

**TITV Greiz – The institute for special textiles and flexible materials**



# TITV Greiz – Research for Smart Textiles



**Founded** 1992 in Greiz / Thuringia

**Team of from** ~ 60 Experts  
textiles, confection, physics,  
chemistry, medical engineering,  
electro technology, electrochemistry,  
materials, physical engineering

**Funded research projects**

**Individual contract research and development**

**Prototyping**

**Accredited testing laboratory**

**Conference / workshops/ seminars**

# Technology

## Special threads and fabrics

- Special thread construction
- Wide/ narrow weaving (dobby/ jacquard)
- Weaving embroidery
- Rope weaving
- Warp knitting machines (Spacer fabrics)
- Seamless knitting
- Pattern weaving
- Flat knitting

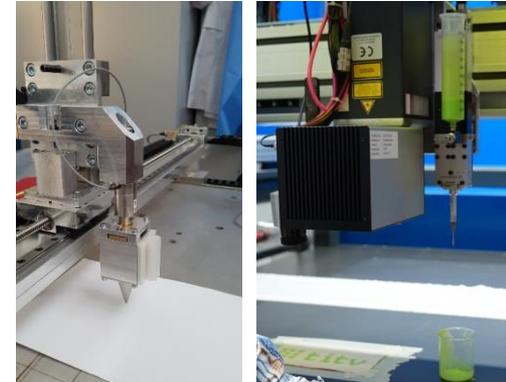
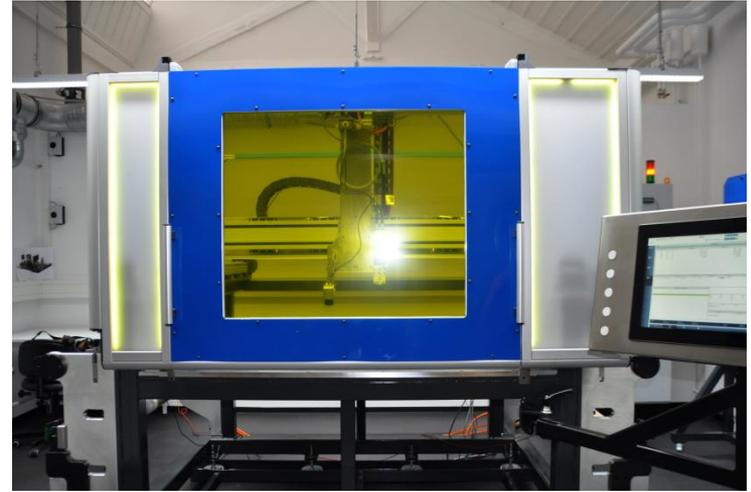
## Surface functionalisation on threads and fabrics

- Chemical Vapour Deposition (CVD)
- Continuous thread coating
- Textile electroplating/ electrochemistry
- Modular Coating
- Modular tape finishing
- Coating/ finishing/ plating/ laminating
- Digital printing
- Powder coating



# Technology for Smart Textiles

- Multi-head special embroidery for PCB production and component assembly
- FSD™
- Laser
- Sewing
- Components pick and place system
- Textile contacting & bonding
- Testing, Measuring & controlling equipment
- Smart textiles testing
- Digitally connected handling



# Technology for Smart Textiles

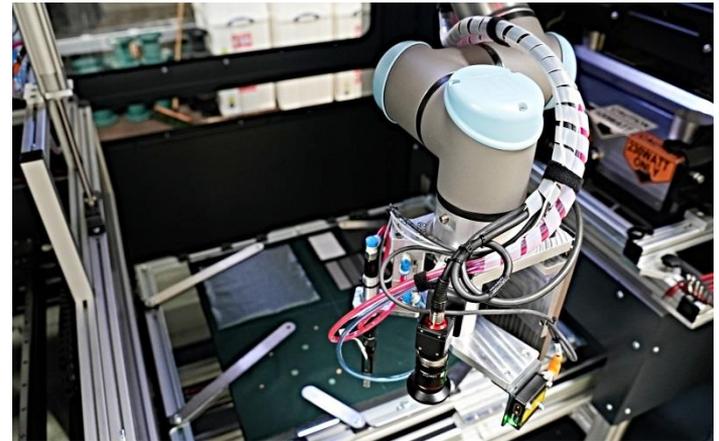
- Functionalization technology
- Individual functionalization of textiles by powder coating using laser fixation
- Combination of powder application and CO2 laser fixation in one installation space
- Current process developments



# Technology for sustainable material cycles

## SmartAutoSort - Sustainable smart textiles

- How can high-tech textiles improve their recyclability?
- New process & technology for recycling valuable raw materials (precious metals, electrical & electronic components)
- Automatic detection, separation and sorting
- Analysis using camera and sensor technology
- Cutting laser separates textile from other components
- Robot-assisted sorting into relevant collection points
- Digitally connected handling



# Accredited Testing Laboratory

- Physical textile testing of fibers, threads, surfaces, fabrics
- Chemical-analytical tests on textiles and consumer goods
- Material testing
- Pollutant analysis
- Reliability of Smart Textiles

Accredited acc. to  
*DIN EN ISO/IEC 17025:2005*



# Methods and devices for smart textiles testing

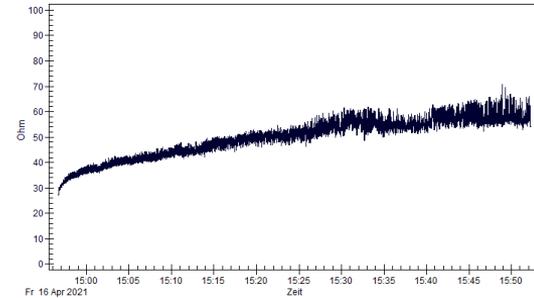
Combination of **textile** and **electrical** function tests for the evaluation of smart textiles

**Example: Torsion and bending tests in correlation with the measurement of electrical resistance:**

- Connection between electrical and textile components
- Flexible electronic connections
- Conductive tapes



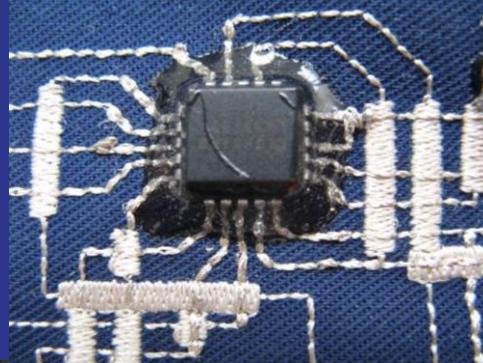
Testsiegel  
„Smart Textiles“



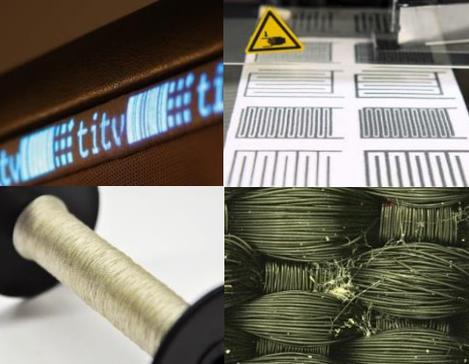
FLEX-O-MAT with online monitoring to determine the electrical resistance



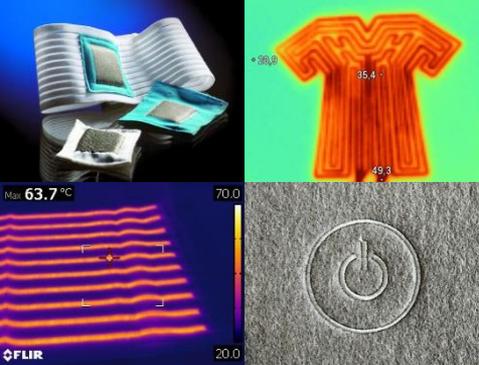
## SMART MATERIALS AND PROCESSES



## SPECIAL TEXTILES AND FLEXIBLE MATERIALS



## SUSTAINABILITY AND CIRCULAR ECONOMY



## KNOWLEDGE TRANSFER RESEARCH



## SURFACE FUNCTIONALIZATION

# Services of TITV

## Research service and consulting

- Development of innovative products and processes
- Samples, demonstrators and prototyping
- Process and product optimization
- Testing and evaluation of new techniques and technologies
- Renting our technical centers including professional advice
- Feasibility studies

## Testing services

- Accredited laboratory
- Method development for testing smart textiles
- Seal of approval “*TITV tested*” - Objective and transparent proof of quality

## Participation in networks and research projects

## Qualification of your employees

- Seminars
- Individual trainings, workshops

**Organization of small and series production**, adjusted to your requirements and needs



# Thank you for your attention!

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