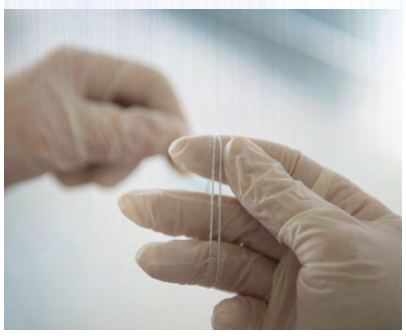
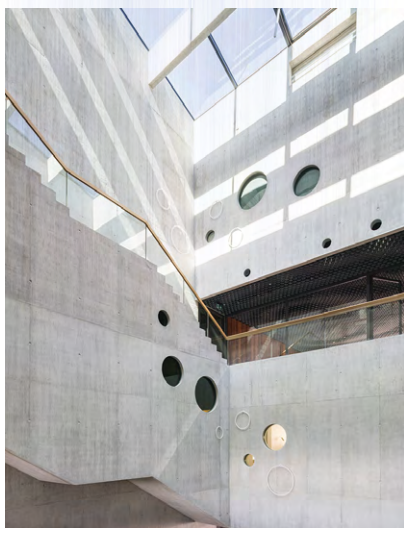
Switzerland.

swiss TEXTILES

ABOVE ALL EXPECTATIONS

SWISS PAVILION
TECHTEXTIL 2017





SWITZERLAND FORMS A UNIQUE **COMPETENCE CENTRE** FOR TEXTILE SOLUTIONS

DISCOVER OUR INNOVATIVE PRODUCTS FOR **MEDICINE, SUSTAINABILITY** AND **ARCHITECTURE**

CONTENTS

SWITZERLAND: A COMPETENCE CENTRE FOR TEXTILE SOLUTIONS

Interview: Mirjam Matti Gähwiler
Photo: Dan Cermak

For decades, Swiss companies were primarily active in the fashion segment. Why have an increasing number of companies become active in the technical textiles segment?
ANDREAS SALLMANN / The Swiss have always been innovators. When globalisation set in and orders moved out of Switzerland to less expensive locations, many companies began to search for new uses for their products. They made a virtue out of necessity, so to speak. Numerous innovative manufacturers in Switzerland along the entire value chain are now developing new products.
PETER FLÜCKIGER / The Swiss have always benefited from the existence of a strong textile machines industry, as well as an established chemicals and pharmaceuticals industry, alongside the entire textile value chain. Switzerland also has outstanding academic and research institutions, e.g. the Federal Institutes of Technology, Empa laboratories, colleges of technology, etc.

So could it be said that Switzerland's small size is an advantage?
ANDREAS SALLMANN / Definitely. Distances are short, and this creates trust among the involved players, and also makes it possible to respond quickly to changes and demand on the market.

How many Swiss companies focus on technical textiles today?
PETER FLÜCKIGER / Around half of our 200 members. But there are also hybrids: for example, embroiderers who produce for haute couture, but also make sensors. Or ribbon weavers who manufacture decorative ribbons as well as ribbons as artificial ligaments, or ropemakers who in addition to making playground equipment also braid artificial tendons in the clean room.

Are technical textiles growth drivers for Swiss companies?
ANDREAS SALLMANN / The growth potential is very high. Thanks to their flexibility, porosity, large surface area with low weight and their ability to be chemically modified, textiles have many advantages over other materials. Their potential uses, e.g. in the automotive industry, architecture or medicine, are practically unlimited.
PETER FLÜCKIGER / The main drivers also include the two megatrends, digitisation and sustainability, in both of which Switzerland is well positioned. In the area of sustainability we are able to stand out from international competition because we have high ecological and social standards and have initiated numerous research and development projects, including, for example, new ecological refining technologies. Switzerland is also strong in the use of microelectronics, and Zurich is evolving into a game development cluster. Electronics is becoming increasingly miniaturised and thus easier to integrate into textiles. App and textile developers are an exciting combination.
ANDREAS SALLMANN / The problem is that very high investments are required for moving into new segments, and a great deal of time is required before a product can gain success on the market.

How are Swiss companies being supported?
PETER FLÜCKIGER / As an industry association we support a variety of research initiatives in which Swiss companies can participate. And in Switzerland there is also the Commission for Technology and Innovation, which financially supports projects within companies.

Industrial production is slowing down in Switzerland, yet you say the sector has great potential. How can you substantiate this?
PETER FLÜCKIGER / Specialisation is increasing rapidly. The focus is on research, development, design and high value-added activities. Viewed in an international context, Switzerland is a competence centre for textile solutions, regardless of whether or not industrial production actually takes place here.
ANDREAS SALLMANN / I firmly believe that the “brain” will always remain in Switzerland. We have attractive jobs and well qualified personnel who are inquisitive and courageous. But in order to quickly turn a development into a product we need to have our own machines. This speeds up and secures the production of prototypes, etc. I doubt whether industrial mass production can remain here, though.

If the industry is changing so rapidly, which professions will be required in the future?
ANDREAS SALLMANN / We do not yet know which professions will be relevant in 30 years’ time. We have a period of major transition ahead of us. But our dual education system will help us because it uniquely combines theory and practice.

What about Switzerland’s position in the world and its relations with Europe? Is our non-membership of the EU a disadvantage?
PETER FLÜCKIGER / We have access to the market, personnel and research programmes thanks to the bilateral agreements, which are vital for Switzerland and must be carefully fostered. But it is also important for us to enter into free trade agreements with countries in Asia and America.
ANDREAS SALLMANN / We are in a strong position compared with other European countries. We have a very healthy economy. Everything can be readily planned in advance here. We have a flexible labour market, and our level of patent and design protection is very high. ✖

“The Swiss have always been innovators.”

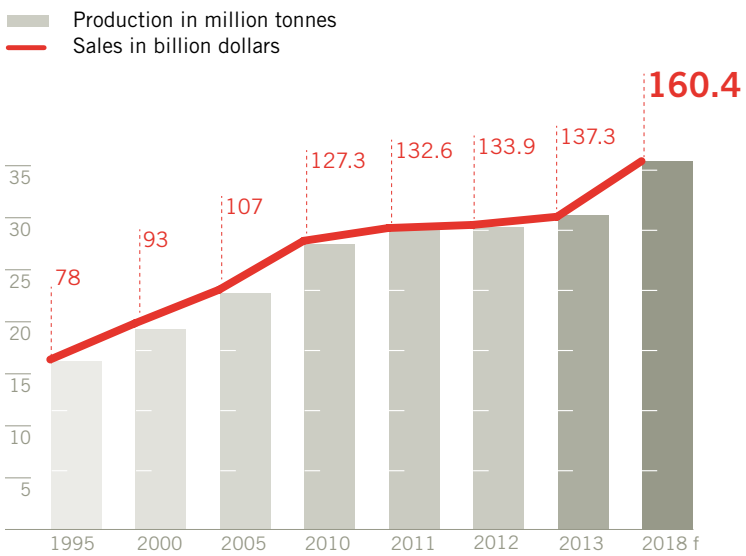
Andreas Sallmann, Chairman Swiss Textiles

“The focus is on research, development, design and high value-added activities.”

Peter Flückiger, Director Swiss Textiles

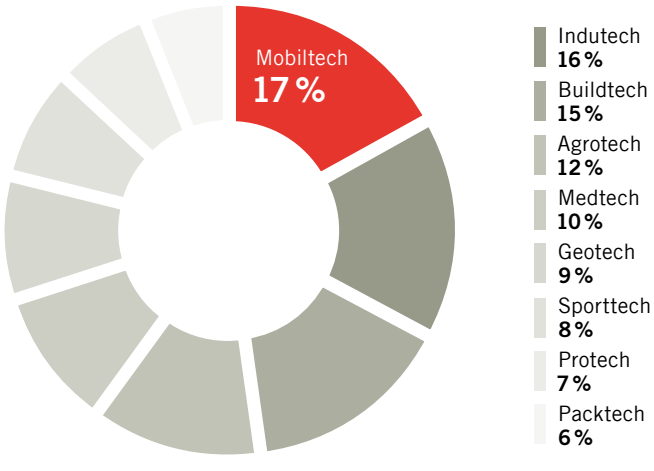
04 ////////// FACTS AND FIGURES ///

GLOBAL MARKET: DEVELOPMENT OF TECHNICAL TEXTILES



AREAS OF APPLICATION

2014, worldwide



GLOBAL COMPETITIVENESS RANKING

2016 – 2017

1.	**SWITZERLAND**
2.	Singapore
3.	United States
4.	Netherlands
5.	Germany
6.	Sweden
7.	United Kingdom
8.	Japan
9.	Hong Kong SAR
10.	Finland

GLOBAL INNOVATION INDEX

2016

1.	**SWITZERLAND**
2.	Sweden
3.	United Kingdom
4.	USA
5.	Finland
6.	Singapore
7.	Ireland
8.	Denmark
9.	Netherlands
10.	Germany

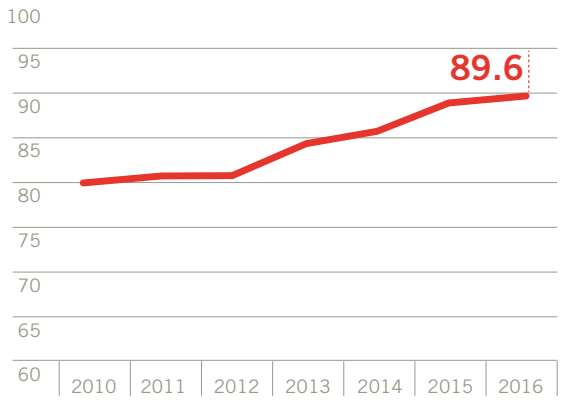
PATENT APPLICATIONS

2015, applications by country

1.	Republic of Korea
2.	Japan
3.	**SWITZERLAND**
4.	USA
5.	Germany
6.	China
7.	Finland
8.	Sweden
9.	Denmark
10.	Netherlands

SWISS EXPORTS OF TECHNICAL TEXTILES

In thousand tonnes



IMPORTS OF TECHNICAL TEXTILES

2016, annual change versus 2015

812 MILLION SWISS FRANCS

+ 7 %

EXPORTS OF TECHNICAL TEXTILES

2016, annual change versus 2015

546 MILLION SWISS FRANCS

+ 1 %

Sources: Cornell University, Gherzi, INSEAD, WIPO, World Economic Forum, WTO, Techtextil, Swiss Customs Administration

INNOVATION THROUGH NETWORKING

In the textiles sector, Switzerland's research landscape is characterised by leading worldwide innovation. Innovation requires time, a solid network and framework conditions that do not stand the way. Adequate financial resources are also essential, because at the early stage of a new development, the development is often unclear whether it will be possible for it to be implemented profitably. Switzerland's textiles industry is able to count on a well-established network in the country's research sector, as well as on financial support from various sources. It is only in this way that long-term research and development projects can be placed on a firm footing and innovations can be successfully put into practice.

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Support by the Federal Commission for Technology and Innovation (CTI)
As the life cycles of products grow shorter and a growing number of emerging countries make use of advanced technologies, the pace of the innovation cycle within Switzerland's textiles and clothing industry needs to be accelerated. The fast pace of this cycle and the large financial resources required represent major challenges for small and mediumsized companies in particular. Here the Federal Commission for Technology and Innovation (CTI) provides support in a variety of ways. Through subsidies it promotes knowledge and technology transfer between universities and the industry. This facilitates the implementation of innovation projects and joint ventures that would otherwise be associated with an excessive financial risk for the involved companies. Cooperation between companies and public research is monitored by CTI "mentors" who inform the companies about support options in Switzerland and assist them in preparing the submission of requests for support to the CTI. The members of Swiss Textiles appreciate this cooperation with the CTI, despite the complexity of the application process, and make intensive use of the opportunities the CTI provides to obtain support.

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Promotion of networking
Networking with research partners is one of the main driving forces behind the innovative capacity of a company. It is often the case that product improvements and innovations arise from customers' needs, are inspired by other sectors or are based on concepts resulting from basic and applied research. Swiss Textiles unites companies with partners such as the Federal Laboratories for Materials Science and Technology in St. Gallen, the College of Science and Technology in Rapperswil, the University of Lucerne, Zurich University of Applied Sciences in Wädenswil and the Swiss Textile College. The expertise of the research partners of Swiss Textiles encompasses a broad variety of areas, including materials science, fibre technology, design, mechanical engineering, chemicals and process technology. The ongoing exchange between companies and researchers is being supported within the scope of research initiatives such as "Subitex" (Sustainable Biomedicine Textiles) and via major networking events such as "Innovation Day".

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International cooperation
Swiss Textiles always welcomes new research partners – innovation does not recognise any borders. The textile federations and research institutions in Germany, Austria and Switzerland have been working closely together for many years in order to offset the disadvantages of size and cooperate with the most suitable research and business partners. Swiss Textiles promotes cross-border exchanges between companies and EU research bodies by organising special study visits on behalf of its members.

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First-class education
Education and research are, of course, major pillars of innovation. In the area of technical textiles, Switzerland, although a very small country, offers outstanding facilities in the fields of education and research. Its training and further education options range from basic training courses for qualification as an EBA textile practitioner or EFZ textile technologist, through to the Swiss Textile College and a large number of technical colleges, including the two Federal Institutes of Technology in Zurich and Lausanne. The textiles industry benefits enormously from the advantages of Switzerland's dual education system, which offers a perfect combination of theoretical and practical training. ✖

EMPA
Swiss Federal Laboratories for Materials Science and Technology (Empa): This institution is a part of the Federal Institute of Technology. It focuses on application-based research and development. In the area of textiles it specialises in materials for the improvement of health and efficiency. Developments arising from its research activities range from biodegradable implant materials and medical textiles, through to functional surfaces.
➲ www.empa.ch

HSLU
University of Lucerne School of Art and Design: This institution carries out research and provides training and further education in the fields of textile design, trends in fashion and interior design, digital printing design and technology, conceptual design for smart textiles and experimentation on surfaces for new functional fibres.
➲ www.hslu.ch/design-kunst

HSR
University of applied sciences HSR Rapperswil: The Institute for Product Design, Development and Construction (IPEC) at the HSR is of interest to manufacturers and developers of machines for the textiles industry. Other institutes offer specific know-how, for example in the fields of mechatronics and environmental and energy technology, which can lead to innovative solutions in the textiles and associated industries.
➲ www.hsr.ch

STF
Swiss Textile College (STF): The STF is a high-level educational institution for the textiles sector. In addition to its education mandate, it also acts as a project partner for companies in the fields of textile production, textile machinery technology, textile refinement, nanotechnology, smart textiles and clothing.
➲ www.stf.ch

ZHAW
Zurich University of Applied Sciences (ZHAW): The Institute for Chemistry and Biotechnology at the ZHAW is an important partner for issues relating to industrial chemistry, the production of textile auxiliaries and the development of functional, biological materials and nanomaterials.
➲ www.zhaw.ch/icbt

TEXTILES IN MEDICINE: FOR USE IN AND ON THE BODY

In the “Subitex” research initiative, the Swiss textile federation Swiss Textiles and the textiles research laboratory at Empa are working together to promote innovation. Ten CTI projects have already been initiated.

Text: Anemone Seger

When people hear the term “textiles”, very few immediately think of textile sensors, heart pumps or plasters that can dispense substances. “But the notion that, when we speak of textiles, we are referring to woollen socks or cotton shirts, is well and truly outdated,” explains Prof. Dr. René Rossi, head of the Laboratory for Biomimetic Membranes and Textiles at Empa (Swiss Federal Laboratories for Materials Science and Technology) in St. Gallen. His laboratory is focusing on the development of materials – especially textiles – that protect the human body and enhance its performance.
“We speak of a textile when a one-dimensional material, i.e. a fibre, is processed into a two- or three-dimensional object.” Every material can be turned into fibres, and thus into a textile, including ceramics, wood, metal, plastic or cotton.
“Textiles have enormous potential thanks to their specific properties. Most of them are flexible, light, tough, pliable but dimensionally stable and have a large surface area. No other material possesses these properties.”

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Subitex – Sustainable Biomedicine Textiles

The textiles and clothing industry has a lengthy tradition in Switzerland, which for many years was a leader in the areas of embroidery and light cotton fabrics. But if Swiss textiles companies are to remain internationally competitive, they will have to be innovative. And this is where the “Subitex – Sustainable Biomedicine Textiles” research initiative comes in, which was launched at the beginning of 2015 by industry association Swiss Textiles in cooperation with Empa in St. Gallen. Here, industry and research are joining forces to promote innovation through knowledge transfer and bring the resulting products more quickly onto the market.
“In the field of biomedicine, textiles offer enormous potential for use inside as well as outside the body, and this has to be more effectively exploited,” explains Rossi, who is head of the Subitex project at Empa. “Here I am thinking of textile sensors, for example, or plasters for the targeted delivery of medicaments.” The main sponsor of Subitex is Swiss Textiles, which is providing its members with this exclusive form of cooperation – 15 of its members are currently involved in the project. “With this initiative, the Swiss textiles industry is underscoring the importance of textile research, while Empa has undertaken to pursue this field of research for a further five years,” notes Rossi.
Subitex can already boast initial successes, just two years after its inception: it has resulted in ten projects that are being co-financed by the Federal Commission for Technology and Innovation (CTI) and which involve the following companies:

/////// PAGE 08

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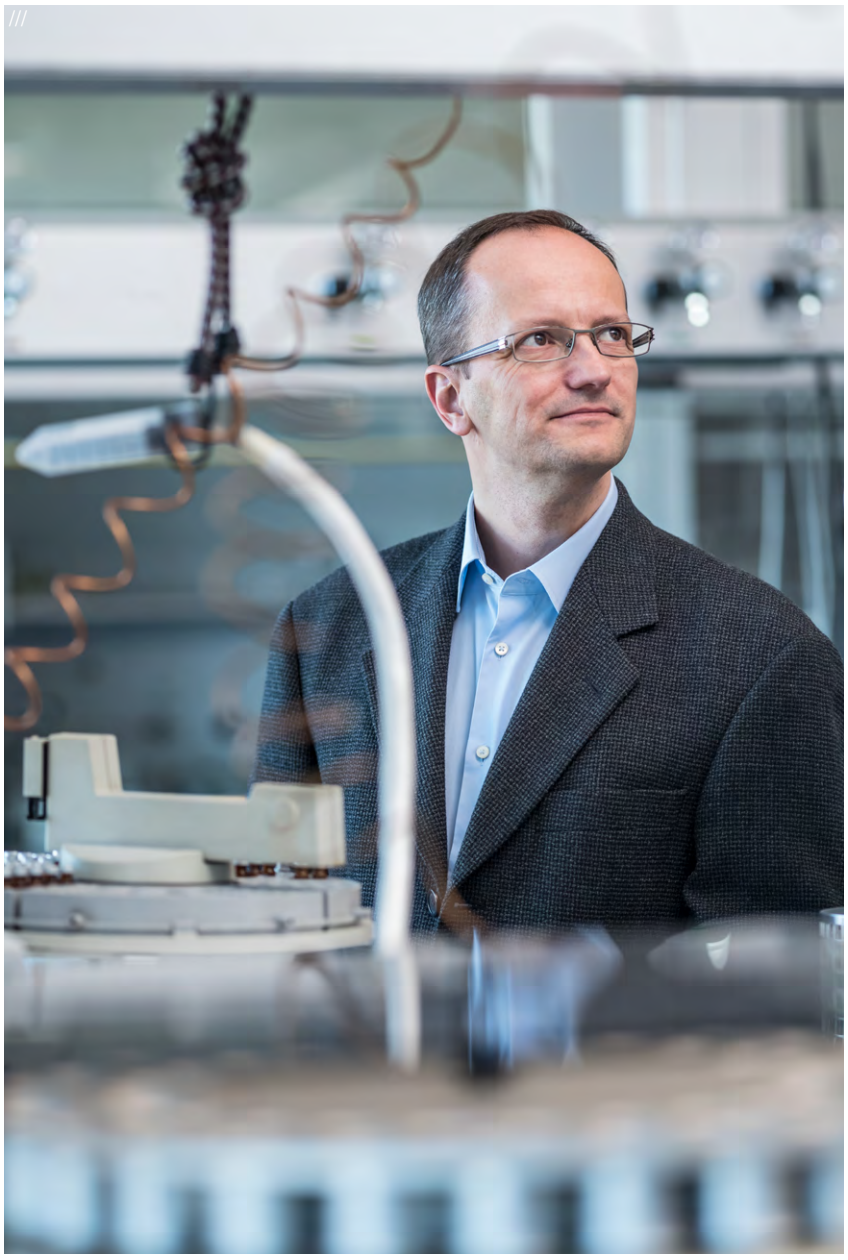

//////// Flawa AG, AG Cilander, E. Schellenberg Textildruck AG, Mammut Sports Group AG, Schoeller Textil AG, Serge Ferrari Tersuisse AG and TISCA Tischhauser & Co. AG. For patent protection reasons, none of the companies want to comment at present on the content of these CTI projects. Subitex is a five-year research programme.

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Empa's entire textile know-how is flowing into the industry

How does the cooperation between the industry and Empa function? "It's a push-and-pull process, i.e. we at Empa are pushing innovation in the industry by implementing ideas that evolve from our research together with a Subitex partner, and, in turn, companies are able to obtain our support for their ideas or products," explains Rossi. Empa organises two innovation workshops each year for Subitex partners, at which three researchers present new technologies and/or materials. The companies in attendance can then hold individual discussions with the researchers. "At these workshops, Empa is successively placing its entire textile know-how at the disposal of the participating companies," says Rossi.

"Every material can be turned into fibres, and thus into a textile."

Prof. Dr. René Rossi, Empa

In order to pass on even more know-how to its Subitex partners, Empa has invested a portion of the financial support for Subitex into the "Self-care materials" programme of the "Competence Centre for Materials Science and Technology" (CCMX) at the ETH Domain. This programme is researching fibre structures for the delivery or absorption of substances. It entails a combination of basic and industrial research and is lucrative in that the Swiss National Science Foundation (SNSF) is providing the same amount of funding as the industry.

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Human body as a textile

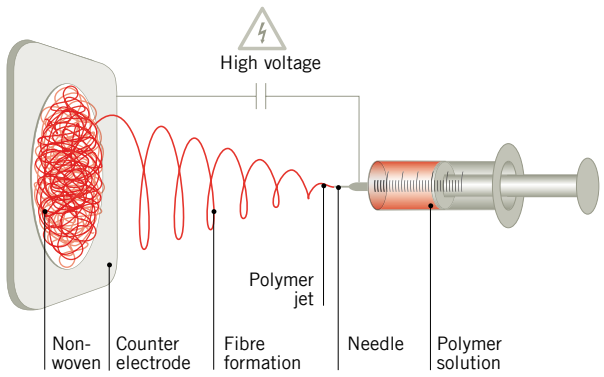
The "Zurich Heart" project is a prime example of the direction in which textile research is heading in the field of biomedicine: heart pumps are being developed that one day will minimise the need for donor hearts. This project involves cooperation between the Federal Institute of Technology, Zurich, the University of Zurich and the Zurich University Hospitals, the "Deutsches Herzzentrum" in Berlin and Empa.

Artificial heart pumps have been in use for around 30 years, but they can cause blood clots because the blood comes into contact with an exogenous material. To prevent this, the patient's own cells need to be cultivated on the interior surface of the Zurich Heart pump. And this is where Empa's textile research comes in.

The researchers aim to emulate the structure of a blood vessel in the interior of the pump. Viewed from the interior outwards, blood vessels comprise a layer of endothelial cells, muscle cells and an extracellular matrix (or "scaffold") that holds the cells together. "In the Zurich Heart, this extracellular matrix is replaced by a polymeric fleece," explains Dr. Giuseppino Fortunato, a researcher in the Zurich Heart project team at Empa. "The principle here is for the fleece to be spun with a layer of the patient's own muscle cells and to subsequently cultivate a layer of endothelial cells."

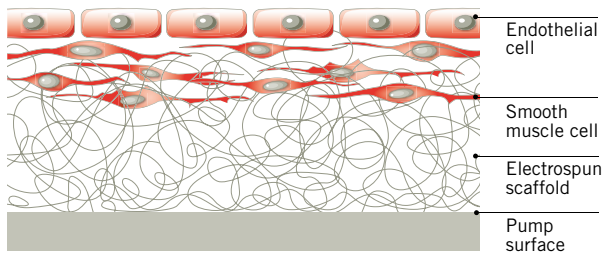
//////// PAGE 09

ELECTRO SPINNING METHOD /// 2



ENVISAGED STRUCTURE OF THE HEART PUMP SURFACE /// 3

Pulsatile, hybride membrane



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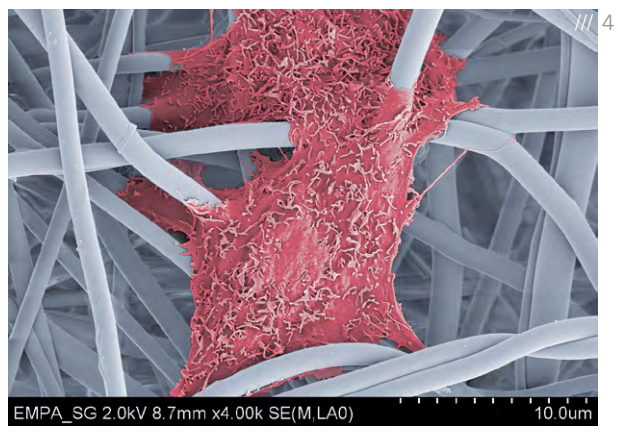

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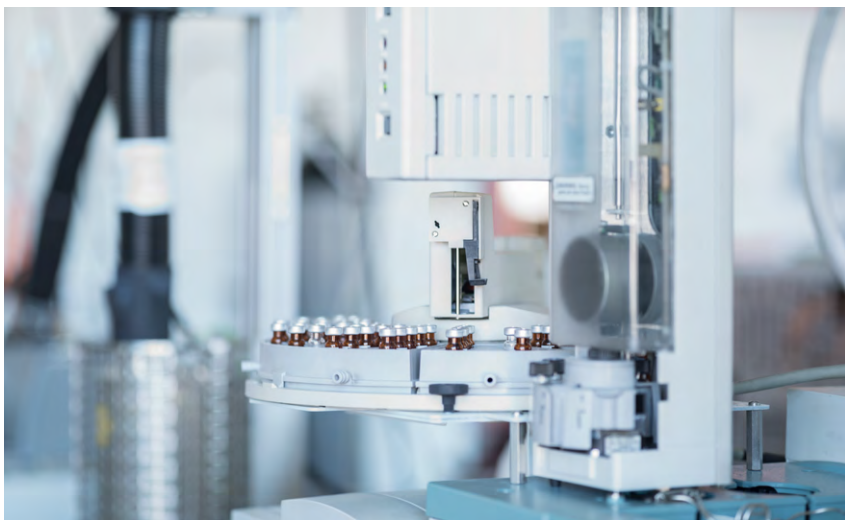

1 /// Prof. Dr. René Rossi is head of the Subitex project at Empa.

2 /// The electrospinning method is used for the production of fleece for the Zurich Heart.

3 /// Diagram of the structure of the interior of the heart pump: the fleece is interwoven with the muscle cells and coated with the endothelial cells.

4 /// Under the microscope we can see the muscle cells (red) that have been simultaneously spun with the fibres.

5 /// Empa research team with Dr. Giuseppino Fortunato (second from right), who is involved in the Zurich Heart project. There are two team members missing on the picture.

THE ORGANISATION OF CCMX AND SUBITEX

Competence Centre for Materials Science and Technology (CCMX)

Industry partner		Academic partner	
Alexander Schaetz	Nina Bachmann	Principal investigator: René Rossi	Principal investigator: Fabien Sorin
Syngenta AG	Swiss Textiles	Empa	EPFL

Subitex Network

AG Cilander
Climatex AG
Flawa AG
Lantal Textiles
Mammut Sports Group
Meister + Cie. AG
Monosuisse AG
Schoeller Textil AG
Sefar AG
Serge Ferrari Tersuisse AG
Sigvaris AG
Swissatest Testmaterialien AG
E. Schellenberg Textildruck AG
TISCA Tischhauser & Co. AG

“The principle here is for the fleece to be spun with a layer of the patient’s own muscle cells and to subsequently cultivate a layer of endothelial cells.”

Dr. Giuseppino Fortunato, Empa

/////// A team of eight biologists, chemists and physicists from Empa are currently involved in this research project, in which the focus is on two central issues: how the fleece can be spun using muscle cells and how the elastic material can be firmly attached to the interior of the heart pump.

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Fleece – seven times lighter than copying paper

Fleece comprises continuous or cut fibres in a non-oriented form and without interweaving. In other words, it does not have a regular structure. Under the microscope it resembles an unrolled ball of wool. The fleece for the Zurich Heart consists of fibres that are several hundred nanometres thick and are made from a polymer solution. By way of comparison, the fibres are around 200 times thinner than a human hair.

The fleece is spun using the electrospinning method. Here the polymer solution is placed in a syringe and connected to a high-voltage power supply. The electrical field causes a jet to be formed, and the fibres are swirled and then separated onto a counter-electrode where the fleece is formed. At the same time, the Empa researchers spray the fleece with muscle cells as it is formed so that the latter become embedded in it. “We have already succeeded in producing the fleece and spraying it with cells,” says Fortunato, “and are now studying how blood reacts when it comes into contact with the fleece and cells.”

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Optimal solution: fleece comprising two different materials?

The material that is used for producing the fleece is a decisive factor, because the fleece has to meet a variety of requirements: For example, it has to remain intact inside the pump, it needs to be elastic so that it follows the pump movements, and it has to adhere to the silicon surface of the pump with the aid of a chemical bonding agent. The researchers at Empa are currently trying to identify the most suitable polymer for this purpose: “We can envisage the possibility of obtaining a gradient in the fleece by spinning it with two polymer solutions. In this way, one polymer would be more suitable for the chemical bonding with the pump surface, while the other could be used for securing the optimal interactions with the muscle cells,” explains Fortunato. “This could be compared to knitting something using red thread to begin with, then changing to blue halfway through.”

The researchers anticipate that it will take another ten years or so before this technology can be brought onto the market. ✖

Swiss Federal Laboratories for Materials Science and Technology, Empa, www.empa.ch, https://subitex.empa.ch, www.hochschulmedizin.uzh.ch/de/projekte/zurichheart.html

“Users will have to feel safe so that they are not afraid to walk or of growing tired too quickly.”

Dr. Konrad Stadler

Dr. Konrad Stadler, Institute for Mechatronic Systems

Prof. Dr. Markus Wirz, Institute for Physiotherapy

INTELLIGENT LEGGINGS FOR SAFE MOVEMENT IN DAILY LIFE

In the XoSoft project, which is part of the Horizon2020 research programme, nine research teams from seven countries are developing a soft and flexible exoskeleton in the form of leggings for elderly people or patients with neurological disorders causing to restricted movement due to muscular weakness or sensory processing disorders. The device comprises three modules on the ankles, knees and hips. It permits safe movement and helps prevent secondary diseases caused by immobility. Prof. Dr. Wirz (Institute of Physiotherapy) and Dr. Stadler (Institute of Mechatronic Systems) at Zurich University of Applied Sciences (ZHAW) explain how it works.

Please tell us more about this practical research project.
PROF. DR. MARKUS WIRZ: The focus of the new technology is on future users. There are three test phases: the first two prototypes will be trialled in the laboratory on patients with restricted walking ability. The findings will be used for developing the third prototype, which will be tested under real living conditions in the clinic in Erlangen.

Safety is to be provided by hardening the material. How will this work?
DR. KONRAD STADLER: The leggings can be hardened using an electro-rheological solution in tubes, which alters the viscosity. The signal is passed on via the sensors to the system that controls the viscosity, and this can prevent the user from losing balance or falling.

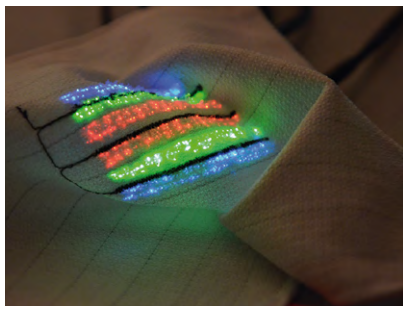
Which tests are currently in progress? Do you have any initial findings?
MARKUS WIRZ: We first have to determine whether the sensors really collect the data required by the system for regulating the leggings and for the monitoring process. The components for the ankles and knees have already been partially tested on textiles in the Movement Laboratory at the ZHAW Institute of Physiotherapy.
KONRAD STADLER: The sensor technology is already working well, but controlling the change in viscosity is still a challenge for users.

What has already been tested in terms of textiles?
MARKUS WIRZ: We are focusing on questions such as how easy it will be to put on and take off the leggings, the best place to install the sensors so that they cannot be bent, and how we can install the wiring.

Which requirements will the leggings have to meet for everyday use?
MARKUS WIRZ: Reliability, intuitive usability, easy to put on and take off. Design is an important factor too: the product will have to be worn beneath the user’s clothing.
KONRAD STADLER: Users will have to feel safe so that they are not afraid to walk or of growing tired too quickly.

Will the sensors be textile-based or integrated into the textile?
MARKUS WIRZ: The need to easily exchange defective sensors points to an integrated solution: wires could be damaged when the leggings are put on or taken off.
KONRAD STADLER: We have also discussed the option of making the thread conductive, but this is something for a future project.

XoSoft project, www.xosoft.eu



SOFT SENSORS FOR SMART TEXTILES

The Swiss Federal Laboratories for Materials Science and Technology (Empa) has succeeded in using a melting process to produce optical fibres for sensors that are suitable for textiles. These fibres are extremely pliable, which means they can be knitted and do not break when knotted. The sensors can be manufactured industrially, are washable and can also be disinfected. They are therefore ideal for use in hospitals.
The newly developed optical textile sensor was tested for measuring heart rate. For this purpose it can be placed on bare skin anywhere on the body. The heart rate can then be measured by transmitting light through the material and measuring the light intensity that is fed back to the detector and changes with the pulse. Together with Swiss research and industry partners, Empa aims to further develop this textile sensor so that it can also monitor a patient’s oxygen saturation or metabolism.

Swiss Federal Laboratories for Materials Science and Technology, Empa, www.empa.ch

TEXTILE SENSOR MATS FOR RELIABLE MONITORING

As a start-up company originating from the Institute for Biomechanics at the Federal Institute for Technology, Zurich, sensomative combines textile sensor technology with intelligent data mining algorithms. “Sensomative science” is a thin, robust and flexible textile mat with an associated mobile app. It allows accurate and rapid analysis of instantaneous pressure distribution. This innovative biocompatible product can be used in research to perform large-scale studies with office chairs, wheelchairs, mattresses, etc., and as a useful tool in the development of products. Moreover, real-time pressure information can also provide vital input for customising chairs. Working together with the Federal Institute of Technology, Zurich, on a joint research and product development project, sensomative is further developing its innovative sensor system for integration into wheelchair cushions, where advanced classification methods will enable user-specific feedback to be provided to wheelchair users. The aim is to increase the effectiveness of and adherence to preventive measures and to support wheelchair users in reducing pressure magnitudes and durations in order to avoid the development of pressure ulcers.

Sensomative, www.sensomative.com
Forster Rohner Textile Innovations, www.frti.com

WEARABLE MOTION SENSORS

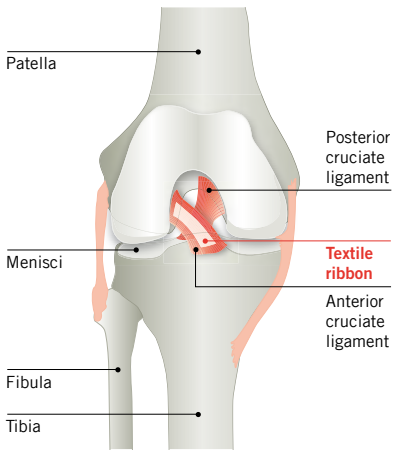
The European research project “Easy IMP” focused on the development of methods, tools and platforms for integrating intelligent, wearable sensors and actuators into clothing. The use of sensors and vibrating actuators is paving the way for the development of a new category of measurement and feedback applications that are suitable for use in a variety of areas, including rehabilitation and training.
The backbone of the developed system is a textile tape with interwoven copper strands for connecting the sensors and actuators.
Interactive Wear AG develops and manufactures products and components for integrating electronics into textiles. It supports its clients in the development of wearable, intelligent textile applications, from the concept stage through to the finished product. It uses conductive textile tapes made by Streiffband AG for connecting the components.

Streiffband AG, www.streiffband.ch

BRAIDED MICRO-STRUCTURES AS IMPLANTS

In the past few years, major successes have been achieved in the development of minimally invasive (keyhole) surgery. An ever increasing number of surgeons are favouring this method, partly because it cuts healthcare costs, but also because the outcome of the surgery is generally better for patients and it also reduces the stress associated with operations. For this purpose, surgeons need instruments and implants that are as small as possible, but which also meet the necessary requirements and are bio-compatible. Braided microstructures meet these requirements in full and can be used for a broad variety of surgical purposes, for example to assist with the healing of torn tendons and ligaments or to support the treatment of fractures. They are also suitable for use in heart valve operations, as replacement arteries and as micro stents. Both the manufacture and the use of such products have to comply with extremely stringent hygiene regulations.

Meister & Cie AG, www.meister-ag.ch



SURGICAL RIBBONS

Following a lengthy and intensive period of development in cooperation with end users, during which we also had to ensure compliance with demanding medical standards, it is now possible to use special textile surgical ribbons as implants to replace irreparably damaged tendons and ligaments. Our company is developing and producing these ribbons in our own factory under carefully controlled conditions. The use of FDA-certified yarns is just one of the essential prerequisites that have to be met.
These textile ribbons strengthen tissue and are used in the transplantation of tendons and ligaments. They reduce the risk of rejection and support movement as robust and functional artificial cruciate ligaments. They also meet the elasticity requirements placed on ligaments and tendons (Achilles tendon, tibia tendons, etc.).

Kuny AG, www.kuny.ch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NATURE AS MENTOR

While sustainability is a global challenge, major impulses are emanating from Switzerland. These include the product label OEKO-TEX® “Made in Green” and the “bluesign®” standard, as well as resource-conserving process innovation in the field of finishing.

Text: Hans-Werner Oertel

As an “eco-nation”, Switzerland is demonstrating how things can be done more sustainably. Throughout the country the focus is on healthcare, the environment and nature. Examples include the Gotthard base tunnel, solar ski lifts and the nationwide sustainability strategy. The approximately 200 companies active in the textiles industry are supporting the various objectives through initiatives, innovation and technological input. In this way they are positioning themselves for the future and strengthening their chances of holding their own against their international competitors.
Sustainability is a major challenge, both for scientists as well as for researchers in companies in the textiles and clothing industry. Regardless of the process (spinning, dyeing, etc.), new concepts for conserving energy and water are about to become the centre of focus, as are future-oriented processes for recycling textiles. Too many used textiles are still being incinerated instead of recycled.
“A broad variety of potential uses for technical textiles are associated with composite materials and functionality. This means that we already need to preconceive sustainability in research and development today. In the medium term, success will also greatly depend on our use of renewable raw materials. We need to utilise and re-use resources instead of consuming them, as well as recycle materials and enable a closed-loop economy and focus on “cradle-to-cradle” as a concept for sustainably developed product life cycles,” says Thomas Strobel, expert for projects on future planning and consultant from Munich.

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Sustainability standards “made in Switzerland”

Out of a sense of ecological responsibility, Swiss textile companies active throughout the world were among the first to define concepts and set benchmarks for monitoring the sustainability of value chains.
As a creator of sustainability standards, Switzerland’s textiles industry has been a driving force behind this development at the international level since the turn of the millennium. It is thus providing manufacturers with a strong orientation and private and industrial consumers and users with the assurance that, when they buy clothing or use lightweight textile construction materials (to cite just one example from the field of technical textiles), they are able to contribute towards a sustainable future.

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Demand for more sustainable finishing

At this year’s Techtexil in Frankfurt, the world’s leading trade fair for technical textiles, Schoeller Textil AG and HeiQ Materials AG are exhibiting a variety of product innovations. Whether for crease-free, fire-retardant, antibacterial, water-repellent or printed and dyed products, textile finishing with potentially 15,000 chemical substances is an extremely broad and exciting sphere of activity for innovative companies.
Based in Sevelen, Schoeller and its subsidiary Eschler specialise in the sustainable development and production of innovative textiles and textile technologies. In Frankfurt, one of the creations this global player will be exhibiting is its range of “Inspire” recycling textiles.
As co-initiator of the widely recognised bluesign® system in the world of textile production, Schoeller has been producing in accordance with the principles of this initiative since 2001. It was the first company in the world to receive the bluesign® award. At that time, Inspire textiles had not yet been developed. Together with DutchSpirit, which is based in Holland, on the basis of this concept Schoeller is creating durable textiles with high wearer comfort using fibres from recycled clothing. For this purpose it exclusively uses special recycled polyester fibres that look and feel similar to cotton. At the end of their lifetime, textile garments made from this material can then be fully recycled.

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Nature as the source of ideas

“Innovation and sustainability are part of our DNA,” says CEO Siegfried Winkelbeiner. And he adds: “We are shaping the textile future together with our partners throughout the world. Because bionics and comparisons with the world of flora and fauna

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PREMIUM WOOL, SWISS MADE

During her Master's studies, Sabina Brägger came across a residual material – bison wool – and now plans to bring the first luxury bison yarn onto the market in 2018.

During your Master's studies you focused on the processing of bison wool. What is the current status of this project?
In my thesis I focused on the fibres, properties and spinning of the material; then, in the framework of the "Swiss Cultural Challenge"* I prepared a business plan and asked myself how I could implement the project. The focus now is on how we can transport the material from all over Europe into Switzerland and how we can process it. And, of course, how we can attract investors.

What gave you the idea to process bison wool?
I first came across it by chance. I had gone to a farm to buy meat and the bison in the paddock had started to shed their winter coat. I asked myself what happens to the hair – does anyone use it?

On which criteria do you base your search for residual materials of this kind, and how do you determine the suitability of a given material?
If a particular material appears to be of interest, I evaluate it on the basis of my own criteria, which include the available quantity, the properties of the raw material, the functionality of the fibres, the required water and electricity consumption, and the production of waste and potential pollutants.

Where do you obtain your bison hair?
We are initially working together with large farms that keep 100 or more bison, but others will soon follow. The hair is either removed using sheep shearing machines after slaughtering or collected from the fields after the bison have shed their winter coat. Together with a Swiss industrial designer I have developed a scratching post system that collects the hair in a container which can then be emptied by the farmer.

When can we expect to see the first products and designs?
We aim to produce the first yarns and felts in 2018. They can be used for carpets, for example, as well as for clothing. Bison wool is one of the warmest and it insulates more effectively than sheep's wool. It is extremely light and the finest type is similar to the texture of cashmere wool. The material is flame-retardant and highly absorbent. It can absorb large quantities of moisture without feeling wet.

Sabina Brägger
http://sabinabraegger.ch

*The "Swiss Cultural Challenge" competition is organised by the FHNW Academy of Art and Design (North Western Switzerland University of Applied Sciences and Arts) with the aim of supporting young people with their entrepreneurial activities in the areas of design, art, media and music.

"Bison wool is one the warmest and it insulates more effectively than sheep's wool."

Sabina Brägger

////// are so fascinating, the Schoeller team, in which every fourth person cooperates in research, development and design, frequently comes up with ideas for new products. The most recent one is a revolutionary finishing technology that uses renewable instead of fossil-based raw materials: ecorepel® Bio, which emulates natural protection of plants with the aid of a highly functional, permanently odourless high-tech finish that is free of perfluorocarbons and is produced from renewable raw materials from sources outside the food and animal feed sectors. It is applied as a thin film around the fibres of the textiles and thus acts as a repellent layer that causes water and mud to pearl off the textile surface. For their creative research, the Swiss company's 200 employees are receiving the support of environmental activist David de Rothschild, who is advising Schoeller in its quest for a "green future". Schoeller is developing fabrics for a special collection being produced by De Rothschild's company "The Lost Explorer". De Rothschild, who crossed the Pacific in 2010 in "Plastiki", a raft made of plastic bottles, considers Schoeller as a partner that regards nature as a mentor.
One of Schoeller's developments in the field of wearables is a technology called HYDRO_BOT, which is now being researched together with four strategic partners (Osmotex, Kjus, Empa, Belginova). After a ten-year period of development, the aim is for it to be used in the fields of sportswear, work wear and protective clothing, tailored to the respective climate zone and level of activity of the user, and optimised for the dissemination of perspiration through the electronic control of moisture transport in membranes and textiles.

HeiQ setting its sights on efficient use of resources
The history of the establishment of HeiQ (Schlieren) is as unusual as the story of this rapidly expanding company specialising in finishing technologies for textiles and functional textiles, with more than 100 brand partners throughout the world. With HeiQ Eco Dry, this innovative Swiss company has introduced one of the most efficient fluorine-free, water-repellent textile technologies currently available on the market. This environment-friendly technology imitates the efficiency of a duck's feathery coat and provides protection against water as well as water-based stains. This is one of the technologies HeiQ will be exhibiting at the Techtextil. It will also be presenting its resource-saving HeiQ Clean Tech, which enables textile producers to reduce their CO_2 emissions by up to 30 percent. The HeiQ Clean Tech family includes rapid polyester dyeing HeiQ Dyefast and eco cotton bleaching HeiQ Cool Bleach. HeiQ Dyefast accelerates the polyester dyeing process with disperse dyes and simultaneously optimises the textile product quality. On top of that, HeiQ's brand partners can track savings and reveal the cut in CO_2 emissions with the help of HeiQ's sustainability reporting tool.

International research team
HeiQ was founded by Carlo Centonze and Murray Height during a mountain hiking tour in 2005 as a spin-off of the Federal Institute of Technology, Zurich. Its current team of textile chemical specialists is able to draw on worldwide research input for developing their sustainable technologies. The list of cooperating universities and research centres is truly international. Scientists from Austria, the UK (Cambridge), Hong Kong, the USA and Australia are working together to develop unique, high-performance textile effects.
One of the first innovations based on the HeiQ theme of "safety and ecological awareness", was a wet, tear-resistant, oil-absorbent, water-repellent non-woven called Oilguard that was introduced in 2010 to protect beaches against oil spills. In the meantime, the company has been presenting groundbreaking finishing technologies at regular intervals, such as HeiQ Sun Block for UV protection in 2014 and HeiQ Real Silk in 2016, a unique technology that reproduces the luxurious feel of silk. HeiQ Real Silk makes use of revolutionary, formulated short silk fibres which can be applied by standard textile finishing processes onto the surface of any kind of fabric. In 2017, HeiQ entered into a strategic research partnership with Patagonia, the outdoor clothing brand, with the aim of developing breathable and durable, water-repellent, high-performance finishing technologies. ✖

Schoeller Textil AG, www.schoeller-textiles.com
HeiQ Materials AG, www.heiq.com
Testex AG, www.testex.com, www.madeingreen.com
Bluesign Technologies AG, www.bluesign.com

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“Innovation and sustainability are part of our DNA.”

Siegfried Winkelbeiner, Schoeller Textil AG

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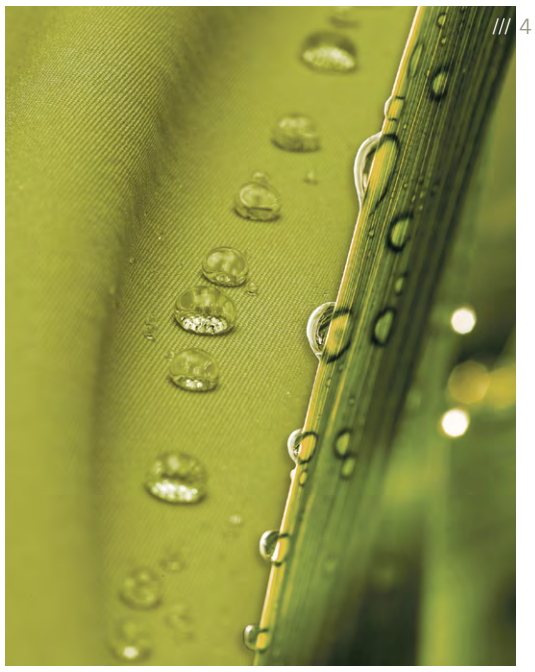

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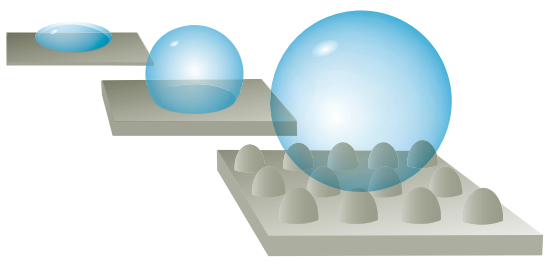
HEIQ ECO DRY



The unique microscopic 3D structure of HeiQ Eco Dry makes water slide right off textiles.

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© Groenendijk bedrijfskleding

1 /// Schoeller Textil AG collaborates with the British environmentalist David de Rothschild. They are working together on research for sustainable, durable products with outstanding longevity.

2 /// Oilguard by HeiQ is an innovative product for the protection of beaches against oil spills. The unique oil-absorbing mat can be up to around 6 metres wide and allows for the protection of many hundreds of kilometres of beach.

3 /// The Sustainable Inspire Collection, made of 100% polyester, has a longer service life, and over 60% originates from recycled PET bottles.

4 /// 3XDRY® Bio ensures reliable repellence of water droplets and mud on the exterior side, and optimum moisture management on the interior. It is PFC-free and bio-based.

5 /// HeiQ Eco Dry is fluorine-free and protects against rain and snow without compromising breathability.

bluesign®

The bluesign® system co-initiated by Schoeller Textil AG in 2000 is a label that informs chemicals suppliers, textile producers and brands about the sustainable production of textiles. With the aid of this voluntary code, environmental impacts can be reduced along the entire textile supply chain. To qualify for the label, industry partners have to subject their components and processes to a verification procedure based on clearly defined principles. This applies to resource productivity, protection of consumers and bodies of water, and measures to reduce emissions, as well as workplace safety. This procedure ensures that the finished textile product complies with the stringent worldwide requirements placed on consumer protection. It also provides an incentive for consumers to buy products that have been manufactured sustainably.

OEKO-TEX® | MADE IN GREEN

Swiss laboratory Testex AG (Zurich) proposed the introduction of an independent textile label, “Made in Green”, from OEKO-TEX. This label certifies consumer products and semi-finished articles from all segments of the textiles chain which are produced without the use of materials that are harmful to human health, are manufactured in an environment-friendly manner and comply with high social standards, and whose manufacturer is able to demonstrate the existence of safe and socially acceptable working conditions. It is valid for one year and comprises a product ID plus an accompanying quality code. This enables manufacturers, brands, dealers and consumers to identify the manufacturing chain of a given product via the Internet or a smartphone.

CAS “SUSTAINABILITY MANAGEMENT IN TEXTILES”

For Swiss companies, sustainable business practice is a decisive competitive advantage at the international level. Sustainability is regarded as a three-dimensional concept in which ecological, social and economic factors have to be taken into account. It has become increasingly important for specialists employed by companies in the textiles industry to pay greater attention to the various facets of sustainability and intensify their knowledge. Currently there are practically no courses in German-speaking countries that focus exclusively on this subject and ideally combine theory and practice. However, Switzerland is planning on playing a pioneering role here: Swiss Textile College (STF), Scuola universitaria professionale della Svizzera italiana (SUPSI) and Swiss Textiles are about to launch a “Certificate of Advanced Studies in Sustainability Management”. This further education course will offer the special benefit of providing a combination of specialised know-how and practical experience. Aspects of social, ecological and economic sustainability will be presented across the broad range of activities within the textiles industry. Following an introduction to the principles of sustainability, the course will focus on aspects such as social responsibility, initiatives and standards, and the life-cycle assessment of a product. A few lessons will deal with textile chemistry and the right choice of fibres. The topics of sustainability communication, practical applications and innovative future scenarios will round off the course.
Lecturers from the partner institutions will provide a sound and practice-related framework, while guest speakers from various industry sectors will enrich the course, which is to be held from November 2017 in the form of 2-day modules in Zurich and Lugano, Switzerland. It will address specialists and management personnel from trade and industry (for example, acquisition managers, designers, product managers, corporate social responsibility managers) and have a clear focus on textiles, fashion and lifestyle.

Swiss Textile College (STF), www.stf.ch

FIRST FLAME-RETARDING FASTENERS

Kuny AG manufactures all its products at its factory in Küttigen, Switzerland. Thanks to its core competencies in the fields of weaving, dyeing, finishing, printing and coating, it has succeeded in developing the first flame-retarding polyamide fastener, HAKOFIX® “FR”.
The outstanding safety properties of this product are setting new standards with regard to the protection of people and equipment.
Its notable features include its high-quality processing with aramid fibres, as well as the fact that it can be washed without reducing its flame-retarding effect.
HAKOFIX® “FR” is furnished with non-polluting, high-grade finishing chemicals. Thanks to the low level of waste water during production and the fact that it is free from toxic fumes, its life-cycle assessment is excellent. HAKOFIX® “FR” complies with Eco-Tex Standard 100.
These features make the permanently flame-retarding PA 6.6 HAKOFIX® “FR” ideally suited for use in safety clothing. In protective vests (ballistic protection), for example, it provides a multifunctional support system with excellent fastening properties.
It also prevents flames from spreading, thus ensuring that the wearer is better protected and the protective clothing remains intact. This eliminates the risk of injury due to flaming or melting droplets.
The HAKOFIX® “FR” fastener is also ideally suited for use in aircraft, railway vehicles and ships (for the fastening of loads, as interior floor covering, for covering pillows and seats, etc.) wherever a permanently flame-retarding material is an essential prerequisite.

Kuny AG, www.kuny.ch

SKI CLOTHING FOR THE FUTURE

The “Freelite” ski jacket is an innovative product in terms of both design and production technology. It was developed within the scope of an applied research project involving LK International AG (the company that markets the KJUS sportswear brand) and the Lucerne University of Applied Sciences and Arts (School of Art & Design, Products and Textiles Research Group).
“Freelite” is a high-performance knitted product. It is manufactured on the basis of a modified production process in which the conventional cut and sew method has been replaced by the use of a low number of 3D knitted preformed parts that are then joined together. This highly innovative and sustainable production method makes it possible to integrate design and the desired functionality during the creation of the material as a knitted fabric.
The project was based on a sustainable design vision. LK International AG consistently incorporated the research findings into its product development and launched “Freelite” in December 2016, approximately 18 months after the joint project was concluded. The special features of this ski jacket include:
– Maximum freedom of movement thanks to the elasticity of the knitted fabric
– Maximum comfort thanks to the softness of the material
– Stunning combination of colour and design

Lucerne University of Applied Sciences and Arts – School of Art & Design, Lucern, www.hslu.ch
LK International AG, www.kjus.com

TEST STRIPS FOR RESOURCE-FRIENDLY LAUNDRY

At Swissatest Testmaterialien AG, textiles are subjected to all sorts of staining and soiling: for example, by pouring chocolate milk, red wine and numerous other products that are difficult to wash out onto a piece of cotton cloth. The purpose here is to test the energy consumption of the latest washing machines to be brought onto the market. Swissatest manufactures standardised strips soiled with five different products that are then used for evaluating the performance of washing machines in order to determine whether they meet the requirements of the European energy label. The washing machine has to be able to wash out stains caused by red wine, cocoa, blood, artificial skin oil and an oil and soot mixture, despite the minimised level of energy consumption. The company produces the various stains at its factory in St. Gallen, where it also subjects them to quality tests.
It would, of course, be better if such stains did not cling to material in the first place. We have all seen how dark blue jeans, for example, can leave a pale blue mark on light-coloured leather. Upholstery and car manufacturers are doing their best to prevent this from occurring by equipping seats with materials that do not discolour or take on stains. Using standardised jeans materials stained with soot and olive oil, for example or soot and skin oil, tests are being carried out in order to come up with a solution that guarantees stain-free fabric over the long term.
Resource-friendly machines and sustainable products also have to be subjected to quality tests.

Swissatest Testmaterialien AG, www.swissatest.ch

NEW WEBBINGS: HARNESS FOR SPACE APPLICATION

For many years, Cortex Hümbelin AG has been producing special textile webbings for harness manufacturer Sabelt S.p.A., Italy. These webbings are converted into a harness concept for attaching loads inside rockets that periodically supply the international Space Station (ISS) with materials. These harnesses have to meet extremely high quality requirements in terms of lightness, performance and material properties, and are subjected to stringent tests by NASA.
The webbings manufactured by Cortex Hümbelin AG offer a combination of extremely robust materials such as PBO (polybenzoxazole) with a new type of specific surface coating that optimises the properties of the support material and simultaneously protects against environmental influences in space. Thanks to this unique technology it is possible to reduce the weight of the harness by more than half compared with conventional products. By achieving this harness weight reduction, a higher quantity of goods can be transported into space. Furthermore, by increasing the payload capacity without an increase in energy consumption, Cortex Hümbelin AG is able to contribute towards the preservation of resources.

Cortex Hümbelin AG, www.cortexhuembelin.com

RECYCLED POLYAMIDE MADE FROM PLASTIC WASTE FROM THE SEA

bäumlin & ernst ag is developing yarns for use in lightweight, functional and resilient outdoor and lifestyle textiles in joint efforts with its strategic clients – for example, Schoeller Textil AG. During development, it pays special attention to sustainability, even at the production stage of the polymer and the basic yarn. The processing and dyeing of the yarns has to be standardised, and it is also necessary to ensure that the product delivers the properties typically associated with polyamides, such as wearing and performance characteristics.
bäumlin & ernst ag succeeded in finding a manufacturer of recycled polyamides that can guarantee the desired properties. The polyamides are not only processed from industrial waste, but also from disused fishing nets that have been pulled out of the sea, cleansed, repolymerised and subsequently rewoven. So, this yarn tells the story of a product that contributes towards the protection of the environment by recycling waste materials and thus conserving natural resources. This forward-looking concept demonstrates how the burden on the environment can be eased by recycling carefully selected materials and turning them into high-quality, tough and functional textiles for a broad variety of purposes.

bäumlin & ernst ag, www.beag.ch

WEATHERPROOF, BREATHABLE FABRIC MADE FROM ORGANIC COTTON

EtaProof, the world's leading breathable, all-weather fabric, is now available in organic cotton. With this development we have placed ourselves at the forefront of a movement that will soon become a major trend.
Stotz & Co. AG is the sole manufacturer of such dense fabrics. EtaProof organic cotton is available in two versions: 200 grams per m^2 and 240 grams per m^2.
EtaProof is spun, woven and dyed/finished in Switzerland. This high-performance woven fabric is produced from the finest-quality, extra-long, stapled cotton fibres, which are spun at low speed, doubled and woven into high-density plain weave. The result is astounding: a high-quality, dense, all-weather fabric that offers outstanding wearing comfort and optimal protection. No other fabric made of natural materials is able to provide as much protection and breathability as EtaProof.
Another remarkable characteristic of EtaProof is that, despite its high density (the density – or weight – of the weave is more than 30 percent higher than that of conventional fabrics), it has an extremely soft and pleasant feel.
If the fabric comes into contact with water, the cotton fibres swell by approximately 10 percent. This increase in volume closes the pores and results in a degree of waterproofing that is not equalled by any other natural fibre. Its pore size is 2 to 3 thousandths of a millimetre (2–3 µm). This is small enough to keep off water, but large enough for body moisture to pass through.
Thanks to its special characteristics, EtaProof is ideal for making jackets and trousers for outdoor use. It can also be used for making all types of fashionable weatherproof coats, jackets and hats. EtaProof organic cotton meets the stringent requirements of the Greenpeace Detox Outdoor Campaign.

Stotz & Co. AG, www.stotzfabrics.ch

TEXTILES IN THE BUILDING INDUSTRY

Architects are increasingly using woven, embroidered and knitted fabrics. Below are four examples of Swiss fabric, rope and yarn producers who are providing sustainable impulses in the construction industry.

Text: Lilia Glanzmann

“Girasole” is Italian for sunflower, and it is the name that was chosen for the new headquarters of Swiss Federal Railways near Bern: the building’s colourful shutters follow the path of the sun, depending on how intensely it is shining.
This kinetic facade features five different colours: gold, pearl, aluminium, chromium and copper. Each colour group can be individually regulated so that the building takes on a subtle change in appearance and its temperature can be precisely regulated.
“SEFAR® Architecture VISION” is a sophisticated sun shading system from Sefar (Heiden) that is combined with a specially developed automated mechanism. It comprises black precision-woven fabric, coated on one side, partially printed and incorporated into laminated safety glass. Thanks to the black colouring on the interior, the view to the exterior is unobstructed.
Sefar originally only produced technical fabrics for screen printing and filtration, but these are now being used by architects – fabrics that filter noise or light.
Sefar classifies its architecture fabrics into three categories: “fabric & weather”, “fabric & light” and “fabric & glass”. Its “fabric & glass” products have been used for glass facades in Bern, for example, and for the headquarters of Novartis (Holzer Kobler Architects, near Zug). In the “fabric & weather” category, textiles are used to provide shade as awnings or to protect against rain, e.g. Wimbledon Centre Court. For the foldable roof in Wimbledon, Sefar supplied 5,200 square metres of its product, “Tenara”. And at the end of next year, a further 8,000 square metres will be required for No. 1 Court.
The “fabric & light” category concerns lightweight fabrics that absorb and disseminate noise and light. Architects mainly use these fabrics for interiors, e.g. in museums. Previously, planners had to design each individual component of luminous ceilings, with fabrics and light source as separate components. “We want to make architects’ tasks easier,” says Ingo Thalhammer, who has been head of Sefar’s Architecture Division for ten years. “Cielumina”, a module measuring 90 by 90, 120 by 120 or 150 by 150 centimetres, combines light and textiles. It has a frameless appearance, is fitted with LED circuit boards and is easy to install flush-mounted. The result: soft light that protects exhibits yet enables them to be viewed in perfect conditions. Flury and Furrer Architects (Zurich) were one of the first designers to use “Cieluma” in their partial renovation of the Oskar Reinhart Museum in Winterthur.
In addition to aspects of functionality, Ingo Thalhammer also pays attention to sustainability: for example, at the Swiss Federal Railways headquarters, where Sefar’s intelligent fabrics regulate heat. “By providing quality and the resulting extension of life cycles we also want to help combat today’s throwaway society,” he explains.

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Spun yarn and light-transmitting concrete: monosuisse

The high-performance filaments that are ultimately woven to form durable sunshades and luminous ceilings are produced by Sefar’s subsidiary, Mono-

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© Gruber Fotografie / Colt International GmbH

////// suisse, in Emmenbrücke (near Lucerne), which specialises in technical yarns. Its thinnest weavable thread is just 19 µm (i.e. 19 thousandths of a millimetre) thick, or around a third of the thickness of a human hair.
"Good textiles are produced by spinning," says Markus Wanner, a long-term employee of Monosuisse. The purity of the raw material is absolutely decisive: there are very few suppliers in the world who are able to deliver the ideal polymer. "With regard to luminous ceilings, even the tiniest impurity on the surface would be visible." In addition, the life-cycle of fabrics intended for use by architects has to be longer than that of their technical counterparts: "We often change filters once a month, but a ceiling in a museum has to still look flawless even after five years." To optimise its fibres, Monosuisse has invested a great deal of time and frequently modified its machines.
Monosuisse is also involved in another textile innovation: luminous concrete from "Lucem" (Stolberg, Germany). Shimmering patterns give solid walls the appearance of soft silk. The surface appears to contain numerous tiny perforations through which light can penetrate. "This effect is possible thanks to the use of optical fibres from Monosuisse that let light through our concrete structures almost loss-free," explains CEO Andreas Roye. These fibres are embedded in the concrete and render it translucent.
Lucem initially supplied companies that used concrete slabs to produce washbasins, but today it is increasingly supplying architects with products for interior design, and even for facades. Both luminants and artificial light sources are used, as well as daylight. For the new premises of the Institute for Textile Technology in Aachen, Carpus + Partner Architects integrated an interactive light transmitting wall into a facade for the first time. During the day, the unlit wall has the appearance of a natural stone facade, and at night it shines in a broad variety of colours. Each slab can be regulated individually. Another fine example is the Al Aziz Mosque in Abu Dhabi, which comprises 500 large-format Lucem slabs over an area of 525 square metres. The calligraphy carved out of the slabs also lights up at night.

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Stranded steel: Jakob Rope Systems
Jakob Rope Systems (Trubschachen, Emmental) shows how techniques used in the textiles industry can be transferred to new materials. The company was founded in 1904 as a manufacturer of hemp rope and then focused on making cables for cable cars and use in forestry – an activity that still accounts for 25 percent of its present-day turnover of around 30 million Swiss francs. But its key products today are cables based on textile-like structures, which Jakob has been developing since the late 1980s, when architects began to knock on its door. Its highly delicate ropes were suitable for glass structures. "We didn't even have a catalogue to send to potential customers," recalls CEO Peter Jakob. Working together with architects they quickly realised that selling individual steel cables was by no means easy. In view of this, fifteen years ago Jakob launched "Webnet", a pliable and transparent high-grade steel screen made solely of stranded wires. These are held together with tiny sleeves, or are looped together. With "Webnet", architects can design vertical and horizontal structures as well as curved, free-form creations. "What counts is how it is attached to the structure," says Fabian Graber, who is both an architect and engineer at Jakob. Robust attachment is essential for firmly securing the wires. "The use of stainless steel means that these products can be installed both inside and outside buildings." ////// PAGE 22

TEXTILES FOR REVOLUTIONISING BUILDING TECHNOLOGY

During our lives we spend by far the greatest amount of our time inside buildings: residential dwellings, the workplace, shops, etc. It is frequently the case that buildings are too hot in summer, too dry in winter, have poor acoustics and above all consume far too much energy. In Switzerland alone there are around 1.4 million older buildings with a poor energy balance. The courage to make use of new solutions is often undermined by high costs and time pressure. The aim behind the NEST (Next Evolution in Sustainable Building Technologies) project initiated jointly by Empa and Eawag is to promote the innovation process in the buildings sector. New technologies, materials and systems are being tested, researched, further developed and validated in a modularly constructed building under real living conditions, i.e. in a building in Dübendorf that is being used as a genuine dwelling and workplace. The close cooperation between researchers, companies and the public sector means it will be possible to more quickly bring innovative construction and energy technologies onto the market. Textiles are playing a significant role in the various NEST units:

HiLo: The HiLo unit at the Federal Institute of Technology, Zurich, impressively demonstrates the potentials of lightweight construction. For this two-storey penthouse, ultra-light-weight concrete shells are being used that set new benchmarks with regard to energy standards and savings in terms of materials and weight. The method for constructing the concrete shells is revolutionary: here, a recyclable shell is used that comprises a network of cables and various textile fabrics. This method permits a high degree of planning precision, as well as greater freedom with respect to form. It is also less labour-intensive and reduces material costs. It also eliminates the need to use complex timber shells or rigid foam blocks that cannot be recycled. The average thickness of the concrete roof is just eight centimetres.

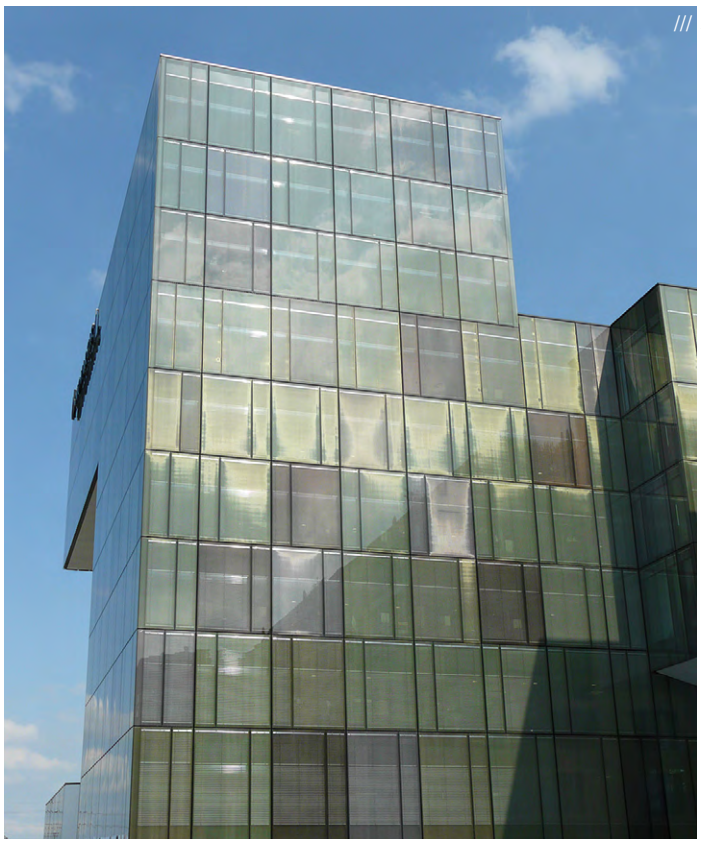
SolAce: In this unit, the focus is on the production of electricity and hot water using solar energy absorbed by the building shell. The concept involves the integration of solar cells into window panes. Swiss company Sefar AG is developing and producing a fabric construction that may be described as a transparent electrode. The fabric concerned is suitable for the production of dye-based solar cells. These are being used by the company glass2energy ag, which has succeeded in producing electricity even at very low levels of light incidence.

Meet2Create: The aim in this unit is to optimise the interactions between people, living space and technology. Here, Swiss company Création Baumann AG is making use of sound-absorbing textiles. These high-grade textiles can be used for improving the acoustic properties of rooms and also permit greater flexibility for room partitioning.

NEST Backbone: Textiles to improve room acoustics are also being used in the conference rooms in the Backbone unit, the NEST building core. Here, transparent acoustic curtains from Annette Douglas Textiles are in use which were developed in cooperation with Empa.

NEST and the broad variety of applications for textiles will bring building technology a major step forward.

NEST and the broad variety of applications for textiles will bring building technology a major step forward.



/// 3

© Roman Keller

1 /// This bank building – designed by Jordan architect Saja Nashashi, Paradigm DH/Amman – which is being constructed in Amman, Jordan, is to include a stairwell cladding made of “Lucem” luminous concrete. The 30-millimetre-thick walls are assembled on a 14-metre-high steel structure.

2 /// The kinetic facade of the new headquarters of Swiss Federal Railways in Bern comprises five different colours. “SEFAR® Architecture VISION” is a sophisticated system offering protection from sunlight, developed by Sefar.

3 /// Novartis head office on the “Suurstoffi” site in Rotkreuz, near Zug: the facade designed by Holzer Kobler Architects was finished using a special fabric called “SEFAR® Architecture VISION AL 140/70”.

NEST, www.nest.empa.ch

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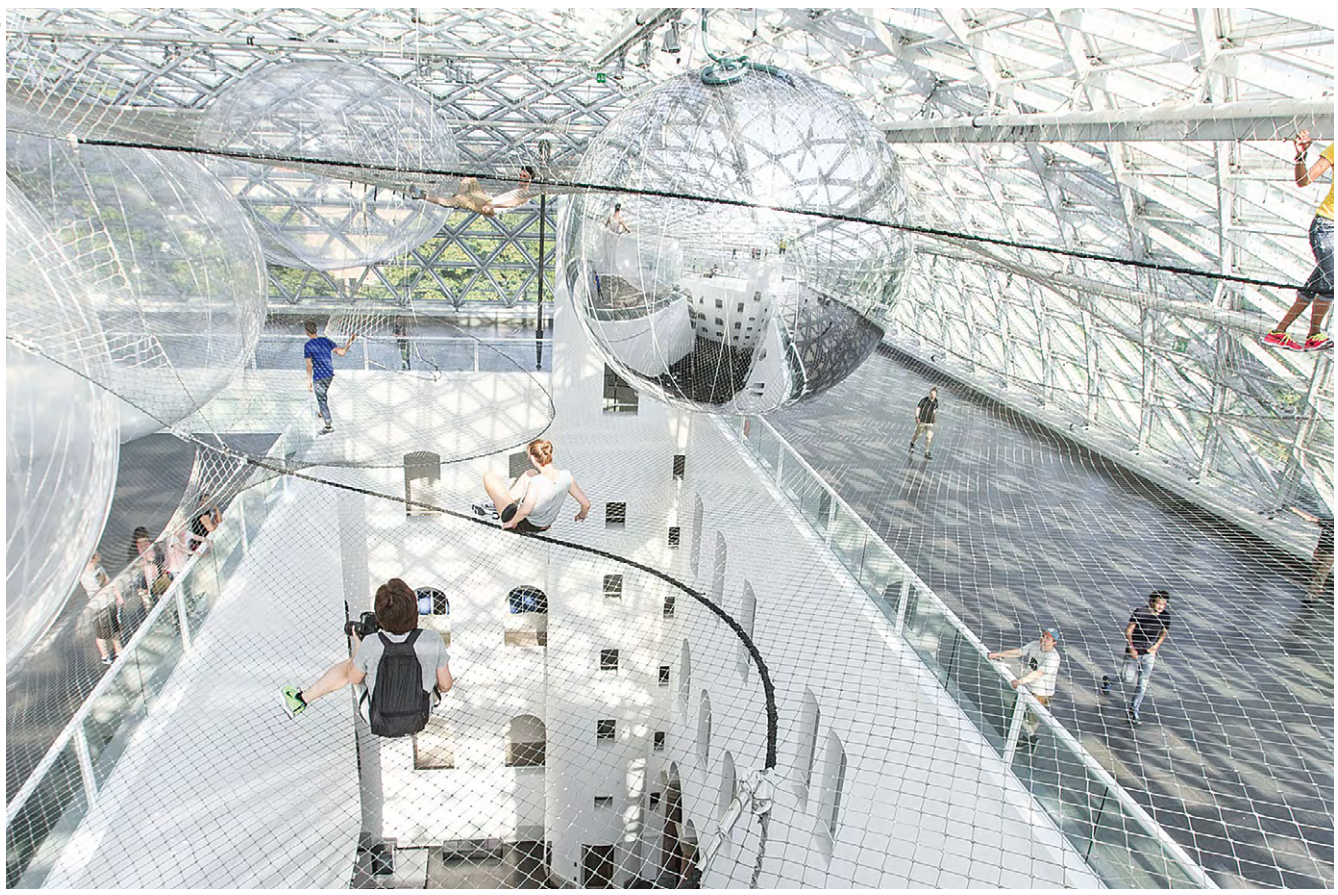
2 ///

3



1 /// Kinetic mesh structures from Jakob: wind roundabout designed by artist Ned Kahn in Fort Worth, Texas. The numerous small rectangles move with the wind and reflect sunlight as well as lights from passing cars.

2 /// Test setup of the "Texlining" prototype in Lungern: the glass fibre fabric is fixed with the aid of buttons, giving it an appearance similar to that of a sofa.

3 /// For his "in orbit" space installation at the K21 Museum in Dusseldorf, Argentine artist Tomás Saraceno stretched a total of 2,500 square metres of safety netting from Jakob at three different levels.

////// Jakob is continually developing its product range in order to provide sustainable solutions, "Sometimes at the suggestion of customers, but also proactively." Each screen is customised and primarily used as a support, but a standardised solution is currently in preparation. With the "Webnet ID" project the aim is to enable screens to be fitted with chromium steel or aluminium panels decorated with the customer's own designs. "This is attractive when privacy is required," says Graber. These screens are also ideal for "green" facades, which are currently very much in demand. Different mesh dimensions within a given screen also permit flexibility for designers. And the latest developments? "We're currently working towards kinetic screens," says Fabian Graber.

"We're currently working towards kinetic screens."

Fabian Graber, Jakob AG

—

Textiles for insulation

Efficiently insulated buildings reduce energy consumption and pollutant emissions. An interdisciplinary team at Lucerne University is researching a new insulation method using textiles. "Together with HP Gasser AG Membranenbau, Lungern, we are developing a solution to efficiently renovate warehouses and sports centres dating from the 1970s and 1980s," explains Daniel Wehrli, scientific assistant at Lucerne University School of Art and Design. Most of these buildings are no longer able to meet the applicable insulation requirements.

"TexLining" is part of a project to develop a multiple-layer, textile-based insulation system. It is being supported by the Federal Commission for Technology and Innovation (CTI).

"We are looking for a competitive product that optimises existing methods and simultaneously utilises the advantages of textiles," says Daniel Wehrli.

This project combines the tried-and-tested method of blowing insulation material into a cavity and a new concept: instead of using cladding made of wood or other materials, "TexLining" is based on a fabric sheathing that holds the insulation material. The lengthy fabric panels permit generous dimensioning, but the textile can be folded for transport to save space.

The initial concept involved a kind of enormous pillowcase directly attached to the support system, but this did not work because the insulation material could not be evenly distributed, which caused the textile to bulge at overfilled locations. So, the researchers decided to attach the material with buttons as is done with upholstered furniture. "The buttons are not only functional, but are also an attractive design feature," says Wehrli.

The textile is a glass-fibre fabric produced by Tissa Glasweberei AG, while rock wool is used for insulation. "We focused on mineral materials so that recycling would be possible later on." The project also set out to reduce as many unknowns as possible. "The fewer the parameters, the better." The first trial with a prototype was successful. The next step will be to develop the product so that it can be brought onto the market.

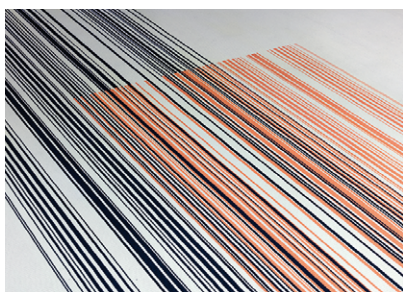
All the above examples concern the use of textiles as auxiliary construction elements. But the researchers in Lucerne are also setting their sights on self-supporting materials. "Construction using textiles entirely without secondary materials is the solution for the future," says general project manager Andrea Weber Marin. ✖

Sefar AG, www.sefar.com
Monosuisse AG, www.monosuisse.com, www.lucem.de
Jakob AG, www.jakob.com
Lucerne School of Art and Design, Lucerne, www.hslu.ch

TEXTILES THAT WITHSTAND EXTREME LOADS

The development of new heat-resistant and high-tensile fibres and yarns has opened up previously almost inconceivable areas of application. TTS INOVA AG specialises in processing these new materials.
In order to successfully develop new products, it needs to work closely together with the potential users. In this way, TTS INOVA AG has succeeded in producing high-tensile, temperature-resistant lifting straps for use in steelworks, where they can replace heavy chain slings. These straps are also suitable for transporting glass, when a great deal of care has to be taken to avoid damage to the surface.
TTS INOVA AG is currently investing in silicone-coating technology. Together with the Swiss Federal Institutes of Technology and their spin-offs, it is focusing its efforts on developing applications for use in the area of energy production.

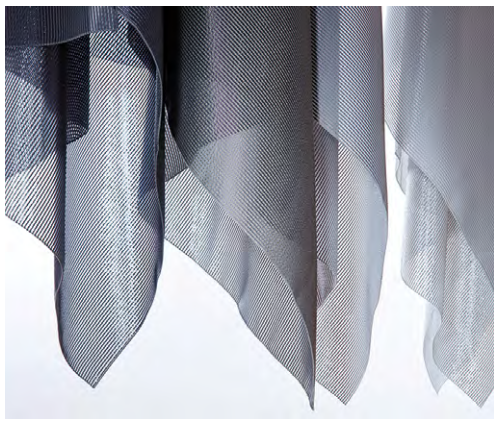
tts innova ag,
www.tts-inova.com



WOVEN CARPETING FOR INDIVIDUAL DESIGN AND MAXIMUM DURABILITY

TISCA FORTE is a woven carpeting that is distinguished not only by its extreme durability, but also by its wide range of design options. Thanks to the production method, woven carpets are of very high quality and extremely durable. As its name indicates, TISCA FORTE is a very strong product that possesses all the necessary properties for meeting the highest demands placed on textile floor coverings, including excellent recovery from compression, high resistance to wear and tear and long-term retention of appearance. Pigment dyeing of the yarn ensures outstanding ease of maintenance, as well as superior fade resistance. The yarn from which this floor covering is produced is obtained from discarded fishing nets and old carpets.
There is no limit to the range of design options. Thanks to the use of the Wilton weaving method it is possible to meet clients' individual requirements with carpet sizes starting from 40 square metres. Depending on the order volume, TISCA TIARA is able to weave carpets ranging in width from 70 to 460 centimetres. Customers can choose from a comprehensive range of designs and colours, or ask us to use their own design.

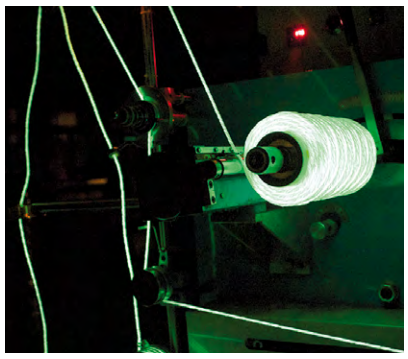
TISCA Tischhauser + Co. AG,
www.tiscatiara.com



USING METAL TO CONTROL HEAT, LIGHT AND NOISE

The working world is changing at a rapid pace, as are offices themselves: twin offices are out, open plan interiors with separate work zones are now in. However, open plan offices place high requirements on protection against glare and sunlight, as well as on privacy and efficient temperature control. Expanses with reverberating surfaces such as concrete walls and large glass facades also require solutions for reducing noise.
The office of the future has to be equipped with mechanisms for optimally controlling heat, light and noise. These are necessary in order to increase energy efficiency as well as enhance user comfort. Création Baumann recognised this at an early stage and now offers numerous products for reducing noise, as well as innovative, metallised fabrics for regulating light and heat. Through intensive research, the textile specialist from Langenthal in Switzerland is able to constantly expand its range of highly functional products. For example, with "Reflectacoustics", a transparent curtain fabric, our designers succeeded in launching a multi-faceted virtuoso. The weave combines several different functions: it offers a high degree of protection against glare and heat and simultaneously absorbs noise. The sound absorption value is approximately 0.6 αw. The two-sided weave incorporates a special aluminium-metallised yarn in the reverse weave. The exterior surface reflects sunlight and reduces the ingress of heat without significantly affecting the degree of transparency. To ensure that the fabric remains sufficiently sheer, it was decided to use a stripe solution. Transparent sections alternate with slightly more opaque sections. The washable, multifarious textile is available in neutral colours and won first prize in the German Design Council's "Iconic Awards 2016: Interior Innovation" competition.

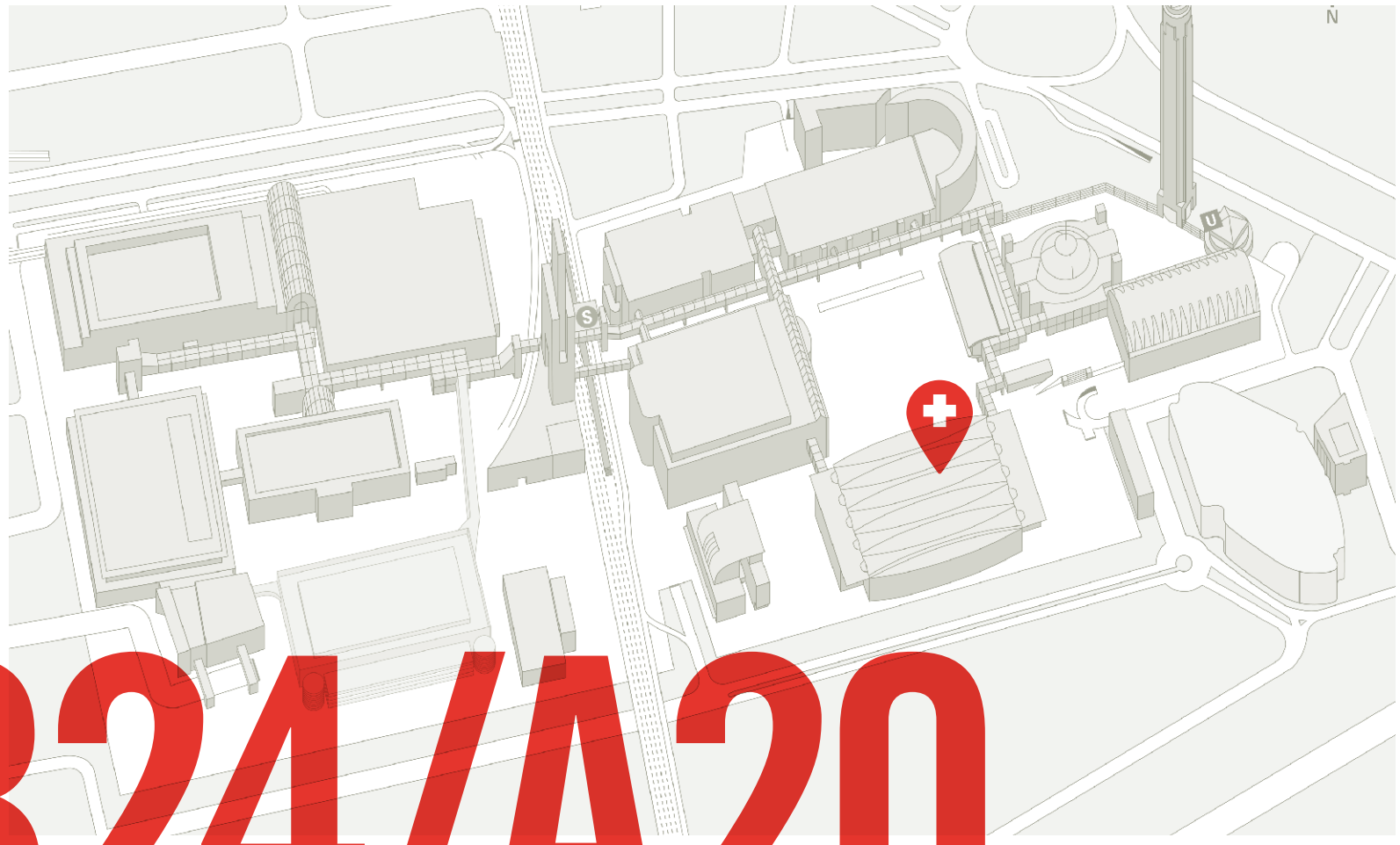
Création Baumann AG
www.creationbaumann.com



LUMINESCENT ROPES FOR VISIBILITY AND ORIENTATION

Seilerei Berger manufactures luminescent ropes that shine entirely without the need for electricity. These phosphorescent products store daylight and release their stored energy in the dark as visible light over an extended period of time. The products are based on the use of zinc sulphide or alkaline earth luminous crystals that are capable of storing light.
Their function may be likened to that of a battery that can store light and subsequently release it. The process can be repeated as often as desired from initial activation through to light output, without any loss of luminescence. The level of brightness and visibility depends on the quantity of luminous pigment utilised, i.e. on the concentration, layer density and surface area. The natural yellowish-green colour provides the ideal luminescent characteristics.
Luminescent products of this type are entirely free from radioactive materials, lead and chrome pigments and are physiologically harmless, which means they can be used without restriction. They are used wherever visibility and orientation have to be secured in the event of a sudden lighting failure, for example for indicating escape routes, obstacles and emergency exits, as well as essential devices such as fire extinguishers and emergency switches, the cladding of shelters, cold rooms and darkrooms, underground garages, labelling, warning signs and signposts. Luminescent ropes can also be used for producing attractive designs and special effects.

Seilerei Berger GmbH,
www.seilerei-berger.ch



B24/A20

EXHIBITORS SWISS PAVILION HALL 3.1 STAND B24/ A20

BÄCHI CORD®

BÄCHI-CORD AG
Herrengasse 19
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Both owner/CEO
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adrian.baechi@baechi-cord.ch

Bächi-Cord AG is a globally successful manufacturer of twines, tapes and pp yarns in the medium to heavy range. On extrusion, twisting and covering machines technical textiles are manufactured for ropemakers, the packaging industry and many other technical users.
Bächi-Cord AG stands for:
– PP tapes, yarns and twists in the range of 600 – 100,000 dtex
– Extrusion lines, various twisting processes, spinning machines
– Family-owned, Swiss production site with 70% export share
– High innovative power
– Certified according to ISO 9001 and BRC / IoP.

beag
...more than just yarn

BÄUMLIN & ERNST AG
Bleikenstrasse 17
CH-9630 Wattwil
www.beag.ch

Bernd Schäfer
Managing Director
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bäumlin & ernst ag is a full-range manufacturer of twisted, elastic-covered, texturised and airjet-texturised yarns. Mainly PA and PET yarns are processed in the texturising department. Functional yarns in combination with PA, PET, carbon, copper, flame-retardant PA, recycled PA and elastane are manufactured in the twisting and airjet-texturising departments. Under the "… more than just yarn" slogan, beag develops customised solutions for textile, technical and SMART textiles.

CORTEX TechTex Products

CORTEX HÜMBELIN AG
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CH-5102 Rupperswil
www.cortexhuembelin.com

Hanspeter and Thomas Hümbelin
Managing Directors
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Cortex Hümbelin AG was incorporated in 1924. Its core business is the production of braided cords and ropes. Specialities are ropes with high energy absorption and extremely high strength and the coating of belts and fabrics for motor racing and the aerospace industry. The coatings feature excellent adhesion on high-tech fibres (such as PBO and aramid) and can be adjusted to meet the needs of the specific application areas, e.g. fuel-resistant and food-grade.

Empa
Materials Science and Technology

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CH-9014 St. Gallen
www.empa.ch

Prof. Dr. René Rossi
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Protecting people, safeguarding their health, maintaining and improving their quality of life and their physical performance: Empa, the Swiss Federal Laboratories for Materials Science and Technology, takes up these challenges and brings together knowledge and know-how from the fields of textiles and materials sciences, biology and nanotechnology. Materials for medtech applications in and on the human body are another focus area, together with materials and systems that protect and support people in their daily lives.

FEIN-ELAST GRABHER AG
Güterstrasse 39
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The Fein-Elast Group makes elastic / non-elastic combination yarns from synthetic and / or natural fibres. The range extends from single and double covered yarns to air-interlaced/air-covered yarns, Hamel "Elasto Twist®" twines, Corespun, Sirospun, ring and double wire threads and to specialities such as Knit-de-Knit and metal yarns. The products are used in the fashion sector, medical technology, home textiles, workwear and outdoor garments as well as in the automotive industry and the aerospace sector.

HEIQ MATERIALS AG
Ruetistrasse 12
CH-8952 Schlieren
www.heiq.com

Carlo Centonze
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Founded in 2005 as a spin-off of the Swiss Federal Institute of Technology Zurich (ETH), HeiQ is a leader in textile innovation creating some of the most effective, durable and high-performance textile solutions in the market today. HeiQ leverages its boundless academic research network and internal development specialists to invent disruptive new technologies that help brands to innovate, differentiate their products and outperform the market.

HOCHSCHULE LUZERN – DESIGN & KUNST
Sentimatt 1 / Dammstrasse
CH-6003 Lucerne
www.hslu.ch/de-ch/design-kunst/

Research Group Products & Textiles
Prof. Dr. Andrea Weber Marin,
Isabel Rosa Müggler Zumstein

The Research Group Products & Textiles is engaged in design-driven applied research and development, primarily in the field of textiles. Design expertise is brought to bear on traditional textile applications and also in interdisciplinary relationships extending beyond textiles. The potentials arising from the combination of textile traditions, specific material properties and process technology know-how are utilised for pioneering developments in a visionary, creative and innovative spirit.

JENNY FABRICS AG
Fabrikstrasse 2
CH-8867 Niederurnen
www.jenny-fabrics.ch

Ralf Itzek
CEO
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ralf.itzek@jenny-fabrics.ch

Weaving is one of the oldest techniques used in the manufacture of textile fabrics. Jenny Fabrics AG develops raw fabrics for all kinds of different needs and applications. Our industrial manufacturing draws on traditional techniques translated into the 21st century which, with its dynamism and modernity, enables a traditional craft trade to survive.
With our weaving mill in Niederurnen, global partners and subsidiary companies, we supply a comprehensive range of raw fabrics which fulfil individual quality specifications for garments and home and technical textiles.

KUNY AG
Benkenstrasse 3
CH-5024 Küttigen
www.kuny.ch

René Lenzin
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rene.lenzin@kuny.ch

Kuny AG is a European market leader and has been manufacturing woven textile ribbon for 100 years. Many variations of both colour and design are available to cover many application areas; these include textiles, decoration and gift wrapping, crafts, hobby and floristry. Kuny AG is also specialised in the manufacture of customised technical applications. A comprehensive range of products is held in stock and is available for fast and flexible delivery to meet our customers' demands.

MEISTER & CIE AG
Lützelflühstrasse 40
CH-3415 Hasle-Rüegsau
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Marcel Meister
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Meister & Cie AG develops and manufactures technically challenging precision braids in the field of medical technology and machine construction: braided sleeves, fine and micro-braids, tubular braids, core-cover braids, circular braids and sling braids (spiral braids).
The Meister team accompanies projects from the search for optimised fibres to the finished product with assured quality management.
Innovation: An innovative production concept enables Meister & Cie AG to manufacture braided microstructures (with a diameter of 0.04 mm or more) in series in a clean room.

E. SCHELLENBERG TEXTILDRUCK AG
Alte Wermatswilerstrasse 4
CH-8320 Fehraltorf ZH
www.estextildruck.ch

Urs Schellenberg
Managing Director
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u.schellenberg@estextildruck.ch

As a knitwear specialist, we sell high grade textiles made from all types of fibre under the Greuter-Jersey brand. Our range comprises:
– Commission finishing: cpb dyeing, exhaust dyeing, printing and finishing; annual output of 6 million linear metres on a 20,000 m^2 production area with 95 employees
– Knitwear sales: technical textiles, lingerie, ladies outerwear and menswear
– Manufactured garments made to clients' specifications for workwear, lingerie, ladies outerwear and menswear

SEILEREI BERGER GMBH
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Oswald Berger
Managing Director
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Seilerei Berger GmbH is a family-owned company. It was established in 1951 and is currently in the hands of the second generation.
We produce braided ropes and cables from natural and synthetic fibres. Seilerei Berger GmbH is well known for its splicing expertise.
Our present-day product range is primarily intended for use in the civil engineering and construction industries, as well as in the fields of agriculture, sports, hobbies and recreation.
At the national level we provide a safety net installation service, which includes lateral and fall protection nets. We also sell a broad variety of nets and offer a safety net hire service.

SCHWEIZERISCHE TEXTILFACHSCHULE STF
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CH-8004 Zurich / CH-9630 Wattwil
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Sonja Amport
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STF is the internationally recognised training institute for textiles, fashion and management in Switzerland. As a centre of competence since 1881, STF stands for sustainable expert knowledge in the fields of textiles, fashion and lifestyle products and their life cycles. STF offers courses leading from federally recognised diplomas to bachelor and master courses and provides customised services as well as research and development.

STOTZ & CO. AG
Walchestrasse 21
CH-8021 Zurich
www.stotzfabrics.ch

Daniel Odermatt
Head of Division
+41 (0)44 366 51 15
daniel.odermatt@stotzfabrics.ch

Stotz is a family business founded in 1939. Almost 100% of our fabrics are still produced in Switzerland. This enables us to offer outstanding quality, flexibility and ecologically and socially friendly production. We offer solutions from the loom stage to the dyed and finished fabric.

STREIFFBAND AG
Hauptstrasse 2
CH-5027 Herznach
www.streiffband.ch

Roland Stutz
Head of Production and Sales
+41 (0)71 987 02 02
roland.stutz@streiffband.ch

Streiffband specialises in the manufacturing of narrow woven fabrics for technical and textile applications. As a Streiffband customer you can count on our know-how in the development of high-quality products. With innovative ideas, passion and the very highest level of flexibility we produce products for:
– Electrical insulation
– Electric motor windings
– EMI shilding
– Flameproofing
– Plastic reinforcement
– Data- and energy transmission
Our quality management system, certified in accordance with ISO 9001:2015, guarantees quality throughout all our processes.

SWISSATEST TESTMATERIALIEN AG
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CH-9015 St. Gallen
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Christian Portmann
Head of Technology and Quality
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Based in St. Gallen, Swissatest Testmaterialien AG, formerly, EMPA Testmaterialien AG, produces and distributes standard test materials for various applications for the textile, leather and washing industry. We distribute reference materials according to IEC, EN, ISO, VDA, IUF, VESLIC and other standards worldwide. Our microbiology department complements this with expertise and services in hygiene matters. We are a member of standard-setting institutions and various specialist committees.

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Simon Bernath
General Manager
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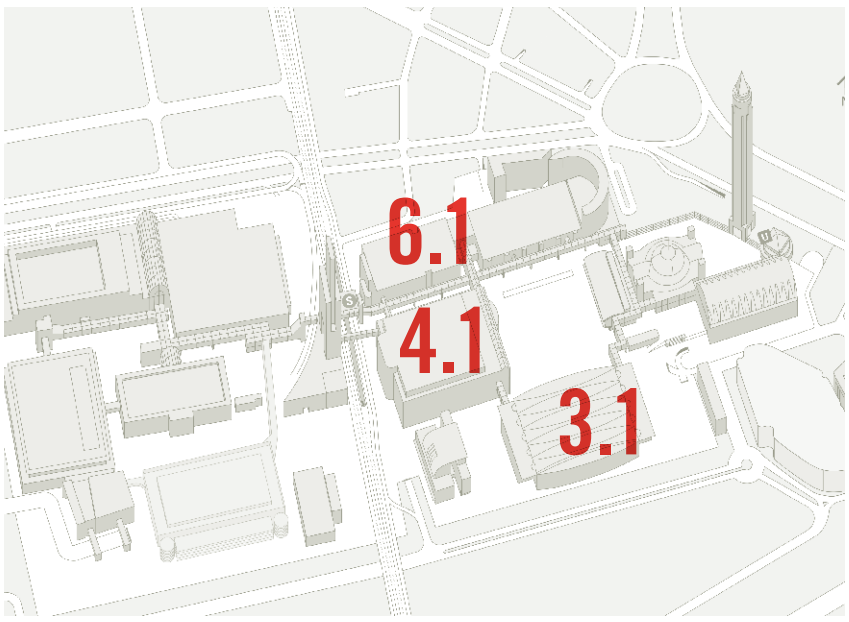
TTS inova AG and its subsidiary company TTS hengersberger GmbH manufacture heavy technical textiles and decorative trimmings. In the heavy technical textile sector, TTS inova AG is well known for its conveyor belts, heavy lifting belts, protective tubes and insulating fabrics. Fabrics are manufactured in thicknesses between 1 and 30 mm. In the decorative trimmings sector, TTS inova AG makes traditional, modern and innovative ornamental textiles. The range comprises cords, tassels, fringes and ribbons for curtains and upholstered furniture as well as decorative materials.



SWISS EXHIBITORS TECHTEXTIL 2017

HALL 3.1, STAND E71

AG CILANDER
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Technical Textiles
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Based in Herisau, Appenzell, Switzerland, AG Cilander is an innovative textile company boasting a rich tradition and a reputation for high-quality finishing services that extends well beyond the borders of Switzerland. Among its strengths are broadly based know-how, high flexibility, a pronounced sensitivity to the needs of the market and efficient organisational and flow structures in all processes.

HALL 6.1, STAND B09

FORSTER ROHNER TEXTILE INNOVATIONS
Flurhofstrasse 150
CH-9006 St. Gallen
www.forsterrohner.com

Jan Zimmermann
Head of Division
+41 (0)71 243 15 54
j.zimmermann@forsterrohner.com

Our offer focuses on the integration of electronic functions into textiles (smart fabrics) by machine embroidery. Our competencies lie in the production of illuminated textiles, textile conductors, textile heating and textile sensors. Forster Rohner Textile Innovations unites a tradition of more than one century in the textile industry with sound knowledge of material science, textile technology and electronics – a unique basis for the development and series production of highly innovative textiles!

HALL 3.1, STAND D04

HUBER & CO. AG BANDFABRIK
CH-5727 Oberkulm
www.huber-bandfabrik.com

Andreas Scherrer
Sales and Marketing Manager
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Huber produces more than 25 million metres of tapes and narrow fabrics annually, woven from various synthetic multi- and monofilaments including aramids, glass yarns and natural fibres in widths between 2 and 350 mm. Apart from a variety of needle looms, Huber also weaves on traditional shuttle weaving machines enabling the production of tapes with two absolutely identical edges. Furthermore, woven filter tube fabrics in diameters of up to 120 mm are produced on needle looms or seamlessly on shuttle weaving machines.

HALL 4.1, STAND D22

MONOSUISSE AG
Gerliswilstrasse 19
CH-6021 Emmenbrücke
www.monosuisse.com

+41 (0)41 414 71 72
info@monosuisse.com

Monosuisse specialises in the manufacture of precise, high-quality monofilament yarns with a range of diameters from 27µm to 3.00 mm made from a wide variety of polymers such as PA, PET, PP, PPS, PEN, PVDF and PFA. The monofilaments are used for a variety of high-quality end uses like filtration, screen print mesh, paper machine clothing, conveyor belts, braids and spacer fabrics. The production of monofilaments is located in Switzerland (HQ), Poland, Romania and Mexico.
The new Monosuisse product range comprises high-tenacity, finer-count multifilament yarns made from polyamide 66 or polyester.
The yarns, with different filament counts, are mainly used for sailcloth fabrics, parachutes, hot-air balloons and MRG products.
All the high-quality multifilaments are produced in Switzerland.

HALL 6.1, STAND D33

SEFAR AG
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Sefar is the leading manufacturer of precision fabrics from monofilaments for the screen-printing and filtration markets. Sefar products are used in a wide variety of industries, ranging from electronics, graphics, medical, automotive, food and pharmaceutical applications to aerospace, mining & refining and architecture. With its profound understanding of the applications, Sefar helps its customers to achieve optimum results in their industrial processes.

HALL 6.1, STAND B08

SCHOELLER TEXTIL AG
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Founded in 1868 with headquarters in Switzerland, Schoeller Textil AG is a global leader in high-performance textile manufacturing specialising in the sustainable development and production of innovative textiles and textile technologies. As a system supplier of solution-oriented products, Schoeller addresses specific customer requirements and supplies its customers and partners with tangible added value. The company is a world leader in several niche markets such as active sports, outdoor, knitwear and smart textile technologies.

HALL 4.1, STAND C07

SWISSLASTIC AG ST. GALLEN
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We manufacture covered and interlaced elastic yarns “Made in Switzerland” on modern machinery. Quality assurance is guaranteed by our ISO 9001 certification. We specialise in customised product development. Our strengths: yarns for fine hosiery and compression stockings, functional yarns for technical textiles, sock yarns in a wide range of colours, medical compression stockings and devices (MST) to measure the pressure of functional textiles.

HALL 3.1, STAND B27

SWISSTULLE AG
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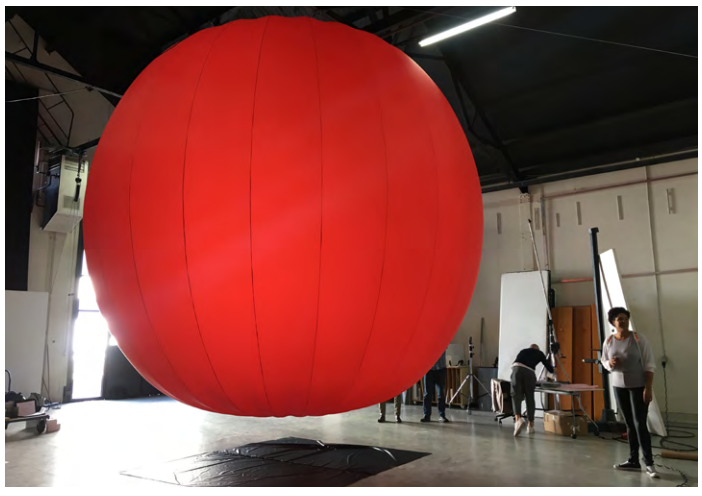
swisstulle is one of the leading European warp knit manufacturers. In our main facility in Switzerland, we produce warp knits for different applications. Our performance is based on quality thinking, strength of innovation and service. As the largest producer of bobbinet in the world, swisstulle UK is ideally placed to supply its diverse customer base with this unique, high-quality tulle. Additionally, swisstulle operates its own knitting and finishing plant in China for producing high-quality articles.

The Swiss Textiles and P'INC team preparing the Swiss exhibition at Techtextil 2017 in Frankfurt.

"*Above all expectations* is the motto of our exhibition at Techtextil 2017 – it perfectly expresses the competence of our member companies and institutions."

Peter Flückiger, Director Swiss Textiles



THE MAKING OF THE SWISS PAVILION

Above all expectations is the motto under which Swiss Textiles members will be presenting their products at Techtextil 2017. In the Swiss Pavilion, 17 companies will present their products for a broad variety of applications. All of these companies have an international orientation and are highly innovative. And they all represent typical Swiss values such as reliability, sustainability, punctuality and flexibility and share a high level of understanding for top quality and service.
Our stand is designed to reflect the expertise of these companies in combination with the image of Switzerland as a country with magnificent landscapes and pure, fresh mountain air.
The centre of the pavilion features a red balloon. Here visitors can linger in a relaxed atmosphere, hold lively discussions and discover the innovative products of our members. The 17 exhibitors are distributed around the shared zone. An overview of all the companies can be found on pages 24 and 26.

The Swiss Pavilion is a joint project of Swiss Textiles and the export promotion platform Switzerland Global Enterprise (S-GE), which is supporting Switzerland's participation in Frankfurt for the second time. The Swiss Pavilion concept was developed together with the Swiss agency P'INC.

Swiss materials were used in the following areas:
– Balloon ripstop: Meyer-Mayor AG
– Finishing Balloon Ripstop: AG Cilander
– Ropes: Meister & Cie. AG
– Design for textile walls: Christoph Hefti and Lela Scherrer

SWISS INNOVATIONS FOR THE GLOBAL MARKET

In the course of the past few decades, the Swiss textiles and clothing industry has evolved into a globally integrated workplace. Research and development activities are carried out at one location, management and financing at another, and manufacturing at several. Today, entrepreneurs in this industry primarily focus on niche markets, and offer specialised products: for example, in the fashion segment, including high-quality embroidery or fabrics for haute couture; in the household textiles segment, with products that meet high demands in terms of function and design; and in the area of technical textiles, in which high-tech products made of textile materials are utilised in a broad variety of applications. A large number of Swiss companies have been in business for well over a century. They have repeatedly succeeded in adapting themselves to new developments and markets, while playing a pioneering role by utilising tried-and-tested technologies for new applications.
Swiss Textiles members include ropemakers, weavers, knitters, finishers and ribbon and clothing manufacturers. They are all able to hold their own against international competitors because they are flexible, close to their customers and integrated into the global value-added chain and they manufacture sustainably.
In order to represent the interests of our members, we lobby for favourable political and economic background conditions and act on their behalf within the political process. We provide advice on labour law, environmental regulations, intellectual property, the protection of brands and models, and issues relating to import and export, including rules of origin, customs duties and customs clearing procedures. We unite our members with important industry and research partners and are strongly committed to basic training and further education. ✖

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