Univ.-Prof.
Prof. h.c. (Moscow State Univ.)
Dr.-Ing. Dipl.-Wirt. Ing.
Thomas Gries
Institutsleiter

Inga Noll
Wissenschaftliche Mitarbeiterin

Mein Zeichen: NL
08.12.2018

Project titel:	Development of a fabric with increased sound absorption capacity through the use of non-circular fibers (SoundTex)
Partners:	Carl Weiske GmbH & Co. KG, Hof Gebrüder Munzert GmbH & Co. KG, Naila Schmitz Textiles GmbH & Co. KG, Emsdetten
Duration:	04/2018 – 03/2020
Funding:	Zentrales Innovationsprogramm Mittelstand (ZIM) of the Federal Ministry of Economics and Energy

Mission Statement:

More than 50 % out of 15 million office workplaces in Germany are open-space offices. Due to the architectural change, clear and open structures, mostly concrete walls and the use of glass elements are preferred. This leads to poor acoustics, as sound can only be absorbed by individual absorber elements, furniture, carpets or ceilings. Office noise, in particular conversations between colleagues or phone calls, has a negative effect on the concentration of employees in the room. According to studies on the effects of office noise, the efficiency of employees is reduced by 10 %. Noise affects the vegetative nervous system and is considered a stress factor. A study by the Federal Statistical Office has shown that the second most common cause of stress at the workplace is noise and vibration. This is also reflected in the sickness rate. At the same time, motivation is reduced, which, according to a study by the market and survey institute Gallup, amounts to an annual economic loss of up to 118 billion euros in Germany. This means that wherever sound is perceived as disturbing, the degree of sound absorption must be increased. In order to be able to guarantee the required sound absorption coefficients of acoustic textiles depending on the application, thick layer structures are required. On the one hand, this requires a high material input; on the other hand, this cannot be reconciled with architectural trends towards optically clear structures and geometric arrangements in buildings in a large number of applications. This leads to a deficit in acoustic equipment.

The aim of this research project is to increase the sound absorption of acoustic fabrics by using non-circular fibers. In contrast to conventionally used round fibers, the highly specific surface of profile fibers and the associated setting of a porous textile structure allow sound waves to be absorbed to a particularly high degree. To achieve a sound insulation class B (α = 0.8 - 0.85) with a specific weight of 150 g/m^2 is the goal. Compared to established acoustic textiles, a higher sound-absorbing effect is achieved with a lower weight per unit area. This particularly favors the use of sound-absorbing textiles in the form of upholstery and decorative fabrics such as curtains in open-space offices. As a result, a targeted reduction in office

noise is achieved, which improves the quality of life and performance of the employees.

Aproach:

In this project, the company *Carl Weiske GmbH & Co. KG* is developing a flame-resistant material for the production of non-circular fibers for acoustic textiles and is investigating the up-scaling of filament extrusion. The Institute of Textile Technology is responsible for the production of the profile fibers on a pilot scale and the subsequent optical and mechanical analysis. The fabric production and the analysis of the application potential with regard to the upholstery fabric are carried out by the company *Gebrüder Munzer GmbH & Co. KG*. *Schmitz Textiles GmbH & Co. KG*, as an associated partner, also investigates the manufacture of fabrics, taking into account the requirements of a decorative fabric, so that the development carried out in the research project can be placed on the market with a maximum multiplier effect. The Institute for Technical Acoustics of the RWTH Aachen University acts as a subcontractor, advising on the design of the acoustic fabric and taking measurements in the impedance tube. The demonstrably best parameter combination for increasing sound absorption is mapped on an industrial scale by up-scaling and the market launch is validated under consideration of technical and economic aspects.

Acknowledgements:

We would like to thank the support of the Federal Ministry of Economics and Energy, AiF Projekt GmbH, for funding within the framework of the program „Zentrales Innovationsprogramm Mittelstand“.

Contact:

Inga Noll, M.Sc.
Group Leader Spinning Processes and -Technology
Otto-Blumenthal-Str. 1
52064 Aachen
Fon: +49 (0)241 80 23429
Email: inga.noll@ita.rwth-aachen.de