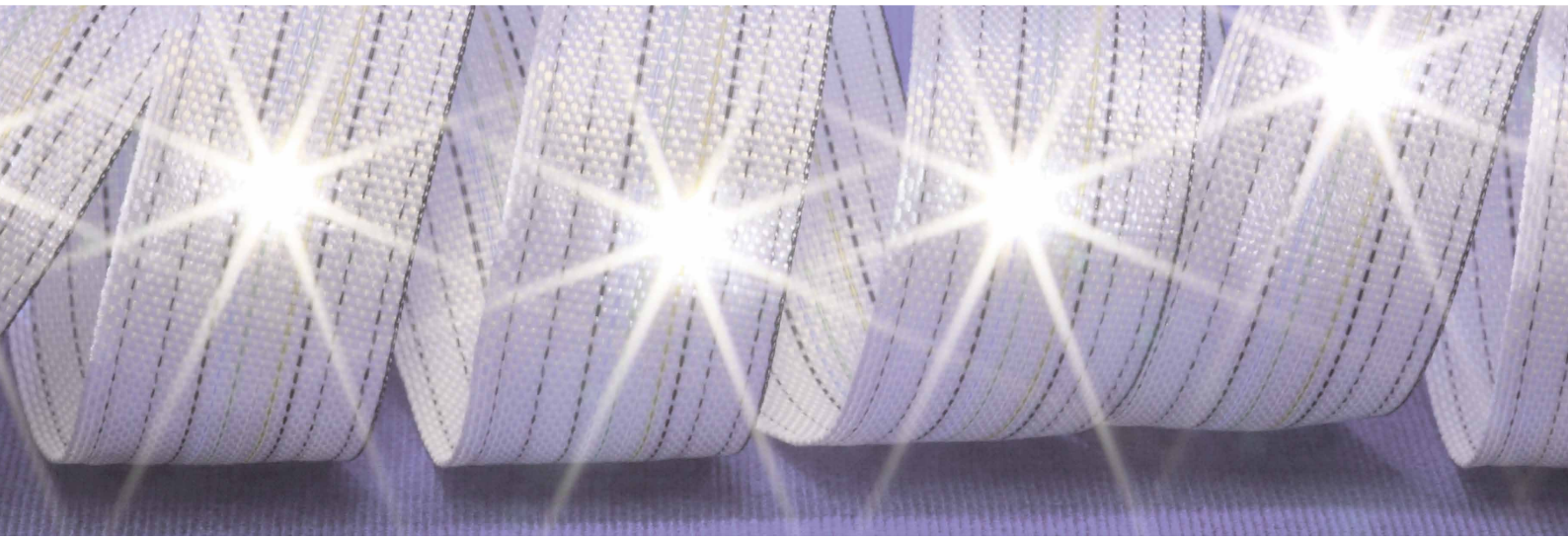
DEUTSCHE INSTITUTE FÜR
TEXTIL+FASERFORSCHUNG

E-Textiles: Electronics and microsystems meet smart textiles



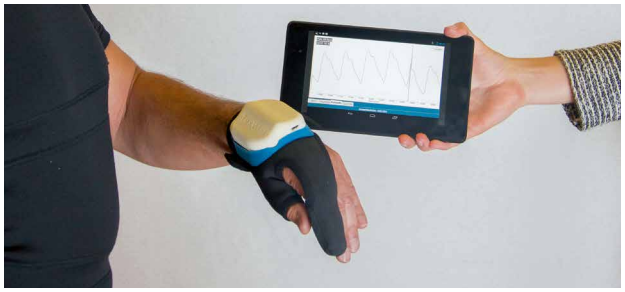
Ribbon fabric with insulated conductors and LEDs integrated in waterproof manner

Research topics

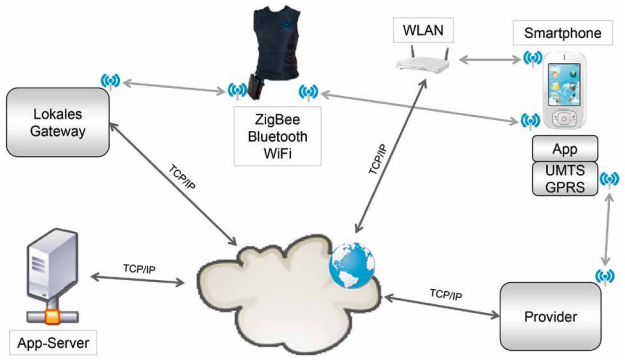
- Integration of electronics and microsystems technology in textiles
- Development of textiles with electrophysical properties
- Wearable computing
- Energy supply
- Development of new connection, assembly, and production technologies
- Sensory fiber composite structures

Range of services

- R & D of E-Textiles for technical textiles, health care, protective textiles, sports and leisure
- Development of new production methods for E-Textiles
- Knowledge transfer between textile and electronics industry for technologies, products, and processes
- Application developments in the field of miniaturization and micro-systems technology for intelligent textile products and processes
- Rationalization and automation for the production of E-Textiles
- Industrial pilot production for industrial research in small series



Recording and determination of ECG, oxygen saturation, and blood pressure



Information and reporting system for vital monitoring and emergency monitoring *Source: COSI*

Interdisciplinary project work

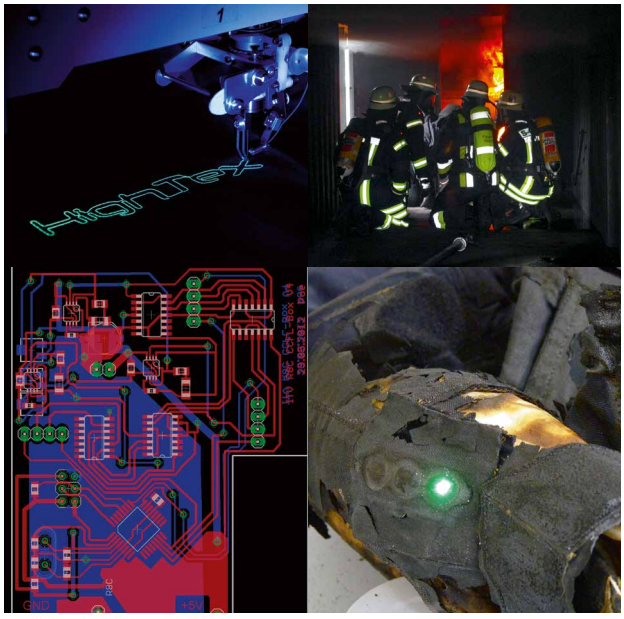
The complex topic of E-Textiles utilizes synergetic effects by combining the knowledge of the different branches of research at the DITF. The linked special fields, among others, are textile technology, textile finishing, mechanical and process engineering, electronics and electrical engineering, chemistry, physics, and biology, and last but not least information technology and cybernetics.

Cooperations

In the wide field of E-Textiles an interdisciplinary approach is essential. DITF Denkendorf work in close cooperation with other institutes and companies, especially in textile and clothing technologies, electronics, mechanical engineering and toolbuilding, medical engineering and chemistry.

Fields of application for Smart Textiles

The DITF Denkendorf investigate and develop technologies for E-Textiles with focus on textile-integrated/based sensor technology, electrical actuators, electronic and electrophysical functions as well as energy generation. Thus, completely new markets are opened especially for the textile, electronics and microsystems industry. These developments affect areas such as health care, workwear, protective clothing, sports, leisure, and technical textiles (automotive, industrial, and constructional applications). Among others one research field is the integration of photovoltaic systems into textile structures. Also sensor and actuator technology for autonomous systems with limited power supply in textiles are of importance. Electrostatic charging/discharging as well as electromagnetic shielding in textiles are important topics too.



Top left: Embroidered, electroluminescent yarns
Top right: Sensory protective jacket in use
Bottom left: Electronics development for controlling of electroluminescent yarns
Bottom right: Sensoric protective jacket after Thermo-Man-Test® (flame-treated at 1000 °C)

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.

At the Technology Center E-Textiles & Acoustics, functional textiles are created by combining them with electronics and microtechnology, as well as textiles for sound insulation and sustainable noise reduction concepts.

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