1	-0.1	-0.3	-0.1	0.0
30	0.0	-0.4	-0.1	0.0	-0.3	-0.1	0.0
33	0.0	-0.4	-0.2	-0.1	-0.4	-0.3	0.0
36	0.0	-0.6	-0.4	-0.1	-0.6	-0.3	0.0
39	0.0	-0.8	-0.7	-0.1	-0.8	-0.7	0.0
42	0.0	-1.1	-1.1	-0.1	-1.1	-1.2	0.0
45	-0.1	-1.4	-1.5	-0.1	-1.4	-1.6	-0.1
48	-0.1	-1.6	-1.9	-0.1	-1.6	-2.0	-0.1
51	-0.1	-1.9	-2.3	-0.2	-1.9	-2.3	-0.1
54	-0.1	-2.2	-2.6	-0.2	-2.2	-2.6	-0.1
57	-0.3	-2.4	-3.0	-0.4	-2.4	-2.9	-0.3
60	-0.4	-2.7	-3.3	-0.5	-2.8	-3.3	-0.4
63	-0.7	-3.0	-3.5	-0.8	-3.1	-3.5	-0.7
66	-0.9	-3.4	-3.8	-0.9	-3.4	-3.9	-0.9
69	-1.2	-3.9	-4.2	-1.3	-3.9	-4.2	-1.2
72	-1.5	-4.3	-4.5	-1.7	-4.4	-4.5	-1.5
75	-1.9	-4.8	-4.9	-2.0	-4.8	-4.9	-1.9
78	-2.2	-5.3	-5.4	-2.2	-5.4	-5.3	-2.2
81	-2.5	-5.9	-6.0	-2.5	-5.9	-6.0	-2.5
84	-2.7	-6.6	-6.8	-2.8	-6.6	-6.9	-2.7
87	-3.0	-7.7	-8.4	-3.0	-7.7	-8.4	-3.0
90	-3.2	-9.2	-10.9	-3.2	-9.2	-11.0	-3.2
93	-3.3	-11.6	-15.2	-3.3	-11.6	-15.1	-3.3
96	-2.7	-15.6	-23.1	-2.6	-15.6	-23.1	-2.6

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

Vertical deformation rate

Deformation per minute



Vertical deformation rate

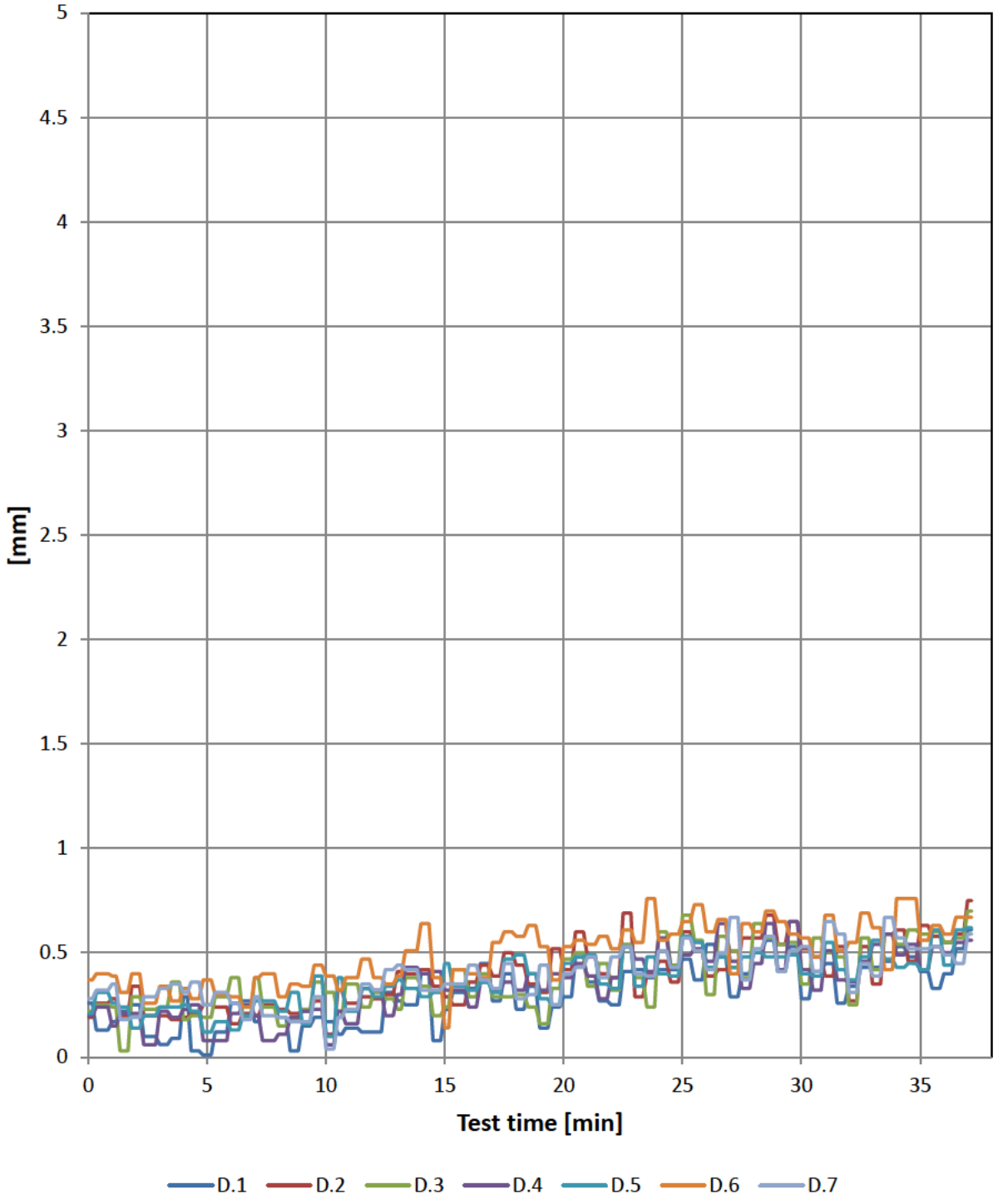
Deformation per minute

Min. / mm/min	VDR.1	VDR.2	VDR.3	VDR.4	VDR.5	VDR.6	VDR.Max
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.01	0.04	0.00	0.01	0.06	0.03	0.06
6	0.01	0.02	0.04	0.06	0.01	0.02	0.06
9	0.01	0.06	0.01	0.02	0.08	0.01	0.08
12	0.01	0.03	0.01	0.03	0.08	0.01	0.08
15	0.01	0.06	0.04	0.01	0.02	0.05	0.06
18	0.01	0.01	0.02	0.03	0.01	0.01	0.03
21	0.01	0.01	0.02	0.01	0.03	0.06	0.06
24	0.01	0.00	0.01	0.02	0.02	0.01	0.02
27	0.01	0.05	0.01	0.00	0.01	0.07	0.07
30	0.00	0.04	0.02	0.02	0.01	0.05	0.05
33	0.01	0.01	0.02	0.02	0.04	0.05	0.05
36	0.00	0.07	0.09	0.00	0.02	0.05	0.09
39	0.00	0.10	0.12	0.03	0.11	0.08	0.12
42	0.00	0.09	0.13	0.03	0.09	0.15	0.15
45	0.00	0.09	0.09	0.03	0.08	0.20	0.20
48	0.00	0.12	0.12	0.01	0.09	0.14	0.14
51	0.00	0.08	0.10	0.03	0.04	0.11	0.11
54	0.05	0.10	0.05	0.04	0.09	0.09	0.10
57	0.03	0.11	0.14	0.07	0.04	0.11	0.14
60	0.08	0.11	0.11	0.03	0.12	0.11	0.12
63	0.09	0.07	0.03	0.09	0.13	0.07	0.13
66	0.06	0.13	0.09	0.06	0.10	0.14	0.14
69	0.11	0.16	0.15	0.12	0.19	0.14	0.19
72	0.09	0.07	0.02	0.09	0.17	0.12	0.17
75	0.10	0.13	0.14	0.04	0.14	0.08	0.14
78	0.10	0.21	0.20	0.10	0.16	0.09	0.21
81	0.20	0.24	0.25	0.12	0.16	0.25	0.25
84	0.09	0.21	0.32	0.08	0.25	0.33	0.33
87	0.08	0.40	0.60	0.08	0.43	0.64	0.64
90	0.05	0.53	0.96	0.08	0.56	0.94	0.96
93	0.01	0.93	1.82	0.03	0.90	1.64	1.82
96	0.23	1.58	3.16	0.32	1.59	3.12	3.16

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

Horizontal deformation during the loading phase

Negative values indicate movement towards the furnace



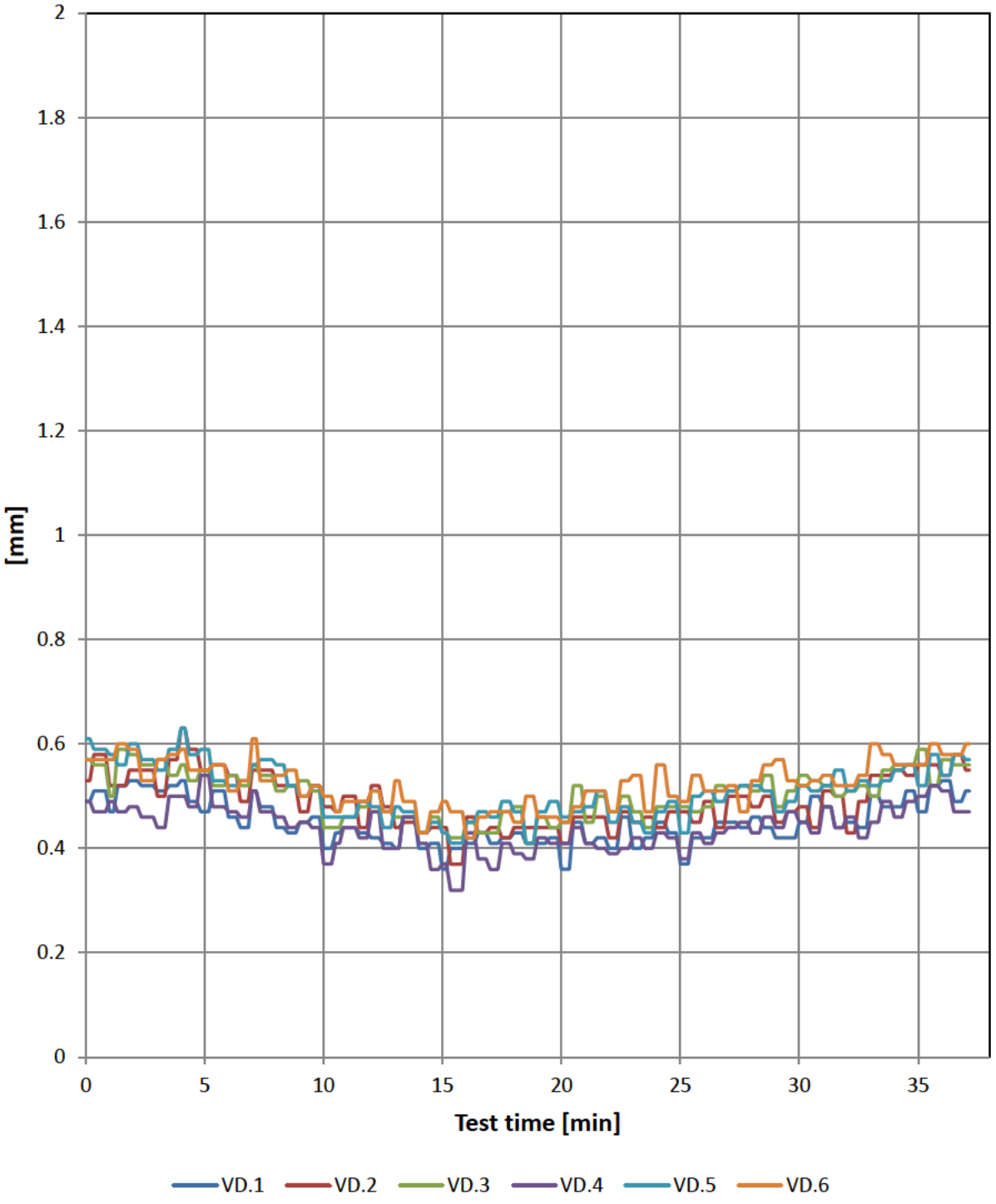
Horizontal deformation during the loading phase

Negative values indicate movement towards the furnace

Min. / mm	D.1	D.2	D.3	D.4	D.5	D.6	D.7
0	0.3	0.2	0.2	0.2	0.2	0.4	0.3
2	0.3	0.3	0.3	0.2	0.1	0.4	0.2
4	0.3	0.2	0.2	0.2	0.3	0.3	0.3
6	0.3	0.2	0.4	0.2	0.1	0.3	0.3
8	0.2	0.2	0.2	0.1	0.2	0.3	0.2
10	0.2	0.1	0.3	0.1	0.1	0.4	0.0
12	0.1	0.3	0.3	0.3	0.3	0.4	0.3
14	0.4	0.4	0.3	0.4	0.3	0.6	0.3
15	0.2	0.3	0.2	0.3	0.5	0.1	0.4
16	0.3	0.4	0.3	0.2	0.3	0.4	0.4
18	0.2	0.4	0.3	0.3	0.5	0.6	0.3
20	0.3	0.4	0.5	0.4	0.5	0.5	0.4
22	0.3	0.4	0.3	0.4	0.3	0.5	0.5
24	0.4	0.5	0.6	0.6	0.4	0.6	0.5
26	0.5	0.4	0.3	0.5	0.4	0.6	0.4
28	0.5	0.6	0.6	0.5	0.5	0.6	0.5
30	0.3	0.5	0.4	0.4	0.4	0.6	0.5
32	0.3	0.3	0.3	0.4	0.4	0.6	0.3
34	0.5	0.6	0.5	0.5	0.4	0.8	0.6
36	0.4	0.6	0.6	0.5	0.4	0.6	0.5
37	0.6	0.8	0.7	0.6	0.6	0.7	0.6

Vertical deformation during the loading phase

Negative values indicate downwards movement

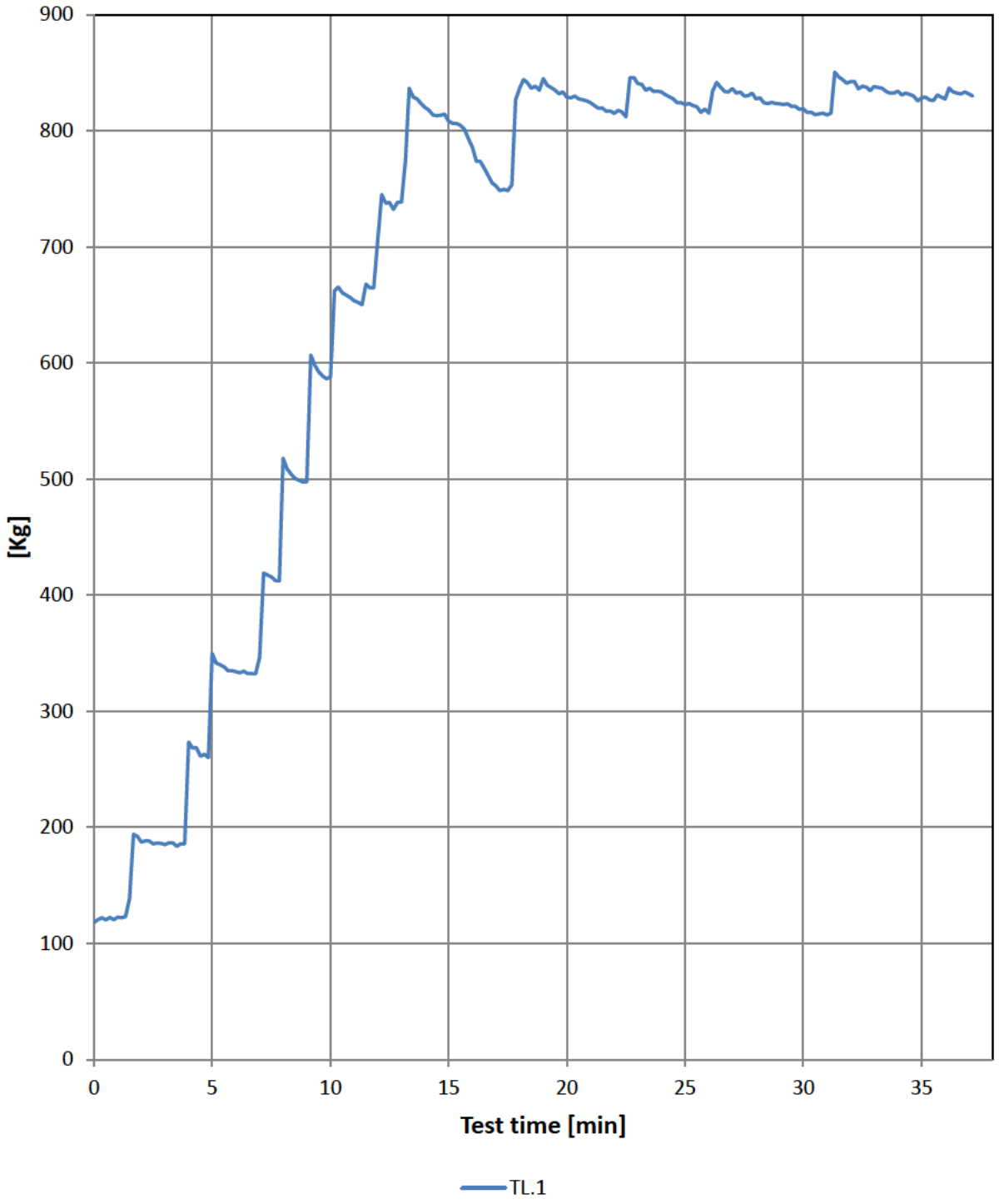


Vertical deformation during the loading phase

Negative values indicate downwards movement

Min. / mm	VD.1	VD.2	VD.3	VD.4	VD.5	VD.6
0	0.5	0.5	0.6	0.5	0.6	0.6
2	0.5	0.6	0.6	0.5	0.6	0.6
4	0.5	0.6	0.6	0.5	0.6	0.6
6	0.5	0.5	0.5	0.5	0.5	0.5
8	0.4	0.5	0.5	0.5	0.6	0.5
10	0.4	0.5	0.4	0.4	0.5	0.5
12	0.4	0.5	0.5	0.5	0.5	0.5
14	0.4	0.4	0.4	0.4	0.4	0.4
15	0.4	0.4	0.4	0.4	0.4	0.5
16	0.4	0.5	0.5	0.4	0.5	0.4
18	0.4	0.4	0.5	0.4	0.5	0.5
20	0.4	0.4	0.5	0.4	0.5	0.5
22	0.4	0.4	0.5	0.4	0.5	0.5
24	0.5	0.4	0.5	0.4	0.5	0.6
26	0.4	0.5	0.5	0.4	0.5	0.5
28	0.5	0.5	0.5	0.4	0.5	0.5
30	0.5	0.5	0.5	0.5	0.5	0.5
32	0.5	0.4	0.5	0.5	0.5	0.5
34	0.5	0.6	0.6	0.5	0.6	0.6
36	0.5	0.5	0.6	0.5	0.5	0.6
37	0.5	0.6	0.6	0.5	0.6	0.6

Load per cylinder during the loading phase



Load per cylinder during the loading phase

Min. / Kg	TL.1
0	118
2	187
4	274
6	334
8	518
10	588
12	706
14	820
15	808
16	786
18	837
20	829
22	815
24	833
26	815
28	828
30	819
32	843
34	834
36	827
37	832

Photo No. 1 Free edge was established along both vertical edges of the test specimen.

Photo No. 2 Holes in the wall showing the wood fibre insulation between wooden studs.

Photo No. 3 Layer of OSB-3 mounted to the studs of the wall on the unexposed side.

Photo No. 4 Both layers of fibre gypsum boards mounted to the OSB-3 board.

Photo No. 5 Finished layers of the fibre gypsum boards on the unexposed side.

Photo No. 6 Layer of wood fibre board mounted to studs on the exposed side.

Photo No. 7 Spacer studs is being mounted on the exposed side.

Photo No. 8 Layer of chipboard mounted to studs/spacers on the exposed side.

Photo No. 9 Unexposed side of the test specimen before test.

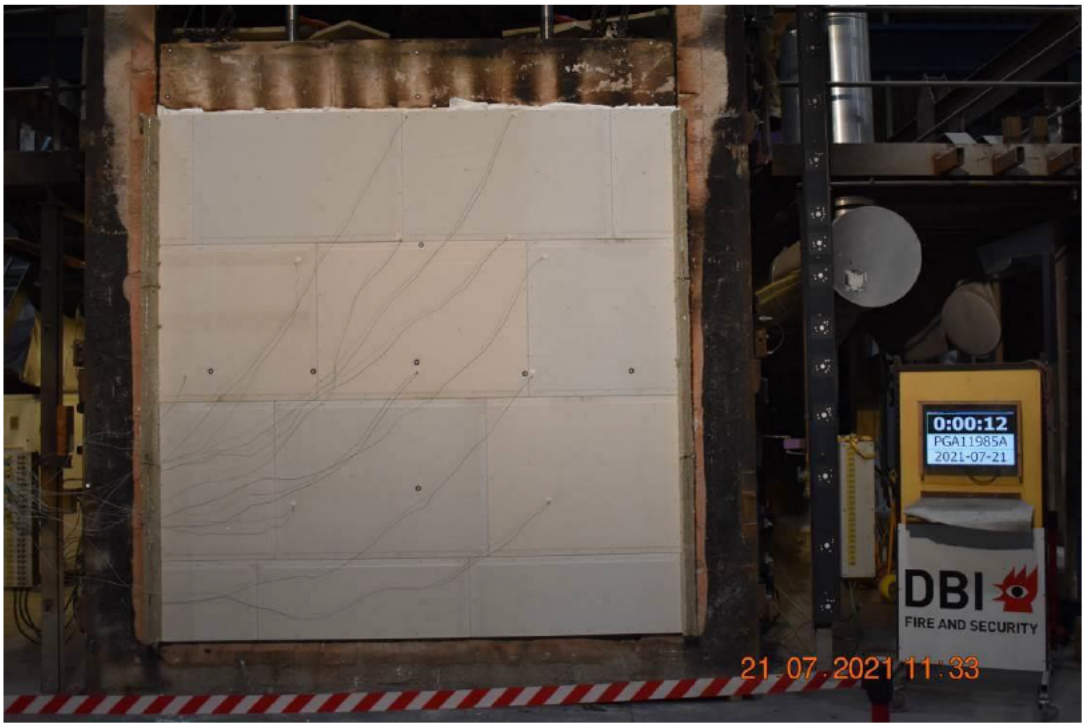


Photo No. 10 Test specimen at start test.

Photo No. 11 Test specimen 15 minutes into the test.

Photo No. 12 Test specimen 30 minutes into the test.

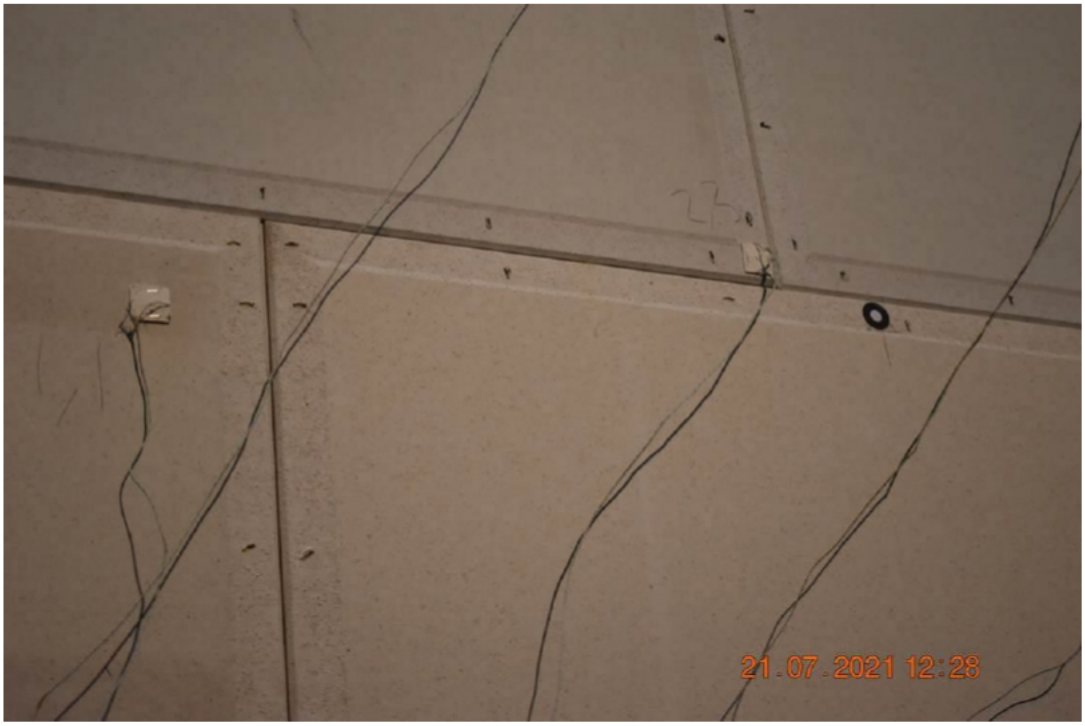


Photo No. 13 Smoke development from the surface of the test specimen, 55 minutes into the test.

Photo No. 14 Test specimen 45 minutes into the test.

Photo No. 15 Test specimen 60 minutes into the test.

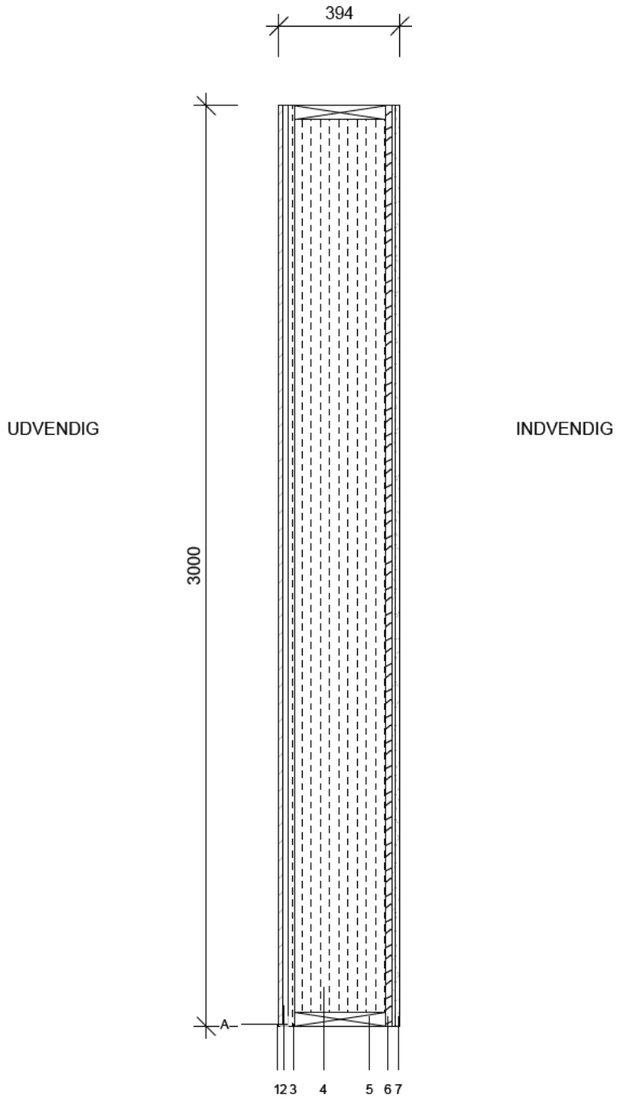
Photo No. 16 Test stopped, 96 minutes into the test

Photo No. 17 Test specimen after the test.

Photo No. 18 Test specimen after the test.

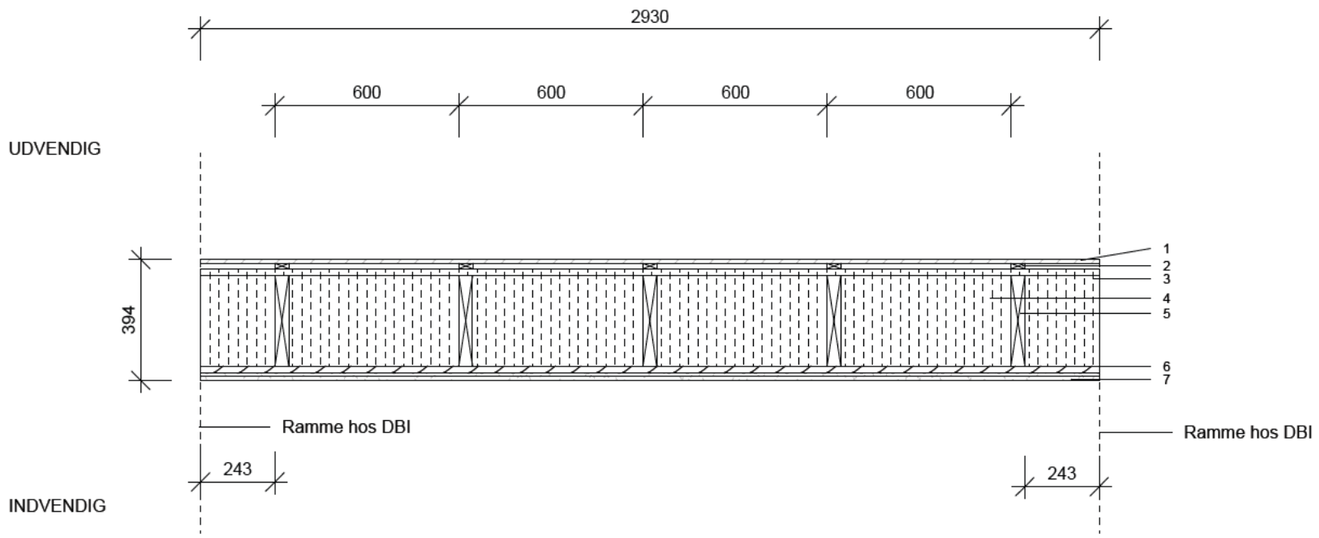
Photo No. 19 Test specimen after the test.

Photo No. 20 Test specimen after the test after the fire has been put out.



Lodret snit ydervæg

1 : 20



Vandret snit ydervæg

1 : 20

1.	12 mm spånplade	Materiale = Væg/gulv spånplade TG4, densitet = 690 kg/m³
2.	18 x 46 mm afstandslister	Materiale = Fyrretræ, densitet = 450 kg/m³
3.	22 mm træfiberisoleringsplade (vindspærre)	Materiale = Gutex Multiplex-top, densitet = 220 kg/m³
4.	295 mm indblæst træf berisolering	Materiale = Woodfiber AIR, densitet = 43 kg/m³
5.	45 x 295 mm høvlet konstruktionstræ	Materiale = Spærtræ af gran, C24, densitet = 450 kg/m³
6.	22 mm OSB3	Materiale = OSB 3 tag/gulv TG2, densitet = 650 kg/m³
7.	2 x 12,5 mm fibergips	Materiale = Fermacell fibergips = 15,55 kg pr. plade
A.	Musebånd	Materiale = EFTEX Musebånd

NOTE!

Insektnet bliver monteret i bunden af konstruktionen

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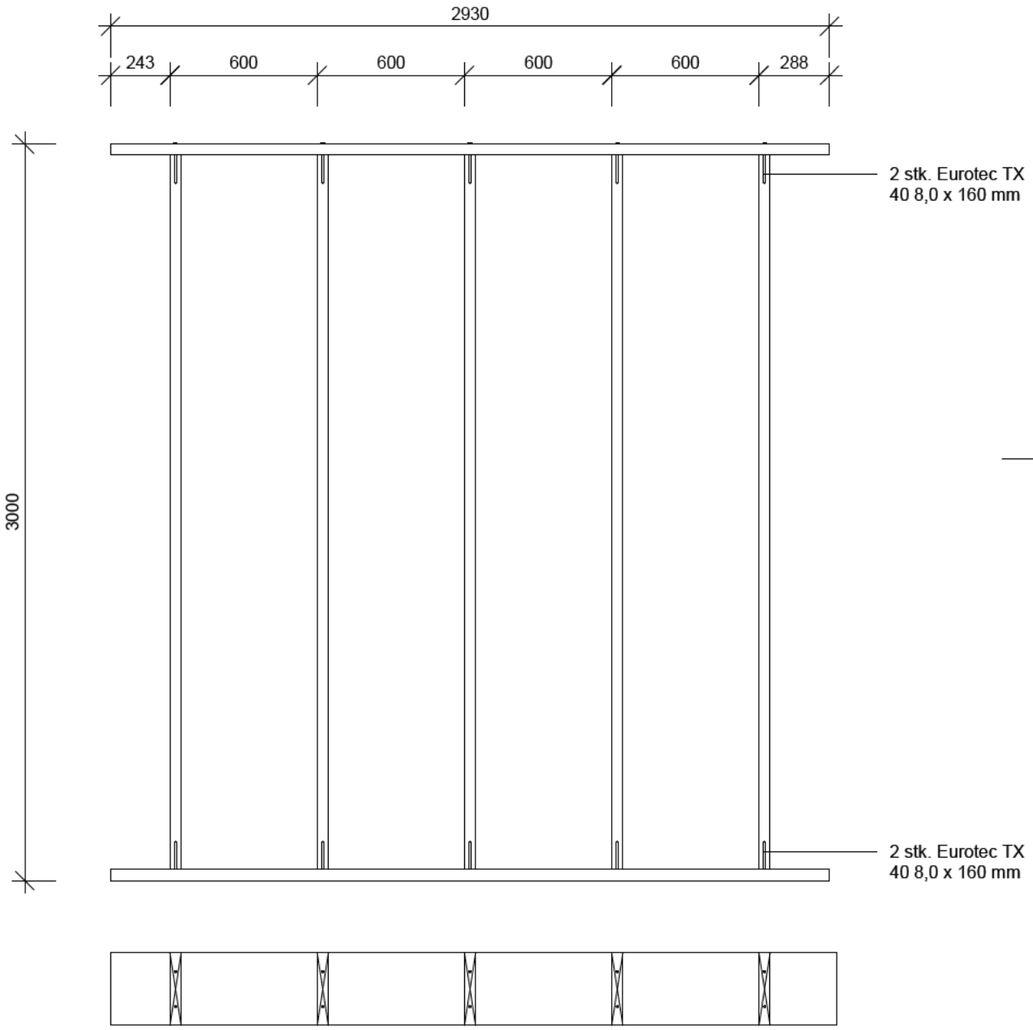
Projektering

Projekt
DBI
Brandsnit

Emne
Snit ydervæg
REV E

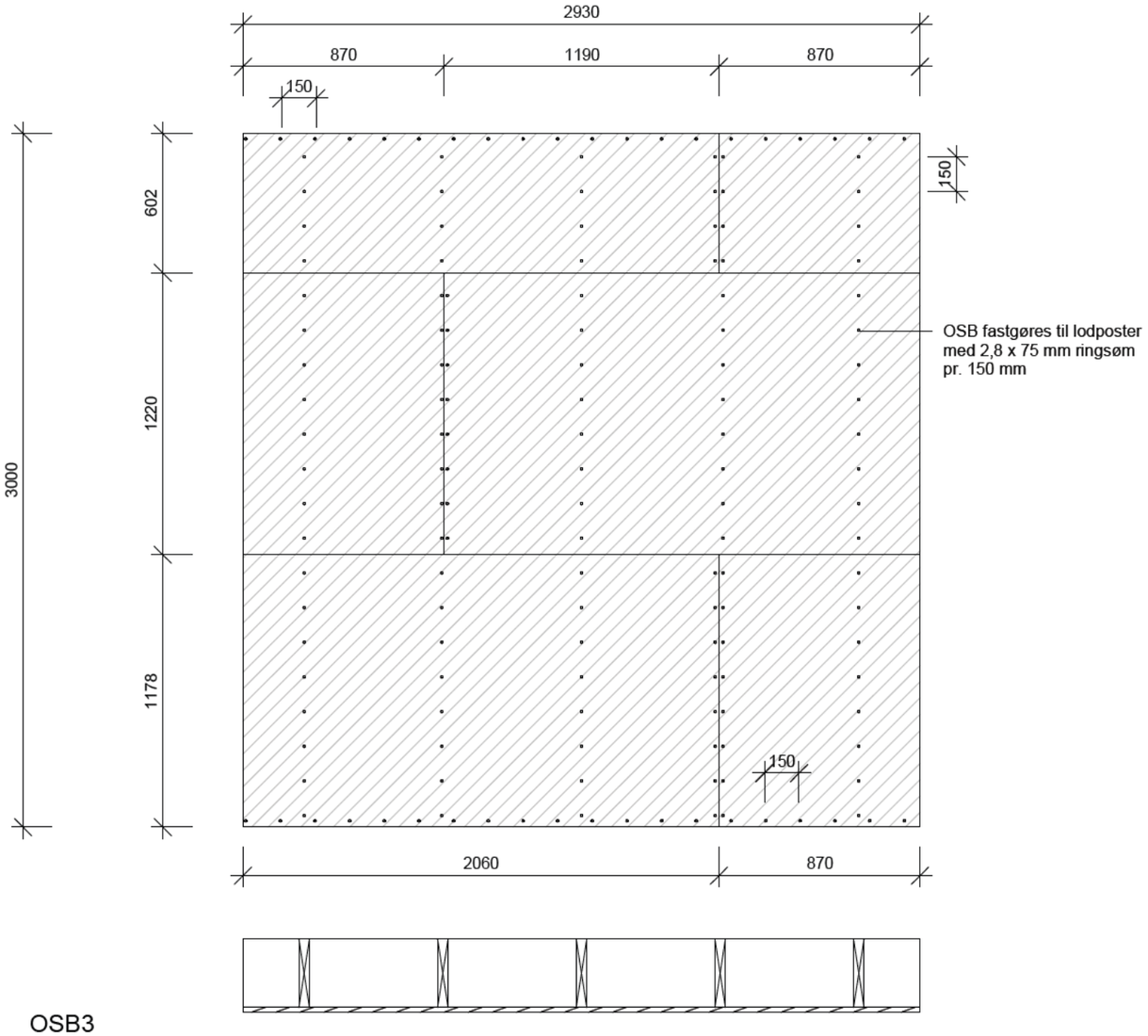
Format	A3
Sag:	30878
Tegn.	YBV
Kontrol	BJ / NOL
Dato	08/05/21
Skala	1 : 20

Tegning
01



Samling af konsturktionstræ

1 : 25



OSB3

1 : 25

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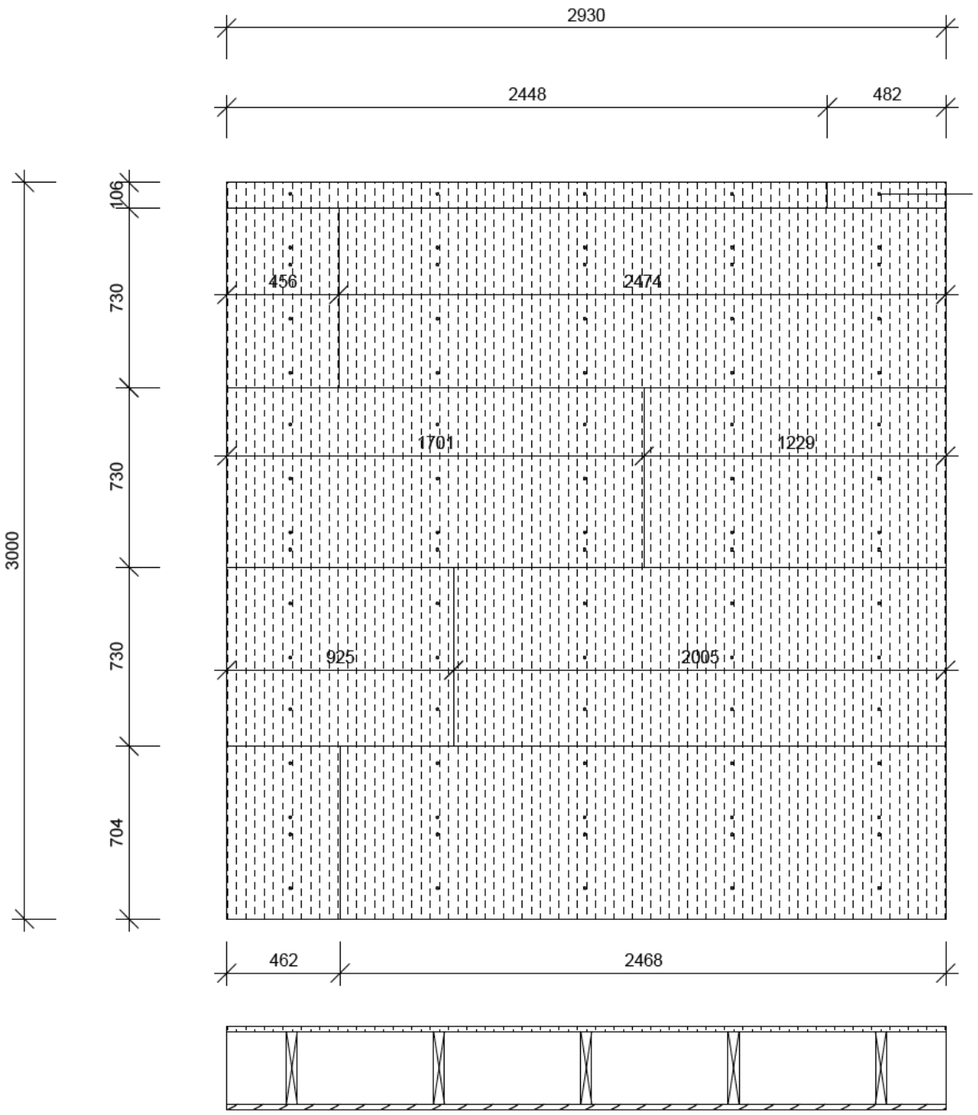
DBI
Brandsnit

Emne
Proces A REI 60
Skelet + indvendig
REV A

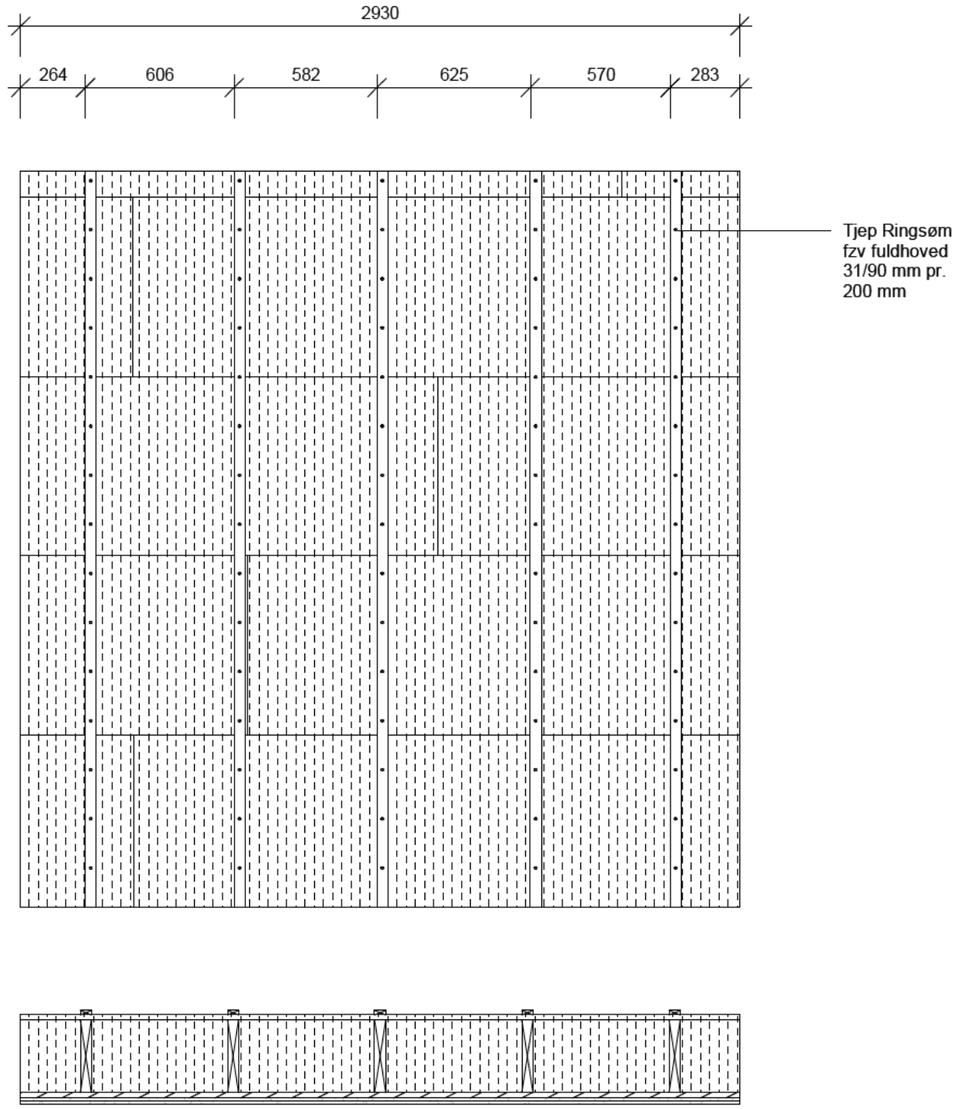
Format	A3
Sag:	30878
Tegn.	YBV
Kontrol	BJ/NOL
Dato	08/02/21
Skala	1 : 25

Tegning
02



Træfiberplade (vindspærre)
1 : 25

TRÆFIBERISOLERING INDBLÆSES



Afstandslister
1 : 25

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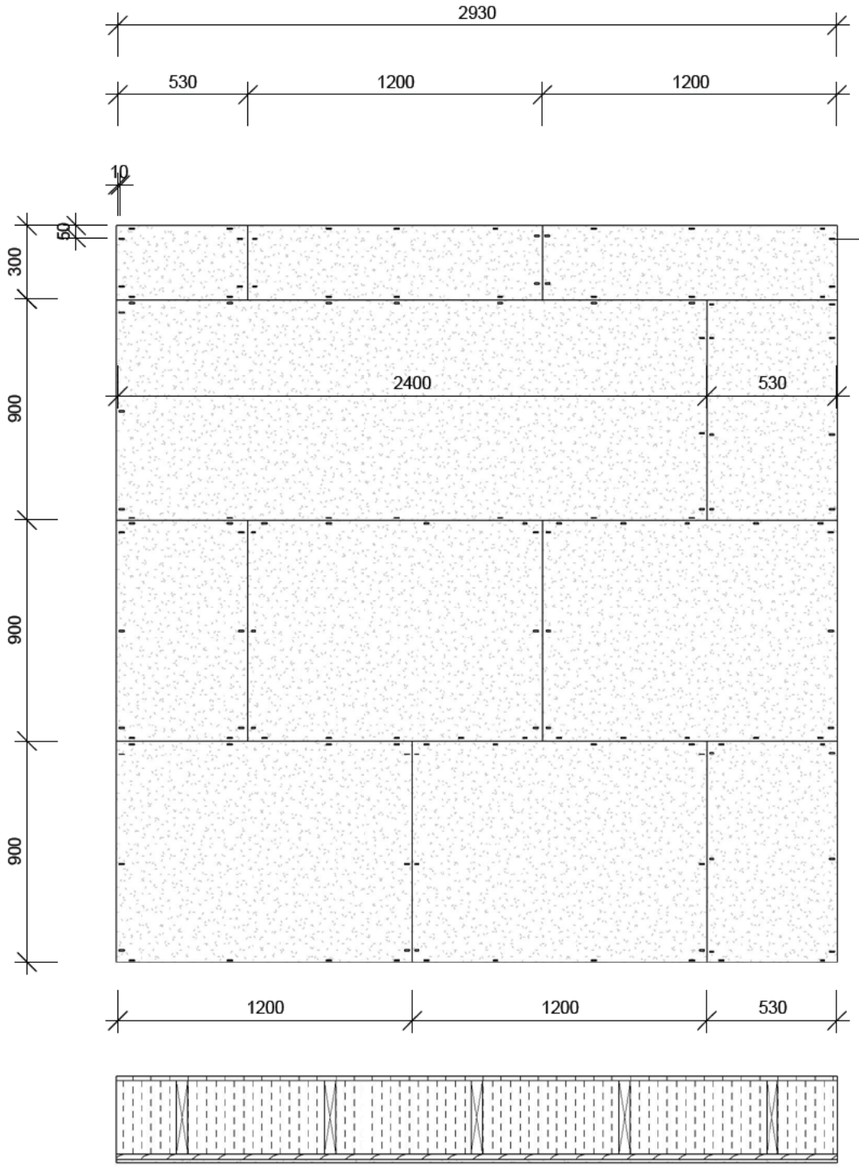
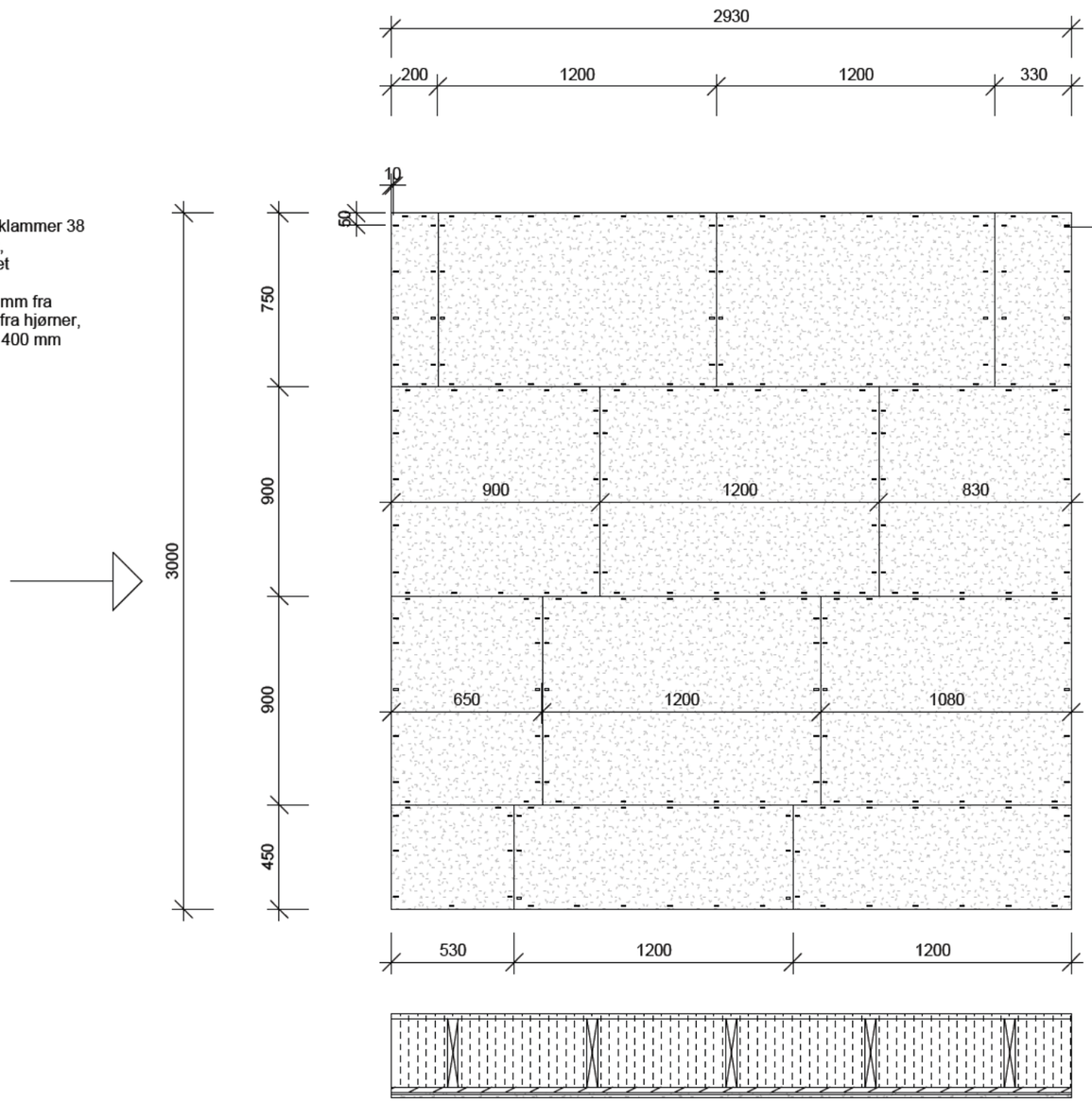
Emne
Proces B REI60
Udvendig
REV A

Format	A3
Sag:	30878
Tegn.	YBV
Kontrol	BJ/NOL
Dato	08/02/21
Skala	1 : 25

Tegning
03



Fibergips 1. lag
1 : 25



Fibergips 2. lag
1 : 25

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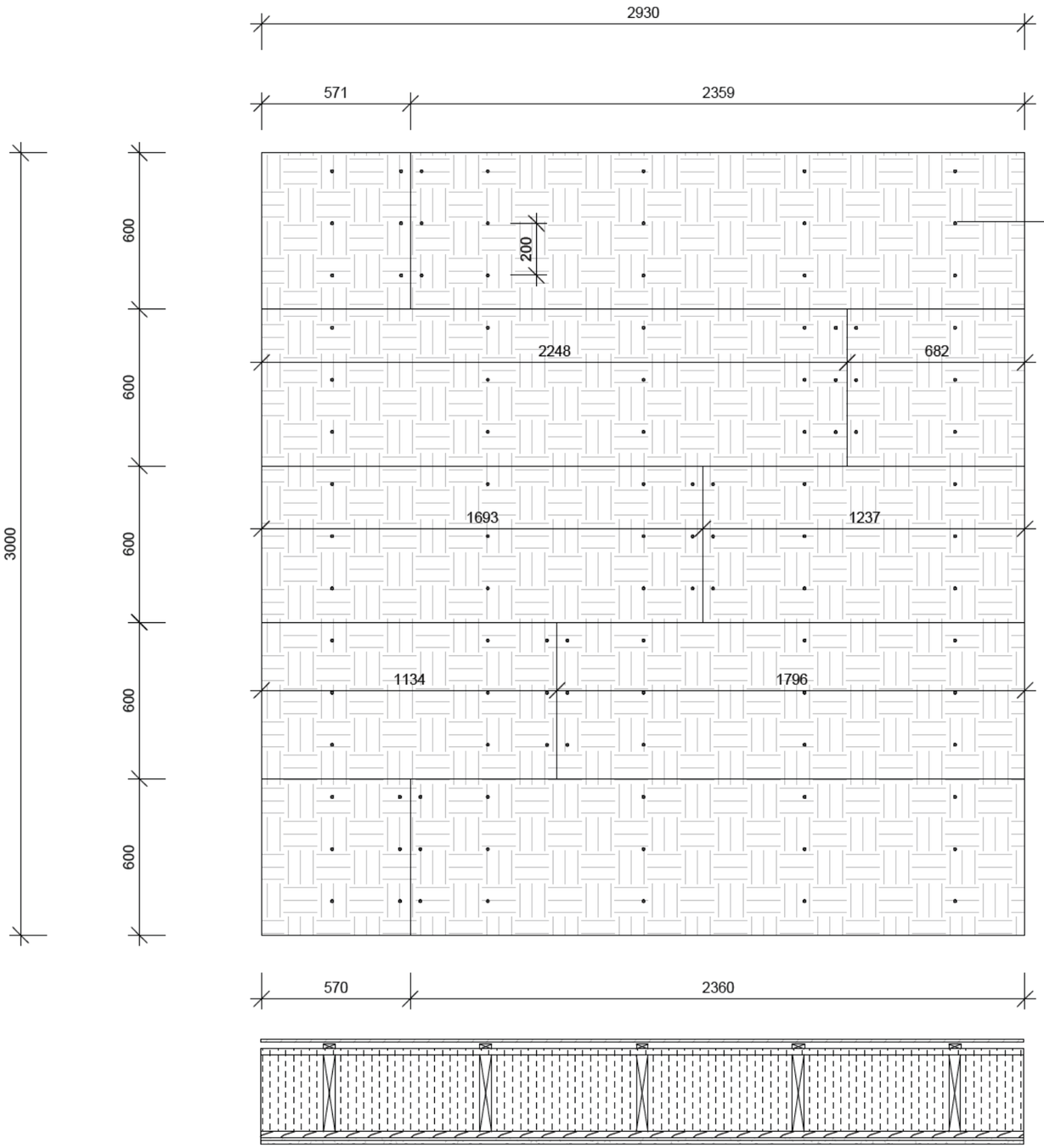
Projektering
Projekt
DBI
Brandsnit

Emne
Proces C REI60
Indvendig
REV A

Format	A3
Sag:	30878
Tegn.	YBV
Kontrol	BJ/NOL
Dato	08/02/21
Skala	1 : 25

Tegning
04



Fastgøres til lodposter m.
Eurotec spånskruer ruspert ph Tx 5,0 x 60 mm
pr. 200 mm

Spånplade - beklædning
1 : 20

DBI
PGA11985A

LOGIK & CO.

Projektering

Projekt
DBI
Brandsnit

Emne
Proces D REI60
Udvendig
REV B

Format	A3
Sag:	30878
Tegn.	YBV
Kontrol	BJ/NOL
Dato	08/05/21
Skala	1 : 20

Tegning
05