Test Report
Loadbearing roof

Name of sponsor:	**Nordic Build A/S**		
Product name:	Loadbearing roof		
File no.:	PGA11454A	**Revision no.:**	0
Test date:	07-06-2019	**Date:**	03-07-2019
Pages:	11	**Encl.:**	56
Ref:	RBI / NOL		

Danish Institute of Fire and Security Technology

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Client information

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The results relate only to the items tested. The test 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 07-06-2019.

Purpose of test

Examination of the fire-resistance of a loadbearing and separating roof.

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

DS/EN 1363-1:2012 Fire resistance tests – General requirements

in conjunction with

EN 1365-2:2014 Fire resistance test for loadbearing elements – Part 2: Floors and roofs

Test specimen

The trade name and sponsors identification mark is stated below:

Trade name:	Loadbearing roof
Identification mark:	None

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

The sponsor delivered one test specimen for fire testing.

The process of verification was carried out by DBI - Danish Institute of Fire and Security Technology. The laboratory oversaw the fabrication of the test specimen, material for verification of density, thickness, moisture and organic content were sampled during the inspection.

Drawings and description

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

Type	Drawing No.	Dated	Subject
Drawing	1	01.06.2019	Tagelement monteret på DBI betonramme
Drawing	2	20.05.2019	Tagelement uden brandbeskyttende beklædning
Drawing	3	06.06.2019	Hatteprofiler
Drawing	4	06.06.2019	Tagelement med 1. lag 15 mm brandgips
Drawing	5	06.06.2019	Tagelement med 2. lag 15 mm brandgips
Drawing	6	20.05.2019	Tagelement
Drawing	7	20.05.2019	Tagelement vederlagsdetalje
Drawing	8	20.05.2019	Tagelement vederlagsdetalje
Drawing	9	20.05.2019	Tagelement
Drawing	10	20.05.2019	Tagelement uden brandbeskyttende beklædning
Drawing	11	20.05.2019	Tagelement tværsnit
Data sheet			M4 composite board (2 pages)
Data sheet			Stone wool (2 pages)
Data sheet			Adhesive
Data sheet			Steel (2 pages)
Data sheet			Gypsum boards

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 assembly, the test and after the test.

The sponsor carried out the mounting of the test specimen.

Test specimen

External measures: Full length: 6170 mm Width: 2900 mm Thickness: 472 mm

The test specimen was a loadbearing roof construction made of elements of steel, M4 composite boards and stone wool. The test specimen consisted of 12 elements – further documentation see drawing 6, 7, 9 and 11.

The test specimen was built of individual elements with a width of 250 mm – further documentation see drawing 11.
The elements at free edge had a width of 200 mm.

On the exposed side of the test specimen, two layers of 15 mm gypsum plasterboards were mounted on steel hat profiles.

Each individual element consisted of two 0.9 mm profiled flanges of steel. The two flanges of steel were connected through a M4 composite board – the M4 composite boards were glued with 140 g/m to the flanges of steel. The vertical joints in the M4 composite boards were not glued. Stone wool was installed between the two flanges of steel – there was no glue used to bond the stone wool to the flanges of steel. Each individual element formed an insulated beam. The individual elements were connected in an airtight tongue and groove lock – further documentation see drawing 9.

The test specimen was symmetrical – to leave out of account the gypsum plasterboards.

Components

Boards:	15 mm M4 composite boards designated Cantona M4 komposit with a nominal density of 1.100 kg/m^3. The M4 composite boards had a height of 470 mm and were installed with two joints in the longitudinal direction of the test specimen – 1850 mm / 2400 mm / 1850 mm.
Insulation:	420 mm stone wool insulation designated Rockwool Flexibatts 34 with a nominal density of 42 kg/m^3. The nominal density is not indicated. The stone wool was installed in full length of the test specimen – 6100 mm – with a plural number of joints.
Adhesive:	A two component adhesive designated PKI ProFect 41176 + 91102 with a nominal density of 1.6 kg/L + 1.2 kg/L.
Steel:	Exterior side of the test specimen was formed with steel plates designated Aluzinc with a bulk density of 3750 kg/m^3.
Hat profile:	Steel hat profiles with dimension 25 x 85 mm was mounted cc 400 mm on the exposed side of the test specimen. The hat profiles were mounted with screws designated BYGMA T/STÅL gipsskruer m/borspids 3.5x25 mm. The screws were placed cc 250 mm – corresponding to the width of each insulated beam. Further documentation – see drawing 3. A 50 x 50 mm steel profile was mounted on each side of the test specimen as support for the gypsum plaster boards. See photo no. 10.
Gypsum plaster boards:	Two layers of 15 mm gypsum plaster boards designated Siniat GKF SCAN 15 was mounted on the exposed side of the test specimen. The dimension of the gypsum plaster boards before cutting into size was 3000 x 1200 x 15 mm. The first layer of gypsum plaster boards consisted of four boards in full width and two boards cut into size with width 400/800 mm. The two boards cut into size were mounted at each end of the test specimen. One full width board had a joint placed 500 mm from the edge of the test specimen. The second layer of gypsum plaster boards consisted of five boards in full width. One full width board had a joint placed 500 mm from the edge of the test specimen – opposite edge side as the joint in first layer of gypsum plaster boards. The first layer of gypsum plaster boards were mounted with screws designated P-SCREW S 3.5x35 mm. The screws were placed cc 200 mm along the edges and cc 300 mm at mid width of the gypsum plaster boards.

The second layer of gypsum plaster boards were mounted with screws designated BYGMA T/STÅL 3.5x51 mm. The screws were placed cc 200 mm along the edges and cc 300 mm at mid width of the gypsum plaster boards.

Further documentation – see drawing 4 and 5.

Measured by DBI

Product		Flexibatts 34	M4 Composite	GKF SCAN 15
Density	kg/m³	41	978	896
Thickness	mm		14.7	15.5
Moisture content	%	0.3	14.8	0.4
Organic content	%	2.5	-	-
Sampling method		Extra material	Extra material	Extra material
Drying temperature		105 °C	105 °C	55 °C

Test conditions

Conditioning

The test specimen was delivered on the 03-06-2019 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 length and width of 6000 x 3070 mm (exposed area). The loadbearing roof element was supported 50 mm in from the furnace edges resulting in a total loaded roof span of 6100 mm.

The two layer of 15 mm gypsum boards were mounted after the test specimen was mounted in the test frame.

Free edges between the roof and the furnace frame were established along both vertical edges of the test specimen (2 x 25 mm stone wool in each side) to allow for unrestrained deformation of the test specimen.

Loading

The test specimen was loaded with a total applied load of 45.2 kN (2.60 kN/m^2) placed as two line loads in the two quarter sections each on 22.6 kN.

The maximum moment in the deck from the applied load during the fire test was 11.7 kNm/m.
The maximum shear force in the deck from the applied load during the fire test was 7.8 kN/m.

The total applied load of 45.2 kN corresponds to a load of 4608 kg. With a total weight of the loading equipment of 295 kg, the load delivered from the piston was set to 4313 kg.

Prior to the uploading, the applied load was verified by placing the piston under a calibrated load cell. The oil pressure needed to obtain the required load 4313 kg was determined. This pressure was controlled during the test.

The load was applied as a downward oriented point load in the quarter sections of the deck, e.g. there was no eccentricity in the loading conditions.

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. The fully applied load was kept during the full extent of the fire test.

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 and deflection were measured on the unexposed surface of the test specimen as indicated on DBI enclosure 1.0.

The internal temperatures were measured at mid height and 25 mm above lower visible edge of M4 composite boards of the test specimen as indicated on DBI enclosure 1.1.

The surface temperatures were measured on the exposed side of the test specimen placed between the test specimen and the 2x15 mm gypsum boards as indicated on DBI enclosure 1.2.

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 1363-1:2012.

The thermocouples were constructed according to the description in EN 1363-1:2012.

The pressure was kept at 20 Pa just below the aerated concrete deck. The pressure differential was measured 100 mm below the loaded deck, which gives a pressure set point of approximately 20 Pa at the height of the measuring device.

Test results

Duration of the test was 87 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	Horizontal furnace pressure The differential pressure in the furnace during the test, measured 100 mm below the test specimen
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 Temperature rise on the unexposed side
Enclosures 6.0 and 6.1	Maximum temperatures Temperature rise on the unexposed side
Enclosures 7.0 and 7.1	Internal indicative temperatures Temperature rise inside the test specimen
Enclosures 8.0 and 8.1	Internal indicative temperatures Temperature rise inside the test specimen
Enclosures 9.0 and 9.1	Load The load on the deck from the hydraulic jack
Enclosures 10.0 and 10.1	Deformation The vertical deflection measured on the unexposed side (positive values indicates movement towards the furnace)
Enclosures 11.0 and 11.1	Deformation rate per minute D1, D3: at the edges, D2: in the center
Enclosures 12.0 and 12.1	Load during loading phase Total load prior to the test
Enclosures 13.0 and 13.1	Deformation during loading phase The vertical deflection measured prior to the test on the unexposed side (positive values indicates movement towards the furnace)

Visual observations:

Time / Minutes	Visual observations:	U = Unexposed side E = Exposed side
0	Test commences	
15	No changes	U
20	Smoke development from edges of test frame	U
30	No changes	U
40	No changes	U
48	Joints in gypsum boards are opening a bit	E
62	Cracks in 1. layer gypsum boards, more openings from joints in gypsum boards	E
67	Opening up in joints – visible deflection	E
70	Gypsum boards are hanging loose in one side	E
72	Gypsum boards are falling down in medium size pieces	E
74	Cracks in 2. layer of gypsum boards	E
76	2. layer of gypsum boards are falling down on one side of the furnace	E
77	Further gypsum boards from 2. layer falls down	E

79	Visible flames on exposed side of the test specimen	E
82	Approximately 70 % of exposed side of the test specimen is not covered by gypsum boards	E
84	Deflection measuring D1 falls of	U
85	Approximately 90 % of exposed side of the test specimen is not covered by gypsum boards	E
87	Test stopped due to safety reasons	

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 1365-2:2014 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): 81 minutes

- The load on the test specimen was maintained during the entire test
- The measured vertical deflection did not exceed the criteria of $C = L^2/(h \times 400) = 190.7$ mm during the test. The maximum deflection was 176.1 mm.
- The measured rate of vertical deflection exceeded the criteria of $dC/dt = L^2/(h \times 9000) = 8.5$ mm/min after 81 minutes of testing.

Note: according to EN 1363-1:2012 §11.1 the criteria for rate of deflection does not apply in the first 10 minutes of the fire test.

Integrity (E): 87 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): 68 minutes

- During the test no failure of insulation occurred to failure of integrity
- 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 1365-2:2014, 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, and where appropriate EN 1363-2. 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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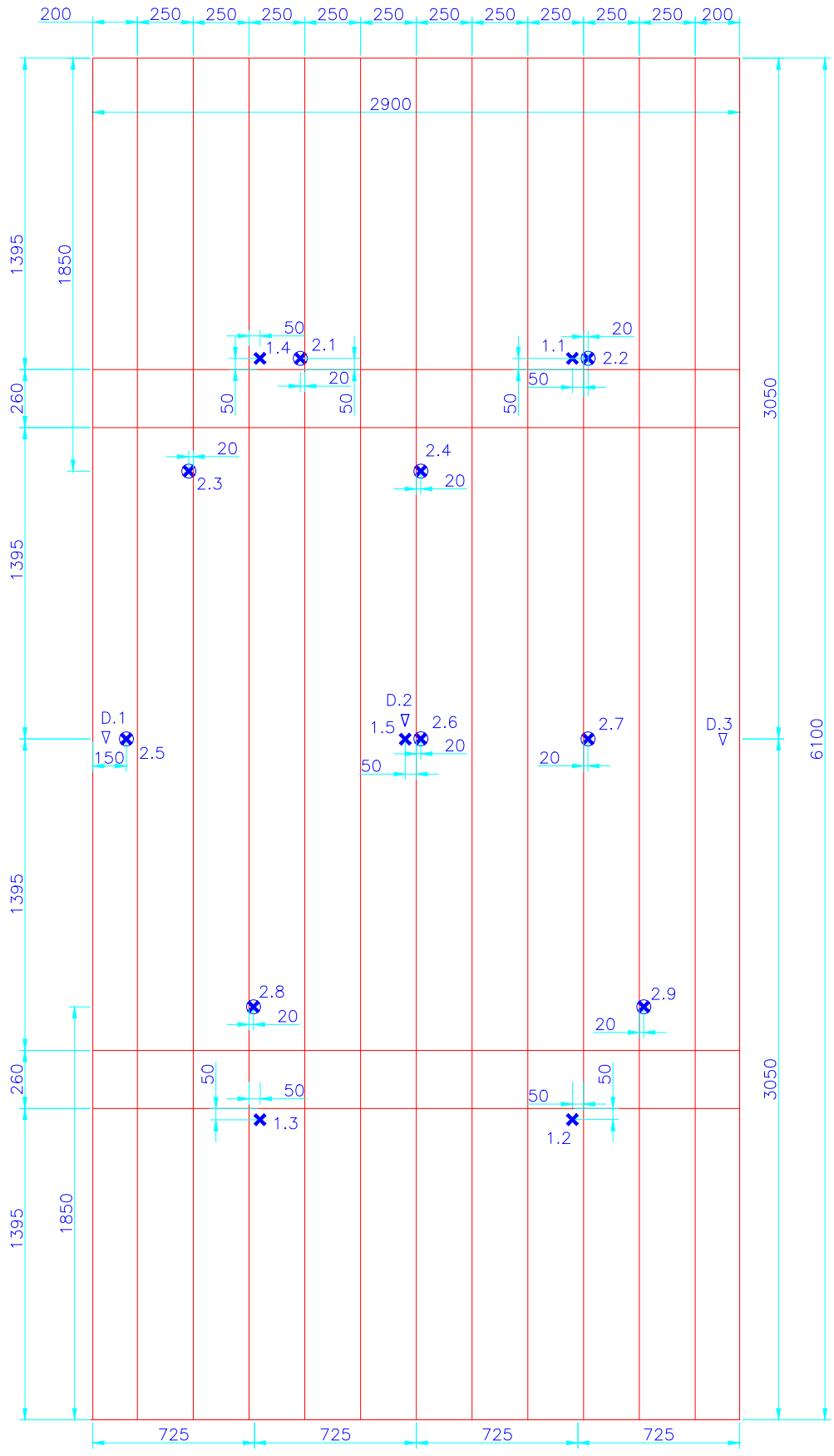
Nordic Build A/S	**Enclosures:**	**56**
Bjernemarksvej 54	DBI drawings:	3
Tåsinge	DBI graphs and tables:	24
5700 Svendborg	Photo sheets:	10
Denmark	Sponsors drawings:	19



✖ Thermocouple placed on the unexposed surface (average)

⊗ Thermocouple placed on the unexposed surface (maximum)

▽ Deflection measuring point

All measurements are in mm

Danish Institute of Fire and security Technology

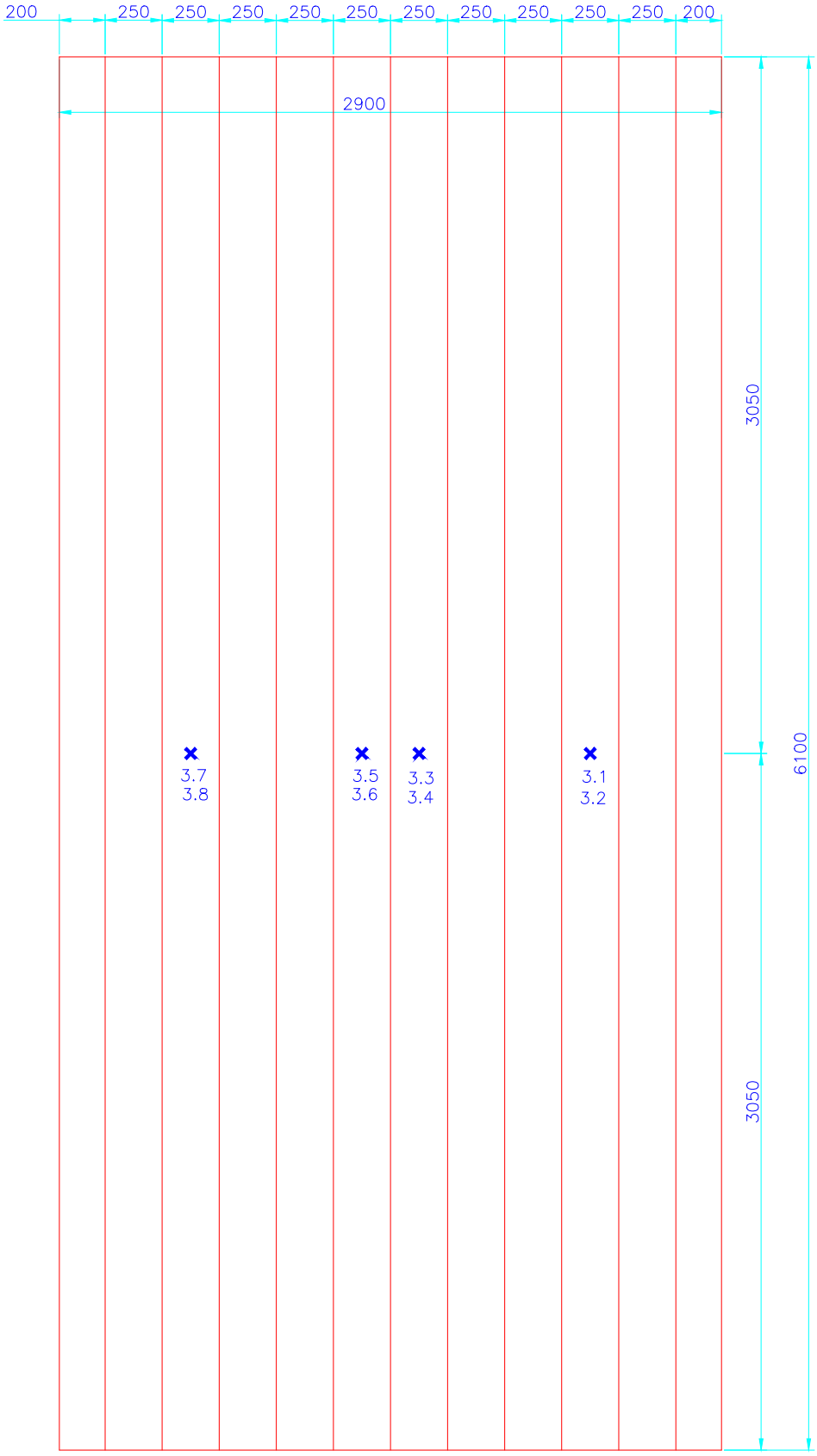
Sponsor: Nordic Build A/S

Subject: Loadbearing roof

File No.: **PGA11454A**

Test date: 07-06-2019

Enclosure: 1.0

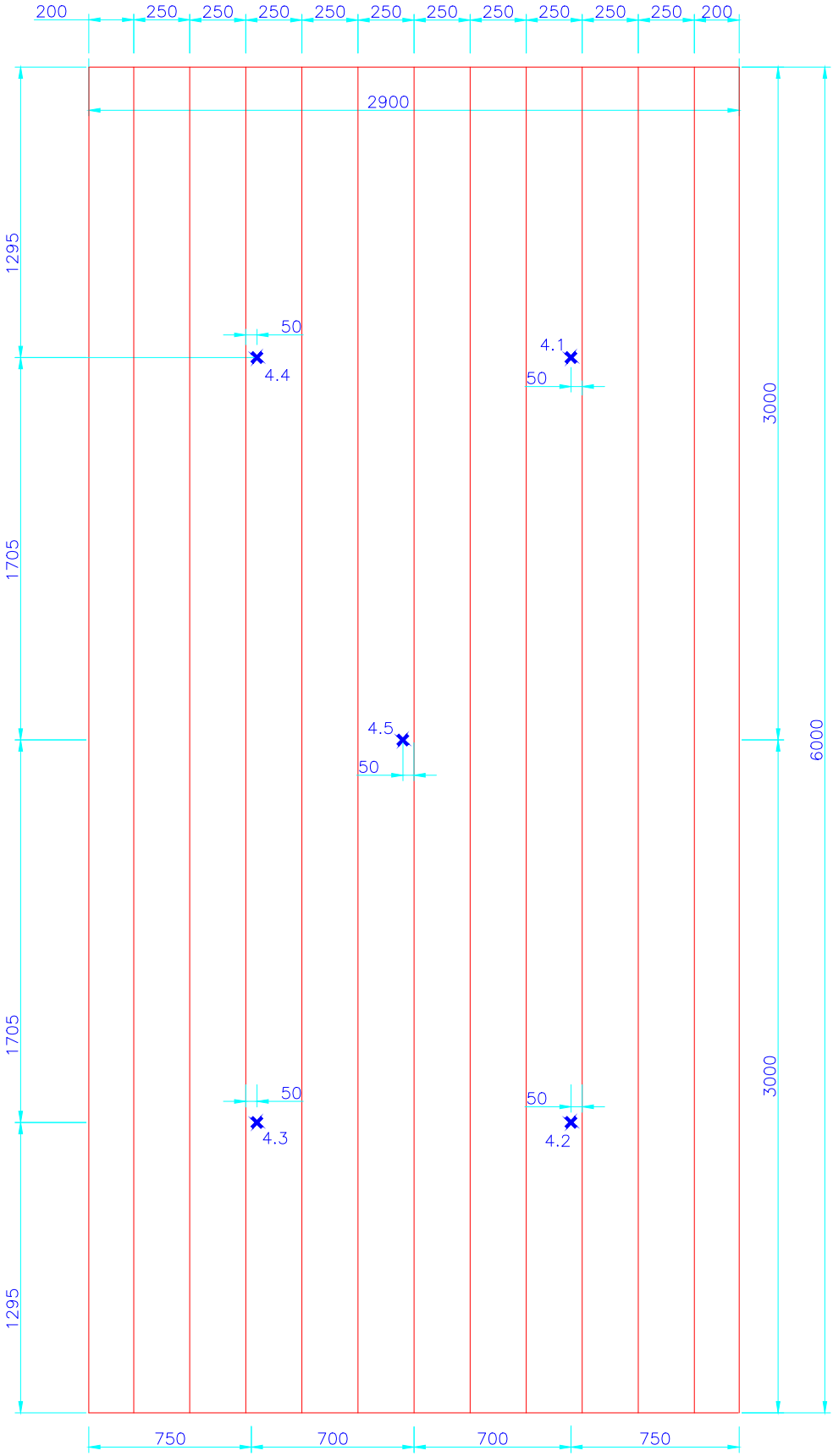


✖ Thermocouple placed inside the test specimen

A3.1, A3.3, A3.5, A3.7 placed 25 mm above lower visible edge of M4 composite board

A3.2, A3.4, A3.6, A3.8 placed mid height M4 composite board

All measurements are in mm



✖ Thermocouple placed on exposed side of the test specimen between the test specimen and the 2x15 mm gypsum boards

All measurements are in mm

Danish Institute of Fire and security Technology

Sponsor: Nordic Build A/S

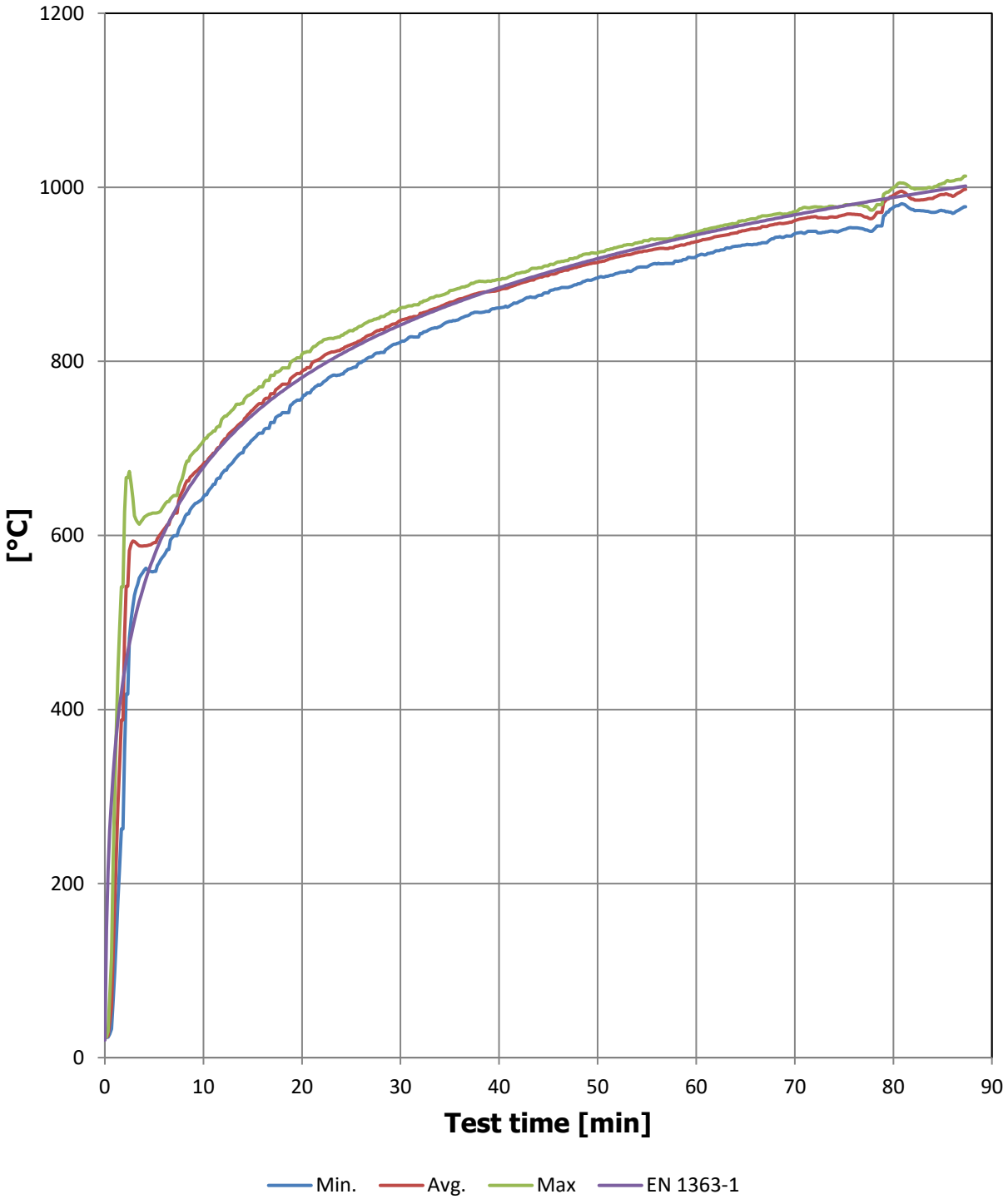
Subject: Loadbearing roof

File No.: **PGA11454A**

Test date: 07-06-2019

Enclosure: 1.2

Furnace temperatures

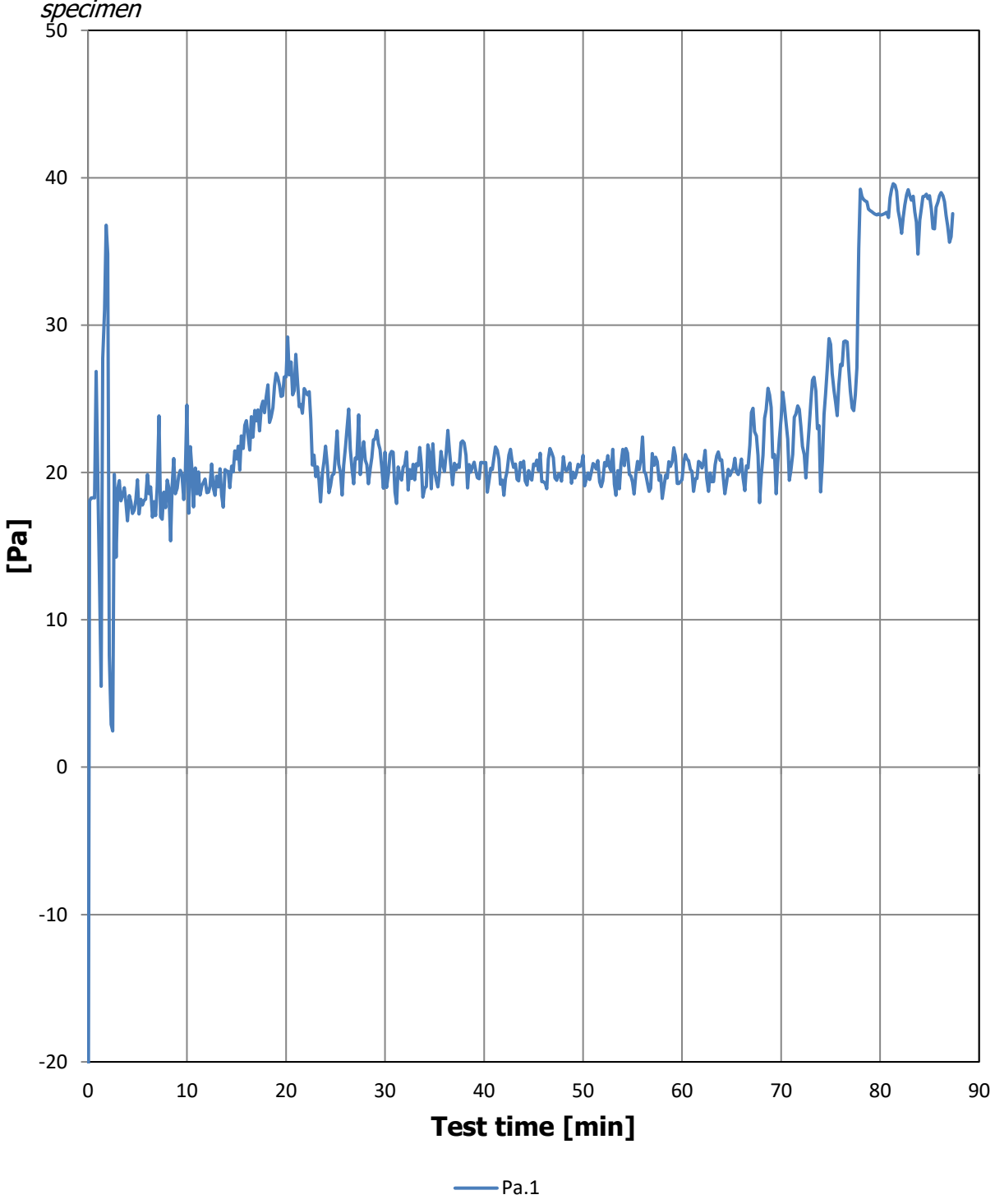


Furnace temperatures

Time	Measured			Norm	Area under curve			
Minutes	Minimum	Average	Maximum	EN 1363-1	Measured	EN 1363-1	Dev. [%]	Limit [%]
0	23	23	24	20	0	0	0,0	
3	531	593	623	502	953	1115	-14,5	
6	577	607	634	603	2731	2790	-2,1	15
9	635	671	696	663	4647	4695	-1,0	15
12	673	709	735	705	6712	6750	-0,6	14
15	710	744	764	739	8891	8918	-0,3	13
18	741	774	792	766	11166	11176	-0,1	11
21	767	798	815	789	13519	13508	0,1	10
24	785	814	830	809	15940	15904	0,2	8
27	805	831	847	826	18407	18357	0,3	7
30	822	847	861	842	20923	20859	0,3	5
33	837	859	873	856	23480	23406	0,3	5
36	849	872	884	869	26076	25994	0,3	5
39	857	880	892	881	28706	28619	0,3	4
42	869	889	901	892	31357	31279	0,3	4
45	879	898	910	902	34040	33971	0,2	4
48	889	909	919	912	36751	36692	0,2	4
51	898	917	928	921	39489	39442	0,1	3
54	908	925	936	930	42253	42218	0,1	3
57	913	930	941	938	45037	45019	0,0	3
60	920	938	949	945	47838	47844	0,0	3
63	930	945	957	953	50663	50691	-0,1	3
66	935	952	964	960	53510	53559	-0,1	3
69	943	959	969	966	56378	56448	-0,1	3
72	949	966	978	973	59267	59356	-0,2	3
75	952	968	980	979	62165	62283	-0,2	3
78	951	966	975	985	65067	65228	-0,2	3
81	981	995	1005	990	68019	68190	-0,3	3
84	971	987	999	996	70981	71169	-0,3	3
87	976	996	1011	1001	73956	74164	-0,3	3

Horizontal furnace pressure

The differential pressure in the furnace during the test, measured 100 mm below the test specimen



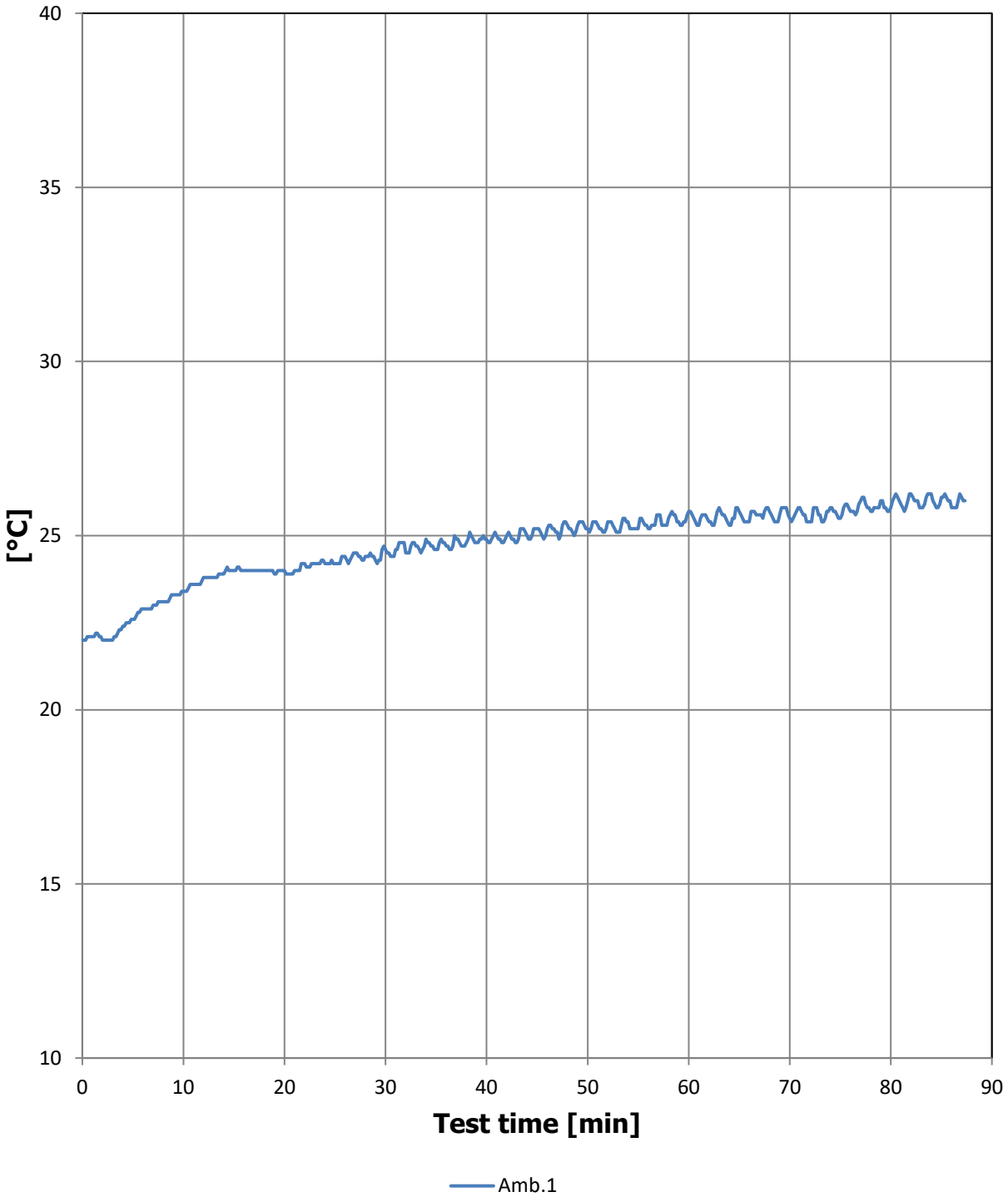
Horizontal furnace pressure

The differential pressure in the furnace during the test, measured 100 mm below the test specimen

Min. / Pa	Pa.1
0	-35,8
3	18,9
6	19,9
9	18,9
12	18,6
15	20,9
18	25,1
21	28,0
24	21,8
27	21,0
30	21,4
33	19,5
36	20,1
39	20,7
42	18,4
45	20,6
48	21,1
51	20,6
54	21,6
57	21,3
60	19,5
63	19,4
66	20,9
69	24,4
72	23,1
75	28,7
78	39,2
81	38,6
84	37,1
87	35,6

Ambient temperature

The ambient temperature in the laboratory during the test



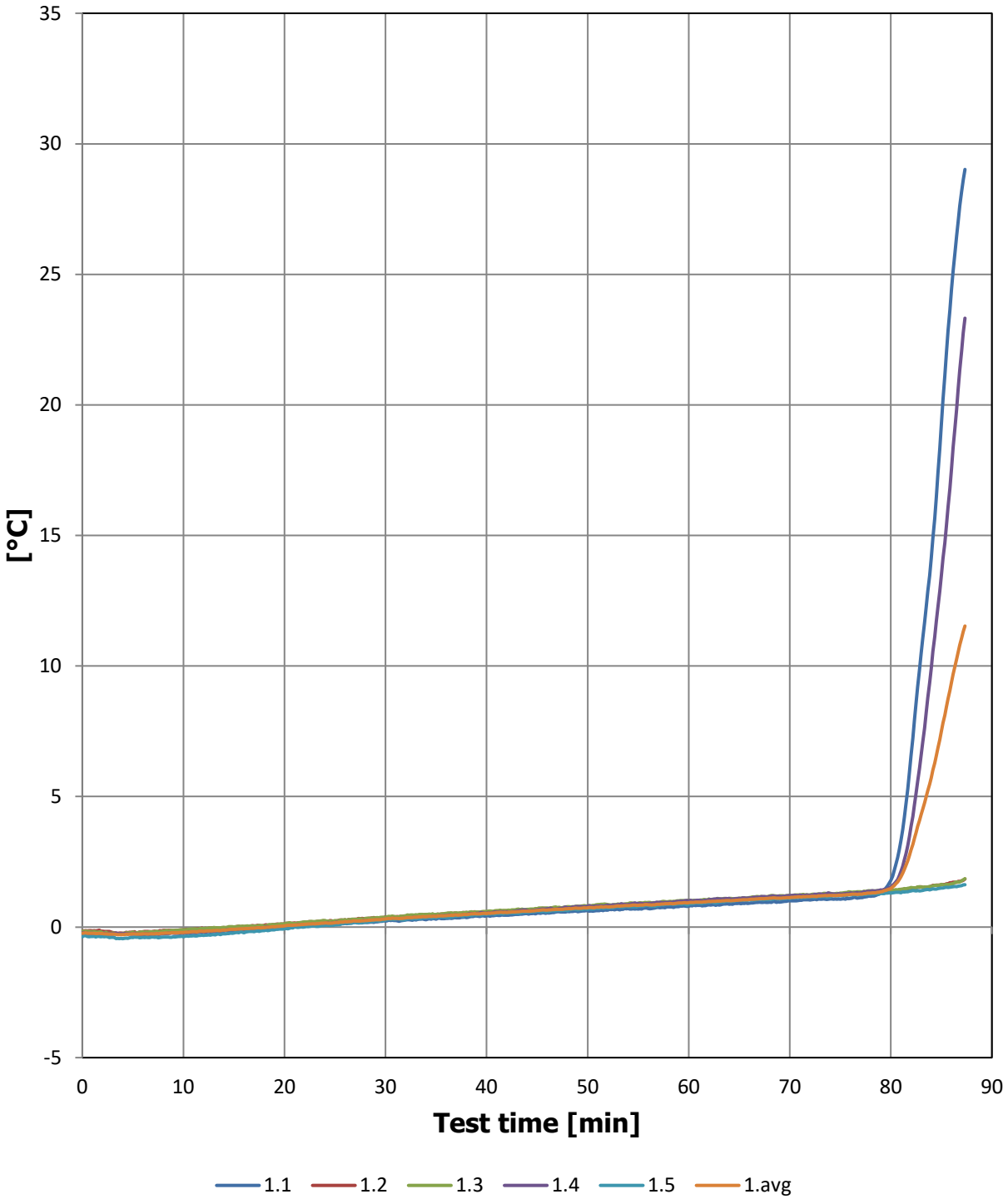
Ambient temperature

The ambient temperature in the laboratory during the test

Min. / °C	Amb.1
0	22,0
3	22,0
6	22,9
9	23,3
12	23,8
15	24,0
18	24,0
21	24,0
24	24,2
27	24,5
30	24,6
33	24,7
36	24,7
39	24,8
42	25,0
45	25,2
48	25,3
51	25,3
54	25,4
57	25,6
60	25,7
63	25,8
66	25,4
69	25,6
72	25,4
75	25,5
78	25,7
81	25,9
84	26,2
87	26,1

Average temperature

Temperature rise on the unexposed side



Average temperature

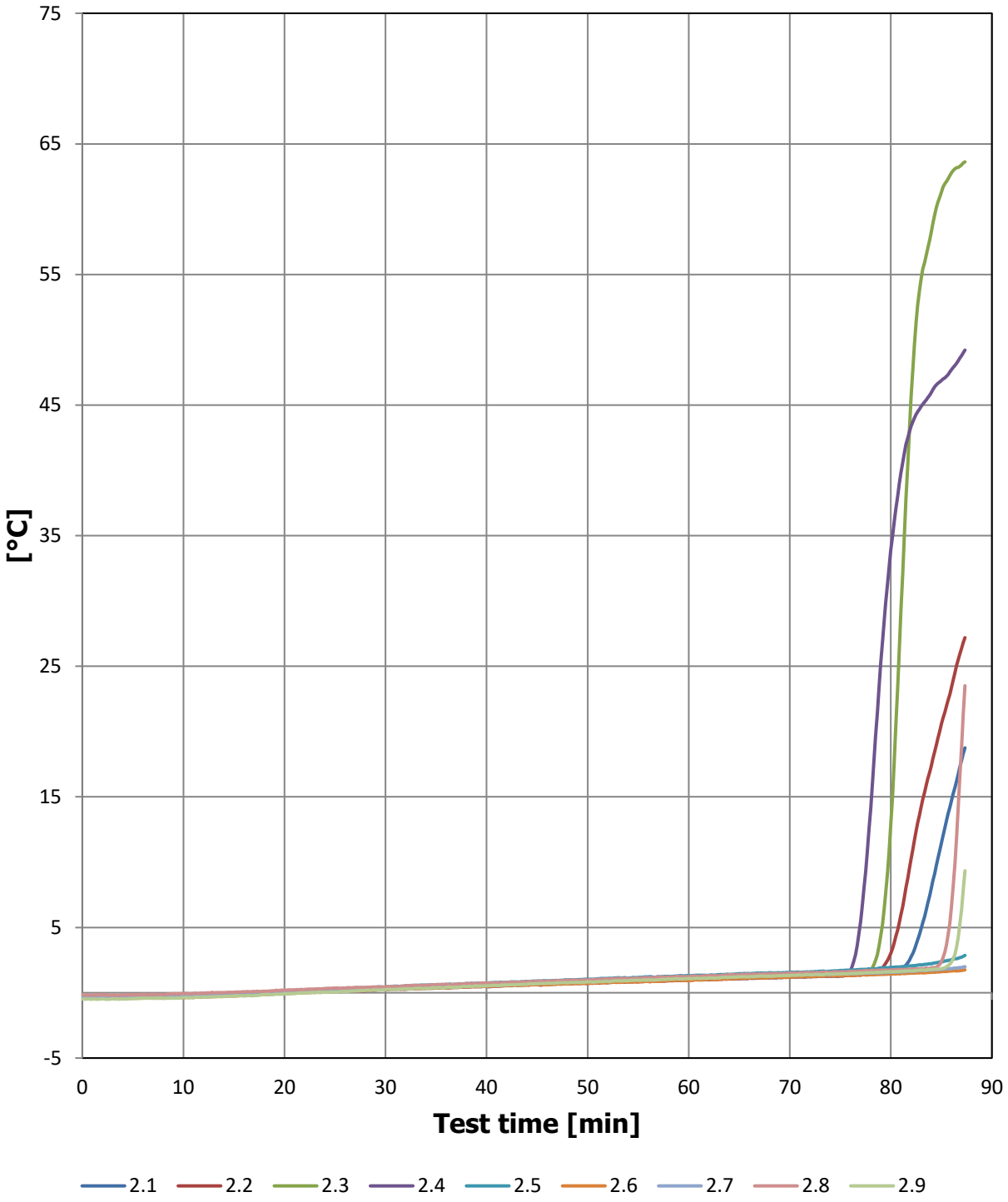
Temperature rise on the unexposed side

Min. / °C	1.1	1.2	1.3	1.4	1.5	1.Avg	1.Max
0	0	0	0	0	0	0	0
3	0	0	0	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	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0
36	0	0	1	0	0	0	1
39	0	1	1	1	0	1	1
42	0	1	1	1	1	1	1
45	1	1	1	1	1	1	1
48	1	1	1	1	1	1	1
51	1	1	1	1	1	1	1
54	1	1	1	1	1	1	1
57	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1
63	1	1	1	1	1	1	1
66	1	1	1	1	1	1	1
69	1	1	1	1	1	1	1
72	1	1	1	1	1	1	1
75	1	1	1	1	1	1	1
78	1	1	1	1	1	1	1
81	3	1	1	2	1	2	3
84	14	2	2	10	1	6	14
87	28	2	2	22	2	11	28

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

Maximum temperatures

Temperature rise on the unexposed side



Maximum temperatures

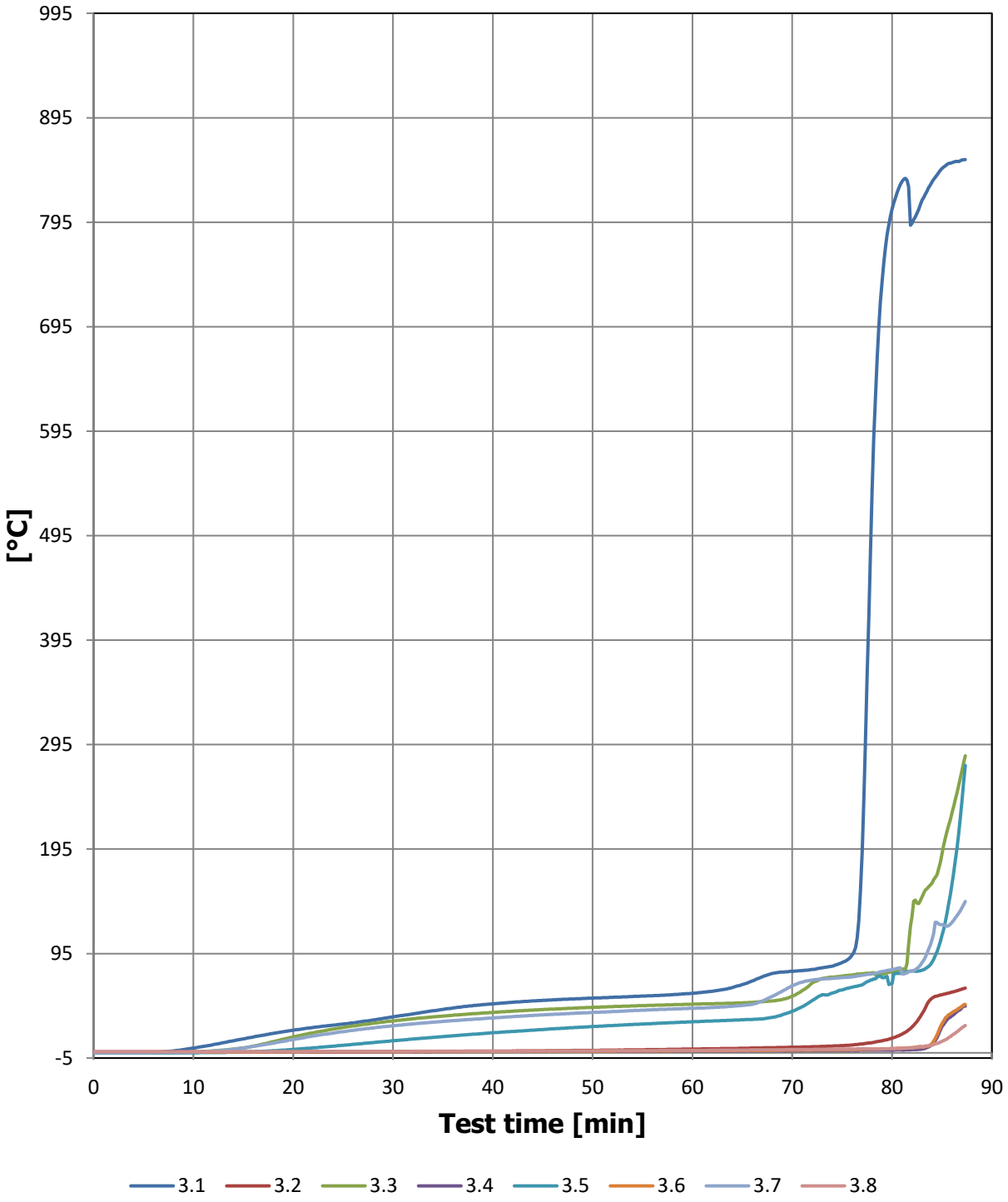
Temperature rise on the unexposed side

Min. / °C	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.Max
0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	1	0	0	1	0	1
36	0	0	1	0	1	0	1	1	0	1
39	1	0	1	1	1	0	1	1	1	1
42	1	1	1	1	1	1	1	1	1	1
45	1	1	1	1	1	1	1	1	1	1
48	1	1	1	1	1	1	1	1	1	1
51	1	1	1	1	1	1	1	1	1	1
54	1	1	1	1	1	1	1	1	1	1
57	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1
63	1	1	1	1	1	1	1	1	1	1
66	1	1	1	1	1	1	1	1	1	1
69	1	1	1	1	2	1	1	1	1	2
72	1	1	1	1	2	1	1	2	1	2
75	1	1	1	1	2	1	1	2	1	2
78	1	1	2	14	2	1	1	2	2	14
81	2	6	29	40	2	1	2	2	2	40
84	8	17	58	46	2	2	2	2	2	58
87	18	26	63	49	3	2	2	19	6	63

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

Internal indicative temperatures

Temperature rise inside the test specimen



Internal indicative temperatures

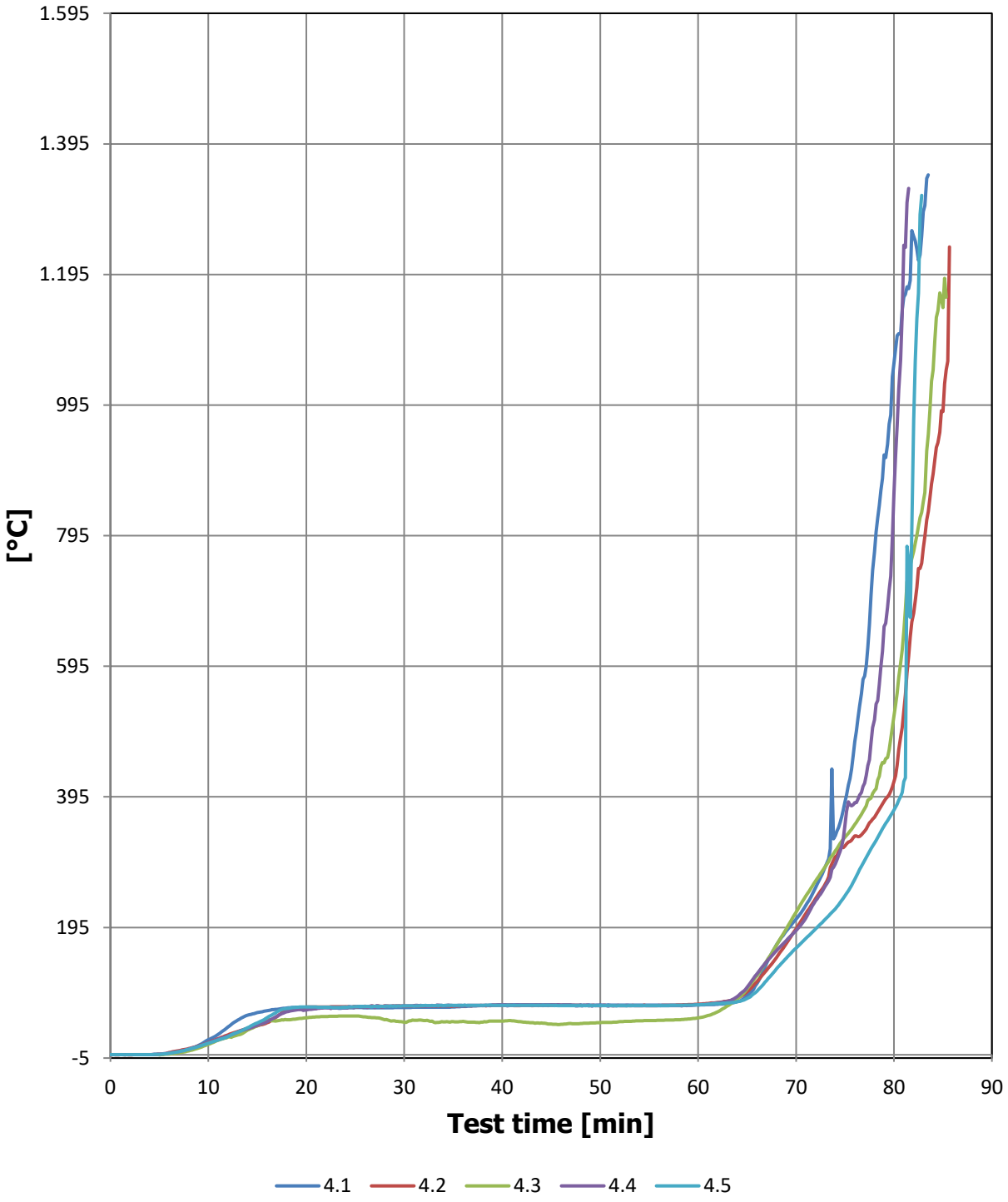
Temperature rise inside the test specimen

Min. / °C	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.Max
0	0	1	0	1	0	1	0	1	1
3	0	1	0	1	0	1	0	1	1
6	0	1	0	1	0	1	0	1	1
9	3	1	0	1	0	1	0	1	3
12	8	1	2	1	0	1	2	1	8
15	13	1	5	1	1	1	5	1	13
18	19	1	11	1	2	1	9	1	19
21	23	1	17	1	4	1	14	1	23
24	27	1	23	1	6	1	19	1	27
27	30	1	27	1	9	1	23	1	30
30	34	1	31	1	12	1	26	1	34
33	39	1	34	1	14	1	29	1	39
36	43	1	36	1	16	1	31	2	43
39	46	2	38	1	18	1	33	2	46
42	48	2	40	1	21	1	35	2	48
45	50	2	41	1	22	1	36	2	50
48	52	2	43	1	24	2	38	2	52
51	53	2	44	2	26	2	39	2	53
54	54	3	45	2	27	2	40	2	54
57	55	3	46	2	29	2	42	2	55
60	57	4	47	2	30	2	43	2	57
63	60	4	47	2	31	2	44	3	60
66	69	5	48	2	32	2	47	3	69
69	77	5	51	2	36	2	59	3	77
72	80	6	67	2	50	3	70	3	80
75	86	7	74	2	60	3	72	4	86
78	538	10	77	3	70	3	76	3	538
81	834	18	80	3	77	4	76	4	834
84	834	52	163	8	87	9	108	7	834
87	854	61	270	43	241	44	139	24	854

Failure [min]	76,83	-	84,67	-	86,17	-	-	-	76,83
Failure [°C]	180	180	180	180	180	180	180	180	180

Internal indicative temperatures

Temperature rise inside the test specimen



Internal indicative temperatures

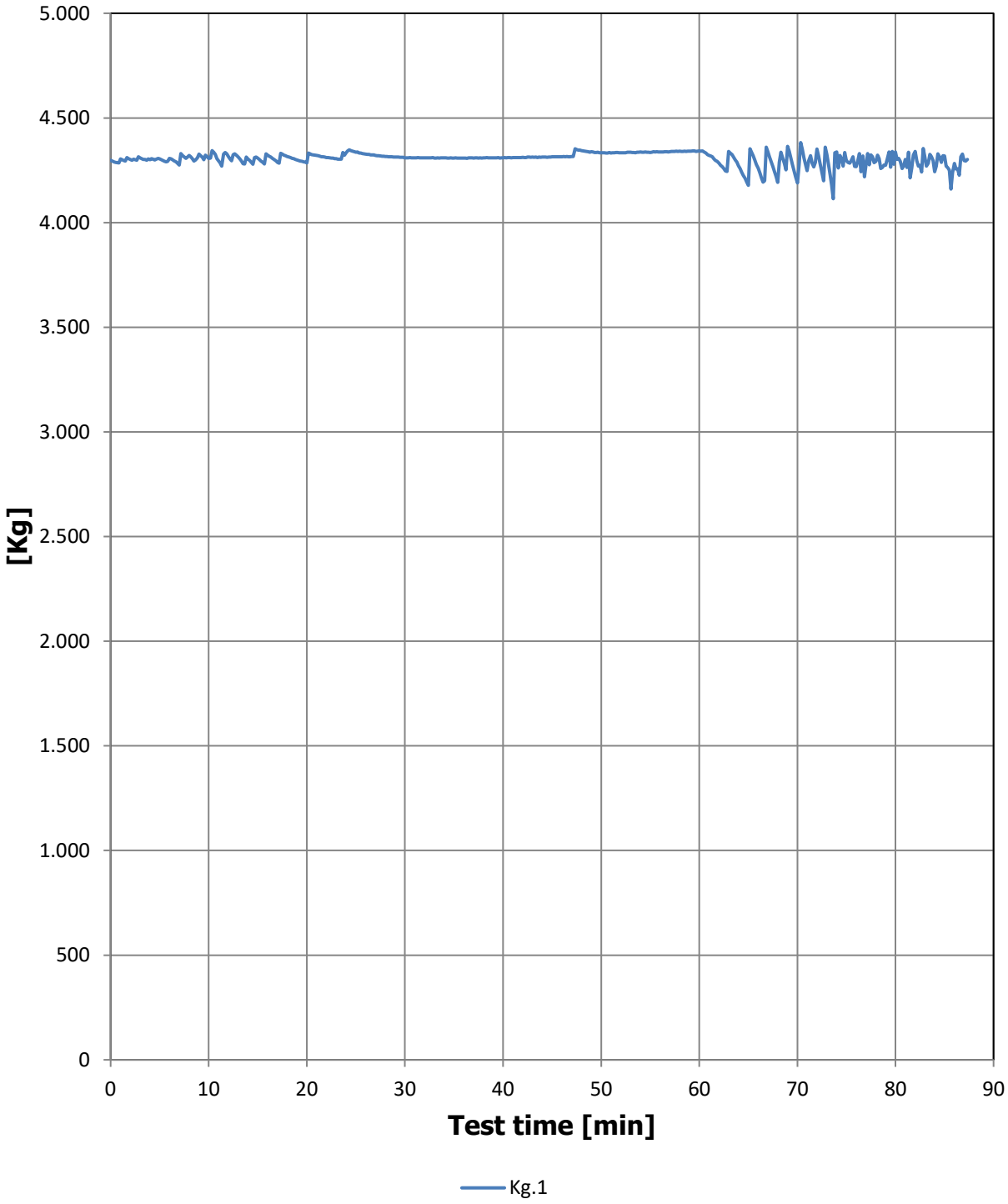
Temperature rise inside the test specimen

Min. / °C	4.1	4.2	4.3	4.4	4.5	4.Max
0	0	0	0	0	0	0
3	0	0	0	0	0	0
6	2	3	1	3	2	3
9	14	14	10	13	13	14
12	43	30	27	29	28	43
15	65	44	44	45	49	65
18	72	69	54	66	71	72
21	73	73	58	70	73	73
24	72	74	59	73	73	74
27	72	74	57	72	74	74
30	73	75	50	75	75	75
33	73	75	50	75	75	75
36	74	75	51	75	76	76
39	76	76	52	76	76	76
42	77	76	50	76	76	77
45	77	76	47	76	75	77
48	76	76	48	75	75	76
51	76	75	50	76	75	76
54	76	75	52	75	75	76
57	76	76	53	75	75	76
60	76	77	57	77	77	77
63	78	82	75	82	79	82
66	109	112	121	124	97	124
69	189	170	193	175	148	193
72	256	239	266	236	193	266
75	387	320	333	351	243	387
78	770	364	404	513	324	770
81	1161	527	648	1240	418	1240
84	0	889	1049	0	0	1049
87	0	0	0	0	0	0

Failure [min]	68,50	69,33	68,50	69,33	71,00	68,50
Failure [°C]	180	180	180	180	180	180

Load

The load on the deck from the hydralic jack



Graph showing indication of load, determined from oil pressure measurement in piston

Load

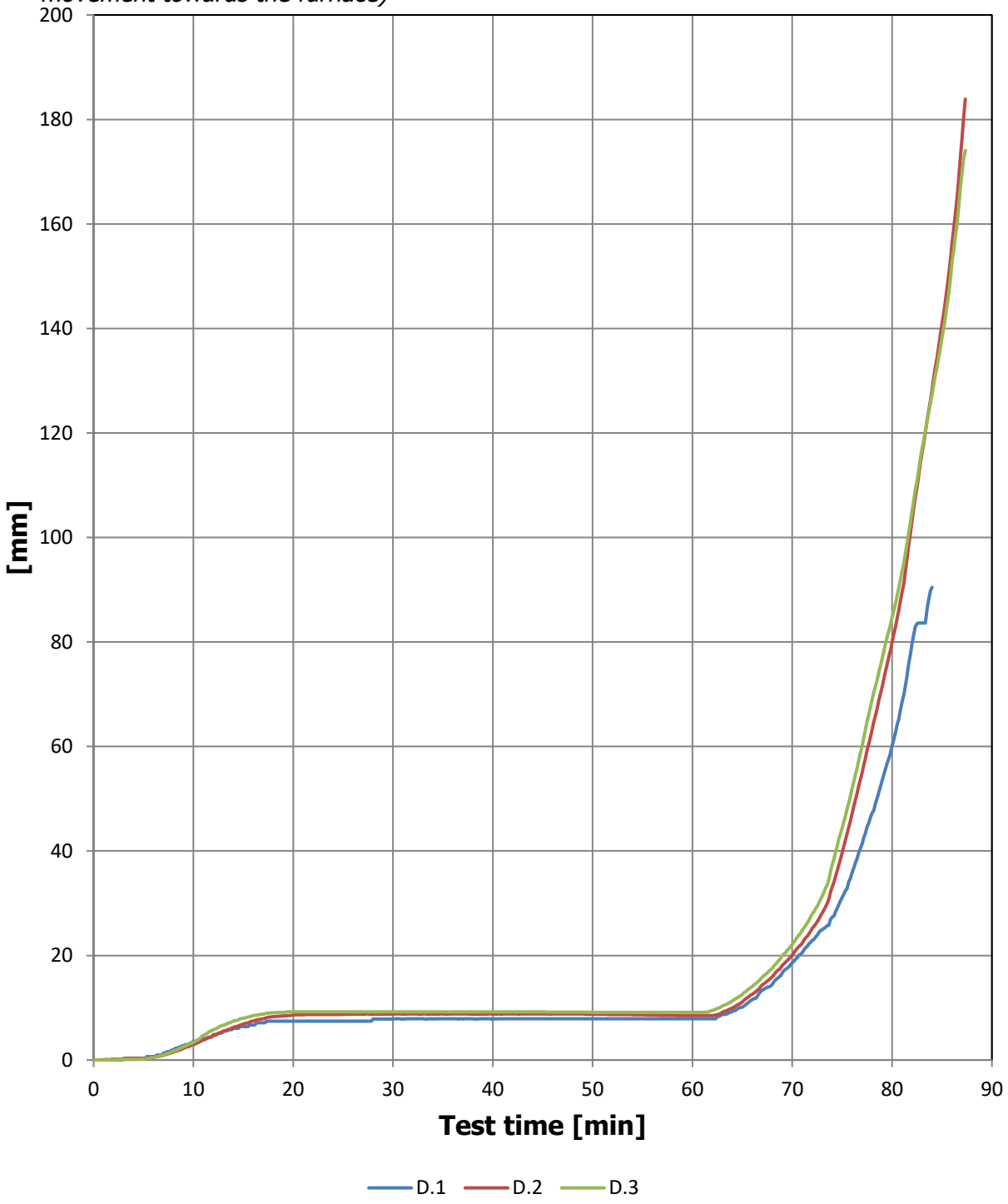
The load on the deck from the hydralic jack

Min. / Kg	Kg.1
0	4297,44
3	4309,50
6	4307,32
9	4327,40
12	4316,03
15	4307,54
18	4315,34
21	4320,47
24	4333,19
27	4321,41
30	4309,87
33	4307,97
36	4308,05
39	4309,77
42	4311,56
45	4314,73
48	4344,40
51	4332,87
54	4336,95
57	4338,45
60	4341,92
63	4340,47
66	4259,86
69	4364,12
72	4352,02
75	4297,19
78	4293,32
81	4301,28
84	4243,46
87	4296,87

Graph showing indication of load, determined from oil pressure measurement in piston

Deformation

The vertical deflection measured on the unexposed side (positive values indicates movement towards the furnace)



Deformation

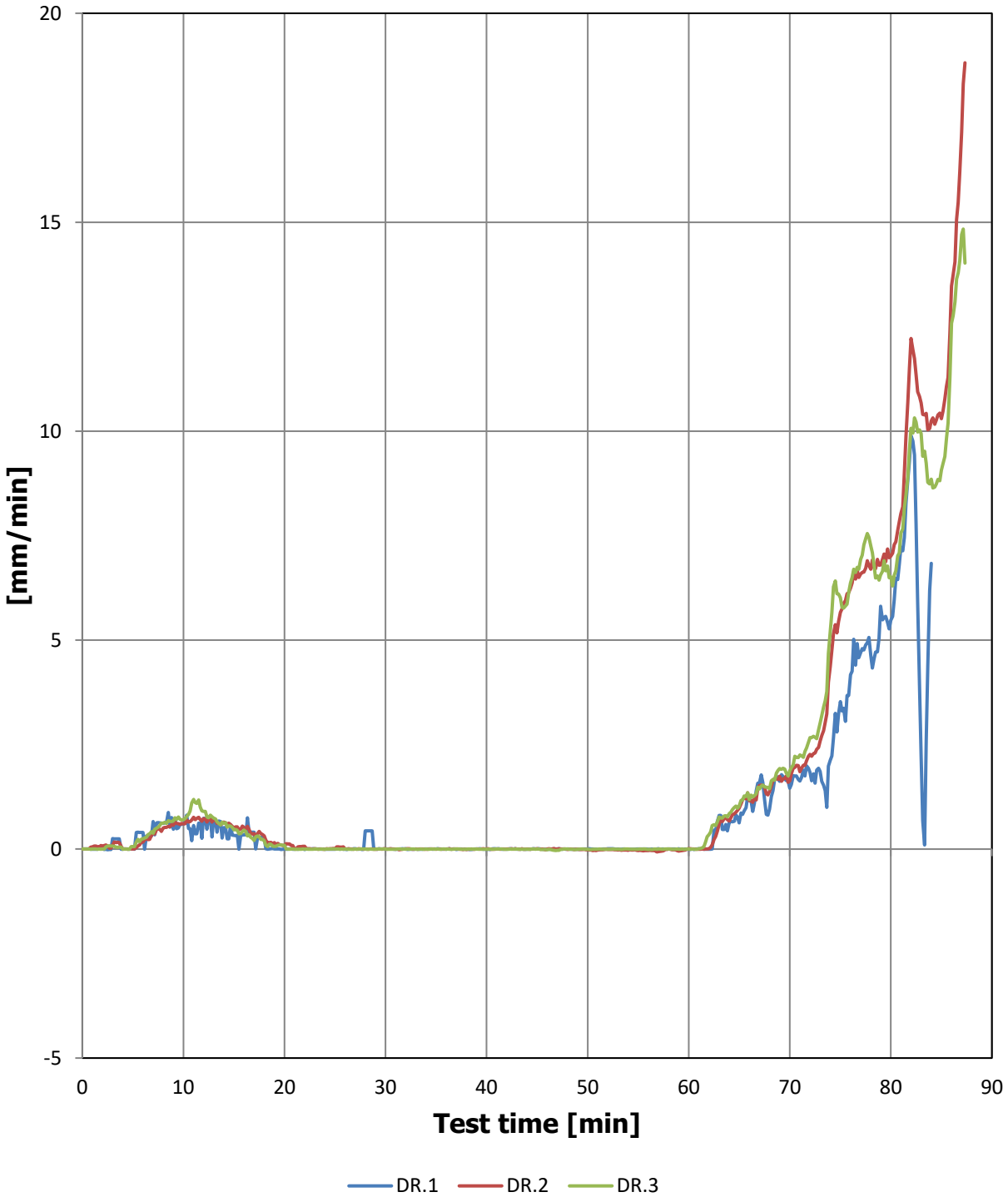
The vertical deflection measured on the unexposed side (positive values indicates movement towards the furnace)

Min. / mm	D.1	D.2	D.3	D.Max
0	0,0	0,0	0,0	0,0
3	0,2	0,3	0,1	0,3
6	0,6	0,5	0,4	0,6
9	2,7	2,2	2,5	2,7
12	4,9	4,7	5,8	5,8
15	6,4	6,9	8,0	8,0
18	7,4	8,3	9,0	9,0
21	7,4	8,7	9,2	9,2
24	7,4	8,7	9,2	9,2
27	7,4	8,8	9,2	9,2
30	7,9	8,8	9,2	9,2
33	7,9	8,8	9,2	9,2
36	7,9	8,8	9,2	9,2
39	7,9	8,8	9,2	9,2
42	7,9	8,8	9,2	9,2
45	7,9	8,8	9,2	9,2
48	7,9	8,8	9,2	9,2
51	7,9	8,7	9,1	9,1
54	7,9	8,7	9,1	9,1
57	7,9	8,5	9,1	9,1
60	7,9	8,5	9,1	9,1
63	8,7	9,1	10,3	10,3
66	11,5	12,6	14,1	14,1
69	16,6	18,1	20,0	20,0
72	22,9	25,2	27,9	27,9
75	31,1	39,7	44,5	44,5
78	47,2	63,2	69,0	69,0
81	68,4	89,4	93,5	93,5
84	90,5	128,3	127,4	128,3
87	0,0	176,1	169,5	176,1

Failure [min]	-	-	-	-
Failure [mm]	190,7	190,7	190,7	190,7

Deformation rate per minute

D1, D3: at the edges, D2: in the center



Note: according to EN 1363-1:2012 §11.1 the criteria for rate of deflection does not apply in the first 10 minutes of the fire test.

Deformation rate per minute

D1, D3: at the edges, D2: in the center

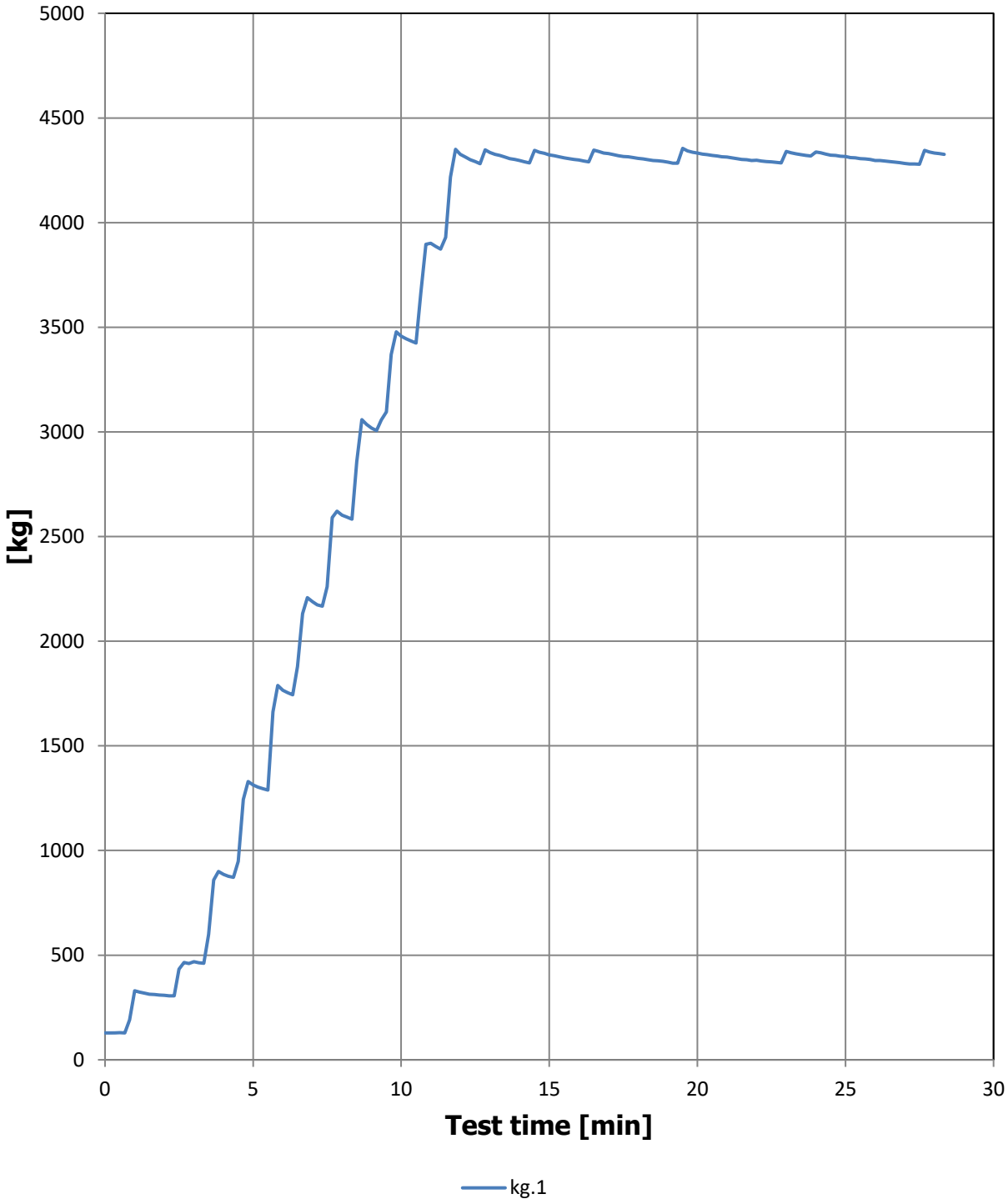
Min. / mm/min	DR.1	DR.2	DR.3	DR.Max
0	0,00	0,00	0,00	0,00
3	0,25	0,10	0,08	0,25
6	0,40	0,17	0,24	0,40
9	0,48	0,57	0,67	0,67
12	0,74	0,73	0,90	0,90
15	0,33	0,52	0,46	0,52
18	0,27	0,32	0,20	0,32
21	0,00	0,00	0,00	0,00
24	0,00	0,00	0,00	0,00
27	0,01	0,00	0,00	0,01
30	0,00	0,01	0,00	0,01
33	0,00	0,00	0,00	0,00
36	0,00	0,00	0,00	0,00
39	0,00	0,00	0,00	0,00
42	0,00	0,00	0,00	0,00
45	0,00	0,01	0,00	0,01
48	0,00	-0,01	0,00	0,00
51	-0,01	-0,02	0,00	0,00
54	0,00	-0,03	0,00	0,00
57	0,01	-0,06	0,00	0,01
60	0,00	0,01	0,01	0,01
63	0,80	0,59	0,77	0,80
66	1,23	1,15	1,18	1,23
69	1,62	1,74	1,93	1,93
72	1,83	2,27	2,67	2,67
75	3,53	5,66	6,01	6,01
78	4,64	6,70	7,26	7,26
81	7,22	8,03	7,57	8,03
84	6,84	10,25	8,85	10,25
87	0,00	17,16	14,71	17,16

Failure [min]	81,50	81,17	81,50	81,17
Failure [mm/min]	8,50	8,50	8,50	8,50

Note: according to EN 1363-1:2012 §11.1 the criteria for rate of deflection does not apply in the first 10 minutes of the fire test.

Load during loading phase

Total load prior to the test



Graph showing indication of load, determined from oil pressure measurement in piston

Load during loading phase

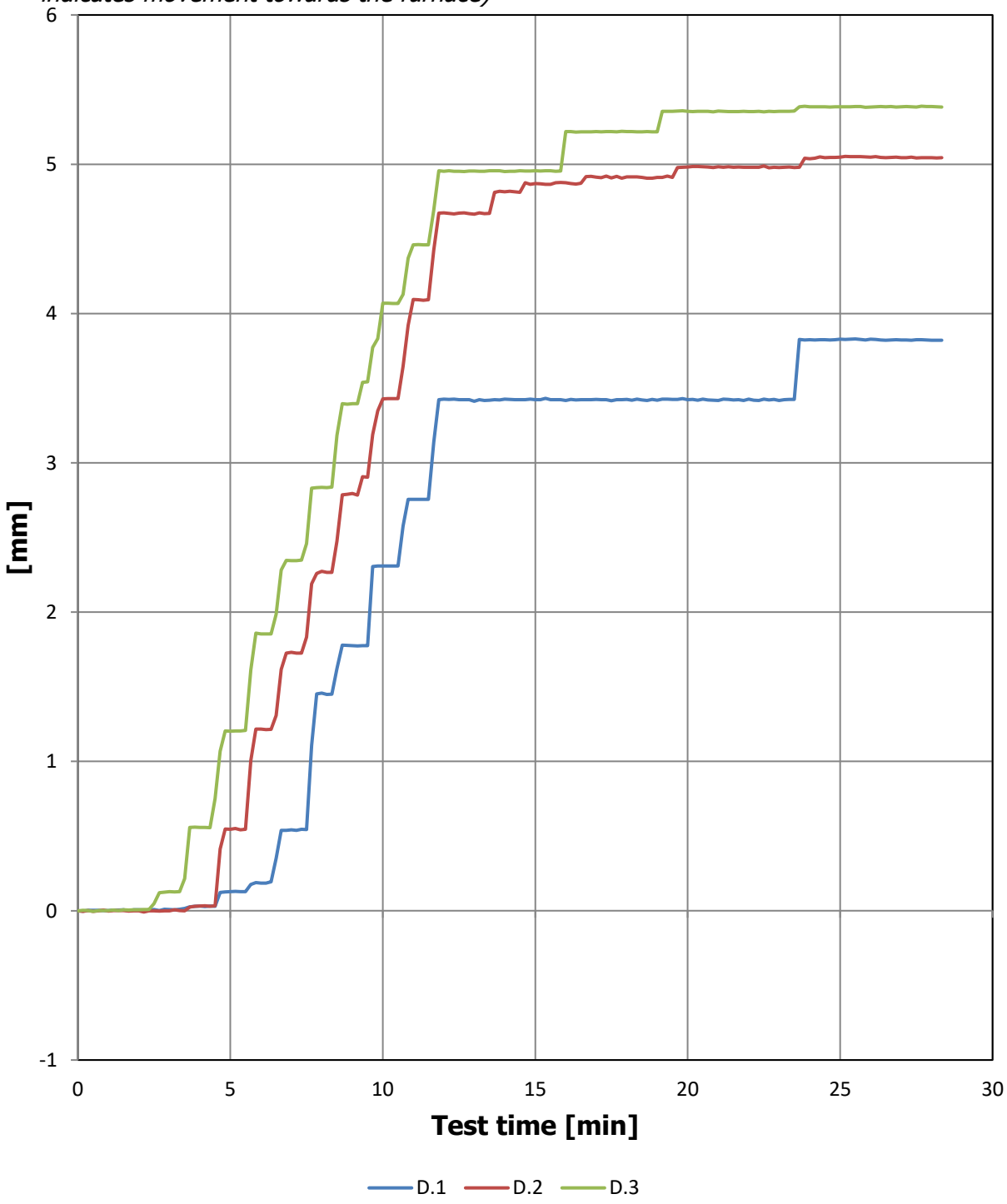
Total load prior to the test

Min. / kg	kg.1
0	128,70
1	329,33
2	308,43
3	468,49
4	885,89
5	1313,08
6	1765,93
7	2188,98
8	2602,42
9	3017,92
10	3457,54
11	3901,17
12	4326,37
13	4335,48
14	4296,04
15	4323,09
16	4299,17
17	4329,95
18	4307,23
19	4289,18
20	4332,21
21	4312,83
22	4297,51
23	4339,74
24	4337,31
25	4315,41
26	4297,17
27	4282,84
28	4332,17

Graph showing indication of load, determined from oil pressure measurement in piston

Deformation during loading phase

The vertical deflection measured prior to the test on the unexposed side (positive values indicates movement towards the furnace)



Deformation during loading phase

The vertical deflection measured prior to the test on the unexposed side (positive values indicates movement towards the furnace)

Min. / mm	D.1	D.2	D.3	D.Max
0	0,0	0,0	0,0	0,0
1	0,0	0,0	0,0	0,0
2	0,0	0,0	0,0	0,0
3	0,0	0,0	0,1	0,1
4	0,0	0,0	0,6	0,6
5	0,1	0,5	1,2	1,2
6	0,2	1,2	1,9	1,9
7	0,5	1,7	2,3	2,3
8	1,5	2,3	2,8	2,8
9	1,8	2,8	3,4	3,4
10	2,3	3,4	4,1	4,1
11	2,8	4,1	4,5	4,5
12	3,4	4,7	5,0	5,0
13	3,4	4,7	5,0	5,0
14	3,4	4,8	5,0	5,0
15	3,4	4,9	5,0	5,0
16	3,4	4,9	5,2	5,2
17	3,4	4,9	5,2	5,2
18	3,4	4,9	5,2	5,2
19	3,4	4,9	5,2	5,2
20	3,4	5,0	5,4	5,4
21	3,4	5,0	5,4	5,4
22	3,4	5,0	5,4	5,4
23	3,4	5,0	5,4	5,4
24	3,8	5,0	5,4	5,4
25	3,8	5,0	5,4	5,4
26	3,8	5,0	5,4	5,4
27	3,8	5,0	5,4	5,4
28	3,8	5,0	5,4	5,4

Failure [min]	-	-	-	-
Failure [mm]	190,7	190,7	190,7	190,7

Photo No. 1 The set-up of the test specimen at the sponsors location

Photo No. 2 The internal thermocouples mounted on the M4 composite boards

Photo No. 3 The internal thermocouples mounted on the M4 composite boards

Photo No. 4 The set-up of an individual insulated beam at the sponsors location

Photo No. 5 The set-up of the test specimen at the sponsors location

Photo No. 6 The test specimen delivered at the DBI location

Photo No. 7 Mounting of hat profiles with cc 400 mm on exposed side of the test specimen

Photo No. 8 The gypsum plaster boards were mounted with screws cc 200 mm along the edges

Photo No. 9 The gypsum plaster boards were mounted with screws cc 300 mm at mid width

Photo No. 10 A 50 x 50 mm steel profile was mounted on each side of the test specimen as support for the gypsum plaster boards

Photo No. 11 The first layer of gypsum plaster boards with width 400 mm by one end

Photo No. 12 Mounting of first layer of gypsum plaster boards

Photo No. 13 Mounting of second layer of gypsum plaster boards

Photo No. 14 The test specimen seen from exposed side before testing

Photo No. 15 The test specimen seen from unexposed side at testing start

Photo No. 16 The test specimen seen from unexposed side after 38 minutes of testing

Photo No. 17 The test specimen seen from unexposed side after 87 minutes of testing

Photo No. 18 The test specimen seen from exposed side after testing

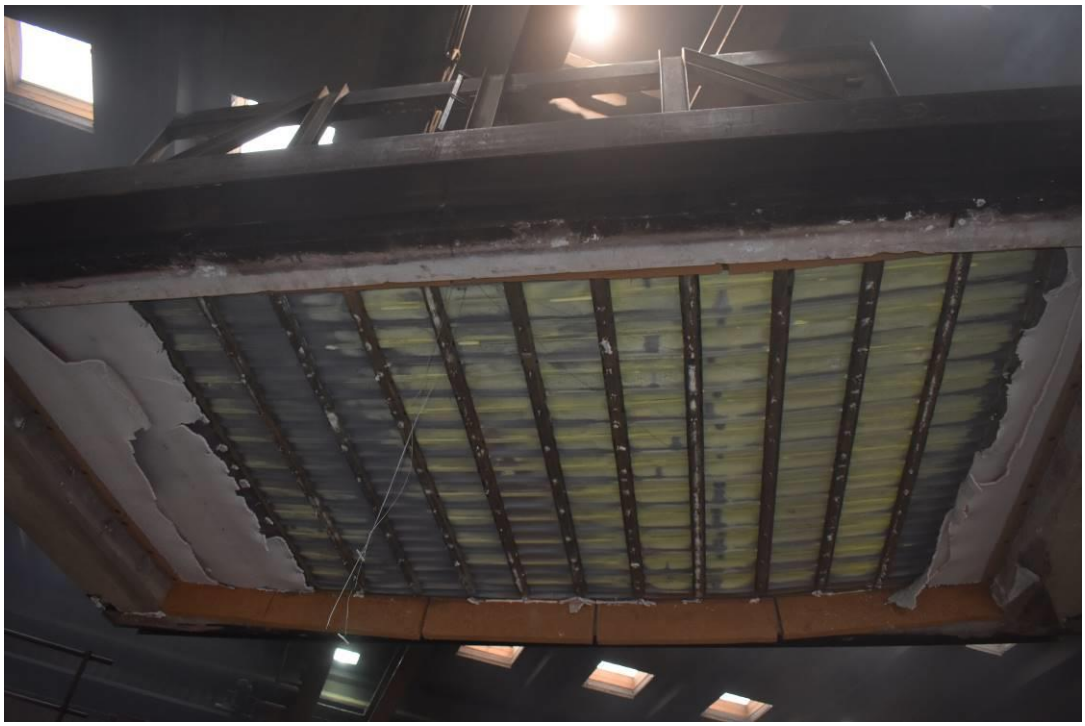


Photo No. 19 The test specimen seen from exposed side after testing

Photo No. 20 The test specimen seen from unexposed side after testing

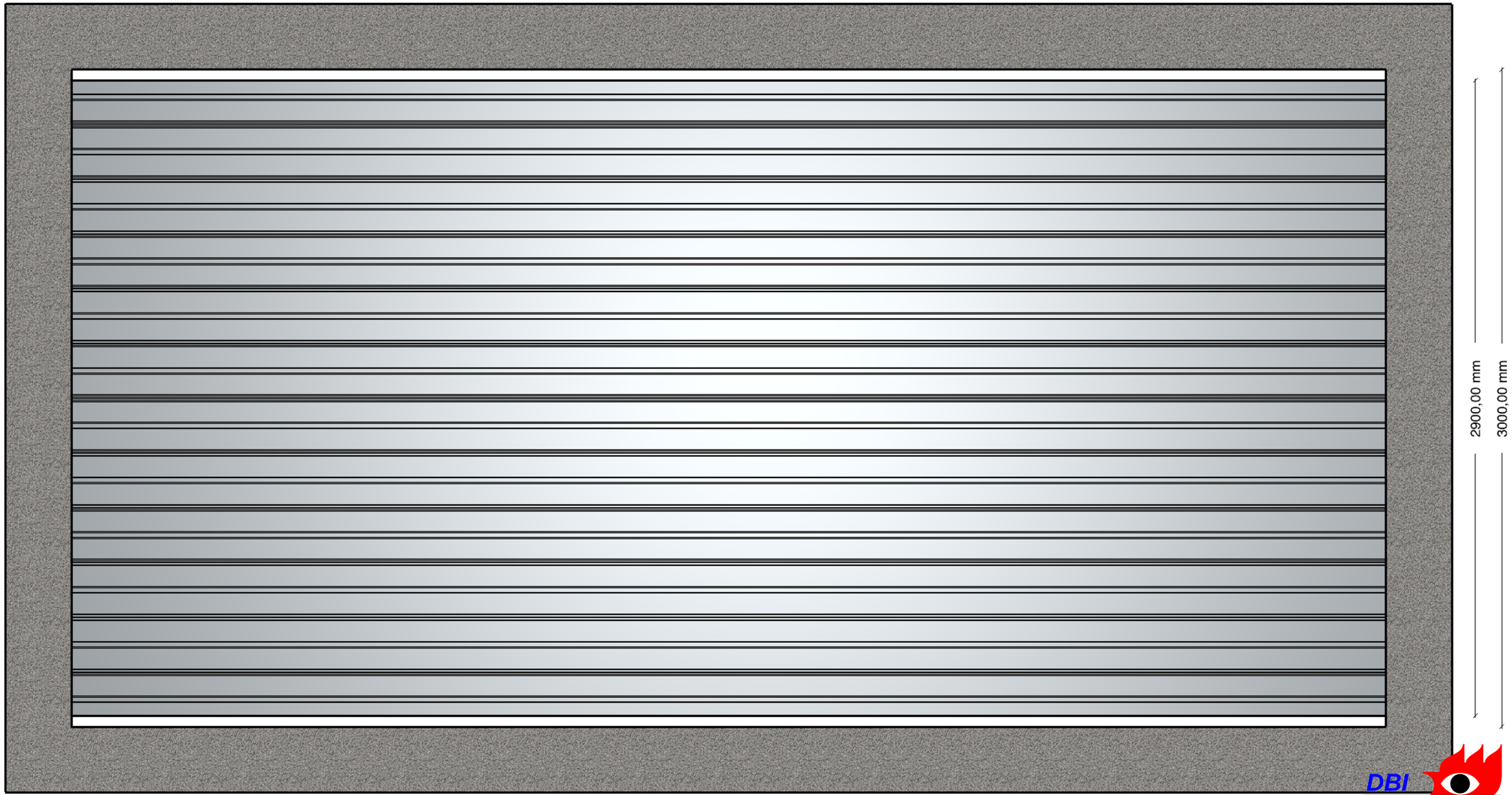
Nordic Build tagelement:
Spænd 6000
Bredde 2900 mm
Underlag 0,9 mm Svalehaleprofiler
Profilhøjde 25 mm

DBI brandtest:
Eksponeret side:
Betonramme hulmål: 3000 x 6000 mm
FREE Edge: 50 mm i hver side. (Isoleres før test)

EKSPONERET SIDE - Uden brandbeklædning.

DBI
PGA11454A

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Perspektiv
			Status:
			SAG: NR.
SAG: **Brandtest Tagelement / DBI**			TEGN. NR. 1
EMNE: Tagelement monteret på DBI Betonramme			
DATO: 01.06.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



DBI
PGA11454A

Eksponeret side / uden brandbeskyttende beklædning

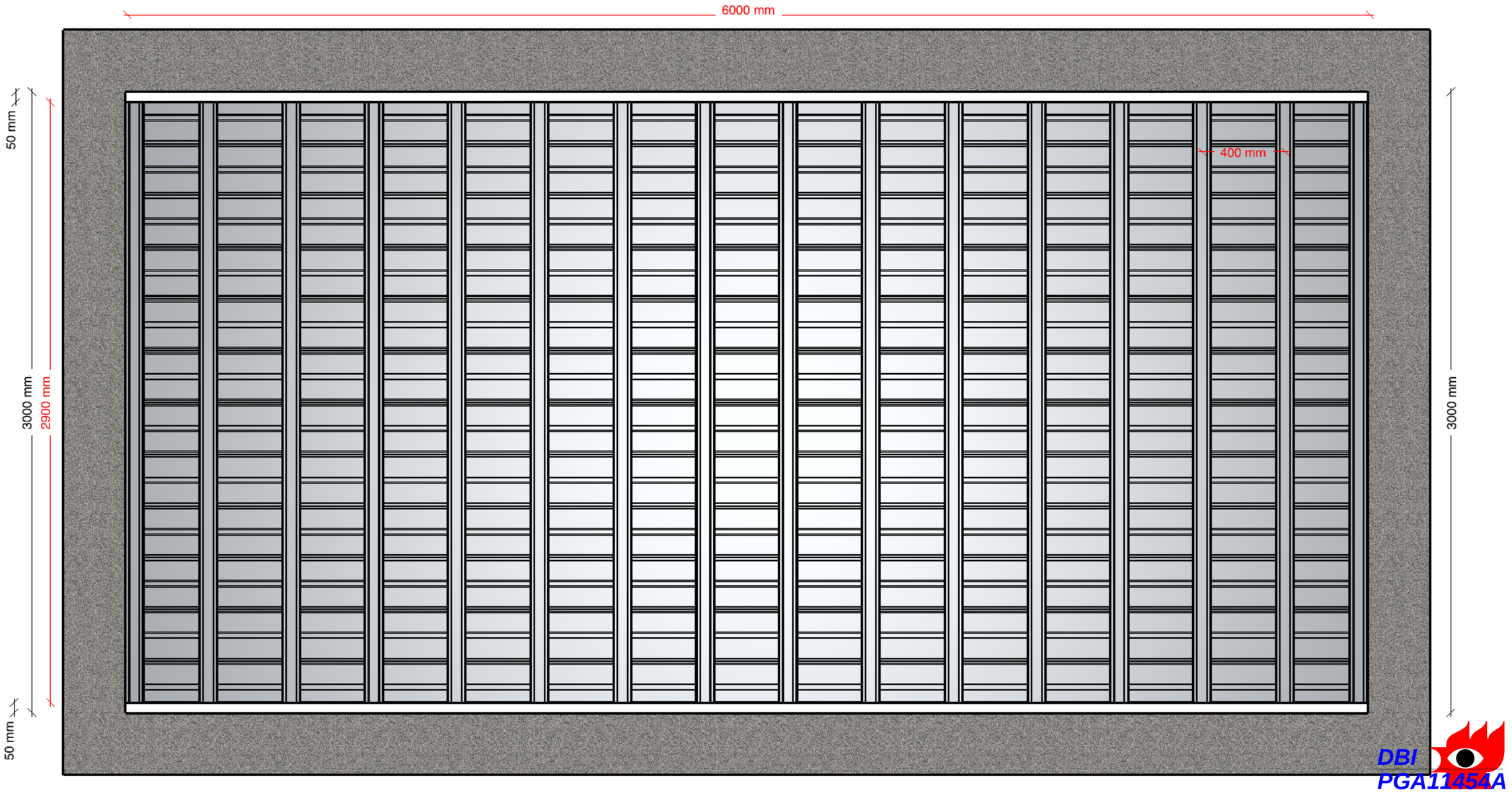
Svalehaleprofiler: Standard 250 x 26 mm, (længde variabel), 0,9 mm DX51 D + AZ 150

Isolering: 420 mm Rockwool 34, densitet 42 kg.

Kropsplade: M4 Composite.

Lim: 2 komponent: Base, ProFect 41176. Hærder, ProFect 91102

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Plan
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 2
EMNE: Tagelement uden brandbeskyttende beklædning			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



DBI
PGA11454A

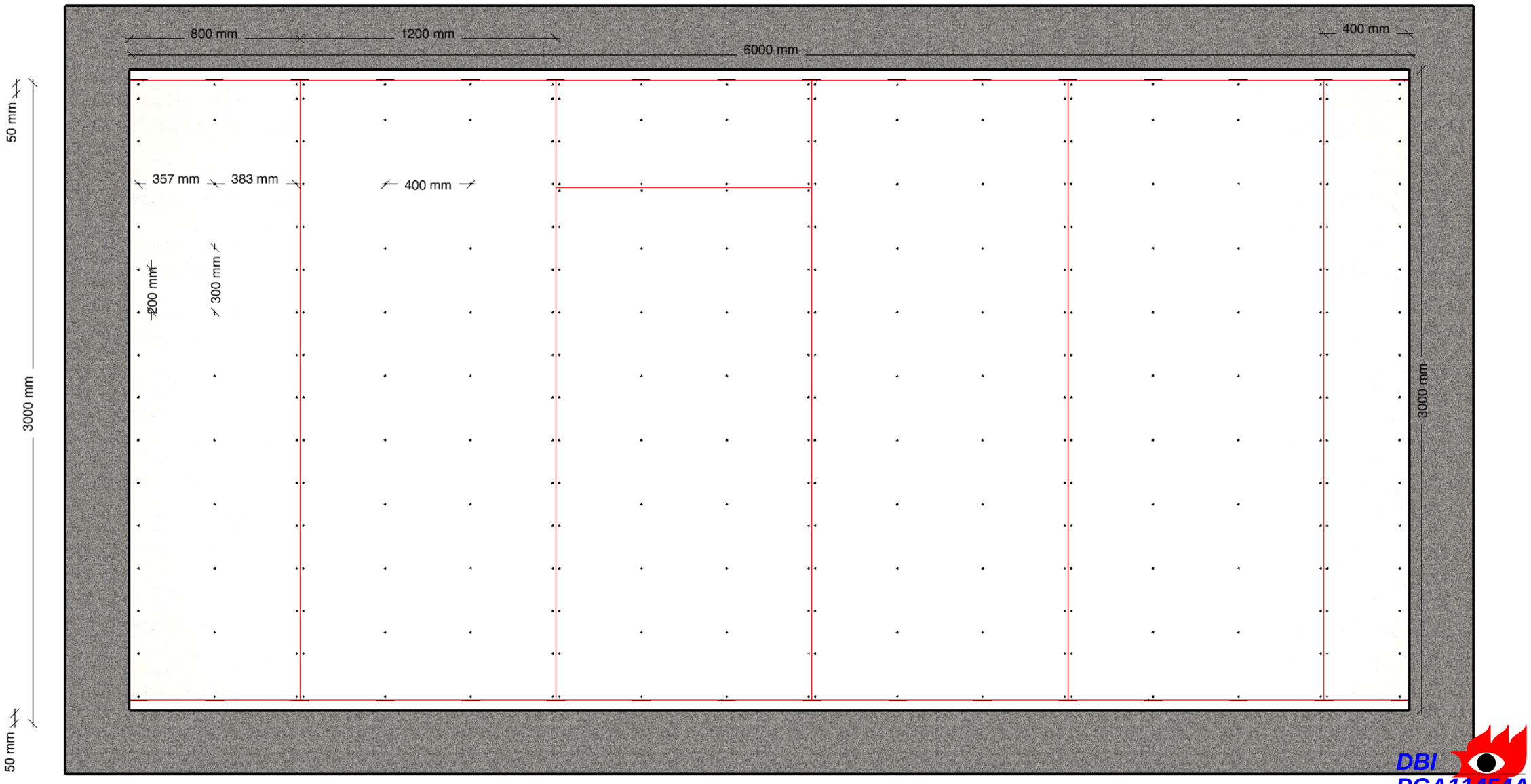
Hatteprofiler: 25 x 85 mm pr. 400 mm. (Skruefastgøres til underlag pr. 250 mm)

Der monteres kantprofiler langs FREE Edge, som underlag for Gips.

FREE Edge 50 mm i hver side. (Isoleres før test)

Hulmål: 3000 x 6000 mm

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Plan
			Status:
			SAG: NR.
SAG: **Brandtest Tagelement**			TEGN. NR. 3
EMNE: Hatteprofiler			
DATO: 06.06.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



DBI
PGA11454A

Eksponeret side med 1. lag 15 mm brandgips

Svalehaleprofiler: Standard 250 x 26 mm, (længde variabel), 0,9 mm DX51 D + AZ 150

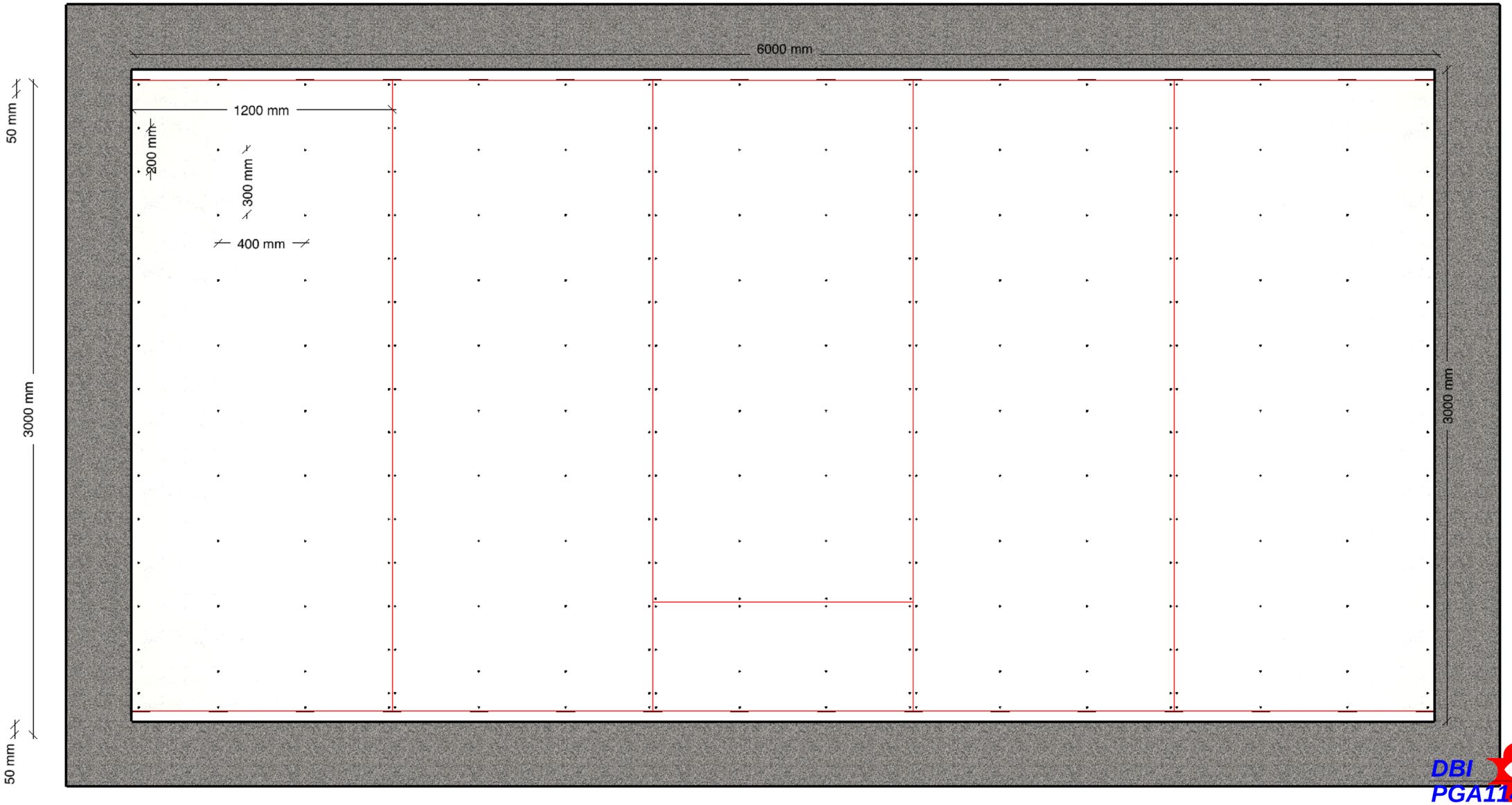
Isolering: 420 mm Rockwool 34, densitet 42 kg.

Kropsplade: M4 Composite.

Lim: 2 komponent: Base, ProFect 41176. Hærder, ProFect 91102

Brandgips 15 mm

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Plan
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 4
EMNE: Tagelement med 1. lag 15 mm brandgips			
DATO: 06.06.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



Eksponeret side med 2. lag 15 mm brandgips

DBI
PGA11454A

Svalehaleprofiler: Standard 250 x 26 mm, (længde variabel), 0,9 mm DX51 D + AZ 150

Isolering: 420 mm Rockwool 34, densitet 42 kg.

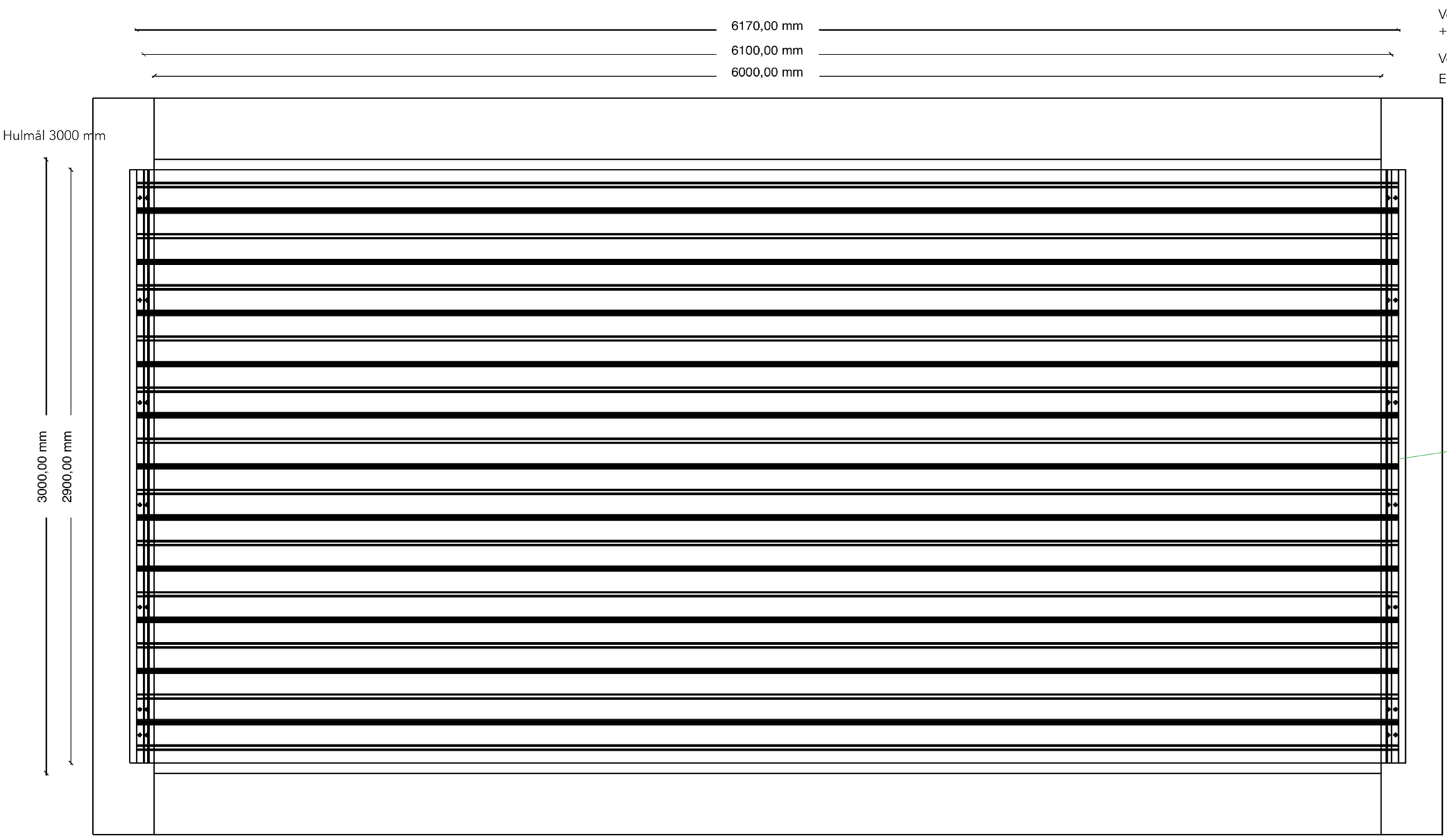
Kropsplade: M4 Composite.

Lim: 2 komponent: Base, ProFect 41176. Hærder, ProFect 91102

Brandgips 30 mm

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Plan
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 5
EMNE: Tagelement med 2. lag 15 mm brandgips			
DATO: 06.06.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:

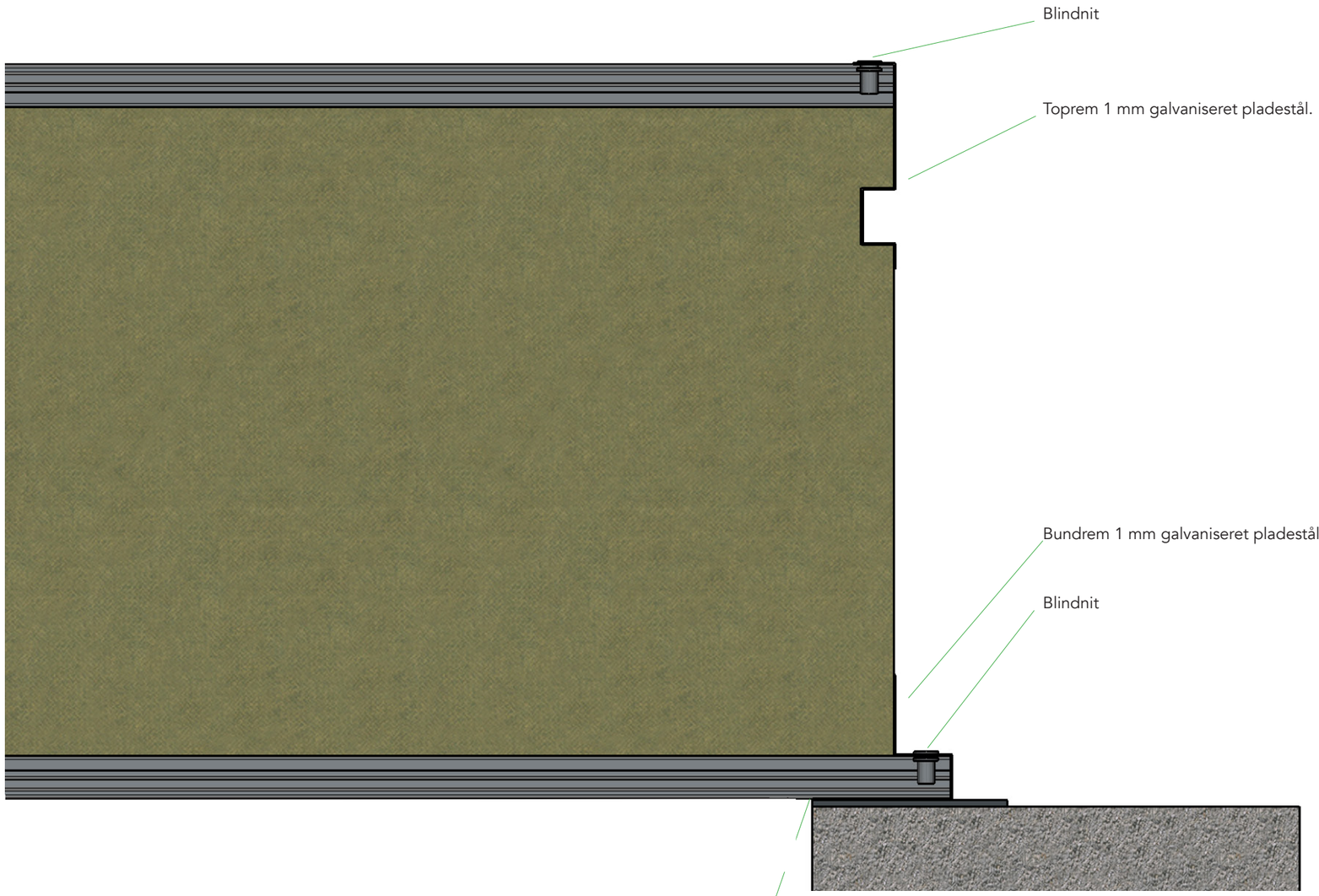
Ikke-eksponeret side



Elementbredde 2900 mm
50 mm free edge

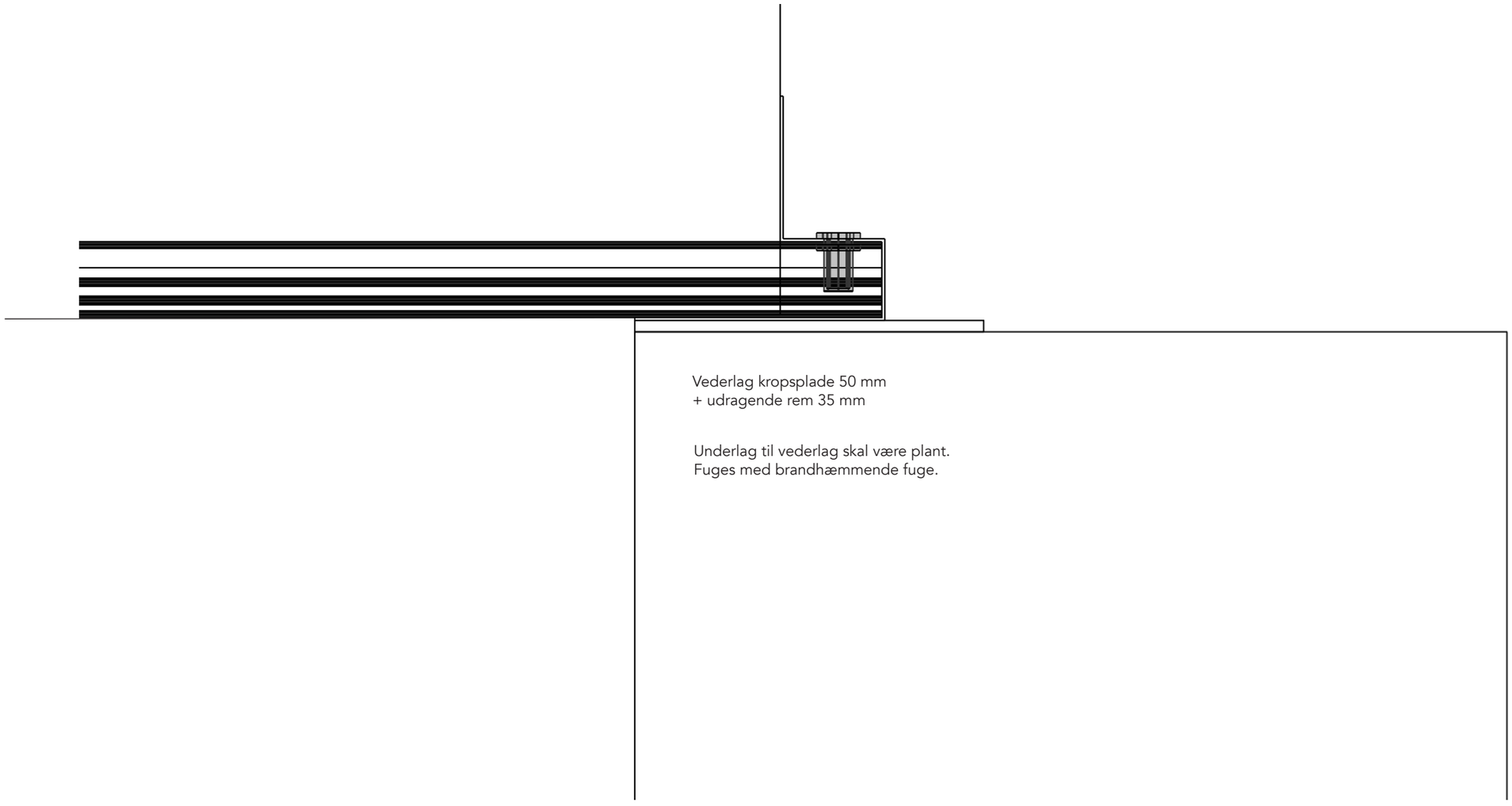
DBI
PGA11454A

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Plan
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 6
EMNE: Tagelement			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



DBI
PGA11454A

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Detalje
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 7
EMNE:Tagelement vederlagsdetalje			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



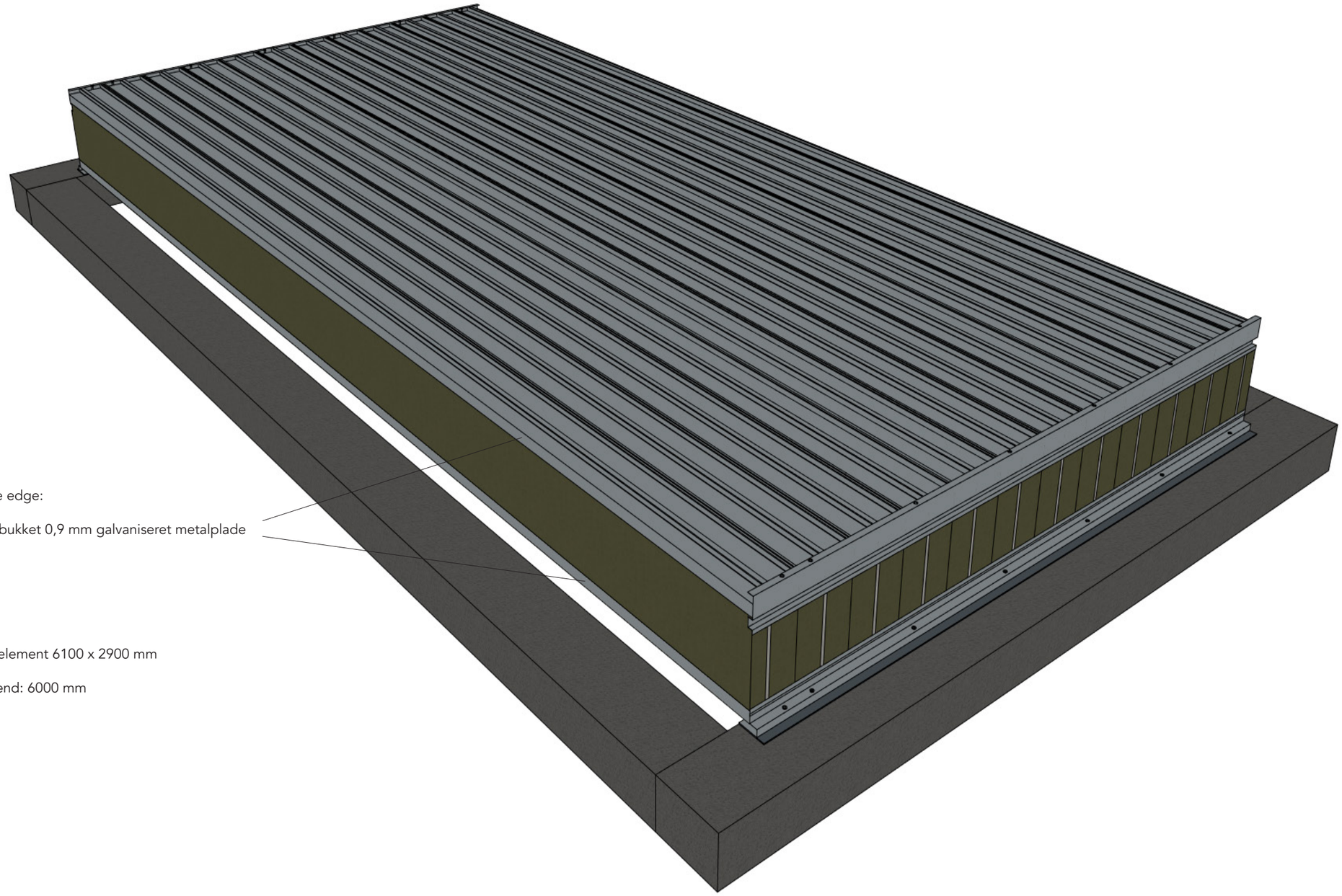
Vederlag kropsplade 50 mm
+ udragende rem 35 mm

Underlag til vederlag skal være plant.
Fuges med brandhæmmende fuge.

DBI
PGA11454A

NORDIC BUILD
INORGANIC BUILDING SYSTEMS

			SNIT:
			Status: Teknisk afklaring
			SAG: NR.
SAG:**Brandtest**			TEGN. NR. 8
EMNE: Tagelement vederlagsdetalje			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



Tagelement 6100 x 2900 mm

Spænd: 6000 mm

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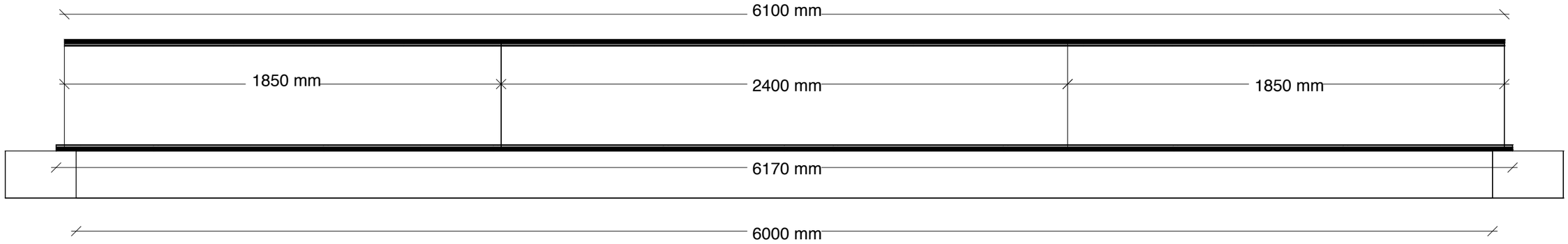
Svalehaleprofiler: Standard 250 x 26 mm, (længde variabel), 0,9 mm DX51 D + AZ 150

Isolering: 420 mm Rockwool 34, densitet 42 kg.

Kropsplade: M4 Composite.

Lim: 2 komponent: Base, ProFect 41176. Hærder, ProFect 91102

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT:
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 9
EMNE: Tagelement			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:



DBI
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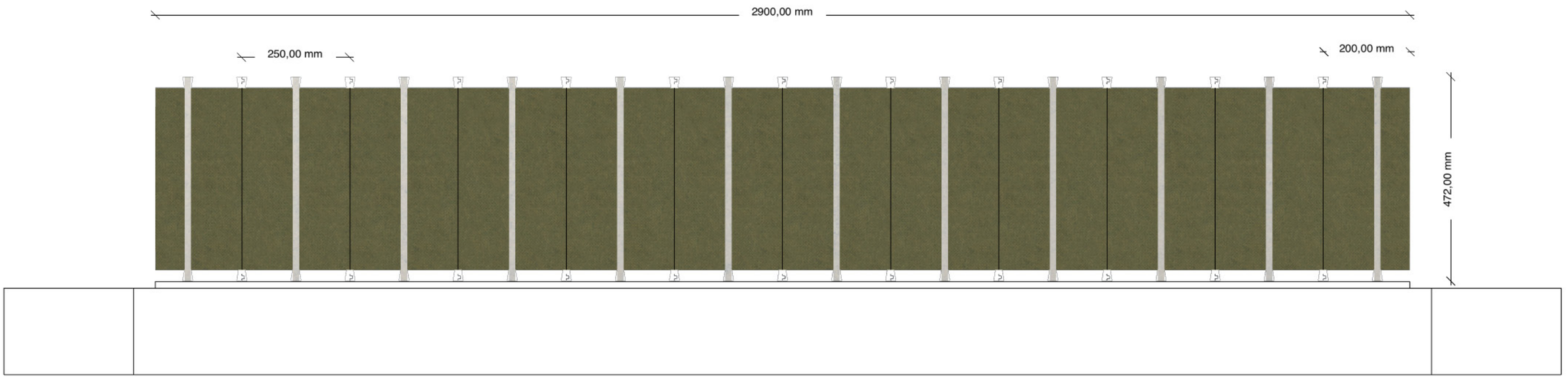
Svalehaleprofiler: Standard 250 x 26 mm, (længde variabel), 0,9 mm DX51 D + AZ 150

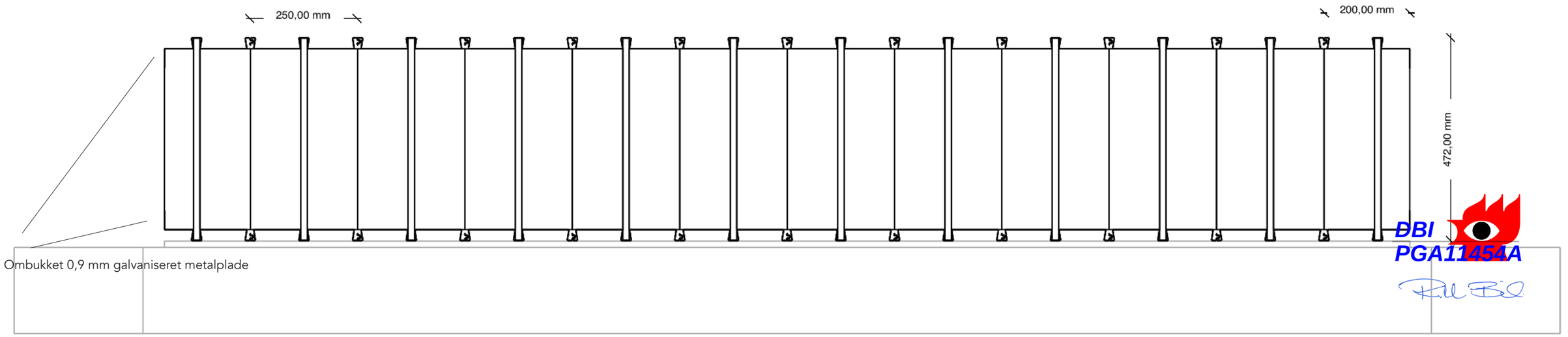
Isolering: 420 mm Rockwool 34, densitet 42 kg.

Kropsplade: M4 Composite.

Lim: 2 komponent: Base, ProFect 41176. Hærder, ProFect 91102

NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Længdesnit
			Status: Teknisk afklaring
			SAG: NR.
SAG: **Brandtest**			TEGN. NR. 10
EMNE: Tagelement uden brandbeskyttende beklædning			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:





NORDIC BUILD INORGANIC BUILDING SYSTEMS			SNIT: Tværsnit
			Status: Teknisk afklaring
			SAG: NR.
SAG:**Brandtest**			TEGN. NR. 11
EMNE: Tagelement tværsnit			
DATO: 20.05.2019	MÅL: Scale tfm.	UDF af: INK	GODK:
REV A:	B:	C:	D:

Cantona M4 komposit

15mm. vindspærreplade af Magnesium Oxide

Materiale

Cantona M4 komposit letvægts vindspærreplade er fremstillet af uorganiske stoffer og forstærkning med glasfibernet sikre stor dimensionsstabilitet. Pladen er diffusionsåben og velegnet som vindspærreplade i ventilerede konstruktioner, med en vandtæt beklædning.
Cantona M4 komposit er brandklasse A1 ubrændbar og er meget modstandsdygtig over for frost, fugt og slag, og kan stå eksponeret i op til 12 måneder.

Anvendelse

Vindspærreplade i konstruktioner med ventileret vandtæt beklædning.

Fugtbestandig - skimmelsvamp

Cantona M4 Komposit vindspærreplade svækkes ikke i våd tilstand, kan ikke rådne eller nedbrydes i fugtigt miljø, og er meget modstandsdygtig overfor angreb af svamp og skimmel.

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Datablad December 2018

Tekniske specifikationer for Cantona M4 komposit vindspærreplade

Dimensioner	**Enhed**	**Kvalitet**
Længde standard	mm	2400
Bredde standard	mm	1200
Tykkelse standard	mm	15
Densitet	Kg/m^3	1.100
Vægt	15 mm/kg/m^2	16,51
Bøjningsstyrke MPa	MPa	≥6,0
Slagstyrke	KJ/M^2	≥2,0
Udtræksstyrke	N/mm	≥35
Klorid indhold – GB/T 33544-2017	%	0,026
Termisk varmledningsevne	W/mK	0,19
Termisk modstand	M^2K/W	0,078
Brandegenskaber		
Brand klassifikation - EN 13501-1:2007+A1:2009		A1
Dampdiffusionsmodstand - EN ISO 12572	MNs/g	0,31

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FLEXIBATTS 34

PRODUKT

ROCKWOOL FLEXIBATTS 34 er formstabile isoleringsplader fremstillet af ubrændbar, fugt- og vandafvisende ROCKWOOL stenuld. ROCKWOOL FLEXIBATTS 34 er fleksibel i både længde- og bredderetningen. Flexzoner er afmærket på produktets kantflader. ROCKWOOL A/S anbefalede isoleringstykkelser fremgår af Den lille lune.

ANVENDELSE

FLEXIBATTS 34 anvendes til isolering af skråvægskonstruktioner og lette ydervægge. FLEXIBATTS 34 isolerer 8% bedre end FLEXIBATTS 37.

TEKNISKE EGENSKABER

Område	Beskrivelse	Standard
Varmeledningsevne	λ_D = 34 mW/mK	EN 13162
Varmemodstandsevne	mm: 45 / 70 / 95 / 120 / 145 / 170 / 195 / 220 / 245 m^2K/W: 1,32 / 2,06 / 2,79 / 3,53 / 4,26 / 5,00 / 5,74 / 6,47 / 7,21	EN 12667
Brandklasse	A1	EN 13501-1
Fugt	Diffusionstal = MU1 (Samme diffusionsmodstand som luft)	EN 12086
	Kapillarsugning = 0 m	
Vandabsorption	Kort tid, WS ≤ 1 kg/m²	EN 1609
Produktcertifikat	Certifikat	

SORTIMENT (ENHEDER PÅ PALLE)

Type	Dimensioner (mm)	Antal pk. pr. palle	Mængde m²	DB nr.	Leveringstid
FLEXIBATTS 34	965 x 565 x 45	20	109,05	1899010	24timer
FLEXIBATTS 34	965 x 565 x 70	20	65,43	1899011	24timer
FLEXIBATTS 34	965 x 565 x 95	20	43,62	1899012	24timer
FLEXIBATTS 34	965 x 565 x 120	15	32,71	1899013	24timer
FLEXIBATTS 34	965 x 565 x 145	20	32,72	1899015	24timer
FLEXIBATTS 34	965 x 565 x 170	15	24,53	1899016	24timer
FLEXIBATTS 34	965 x 565 x 195	15	24,53	1899018	24timer
FLEXIBATTS 34	965 x 565 x 220	20	21,81	1899020	24timer
FLEXIBATTS 34	965 x 565 x 245	15	16,36	1899021	24timer

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Særlige oplysninger:

ROCKWOOL FLEXIBATTS 34 er fleksibel på de to mørkegrå kolonner i tabellen.

ROCKWOOL FLEXIBATTS 34 kan flekse op til 20 mm på længden og på bredden.
Flexzoner er afmærket på produktets kantflader.

EMBALLERING

ROCKWOOL FLEXIBATTS 34 leveres fuldforpakket og komprimeret.

KVALITETSSIKRING

ROCKWOOL A/S har et kvalitetsstyringssystem, som er certificeret efter DS/EN ISO 9001. ROCKWOOL A/S er medlem af VIF (Dansk forening af fabrikanter af varmeisoleringsmaterialer).

ROCKWOOL produkter er CE-certificerede CE og er med i Keymark-ordningen, etableret af den europæiske standardiseringsorganisation CEN. ROCKWOOL A/S er tilsluttet byggeleverancеklausulen for leverancer til byggeri i Danmark. ROCKWOOL Byggeprodukter er løbende under udvikling, og produkternes tekniske specifikationer er angivet med forbehold for ændringer.

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Produktdatablad
ProFect® 41176

Type

2K Polyurthean

Produktbeskrivelse

ProFect® 41176 er en to-komponent, opløsningmiddelfri polyurethan lim, som giver en stærk og elastisk limfuge. Limen påføres med tandspartel.

ProFect® 41176 bruges altid sammen med hærderen **ProFect® 91102.**

Anvendelsesområder

ProFect® 41176 er velegnet til limning af metal, træ, isoleringsmaterialer, PVC, beton, glas samt glasfiber

Tekniske data

Farve:	Beige
Viskositet v. 20°C	
• **ProFect® 41176:**	Ca. 17.000 mPas
• **ProFect® 91102:**	Ca. 200 mPas
• **Blandet:**	Ca. 6.500 mPas
Densitet:	
• **ProFect® 41176:**	1,6 kg/L
• **ProFect® 91102:**	1,2 kg/L
Shore D-hardness[1]	65
Brudforlængelse (DIN 53504)[1]	15%
Trækstyrke (DIN53504)[1]	7 N/mm²
Trækforskydningsstyrke[1]	
• **Alu - Alu**	7 N/mm²
• **Rustfristål - rustfristål**	7 N/mm²
• **Bøg – bøg**	15 N/mm²
Pot-life (20°C, 50 RH%):	Ca. 4½ minutter
Åbentid (20°C, RH 50%):	7½ – 2 minutter
Presse tid, 20°C:	25 minutter
Forbrug	200 – 600 g/m²

1) 28 dage, 23°C, 50 %RH.

Arbejdsbetingelser

Overfladerne skal være fri for snavs, støv og fedt. Slipmidler på overfladen kræver speciel forbehandling eller slibning.

4,5 dele **ProFect® 41176** + 1 del **ProFect® 91102** (Vægt)

Vær omhyggelig ved afvejning/afmåling
Blandes med langsomme bevægelser til blandingen er homogen.

Påføres emnerne manuelt eller med 2-komponent påføringsudstyr.

Må ikke blandes med andre lime.

Rengøring

Våd lim fjernes med en tør klud og efterfølgende aftørring med **ProFect® 4801.**
Hærdet lim fjernes mekanisk.

Opbevaring

ProFect® 41176 opbevares fra 5 - 30°C . Holdbarhed 6 måneder. Beskyt mod frost. Anvend ældst lager først.

Emballage

Kontakt venligst vort salgskontor for yderligere information.

Ansvarsfraskrivelse

De i nærværende produktdatab visninger og data har kun til formål at være vejledende i forbindelse med anve vore produkter. Der gives således ingen garanti eller tages ansvar for eventuelle misfarvninger, afsmitning mv. som måtte opstå ved anvendelse af produktet. Vi te anbefale, at brugeren før egentlig opstart af produktionen foretager de nødve at fastslå produktets anvendelighed til et hvert konkret formål. Dette bør fore produktionsbetingelser. Ved vurderingen af anvendeligheden skal der tages højde for materialernes type, beskaffenhed og alder/levetid, ligesom nye forsøg bør iværksættes, hvis materialer og/eller produktionsbetingelserne i øvrigt på nogen måde ændres, herunder eventuel ny materialeleverandør.

PKI Supply A/S I Vesterballevej 29 I 7000 Fredericia I Tlf. 76 240 240 I info@pki.dk

Aluzinc®

Coatings

Designation EN 10326 – EN 10327	Coating weight – Double sided (g/m2)	Coating thickness (µm per side)
AZ100	100	13
AZ150	150	20
AZ165	165	23
AZ185	185	25
AZ200	200	26

Coating thickness for indication.

Steel grades

Steel for bending and deep drawing applications

Designation EN 10327	R_e (N/mm²)	R_m (N/mm²)	A_{80} (%)
DX51D+AZ	≥ 140	270 – 500	≥ 22
DX52D+AZ	140 – 300	270 – 420	≥ 26
DX53D+AZ	140 – 260	270 – 380	≥ 30
DX54D+AZ	140 – 220	270 – 350	≥ 34
DX56D+AZ (HFX)*	120 – 180	260 – 330	≥ 39

Measurements transverse to rolling direction. When thickness t < 0.7 mm, A_{80} should be decreased with 2%.
** Steel grade not mentioned in the standard.*

Structural steel

Designation EN 10326	R_e (N/mm²)	R_m (N/mm²)	A_{80} (%)
S220GD+AZ	≥ 220	≥ 300	≥ 20
S250GD+AZ	≥ 250	≥ 330	≥ 19
S280GD+AZ	≥ 280	≥ 360	≥ 18
S320GD+AZ	≥ 320	≥ 390	≥ 17
S350GD+AZ	≥ 350	≥ 420	≥ 16
S380GD+AZ*	≥ 380	≥ 450	≥ 22
S420GD+AZ*	≥ 420	≥ 500	≥ 21
S550GD+AZ	≥ 550	≥ 560	-

Measurements in rolling direction. When thickness t < 0.7 mm, A_{80} should be decreased with 2%.
** Steel grade not mentioned in the standard.*

Dimensions

Thickness (mm)	Width (mm)
0.25 – 2.00	700 – 1500

Surface aspect

Designation EN 10326 – EN 10327	Definition
A	Standard finish (normal spangle)
B	Improved finish (skinpassed)

Protection – surface treatments

Designation	Definition
E-Passivation®	Chromium-free chemical passivation
O	Oiling
	Passivation and oiling
Easyfilm® E	Environment-friendly thin organic coating (chromium-free, complying with European directives)

The technical informations above respond to the extreme feasibilities of ArcelorMittal's installations. Some extreme combinations may not be available. It is therefore recommended to consult us in these cases or when specific dimensions, packaging, finishing etc are requested.

Technical data sheet

Aluzinc®

Type	Continuous hot dip coating		
	Double-sided coating		
Properties	Excellent corrosion resistance Very attractive appearance Excellent thermal and light reflectivity Good abrasion resistance		
Applications	Construction	Roofing, cladding, profiling, tiles etc	
	General industry	Housings, cabinets and cases for air conditioning, computers, pipes, electrical equipment etc	
	Appliances	Washing machines, tumble dryers, refrigerators, ovens, toasters etc	
Description	Composition	Aluminium (55%) Zinc (43.4%) Silicon (1.6%)	
	Structure	Bi-phase structure, with grains of aluminium and zinc	
	Bulk density	3750 kg/m³	
	Aspect	Bright silvery metallic spangle	
	Aspect durability	Good Excellent with Easyfilm®	
Performances	Edge protection	Very good	
	Surface protection • Salt spray test, corrosion resistance (ISO 7253 / DIN 50021) • Outdoor exposure, corrosion resistance	50 hours/µm Marine Industrial	 0.6 µm/year 0.3 µm/year
	Adhesion (Resistance to cracking on bending for DX51D+AZ reference) (EN 10327)	0 T (AZ100, AZ150) 1 T (AZ185)	
	Hardness on cross section (Vickers, 5g)	140 HV 100 HV for HFX grade	
	Reflection of solar heat	New Aged	81% 39%
	Heat transmission	65 Watts/m^2	
	Temperature resistance T_{max}	315°C	
	Fire resistance	European standard (EN 13501) French standard (FD P 92-507) British standard (BS 476)	
Remarks	The performances indicated are averages and may vary in particular according to the type of support used. These data are not contractual and may be amended in line with technological progress related to the product.		

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ArcelorMittal

Flat Carbon Europe

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fce.technical.assistance@arcelormittal.com
www.arcelormittal.com/fce

Credits

Cover: Tom D'Haenens, Philippe Vandenameele with kind permission of Topsporthal Vlaanderen, Gent
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PRODUKTDATABLAD

GKF SCAN 15

Beskrivelse
Siniat GKF Scan er en kraftig, glasfiberforstærket gips karton plade, med forsænkede katonklædte lang kanter og skårne kort kanter.
Typemærkning ifølge EN520: DF

Anvendelse
Siniat GKF Scan anvendes indendørs hvor der stilles store krav til brand beskyttelse.
Anvendelsestemperatur +10°C til +40°C.
Luftfugtighed: 30% til 80% RF

Produktdata og egenskaber		Enhed	
Bredde		mm	1200/900
Længde		mm	Se produktoversigt
Tykkelse (nominel)		mm	15,5
Tolerancer:	Bredde Længde Tykkelse Retvinklethed - kort kant Parallellitet - lang kant	mm	+ 0 / - 3 + 0 / - 4 ± 0,5 ± 2 ± 0
Densitet		kg/m³	ca. 880
Vægt		kg/m²	ca. 13,7
Brandklasse			A2-s1, d0 (B1)
Fugtindhold ved 20 °C		% af vægt	ca. 0,6 - 1,0
Modstandsdygtighed overfor damp Z		GPa s m² / kg	0,67
Diffusionsmodstandsfaktor, vanddamp		μ	10
Varmeledningsevne λ		W / (m·K)	0,21
Max temperatur - varig		°C	45
Længdeforandring ved 20 °C mellem 65% til 95% RH		mm/m	0,3
Bøjningsstyrke:	på langs på tværs	N	≥ 610 ≥ 210
Farlige stoffer		EN 67/548 EWC	Ingen

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