

WELCONTEX 2 - Welded electrical interconnection technologies for smart textiles production



Collective Research networking CORNET - 28th Cornet Call



Project partners: Fraunhofer IZM Berlin
UWB - University of West Bohemia, Pilsen
VUB a.s. Ústí nad Orlicí

Project Coordinating Association Forschungskuratorium Textil e. V. - FKT (Germany)
Participating Association CLUTEX - cluster technical textiles (CZ)

Solution time: 07/2020 – 06/2022

Project objective

A major challenge for the mass production of textile-integrated electronic systems is the availability of a reliable and cost-effective interconnection technology. As this has not yet been sufficiently resolved in the industry, WelConTex2 project will concentrate on the development of reliable joining technologies and suitable conductor materials.

Most textiles are made of thermoplastics or can be coated with a thermoplastic material or a film. Ultrasonic plastic welding (UPW) can therefore be particularly suitable as a scalable connection technology for conductive textiles with one another or for the integration of electronic components.

Project goal

Within the WelConTex preliminary project, the partners completed the development of interconnected embroidered conductive threads and metallized fabrics using ultrasonic plastic spot welding.

Based on the successful results of its predecessor, the new project aims to develop new generation of reliable flexible conductive threads able to be embedded in stretchable elastic ribbon, as well as to transfer ultrasonic welding technology from spot to roll technique. The ultrasonic roll welding process enables continuous manufacturing and could become the first mass production method for making smart textiles.

Alternatively, resistance welding and the combination of resistance and ultrasonic spot welding are being developed in the project and the suitability of UPW as a through-hole technology for soft thermoplastic circuit boards is being investigated.

The results of this project will be seen in industrial manufacturing of smart textiles in automotive, healthcare and workwear applications.