



**PHD DEFENCE**  
by **Vasilis Soulios**

PHD defence

## **Hygrothermal Performance of Hydrophobized Brick and Mortar**

**Energy renovation through internal insulation – Can  
hydrophobization improve the moisture safety?**

26 November 2021  
13:00 – 17:00

Organised by



DEPARTMENT OF  
THE BUILT ENVIRONMENT

AALBORG  
UNIVERSITY

## THESIS SUMMARY

Denmark is targeting to be independent of fossil fuels by the year 2050. Although the use of renewable energy sources will be increased, it also requires the energy demand from buildings to be reduced. Further, the maintenance of cultural heritage is of primary importance, which often leaves internal insulation as the only feasible option. However, internal insulation is not necessarily moisture safe in Denmark, mainly due to the high wind-driven rain load. A transparent coating for exterior use in buildings could be the solution.

This PhD thesis investigates whether hydrophobization is able to create a transparent coating against rain by leaving the wall elements, brick and mortar, to breathe. It also investigates whether this transparent coating can stay durable in the long run. Based on these studies it discusses whether a robust energy renovation of solid masonry walls is possible by combining hydrophobization with internal insulation.

For a copy of the thesis, please email [inst.build.phd@build.aau.dk](mailto:inst.build.phd@build.aau.dk).

### ASSESSMENT COMMITTEE

- Senior Researcher Martin Morelli, Dept. of the Built Environment, Aalborg University (chairperson)
- Associate Professor Kurt Kielsgaard Hansen, Technical University of Denmark
- Professor Andra Blumberga, Riga Technical University, Latvia

### PHD SUPERVISORS

- Supervisor, Senior Researcher Ernst Jan de Place Hansen, Dept. of the Built Environment, Aalborg University
- Co-Supervisor, Research Director Ruut Peuhkuri, Dept. of the Built Environment, Aalborg University

### MODERATOR

- Senior Researcher Stefan Gottlieb, Dept. of the Built Environment, Aalborg University

GRADUATE PROGRAMME: Civil Engineering

## PROGRAMME

13:00 Welcome by moderator

13:05 Lecture and presentation by Ph.D. student

13:50 Break

*During the break, participants can email questions to the moderator, Stefan Christoffer Gottlieb [scg@build.aau.dk](mailto:scg@build.aau.dk) or contact him personally in room. The moderator presents any questions received after the Q&A session with the assessment committee.*

14:00 Q&A session with the assessment committee

16:00 End of defence

*The assessment committee enters another "room", evaluates and writes the final assessment.*

Approx.

16:45 The assessment committee re-joins the "Defence room" and announces its decision.

17:00 End of event

### HOW TO PARTICIPATE

This PhD defence will be carried out in hybrid format, meaning you can join on location or online:

#### *Location*

Aalborg University Copenhagen  
Auditorium (A) 1.008  
A.C. Meyers Vænge 15  
2450 København SV

#### *Online*

Zoom  
<https://aaudk.zoom.us/j/67535550911>  
Meeting ID: 675 3555 0911  
Passcode: 910048

### REGISTRATION REQUIRED

Registration required for both participation formats at [inst.build.phd@build.aau.dk](mailto:inst.build.phd@build.aau.dk)  
Sign-up deadline: 24 November 2021