



RWTH, Peter Winandy

Institut für Textiltechnik of RWTH Aachen University

Our research infrastructure

Machines, Laboratories, Buildings

- Technical centre with 250 textile machines and test setups for all textile process levels from fibre to product
- Testing laboratories from polymer to textile
- Workshops for mechanics, electronics and software
- Buildings:
 - „INNOTEX“ with 4,000 m² (technical centre and office)
 - „Spinnturm“: 1,000 m² (technical centre for melt spinning)
 - „Centre für High Performance Fiber Materials“ CFM: 1,000 m² (especially carbon fibre production)
 - Additional offices in another building (Kackertstr. 9)
 - Different premises (offices and technical centres) in other establishments (in planning)

Machinery yarn production/structure

- Technical centre for spinning:
 - Melt and solution spinning from 10 g → 100 kg polymer
 - Technical centre for carbon fibres: precursor, stabilisation, carbonisation
 - High temperature and bico-systems, electrospinning (solution & melt)
 - Glass/basalt spinning machine
- Staple fibre yarn production plus preparation:
 - Opener, rubber condensor & frame, card, flyer, spooling and cleaning
 - Ring spinning, rotor spinning,
- Structure
 - Texturising (false twist, air, crimper)
 - Hybrid yarn processes (entanglement, OE-friction) and twisting

Machinery textile fabrics

- Weaving
 - Different gripper and air jet machines
 - Narrow fabrics (jacquard)
 - Multiaxial fabrics (open reed weaving)
 - Pattern warping machine
- Knitted fabrics
 - Various circular knitting machines (jacquard)
 - Various warp knitting and raschel machines (jacquard, spacer fabrics)
- Nonwovens:
 - Carding machine with crosslayer
 - Airlaid, Airlay (continuous und discontinuous)

Machinery for reinforcement textiles

- Reinforcement textiles (2D textiles)
 - Warp-knitted bi- and multiaxial fabrics
 - Knitting, tailored fibre placement (2.5 -D textiles)
- ITA-Preformcentre (3D textiles)
 - Different tools for handling, binder application, sewing and tufting, quality control
 - Cutter machine and ultrasound cutter
- Braiding (3D textiles)
 - Circular braiding & 3D braiding for composites
 - Hexagonal- und small scale braiding machine for medical use
- Coating
 - Different coating systems plus in-situ polymerisation

Machinery for joining and other machinery

- Joining process/manufacturing
 - Different sewing machines
 - Welding systems (ultrasound, thermal)
- Others
 - Tribological test stand
 - Tow spreading test stand
 - Autoclave
 - Mould production for fibre composites

Measuring technologies

- Optical:
 - Digital photography and digital editing
 - Laser-Doppler anemometer (LDA)
 - Particle Image Velocimetry (PIV)
 - Fibre orientation, 3D deformation: Argus, Aramis, Apodius measuring systems
 - Highspeed camera
 - Thermal imaging camera
- Online measuring technologies:
 - Measuring sensors for yarn tension, fibre diameter, filament friction etc.
 - Hard- and software for high frequency real time recording of online sensors and process parameters plus visualisation

Laboratories

- Air conditioned textile testing laboratories:
 - fibres, yarns and fabrics
 - tensile, strength, bending test (up to 10 to), temperature chamber and video-extensiometer
 - Digital light microscopy plus sample preparation and ultra microtome
 - SEM, Micro-CT, TEM
- Polymer laboratories:
 - DSC-TGA, DMA, FT-IR, Gas-Pycnometer, rheometry, Karl-Fischer-titration
- Other laboratories:
 - Lamination of fibre composites
 - Mineral matrices (concrete)

Workshops

- Mechanical workshop
 - Machining plus 5-axle-CNC-milling
 - Welding
 - 3D print
 - construction
- Electrical workshop
- Software and network department

Software

- Modelling, simulation, numeric, evaluation:
 - CFD Computational Fluid Dynamics
 - FEM Finite Element Method and DEM (Discrete Element Model)
 - Neural network
 - Textile modeling Wisetex and GeoDict (from CT-Scans)
 - MatLab
- Construction
 - Autodesk Inventor

Univ.-Prof. Prof. h.c. (MSU) Dr.-Ing. Dipl.-Wirt. Ing. Thomas Gries

thomas.gries@ita.rwth-aachen.de

Director of institute

Dr.-Ing. Bernhard Schmenk

bernhard.schmenk@ita.rwth-aachen.de

Head of corporate development and communication

Unsere Partner:



ITA TechnologieTransfer GmbH, Aachen



Institut für Textiltechnik Augsburg gGmbH, Augsburg



ITA Teknoloji Transfer Ltd. Sti., Bursa (Türkei)



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