REPORT

issued by an Accredited Testing Laboratory

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8P00519rev1

Testing

Fjord Panel AS
Indre Torvund
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Norge

Contact person RISE | Date | Reference | Page

Rate of heat release and smoke production of surface material when tested according to IMO 2010 FTP Code, Annex 1, Part 10

(4 appendices)

Introduction

RISE Safety – Fire Research has by request of Fjord Panel AS performed a fire test according to IMO 2010 FTP Code, Annex 1, Part 10. The purpose of the test is to form a basis for technical fire classification.

This reports replace RISE report 8P00519 dated February 7, 2018. A mounting drawing has been added in appendix 4.

Product

According to the client:

Product called “Fjordpanel”, consisting of an inorganic fibre called Waterglass and basalfibre/cilicat binding. The product has a nominal density of 300 kg/m^3 and a nominal thickness of 6 mm.

The product also come in a 4 mm version with the same content of mass with a nominal density of 500 kg/m^3.

Manufacturer

FRM Sweden AB, Karlstad, Sweden.

Sampling

The sample delivered by the client. It is not known to RISE Safety – Fire Research if the product received is representative of the mean production characteristics.

The sample was received January 15, 2018 at RISE Safety – Fire Research.

Test procedure

The test room has the nominal internal dimensions of 3.6 m by 2.4 m by 2.4 m (length by width by height). The test material is mounted so that three walls and the ceiling in the room are covered. Smoke gases are vented and air is let in through the door opening. The ignition source is a gas burner, which is placed in one of the inner corners. The burner heat output is 100 kW for the first ten minutes and then 300 kW for another ten minutes. The smoke gases

coming out through the doorway are collected by a hood and exhaust system from where samples are taken for gas analysis. Heat release rate and smoke production rate are measured

continuously, see figure 1.

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ISO/IEC 17025

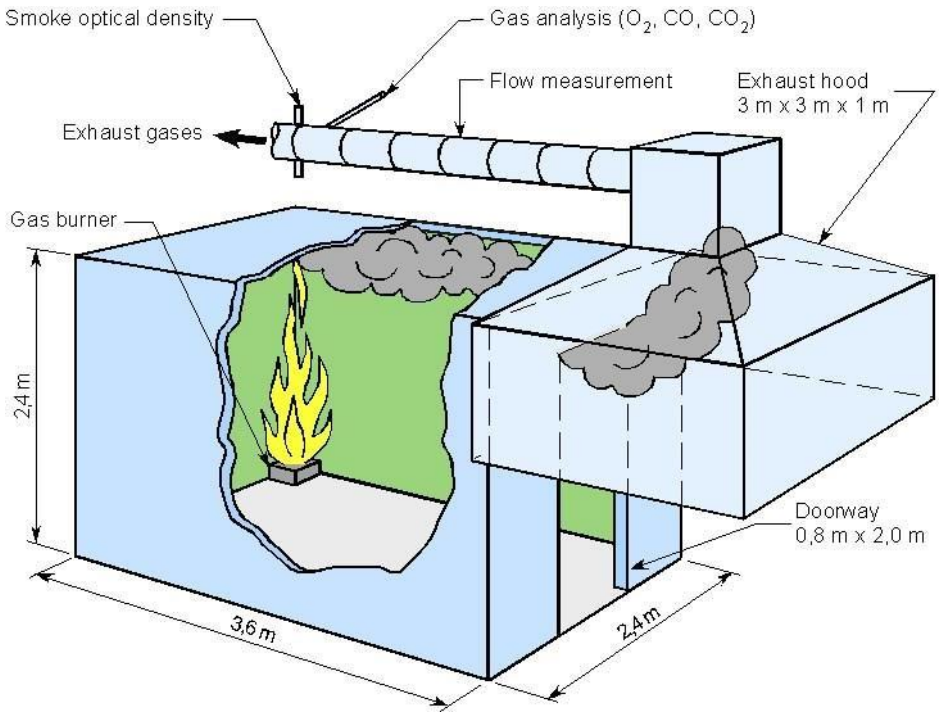


Figure 1. Schematic drawing of the room test equipment.

Test results

Test results with graphs of heat release and smoke production are given in Appendix 1. Photographs are shown in Appendix 2. An explanation of the test parameters is given in appendix 3.

The test results relate only to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Deviation from standard

Information regarding paragraph 9.15.1 and 9.15.8 in IMO 2010 FTP Code, Annex 1, Part 10 is not reported.

Basis for Assessment

According to IMO 2010 FTP Code, Annex 1, Part 10, surface materials used as bulkhead, wall and ceiling linings including their supporting structure are qualified as “fire-restricting material” if, during the testing time of 20 min according to appendix 1 of IMO 2010 FTP Code, Annex 1, Part 10, the following criteria are met:

1. the time average of heat release rate (HRR) excluding the HRR from the ignition source does not exceed 100 kW;
2. the maximum HRR excluding the HRR from the ignition source does not exceed 500 kW averaged of any 30 s period of time during the test;
3. the time average of the smoke production rate does not exceed 1.4 m^2/s;
4. the maximum value of the smoke production rate does not exceed 8.3 m^2/s averaged over any period of 60 s during the test;
5. flame spread shall not reach any further down the walls of the test room than 0.5 m from the floor excluding the area which is within 1.2 m from the corner where the ignition source is located; and
6. no flaming drops or debris of the test specimen may reach the floor of the test room outside the area which is within 1.2 m from the corner where the ignition source id located.

Assessment

The tested product meet the technical fire requirements of IMO 2010 FTP Code, Annex 1, Part 10.

It is assessed that the product also meets the technical fire requirements 1 – 6 above for a mounting without screws and washers on the walls. This mounting can be seen in appendix 4.

RISE Research Institutes of Sweden AB Safety
- Fire Research Materials

Performed by

Richard Johansson

Examined by

Per Thureson

Appendices

1 Test results IMO 2010 FTP Code, Annex 1, Part 10

2 Photographs

3 Test parameter explanation

4 Mounting drawings (client made)

Appendix 1

Test results, IMO 2010 FTP Code, Annex 1, Part 10

Product

According to the client:

Product called “Fjordpanel”, consisting of an inorganic fibre called Waterglass and basalfibre/cilicat binding. The product has a nominal density of 300 kg/m^3 and a nominal thickness of 6 mm.

The product also come in a 4 mm version with the same content of mass with a nominal density of 500 kg/m^3.

Mounting

See photo 1 – 2, appendix 2.

The product was mounted on three walls and in the ceiling. The wall containing the door opening was not included in the mounting as defined as the standard specimen configuration in ISO 9705.

The product was mounted with a glue of type MS 40 Polymer , nominal area weight 100 – 150 g/m^2 to a CaSi-board. The product was also fixed mechanically with screws and washers.

Observations during / after test

Time, min:s	Observations during test
00:00	The burner was ignited. Burner heat output 100 kW.
01:00	The flames climb on the walls up to the ceiling.
09:55	The specimen has not ignited.
10:00	The burner heat output was increased to 300 kW.
10:20	The flames reach approximately 1 meter in radius in the ceiling.
19:55	The specimen has not ignited.
20:00	The gas turned off.
20:00	The fire self-extinguished immediately.
After test	When removing the screws and washers in the ceiling the specimen fell to the floor.
After test	When removing the screws and washers in the specimen on the walls next to the burner the specimen stayed up. The specimen had partly loosened from the wall.

Appendix 1

Observations after fire test See

photo 8 – 10, appendix 2.

Test results

Evaluation time	20:00
Fire performance , see also graph no 1 and 2	
$HRR_{average30}$ (excl. burner heat output)	17 kW
HRR_{peak30}* (excl. burner heat output)	43 kW
$SPR_{average}$*	0.1 m^2/s
SPR_{peak60}*	0.2 m^2/s
Observations	
Flame spread down the walls to within 0.5 m of the floor and at a distance of > 1.2 m from the burner	No
Flaming droplets/ particles outside a distance of 1.2 m from the burner	No

* Parameters were determined between the start of test and the end of the test.

Appendix 1

Graph of heat release rate

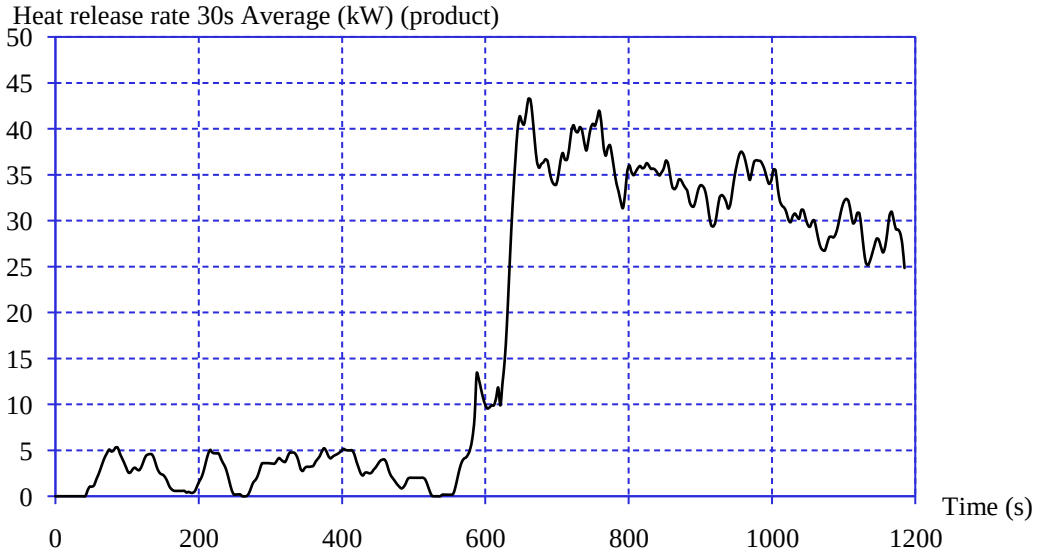


Figure 1 Heat release rate from "Fjord Panel" during test excluding burner heat output.

Graph of smoke production rate

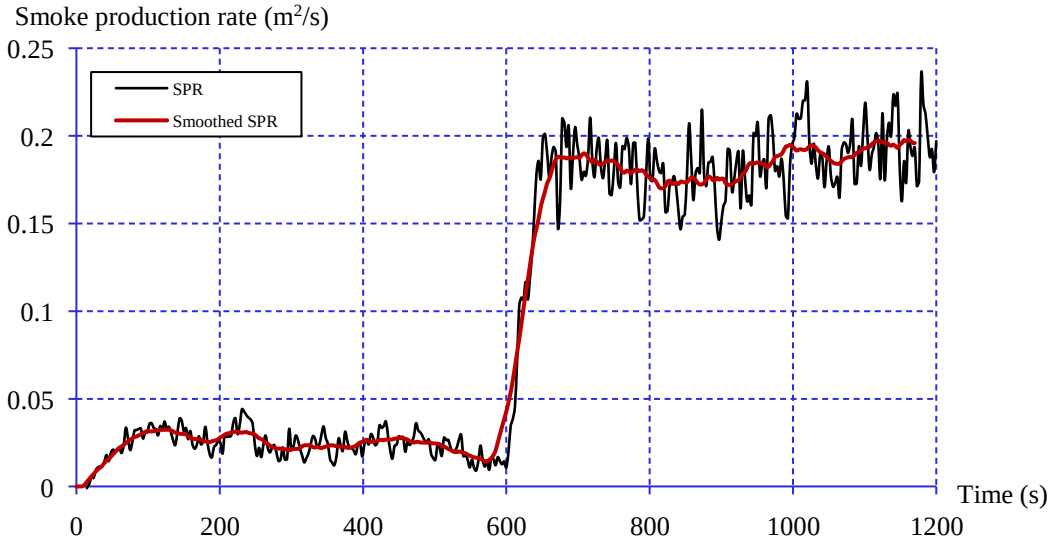


Figure 2 Smoke production rate from "Fjord Panel" during test including burner.

Measured data

Appendix 1

No measurements were made on the tested product.

Conditioning

The specimen was conditioned in indoor climate

Time 48 h. Temperature
(23 ± 2) °C.

Date of test

January 17, 2018.

Appendix 2

Photographs

Photo no 1 Prior to test "Fjordpanel"

Applying the glue to the specimen prior to testing.

Appendix 2

Photo no 2 Prior to test "Fjordpanel"

Photo no 3 Time 2:00 (min:s) "Fjordpanel"

The flames climb on the specimen to the ceiling.

Photo no 4 Time 09:00 (min:s) "Fjordpanel"

Appendix 2

The specimen has not ignited.

Photo no 5 Time 10:17 (min:s) "Fjordpanel"

The burner heat output has been increased to 300 kW.

Photo no 6 Time 18:00 (min:s) "Fjordpanel"

The flames reach approximately 1 meter in radius in the ceiling.

Appendix 2

Photo no 7 Time 19:59 (min:s) "Fjordpanel"

The specimen has not ignited.

Photo no 8 After test "Fjordpanel"

The specimen self-extinguished immediately

Appendix 2

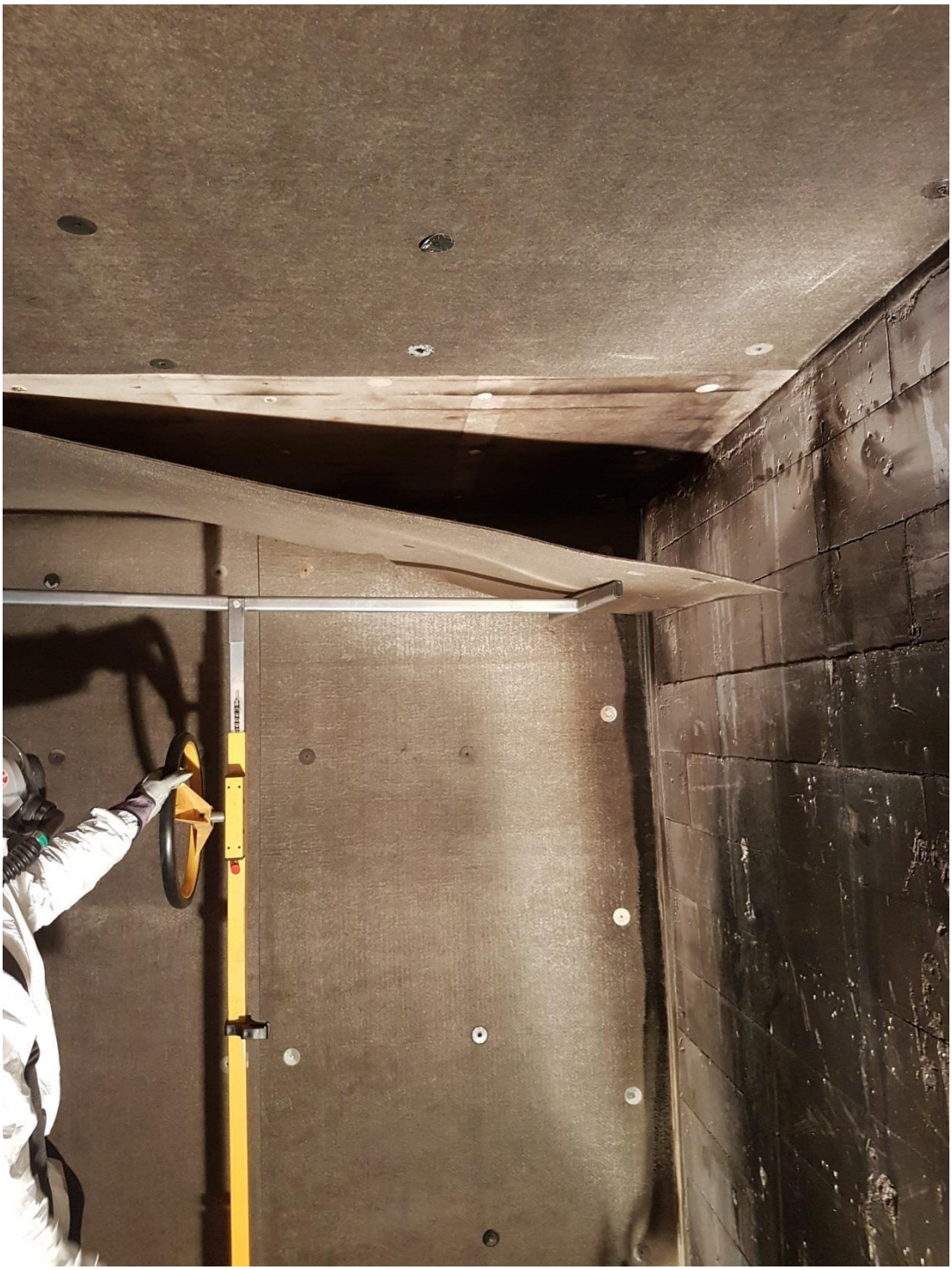


Photo no 9 After test "Fjordpanel"

The specimen in the ceiling came loose when taking off the screws and washers.

Appendix 2

Photo no 10 After test "Fjordpanel"

The specimens on the wall stayed up after taking off the screws and washers. The specimen had partly detached in its corners.

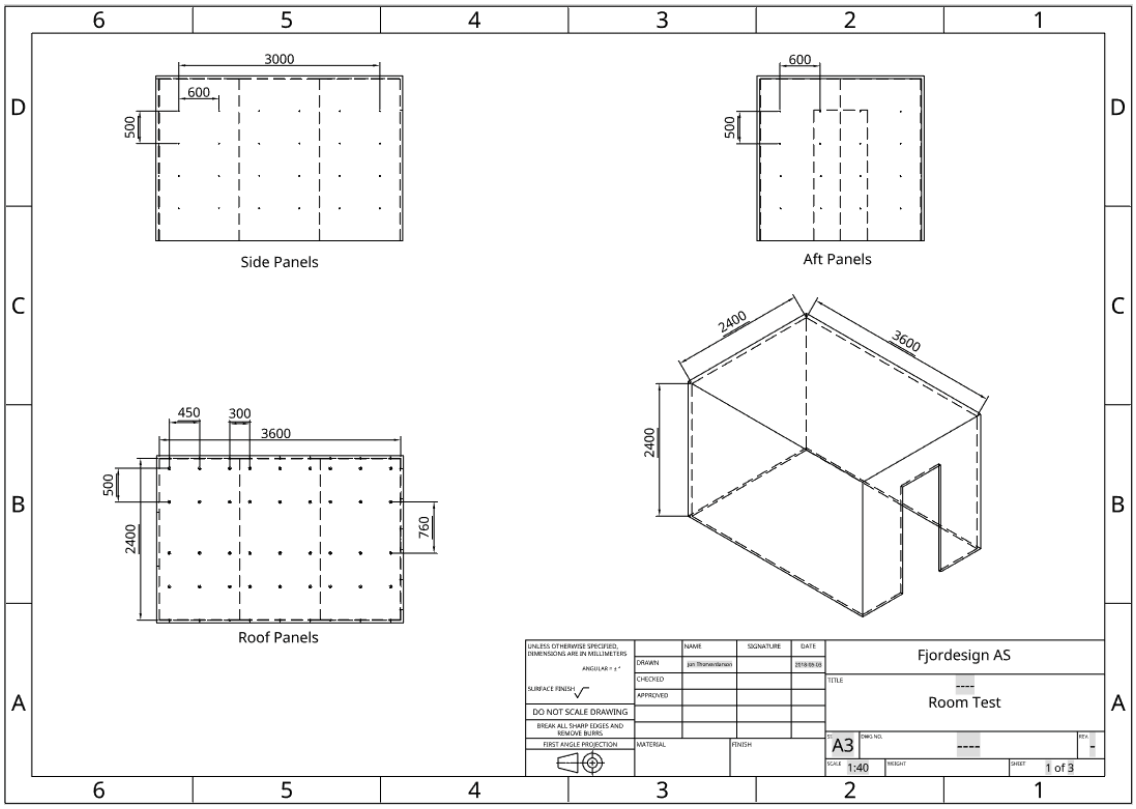
Appendix

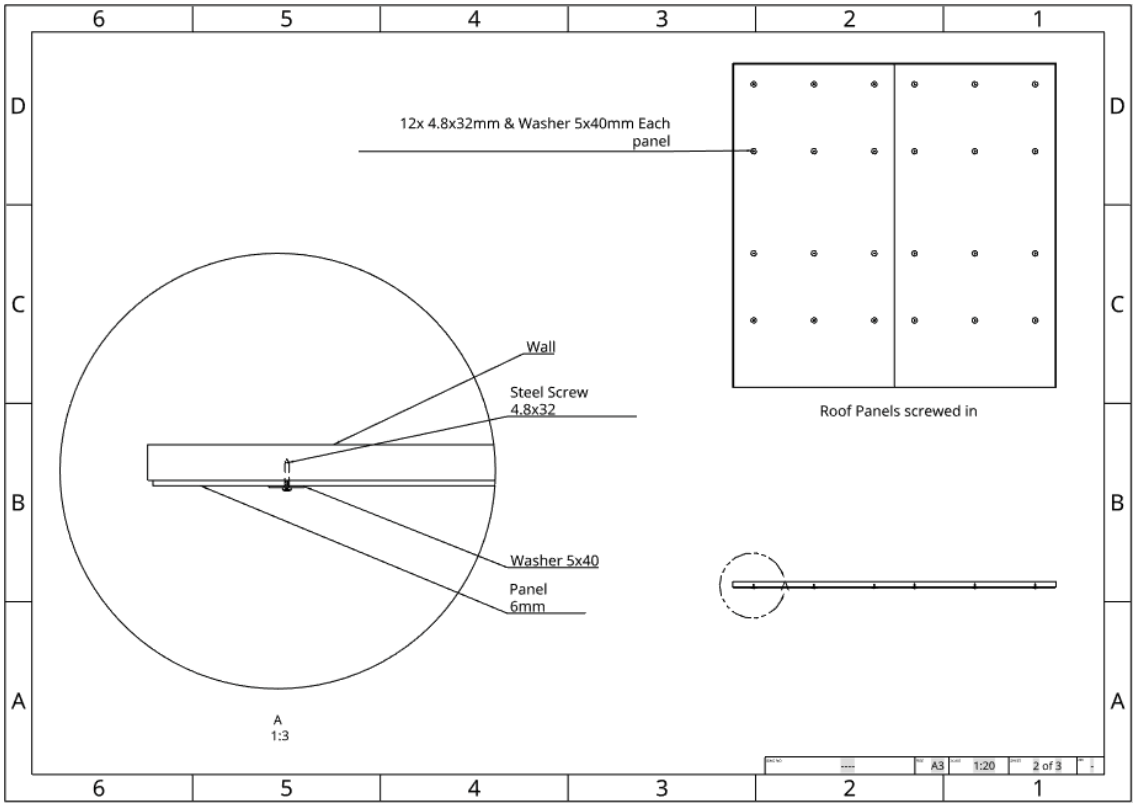
3

Test parameter explanation, IMO 2010 FTP Code, Annex 1, Part 10

Parameter	Explanation
Test start	00:00 (min:s) ignition of burner.
End of test	20:00 (min:s) after test start, or at the point of flashover.
$HRR_{average}$, kW	Average of Heat Release Rate from ignition until end of test, excluding contribution from the ignition source.
HRR_{peak30}, kW	Peak Heat Release Rate between start and end of the test averaged over 30 seconds, excluding contribution from the ignition source.
$SPR_{average}$, m^2/s	Average of Smoke Production Rate from ignition until end of test.
SPR_{peak60}, m^2/s	Peak Smoke Production Rate between test start and end of test averaged over 60 seconds.

Appendix

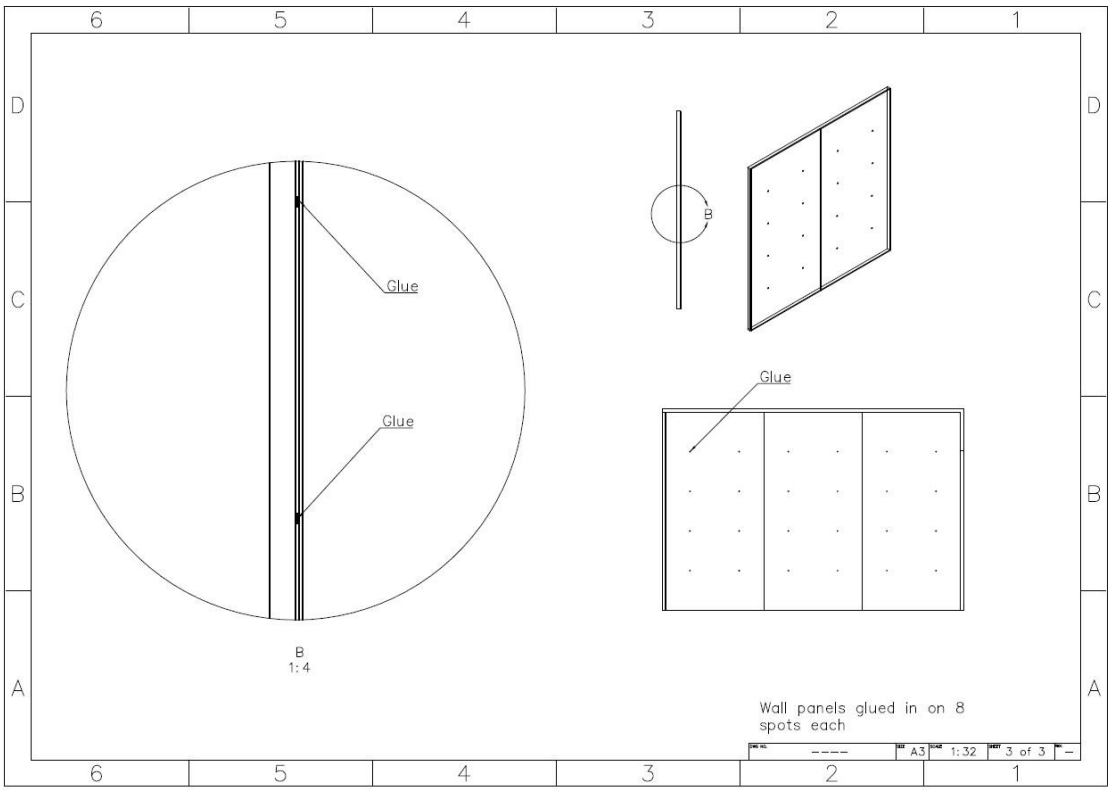

3000
600
500
Side Panels
600
500
Aft Panels
2400
3600
2400
450
300
3600
500
2400
760
Roof Panels
Fjordesign AS
Room Test
A3
1:40
1 of 3


12x 4.8x32mm & Washer 5x40mm Each panel
Roof Panels screwed in
Wall
Steel Screw 4.8x32
Washer 5x40
Panel 6mm
A
1:3
A3
1:20
2 of 3

(2)

Appendix

4


6
5
4
3
2
1
D
C
B
A
Glue
Glue
B
1:4
B
Glue
Wall panels glued in on 8 spots each
A3
1:32
3 of 3