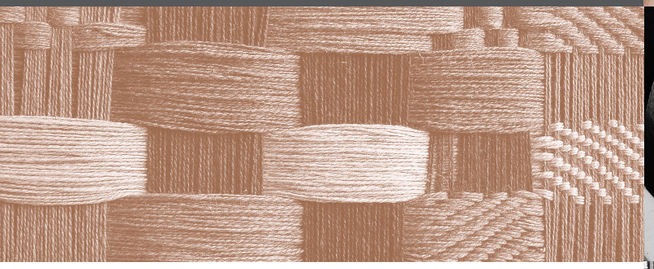
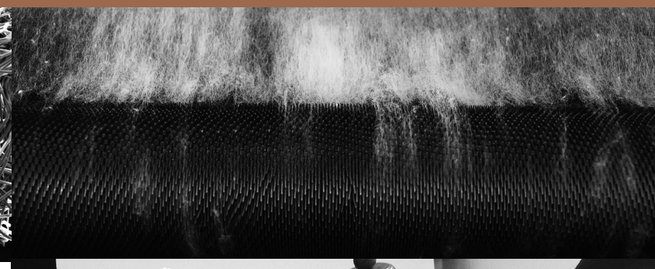


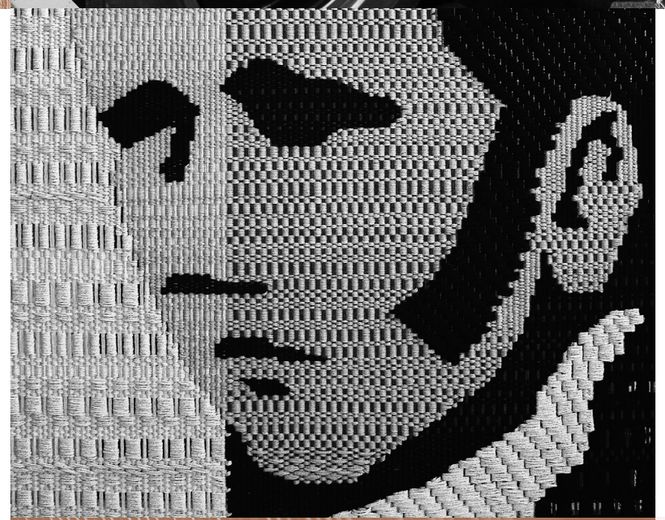


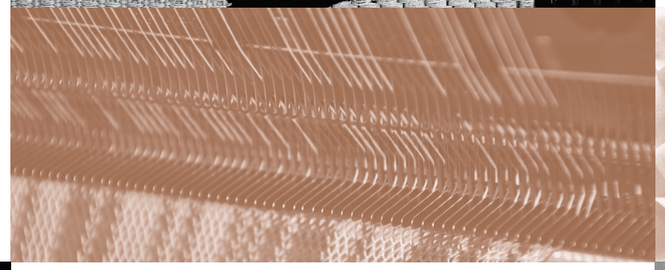
Spinning

- Mini line for production of conventional short-staple ring spun yarns – laboratory carding machine, drawing frame and ring spinning machine.
- Rotor spinning machine for production of cotton staple spun yarns from sliver.
- Single-spindle ring twisting machine enables production of maximum eight-fold yarn.
- Single-unit winding machine Autoconer X5 with yarn clearer - to rewind yarn from one bobbin on a cross-wound package with defined yarn length and with simultaneous removal of the predefined faults.
- Multifunctional twisting device DirecTwist for production of plied and wrapped yarn.

Weaving

- Hand weaving looms for interior textiles, art purposes and experimental formation.
- Weaving machine (shuttle) with jacquard shedding mechanism – weaving narrow plain fabrics, tubular and bifurcation fabrics for medical application.
- Rapier weaving machine with electronic jacquard STÄUBLI (including CAD system EAT) – production of standard fabrics for apparel and technical applications.
- Rapier laboratory weaving machine with electronic dobby – production of the fabrics (including leno fabric) from standard and special materials optical fibres, nitinol, basalt, carbon fibre, hollow fibres, etc.) for apparel and technical applications.
- Rapier laboratory weaving machine with electronic jacquard BONAS – production of the fabrics from standard and special materials basalt, carbon fibre technical applications.





Production of nonwovens and nanofibrous materials

- Industrial line for the production of nonwovens, opening machine, carding machine, cross lapper, needle-punching machine.
- Meltblown pilot plant for micron fibre production.
- BIAX pilot plant for micron and submicron fibre production.
- Laboratory heated press machine, hot melt technology, powder coating, and laminating machine.
- Thermal bonding using industrial and laboratory hot air chambers.
- Technologies for the production of nanofibers using DC and AC voltage (Nanospider, AC spinning).
- Apparatus for perpendicular fibre laying and bulk NT (Struto, Rotis).
- Equipment for application of latex binders.
- Equipment for centrifugal spinning and ultrasonic bonding.
- Fibber production by drawing technology.

Braiding

- Circular braiding machines for production braids with or without the core Bobbin lace machine.

Knitting

- Raschel machine (laboratory version) with six guide bars for production warp knitted fabrics for technical application from standard and special materials.
- Double needle bar raschel machine with six guide bars for production 3D warp knitted structures, (possibility of construction spacer textiles with distance max. 15 mm, fully or with tubular part).
- Crochet machine for knitting narrow width structures, belts, tapes with inlaid yarn passing across one or more wales.
- Small-diameter circular knitting machines with gauges E 20, E 25 for testing „knittability" of threads.
- Double cylinder sock knitting machine for sock producing.
- V-bed flat knitting machines with individual needle selection used for 2D, 3D shaped product (option with flechage and inlay patterns).
- Single-purpose V-bed flat knitting machine with group needle selection, gauge E 30 for tubular knitted structures with different diameter.
- V-bed flat knitting machine with group needle selection, gauge E 4, E 5, E 6, E 7, E 8 for art purposes and experimental formation.
- Knitting systems for patterning (Text Mind – Warp Knitting Pattern Editor, EAT – Victor Raschel, APEX 3, M1PLUS).

Conventional and unconventional joining methods

- Industrial lockstitch sewing machines with drop feed (SIERUBA L818F-M1, BROTHER DB2-B755-403A, JUKI DDL-888).
- Industrial lockstitch sewing machine with compound feed (Brother Idustries DB2B721-3).
- Industrial chainstitch machine (Brother Industries DT4B261-012-0).
- Overlock machine (SIRUBA model 747E).
- High-speed flat bed interlock stitch machine (SIRUBA W122-356).
- Double needle industrial lockstitch sewing machine (Brother LT2 - B842-3.
- Eyelet buttonholing sewing machine (Brother DH4-B980), button sewing machine.
- Continuous fusing press (Mayer RPS-MINI), discontinuous fusing machine and industrial steam iron.
- Hot-air seam sealing machine with front off-set post and 25 mm wide feed rollers (PFAFF 8303-040).
- Ultrasonic welding machine (PFAFF 8310-142 / 001).
- Welding machine for hot wedge bonding (PFAFF 8340-020 / 01).
- Hot air and/or hot wedge welding machine (PFAFF 8340-020 / 01).
- Tajima embroidery machine (model TEJT – C, 15 colors, 1200 stitches/ min).

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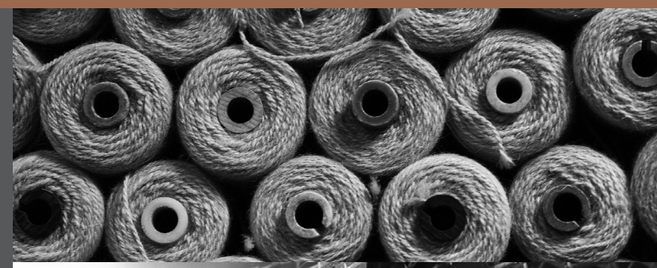
Production Labs & Facilities

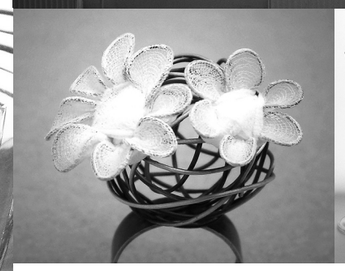
Printing and other processing procedures

- Digital printing using a MIMAKI Textile Jet TX-1600S.
- Printing table with magnetic squeegee for printing with flat template (max. width: 53 cm).
- IR laser-guided surface treatment of textile substrates and-patterning.
- Device Foulard for depositing solutions and suspensions on porous materials and other fabric treatment.
- Plasma and microwave reactors for modifying textile surface.
- Spray drying device for the preparation of capsules.
- Measurement of the Rheological properties - optimizing the composition and quality of printing pastes using VT550 Viscometer,
- Ultrasonic Homogenizer for process intensification of textile chemistry, preparation of emulsions and suspensions
- Dyeing apparatus AHIBA NUANCE ECO with infrared heating.
- Special transfer printing equipment.

The main objectives and activities

- To develop special textile structures or their modifications to increase utility value of products using laboratory or equipment for the spinning, weaving and knitting,
- To produce nonwovens and nanotextiles,
- To produce multi-layered composites, 3D woven and knitted structural composites and nanoparticle reinforced composites,
- To perform printing, skimming (depositing), specific processing procedures (laser, encapsulation, microwaves) sewing and unconventional bonding,
- To use computer programs (TEX-Design, TEX-Dress, TechKnit, TexCheck & TexLine) from conception of design idea to manufacture of end product,
- To design clothes using professional software (CoralDraw & Adobe Photoshop),
- To process design of fabrics using CAD EAT systems,
- To process constructional solution design using CAD Inves Mark Futura, Design concept, MTM, ClasiCAD,
- To schedule industrial production with assistance of Optiplan CAM or Wittness system.





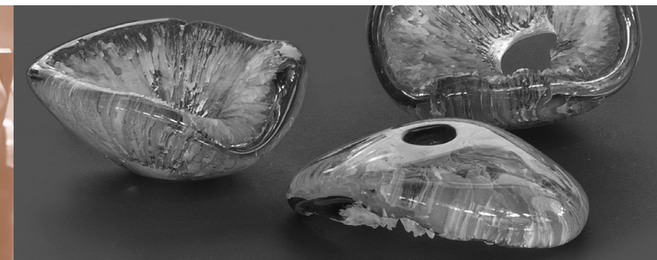
Glass and Jewellery

- Jewellery workshop for making bijou and jewellery products,
- Casting equipment - Mix Cast from Auren company,
- Electric kiln for slumping glass and dye fixation,
- Blasting equipment - sandblasting box for surface treatment of glass,
- Engraving and grinding machines for surface treatment of glass.

Field of specialization

- Development of comprehensive solutions for Glass, Jewellery and Textile accessories - from draft design upto complex presentation of the final product,
- Modification of the jet and ring spinning,
- Development and testing of special textile structures to allow controlled moisture transport,
- Development, manufacture and testing of textile structures with special optical effects. Use of optical fibers in jacquard patterning and multipurpose fabrics,
- Development, manufacture and testing of complex thin-walled woven and knitted structure for synthetic vascular grafts,
- Modification of yarn for subsequent production of special fabrics and knits with the option to increase the utility value of the fabrics, or to reduce material and energy intensity of production,
- Use of optical fibers, shape memory materials, hollow fibers and profile fibers for innovative technical products,
- Development of constructional solutions for highly functional sports clothing with increased safety,
- Implementation of sensors into textiles and their interconnections by conductive pathways,
- Use of plasma and laser for treatment of textiles. Use of non-traditional ways of intensification of treatments (ultrasound, microwaves) and fixation of active substances on textiles (encapsulation, coating, layers),
- Use of nanotechnology - photocatalysis using TiO_2 nanoparticles; preparation of inorganic nanofibres through electrospinning of polymer solutions prepared by sol-gel method,
- Experimental research through analysis of newly developed textile structures containing nanoparticles and nanofibers from the point of view of mechanical, thermal, electrical, electro-magnetic, filtration, transport and biological properties,
- Development, manufacture and testing of new and modified textile structures mainly for hygiene, healthcare and industrial applications such as filtration,
- Processing of different types of staple fibers by mechanical means; strengthening of nonwoven textiles mechanically, thermally, chemically or by appropriate combination of technological processes,
- Production of nonwovens using meltblown and preparation of nanofiber layers by different procedures,
- Application and evaluation of final treatment - hydrophobic, oleophobic, antistatic, non-shrinking, wrinkle-resistant, soiling and non-flammable properties,
- Qualitative and quantitative analysis of fibers; determination of the content of individual components in a fiber mixture,
- Impact of individual components of the printing paste on the final print parameters and objective evaluation of their shades,
- Efficiency of the washing process, evaluation of detergents, evaluation of bleaching agents including stabilizers and efficiency of sequestering substances; optimization of dyeing processes and patterning.

Spinning • Weaving • Stranding • Knitting • Production of nonwovens • Connecting conventional and unconventional • Printing and treatment procedures • Glass and Jewellery



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