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Faculty of Textile Engineering

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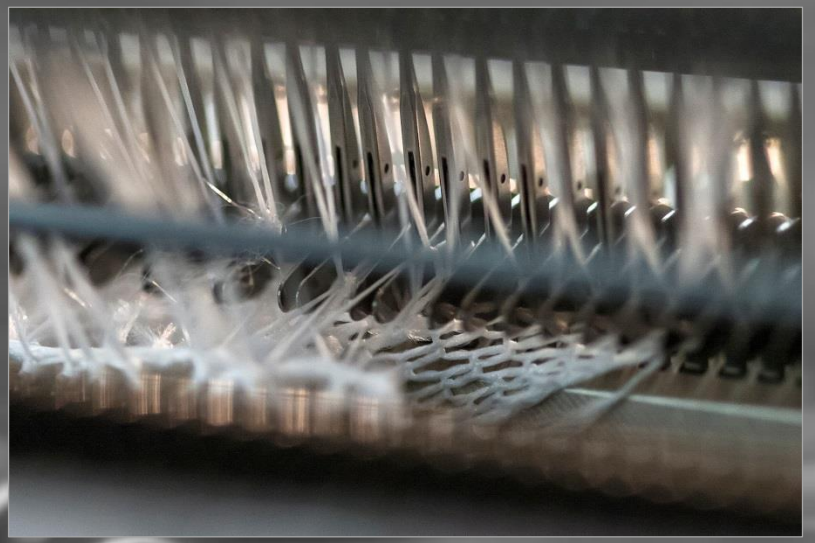
Research & Inovations

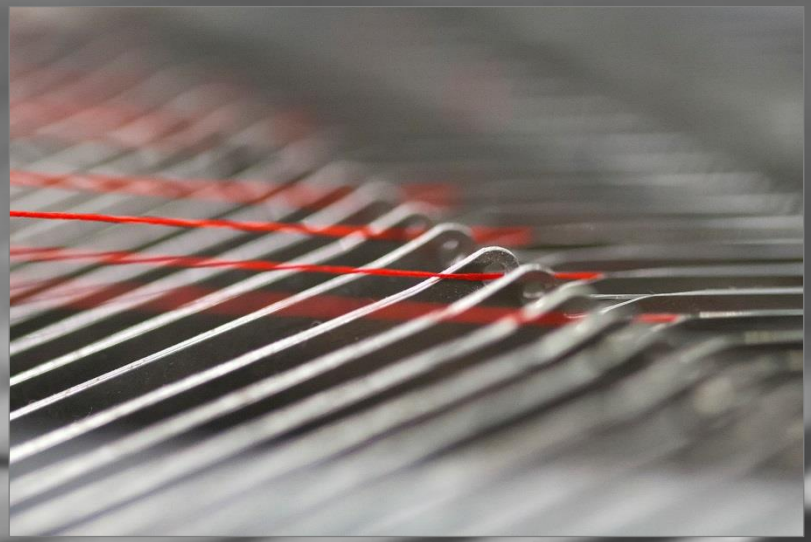
DEPARTMENT OF TEXTILE TECHNOLOGIES FT TUL

Knitting

Warp knitting

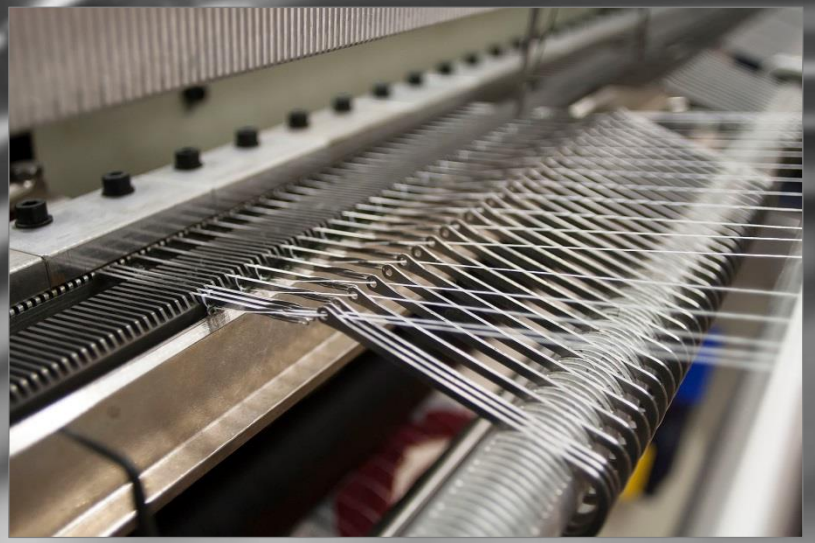
- Electronic double needle bed knitting machine - Rius Mini-Tronic MT.
- Variable distance between needle beds, gauge 12E, work width 800mm, 6 pattern bars.

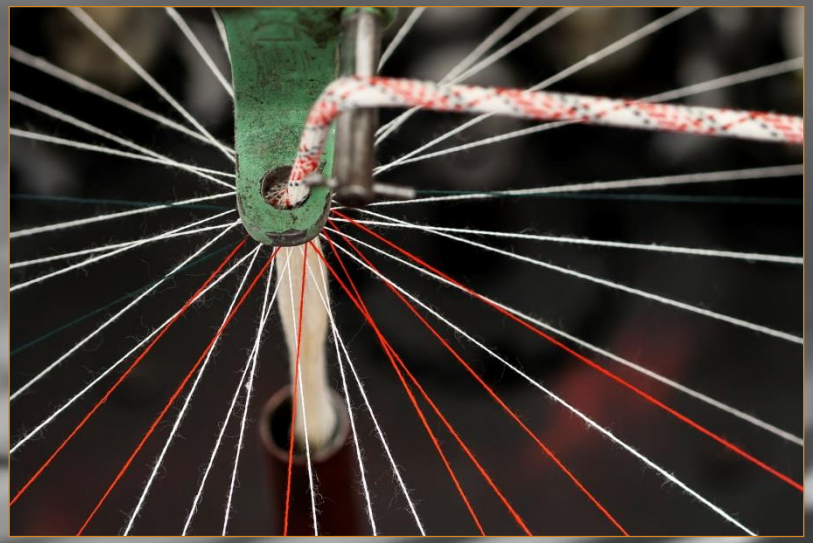


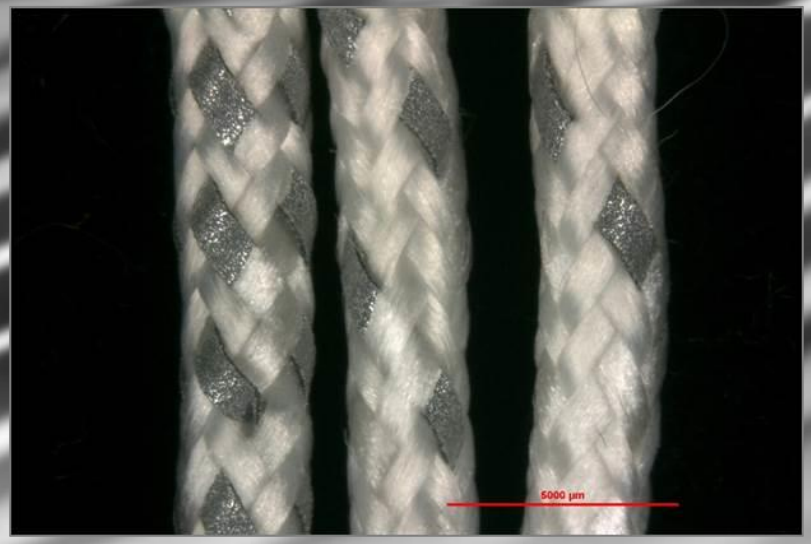


Warp knitting

- Crochet machine - Rius Medical, gauge 10E







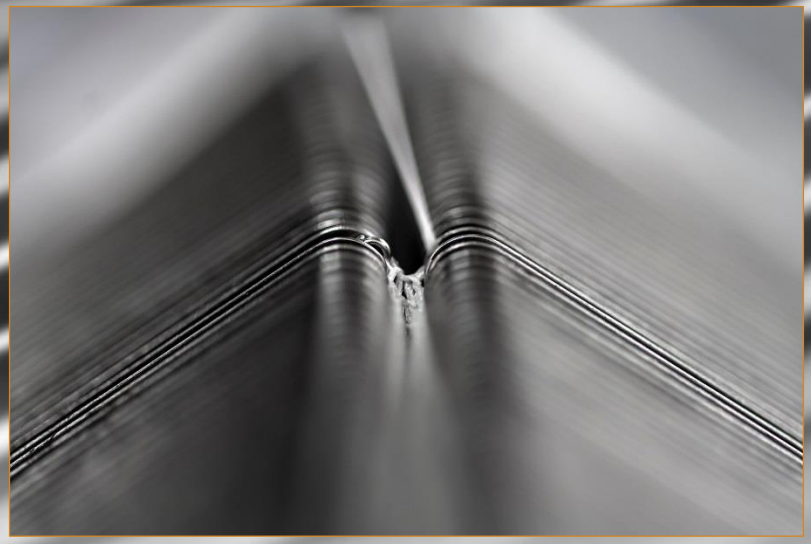
Braiding

- Braiding machines with different number of spindles: 2x16; 40; 96 spindles
- Production of ropes with and without core

Braiding machines

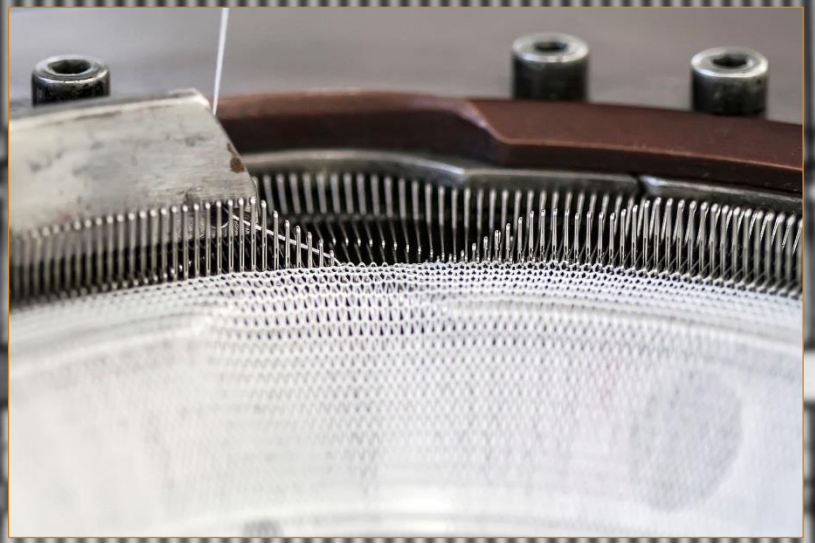
Weft knitting

- Flat knitting machine for medical use - Harry Lucas (gauge 30E)

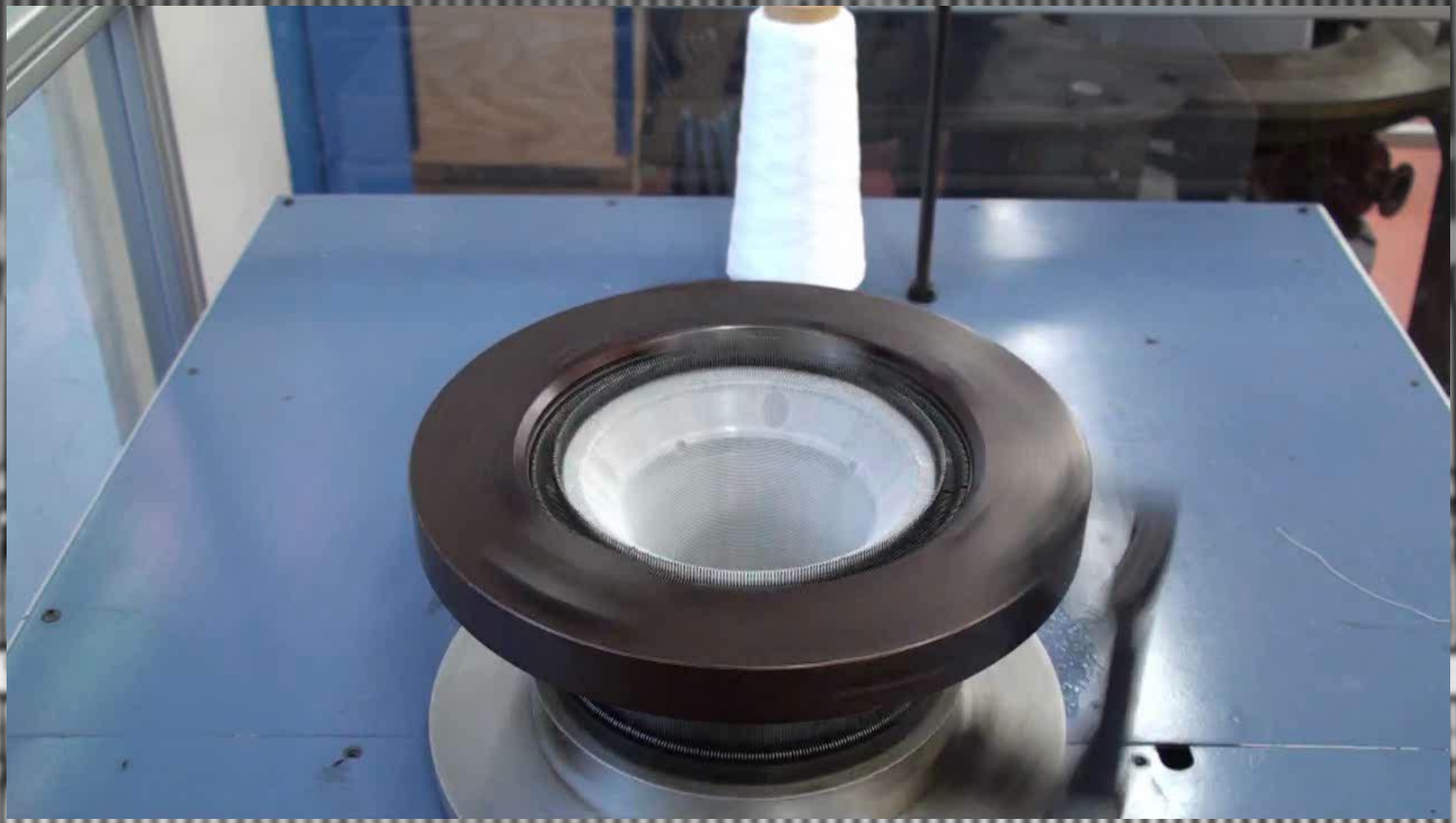


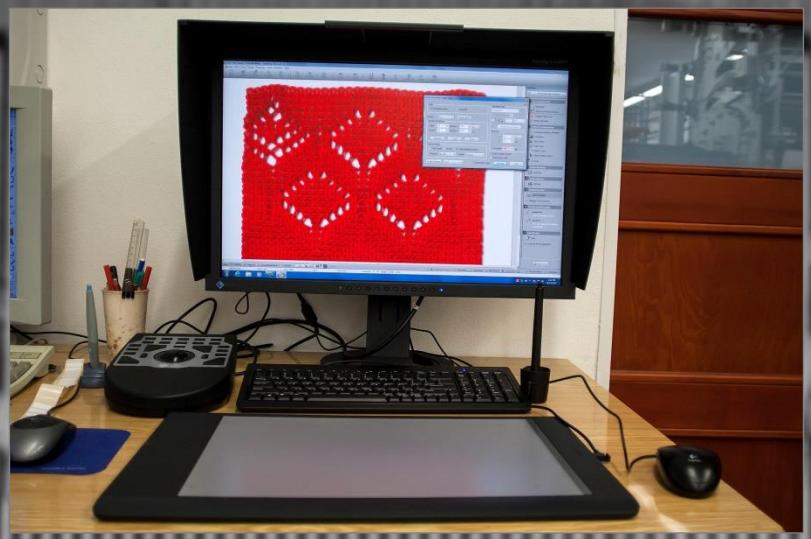
Weft knitting

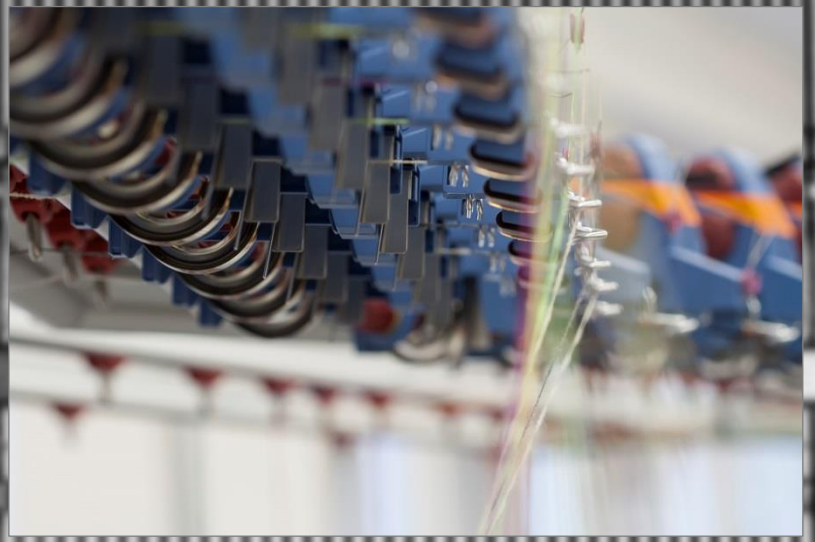
- Circular knitting machines
- Fine rib circular body knitting machine Terot, 15E, d13"
- Plain circular knitting machine Rius E25; E20



Plain circular knitting machine Rius E25



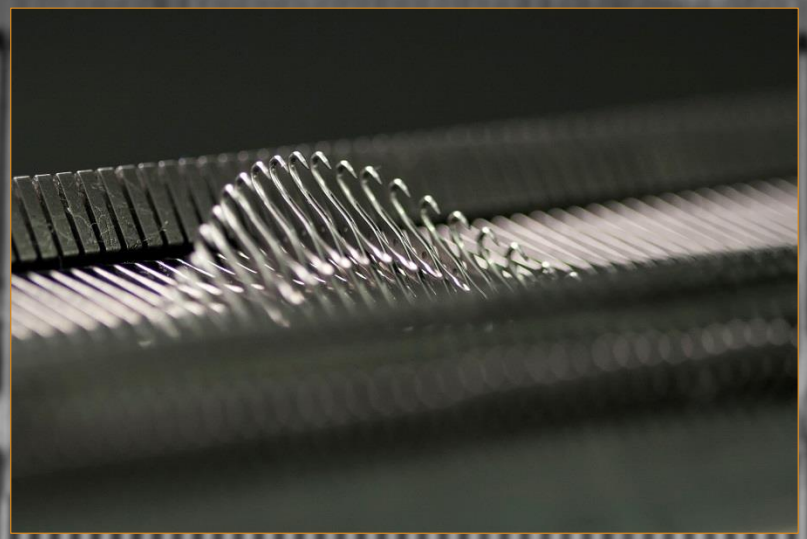




Weft knitting

- Electronic flat knitting machine - Shima Seiki NSSG 122, multigauge E3,5.2; 2 systems
- CAD system - SDS One Apex

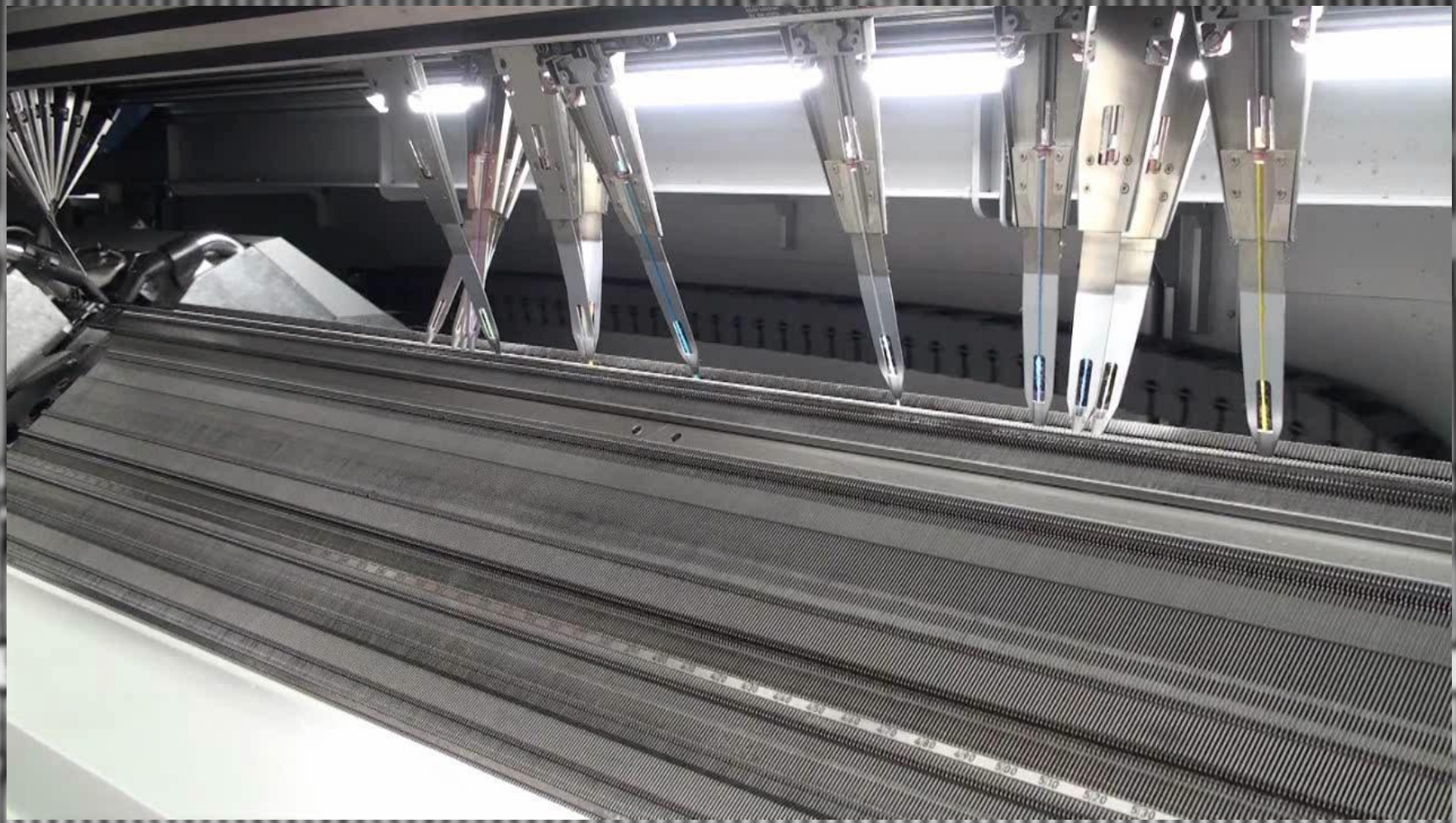
Electronic flat knitting machine - Shima Seiki



Weft knitting

- Electronic flat knitting machine – STOLL CMS ADF – intarsia machine
- Gauge 7.2, 3 systems

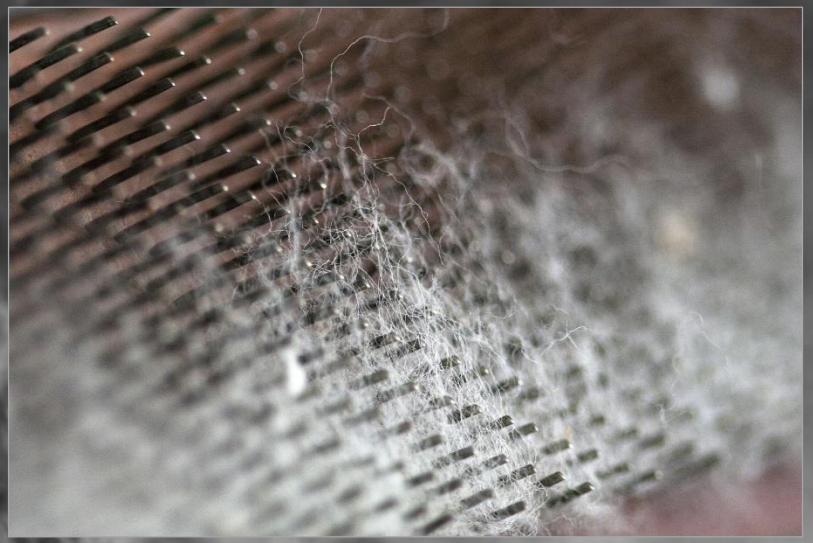
Electronic flat knitting machine – STOLL CMS ADF – intarsia machine

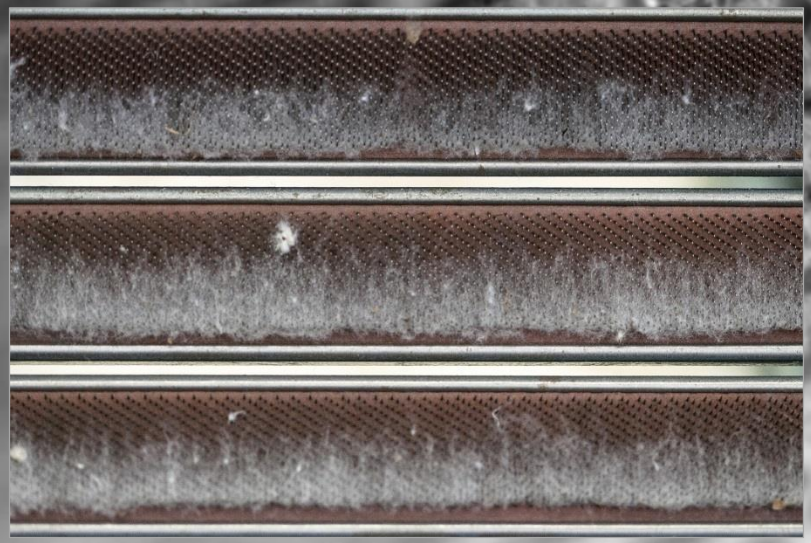


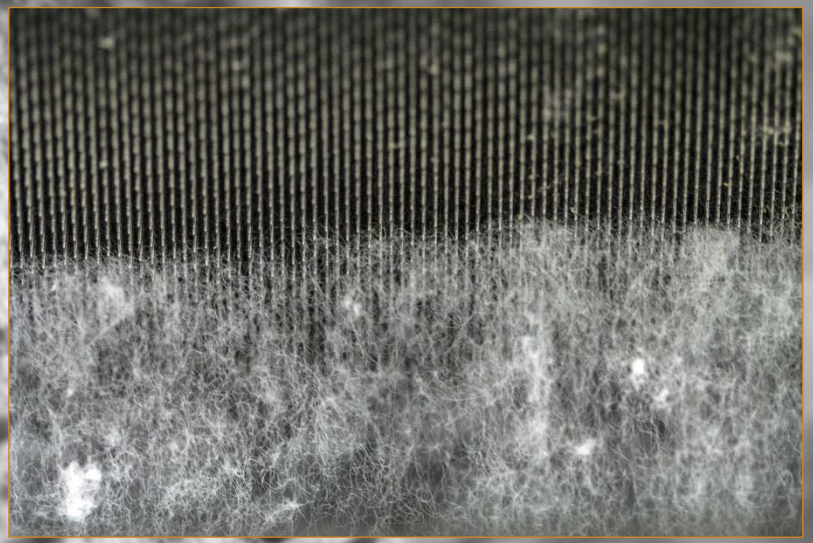
Spinning

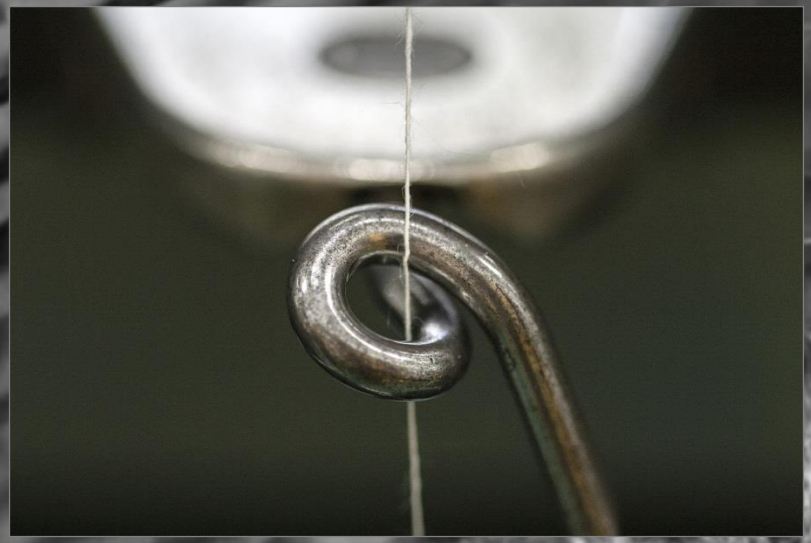
Laboratory Flat Carding Machine

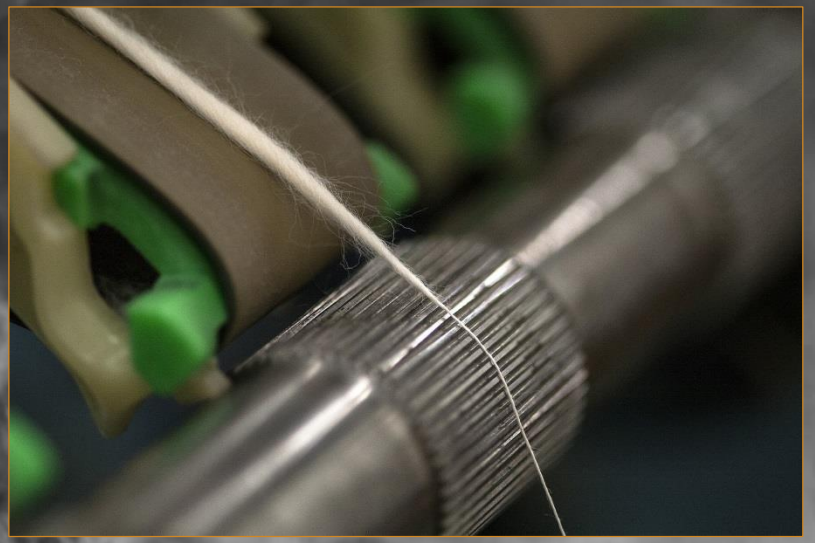
- Short fibres and impurities in the flat clothing
- Stripping fibres from the doffer - web forming







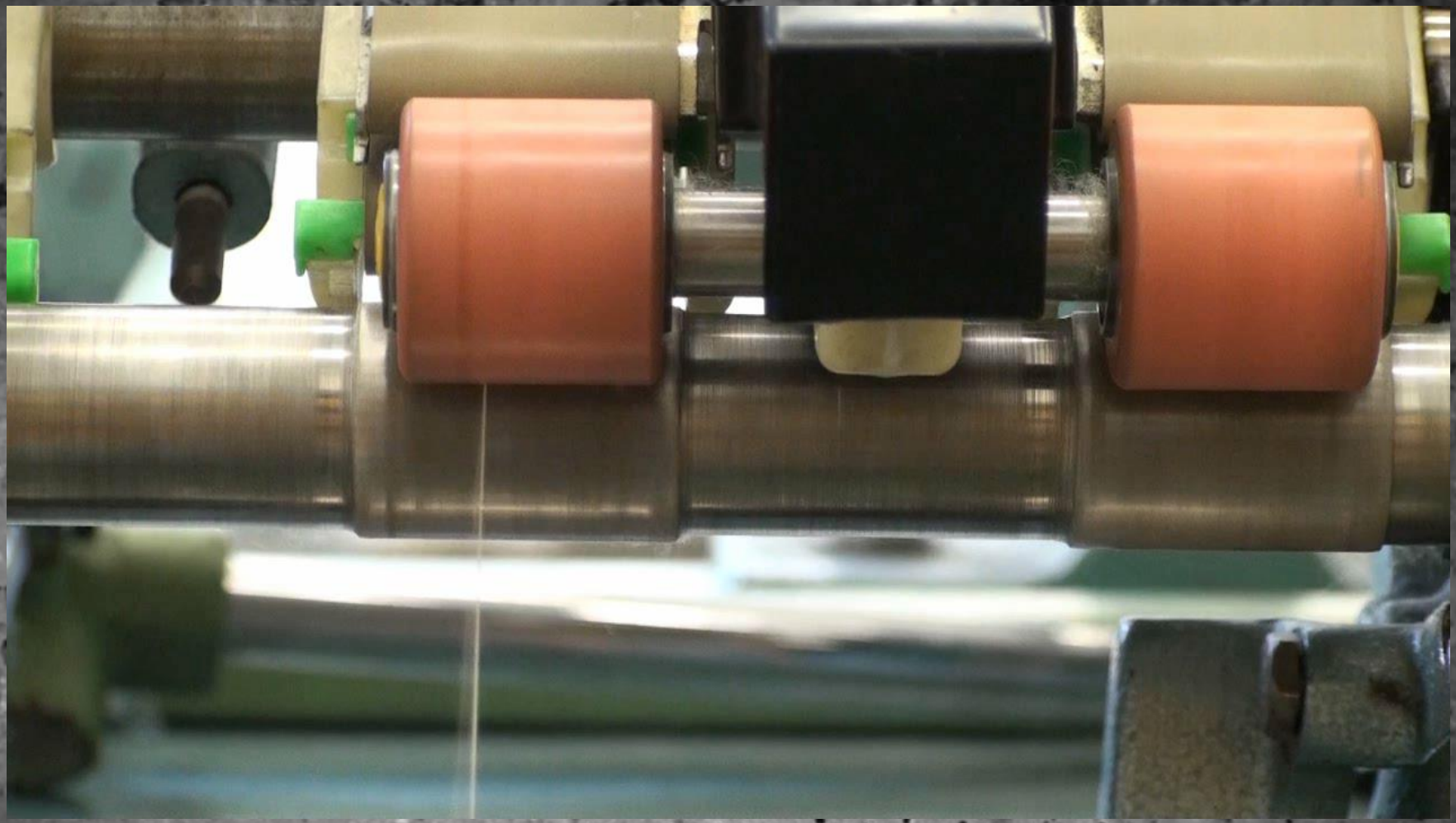




Laboratory Ring Spinning Machine

- Attenuation of roving into yarn count
- Yarn guiding in the eyelet
- Yarn drags the traveller which circulates on the ring = yarn twisting and winding

Laboratory Ring Spinning Machine



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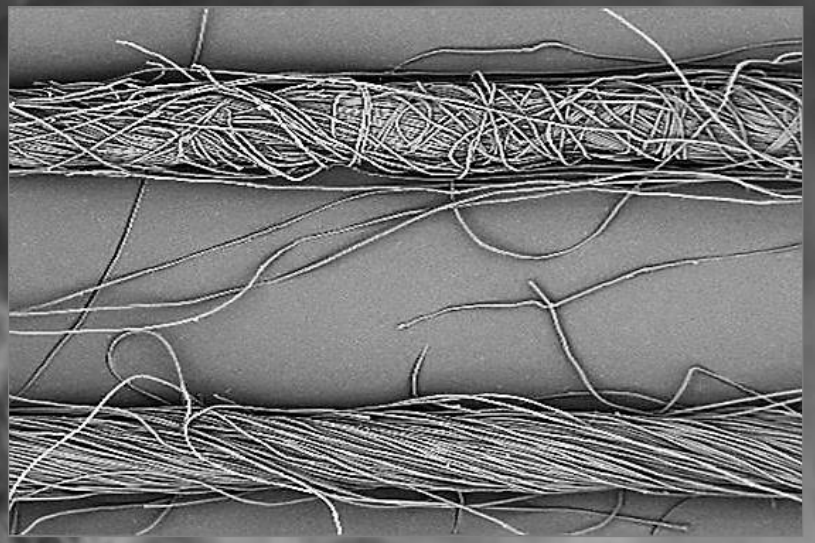
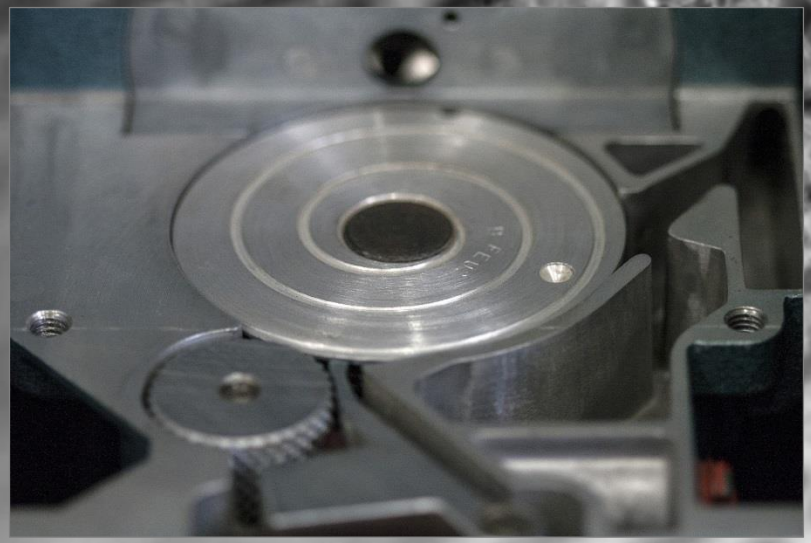
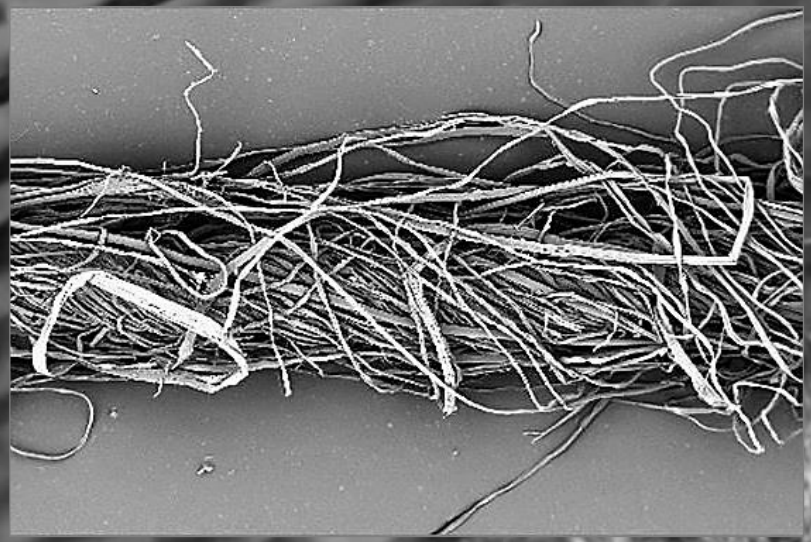




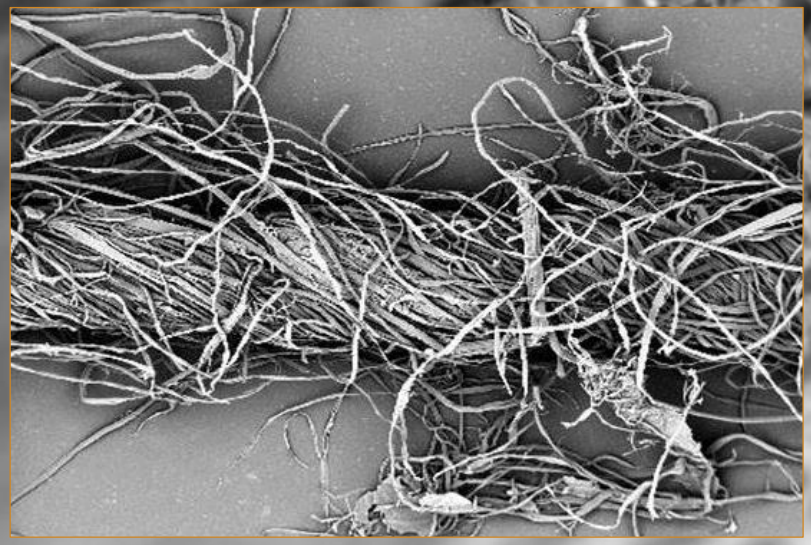
Rotor Spinning Machine BD - RNOM

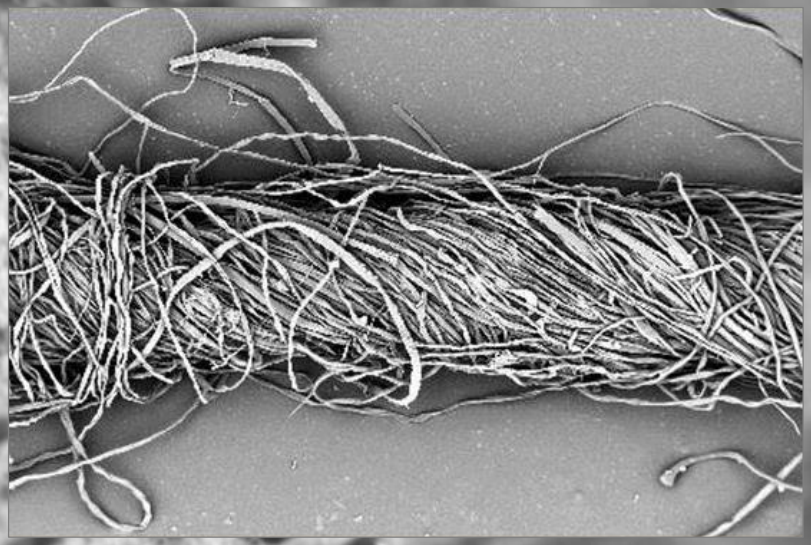
- Fibrous strand in the rotor collection groove
- Detail of spinning box
- Comparison of structure of rotor and ring spun yarn



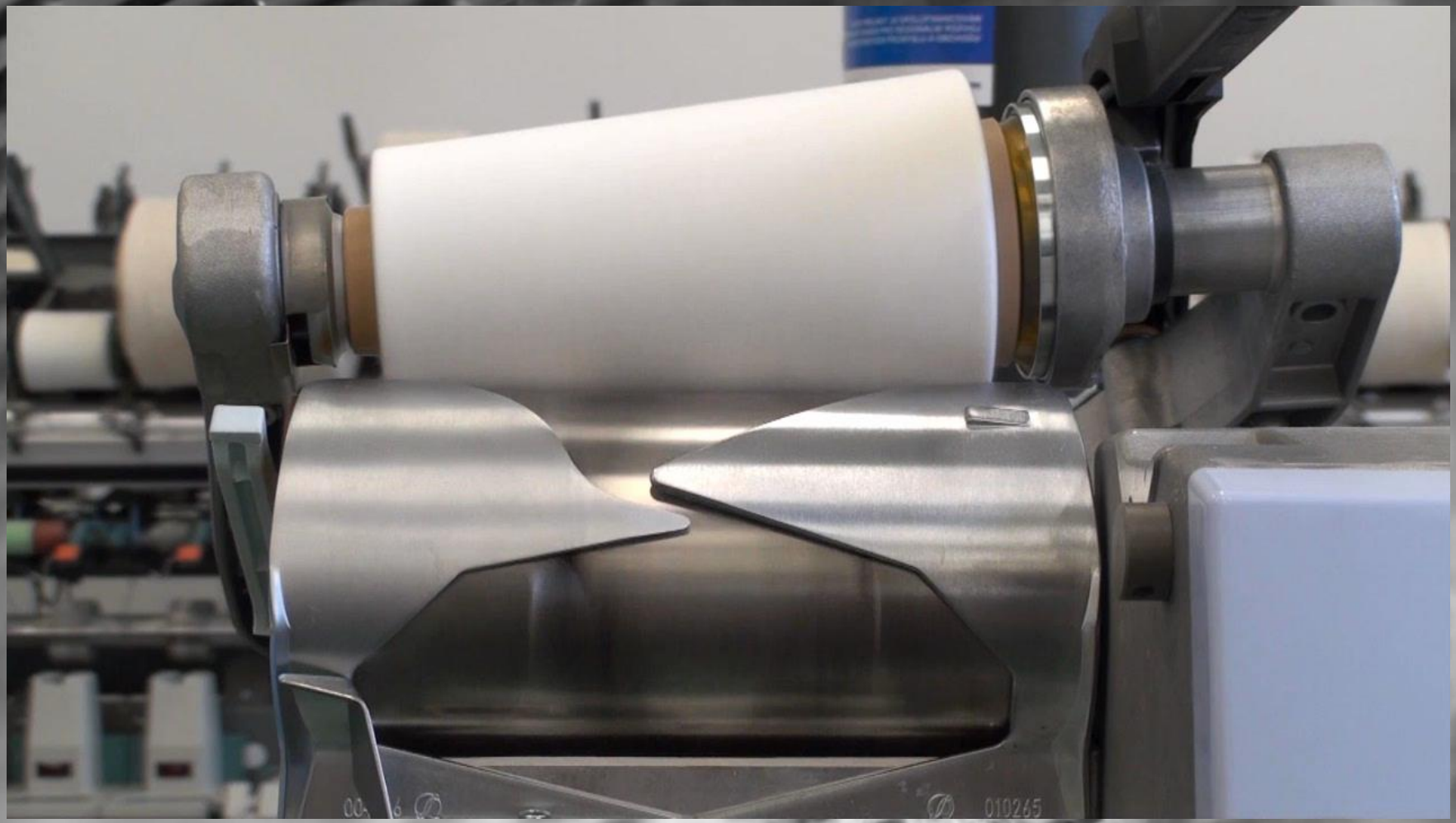
Yarn structure analysis

- Various quality of 50 % CO / 50 % CN rotor spun yarn - captured from one bobbin



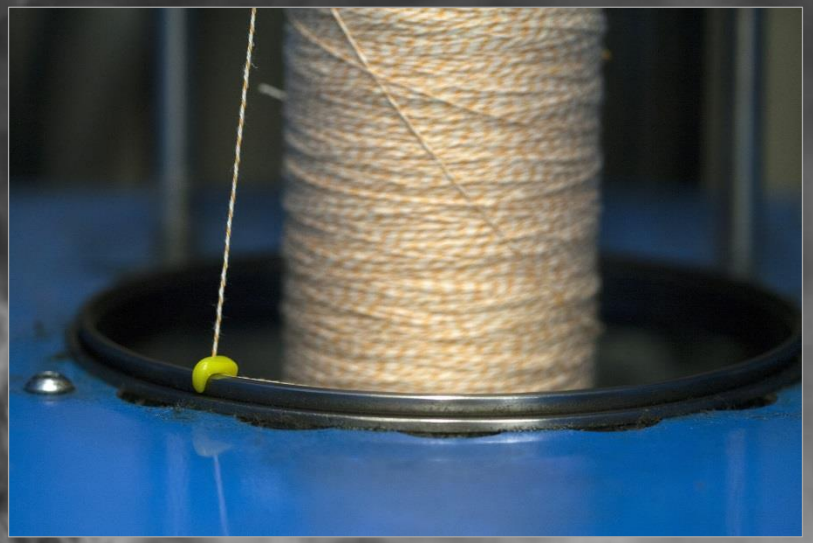


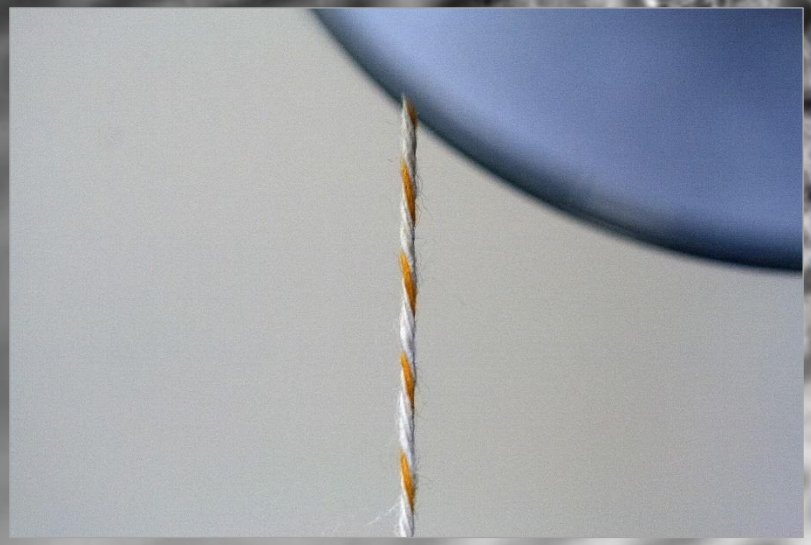
Winding machine

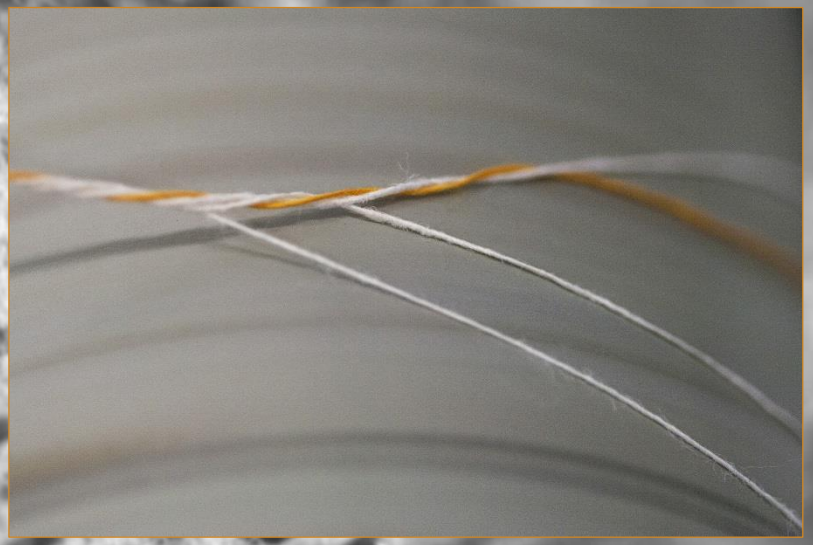


Ring Twisting Machine

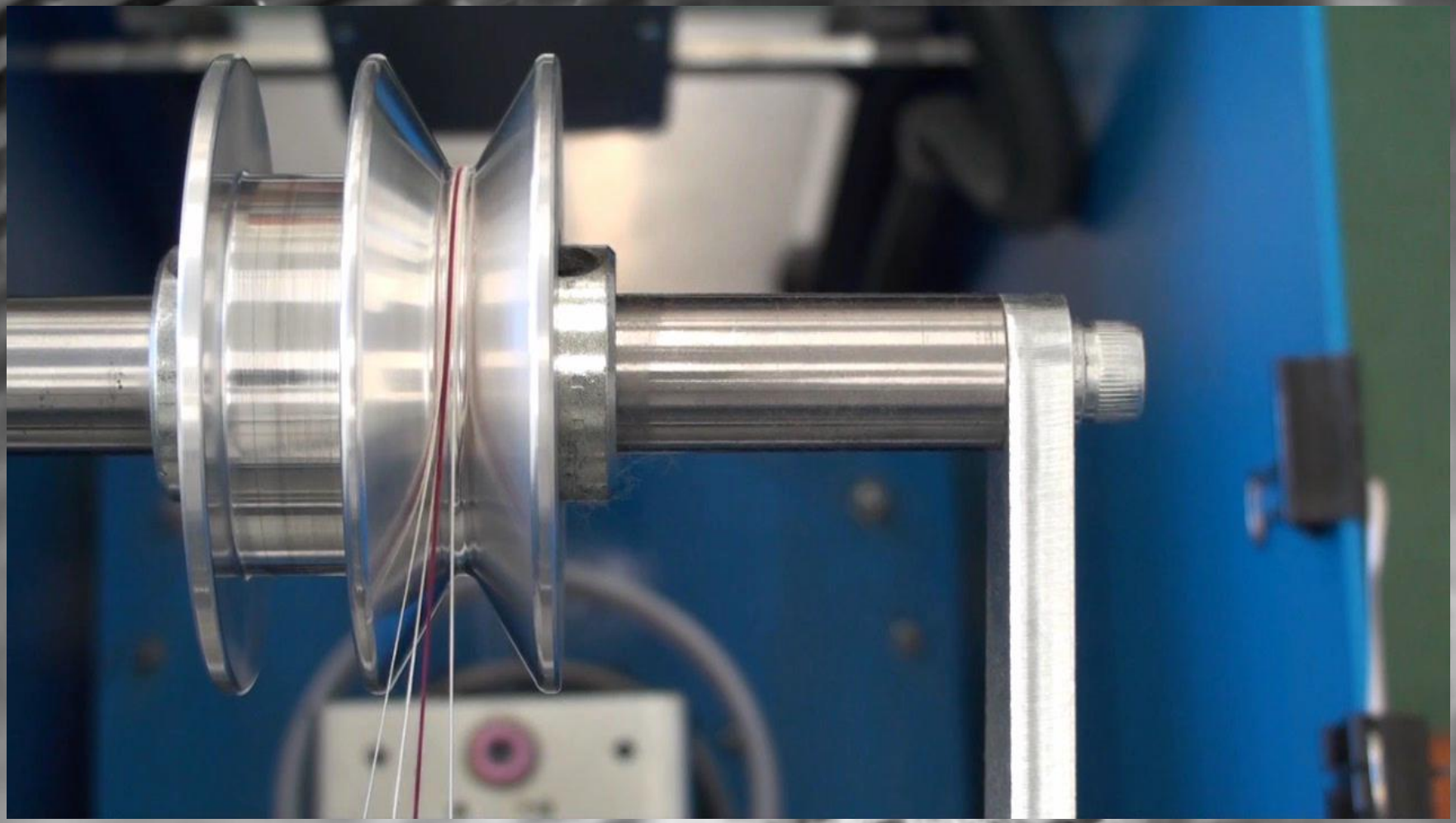
- Plied yarn
- Untwisted plied yarn
- Yarn twisting and winding with the traveller, the ring and the spindle







Ring Twisting Machine



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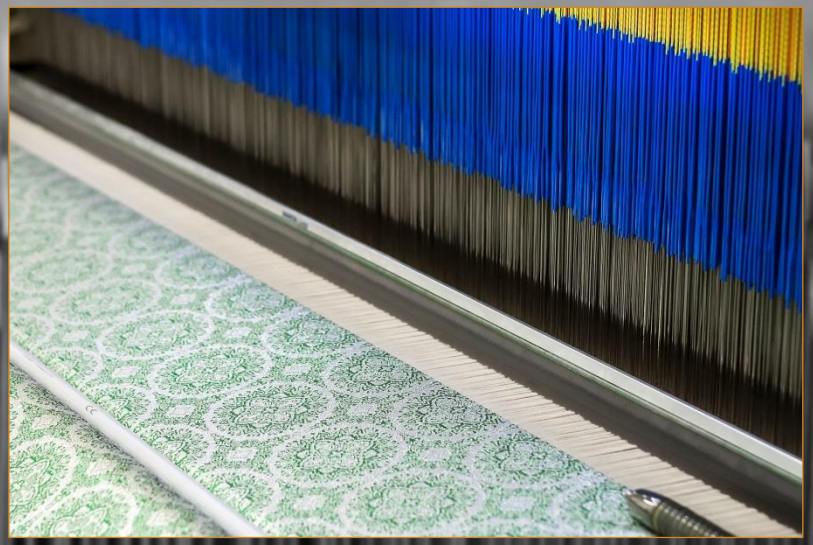
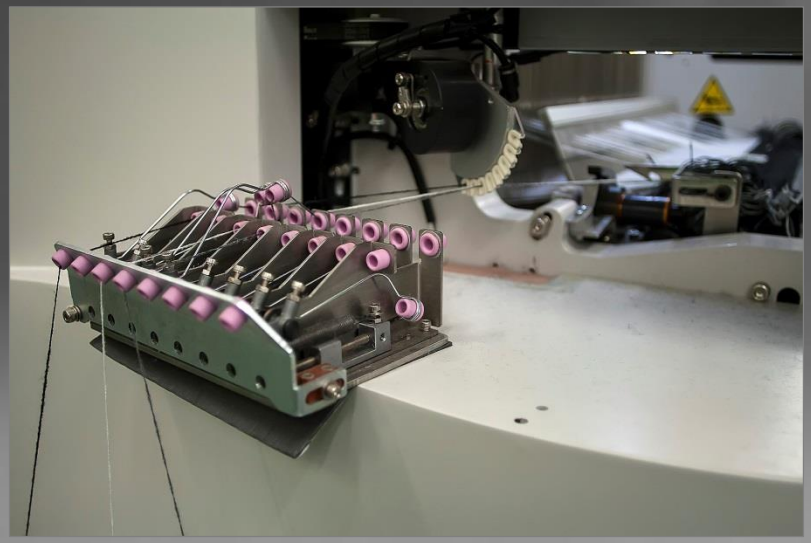
Weaving

Jacquard Weaving

- Rapier weaving machine SOMET with electronic jacquard STÄUBLI (1344 hooks)



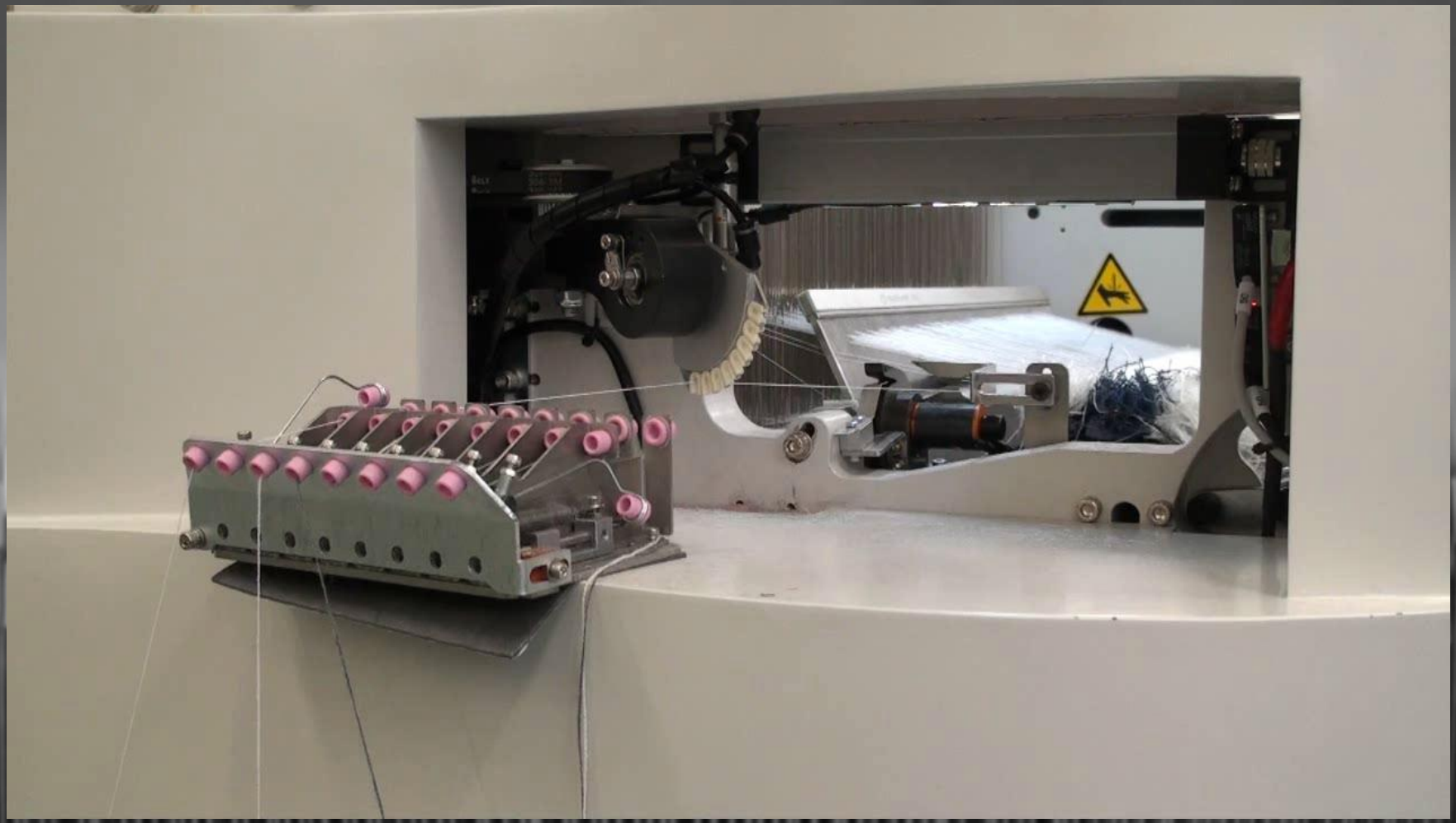
Rapier weaving machine (weaving of phosphoresce – luminescent effect)

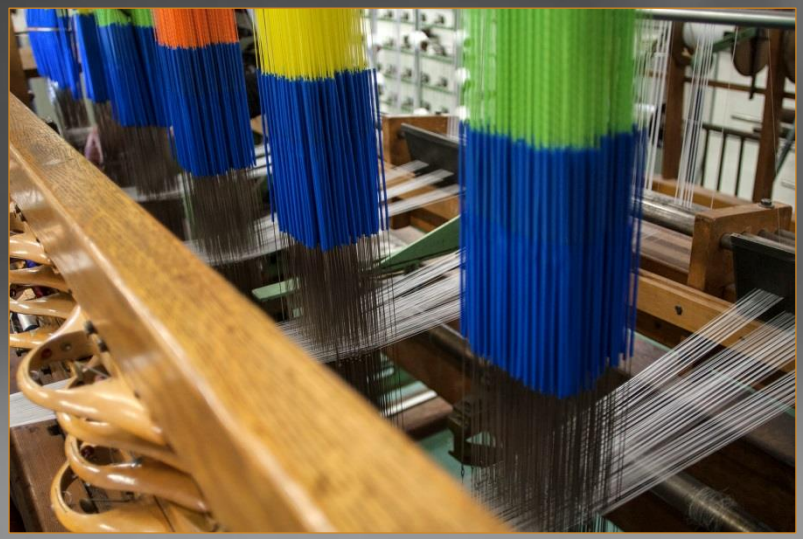


Jacquard Weaving

- Rapier laboratory weaving machine CCI with electronic jacquard BONAS (1344 hooks)

Rapier laboratory weaving machine CCI



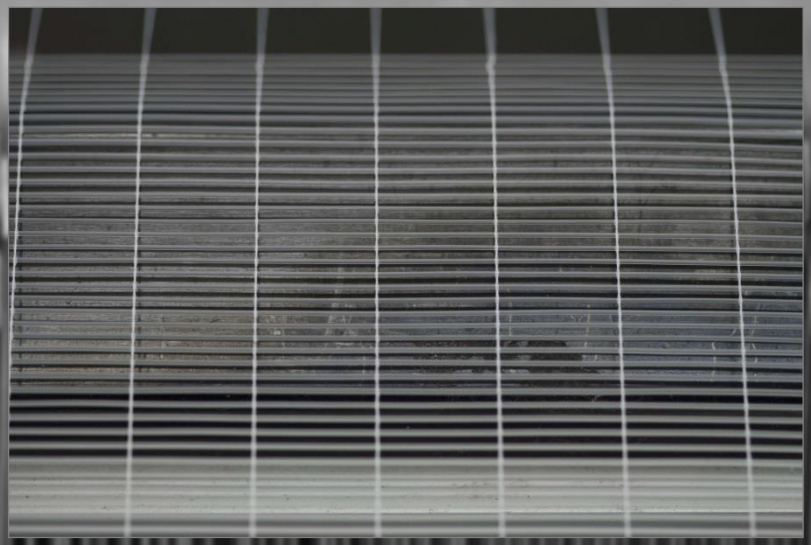


Jacquard Weaving

- Shuttle weaving machine with jacquard shedding mechanism (400hooks), medical application

Dobby weaving

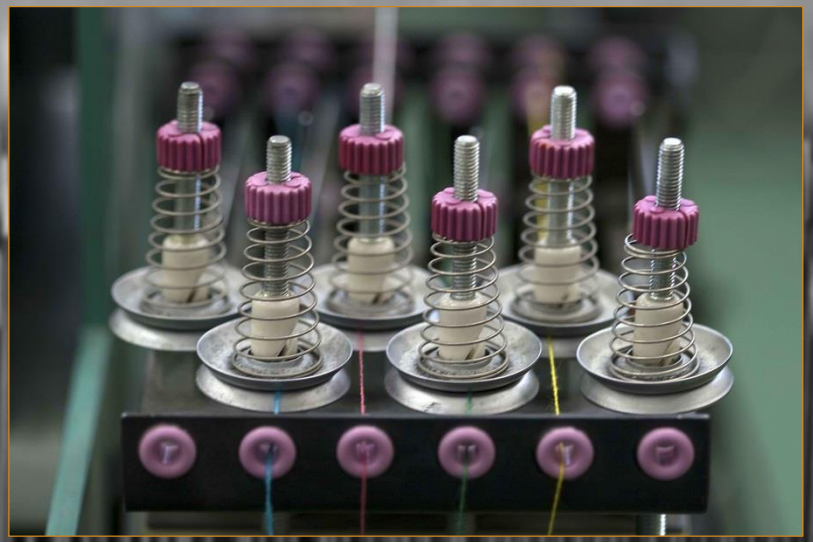
- Laboratory rapier weaving loom with electronic leno shedding mechanism



Laboratory rapier weaving loom with leno

Dobby weaving

- Laboratory rapier weaving loom with electronic shedding mechanism CCI (20 shafts)



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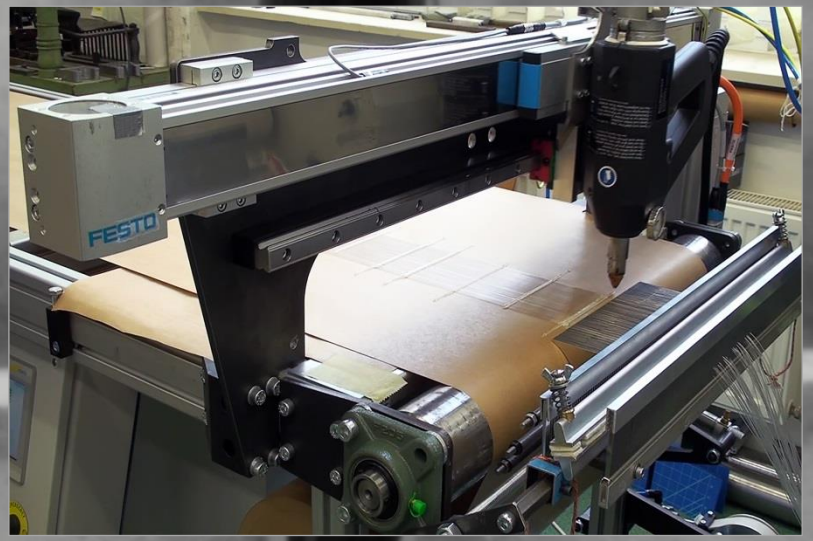
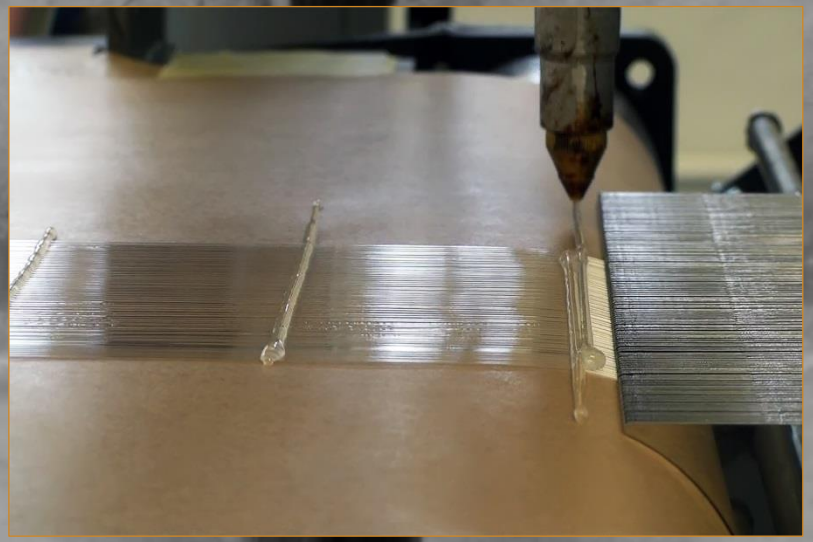
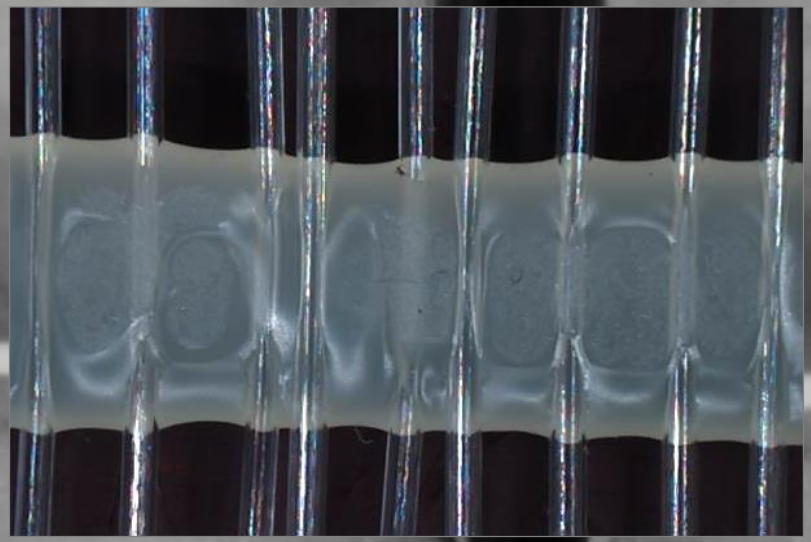
Innovation & Technology

Prototype technology

- Manufacturing of 2D structures bonded by perpendicular laying of the polymer melt







Application of technology

- Hollow-fiber heat exchanger
- Optical fibers in planar structure
- Waste water treatment composite structure

Manufacturing of 2D structures bonded by perpendicular laying of the polymer melt

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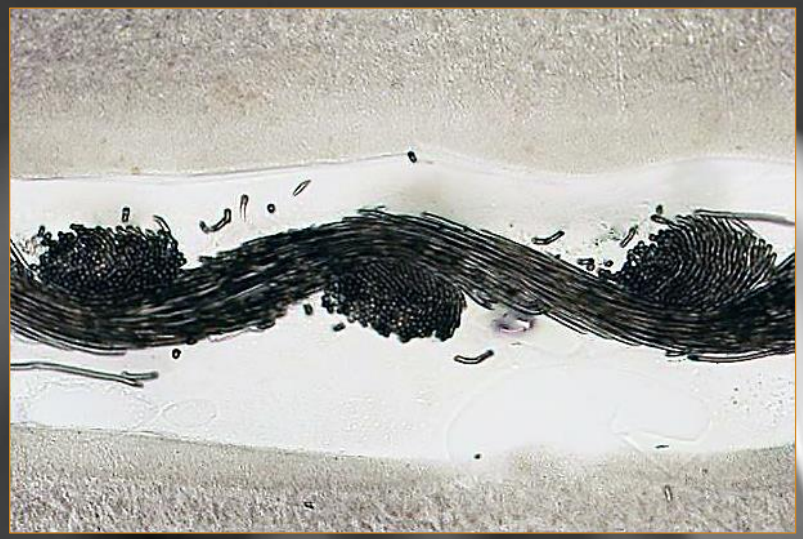
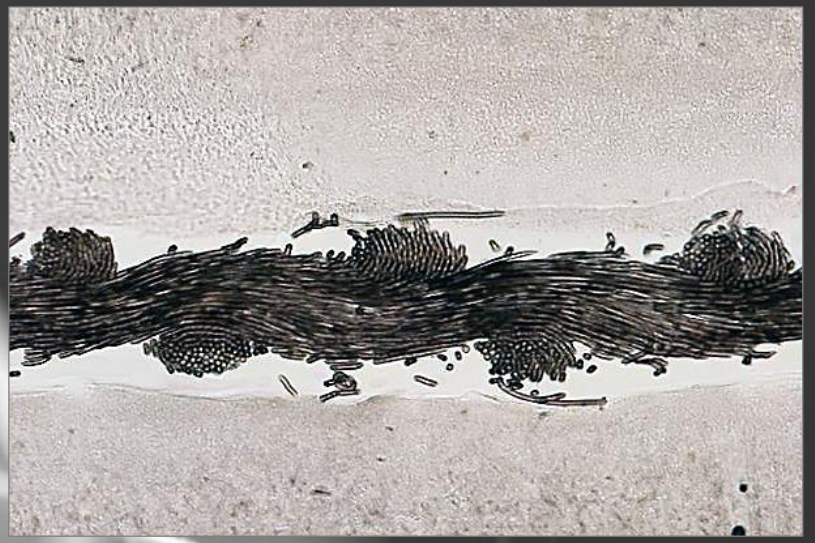
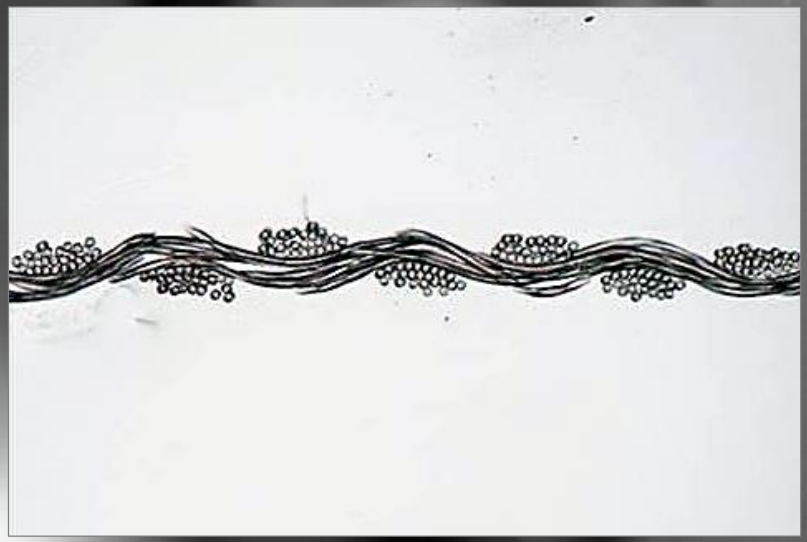
Testing

- Principle of the textile cross-section preparation, execution and presentation

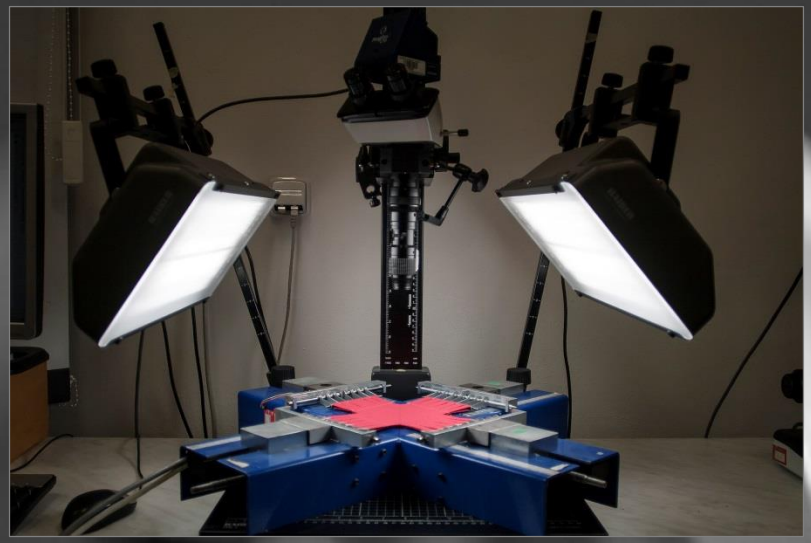
- Linear textile cross-section presentation, analysis





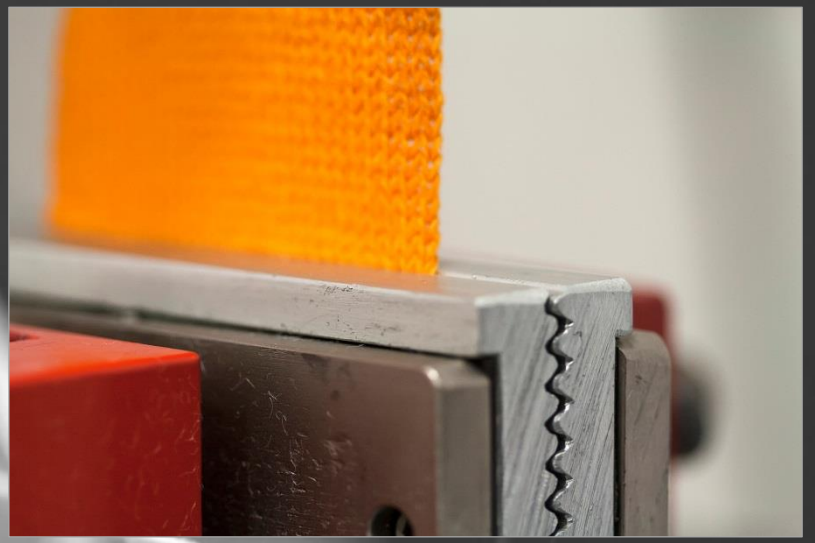


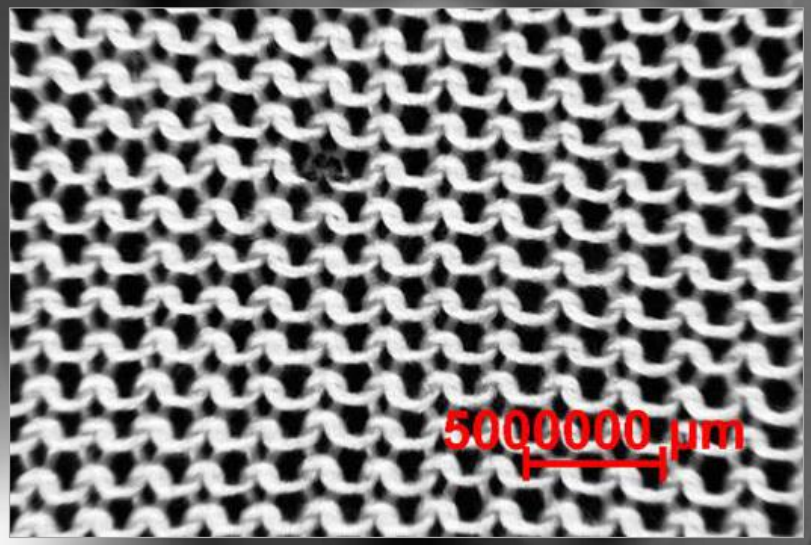
- Woven fabric cross-section, presentation, analysis

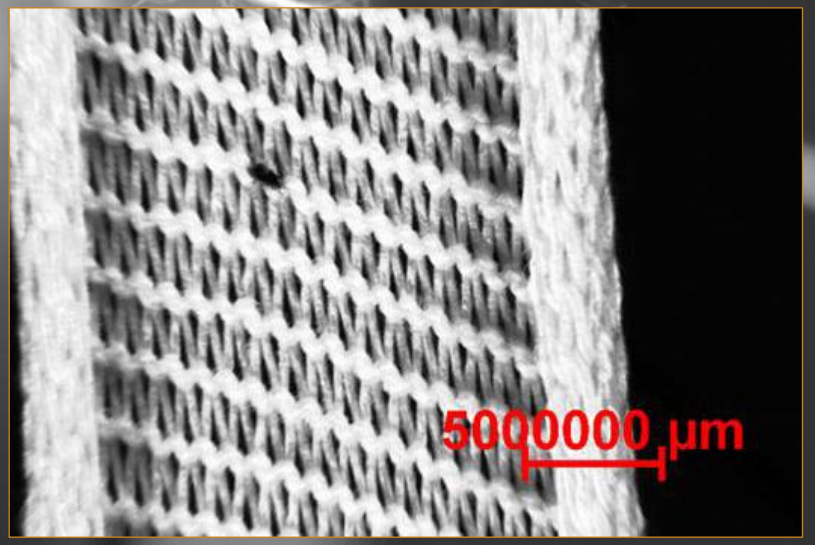


- BiaxiaL fabric loading

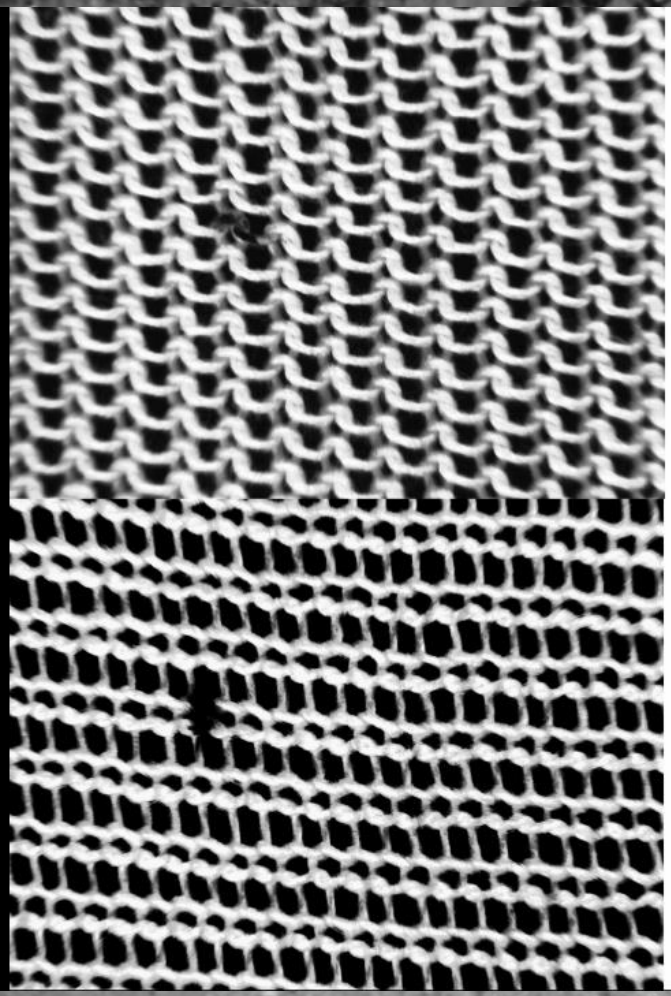
- Uniaxial fabric loading

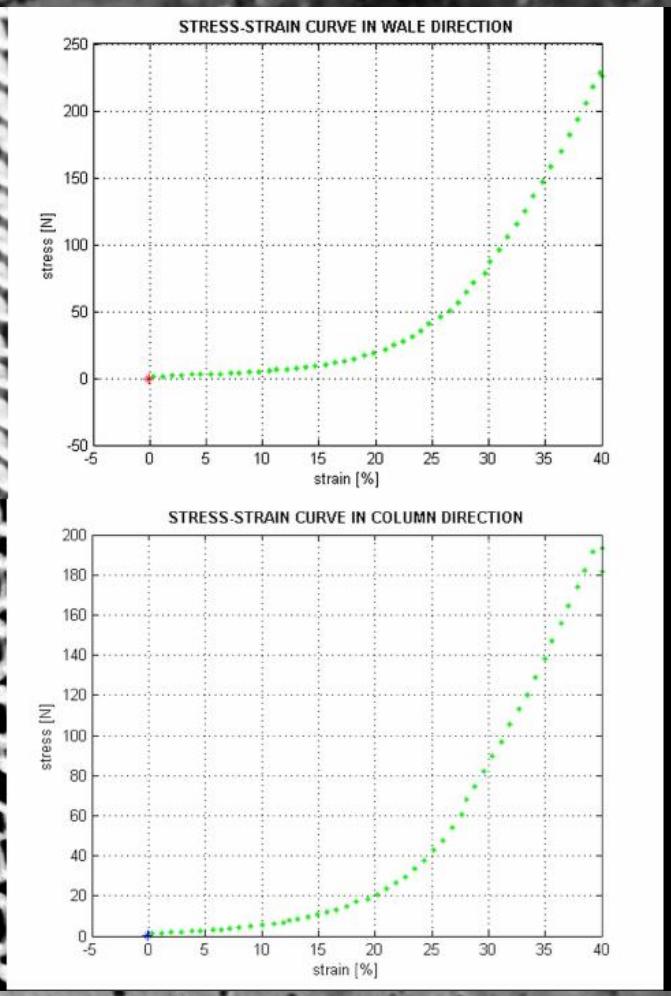


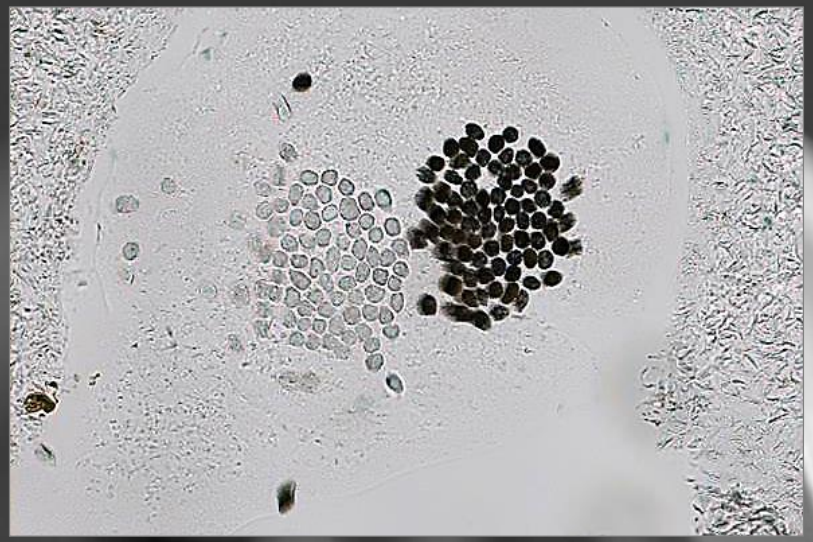




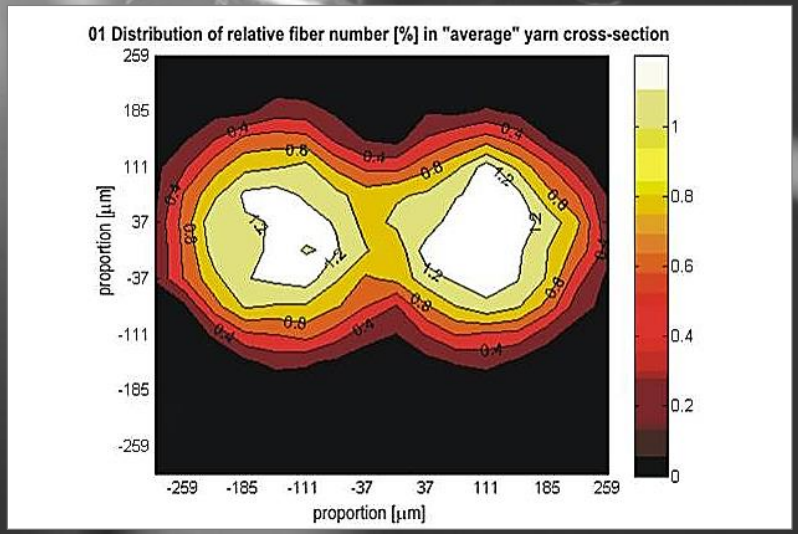
Uniaxial fabric loading

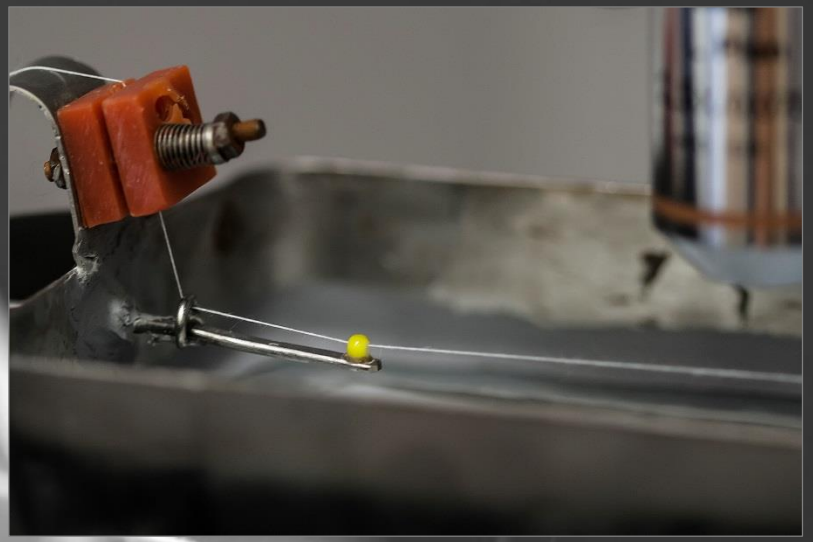


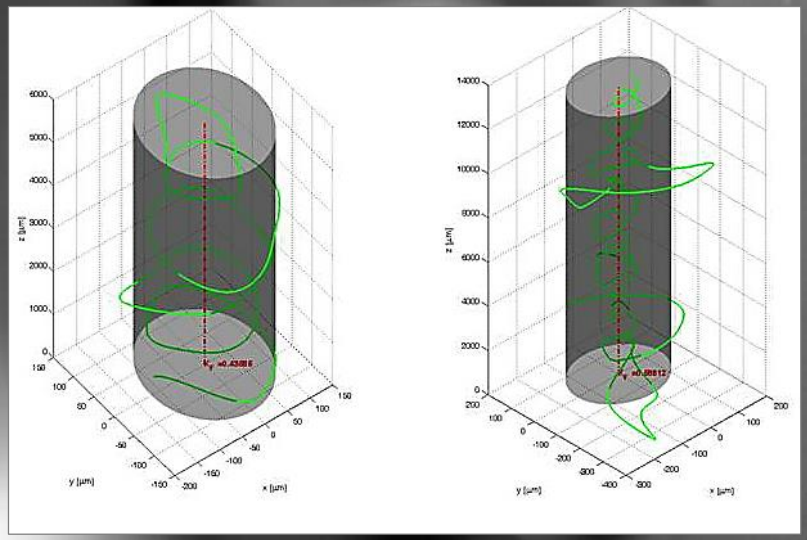




- Internal life of two-ply yarn





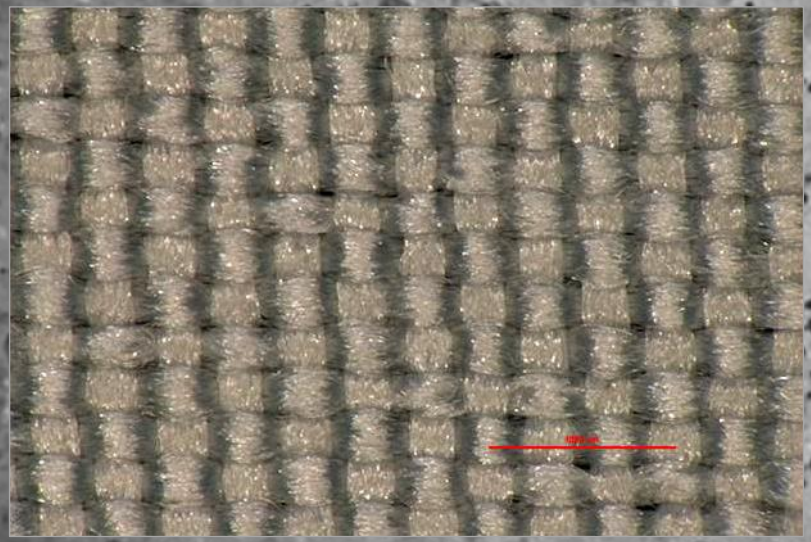


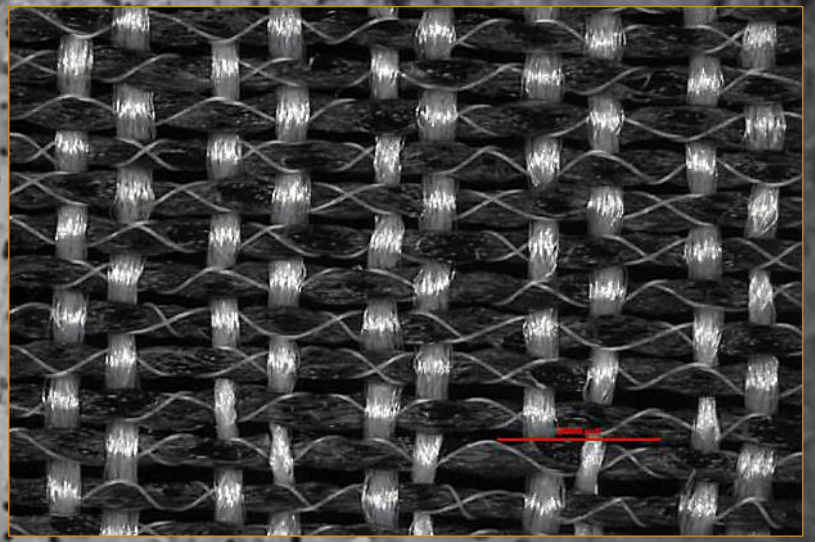
- Traces fiber technique – analysis of the yarn internal structure

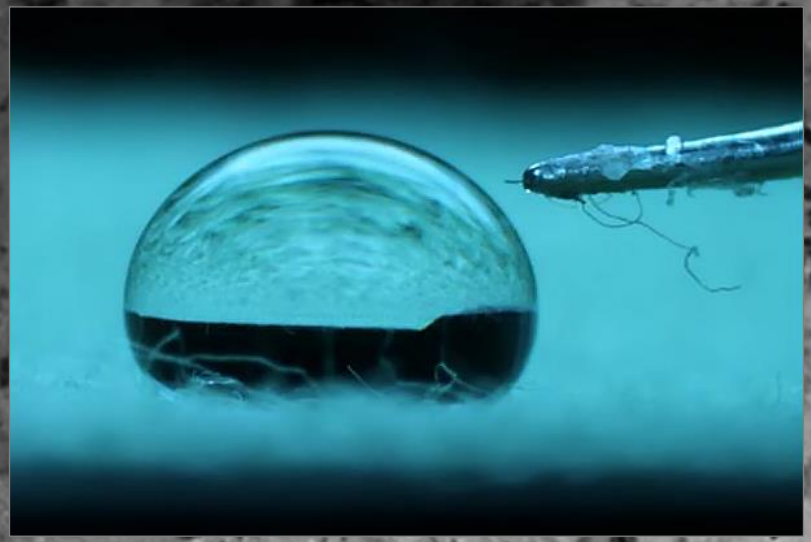
Applications

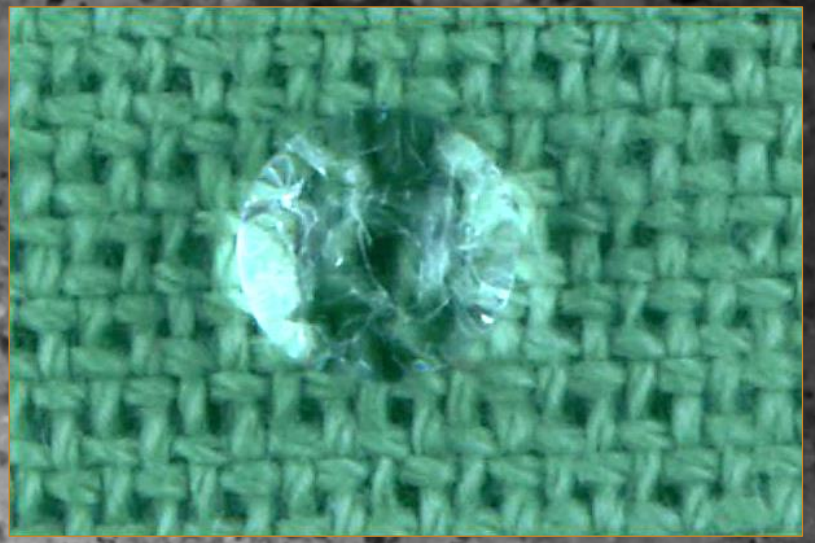
Filtration and membranes structures

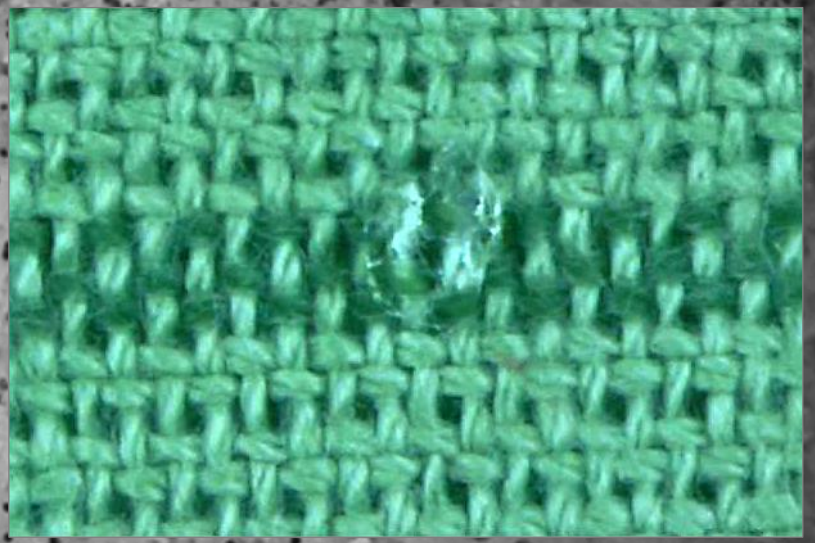
- Woven structure with multifilament 7,5tex 144fibrils
- Equipment for measuring of liquid permeability
- Woven structure with nano-covering of yarn





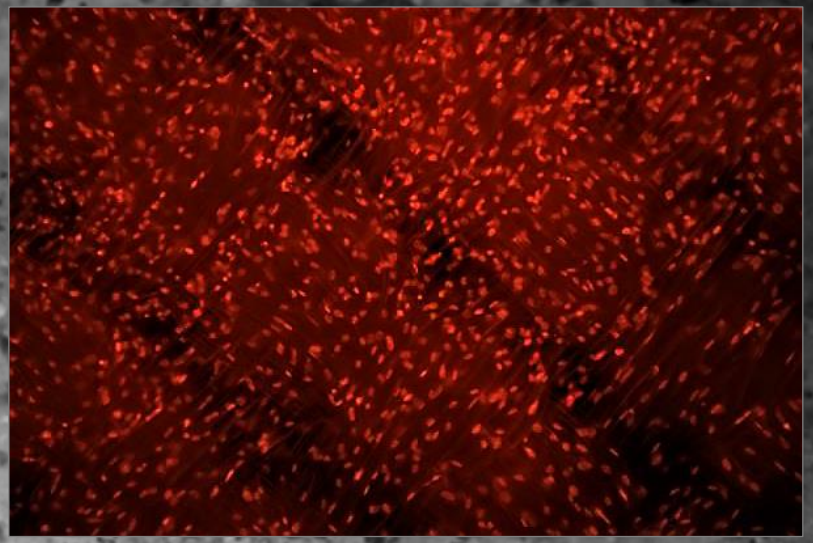


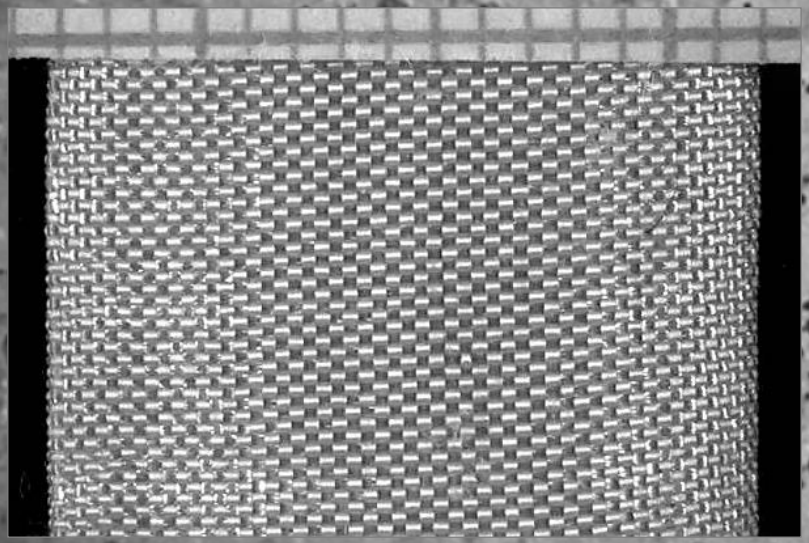




Transport of liquid in the woven structure

- Hydrophobic and hydrophilic effect in cotton woven structure





Synthetic vascular prosthesis

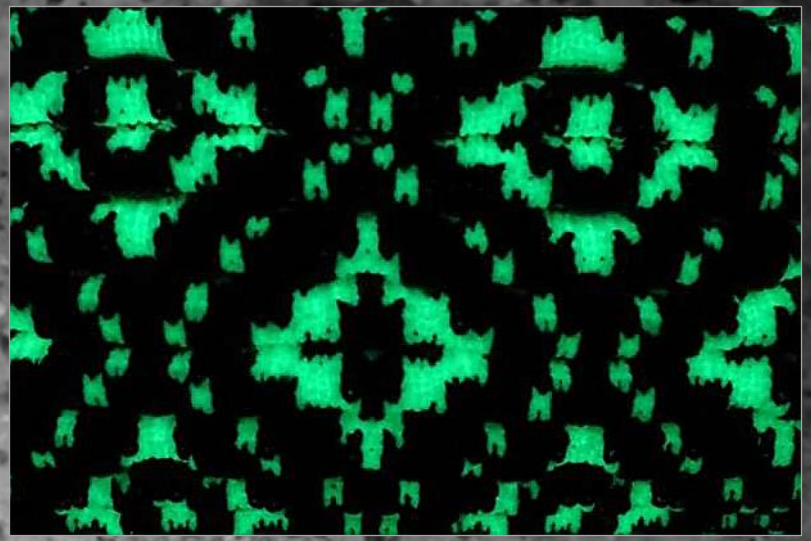
- Woven structure of tubular vascular prosthesis
- Knitted structure of tubular vascular prosthesis
- Proliferation of cells (woven structure)

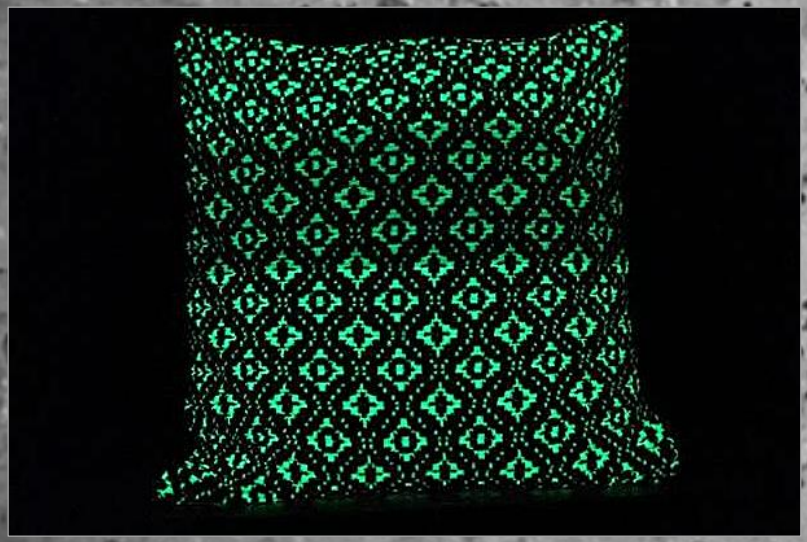
Lightning effect in woven structures

- Laboratory rapier weaving loom with electronic leno shedding mechanism

Lightning effect in knitted structures

- Phosphoresce – luminescent effect in knitted structure



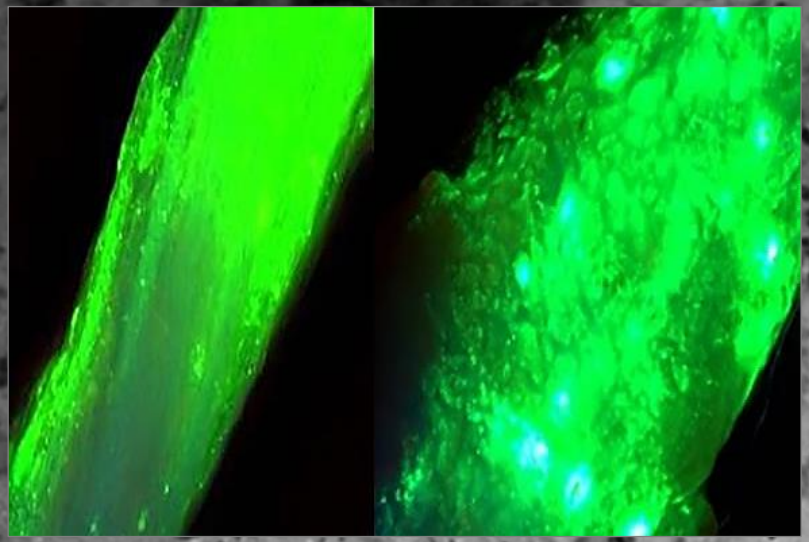


Lightning effects in structure

- Reflective yarn effect in 2D and 3D structures

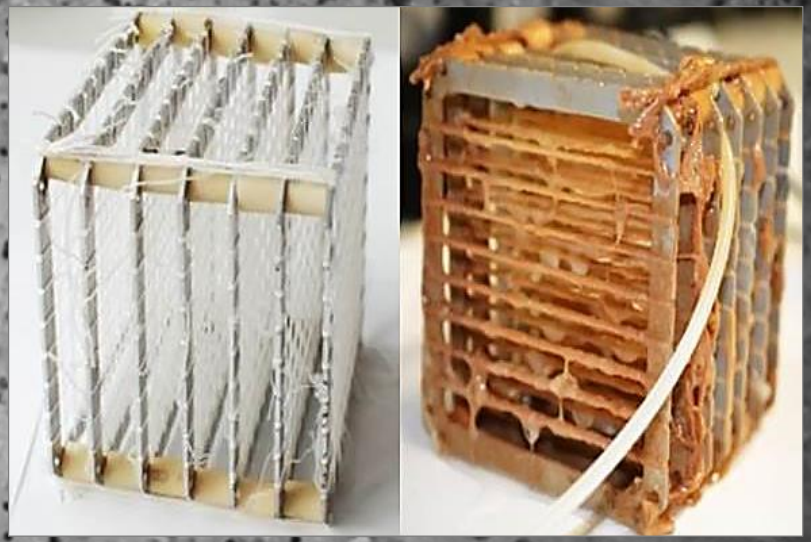
Hollow - fiber heat exchanger

- Textile structure bonded by perpendicular laying of polymer melt
- Heat exchanger
- Defect of structure - deformation of hollow fibers in interlacing point



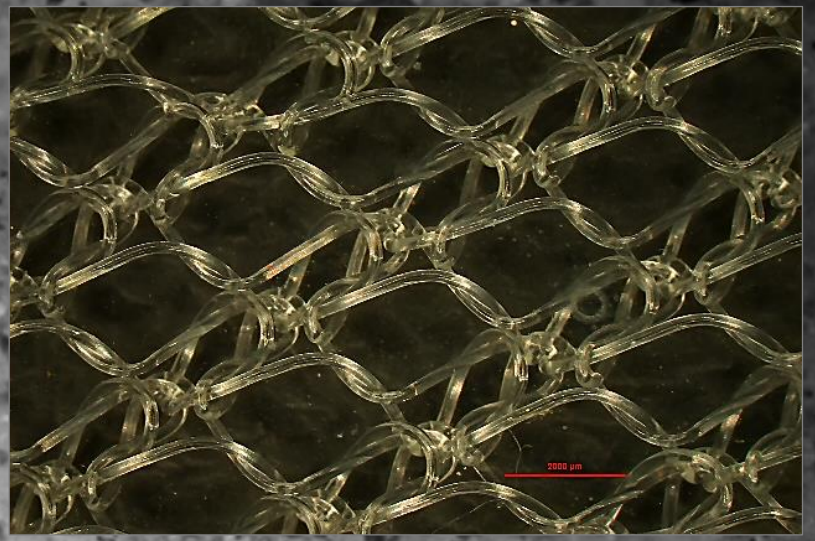
Wastewater treatment

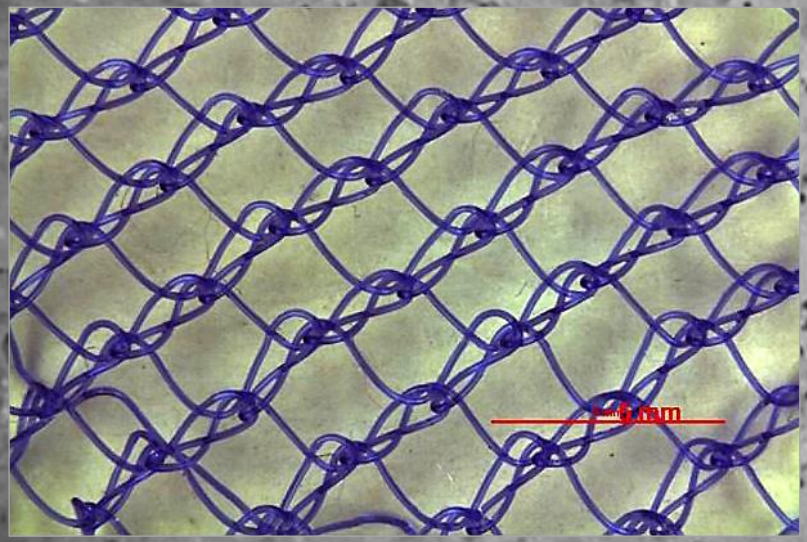
- Progress of colonization: the 1st and 41st day
- The growth of biofilm - fluorescent coloring: the 1st and 41st day
- Carrier for bioreactor: the 1st and 41st day

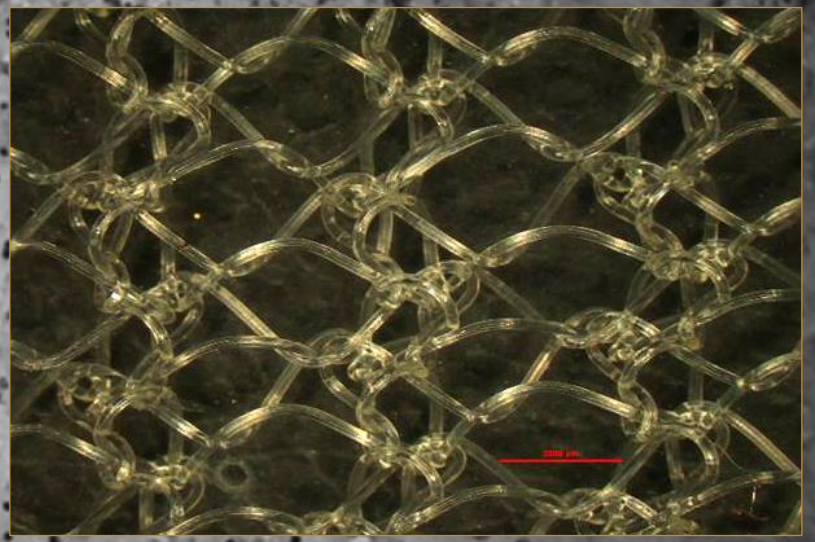


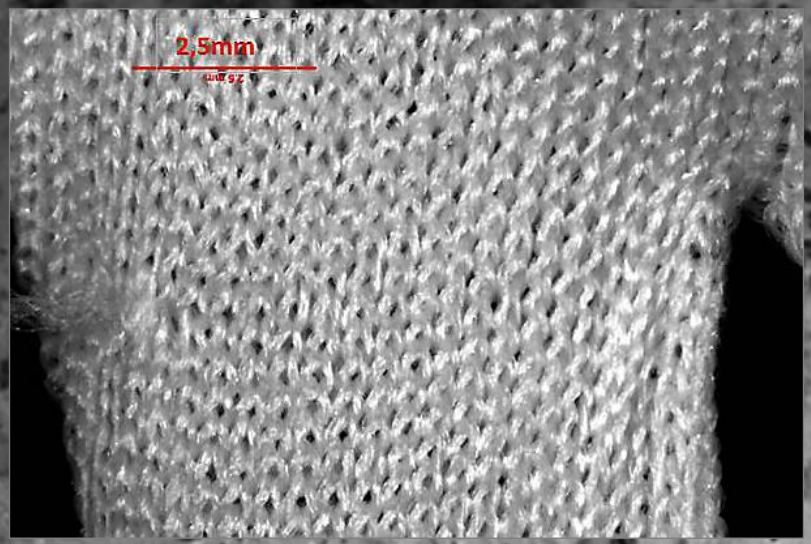
Biodegrabile structures

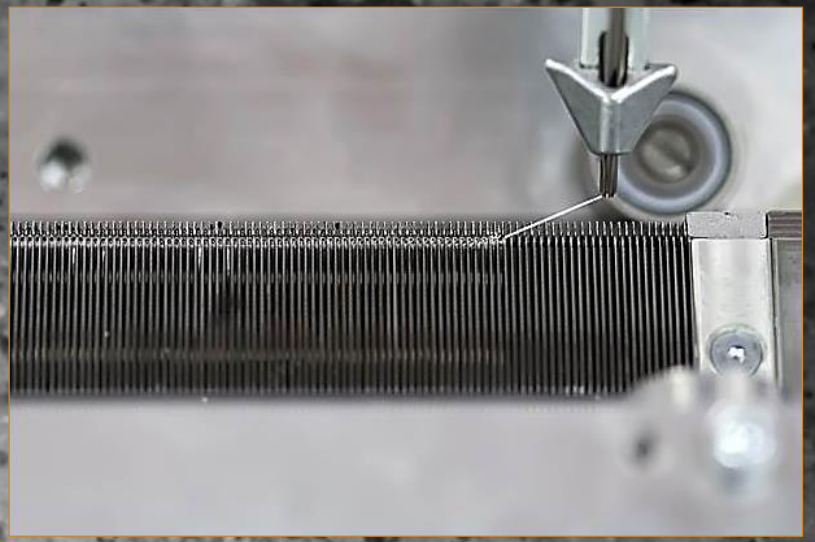
- Processing of monofilament and biodegradable yarn
- Hernia meshes
- 2D shaped hernia meshes











Vascular prosthetis - grafts

- Thin wall -knitted structure (24w/10mm; 20c/10mm)
- Bifurcated structure
- Variable diameter of grafts
- Device pro production flat knitting machine gauge 30E