Technische Universität Dresden

ITM LEADING IN HIGH-PERFORMANCE FIBRE SYSTEMS TECHNOLOGY
The Research Institute of the University of Excellence TUD

Faculty of Mechanical Science and Engineering Institute of High-Performance Fibre Systems Technology: Medicine, Mobility, Energy, Infrastructure

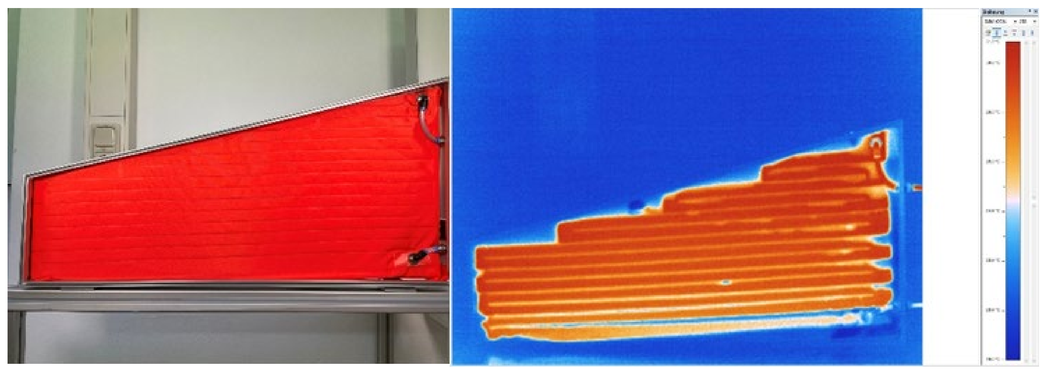
Textile-based conditioning systems for cost-efficient indoor climate control

Introduction

With the IGF project KonTex (01IF23804N), running from 07/2025 to 12/2027, we are advancing the development of textile-based conditioning systems for cost-efficient indoor climate control. Together with the Institute of Power Engineering at TU Dresden and Forschungsgesellschaft Heizung-Lüftung-Klimatechnik Stuttgart mbH (FG HLK) – The Research Organization for HVAC associated with Stuttgart University, the project builds on previously developed textile heating and cooling systems and improves and expands them with additional functionalities.
A central focus lies on local and portable heating, cooling, and conditioning solutions that support flexible workplace concepts The targets are the significant energy savings combined with measurable improvements in thermal and hygienic workplace comfort. By merging textile engineering with building energy technology, KonTex contributes to a more flexible, energy-efficient, and user-centered approach to indoor climate systems. We develop different functional patterns, one of them is welded textiles with small water channels. In this way we can heat and cool rooms or other spaces.



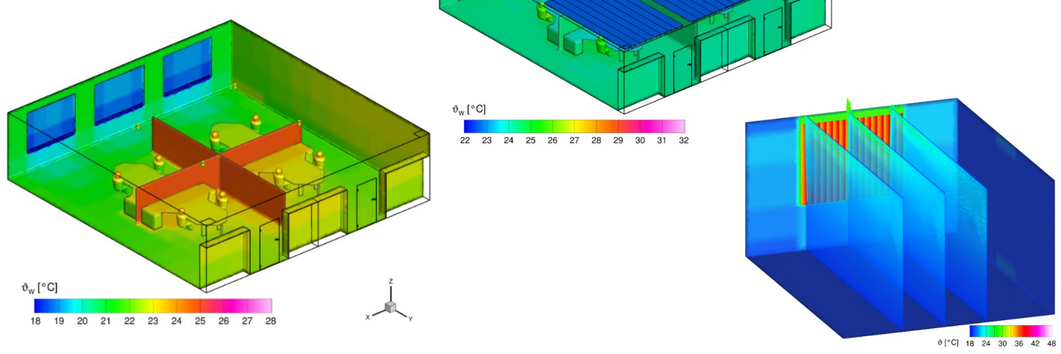
Possible application scenarios: room divider, think space [Chat gpt]



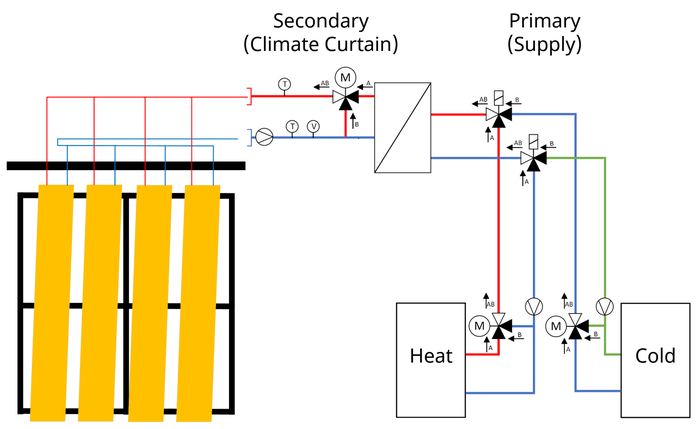
Thermoactive textile room divider module, photo on the left, thermographic image in operation on the right [IGF project TexTemp]

Procedure and results

- Defining application scenarios for textile conditioning systems
- Textile engineering development and testing of prototypes
- Numerical simulation of prototypes and application scenarios
- Development of a concept for the system integration of textile conditioning systems
- Experimental verification of prototypes
- Planning guide



Numerical investigation of the potential applications and operational limits of the prototypes in office spaces, using fully coupled transient CFD and building performance simulations. Use of the typical day method to analyse energy demand and comfort from a thermal and hygienic perspective for both heating and cooling scenarios.

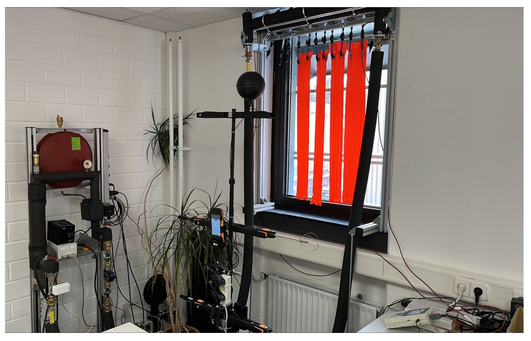


Concept of integration in building energy system

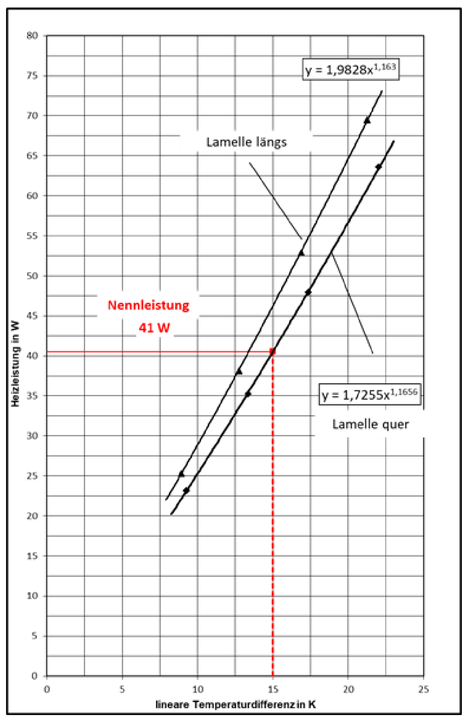


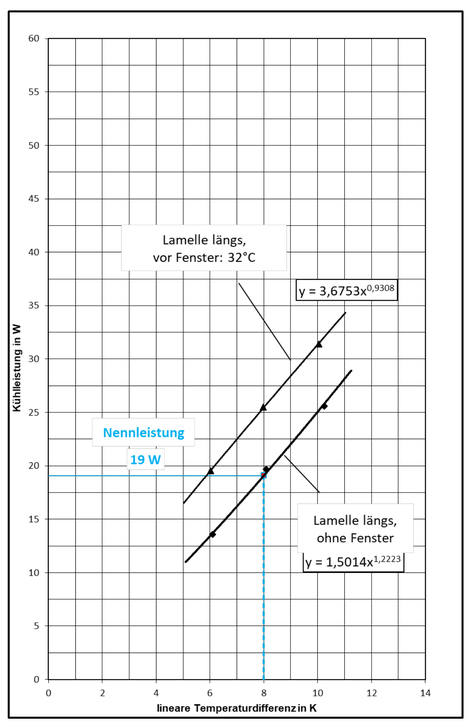
Welding of textiles by high frequencies





Curtain of thermoactive lamellas in climate chamber and field test [TexTemp]





Power measurement for heating (left) and cooling (right) per lamella 0.1m x 1.2 m; 0.12m² per side [TexTemp]

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Die TUD ist Gründungspartnerin der Forschungsallianz DRESDEN-concept e.V.
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From Atom to Product

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