

## Development of a textile-based false façade for thermally insulated greening

### Objective

The goal was to develop a green facades system that would allow building surfaces to be greened using a simple, modular segment design, as well as to select suitable plants.

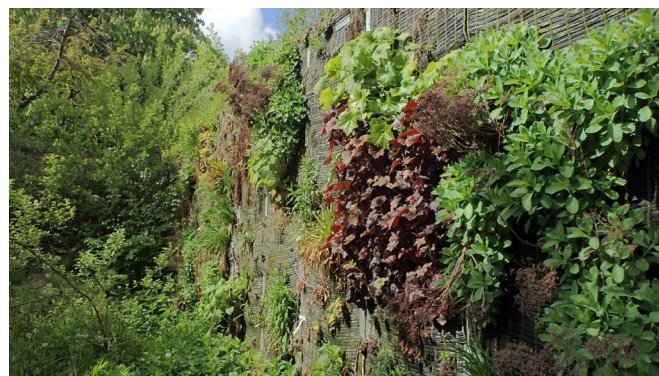


### Approach and results

High-performance yarns, nonwoven strips, and/or bundled trimmed edges were processed into right-right warp-knits with weights from 2,072 to 3,300 g/m<sup>2</sup>. The water storage capacity of the mats reached up to 20 L/m<sup>2</sup>. Integrated wicking materials enable capillary water transport. A sandwich construction consisting of two knitted PET mats with an intermediate nonwoven (PET/CV) achieved a total thickness of more than 50 mm. In field trials, the textile planting medium was tested in a false façade system equipped with a capillary gutter system for irrigation. Despite prolonged cold spells with temperatures below -10°C, the temperature behind the facade element remained above freezing at all times. The capillary water transport capacity was determined to be 0.4 to 0.5 L/h per wick (5.6 to 7.1 L/h per mat, 1 m wide). At two sites belonging to the project partners – Geisenheim University and Wirth & Co. GmbH in Chemnitz, as well as Wirth und Wiener GmbH in Chemnitz – plant growth was evaluated under various climatic conditions. Recommendations were developed for suitable plants thriving the extreme conditions of vertical greening and for this textile vegetation system. The material was resistant to weather conditions and wind speeds of up to 120 km/h. The substrate was certified to have a fire resistance rating of "B2" according to DIN 4102.



Frost-resistant capillary irrigation



Fabric-based vertical greening in May 2019

### Acknowledgement

We would like to thank the Association of Industrial Research Organizations "Otto von Guericke" (AiF) for its financial support of this research project (ZF4013810HF6), which was provided from the budget of the Federal Ministry of Economics and Technology (BMWE) as part of the "Central Innovation Program for SMEs" (ZIM). We would like to thank our project partners Wirth & Co. GmbH, Chemnitz, Wirth & Wiener GmbH, Chemnitz, and Geisenheim University for their helpful support and constructive discussions.



Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages

The final report on this project is available on request.

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19/05/2020