

## Comparative measurement of heat flow through cement slab painted with two different types of paint.

(2 appendices)

### The mission

Thermoshield Extérieur is said to lower heating costs by up to 24 percent and improve a wall's thermal insulating capacity by up to 45 percent. Based on this, RISE has been commissioned by Villaägarnas Riksförbund to evaluate whether the paint Thermoshield Extérieur has a greater insulating capacity than standard paint of the brand Caparol Amphisilan.

### Implementation

Two sandwich elements of fiber cement wall panels of the brand Cembrit Construction Facade were installed in a window opening in one of RISE's buildings in Borås (BUILDING 2, position SE). One slab was painted with insulating white paint of the brand Thermoshield Extérieur and the other with white paint of the brand Caparol Amphisilan.

Heat flow meters and temperature sensors were installed on the wall panels to measure the difference between them in terms of thermal resistance. The measurement values were logged every two minutes and the entire measuring period was just over one month.

### Results

RISE measured the thermal resistance of Thermoshield Extérieur to be 1.05 m K/W and that of Caparol Amphisilan to be 1.04 m K/W. Thermoshield Extérieur thus had approximately the same insulating capacity as a regular paint of the brand Caparol Amphisilan. The difference in measured thermal resistance between Thermoshield Extérieur and Caparol Amphisilan was insignificant and was within the error margin of the measurement method. Furthermore, there was no difference between the values during day and night.

Product	Measuring period	Measured thermal resistance of the structure, m <sup>2</sup> K/W
Caparol Amphisilan	02/05/2020 – 09/03/2020	1.04
Thermoshield Extérieur	02/05/2020 – 09/03/2020	1.05

The results from the measurement are reported in more detail in Appendix 1. Photos are presented in Appendix 2.

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approved in advance and in writing by RISE.

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**Appendices**

1. Measurement results and charts
2. Photos

Appendix 1

**Measurement results**

**Commissioned by** Villaägarnas riksförbund

**Product** Sandwich elements consisting of Cembrit Construction Facade painted with either Caparol Amphisilan or Thermoshield Extérieur

**Measuring equipment** **Heat flow meter:** FM3 inv. no. 202015 and FM6 inv. no. 202018 last calibrated 16-21/01/2020  
**Thermocouple:** of the type T verified on 02/03/2020  
**Logging equipment:** Field logger Novus, with logging every two minutes.  
**Thermographic camera:** FLIR T420 inv. no. BX33764 last calibrated 29/01/2020

**Measuring period** 05/02/2020 – 09/03/2020

**Measurement uncertainty** For the thermal resistance, the measurement uncertainty was estimated at ± 5%

**Results**

Construction	Cembrit Construction Facade painted with Caparol Amphisilan	Cembrit Construction Facade painted with Thermoshield Extérieur
Average outdoor temperature*, °C	2.16	2.16
Average indoor temperature*, °C	22.4	22.7
Average surface temperature** outdoors, °C	3.81	4.04
Average surface temperature** indoors, °C	20.4	21.3
Temperature difference, °C	16.6	17.3
Heat flow, W/m <sup>2</sup>	16.0	16.3
Thermal resistance, m <sup>2</sup> K/W	1.04	1.05

\* The air temperature was measured with two sensors indoors and two outdoors. The value indicated is the average value of these two sensors.

\*\* The surface temperature outdoors was measured with two sensors on each sample wall attached directly to the panel. The surface temperature indoors was measured with three sensors each taped directly onto the panel measuring the heat flow. The value indicated is the average value of these sensors.

**Construction of facade**

- exterior
- two layers of paint of either Caparol Amphisilan or Thermoshield Extérieur
- 8 mm Cembrit Construction Facade
- glue
- 30 mm XPS
- glue
- 8 mm Cembrit Construction Facade
- white indoor paint

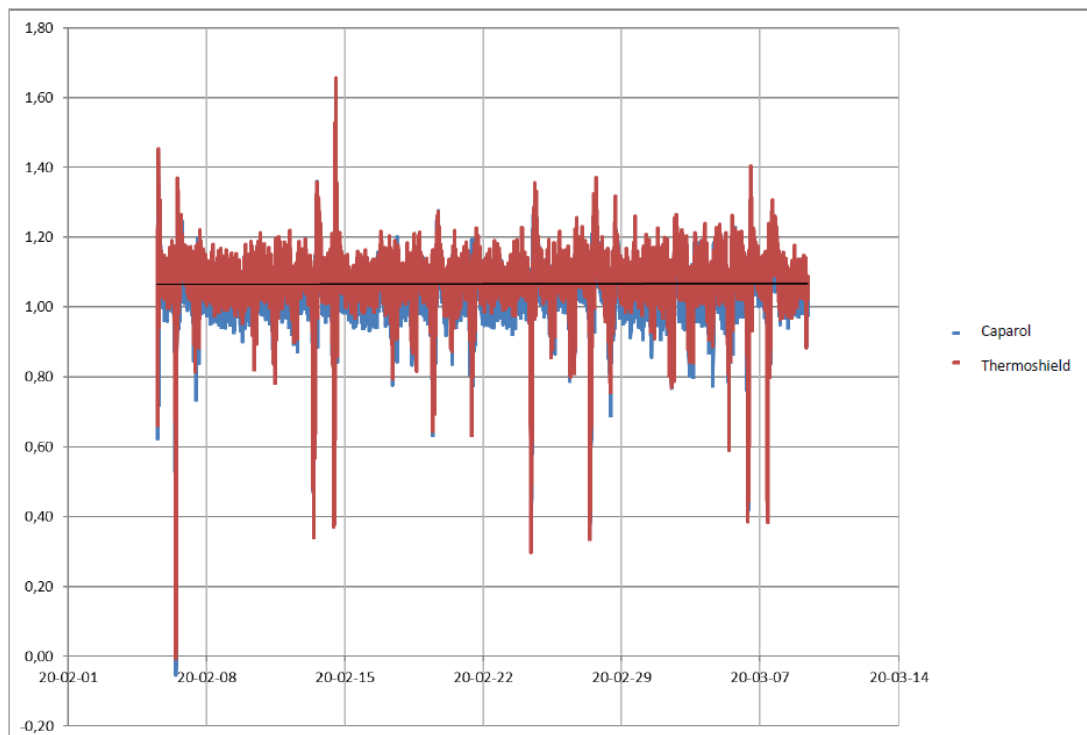
Appendix 1

interior

Appendix 1



Measured temperatures for both wall panels from 05/02/2020 to 09/03/2020



Measured thermal resistance for both wall panels from 05/02/2020 to 09/03/2020

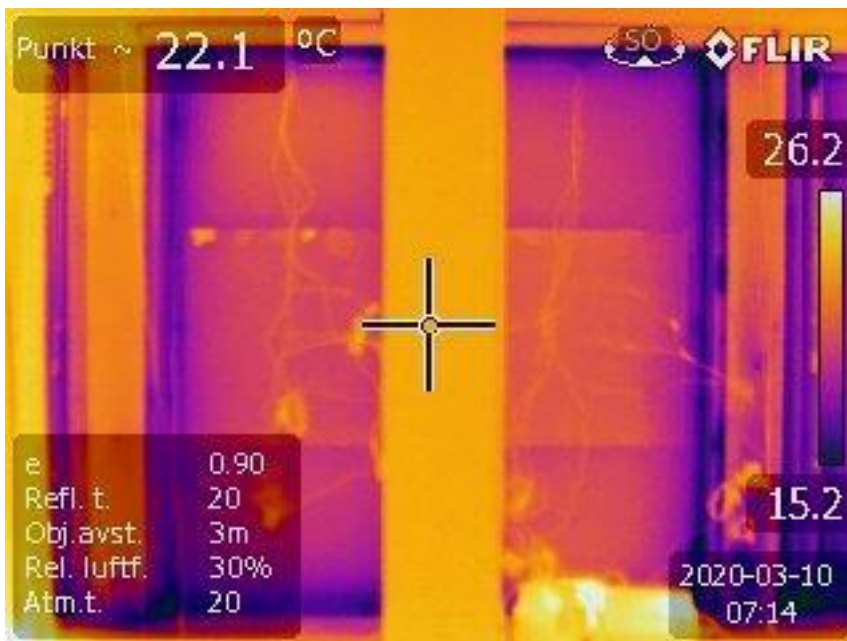
Appendix 2

**Photos**



Exterior, the left side is painted with Thermoshield Extérieur and the right side is painted with Caparol Amphisilan. The position is southeast.

Appendix 2



Interior, the left side is painted with Caparol Amphisilan and the right side is painted with Thermoshield Extérieur. The large gray plates are the heat flow meters.