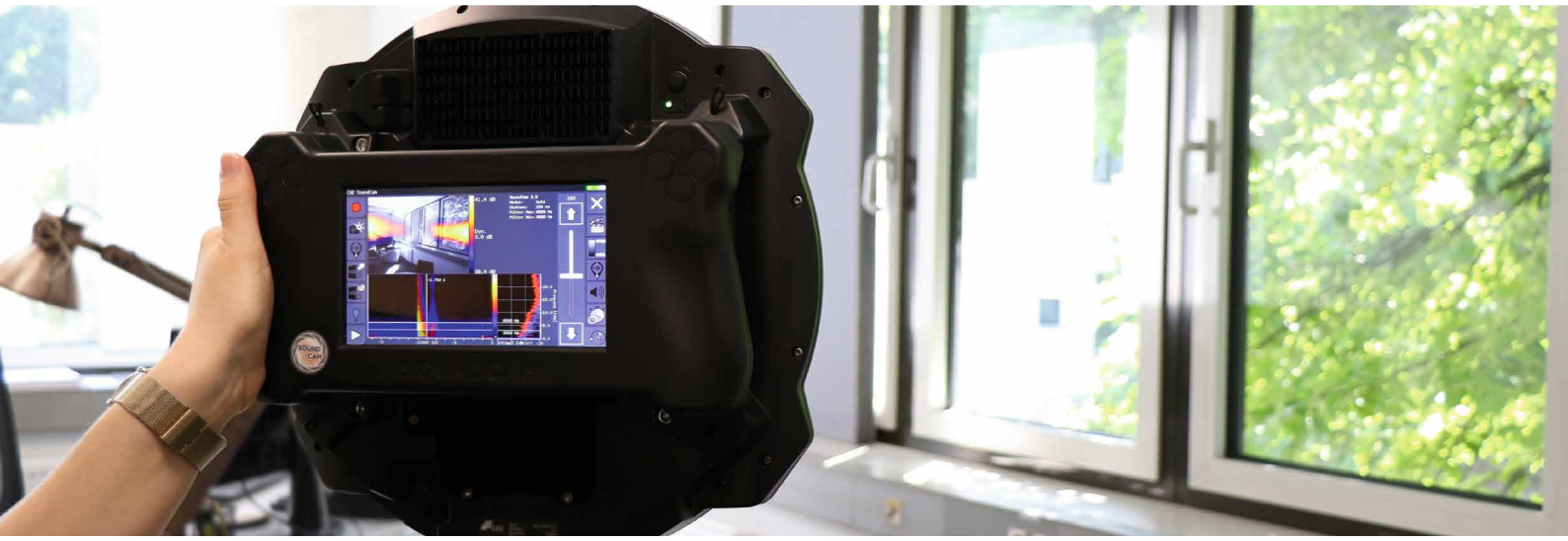
DEUTSCHE INSTITUTE FÜR
TEXTIL+FASERFORSCHUNG

Textiles:
The Future of Acoustics



Stainless steel reactors in the polymer technical center

Research topics:

Acoustically effective, textile-based materials and systems for controlling airborne and structure-borne sound:

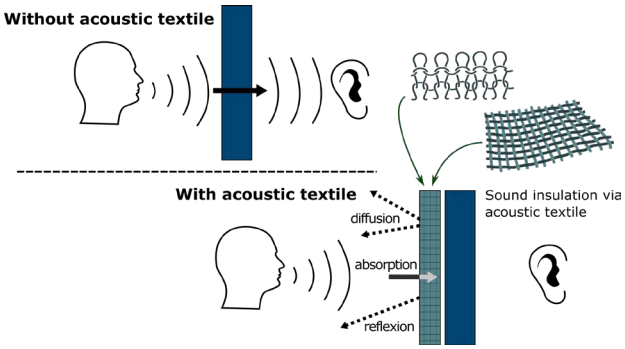
- Textile sound absorbers and sound-absorbing/insulating systems with a focus on sustainability and circular thinking
- Three-dimensionally structured acoustic metamaterials
- Textile electroacoustics, sound-emitting textiles

Range of services:

- Developments in the fields of room and building acoustics as well as vibration damping
- Knowledge transfer of technologies, processes and products between the textile and acoustics industries
- Contract measurements for acoustic material characterization (e.g. in impedance tube and semi-anechoic chamber)
- Small-scale manufacturing following the development phase

Textile-based acoustic solutions

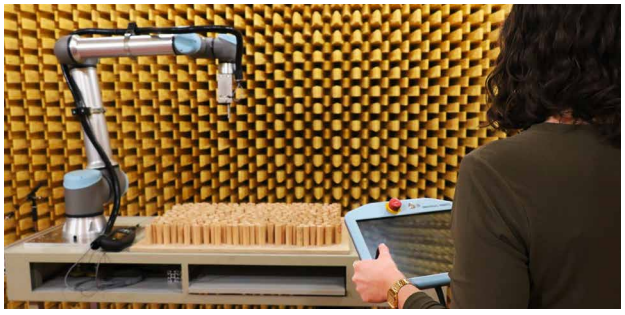
The acoustics team focuses on the research and development of textile-based, acoustically effective materials and systems which are able to influence airborne and structure-borne sound in various environments. Within this, the principles of sustainability and circular thinking are in the center of the processes. The research spectrum ranges from the development of textile sound absorbers and sound-insulating systems to three-dimensionally structured metamaterials. In addition, textile-based systems for sound emission and textile electroacoustics (loudspeakers, active noise canceling, etc.) are another area of interest.



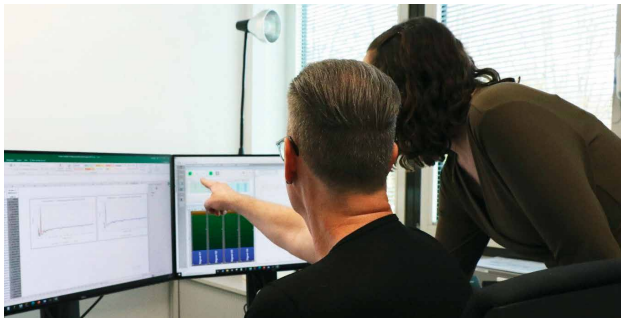
Working principle of sound transmission reduction via textile sound insulation system

Collaborations

Whether companies from the fields of textiles, mechanical engineering, interior design and architecture, audio systems or vibration and acoustic simulation – the DITF collaborate with a wide variety of national and international industry branches.



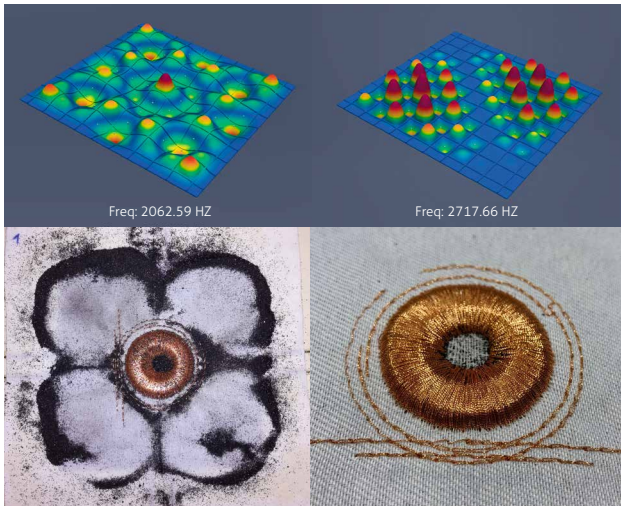
Robot-assisted measurement of acoustic properties



Evaluation of measurements in the impedance tube

Interdisciplinary work

The broad range of research areas at the DITF enables the bundling of competencies and access to extensive expert knowledge in various fields besides acoustics, e.g. in fluid mechanics, textile technology, physics, chemistry, electronics and artificial intelligence (AI), among others. This unique combination allows us to offer innovative approaches and customized solutions for your needs. Contact us to find out more about our current research projects and developments in the field of textile-based acoustics.



Top: Eigenmodes of locally resonant textile
Left: Chladni figure of textile resonator
Right: Textile resonator

The German Institutes of Textile and Fiber Research (DITF) form the largest textile research center in Europe. From the molecule to the finished product, the DITF conduct research and develop products along the entire textile value chain, always taking into consideration the corporate processes and business models. A wide range of textile testing services, prototype construction and a pilot factory complete the offer.

The Technology Center E-Textiles & Acoustics develops textiles with sensory and actuator functions as well as textiles for sound insulation and sustainable noise reduction concepts.

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