



Wood:UpHigh

Indicative tests



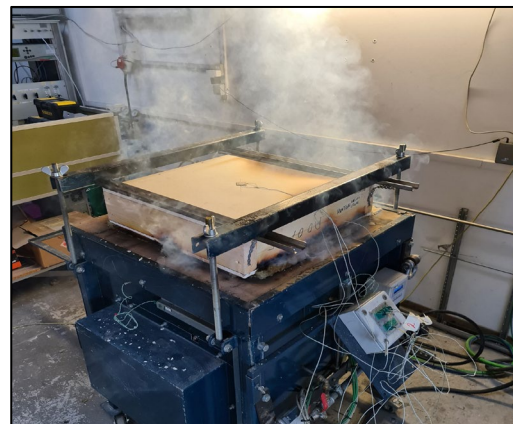
PURPOSE

Wood:UpHigh aims to accelerate bio-based construction by providing evidence that composite bio-based structures can be more widely and easily employed in multi-story buildings.

The project will explore, analyse, and document the fire resistance of selected load-bearing timber structures in combination with bio-based insulation.



Wood:UpHigh – Construction



Wood:UpHigh – During indicative test



Wood:UpHigh – After indicative test



Wood:UpHigh – After indicative test



DISCLAIMER

The following tests are intended as an inspirational basis, indicating whether it is possible to design biobased structures that may pass a full-scale classification test.

These tests cannot be used as documentation.

Not all insulations materials has a reaction to fire classification.

Følgende test er ment som et inspirationsgrundlag, som indikativt påviser om det er muligt at designe biobaserede konstruktioner som muligvis vil kunne bestå en fuldskala klassifikationstest.

Følgende test kan ikke anvendes som dokumentationsgrundlag i en konkret byggesag. Konkret dokumentation til hver enkelt byggesag skal stadig tilvejebringes.

Materialerne i sig selv er ikke nødvendigvis klassifikationstestet for reaktion-på-brand.



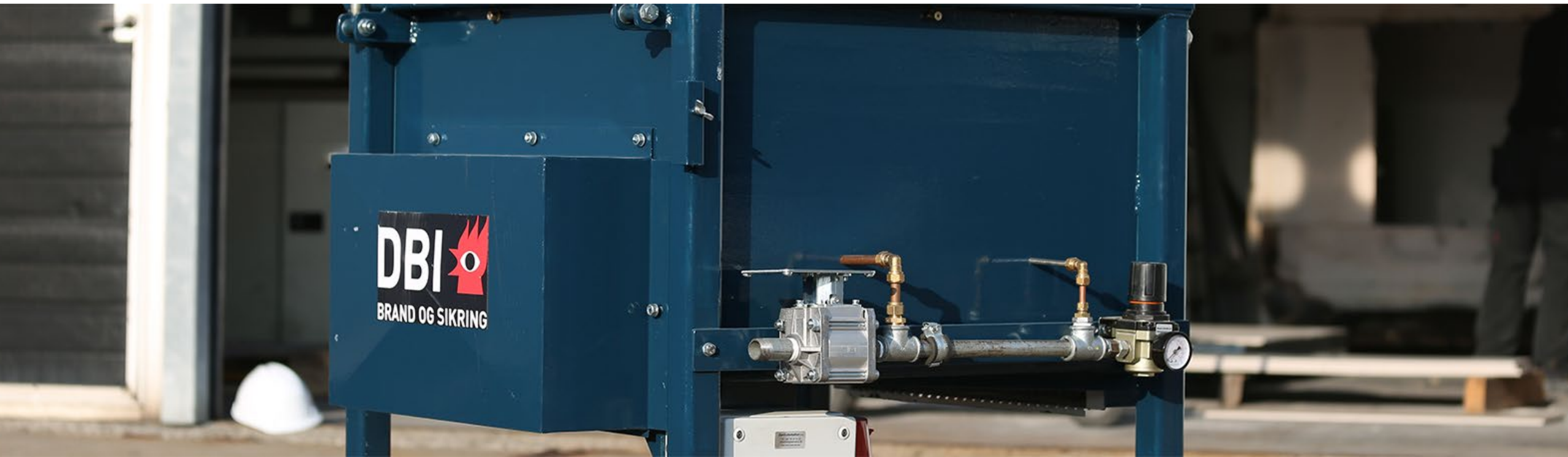
Test procedure

Tested on mobilefurnance using ISO 834 fire curve

The test is stopped after:
90 minutes *or* unexposed temperature ≥ 200 °C

Observations

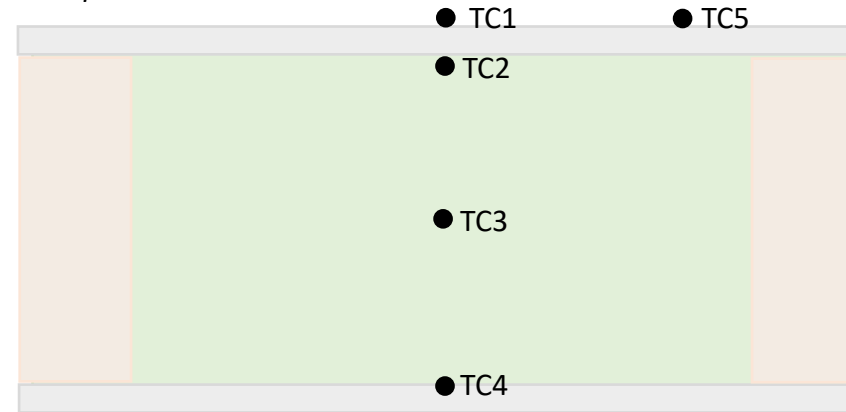
- The conditions of the insulation
- The burning of the timber



Indicative test



Unexposed side



Exposed side

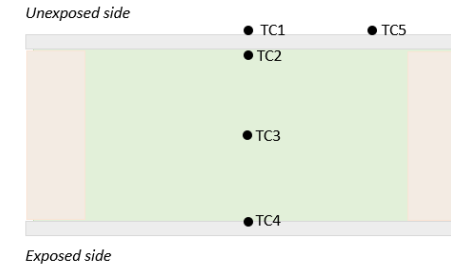
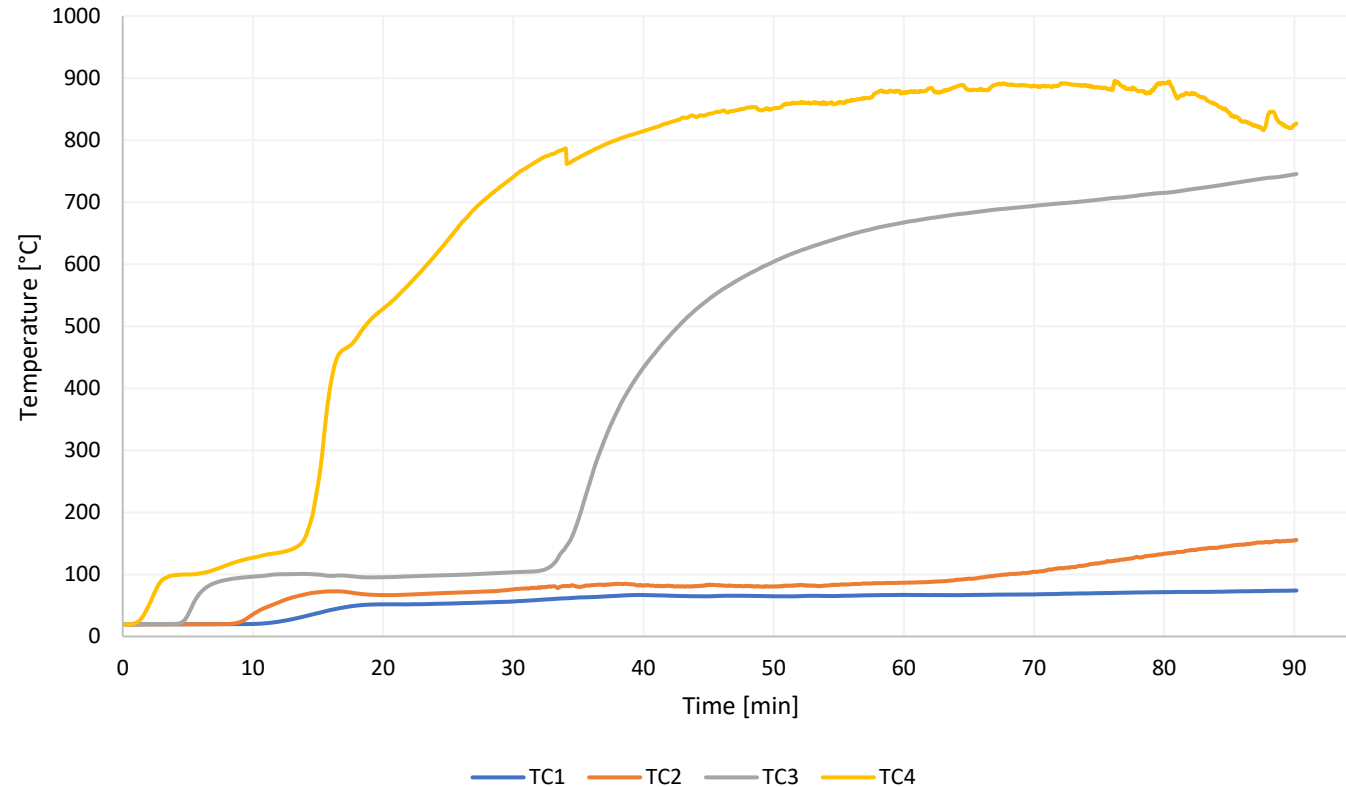


- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber



Results for test 1

Temperatures Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

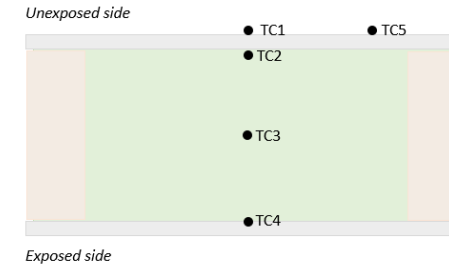
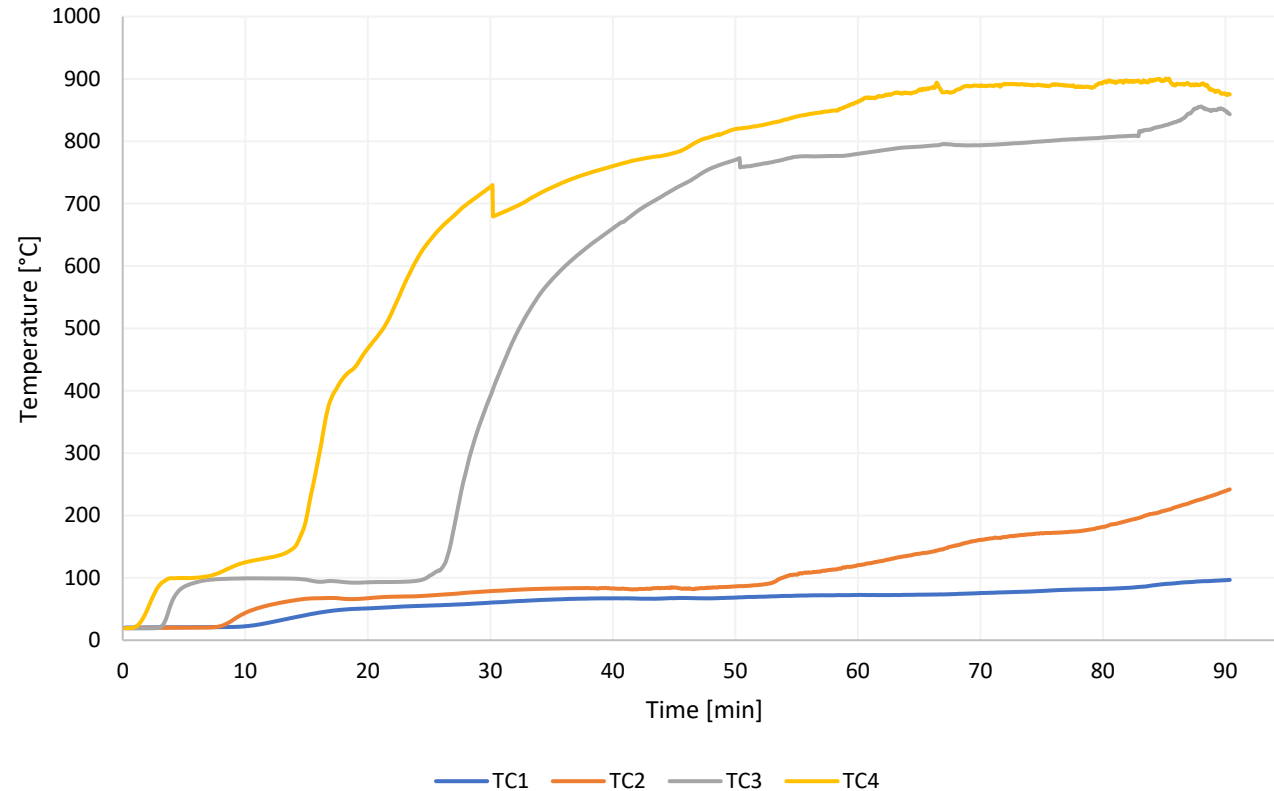


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-01	Woodfibre	Board	40 kg/m ³	1.25 kg	1	90 minutes



Results for test 2

Temperature Relative Exposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

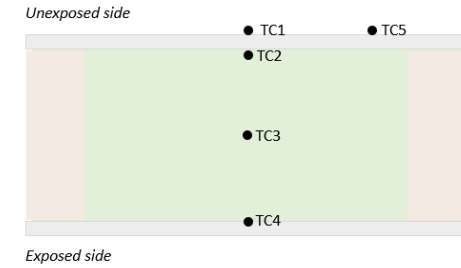
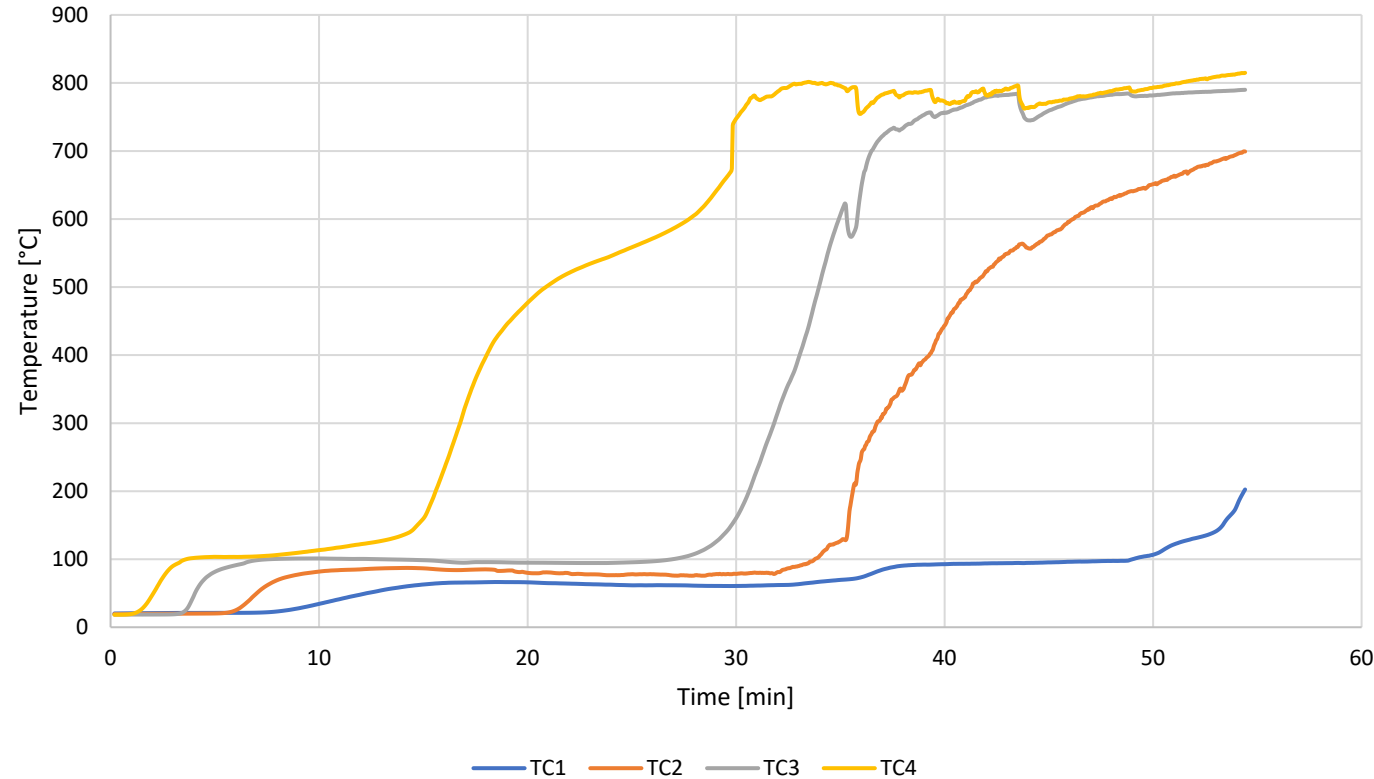


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-02	Woodfibre	Loose-fill	43 kg/m ³	1.34 kg	1	90 minutes

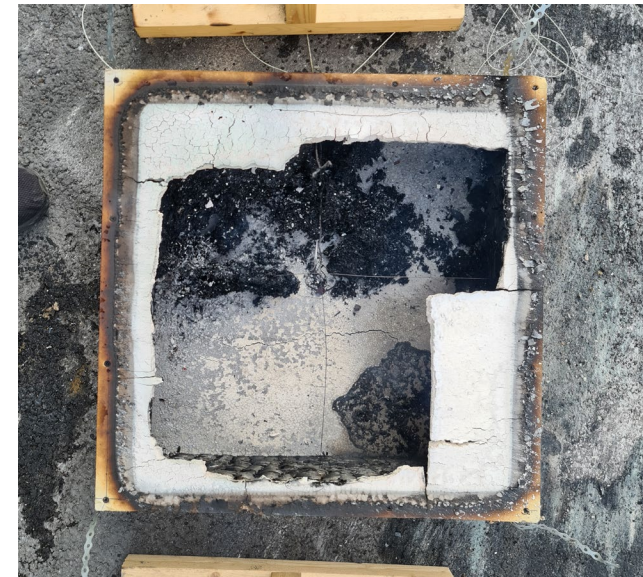


Results for test 3

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

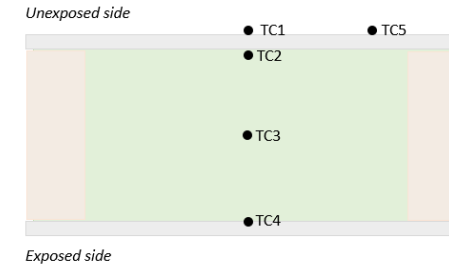
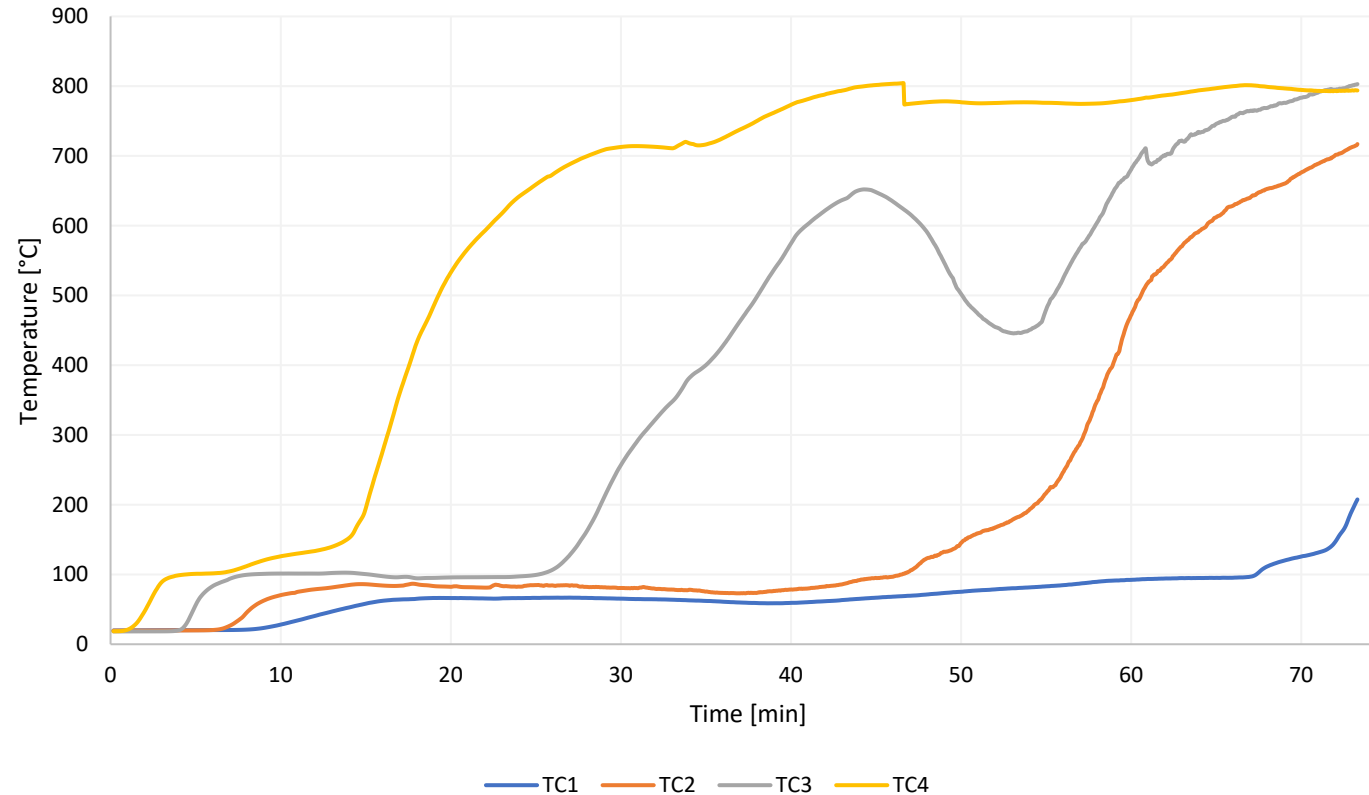


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-03	Paper	Loose-fill	34 kg/m ³	1.06 kg	1	54.2 minutes



Results for test 4

Temperature Relative Exposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

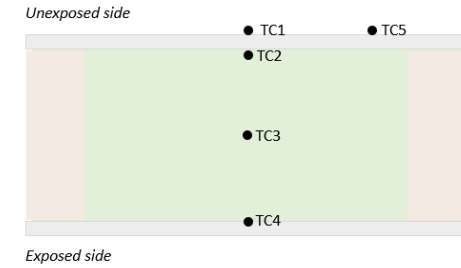
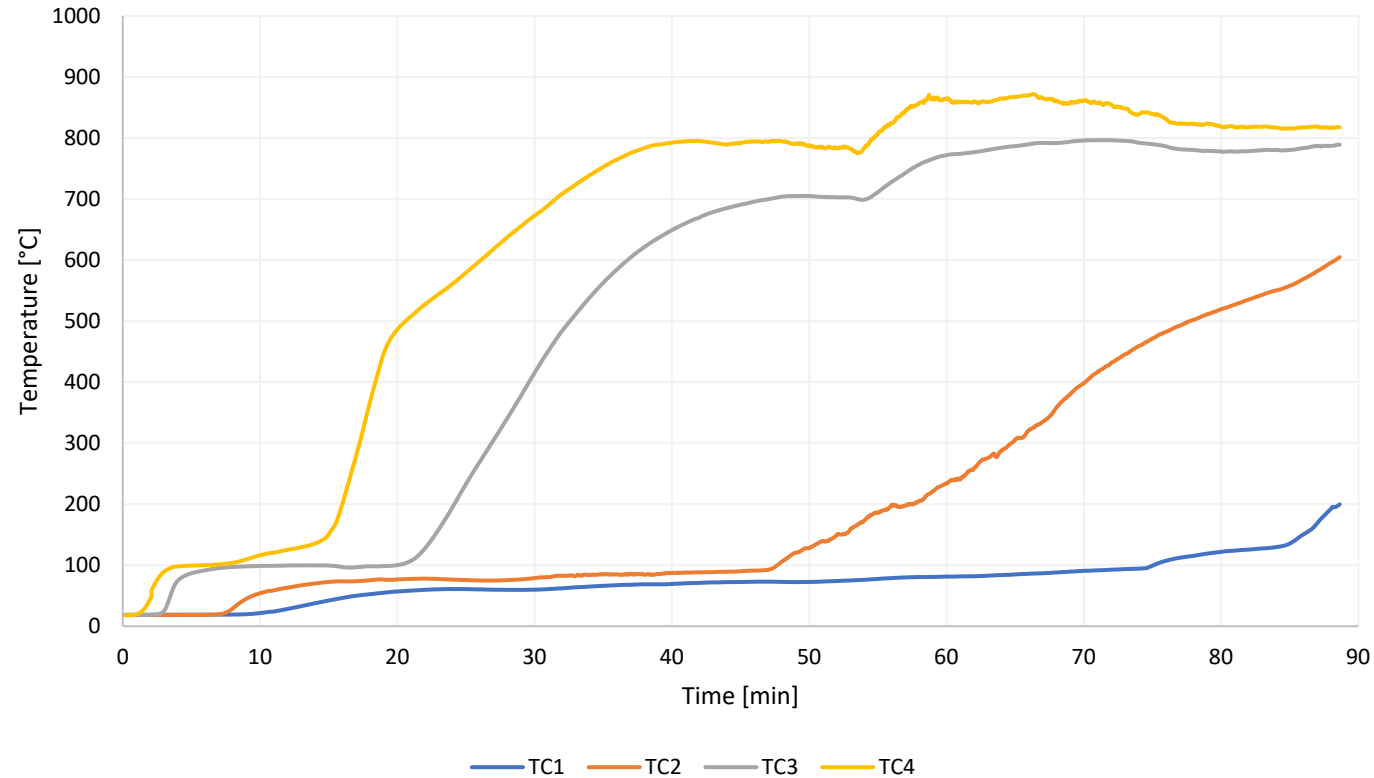


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-04	Paper	Loose-fill	37.5 kg/m ³	1.17 kg	1	73.1 minutes



Results for test 5

Temperature Relative Unexposed



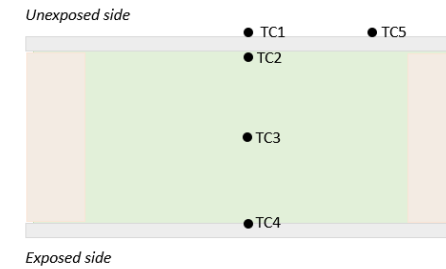
- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber



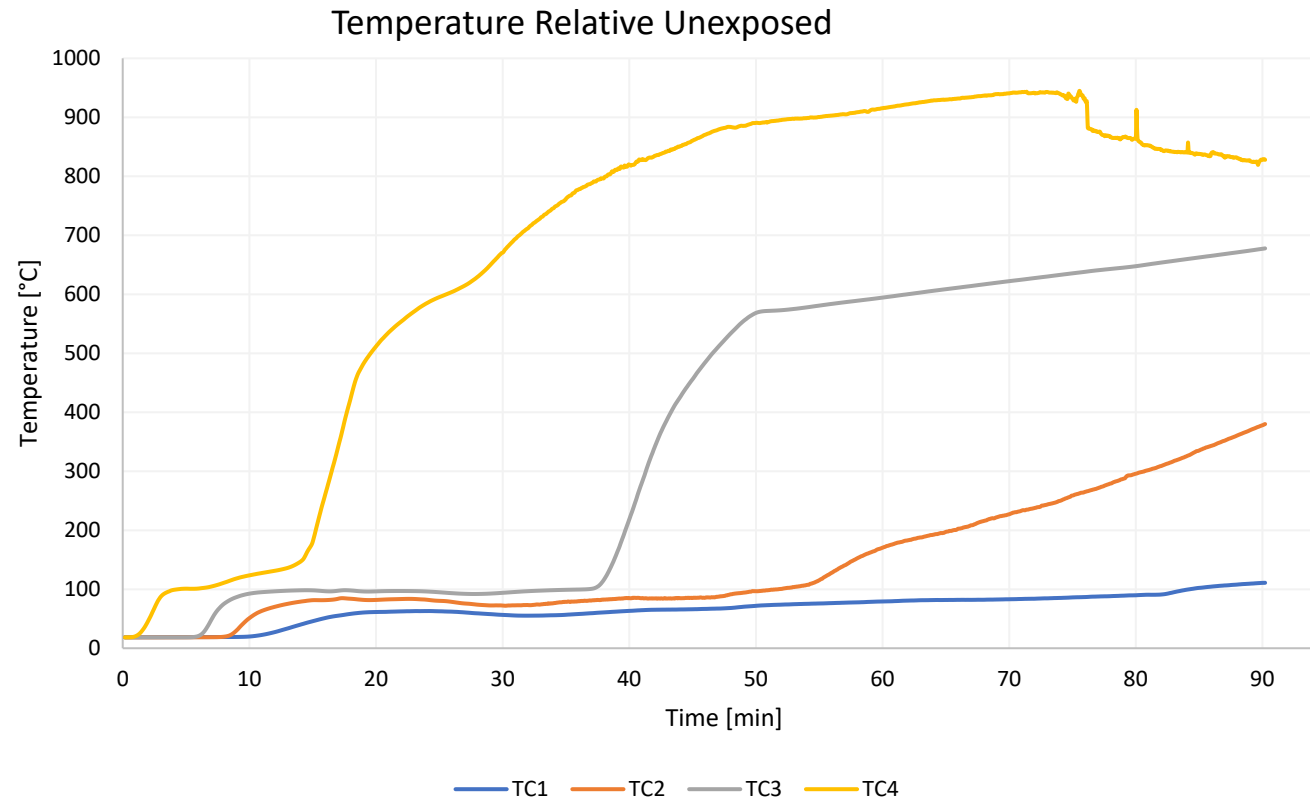
Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-05	Woodfibre	Loose-fill	37.5 kg/m ³	1.17 kg	1	88 minutes



Results for test 6



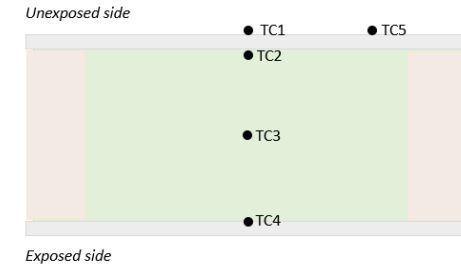
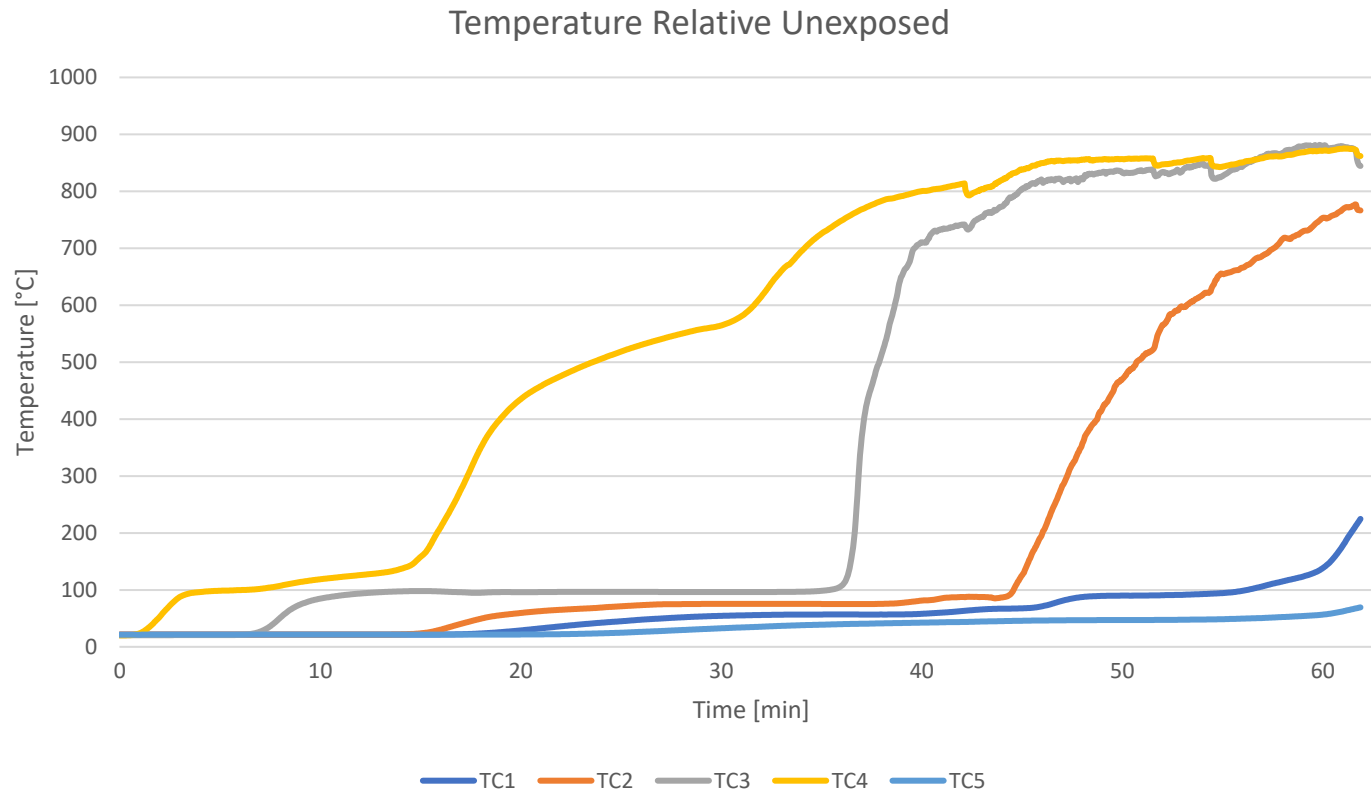
- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber



Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-06	Woodfibre	Board	50 kg/m ³	1.56 kg	1	90 minutes



Results for test 7



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

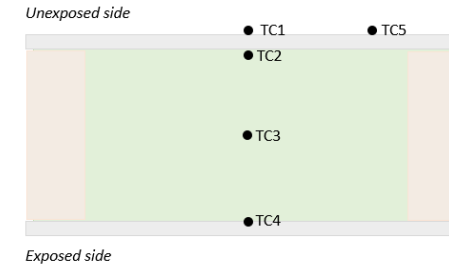
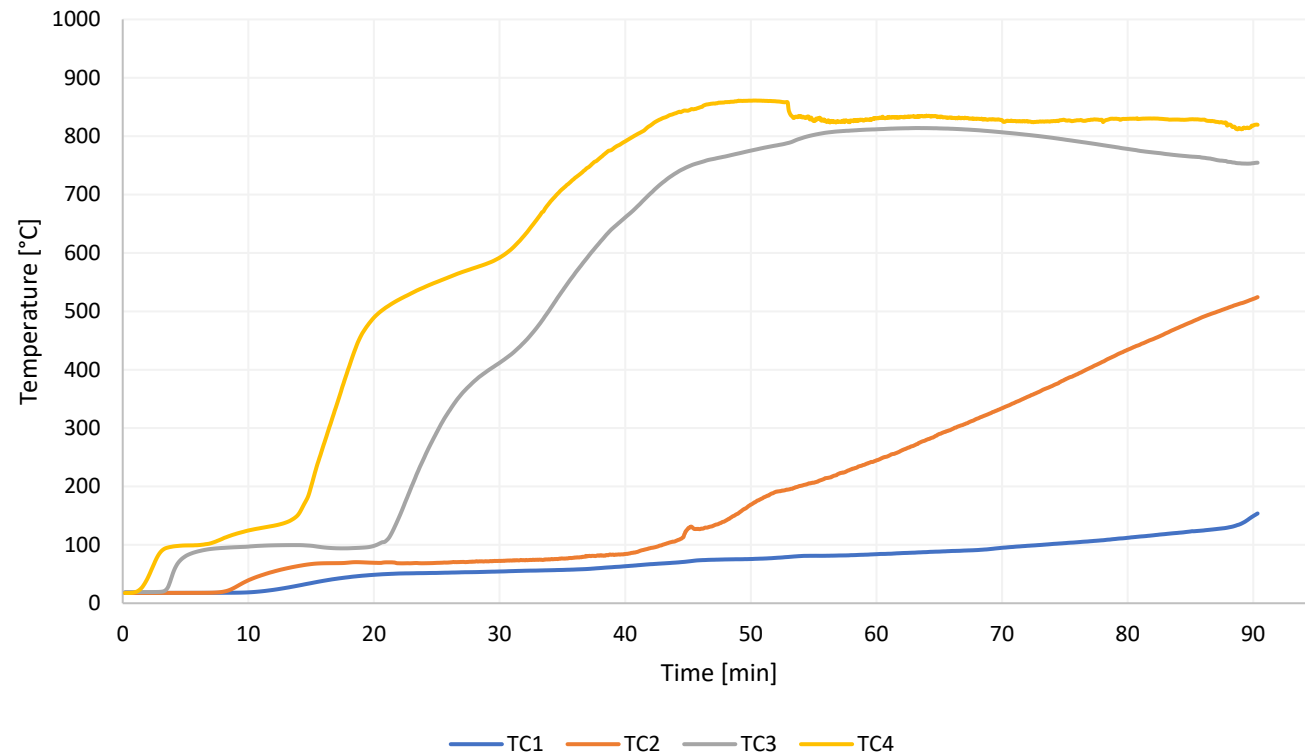


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-07	Eelgrass	Board	70 kg/m ³	2.18 kg	1	60 minutes



Results for test 8

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

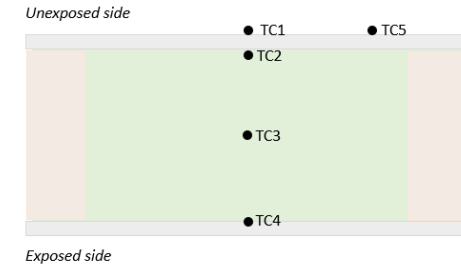
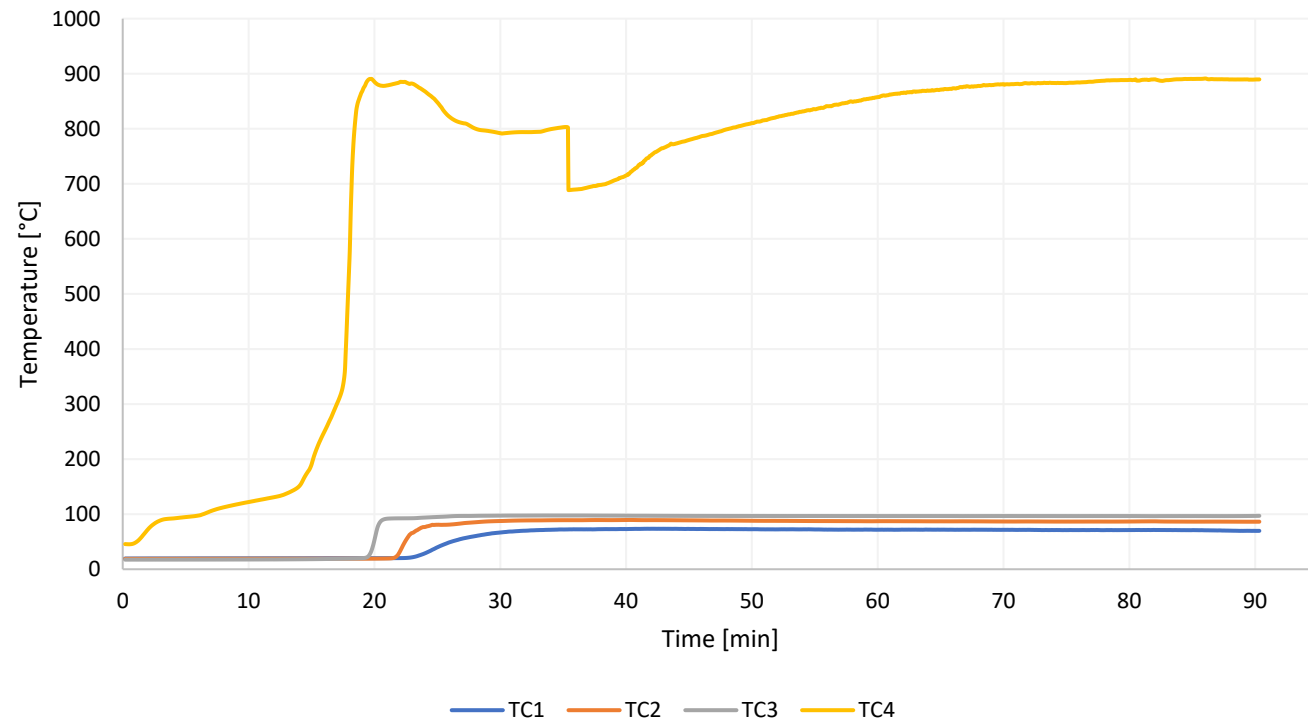


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-09	Grass	Board	40 kg/m ³	2.18 kg	1	90 minutes



Results for test 9

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

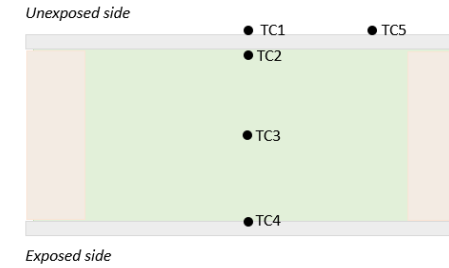
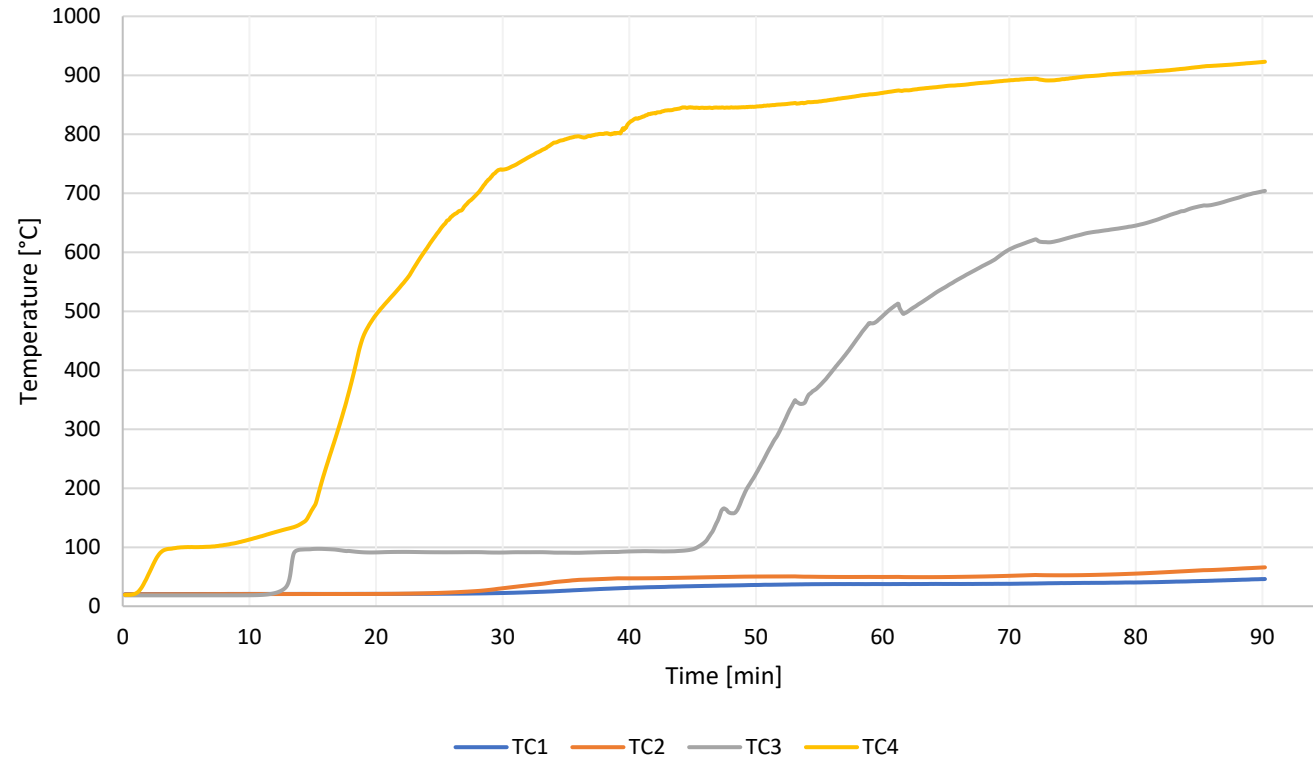


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-10	Hemp	Element	340 kg/m ³	10.61 kg	1	90 minutes



Results for test 10

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

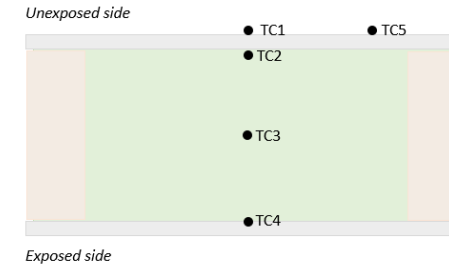
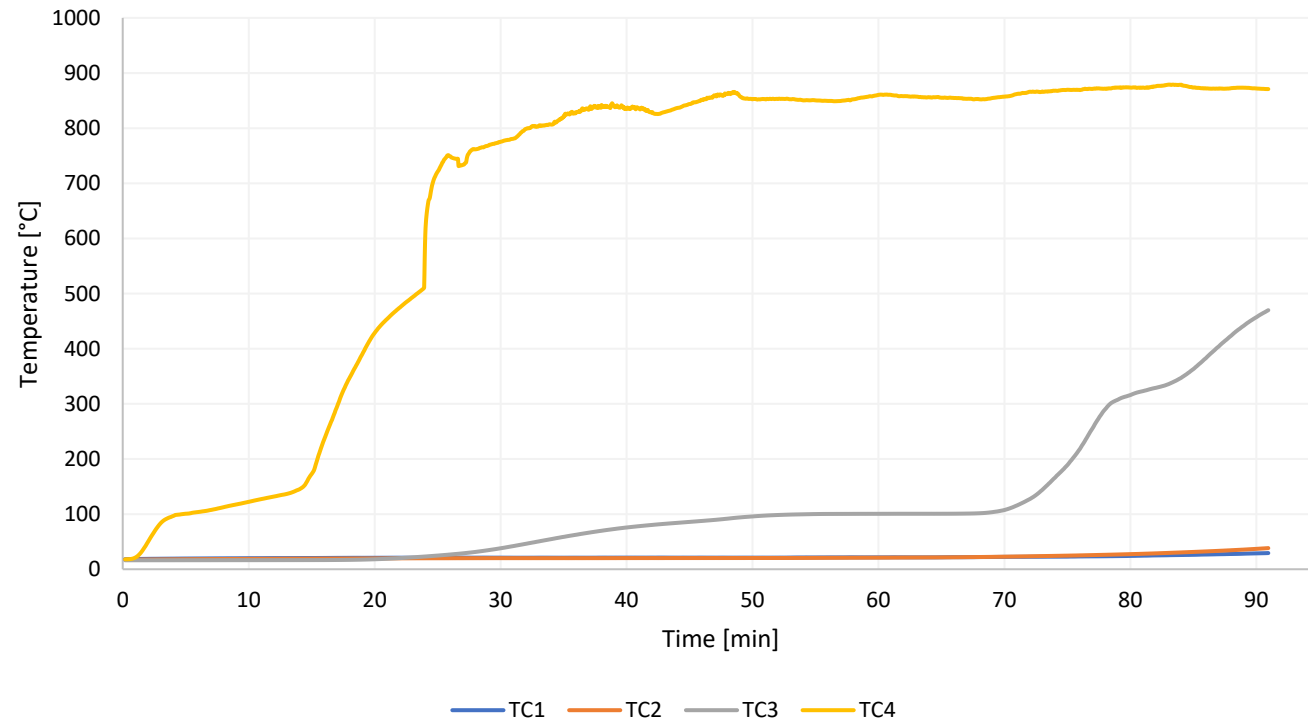


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-11	Cork	Board	115 kg/m ³	3.59 kg	1	90 minutes



Results for test 11

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

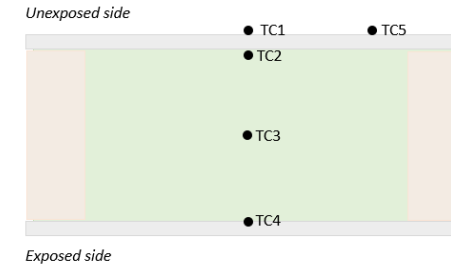
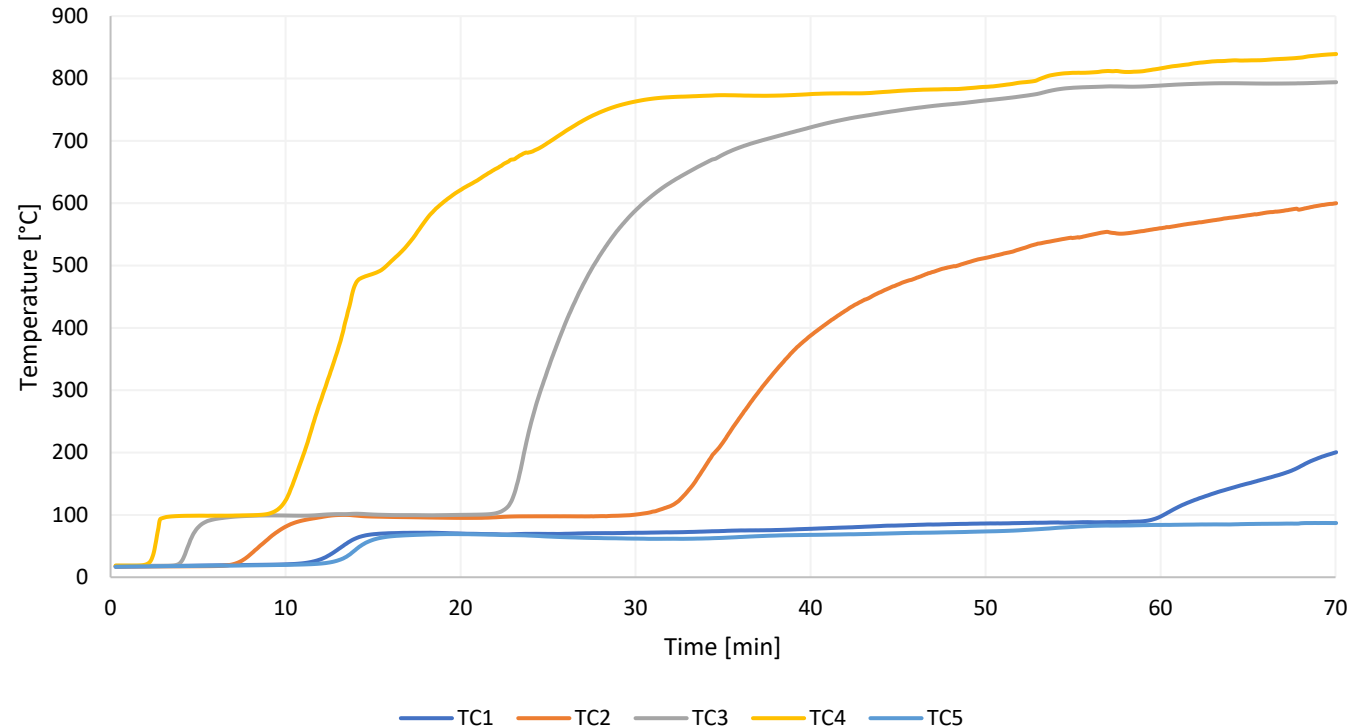


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-12	Plant fibers	Board	140 kg/m ³	4.37 kg	1	91 minutes



Results for test 12

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

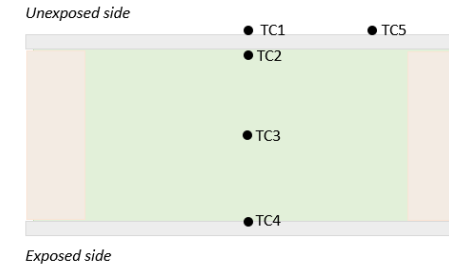
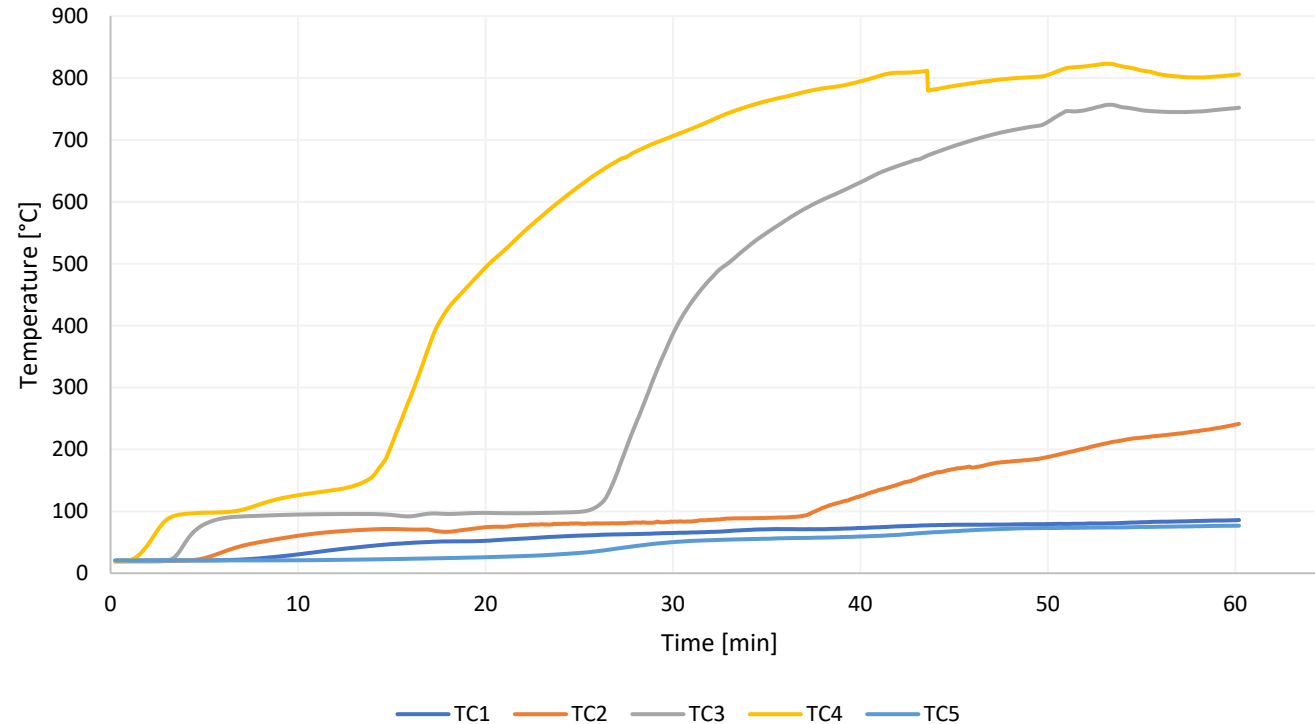


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-13	Woodfibre	Loose-fill (blown in)	40 kg/m ³	1.25 kg	1	69.7 minutes

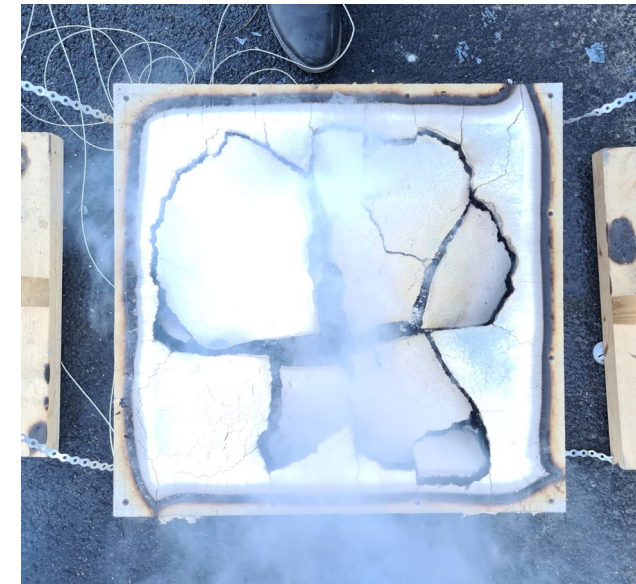


Results for test 13

Temperature Relative Unexposed



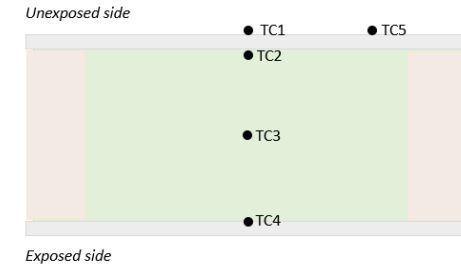
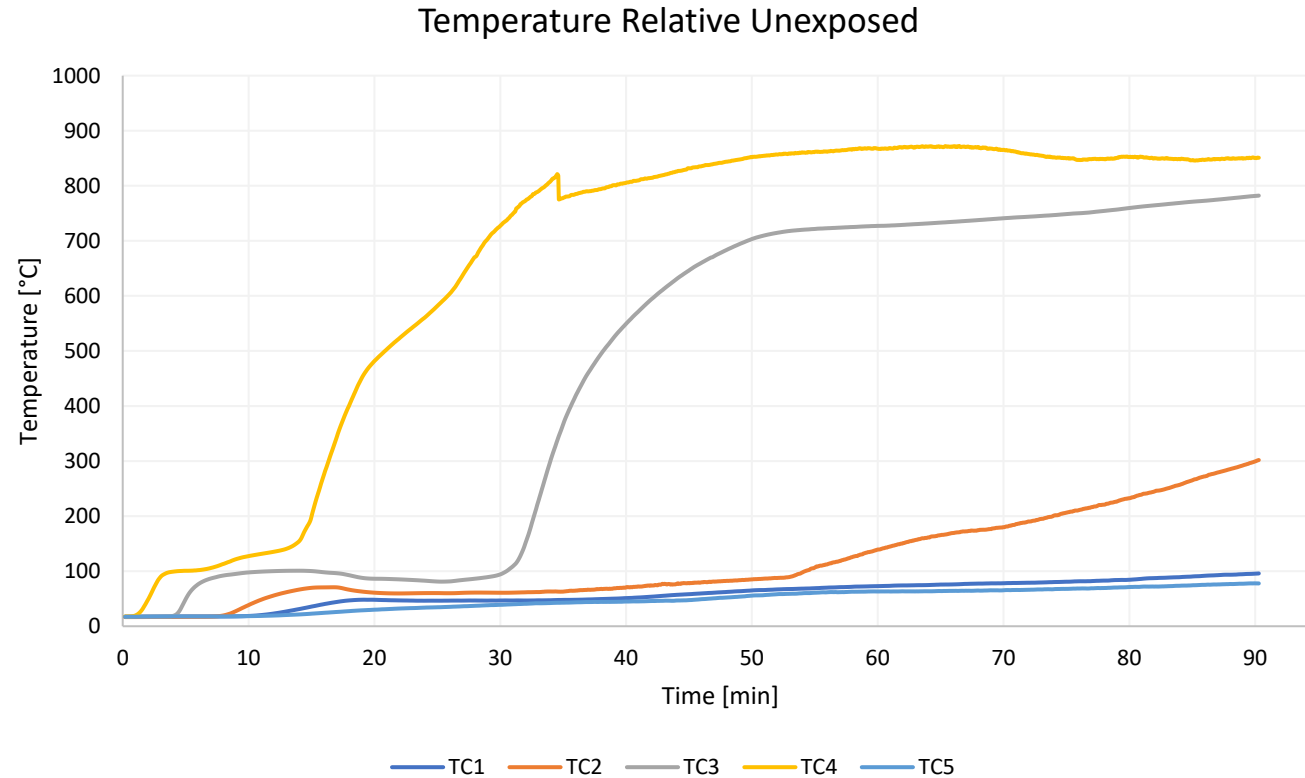
- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber



Test	Insulation type	Mounting type	Density	Amount	Layers	Exposure time
07-14	Woodfibre	Loose-fill (blown in)	40 kg/m ³	1.25 kg	20 mm wind barrier	60 minutes



Results for test 14



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

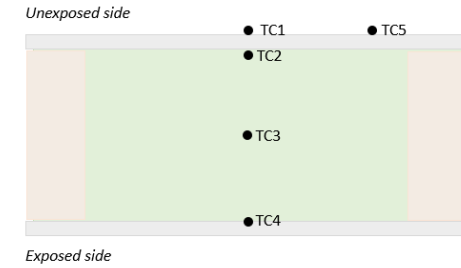
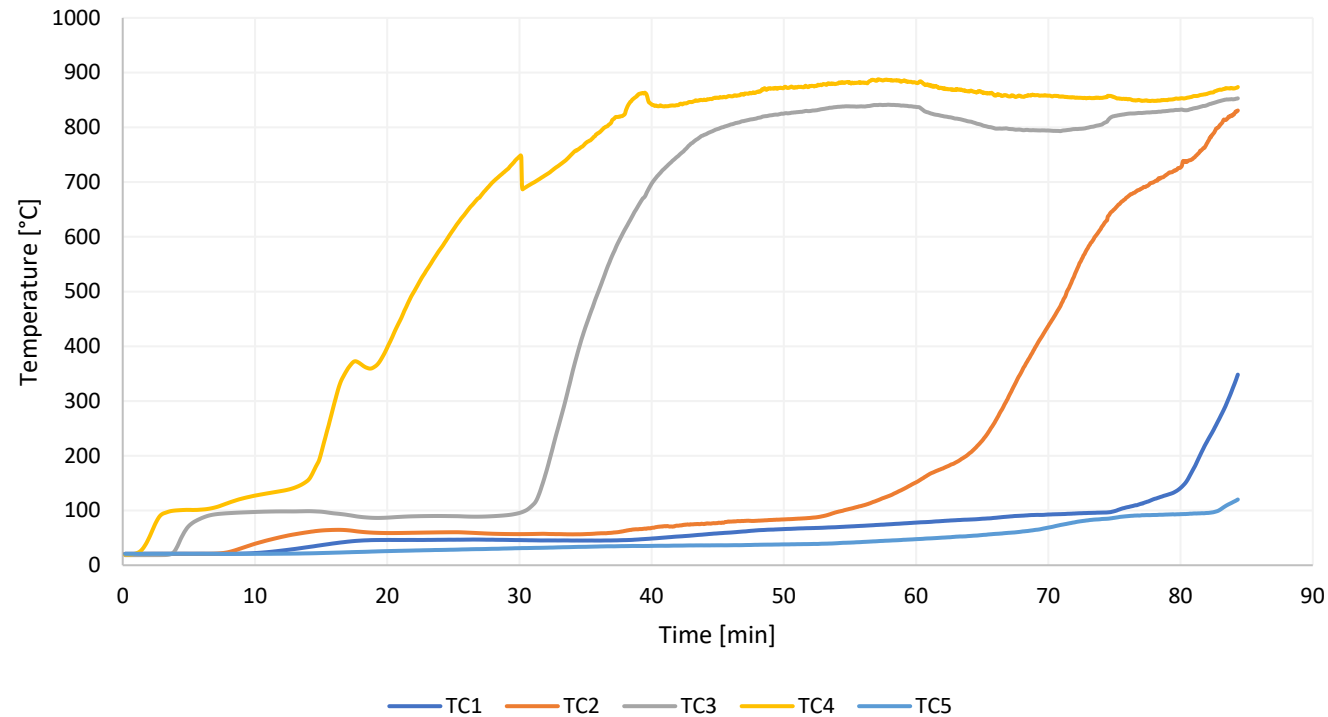


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-15	Paper	Loose-fill (blown in)	45 kg/m ³	1.4 kg	1	90 minutes



Results for test 15

Temperatures Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

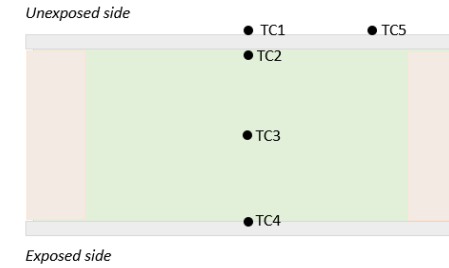
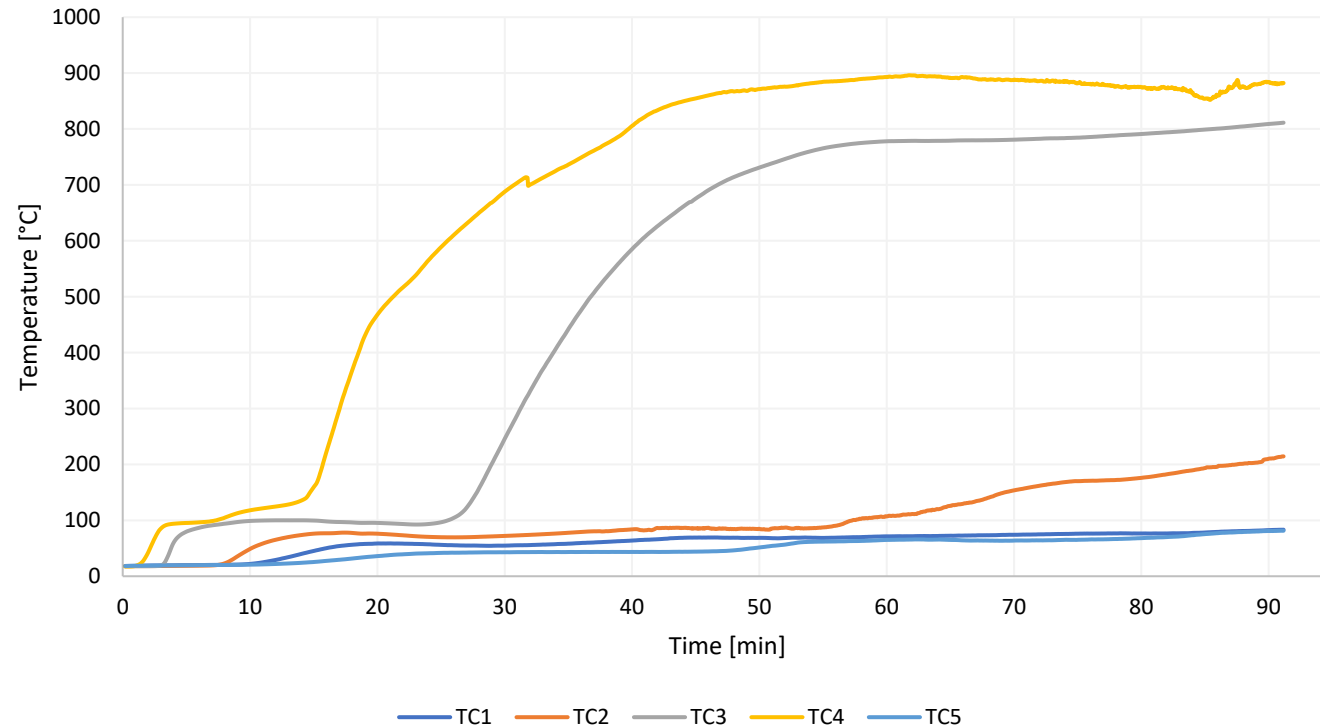


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-16	Paper	Loose-fill (blown in)	44 kg/m ³	1.37 kg	1	84.1 minutes



Results for test 16

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

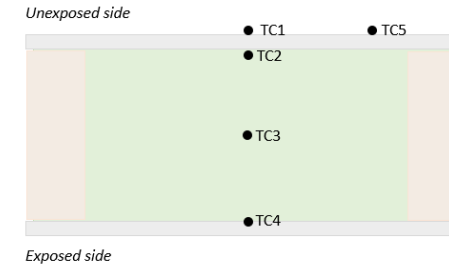
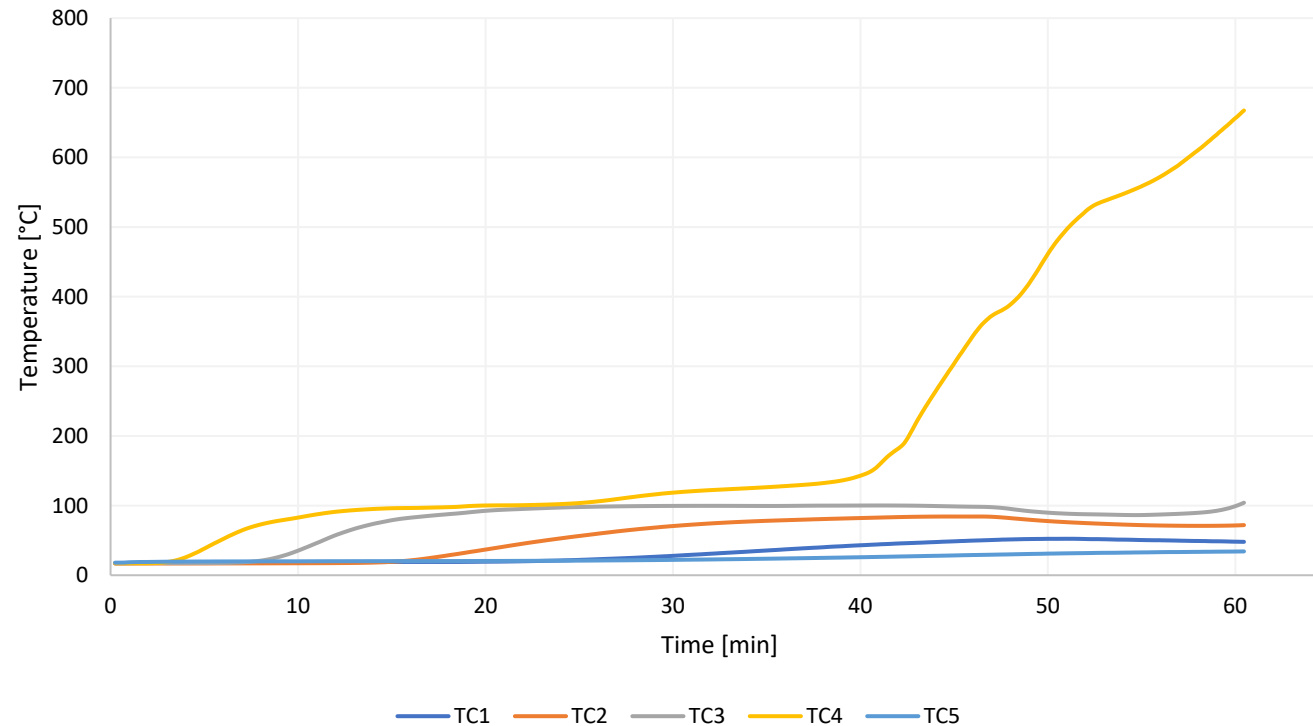


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
07-17	Woodfibre	Loose-fill (blown in)	43 kg/m ³	1.34 kg		90.9 minutes



Results for test 16

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

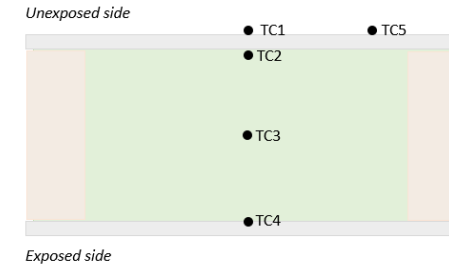
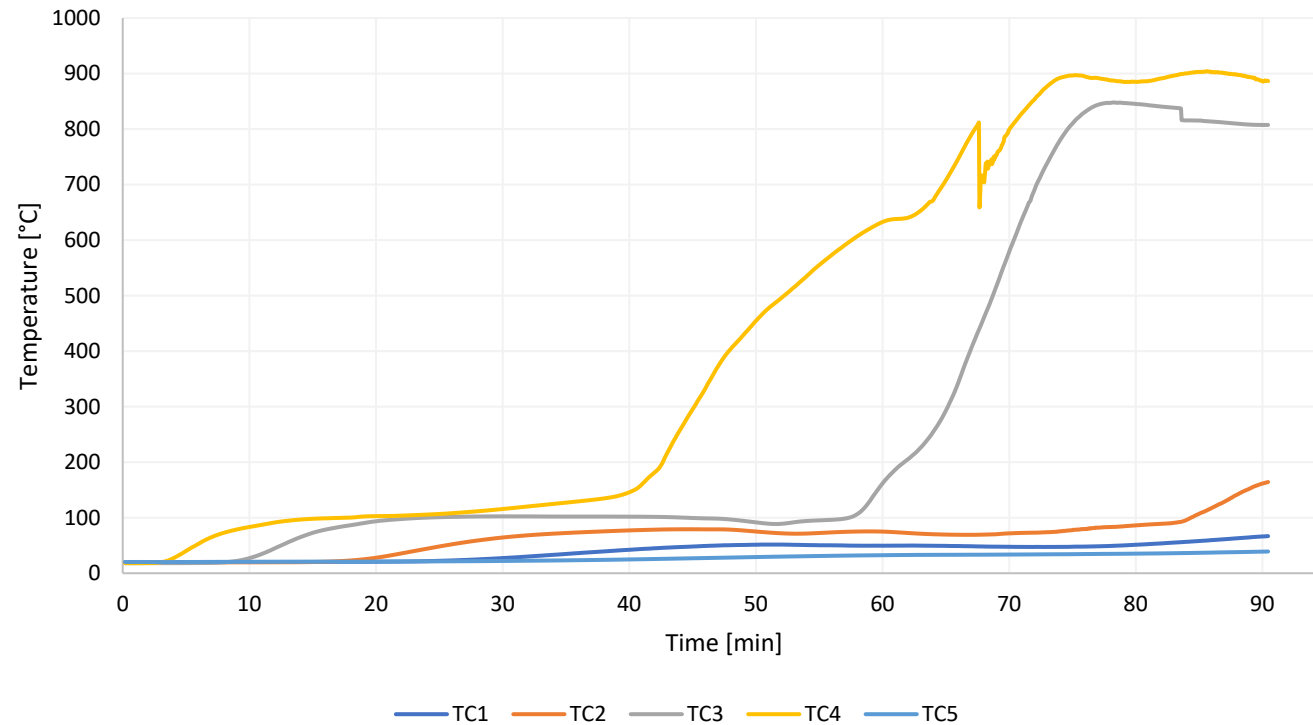


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
08-01	Woodfibre	Loose-fill (blown in)	40 kg/m ³	1.25 kg	2	60.1 minutes

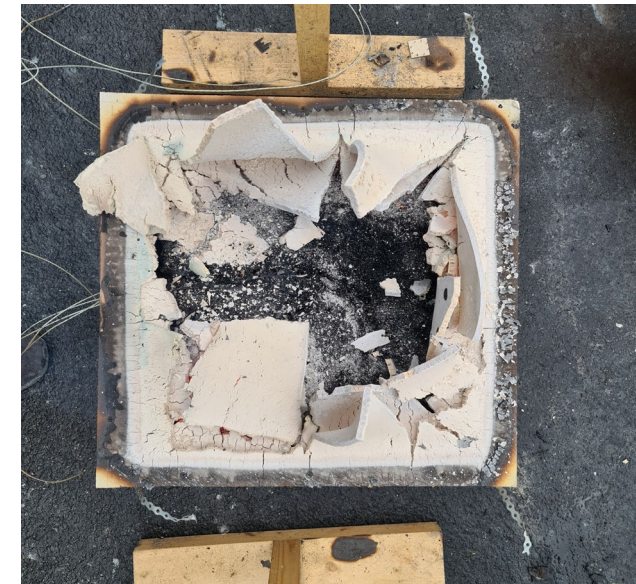


Results for test 17

Temperatures Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

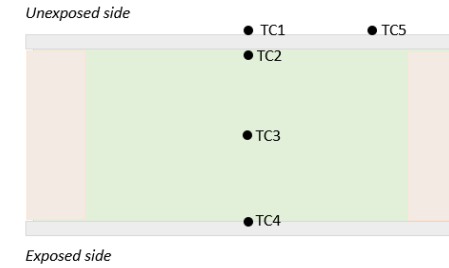
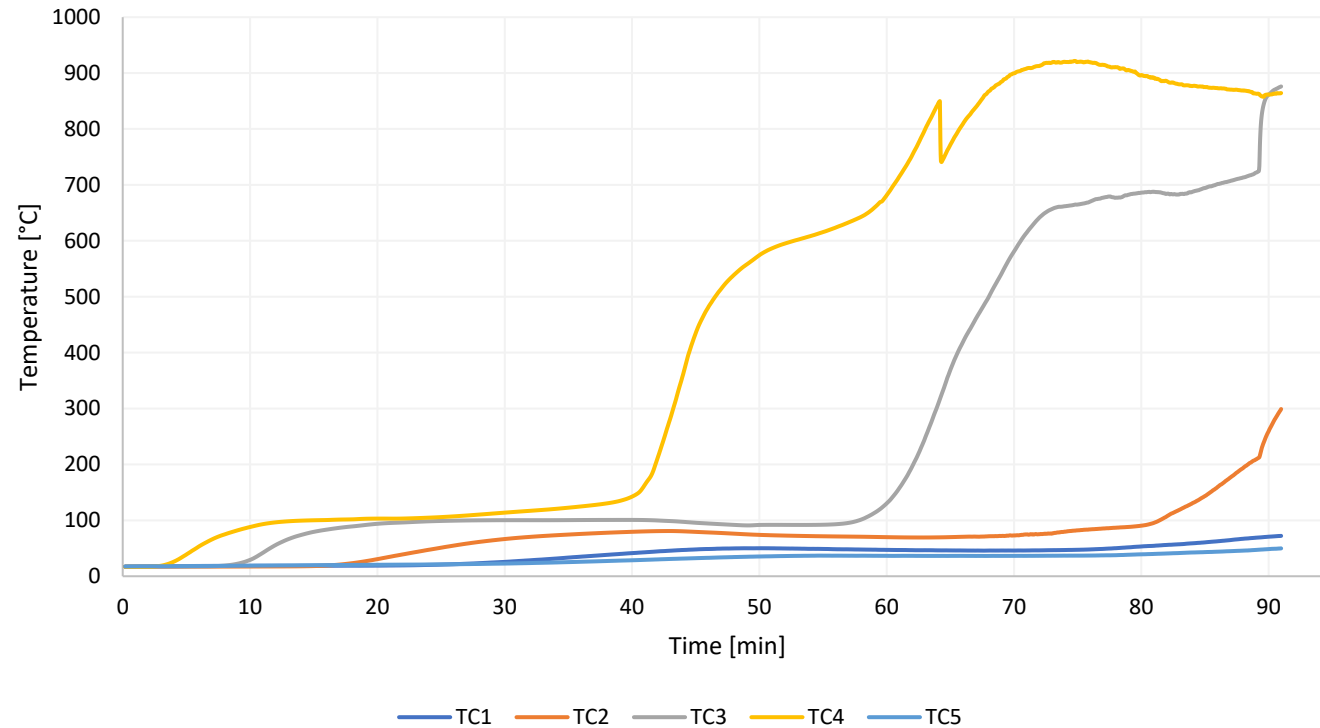


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
08-02	Paper	Loose-fill (blown in)	45 kg/m ³	1.4 kg	2	90.1 minutes

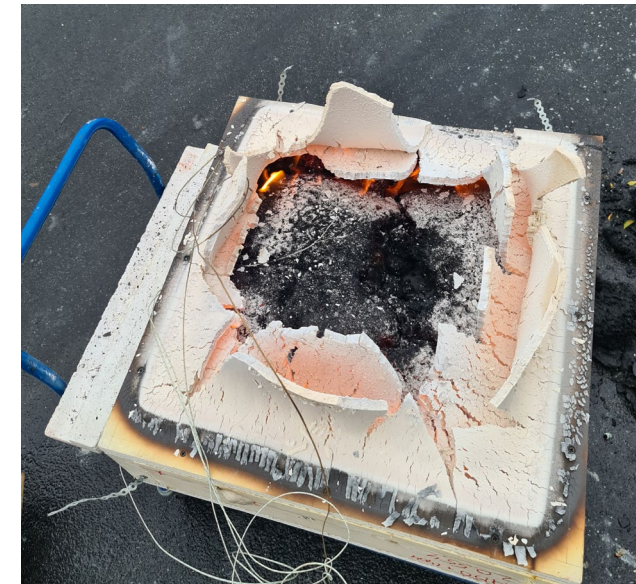


Results for test 18

Temperatures Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

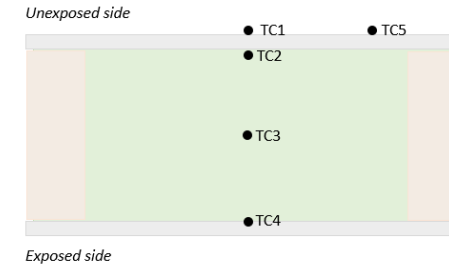
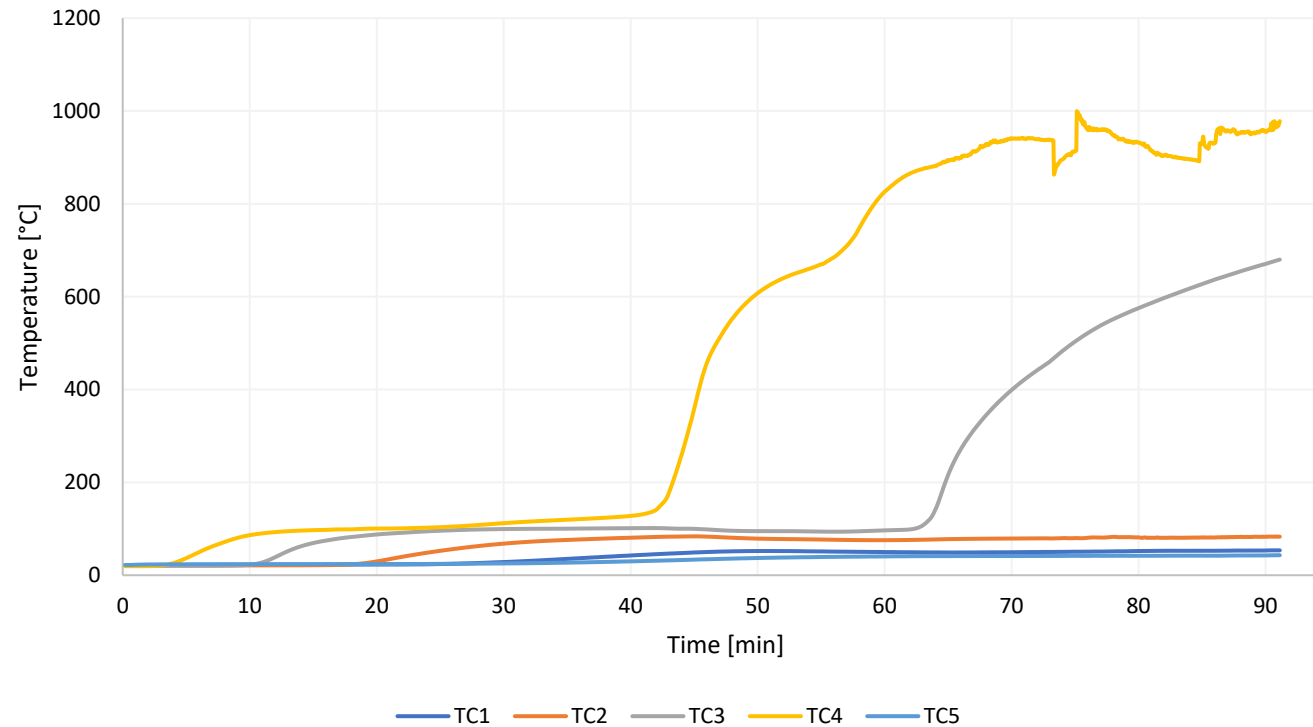


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
08-03	Paper	Loose-fill (blown in)	44 kg/m ³	1.37 kg	2	90.8 minutes



Results for test 19

Temperature Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber

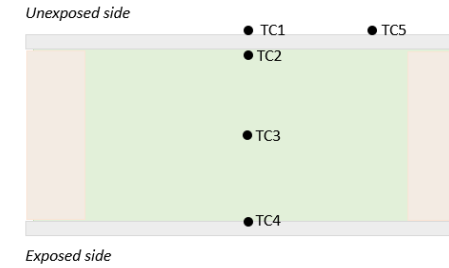
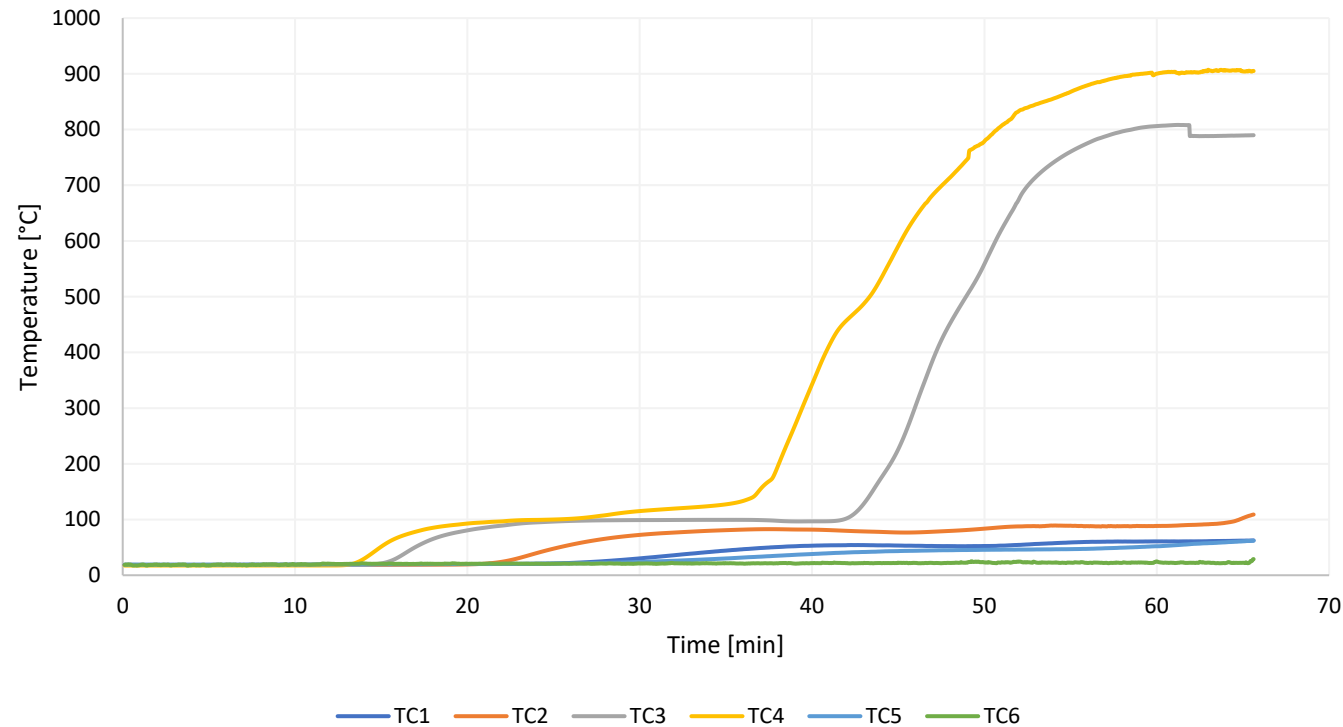


Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
08-04	Woodfibre	Board	40 kg/m ³	1.25 kg	2	90.9 minutes



Results for test 20

Temperatures Relative Unexposed



- Thermocouple
- Covering: Gypsumboard
- Biobased insulation
- Structural timber



Test	Insulation type	Mounting type	Density	Amount	Gypsum layers	Exposure time
08-05	Woodfibre	Loose-fill	43 kg/m ³	1.34 kg	2	90.4 minutes

