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

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Abstract

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, 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 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.
In addition, the thermal and air-hygiene performance in specific usage scenarios is being investigated on the basis of simulations and measurement-based tests in climate chambers and a field trial. The evaluation criteria for the textile conditioning systems are the heat and cooling output, as well as compliance with comfort criteria from a thermal, acoustic and hygienic perspective.

Keywords: Technical textiles, climate conditioning systems, Welding Technology, Functionalization

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