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THE TEXTILE FUTURE TAKES SHAPE

ITM 2026
THE NEW GEOGRAPHY OF
TEXTILE PRODUCTION

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index26

THE NONWOVENS INDUSTRY
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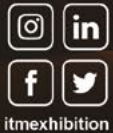
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FROM THE EDITOR

DEAR READER,

the textile industry is in the midst of a profound transformation. This became particularly evident at Techtextil and Texprocess 2026 in Frankfurt, where exhibitors from across the value chain showcased innovations that extended far beyond individual products or machines. Recycling technologies, automation, digitalization, artificial intelligence, technical textiles, and new material concepts all pointed in the same direction: the industry is redefining itself.

What was perhaps most striking was not any single innovation, but the growing recognition that future competitiveness will depend on the ability to connect technologies, processes, and business models in new ways. The traditional textile value chain is evolving into a more integrated and circular system, creating both opportunities and challenges for companies worldwide. Techtextil and Texprocess provided a glimpse of what this future may look like and where investment and innovation efforts are increasingly being directed.

Now the industry's attention turns to Istanbul, where ITM 2026 is about to open its doors. As one of the four major textile machinery exhibitions worldwide, ITM has become an important platform for the presentation of the latest technologies and, increasingly, for world premieres. For machinery manufacturers, the exhibition offers an opportunity to demonstrate how their solutions can help textile producers navigate a rapidly changing market environment.

Few countries illustrate the current transformation of the textile industry as clearly as Türkiye. The sector continues to face significant challenges, including weak demand, intense international competition, rising costs, and the lingering effects of global overcapacity. At the same time, the country's proximity to major European markets, its strong manufacturing base, and its willingness to modernize provide important long-term opportunities.

This is precisely where ITM 2026 comes into play. The technologies on display will address many of the questions currently facing Turkish textile manufacturers: How can production become more efficient? How can automation compensate for labor shortages and cost pressure? How can sustainability requirements be met without sacrificing competitiveness? And how can existing machinery be upgraded to serve new products and markets?

As always, the TexData and textile.4U teams will be on site throughout the exhibition. We look forward to reporting from Istanbul, meeting industry partners from around the world, and sharing insights into the technologies and trends that will shape the future of the textile industry.

Yours sincerely

OLIVER SCHMIDT

#Editor-in-chief



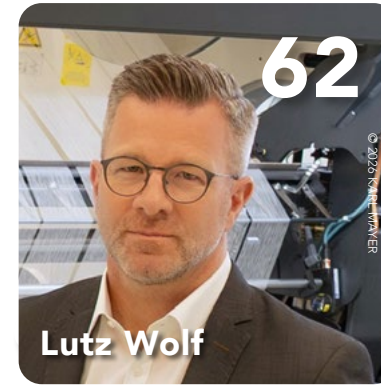
ITM 2026
**THE NEW GEOGRAPHY OF
TEXTILE PRODUCTION** 28

TECHTEXTIL & TEXPROCESS 2026:
THE TEXTILE FUTURE TAKES SHAPE 12

INDEX 2026
**THE NONWOVENS INDUSTRY
KEEPS INVESTING DESPITE UNCERTAINTY** 24

KARL MAYER OPENS
TEXTILE INNOVATION CENTER 56

CONTENT



INTERVIEW CORNELIA BUCHWALDER

SECRETARY GENERAL
SWISS TEXTILE MACHINERY ASSOCIATION / SWISSMEM

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| | | |
|----|--|----|
| 6 | FUTUREWEAVING: CONCEPTS FOR INDIVIDUAL WEAVING MACHINE OPTIMISATION | 70 |
| 6 | PROCESSING OF BIO-BASED POLYMERS IN TEXTILE TECHNOLOGY | 72 |
| 20 | SHAPE MEMORY POLYMER FIBRES FOR TEXTILE SHADING SYSTEMS | 74 |
| 58 | WARP-KNITTED PCL NETS: DEGRADABLE TEXTILE STRUCTURES FOR REGENERATIVE MEDICINE | 76 |
| | Editorial | 3 |
| 62 | Content | 4 |
| | Next Issue 4 / 2026 | 78 |
| 66 | Imprint | 73 |

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“ Innovation, resilience and international experience remain the great strengths of the Swiss textile machinery industry ”

Interview

Cornelia Buchwalder

**Secretary General
Swiss Textile Machinery Association
Swissmem**

by Oliver Schmidt

Geopolitical uncertainty, growing competitive pressure from China, new free trade agreements and the shift towards a circular economy are currently reshaping the global textile industry. In this interview, Cornelia Buchwalder discusses the current mood within the Swiss textile machinery sector, the industry's distinctive innovative strength, new market opportunities in India and Asia, and the technological trends that could shape the upcoming trade fair cycle leading up to ITMA 2027.

1. Ms. Buchwalder, after several months of sabbatical, you recently returned to your role as Secretary General of Swiss Textile Machinery. Looking at the Swiss textile machinery industry with a bit of distance, how would you describe the current mood in the sector – and what developments have stood out to you most?

Naturally, my return was initially overshadowed by current geopolitical developments. I came back at the beginning of March – exactly at a time when new uncertainties were emerging and the global environment had once again changed noticeably. For an internationally oriented industry such as Swiss textile machinery, developments like these have an immediate impact on supply chains, investment decisions and overall market sentiment.

What stood out to me most among our member companies was a remarkable level of resilience and a continued positive spirit. The economic situation remains challenging, without question. Many markets are still characterised by caution, and uncertainty makes long-term planning difficult. Nevertheless, companies are continuing to move forward consistently. Projects are there, initial signs of recovery are becoming visible, and topics such as automation, digitalisation and more sustainable production processes continue to be actively advanced.

What also impresses me is the attitude of many companies. Despite all the challenges, the focus remains clearly on solutions, innovation and customer needs. Especially in times like these, that is anything but self-evident – and in my view, it is also one of the particular strengths of the Swiss textile machinery industry.



TexData Editor-in-Chief Oliver Schmidt in conversation with Cornelia Buchwalder, Secretary General of the Swiss Textile Machinery Association / Swissmem, at Techtextil 2026 in Frankfurt. © 2026 TexData International

2. The global textile industry continues to operate in a challenging environment shaped by geopolitical tensions, changing trade relations and a high degree of uncertainty. How is this situation currently affecting Swiss textile machinery manufacturers?

Uncertainty is probably the greatest challenge at the moment. Many companies tell me that even a difficult situation would be easier to manage if it were at least stable and predictable over a longer period of time. That is exactly what is often missing today. Trade relations can change within a matter of weeks, new tariffs are introduced or withdrawn again, political tensions influence investment decisions – and all of this makes strategic planning extremely difficult.

„Despite these challenges, I currently sense a slightly more positive mood among many of our member companies.“

Naturally, this situation directly affects customers' willingness to invest. In many markets we still see a cautious approach, while overcapacities and weaker demand continue to weigh on parts of the industry. In Switzerland, there is the additional challenge of the strong Swiss franc, which repeatedly creates further pressure for export-oriented companies.

Despite these challenges, I currently sense a slightly more positive mood among many of our member companies. Developments are certainly coming from a low level and definitely not with any sense of euphoria, but initial signs of recovery are visible. There are more project discussions again, more concrete enquiries and, in some cases, the first positive signals in incoming orders.

3. Swiss companies have played an outstanding role in the international textile machinery industry for decades. How can this strong industrial cluster be explained – and what still distinguishes Swiss textile machinery today?

Interestingly, the origins of the Swiss textile machinery industry go back a very long way and are also linked to the international trade policies of that period.

During Napoleon's Continental Blockade, many machines could no longer be imported from England, which at the time was regarded as the leading textile nation. Swiss textile companies therefore began developing their own machines or repairing and improving existing equipment. Over time, this led to the development of an independent mechanical engineering expertise that became firmly established in Switzerland.

„ This export-oriented mindset has shaped the Swiss textile machinery industry for generations and has certainly contributed to the exceptional international experience many companies possess today.“

Of course, this industry could also have disappeared again over time. Instead, an exceptionally strong industrial ecosystem developed over many decades. This includes not only the machinery manufacturers themselves, but also specialised suppliers, a strong academic and research landscape, and the typical Swiss engineering expertise that is also well known from other industries.

Another key factor is the strong international orientation. Switzerland never had a sufficiently large domestic market to focus only on local demand. Swiss companies therefore had to think internationally and establish global trade relationships at a very early stage. This export-oriented mindset has shaped the Swiss textile machinery industry for generations and has certainly contributed to the exceptional international experience many companies possess today.

Added to this are factors such as quality, precision, reliability and long-term thinking. At the same time, companies have repeatedly had to adapt to changing market cycles, technological shifts and global transformations over the decades. In my view, this combination of innovative strength, specialisation and international experience explains very well why Swiss textile machinery continues to hold such a strong global position today.

4. Swiss Textile Machinery often highlights the inventive spirit of Swiss industry in its communication – frequently referring to innovations whose origins many people would not immediately associate with Switzerland. Why does this image fit the Swiss textile machinery industry particularly well?

I believe this is an important part of Swiss industrial identity. Many technologies or everyday solutions that seem completely natural today are no longer consciously associated with their origins. With our communication, we deliberately wanted to show that Switzerland has a long tradition as a centre of innovation in many areas – often in fields that people would not initially associate with Switzerland at all.

Of course, there are the classic images such as chocolate, watches or cheese. At the same time, however, many other innovations also originated in Switzerland that would surprise a lot of people – for example the computer mouse or the carbonation of beverages. This combination of precision, technological expertise and inventive spirit also fits the Swiss textile machinery industry extremely well.

For decades, this industry has stood for the ability to solve complex technological challenges and identify new requirements at an early stage.

It is not only about incremental improvements, but often about genuine next-level innovations. Swiss companies have established themselves worldwide as technology partners because they combine strong engineering expertise with long-term thinking, quality and a strong culture of innovation.

5. ITMA ASIA + CITME in Singapore was widely seen as an important indicator for Asian markets outside China. Looking back several months later, how would you assess the event in terms of market sentiment and concrete business momentum for your member companies?

For many of our member companies, the exhibition was indeed an important indicator of the current market mood in Asia. Naturally, expectations were relatively high, as the event marked a return to Singapore after many years and many in the industry still remembered the successful edition previously held there. At the same time, these expectations were accompanied by a degree of caution, as the general economic situation remains challenging. That made it all the more positive that the event ultimately exceeded the expectations of many companies.

One aspect that was highlighted particularly often was the high quality of the visitors. Numerous companies reported very concrete discussions with decision-makers and project managers. Singapore also fulfilled the role many had expected from the location. The exhibition was highly international and attracted visitors from numerous Asian markets – including India, Pakistan, Bangladesh and the Middle East, but also partly from regions such as Australia and even South America. Especially for markets outside China, the event therefore proved to be a highly relevant platform.

Naturally, it is not always possible to measure directly which specific projects or orders will emerge from such contacts in the longer term. Overall, however, feedback from our member companies was very positive. Many saw the exhibition as an important source of momentum – both for existing business relationships and for the initiation of new projects.

6. Swiss textile machinery manufacturers traditionally stand for highly specialised and technologically sophisticated solutions. In addition, cost pressure is increasing – not least because of growing competition from China. How are companies managing to maintain their technological leadership and strategically differentiate themselves in the market?

This is certainly one of the key strategic questions – not only for the Swiss textile machinery industry, but for the entire European sector. Competitive pressure is especially high in textiles because a large share of the market is now located in Asia, and Chinese suppliers have made significant technological progress. Ten or fifteen years ago, discussions focused mainly on price differences. Today, we also see that the quality of many solutions has improved considerably.

Companies are responding in very different ways. Some are pursuing multi-brand strategies to cover different market segments. Others are focusing even more strongly on highly specialised niches where technological expertise, process know-how and long-term experience are decisive. In these areas, factors such as quality, reliability, energy efficiency and total cost of ownership play a particularly important role.

In addition, consultants are increasingly presenting concepts that encourage companies to think more holistically about their solutions. Today, it is often no longer just about selling an individual machine, but about offering complete production solutions including digitalisation, automation, service and process integration. As a result, cooperation and partnerships are becoming increasingly important because customers are looking more and

more for integrated overall solutions. How these new approaches will develop in practice remains to be seen.

Innovation nevertheless remains the decisive factor. Not innovation for its own sake, but innovation with clear added value for the customer. Swiss companies are particularly strong in complex applications and technical textiles. In these areas, highly demanding processes are involved, where it is not only the machine price that matters, but the overall performance and process reliability of the solution. Of course, competitive pressure remains high, and every company must find its own way to secure its long-term position. But this ability to specialise, continue technological development and work closely with customers has traditionally been one of the major strengths of the Swiss textile machinery industry.

7. Circular economy concepts are increasingly moving to the centre of Europe's textile strategy. On the other hand, many recycling projects are still at an early stage and face economic challenges. How do you assess the current transformation process – and what role do Swiss machinery manufacturers play in it?

The transformation towards a more circular textile industry is undoubtedly one of the major future topics for the sector. Especially in Europe, we see

strong political and regulatory pressure to establish new recycling structures and closed material loops. On the other hand, it is becoming clear just how complex this transformation actually is.

From a technological perspective, many companies are already working intensively on solutions to process recycled fibres efficiently and ensure the quality of the resulting products. Swiss machinery manufacturers are contributing their existing expertise in areas such as spinning technology, quality monitoring, fibre preparation, nonwovens and resource-efficient production processes.

„As an export-oriented industry, our companies depend on stable and as open as possible international trade relationships.“

In many cases, existing technologies are being specifically adapted so they can reliably process recycled materials as well. The greater challenge at the moment lies less on the technological side than on the economic one. In many areas, Europe still lacks the complete industrial ecosystems and scalable value chains needed to im-

plement textile circularity on a large scale. Even when recycled fibres are available, the question often remains where and how they can be processed economically afterwards.

As a result, we currently see numerous initiatives, pilot projects and new recycling concepts, but many of them are still in an early phase or struggling with economic scaling. Technology alone is not enough. The decisive factor will be whether functioning industrial structures and economically viable business models can be established along the entire value chain.

Nevertheless, it is clear that the industry will continue moving in this direction. And especially in technologically demanding processes, Swiss machinery manufacturers can play an important role in helping to shape this transformation over the long term.

8. The new free trade agreements with India and the Mercosur countries could significantly reshape international trade relations. What opportunities do these agreements create for the Swiss textile machinery industry?

Free trade agreements are extremely important for Switzerland and especially for the Swiss textile machinery industry. As an export-oriented industry, our companies depend on stable and as open as possible international trade

relationships. Particularly in times of geopolitical uncertainty, such partnerships become even more important.

The free trade agreement with India is a very good example of this. Negotiations lasted around 16 years, and for a long time it was far from certain whether an agreement would be reached at all. This makes it even more important that the agreement has now entered into force. India is becoming an increasingly attractive market for many of our member companies – not only because of its size, but also due to rising investment activity and the growing dynamism of the Indian textile industry.

The Mercosur agreement is also strategically relevant from the perspective of our industry, particularly with regard to Brazil as an important textile market in South America. It also demonstrates how complex such processes can be. In Switzerland, possible referendums linked to the country's system of direct democracy play an important role, which can make implementation significantly slower than in other regions.

Overall, however, we see major opportunities in these agreements. They can reduce trade barriers, facilitate investment and improve market access. For technology-oriented companies with a strong international focus, stable and reliable trade relationships are an important factor for long-term growth.

9. Several major industry exhibitions will take place before ITMA 2027 in Hanover. What role do these events currently play for the international textile machinery industry – and which technological trends could shape this exhibition cycle?

The coming months and years will be very exciting from an exhibition perspective for the international textile machinery industry. With ITM in Türkiye, ITMA ASIA + CITME in Shanghai, India ITME and finally ITMA 2027 in Hanover, several important events are ahead of us that are highly significant for both our member companies and the industry as a whole.

Each exhibition fulfils a different role. ITM is an important platform for many companies targeting the Turkish market and neighbouring regions. ITMA ASIA + CITME, meanwhile, clearly demonstrates the growing importance and strength of the Chinese textile machinery industry. There, we now see an enormous presence of Chinese suppliers, while many international companies continue to exhibit because China remains a strategically relevant market for them.

India is also increasingly developing into a key future market. Many companies see considerable growth potential there and report strong momentum in investments and projects. As a result, India ITME is becoming increasingly important for our industry.

And of course, ITMA 2027 in Hanover remains the leading global exhibition for the textile industry as a whole. As reflected in its slogan, "Co-Creating the Future of Textiles", the event brings together the entire textile ecosystem – from machinery manufacturers and technology providers to fibre producers, textile manufacturers and brands. We expect to see numerous technological innovations and important impulses for the industry there once again. Although innovation cycles today are far more flexible than they used to be, many companies still orient themselves strongly towards the European ITMA cycles

It will be particularly interesting to observe how areas such as automation, digitalisation, integrated production solutions, sustainability and resource efficiency continue to evolve. The transformation pressure within the industry is high – and it is precisely from this pressure that new technological approaches and innovations often emerge. For this reason, we expect this entire exhibition cycle to be highly dynamic and technologically exciting.

Mrs Buchwalder, thank you very much for the interesting insights and the interview.

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THE TEXTILE FUTURE TAKES SHAPE

Techtextil and Texprocess 2026 took place at a time when many textile companies were facing subdued demand, geopolitical uncertainty and significant pressure to transform. Expectations ahead of the event were therefore cautious. Yet rather than a sense of crisis, a different impression prevailed throughout the exhibition halls: the industry appeared remarkably well prepared from a technological perspective. Recycling solutions, bio-based materials, technical textiles, artificial intelligence and connected production systems offered a glimpse of what the future of textiles may look like. More importantly, the exhibition highlighted that the industry's most significant innovations are no longer focused on individual products alone, but increasingly on entire systems and value chains.

1. NO EUPHORIA – BUT PLENTY OF CONFIDENCE

With more than 36,000 visitors and around 1,700 exhibitors from 54 countries, Techtextil and Texprocess once again confirmed their position as the world's leading platforms for technical textiles and textile processing technologies. The official figures reflected a successful event. Even more revealing, however, was the atmosphere on the exhibition floor.

Conversations with exhibitors showed that expectations prior to the fair had been relatively modest. Weak demand across many textile sectors, geopolitical uncertainty and restrained investment activity left little room for optimism. As a result, many companies were concerned that these challenges might also be reflected in Frankfurt.

The reality on site painted a different picture. Companies appeared neither pessimistic nor overly optimistic. Instead, there was a strong sense that the industry is technologically well positioned and has developed the right solutions for the challenges ahead. The exhibition served as a platform to showcase these innovations, strengthen existing relationships and explore new business opportunities. Techtextil and Texprocess 2026 were therefore not exhibitions driven by market euphoria. Rather, they reflected an industry preparing for its next stage of development. Recycling, digitalisation, automation and advanced materials were no longer presented as future concepts, but as market-ready solutions.

2. TECHNICAL TEXTILES AS A ROUTE TO HIGHER VALUE CREATION

One of the most visible trends at Techtextil 2026 was the growing importance of technical textiles as a strategic business segment. Companies showcased solutions for applications ranging from mobility and protective clothing to industrial manufacturing, construction, healthcare and infrastructure. The exhibition also revealed how many textile manufacturers are deliberately moving into more sophisticated market segments in an effort to differentiate themselves from global price competition.

The organisers themselves placed this theme at the centre of the event. The number of exhibitors in the Performance Apparel Textiles segment doubled compared to the previous edition. Protective clothing, workwear, outdoor applications and textiles for security and defence purposes were among the most prominent topics. Growing investment in occupational safety, civil protection, disaster response and defence is creating new demand worldwide for durable, standards-compliant and high-performance textile solutions.

Modern performance textiles are expected to deliver far more than they did only a few years ago. Protection, comfort, durability and sustainability are increasingly required in a single product. Innovation no longer takes place solely at the material level. Only the interaction of fibres, yarns, textile structures and processing technologies transforms advanced materials into commercially successful products.



Exhibition ground © 2026 TexData International

The examples presented during the opening event illustrated how broad the field has become. They included heat-resistant protective garments for specialised units, UV-protective warp-knitted fabrics that achieve their performance without chemical finishing, and multi-norm protective fabrics containing recycled content. Applications ranged from occupational and protective clothing to outdoor products, military equipment and industrial uses.

The trend was equally visible among exhibitors. The Indian Aditya Birla Group brought together its activities under the new "One ABG Technical Textiles" platform and positioned itself not as a supplier of individual materials, but as an integrated solutions provider covering MobilTech, ProTech, InduTech, HomeTech and other technical textile sectors. This strategy reflects a broader shift that could be observed throughout the exhibition: companies are increasingly selling complete solutions for specific applications rather than individual products.

The boundaries between traditional apparel and technical textiles are also becoming increasingly blurred. High-performance outdoor wear, protective clothing, military applications and smart workwear now combine technical functionality with design, comfort and sustainability. Techtex 2026 demonstrated that apparel has become one of the most dynamic application areas within the technical textiles sector.

For many companies, technical textiles represent far more than an additional source of revenue. They provide access to markets with higher entry barriers, longer product life cycles and lower levels of commoditisation. At a time of growing competitive pressure, these characteristics are becoming a decisive success factor for many manufacturers.

3. RECYCLING MOVES BEYOND THE PILOT STAGE

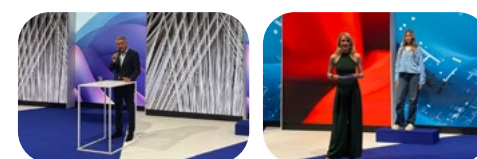
If there was one theme that ran like a common thread throughout Techtex 2026, it was circularity. Few other areas demonstrated a comparable level of momentum. What stood out most, however, was the shift in the discussion itself. Only a few years ago, the focus was on proving that textile recycling technologies could work. Today, attention has clearly moved towards industrial implementation.

Across the exhibition halls, companies presented solutions that have progressed well beyond laboratory and pilot-scale development. Scalability, integration into existing production chains and economic viability took centre stage. As a result, the circular economy is increasingly evolving from a long-term vision into an industrial business model.

One particularly interesting example came from RE&UP. Together with ISKO Pro, the company showcased workwear based on recycled fibres. What makes the project especially noteworthy is the structure be-

hind it. Both RE&UP, the recycling specialist, and ISKO, one of the world's leading denim manufacturers, are part of the Turkish Sanko Group. This creates close links between recycling, yarn production, fabric manufacturing and end-use applications. Such vertically integrated models may play an important role in scaling textile circularity on an industrial level.

The winners of the Techtex Innovation Awards reinforced this trend. Australian company Samsara Eco received recognition for its enzymatic recycling technology, which uses artificially developed enzymes to convert polyester and various nylon grades back into high-quality raw materials. The long-term objective is to keep synthetic fibres in circulation almost indefinitely. Significantly, the company is already collaborating with partners such as Lululemon, Nilit and The LYCRA Company, providing further evidence that the industry is moving from pilot projects towards commercial-scale implementation.



Opening by Ivonne Seifert and Detlef Braun © 2026 TexData International

A different approach is being pursued by the German start-up re.solution, a spin-off from RWTH Aachen University. The company received an Innovation Award for its electrochemically assisted recycling process for blended textiles. By replacing conventional acids with electricity, the technology aims to significantly reduce chemical waste streams. A semi-industrial plant is scheduled to begin operation in 2026.

Alongside chemical recycling, monomaterial concepts also attracted considerable attention. Numerous developments focused on making products easier to recycle from the very beginning. One example was the Texprocess Innovation Award for Amann's AeonIQ Fil sewing thread. Based on cellulose, the thread enables fully bio-based and biodegradable seams for the first time, supporting the development of genuine monomaterial products.

Another notable development was the growing convergence of recycling with other transformative technologies. Artificial intelligence is increasingly supporting sorting and process development, digital product passports are improving transparency across value chains, and new regulatory requirements are accelerating the development of circular products. Consequently, recycling was no longer presented as a stand-alone technology, but rather as part of broader system solutions.

The exhibition clearly demonstrated that textile circularity has entered a new phase. The question is no longer whether recycling is technically feasible. The challenge now lies in building the necessary value chains, securing sufficient feedstock volumes and integrating these solutions into the market on an economically sustainable basis. This is precisely where much of the industry's current effort is being directed.

4. FROM NATURAL FIBRES TO PFAS-FREE SOLUTIONS: SUSTAINABILITY BECOMES MATERIAL INNOVATION

Sustainability was visible throughout Techtex 2026. Unlike in previous years, however, it rarely appeared as a separate topic. Instead, it was deeply embedded in material and product development. The exhibition illustrated how sustainability is increasingly being viewed as a technical performance characteristic rather than simply an additional product attribute.

One visible expression of this trend was the new Nature Performance Area. More than 110 exhibitors showcased natural fibres, bio-based polymers and alternative materials for technical applications. The solutions on display demonstrated that renewable and naturally derived raw materials are no longer confined to apparel or niche markets. They are increasingly finding their way into demanding industrial applications.

The objective is clear: reducing dependence on fossil resources without compromising performance, durability or processability. Numerous companies presented materials capable of meeting stringent technical requirements while offering advantages in terms of carbon footprint, recyclability or biodegradability.

Asahi Kasei Advance provided one example with its portfolio of new bio-based and compostable materials for industrial applications. The company presented biodegradable cellulose-based nonwovens, recyclable spacer fabrics and binder-free nonwoven materials suitable for applications ranging from hygiene products to automotive components. Such developments underline how sustainability is becoming an integral part of material design.

Particularly striking was the industry's search for alternatives to PFAS. These so-called "forever chemicals" are facing growing regulatory scrutiny around the world. In response, numerous exhibitors presented water-repellent finishing and coating technologies that achieve performance without PFAS. This trend was also reflected in the Innovation Awards. Both the Swiss company Bäumlin & Ernst and the French start-up H&B Materials received recognition for PFAS-free solutions. While their approaches differ, they share the same goal: delivering water repellency without the environmental concerns associated with conventional fluorochemicals.

Many developments also focused on utilising previously underexploited raw materials. Lignin, a by-product of the paper industry, emerged as one of the most promising examples. Several award-winning projects demonstrated how this natural resource can be transformed into innovative textile materials. Applications ranged from "knittable wood" to flexible wood-textile composites, highlighting the industry's growing interest in alternative material sources.

Bio-based polymers also attracted increasing attention. Mariva, for example, introduced a new high-performance biopolyester designed to combine the properties of conventional synthetic fibres with biodegradability and chemical recyclability. The development illustrates a broader direction within the industry: the search for materials capable of meeting demanding technical requirements while satisfying growing sustainability expectations.

Taken together, the developments on display suggested that sustainability has evolved far beyond a stand-alone market segment. It is increasingly becoming one of the primary drivers of material innovation. New fibres, polymers, coatings and composite materials are now being designed from the outset with resource efficiency, circularity and environmental performance in mind. The question is no longer whether sustainability should be considered, but how it can be combined with the highest possible level of technical performance.

5. ARTIFICIAL INTELLIGENCE BECOMES A TOOL FOR THE TEXTILE INDUSTRY

Few terms have attracted as much attention in recent years as artificial intelligence. Yet at many industry events, the practical value of AI for textile manufacturing often remained unclear. Techtextil and Texprocess 2026 marked a noticeable shift in perception. For the first time, the exhibitions conveyed the impression that AI is moving beyond demonstrations and future visions and into concrete industrial applications.

What became evident throughout the exhibition was that artificial intelligence is not being viewed as a stand-alone technology. Instead, it is increasingly being deployed as a tool to make existing processes more efficient, precise and flexible. Its applications now extend from material development and product design to quality control and automated manufacturing. This trend was particularly visible at Tex-



Performance Apparels on Stage
© 2026 TexData International

process. Companies such as Assyst and Style3D showcased solutions that connect product development, design, marketing and production planning more closely than ever before. Digital workflows reduce development times, minimise the need for physical samples and enable faster decision-making across the entire value chain. As a result, the traditional boundaries between product development and production are becoming increasingly blurred.

The growing importance of AI was also reflected in the Innovation Awards. The "WiseEye" quality control system developed by Hong Kong's AiDLab uses self-learning algorithms to identify textile defects automatically. While conventional visual inspection processes depend heavily on the experience and concentration of operators, the system continuously analyses fabrics in real time. Such solutions promise not only higher accuracy but also significantly improved productivity.

Robotics is another field in which artificial intelligence is gaining momentum. The Portuguese technology centre CITEVE received an Innovation Award for its automated T-shirt production cell, which combines AI-based gripping-point detection with automated sewing processes. The system addresses one of the most persistent challenges in textile automation: handling flexible materials. While rigid components have long been processed automatically in many industries, textiles continue to present unique difficulties due to their deformable nature.

Artificial intelligence is also becoming increasingly important in recycling. Samsara Eco uses AI to develop new enzymes for the recycling of synthetic fibres. Algorithms analyse existing enzyme variants, learn from their properties and significantly accelerate the development of new recycling processes. In this way, AI itself is becoming a driver of innovation for both materials and manufacturing technologies.

Digital product development and visualisation provide another area of rapid growth. Solutions such as Vizoo's CAST technology enable the digital capture and photorealistic rendering of fabrics and textile products. Material decisions can therefore be made across continents without the need to ship physical samples. This reduces costs, saves time and lowers resource consumption. What was particularly striking was that most of the solutions on display did not aim for complete human automation. Instead, they support experts in decision-making, analysis and process control. This approach aligns closely with the findings of the VDMA study "Threads of the Future", presented during Texprocess. The study concludes that future productivity gains will largely result from the interaction between people, artificial intelligence and digital assistance systems.

Techtextil and Texprocess 2026 demonstrated that artificial intelligence is no longer a distant vision for the textile industry. It is increasingly becoming a practical tool that solves real-world problems – from developing new materials and improving quality control to automating complex production processes.

6. CONNECTED SYSTEMS INSTEAD OF STAND-ALONE MACHINES

Anyone walking through the halls of Texprocess could observe another fundamental transformation. Many companies no longer focused on individual machines or isolated process steps. Instead, complete process chains, digital platforms and integrated production systems took centre stage.

This development reflects a profound structural shift within the industry. For decades, competitiveness was primarily determined by the performance of individual machines. Today, the focus is increasingly moving towards the ability to connect processes, data sources and technologies into cohesive systems. This evolution is described in detail by the VDMA study "Threads of the Future", presented at Texprocess. Its central conclusion is that future competitiveness will no longer be decided at the level of individual machines, but within integrated and digitally connected production systems. Machines are increasingly becoming building blocks of larger digital ecosystems.

The trend was visible throughout the exhibition. Solutions for planning, design, cutting, material handling, production and quality control were increasingly presented as interconnected systems rather than separate technologies. Data is being made available across the entire process chain, creating far greater transparency and flexibility.

The growing importance of Industry 4.0 concepts was equally evident. Connected machines, digital platforms and intelligent interfaces are expected not only to improve productivity but also to enhance responsiveness to changing market demands. Such capabilities are becoming increasingly important in a business environment characterised by smaller production runs, shorter product lifecycles and higher levels of customisation.

One example was the closer integration of product development and manufacturing. Digital twins, virtual prototypes and automated data flows make it possible to take decisions earlier in the development process and adapt production more rapidly. The traditional separation between development, manufacturing and marketing is gradually disappearing.

New business models are emerging as well. The VDMA study highlights the growing importance of data-driven services, digital platforms and software-based production management. Mechanical expertise alone will no longer be sufficient. Companies must increasingly develop capabilities in software, data management and systems integration.

This transformation was by no means limited to individual exhibitors. It could be observed across many areas of Texprocess and served as a common thread linking numerous innovations. Whether artificial intelligence, automation, quality

control or digital product development, these technologies only realise their full potential when they become part of a connected overall system.

Texprocess 2026 clearly illustrated that textile manufacturing is entering a new phase. Future success will no longer depend primarily on individual machines, but on the ability to intelligently connect processes, data and technologies. Many companies now regard this capability as one of the most important foundations for competitiveness and resilience in the years ahead.

7. AUTOMATION AND ROBOTICS – THE LONG ROAD TOWARDS FLEXIBLE PRODUCTION

Automation has been one of the textile industry's most important drivers of innovation for decades. Yet in many respects, it remains significantly more challenging than in industries such as automotive manufacturing or electronics. The reason lies in the material itself. Textiles are flexible, deformable and often behave unpredictably. For this reason, the automated handling of fabrics continues to rank among the industry's most complex technical challenges.

Texprocess 2026 nevertheless demonstrated that substantial progress is being made. Numerous solutions addressed tasks that have traditionally been carried out manually, including the gripping, positioning, transport and processing of textile components.

These activities are labour-intensive and frequently represent bottlenecks within production environments.

One example was the Texprocess Innovation Award presented to Robotextile. The company developed an airflow gripper capable of automatically separating textile layers and preparing them for subsequent processing steps. While this may appear straightforward at first glance, it is widely regarded as one of the most difficult tasks in textile automation. Flexible materials behave very differently from rigid components and are considerably more difficult to grip and position with precision. The solution illustrates how this long-standing obstacle is gradually being overcome.

A completely different approach was taken by the Technical University of Applied Sciences Wildau with its award-winning CryoTec gripper. The system uses the adhesive properties of ice to handle textile

materials gently and in a controlled manner. Supported by artificial intelligence, it automatically adjusts process parameters to suit both the material and environmental conditions. The development highlights how interdisciplinary modern textile automation has become.

Progress was also evident at the level of complete production processes. The Portuguese technology centre CITEVE presented an automated T-shirt manufacturing cell that combines AI-based image recognition with robotic handling and automated sewing operations. The objective is to increase the efficiency of producing one of the world's most widely manufactured apparel products.

Several long-term trends are driving these developments. Labour shortages continue to intensify in many industrialised countries. At the same time, manufacturers face growing demands for speed, flexibility and transparency. Production systems must accommodate smaller batch sizes, respond more rapidly to changing market requirements and maintain consistently high quality standards.

The discussion surrounding nearshoring and regional production networks provides another important driver. While the VDMA study presented at Texprocess does not anticipate a large-scale return of apparel manufacturing to Europe, it does foresee the emergence of increasingly automated regional production clusters, particularly in neighbouring European regions. Automation is therefore becoming



Presentation of the winners of the Techtextil Innovation Award © 2026 TexData International

a key enabler for locating production closer to end markets.

What was particularly noteworthy was that the exhibition did not promote a vision of completely unmanned factories. Instead, the emphasis was on intelligent collaboration between people and machines. Robotics, artificial intelligence and digital assistance systems are expected to support employees, take over repetitive tasks and improve process stability. The role of human expertise is changing, but it is by no means disappearing.

Texprocess 2026 demonstrated that textile automation has reached an important turning point. Many technologies are no longer confined to research environments but are increasingly being integrated into real production settings. Fully autonomous textile factories may still be some distance away. Nevertheless, the founda-



Texprocess Innovation Award Tour
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tions for significantly more flexible, efficient and regionalised production models are already being established today.

8. RESEARCH, START-UPS AND YOUNG TALENT AS INNOVATION DRIVERS

One of the defining characteristics of Techtexsil and Texprocess has always been the close connection between research, development and industrial application. Few trade fairs illustrate as clearly how new ideas move from laboratories, universities and research institutes into market-ready products. Knowledge transfer once again played a central role in 2026. The winners of the Techtexsil and Texprocess Innovation Awards demonstrated how many of today's most exciting developments emerge from collaboration between science and industry. Universities, research institutes, start-ups and established companies worked closely together on numerous projects, turning the awards into a showcase for the strength of international innovation networks.

This trend was particularly visible in the large number of spin-offs and young companies exhibiting at the fair. Solutions for chemical recycling, novel biopolymers, artificial intelligence, automation and intelligent material systems frequently originated from research projects that are now making the transition into industrial applications. Examples such as Aachen-based re.resolution and France's H&B Materials illustrate how scientific concepts can evolve into market-oriented business models.

The exhibition itself actively encouraged this exchange through dedicated start-up initiatives designed to connect young companies with industrial and research partners. In a period of profound transformation, such innovation ecosystems are becoming increasingly important. Many of the technologies presented in Frankfurt would not have been possible without interdisciplinary collaboration.

A particularly memorable moment was the award ceremony of the Walter Reiners Foundation in cooperation with the VDMA. Celebrating its 60th anniversary, the foundation once again recognised outstanding young engineers for their work in sustainability, recycling and production technologies. The award-winning projects from Aachen, Dresden and Denckendorf reflected many of the themes that shaped the exhibition itself, including resource efficiency, advanced materials, circularity and innovative manufacturing processes.

The recognition of young talent highlighted an important reality: innovation in the textile industry is not driven solely by investments in machinery and production facilities. Qualified specialists, fresh ideas and long-term research are equally important. In an industry that is currently reinventing itself, these factors are becoming an increasingly significant competitive advantage.

The close relationship between research and industry was also demonstrated by the Jakob Müller Group and its innovation centre LAB1887. Together with Texsens, ETH Zurich and Empa, the company developed an intelligent mattress topper incorporating more than 500 integrated sensors capable of monitoring movement and pressure distribution in real time. What makes the project particularly remarkable is not only its functionality but also its manufacturing process: the textile structure and sensor technology are created simultaneously in a single weaving operation.

Visitors were able to experience the technology first-hand in an interactive "sleep laboratory". The project exemplifies a broader trend that was visible throughout Techtexsil 2026. Smart textiles are increasingly moving beyond demonstrators and research projects towards practical industrial applications. Equally important, the initiative illustrates how innovation is often created today: through close cooperation between machinery manufacturers, research institutions and specialised technology partners.

Techtextil and Texprocess 2026 therefore showcased not only the latest technologies, but also the people and networks shaping the future of the textile industry. Research, start-ups and talent development are no longer peripheral topics. They form the foundation for many of the innovations that will reach the market in the years ahead.

9. THE TEXTILE VALUE CHAIN IS BEING REIMAGINED

Many of the innovations presented at Techtextil and Texprocess 2026 appeared very different at first glance. Recycling technologies, bio-based materials, artificial intelligence, robotics and digital product development seem to have little in common. Yet when viewed in a broader context, a clear pattern emerges: the textile value chain is undergoing fundamental reorganisation.

More and more companies are moving beyond their traditional role as suppliers of individual products or process steps. In their place, integrated solution concepts are emerging that connect multiple stages of the value chain. Materials, production processes, digital data and end-of-life recycling pathways are increasingly being considered as part of a single system.



Interviews at the booths
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One example was the Aditya Birla Group, which brought together its various activities under a unified technical textiles platform for the first time. RE&UP and ISKO demonstrated how recycling and industrial manufacturing can be integrated more closely within the same corporate structure. Digital platforms are also creating stronger links between product development, production and market implementation.

This trend was confirmed repeatedly in discussions throughout the exhibition. In an interview with textile.4U, Johann Philipp Dilo pointed out that customers increasingly expect complete solutions rather than individual machines or components. Turnkey concepts developed and implemented together with specialised partners are becoming more important. Particularly in areas such as automation, digitalisation and advanced manufacturing technologies, customer value can often only be created through close cooperation between multiple experts.

The observation is reflected in many of the developments presented in Frankfurt. Companies are increasingly positioning themselves as solution providers within larger innovation networks. Partnerships between machinery manufacturers, software developers, material suppliers, research institutions and textile producers were visible throughout the exhibition halls. Significantly, many of the award-winning innovations also emerged from such collaborative environments.

This shift is fundamentally changing the requirements placed on companies. Future competitiveness will no longer be determined solely by the quality of individual products or machines. Equally important will be the ability to connect technologies, processes and partners and transform these connections into new business models and market opportunities.

Techtextil and Texprocess 2026 demonstrated that the future of the textile industry increasingly lies in such integrated systems. The industry is moving away from isolated stand-alone solutions and towards interconnected value networks in which material development, manufacturing, digitalisation and circularity are closely linked.

10. THE FUTURE IS VISIBLE – THE RECOVERY HAS YET TO COME

Techtextil and Texprocess 2026 were not exhibitions of euphoria. Yet they were equally far removed from any sense of crisis. Instead, they presented an industry in the midst of profound transformation, one that is increasingly defining its strategic direction with clarity and confidence. From technical textiles and circularity to artificial intelligence, automation, advanced materials and connected production systems, a common theme ran throughout the exhibition halls: higher value creation, greater efficiency, lower resource consumption and stronger integration across the value chain.

What stood out was that many of the technologies on display have already moved beyond the experimental stage. Numerous solutions are market-ready, scalable and designed for deployment in real industrial environments. The technological foundations for the next phase of the industry's development are largely in place. Whether these innovations will translate into the investment activity and market growth many companies are hoping for remains to be seen. What is clear, however, is that much of the industry's groundwork has already been completed. Companies have aligned their portfolios with future requirements and are preparing for the next cycle of industrial development.

That, perhaps, was the most important message of Techtextil and Texprocess 2026. The textile industry is neither standing still nor experiencing a short-lived boom. It is actively reshaping itself. The direction is unmistakable: the future of textiles will be more technical, more digital, more sustainable and more interconnected than ever before. Frankfurt offered a compelling glimpse of what that future may look like.

www.texprocess.com

www.techtextil.com

“Production is a product”

Interview

**Professor Dr
Thomas Gries**

Director

Institut für Textiltechnik
of RWTH Aachen University

by Oliver Schmidt

Textilfabrik 7.0

Relinking industry –
shaping the future!

CREATE
THE
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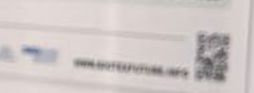
ABOUT US

INNOVATIONSPACE

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |



CONVERT THE TEXTILE VALUE CHAIN
FROM PETROLEUM-BASED TO BIO-BASED



From technical textiles and AI-driven robotics to the limitations of textile circularity: Professor Dr Thomas Gries looks back on more than two decades of development at ITA Aachen. In the interview, he explains why production technology remains a decisive success factor, discusses international collaborations and innovation ecosystems, and shares his views on the transformation of production landscapes and the challenges facing an increasingly regulated industry.

25 YEARS OF PERSONAL COMMITMENT TO ITA

Prof. Gries, you recently celebrated your 25th anniversary and have played a key role in building and shaping ITA Aachen. Looking back, which developments and milestones have been most decisive for the institute and its strategic direction?

It is actually even more years than that. I attended my first Techtexil around 40 years ago – as a student at the time – and I was already fascinated by the enormous diversity of the industry. Topics such as carbon fibres, early textile concrete applications or textile solutions for medical applications were just emerging. At the same time, interdisciplinarity was becoming increasingly important.

We were later able to build on these developments. Of course, in the beginning you also make mistakes, and there were phases in which we had to reposition our-

selves strategically. Parallel to the transformation of the textile industry towards technical textiles, the institute itself also had to redefine its position.

One decisive step was expanding ITA along the entire textile value chain. Based on my experience in plant engineering – from fibre production to finished technical textiles – we developed the institute more strongly as a full-range provider. Simultaneously, we continuously expanded interdisciplinary cooperation in areas such as construction, medical applications and later Smart Textiles. Especially in Smart Textiles, we were able to help shape production technologies at a very early stage. Together, we consciously invested in organisational development and corporate culture. Sustainable growth only works when structures and processes evolve as well. That is why we repeatedly adapted and further developed the organisation step by step.

Important milestones later on included the new institute building, which brought many areas together and created additional synergies, as well as the expansion of fibre technology around carbon fibres. At the same time, our partnership with McKinsey enabled us to establish the Digital Innovation Center Europe (DICE). Overall, this period was characterised by a strong development boost and numerous innovation and start-up activities. Not everything worked out – for example, our attempt to establish a research institute in Turkey was ultimately unsuccessful. What was missing there was the entire innovation ecosystem consisting of research, industry and infrastructure.

Today, however, I see a very stable foundation for the next stages of development. The goal now is to further develop and sustainably secure the grown structure in the long term. The next step should move towards a foundation structure.

ITA IN AN INTERNATIONAL CONTEXT

ITA Aachen has developed into one of the leading institutes for textile technology. From your perspective, what were the decisive factors behind this positioning – and how has international collaboration changed over the years?

“First of all, it is important to say that we are not alone in Germany. Strong competition is part of the system. Institutes such as Dresden or Denkdorf have also positioned themselves extremely well. This kind of healthy competition ultimately makes everyone stronger and ensures that the institutes develop different profiles.

One key success factor in Aachen is certainly our strong focus on production technology, textile chemistry and the transfer of research into industrial applications. While some institutes are more strongly focused on fundamental research, our strength lies in actually bringing new technologies into production. That is why our machinery infrastructure is also set up differently. We do not simply work with existing technologies; we continuously develop the next generation of production technology. As a result, we are in a constant state of transformation. This has become an important part of our positioning.

Internationally, we have also seen for years a clear trend towards technical textiles – for example in Korea, India or Japan. Many international partners have strong expertise in products or materials, but far less frequently in process and production technologies. That is often where our role begins.

I often say: ‘Production is a product.’ This mindset has historically been very strong in Germany. Other countries often have excellent individual technologies or exciting material ideas. But turning these into a stable industrial production line and a marketable product is often the real challenge. This is exactly where many of our international collaborations emerge.

It is also important to know your own strengths and limitations. Successful international cooperation only works when every partner understands the contribution they can make. This clarity has helped us in many projects.”

TRANSFORMATION OF THE TEXTILE VALUE CHAIN

You have closely followed the textile industry for decades. How has the textile value chain changed during this time – and where do you see the biggest structural shifts today?

“The textile industry is essentially in a constant state of transformation. During one of my trips to India, I once read a headline that still holds true today: ‘The textile industry is always dying but never dead.’ That describes the industry quite well.

Looking back historically, there have always been fundamental changes – both in raw materials and in products and production structures. Flax was replaced by cotton, wool lost importance, and later man-made fibres emerged. Even there, we saw constant change – from wood to coal and later petroleum as the raw material base.

At the same time, entire industrial sectors changed or disappeared. When I was studying in Aachen, there was still a traditional woollen spinning industry there. Today, it no longer exists. At one go, technical textiles have grown significantly and have become one of the key drivers of the industry.

Globally, we are now seeing a strong concentration around only a few major market players. This affects many sectors – from apparel to technical applications. Large-volume markets are increasingly dominated by a small number of international players. Smaller companies can often only survive through specialisation and added-value strategies.

Particularly in machinery and technical textiles, I therefore see the greatest opportunities in highly specialised niches and value-added products rather than standardised mass products. This development will continue to intensify.

At the same time, we are seeing new discussions around reshoring, decentralised production structures and regional value creation. I believe that within the next 20 years we will once again experience a very fundamental reorganisation of production landscapes – especially in Europe.

Smaller, flexible and technologically well-supported structures may become increasingly important again. Topics such as repair, recycling, regional production or new logistics models will play a larger role in the future. Nobody can fully predict exactly what this development will look like. But I am convinced that we are once again facing a profound transformation of the industry.”

TECHNOLOGY DRIVERS OF THE FUTURE

Which technological developments have generated the greatest momentum in recent years – and which topics will shape the industry in the future?

“I am convinced that the fundamental core technologies of the textile industry will continue to exist in the future. We will still produce fibres, yarns and textile surfaces. These are cultural technologies that have existed for thousands of years and follow their own internal logic.

The real challenge is to continuously further develop these core technologies – even while new trends and hypes constantly emerge. Topics such as nanotechnology, electronics or other future-oriented technologies are important, but they must not lead to the loss of actual production expertise.

Artificial intelligence and robotics will certainly have a major influence in the coming years. Simply due to the increasing shortage of skilled labour, the industry will not be able to avoid these developments. Anyone who believes this transformation can be stopped will face difficulties in the long term.

„All at once, cooperation will become even more important in the future.“

Another dominant topic remains sustainability. However, I view some discussions more realistically than many public debates do. The idea that textile cycles can one day be completely closed and that 100 percent recycling will become possible is, in my view, technically unrealistic. There will be progress, but the systems will become more complex and differentiated than they are often presented today.

At the same time, the focus will no longer be limited to apparel. Technical textiles, hygiene products and industrial applications will become increasingly important. These areas involve enormous challenges, but also major innovation potential.

Simultaneously, we must ensure that over-regulation does not slow down innovation. I am concerned that new technologies are in some regions of the world being implemented faster than in Germany or Europe. Countries such as India are currently developing enormous momentum.

Nevertheless, I am convinced that sustainability, resource efficiency and alternative raw material sources are indispensable in the long term. The industry will have to move in this direction – not for ideological reasons, but because global conditions will force it to do so.”

RESEARCH, SMES AND TECHNOLOGY TRANSFER

ITA Aachen has traditionally stood for close cooperation between research and industry. How has technology transfer changed – and which new forms of collaboration will become increasingly important?

“When I travel internationally, I repeatedly realise how valuable Germany’s SME-oriented research funding system really is. Programmes such as AiF, ZIM and similar funding instruments are a tremendous strength of our innovation system.

At the same time, however, we are currently seeing a strong trend towards very large projects or highly fundamental research. This is important in principle, but actual innovation power often emerges in SMEs and in many smaller projects. This is where new ideas, technologies and often entirely new business models are created.

That is why we must be very careful not to weaken these structures through political misdirection.

All at once, cooperation will become even more important in the future. The major challenges – digitalisation, sustainability or industrial transformation – can no longer be solved by a single company or a single research institute alone. We therefore need new forms of collaboration.

One important approach, in my view, are innovation and industrial parks where companies, research and development work closely together. One example is T7, our Textile Factory 7.0 - a collaborative project that should definitely serve as a model for further initiatives. Similar structures already exist in fields such as biotechnology or mobility. Comparable models will also become increasingly relevant for the textile industry, and other regions are very welcome to replicate our approach.

„The important thing is simply not to create unrealistic expectations that later lead to disappointment.“

These projects are not primarily about financial support, but above all about the ability to cooperate. Companies need to develop joint projects faster, combine competencies and shape innovation processes together.

This kind of networking will be one of the key factors in counteracting deindustrialisation while jointly addressing the trends of digitalisation and sustainable transformation. No single player can manage these developments alone. That is why innovation ecosystems and strong cooperation structures will become even more important in the future.”

TEXTILE CIRCULAR ECONOMY BETWEEN AMBITION AND REALITY

Textile circular economy is currently one of the central topics of the industry. Where do you see the greatest progress – and where do the decisive hurdles for scaling still remain?

“At the moment, I see the biggest challenge primarily in the partly exaggerated expectations. The idea that textile products can one day be recycled completely and without losses at a rate of 100 percent is, from a technical perspective, unrealistic.

You have to look at the process chains in detail: losses already occur during collection, preparation, opening, spinning, weaving and garment manufacturing. Across the entire textile chain, these losses inevitably accumulate. Even under ideal conditions, completely closed loops will therefore not be achievable. Realistic recycling rates are significantly lower.

That does not mean recycling makes no sense – quite the opposite. Even 30 or 40 percent high-quality recycling would already represent enormous progress. The

important thing is simply not to create unrealistic expectations that later lead to disappointment.

The decisive factor will therefore be the intelligent combination of different material streams. Not every material stream can be turned back into a high-quality fibre. In some cases, the solution lies in polymer recycling, in others in alternative forms of utilisation or energy recovery. This requires much stronger sector coupling and considerably more differentiated systems.

Another key issue is collection and return systems. The real challenge is often less the technical solution itself than the organisation of material flows and consumer behaviour. Without functioning collection systems and new business models, textile circularity will not work.

That is why topics such as rental models, repair concepts and the extension of product lifetimes will become much more important in the future. Repair and reuse in particular are often underestimated, although they offer enormous potential.

In the end, it is therefore not only about recycling technologies, but about a fundamental transformation of the entire value creation and usage system.”

Personal Outlook and the Future of the Industry

When you look at the coming years – both for ITA Aachen and personally – which goals and developments are most important to you?

“Personally, my main focus in the coming years is to ensure a stable and well-prepared transition. The institute has grown over many years and is now very broadly positioned. My goal is to sustainably secure this structure and continue developing it in such a way that it functions independently of individual people in the long term.

At the same time, I continue to see enormous changes ahead for the industry as a whole. I am convinced that we will experience another very fundamental reorganisation of production landscapes within the next 20 years – especially in Europe. Topics such as digitalisation, AI, sustainability, regional value creation and new production models will strongly shape this development.

Despite all the challenges, I also see major opportunities. The textile industry has continuously reinvented itself over centuries. This very ability to transform is ultimately what makes the industry so strong.

Personally, I will probably step back somewhat from day-to-day operational responsibilities in the future. I would like to spend more time on sports and playing the viola – but I will probably never fully leave textile topics behind. I can very well imagine continuing to provide impulses, support start-ups or accompany young developments – just without the responsibility of having to manage several hundred people organisationally.”

Prof Gries, thank you very much for the interesting insights and the interview.

index

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26 THE WORLD LEADING EXHIBITION
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edana
THE VOICE OF NONWOVENS

The Voice of Nonwovens

- 1 Bringing members through...
- 2 Defining strategy & EU regulation
- 3 Identifying market outlook and...
- 4 Defining professional body...
- 5 Assessing sustainability of...
- 6 Setting standards through...
- 7 Fostering self-subsiding...



FIBERT PERSONAL CARE

FIBERT PERSONAL CARE

INDEX 26

THE NONWOVENS INDUSTRY KEEPS INVESTING DESPITE UNCERTAINTY

Geopolitical tensions, economic uncertainty and ongoing cost pressure are currently affecting many industries. The nonwovens sector is no exception. All the more remarkable was the atmosphere at INDEX™26 in Geneva. Rather than caution and hesitation, the exhibition was characterised by investment projects, product innovations and new technology developments.

With 625 exhibitors from 44 countries and 11,452 visits, the world's leading nonwovens exhibition once again confirmed its role as a key international meeting point for the industry. More importantly, however, the event highlighted the direction in which the sector is moving: greater efficiency, stronger sustainability, increased digitalisation and a growing focus on end-user needs.

“Despite the current geopolitical context, affecting travel conditions and budgets, the industry demonstrated a strong commitment to at-

tend. Participants were keen to meet in person, reconnect with their peers and advance discussions. INDEX™ is a great opportunity for the young generation to discover many innovations all gathered under one roof. Once again, INDEX™ confirmed its role as a key event for the global nonwovens community every three years,” said Magali Fakhry Dufresne, Director of INDEX™.

SUSTAINABILITY BECOMES A CORE REQUIREMENT

Only a few years ago, circularity, recyclability and carbon footprint reduction were often treated as specialised innovation topics. At INDEX 26, however, sustainability appeared to be firmly embedded in product development strategies across virtually every part of the industry.

Mono-material concepts, recyclable product structures, PFAS-free solutions and resource-efficient manu-

facturing technologies were visible throughout the exhibition halls. The question is no longer whether sustainability should be considered, but how it can be combined with performance, profitability and industrial-scale production.

The INDEX Awards reflected this development. Among the winners were Lenzing's cellulose-based LENZING™ Dualwipe cleaning solution, Bostik's recycling-friendly Kizen™ Miles 9.0 hygiene adhesive and Confitex's reusable nonwoven bed pads. Together, these innovations demonstrated how circularity and resource efficiency are becoming integral elements of successful product development.

At the same time, many exhibitors presented new materials and product concepts designed to replace complex multi-material constructions with simpler and more recyclable solutions. Reducing the carbon footprint is increasingly emerging as a key performance indicator for the industry.

NOT AN INVESTMENT SLOWDOWN, BUT AN INVESTMENT SHIFT

Anyone expecting a general investment freeze in the current economic climate was proven wrong at INDEX 26. Investments are continuing, but with a clear regional and technological focus.

This became particularly evident through several agreements signed by Trützschler Nonwovens with Chinese manufacturers during the exhibition. Wisdom-Greentech ordered a new 4.2-metre Air-Through-Bonding line for hygiene nonwovens production. Wangjin Holdings signed an agreement for another Pulp-X spunlace line, representing its tenth production line from Trützschler. In addition, Fujian Leo Group and Trützschler agreed on the expansion of multiple Air-Through-Bonding production lines for hygiene applications.



Signatories (from left to right) Mr. Matthias Schemken (Managing Director of Trützschler Nonwovens) and Mr. Guang Yang (General Manager of Wisdom Group)
© 2026 Trützschler

These projects highlight several important trends. Hygiene applications for baby care, feminine care and adult care continue to be major growth drivers for the nonwovens industry. At the same time, sustainable material concepts and pulp-based nonwovens are gaining further momentum.

Another notable observation is the strong investment activity in Asia. While many companies in Europe and North America remain cautious with capital expenditure, numerous Asian manufacturers continue to expand production capacities and invest in advanced manufacturing technologies.

PRODUCTIVITY REMAINS THE INDUSTRY'S KEY CURRENCY

Alongside sustainability, one of the dominant themes at INDEX 26 was how to make production processes more efficient and profitable.



The inauguration of the INDEX™ 2026 © 2026 EDANA

Rising energy, labour and raw material costs are increasing pressure on manufacturers to optimise existing assets while maintaining or improving product quality.

A good example was presented by Reicofil with its new RF 5.10 Upgrade. The latest enhancement of the RF5 platform delivers more than 10 percent higher output while simultaneously improving process and product quality. As the solution is available both for new installations and as a retrofit for existing lines, it directly addresses manufacturers' demand for rapid productivity gains without large-scale capital investments.

Reicofil also introduced RF Core, a highly standardised entry-level platform for the cost-efficient production of high-quality nonwovens. In addition, the company showcased technologies designed to help man-



The INDEX™ Award winners 2026 © 2026 EDANA

ufacturers expand into new market segments while maximising the value of existing production assets.

The message from many machinery suppliers was clear: investments today must not only create new capacity, but also improve the profitability of existing operations.

AI ENTERS NONWOVENS PRODUCTION

Digitalisation also continued its transition from a future concept to a practical production tool.

Particular attention was given to new digital assistance systems designed to automate production start-ups, support operators and preserve process knowledge. Reicofil, for example, introduced new Smart Assistants that automate complex production sequences and utilise artificial intelligence to support troubleshooting and process optimisation.

Such solutions are becoming increasingly relevant as manufacturers face skilled labour shortages and growing process complexity. They help preserve operational know-how, reduce operator errors and improve machine uptime.

While artificial intelligence is still often discussed as a future trend in many industries, INDEX 26 demonstrated that AI-supported applications are already finding their way into everyday nonwovens manufacturing.

THE END USER MOVES INTO FOCUS

Alongside sustainability, efficiency and digitalisation, another important trend emerged at INDEX 26: innovation is increasingly being developed from the user's perspective.

One example was presented by The LYCRA Company with the launch of LYCRA® ADAPTIV fiber for nonwovens. Originally developed for apparel applications, the technology has been adapted for baby diapers, incontinence products and feminine hygiene applications. The aim is to improve fit across a wider range of body shapes while enhancing comfort and ease of use.

Other award-winning products followed a similar philosophy. Corman's recognised incontinence products focus on skin comfort, odour control and leakage protection, while Confitex developed reusable nonwoven bed pads that combine functionality with sustainability.

These examples demonstrate how innovation is evolving beyond individual material or process improvements towards more comprehensive product concepts. Performance, sustainability and user comfort are increasingly being developed in parallel.

PREPARING FOR THE NEXT GROWTH PHASE

The INDEX 26 seminar programme addressed many of the issues that will shape the industry's future. Topics included the impact of geopolitical developments on raw material markets, regulatory changes, public funding opportunities, filtration technologies, mobility applications and new opportunities in construction and infrastructure.

"The INDEX™26 seminar programme and products presentations showcased developments demonstrating how companies are achieving a competitive edge by going beyond regulatory compliance. It showed that it is vitally important for companies to adapt and be agile to successfully master new market challenges such as the Iranian and other crises," said Pieter Meijer, Chairman of the INDEX™ Advisory Board.

The exhibition demonstrated that, despite a challenging business environment, the nonwovens industry remains focused on long-term competitiveness rather than short-term uncertainty.

Sustainability, digitalisation, higher productivity and new material concepts are increasingly becoming interconnected drivers of innovation.

The investment projects, product launches and technology developments presented in Geneva suggest that the industry is already positioning itself for the next phase of growth.

"INDEX™26 has demonstrated how innovation in the industry is now being driven by global collaboration. The synergy between automated machinery, smart chemistry, and extreme weight reduction has pointed to a promising direction for a more efficient, circular manufacturing landscape. We are already looking forward to INDEX™29 (15-18 May 2029), to discuss the latest developments," concluded Murat Dogru, General Manager of EDANA and CEO of GNA.

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STRAHM





ITM 2026: THE NEW GEOGRAPHY OF TEXTILE PRODUCTION

NEW PRODUCTION HUBS ARE EMERGING ACROSS NORTH AFRICA AND CENTRAL ASIA, WHILE TÜRKİYE IS ACCELERATING ITS TRANSFORMATION TOWARD HIGHER-VALUE, TECHNOLOGY-DRIVEN AND MORE SUSTAINABLE TEXTILE MANUFACTURING.

INDUSTRY UNDER PRESSURE

Global textile production is undergoing a profound transformation. Rising costs, geopolitical uncertainty, sustainability requirements and shifting supply chains are reshaping long-established sourcing structures across the industry. While low-cost manufacturing continues to move toward emerging production regions such as North Africa and Central Asia, Türkiye's textile industry is facing growing pressure to redefine its position within the global market.

The challenges are significant. Turkish textile and apparel manufacturers are struggling with rising labour, energy and financing costs, weakening demand in important export markets and increasing competition from countries such as China, Bangladesh and Egypt. Industry reports point to factory closures, employment losses and growing investment pressure across large parts of the sector. At the same time, some labour-intensive production capacities are gradually moving toward lower-cost regions including Egypt and Uzbekistan.

Yet the current transformation is not only a story of cost pressure and market losses. It also reflects a broader structural shift that has shaped the global textile industry for decades: highly price-driven mass production continuously relocates toward the next competitive manufacturing region.

In this environment, Türkiye is increasingly seeking to reposition itself through higher-value production, faster response times, integrated supply chains and advanced manufacturing technologies.

This strategic transition is supported by several structural advantages. Türkiye remains one of the most important textile and apparel manufacturing hubs between Europe and Asia, combining industrial know-how, flexible production capabilities and close proximity to European markets.

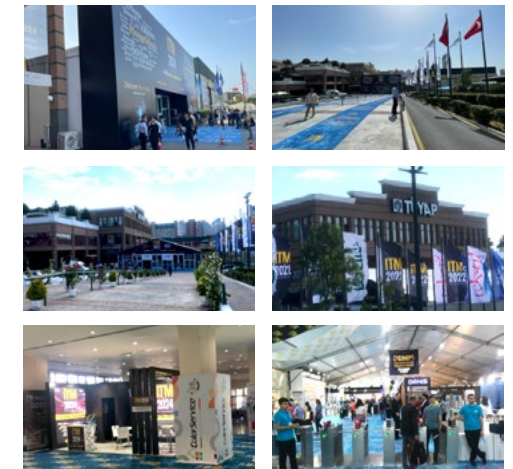
As sustainability, traceability and supply chain transparency become increasingly important for international brands and retailers, shorter transport routes and integrated regional production networks are gaining strategic value. In addition, growing pressure to reduce CO2 emissions and improve circularity is strengthening interest in regionalized and more transparent textile supply chains.

Against this backdrop, technology is becoming one of the key competitive factors for the future of the Turkish textile industry. Automation, digitalization, AI-supported production systems, ener-

gy-efficient processes and recycling technologies are increasingly viewed not only as innovation topics, but as strategic necessities for maintaining competitiveness in a rapidly changing global market.

FROM COST-DRIVEN MANUFACTURING TO VALUE-DRIVEN PRODUCTION

The changing competitive landscape is also redefining what international customers expect from manufacturing partners. For decades, large parts of the global textile industry were primarily driven by production costs and scale. Today, however, additional factors such as supply chain resilience, speed, flexibility, sustainability and transparency are becoming increasingly important. As geopolitical uncertainties, shipping disruptions and regulatory requirements continue to reshape international sourcing strategies, many brands and retailers are reevaluating the structure of their supply chains.



ITM 2018-2024 © 2018-2026 TexData International

In this environment, Türkiye's proximity to Europe is emerging as a major strategic advantage. Compared to long-distance sourcing markets in Asia, shorter transport routes allow significantly faster delivery times, lower logistics risks and reduced transport-related CO2 emissions. At the same time, European customers are placing growing emphasis on traceability, transparency and compliance with environmental standards throughout the textile value chain. Regional and more integrated supply chains are therefore gaining importance not only from a logistical perspective, but also in the context of sustainability strategies and future regulatory frameworks such as digital product passports and circular economy requirements.

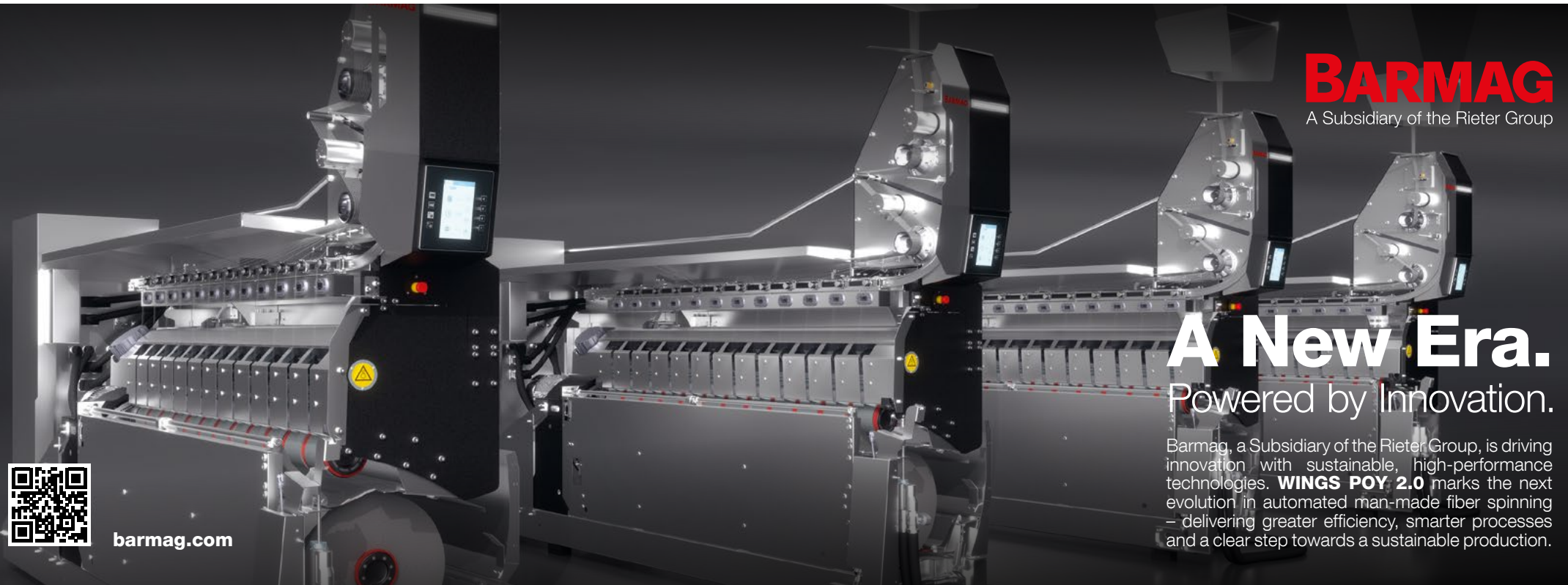
At the operational level, Türkiye continues to benefit from its strong industrial infrastructure and vertically integrated textile production base. The country combines spinning, knitting, weaving, dyeing, finishing and garment manufacturing within comparatively short supply chains, allowing manufacturers to react quickly to changing market demands. This flexibility is becoming increasingly important as fashion cycles accelerate, order quantities become smaller and customers demand shorter development and delivery times. Rather than competing exclusively through large-scale, price-driven production, many Turkish manufacturers are increasingly focusing on flexibility, technical expertise, product development capabilities and higher-value segments.

In addition, sustainability and circularity are moving closer to the center of industrial investment decisions. Recycling technologies, resource-efficient production processes and improved material traceability are becoming increasingly relevant across the textile industry. Especially for European markets, future competitiveness will depend not only on price and quality, but also on the ability to document material flows, reduce environmental impact and integrate recycled materials into industrial-scale production. This transition is further accelerating the need for modern production technologies, digital process control and more efficient manufacturing systems.

As a result, the transformation of Türkiye's textile industry is not simply about adapting to difficult market conditions. It increasingly reflects a broader repositioning toward faster, more flexible, technology-driven and sustainability-oriented production models designed for a changing global textile economy.

TECHNOLOGY BECOMES A STRATEGIC NECESSITY

Against this backdrop, technology is increasingly becoming one of the most decisive competitive factors for the future of textile manufacturing in Türkiye and the surrounding region. In an environment shaped by rising production costs, increasing sustainability requirements



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and growing international competition, investments in automation, digitalization and resource efficiency are no longer viewed as optional upgrades, but as strategic necessities.

This development is expected to strongly shape ITM 2026. Across almost all segments of textile production, manufacturers are focusing on technologies that improve productivity, reduce operational costs and increase process stability. Automation solutions, AI-supported production systems and digital monitoring technologies are gaining importance as companies seek to compensate for rising labour costs while simultaneously improving quality and flexibility.

At the same time, energy and resource efficiency are becoming increasingly critical investment drivers. High energy prices and growing environmental pressure are accelerating demand for technologies that reduce water, chemical and energy consumption throughout textile production. Particularly in dyeing, finishing and other resource-intensive processes, manufacturers are searching for solutions that combine lower environmental impact with higher economic efficiency.

Digitalization is also reshaping production planning and process control across the industry. Integrated digital systems allow manufacturers to improve transparency, optimize workflows and react faster to changing customer requirements. As

order volumes become smaller and product cycles shorter, the ability to manage production processes with greater speed and precision is becoming an increasingly important competitive advantage.

Another major focus area is recycling and circular production. As the textile industry moves toward greater circularity, demand is growing for technologies capable of processing recycled fibres, improving material traceability and supporting more closed-loop production systems. The integration of recycled materials into industrial-scale manufacturing is becoming increasingly relevant not only for sustainability reasons, but also in response to future regulatory requirements and evolving customer expectations.

Technical textiles are also expected to remain an important growth area throughout the region. Applications in automotive, filtration, medical textiles, protective clothing and industrial materials continue to create demand for higher-performance production technologies and specialized manufacturing solutions. For many manufacturers, diversification into more technical and value-added applications represents an important strategic pathway beyond highly price-sensitive commodity segments.

Against this background, ITM 2026 is positioning itself not only as a machinery exhibition, but increasingly as a platform where the future direction of textile pro-

duction is being negotiated. From automation and AI-supported systems to recycling technologies and sustainable production concepts, the exhibition reflects the broader industrial transformation currently reshaping textile manufacturing across Türkiye and neighboring regions.

NEW PRODUCTION HUBS RESHAPE REGIONAL SUPPLY CHAINS

At the same time, the geography of global textile production is continuing to evolve. While Türkiye remains one of the region's most important manufacturing centers, new production hubs are emerging across North Africa and Central Asia, increasingly reshaping international sourcing strategies and regional supply chains.

Countries such as Egypt and Uzbekistan are attracting growing interest from textile and apparel manufacturers seeking lower labour costs, government incentives and access to new regional markets. Especially labour-intensive and highly price-sensitive production segments are gradually shifting toward these regions, reflecting broader global sourcing dynamics that have historically driven manufacturing from one cost-efficient location to the next.

Egypt has gained momentum through expanding industrial investments, relatively low operating costs and its strategic proximity to both European and Middle Eastern markets. Uzbekistan is increasing-

ly positioning itself as a growing textile manufacturing hub for Central Asia and CIS markets, supported by domestic raw material availability, government-backed industrial development and investments in modern textile capacities.

These developments are not necessarily reducing Türkiye's importance within the regional textile ecosystem. Instead, they are contributing to a broader restructuring of manufacturing networks across neighboring regions. As global brands seek more diversified and resilient sourcing structures, the textile industry is becoming increasingly regionalized, with different countries taking on more specialized roles within interconnected supply chains.

In this changing environment, Türkiye continues to play a strategic role as a bridge between Europe, Asia, North Africa and the Middle East. Its industrial know-how, integrated production infrastructure and close proximity to European markets remain significant advantages, particularly for higher-value, flexible and time-sensitive production. Rather than competing solely on labour costs, many Turkish manufacturers are increasingly focusing on speed, technical expertise, product development and more sustainable production capabilities.

This regional transformation is also strengthening the international relevance of ITM 2026.

As textile production networks expand across multiple neighboring regions, the exhibition is becoming an increasingly important meeting point for investors, manufacturers and technology suppliers from Europe, the Middle East, Africa, Central Asia and South Asia. The strong international participation expected at ITM 2026 reflects not only the importance of the Turkish market itself, but also the growing strategic relevance of the wider regional textile landscape.

ITM 2026 AS A GLOBAL MEETING POINT FOR TRANSFORMATION

Against this backdrop, ITM 2026 is positioning itself as far more than a traditional textile machinery exhibition. As the industry faces structural change across multiple regions, the exhibition is becoming an international platform where manufacturers, investors and technology providers come together to discuss the future direction of textile production.

With more than 1,000 companies and company representatives from 55 countries expected to participate, ITM 2026 underlines its growing international significance within the global textile machinery industry. Organized by Tüyap Tüm Fuarçılık Yapım A.Ş. and Teknik Fuarçılık A.Ş. in cooperation with the Textile Machinery and Accessories Industrialists Association (TEMSAD), the exhibition will take place from June 9–13, 2026, at the Tüyap Fair and Congress Center in Istanbul.

The event benefits from Türkiye's strategic geographical position between Europe and Asia, but also from its accessibility for visitors from regions that often face logistical or visa-related challenges when attending exhibitions in Western Europe. According to the organizers, strong interest is expected from delegations and professional visitors from countries including Bangladesh, Egypt, India, Indonesia, Morocco, Pakistan, Tunisia, Turkmenistan, Uzbekistan and Vietnam. This broad international reach reflects the growing importance of regional textile networks extending across Europe, North Africa, Central Asia and the Middle East.

Technology will remain at the center of the exhibition. From digitalization and AI-supported production systems to automation, recycling technologies and energy-efficient manufacturing solutions, ITM 2026 will showcase many of the innovations currently shaping investment decisions across the industry. Especially in an environment characterized by rising costs, sustainability requirements and increasing competitive pressure, the demand for technologies that improve efficiency, flexibility and resource management continues to grow.

At the same time, the exhibition reflects the growing strategic importance of regionalized and more resilient supply chains. For many manufacturers and investors, ITM 2026 offers not only access to new technologies, but also direct con-

nections to rapidly evolving production markets across neighboring regions. As the global textile industry continues to rebalance between cost efficiency, sustainability, speed and supply chain security, Istanbul is increasingly positioning itself as one of the central meeting points of this transformation.

In this sense, ITM 2026 mirrors the broader transition currently reshaping the textile industry itself: away from purely cost-driven production models and toward a more technology-oriented, flexible and sustainability-focused manufacturing landscape.

SOLUTIONS FOR A CHANGING TEXTILE INDUSTRY

The technological focus of ITM 2026 reflects the broader transformation currently reshaping textile manufacturing across Türkiye and neighboring regions. Exhibitors from all major segments of textile production have announced plans to present their latest technologies and most advanced solutions for a market environment increasingly defined by efficiency, flexibility, sustainability and digitalization.

As in previous editions, the exhibition is also expected to feature several world premieres and major technology launches. Due to its strong international reach and strategic location between Europe, Asia, North Africa and the Middle East, ITM has increasingly evolved into an important global platform for introducing new textile technologies to international markets.

Among the notable developments at this year's exhibition is the first appearance of Barmag as part of the Rieter Group following the integration announced earlier this year. The exhibition is therefore also expected to reflect ongoing structural changes and consolidation processes within the international textile machinery industry itself.

Across all technology segments, exhibitors are expected to focus strongly on solutions addressing the current challenges facing textile manufacturers. Automation, AI-supported systems, digital process control, energy-efficient production technologies and recycling solutions are likely to remain among the dominant themes throughout the exhibition halls. At the same time, growing attention is being placed on technologies that improve flexibility, enable smaller production runs and support faster product development cycles.

Another increasingly important area is modernization and upgrading solutions for existing machinery and production lines. Rather than investing exclusively in entirely new production facilities, many manufacturers are looking for ways to adapt and optimize installed equipment in order to improve efficiency, reduce energy consumption and enable the processing of new materials and product categories. Retrofit concepts, expansion solutions and process upgrades are therefore expected to attract considerable interest from visitors seeking more flexible and investment-efficient modernization strategies.

The exhibition will also provide insights into future developments across spinning, weaving, knitting, nonwovens, dyeing and finishing, recycling and technical textile applications. Further details on individual technologies, exhibitors and product highlights can be found throughout the exhibitor preview section of this issue.

OUTLOOK: SHAPING THE NEXT PHASE OF TEXTILE MANUFACTURING

ITM 2026 is expected to take place at a particularly decisive moment for the textile industry. Rarely before have manufacturers across so many regions simultaneously faced such profound pressure to rethink their production models, investment strategies and long-term market positioning. Rising costs, changing supply chains, sustainability requirements and growing technological complexity are forcing companies throughout the industry to redefine how and where they want to compete in the future.

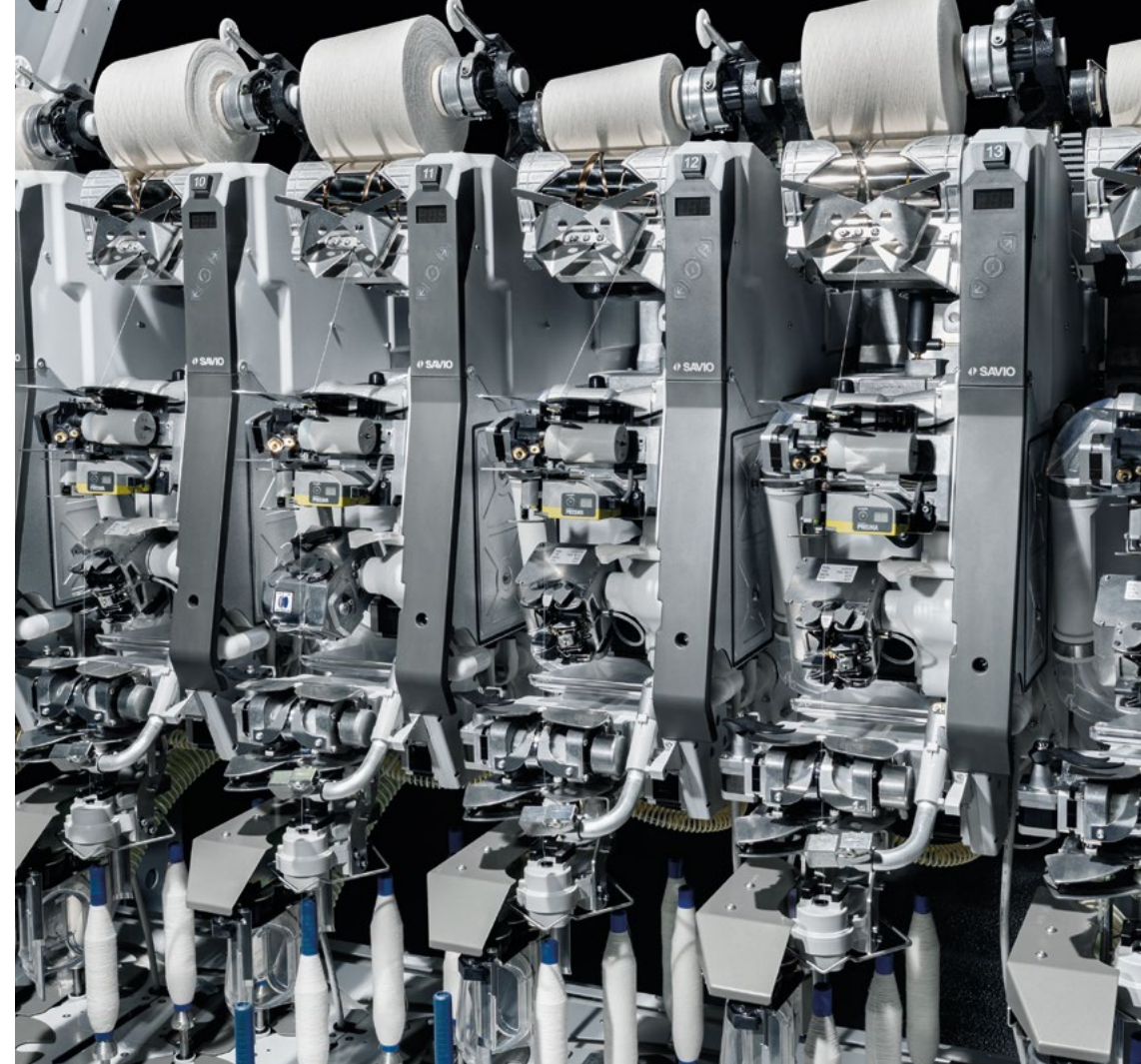
Against this backdrop, the exhibition is likely to become far more than a showcase for machinery and equipment. For many visitors, ITM 2026 will provide an opportunity to exchange ideas, evaluate future investment strategies and identify the technologies and partnerships needed for the next phase of industrial transformation. Questions surrounding flexibility, automation, sustainability, recycling and higher-value production are expected to shape many of the discussions taking place throughout the exhibition halls.

manufacturers are increasingly searching for new market opportunities and more specialized positioning strategies. Identifying future growth segments, developing differentiated products and finding the right technological pathways for greater competitiveness will remain among the key challenges facing the industry. Especially in times of uncertainty, the ability to exchange experiences and discuss practical solutions directly with technology suppliers and international industry partners becomes increasingly important.

In this sense, ITM 2026 reflects not only the current state of the textile industry, but also the broader search for future-oriented production models in a rapidly changing global environment. As the textile landscape across Europe, North Africa, Central Asia and neighboring regions continues to evolve, the exhibition is expected to provide one of the most important international meeting points for shaping the next generation of textile manufacturing.

Ultimately, the developments surrounding ITM 2026 illustrate a broader reality within the textile industry: the future of textile manufacturing will increasingly be defined not only by cost advantages, but by the ability to combine technology, flexibility, sustainability and supply chain integration within an increasingly regionalized global market.

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HIGHTEX 2026

**TECHNICAL TEXTILES
MOVE FURTHER
INTO FOCUS**

When the international textile industry gathers in Istanbul from 9–13 June 2026 for ITM 2026, the parallel HIGHTEX 2026 exhibition will once again highlight the growing importance of technical textiles and nonwovens. Held at the Tüyap Fair and Congress Center, HIGHTEX has developed into one of the region's most important platforms for advanced textile applications, functional materials and nonwoven technologies.

The timing is significant. Large parts of the global textile industry continue to face difficult market conditions, investment restraint and ongoing uncertainty in international markets. At the same time, many textile companies are under pressure to modernize production, improve efficiency and develop new products with higher added value. Technical textiles, functional materials and industrial applications are increasingly seen as important opportunities for future growth.

Organized concurrently with ITM 2026, HIGHTEX benefits from the strong international character of one of the textile machinery industry's key exhibitions. Machinery manufacturers, technology suppliers and textile producers from around the world are expected to use the Istanbul exhibitions not only to present new solutions, but also to discuss future investment strategies, modernization projects and new market opportunities.

TECHNICAL TEXTILES BECOME A STRATEGIC INDUSTRY

Technical textiles have long moved beyond being a niche segment of the textile industry. Today, they play an important role in sectors ranging from medical and hygiene applications to automotive, filtration, agriculture, construction, aerospace and protective solutions.

At the same time, the boundaries between conventional textiles and technical applications are becoming increasingly blurred. Performance, lightweight construction, durability, functionality and sustainability are moving into focus across many areas of textile production.



Crowded hall at HIGHTEX 2024 © 2024 Teknik Fairs

The global technical textiles market continues to grow steadily. According to figures presented ahead of the exhibition, the market volume reached around USD 247 billion in 2025 and is expected to expand further in the coming years. Nonwovens remain one of the strongest growth drivers, supported by rising demand from hygiene, medical, industrial and filtration applications.

Medical textiles are also becoming increasingly important worldwide. Growing healthcare needs, demographic developments and higher hygiene standards continue to drive demand for advanced textile solutions such as surgical textiles, disposable medical products and protective healthcare materials.

DIGITALIZATION, AUTOMATION AND SUSTAINABILITY SHAPE DEVELOPMENT

The technological focus of HIGHTEX 2026 reflects the industry's current transformation. Sustainability, digital manufacturing, automation and resource efficiency are expected to dominate many presentations throughout the exhibition.

Solutions aimed at reducing energy consumption, optimizing raw material usage and improving recycling capabilities are becoming increasingly important for textile manufacturers worldwide. Recyclable materials, circular economy concepts and environmentally friendly production technologies are expected to attract strong interest at the exhibition.

At the same time, digitalization continues to reshape textile manufacturing. Industry 4.0 integration, AI-supported quality control systems and data-driven production infrastructures are increasingly being adopted to improve process stability, production efficiency and competitiveness.

Smart textiles are another important area of development. Sensor-integrated fabrics, conductive materials and intelligent textile structures are opening up new applications in healthcare, mobility, industrial safety and sports technologies. These developments underline how strongly textile innovation is increasingly linked with advanced manufacturing technologies and digital systems.



Discussions at HIGHTEX 2024 © 2024 Teknik Fairs

INTERNATIONAL PLATFORM FOR INVESTMENT AND COOPERATION

According to the organizers, more than 1,000 companies and representatives from 55 countries are expected to participate in HIGHTEX 2026. The previous edition of HIGHTEX and ITM together hosted more than 66,000 visitors from 99 countries, underlining Istanbul's growing importance as an international textile industry hub between Europe, Asia, the Middle East and Africa.

Alongside machinery presentations and product launches, the exhibition is also expected to focus strongly on business development, international partnerships and future investments. Machinery modernization, technology upgrades and new industrial applications are likely to play an important role in many discussions throughout the event.

Especially in a period in which many textile producers are reassessing their future positioning, HIGHTEX 2026 is expected to provide valuable insights into how technical textiles, nonwovens and advanced production technologies may shape the next phase of industrial development.

www.hightex.com.tr

BARMAG AND NEUMAG SHOWCASE INNOVATIONS ACROSS ALL MANMADE FIBER PROCESSES

For the first time, Barmag will present itself together with its new parent company Rieter at ITM 2026. Visitors to Hall 7 / Booth 704 will be able to explore the company's latest developments for filament yarn, staple fiber and BCF production, as well as digital solutions for the connected factory.

The presentation spans the entire manmade fiber process chain and reflects Barmag's focus on productivity, energy efficiency, automation and digital integration. Highlights include the new POY 2.0 spinning concept, energy-saving texturing technologies, further developments in staple fiber production and intelligent systems for BCF manufacturing.

POY 2.0: A NEW GENERATION OF PARTIALLY ORIENTED YARN PRODUCTION

A key attraction at the stand will be the new POY 2.0 concept, which attracted considerable attention when it was presented to a selected group of industry experts at ITMA Asia + CITME 2025. Developed through a comprehensive analysis of the entire spinning process, the concept combines optimized machine components, improved energy efficiency and a higher degree of automation.

At the center of the concept is the new WINGS POY 2.0 winding machine. For the first time, the system incorporates an automatic string-up function, helping to keep string-up times consistently short while reducing waste and operator intervention. For spinning mills facing increasing labor shortages, the reduced personnel requirements at the winding level represent an important advantage.



Part of the new POY 2.0 spinning concept is the new WINGS POY 2.0 winder, which features an automatic string-up function for the first time. © 2026 Barmag

The new winding concept is complemented by a series of process innovations. The redesigned DIO spin pack has been optimized in terms of rheological performance and filament homogeneity. Its more compact construction reduces filter sand consumption by around one third and lowers component weight by more than 30 percent.

At the same time, modifications to the spinning beam reduce the surface area, enabling energy savings of up to ten percent. Further improvements have been made to the EvoQuench radial quenching system. The new EvoQuench 2.0 allows easier adjustment of the convergence length and provides more accessible controls, reducing setup times and minimizing waste during product changes.

Additional features of the WINGS POY 2.0 include active quick returns for faster parameter adjustments, optimized yarn-end fixation and an improved XPT housing design with extended rotor stroke. Together, these developments contribute to greater process stability, improved package formation and higher production reliability.

EFFICIENT TEXTURING WITH eFK EVOSMART

Barmag will also highlight the eFK EvoSmart manual texturing machine. Designed to combine high yarn quality with reduced operating costs, the system focuses on energy-efficient yarn production.

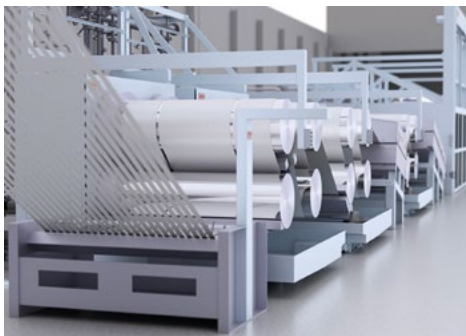
According to the company, the combination of energy-optimized process control with technologies such as EvoHeater and Smart Godets can reduce specific energy consumption by up to 25 percent per kilogram of yarn.

At the same time, maintenance requirements can be reduced significantly, contributing to lower operating costs over the machine lifecycle.

ADVANCING STAPLE FIBER PRODUCTION

In staple fiber production, Neumag will present the latest developments of its EvoSteam process. The technology combines improved fiber quality with lower energy consumption and is now complemented by the new EvoDuct and EvE-2 systems.

EvoDuct improves airflow distribution within the air jet, reducing pressure losses and energy consumption while contributing to more uniform fiber properties. The EvE-2 solution optimizes monomer and hot-air extraction, reducing turbulence and improving cooling conditions during spinning.



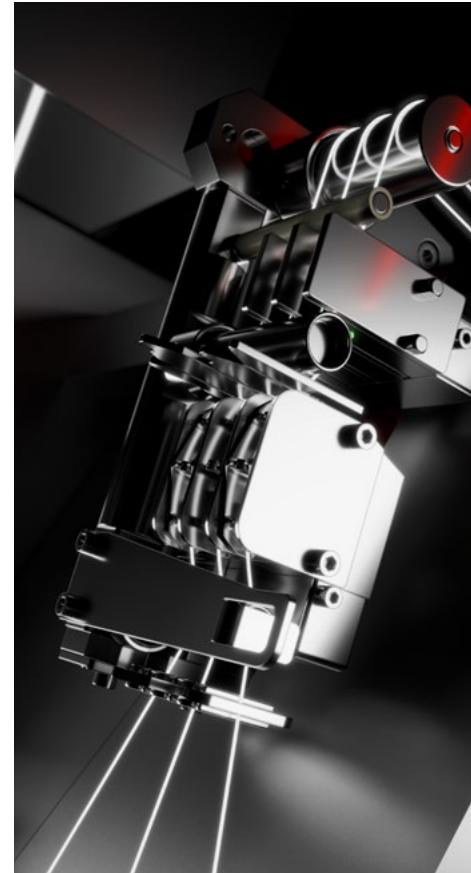
The Neumag EvoSteam process delivers not only significant energy savings but also even better fiber quality. © 2026 Barmag

Another element of the concept is a wiping robot that automates cleaning processes. The system supports consistent cleaning quality, extends cleaning intervals and reduces labor requirements while synchronizing cleaning operations with production processes.

NEW DEVELOPMENTS IN BCF PRODUCTION

For carpet yarn production, Neumag will present its BICO BCF technology. The concept enables the production of bulkier yarns with improved recovery properties while reducing pile yarn consumption by approximately 20 percent. The result is lighter carpets without compromising quality.

The company will also introduce FiberGuard BCF, an intelligent monitoring system combining sensors and software. Positioned between the twisting and winding stages, the system continuously measures yarn tension and automatically adjusts process parameters when deviations occur. According to Neumag, this reduces waste, improves efficiency and enhances sustainability. FiberGuard is compatible with current BCF machines and can also be retrofitted to existing BCF S8 installations.



Neumag's FiberGuard BCF – an intelligent system combining sensors and software – measures yarn tension between the twisting and winding stages in real time. © 2026 Barmag

DIGITALIZATION WITH ATMOS.IO

Connecting all these technologies is atmos.io, Barmag's digital platform for intelligent yarn production. Integrated throughout the production chain, the system provides users with real-time access to production and quality data, from polymer processing through to the finished package.

Through a modular app-based structure, manufacturers can configure the digital tools they require while maintaining full transparency across material flows and machine performance. Continuous monitoring enables faster intervention when required, helping reduce waste, improve yarn quality and support more efficient production management.

With innovations ranging from filament spinning and texturing to staple fiber, BCF and digital production management, Barmag and Neumag will demonstrate how automation, energy efficiency and connectivity are shaping the next generation of manmade fiber manufacturing.

www.barmag.com

TRÜTZSCHLER WILL PRESENT LEADING FIBER PROCESSING TECHNOLOGIES



T-CAN helps spinning mills to lower operational costs and minimize downtime. © 2026 Trützschler

From June 9 to 13, the Trützschler Group will present its latest machinery, service expertise and digital solutions at ITM 2026 in Istanbul, Türkiye. Visitors are invited to explore innovations across Spinning, Card Clothing, and Nonwovens at Hall 7, Booth 714A at the Tüyap Fair Convention and Congress Center. They can experience modern fiber processing with Trützschler.

TRÜTZSCHLER SPINNING

Trützschler Spinning will focus on technologies that enable highly efficient,

stable, and resource-saving spinning preparation, with a strong emphasis on automation and direct spinning. At the heart of our booth, visitors will experience Trützschler's latest automation highlight: T-CAN – a smart system that intelligently combines self-driving cans with AGV technology and an intuitive software interface.

In this way, T-CAN significantly reduces manual handling. The result is lower operational costs, minimized downtime, as well as consistent and reliable material allocation. Developed in response to ris-



T-CAN is Trützschler's automation solution designed to transform can transport in spinning preparation. © 2026 Trützschler

ing labor costs and increasing labor shortages in the global textile industry, T-CAN represents a key step towards more automated, efficient, and future-ready spinning mills.

A further highlight is the combination of the next-generation card TC 30i and the integrated draw frame IDF 3, which together form a perfect match for direct spinning. The TC 30i achieves up to 40% higher productivity, while maintaining or even improving yarn quality. Its intelligent feature T-GO enables extremely precise carding gap settings far beyond what is achievable manually.

The only proven automatic gap optimizer has successfully demonstrated its value in several thousand customer operations worldwide. The IDF 3 provides a short-



The TC 30i achieves up to 40% higher productivity, while maintaining or even improving yarn quality. © 2026 Trützschler

ened spinning preparation process for rotor and airjet applications without compromising on quality. It is highly valued for its user-friendly operation. A new can changing system increases card efficiency by up to 3%, while advanced measuring devices support more homogeneous slivers and improved yarn quality.

The powerful combination of TC 30i and IDF 3 delivers high productivity, stable yarn parameters, and efficient processing of blends with high short fiber content or recycled materials.

Experts will also be available to discuss Trützschler's latest advancement in combing technology: the TCO 21XL. This innovation increases productivity by about 50% because it operates twelve heads instead of a typical eight head setup,

while delivering the same excellent sliver quality and, at the same time, requiring less energy per head. Equipped with the COUNT CONTROL function, the TCO 21XL further enhances quality assurance in the combing process. The result is a permanently constant sliver count for first-class yarn quality.

Beyond machinery, service and digital solutions will complete our presence at the fair. With local service and technology support teams, local spare parts and wire stocks and Trützschler repair stations, customers can rely on fast assistance and minimized downtime in Türkiye and globally. The service team will present possibilities to upgrade existing machinery and the latest service tools. In addition, visitors can explore MyMill, Trützschler's cloud-based platform for monitoring and optimizing spinning mill operations.



IDF 3 enables a shortened spinning preparation process for rotor and airjet applications without compromising on quality. © 2026 Trützschler

MyMill is one of several digital services available via the My Trützschler platform, which serves as the central digital access point for Trützschler customers. My Trützschler bundles all digital services in one place and provides seamless access to applications such as MyMill, Training and Spare Parts Shop, offering valuable insights and support across the entire Trützschler ecosystem.

TRÜTZSCHLER CARD CLOTHING

At ITM 2026, Trützschler Card Clothing (TCC) will unveil a new flat top, designed for spinning mills that aim for reliability and long-term performance in modern spinning preparation. Engineered for robustness and durability, this innovation is designed to support consistent performance over an extended service life. Fully recyclable and seamlessly compatible with Trützschler's intelligent carding systems, the new flat top reflects TCC's commitment to durability, efficiency, and sustainable design in card clothing.

TRÜTZSCHLER NONWOVENS

With the T-SUPREMA needle-punching concept, successfully implemented with Texnology, Trützschler Nonwovens targets producers of technical nonwovens with flexible, proven solutions for geotextiles, filter media and other durable applications. The concept is complemented by the new NC-Xe card, a fit-for-purpose and cost-efficient solution that meets strong demand from cost-conscious investors while delivering proven Trützschler product and process quality.



Trützschler Nonwovens' X-series cards combine consistent quality, high output and scalable solutions – making them uniquely versatile for nonwoven production. © 2026 Trützschler

Another focus is Trützschler Nonwovens' proven carding technology for supersoft air-through bonded (ATB) hygiene nonwovens. With special designs, tailored configurations and dedicated component executions, the NC-X card reliably processes the finest bicomponent microfibers down to 0.4 denier. This enables the formation of highly voluminous, uniform and exceptionally soft webs, ideally suited for high-quality diaper backsheet and top-sheet applications.

Globally proven Carded/Pulp and Wet-Laid/Spunlace line solutions for the production of lightweight nonwovens for disposable wipes and moist toilet tissue complete the Trützschler Nonwovens portfolio.

CONNECT WITH TRÜTZSCHLER IN ISTANBUL!

Whether it's advanced spinning preparation with T-CAN, TC 30i, IDF 3 and TCO 21XL, a powerful new card clothing innovation, or future-oriented nonwoven technologies – ITM 2026 brings all of our key innovations together. The Trützschler experts are looking forward to welcoming you at Hall 7, Booth 714A. Trützschler, together with its customers, aims to bring fiber processing performance to a new level – with greater productivity, efficiency and profitability.

www.truetzschler.com

SAURER ANSWERS MARKETS NEEDS FOR FLEXIBILITY

The textile industry is facing unprecedented challenges: geopolitical tensions, natural disasters and pandemics and are changing market conditions overnight. Today, flexibility is no longer an option, but a survival strategy. At the ITM 2026 in Istanbul, Saurer will be demonstrating how modern machine technology delivers flexibility – from bale to yarn – in hall 7 at booth 709 A.

FIVE SPINNING SYSTEMS FOR FLEXIBLE DECISIONS AND A WIDE RANGE OF MATERIALS

The Saurer machines follow the E³ concept, being optimised for energy-saving, economics and ergonomics, and offering real customer value. As the only supplier in the industry to offer all five end-spinning systems, Saurer helps customers plan their optimised yarn production layout. These are ring spinning (Zinser 51), compact spinning (Zinser 51 Zpact FX), worsted spinning (Zinser 451), air spinning (Autoairo) and rotor spinning (Autocoro 11 and BD 8).

In addition to production flexibility, the market demands the capability to process a wide range of fibres and yarn counts. Saurer machines can process all of these, including cotton and wool, synthetic fibres, high-performance materials such as aramid, and recycled or regenerated fibres – from bale to yarn.

PRE-SPINNING FOR ALL APPLICATIONS

The Saurer pre-spinning product portfolio offers several options for either mass production or flexible lots. Different combinations of opening and carding, using modern technology and digital control, ensure the best possible quality of sliver for subsequent processes in the spinning mill.

At ITM, Saurer will present the Autocard SC8: a high-performance card designed to meet the demands for flexibility of modern spinning mills. With a carding area of 4.8 m², a carding width of 1.38 m, and a cylinder diameter of 1.46 m, the Autocard SC8 delivers superior sliver quality, higher productivity, while optimising energy efficiency. Its smart design with optimised licker-in and doffer positioning extends the length of the carding section, giving spinning mills the flexibility to adapt to different raw materials and fibre



Autocard SC8 in mill © 2026 Saurer

types – including recycled fibres – without compromising on quality or output.

ZINSER 51 ZPACT FX FOR UNLIMITED FLEXIBILITY

The Zinser 51 is the longest ring frame on the market, with up to 2,200 spindles for universal yarn counts (except for very coarse yarn) and is already running successfully in Türkiye.

The Zpact FX is the universal, modular, highly flexible compact system from Saurer that can be used for a wide range of yarn counts and applications. It is suitable for high-speed spinning, siro and core yarns. Even yarns with low twist can be spun at high speeds to fulfil customers' lower hairiness requirements on Zinser 51 Zpact FX. Spinning mills can quickly adapt to market needs because they can easily switch between compact and conventional spinning.



Zinser 51 with compacting unit Zpact FX © 2026 Saurer

AUTOCORO 11 WITH DUO SLIVER FEEDING AT ITM

Two slivers can be blended directly on the Autocoro 11 machine with the help of two opening rollers – adjustable in smallest increments. The result is cost-effective production of coloured mélange yarns, especially in smaller batches, with maximum reproducibility. This is a revolution for manufacturers who need to react quickly to fashion trends, customer requirements, or the processing of recycled materials.

FASHIONABLE YARNS IN FLEXIBLE PRODUCTION

Thanks to the Multilot function, multiple lots can be processed simultaneously on a single machine during rotor spinning (Autocoro 11 and BD 8), air-spinning (Autoairo) and twisting (TC2), allowing orders to be redistributed flexibly. Short set-up times ensure that product changes keep pace with the market. Fancynation



Autocoro 11 installation © 2026 Saurer

software enables any fancy yarns to be produced on ring and rotor spinning machines, providing a direct lever for differentiation and new market opportunities.

INCREASED FLEXIBILITY WITH WORLD-CLASS COMPONENTS

Components from the Texparts product line ensure excellence in spinning. The world's most versatile short-staple weighting arm series, the PK 2630, is available for both round and hexagonal support rods to ensure the highest stable yarn quality. Various types of high-speed spindles are available for all applications, including the latest innovative Eshape spindle with the Spinnfinity Zero underwinding system to ensure maximum productivity. These spindles are complemented by a range of high-speed rings manufactured by Texparts.

DIGITALISATION AND AUTOMATION

The Senses Mill digital control and monitoring solution provides real-time data for fast, informed production decisions. Saurer has been integrating automation



The Autocoro 11 rotor spinning station equipped with the new Duo Sliver Feeding concept. © 2026 Saurer

into its machines for decades, including doffers in rotor spinning machines and automatic doffing in roving and ring spinning machines. Today, modern automation is complemented by external solutions such as the Bobbin Transport System BTS, AGVs and cobots for mill automation. The new Hunter S1 can-transport AGV is designed to transport sliver cans from draw frames to roving or rotor spinning machines.

SUN – SERVICE UNLIMITED: LASTING A LIFETIME

Saurer offers customised service solutions for its machines to ensure a long and productive lifespan. Customers can upgrade their machines with the latest technology to enhance productivity for processing recycled fibres. These services help mills to improve quality, performance and profitability. rX Recycling Xtreme Autocoro upgrades allow customers to benefit from the latest Saurer developments, even in older machine generations.



Hunter S1 can-transport AGV in the spinning mill © 2026 Saurer

www.saurer.com

HOW HEBERLEIN AND BOZOK SUPPORT SYNTHETIC YARN PRODUCERS

Heberlein is internationally recognised for its air interlacing and air texturing jets for synthetic filament yarns. In Türkiye, the company cooperates closely with its representative Bozok Mümessillik Makina Kimya San. ve Tic. A.Ş. in Istanbul to support local producers with advanced technology, technical expertise, and service. Türkiye remains an important textile and filament yarn production hub between Europe and Asia.



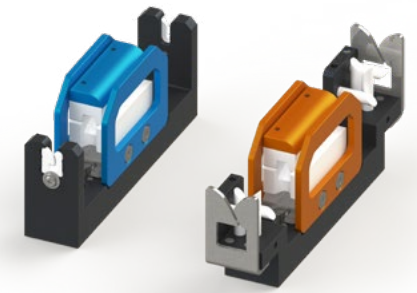
APe series © 2026 Heberlein

One example is the APe series, which can reduce compressed air consumption by up to 15% while maintaining the same number of knots. At ITM 2026 in Istanbul, visitors will also be able to learn more about the PolyJet-TG-3 generation of air interlacing jets for spinning applications, designed for uniform interlacing density and improved yarn performance. Heberlein and Bozok will welcome visitors in Hall 7, Booth 708A, at the Tüyap Fair Convention and Congress Center from June 9 to 13.

“Turkish customers value performance, reliability, and measurable production improvements,” says Levent Umut. “With Heberlein technology, we are able to deliver exactly that.” d partners at ITM 2026 in Istanbul.”

Producers are investing in technologies that improve efficiency, sustainability, and process reliability. Heberlein's solutions meet growing demands for stable processing, reduced compressed air consumption, consistent interlacing quality, and long service life. Bozok supports customers with technical consulting, in-plant trials, and after-sales service. Together with Heberlein specialists, producers evaluate yarn quality, air consumption, and process efficiency to identify suitable solutions for POY, FDY, and texturing applications.

www.heberlein.com



PolyJet-TG-3 © 2026 Heberlein

RIETER WILL RAISE THE BAR ON PERFORMANCE WITH AUTOMATION, DIGITIZATION AND RECYCLING

Automation, intelligence and efficiency drive Rieter's latest spinning innovations. Rieter will showcase a broad portfolio of technologies designed to increase productivity, efficiency and process reliability in Hall 7 / Booth 702. Together with its subsidiaries Accotex, Bräcker, Graf, Novibra, Suessen, SSM and Temco, the company will present innovations that support spinning mills in improving cost efficiency, responding more flexibly to market requirements and strengthening their competitiveness. A key focus is Rieter's Vision 2027 – the fully automated spinning mill – which is being advanced step by step through innovations in automation and digitization.

This year also marks a special milestone, as Rieter and Barmag will exhibit side by side for the first time.



Towards the fully automated spinning mill with automation and digitization © 2026 Rieter

Combining Rieter's expertise in spinning technology with Barmag's man-made fiber capabilities expands the group's position as a system provider for both natural and man-made fibers. Barmag will be located in Hall 7 / Booth 704.

ADVANCING THE FULLY AUTOMATED SPINNING MILL

Automation and digitization remain central elements of Rieter's development strategy. The company will present solutions that support the gradual implementation of fully automated ring and compact spinning operations.

Among the highlights are systems for efficient bale transport, automated can transport and fully automatic packaging processes, including steaming, palletizing and labeling. In parallel, Rieter continues to expand its digital offering through various ESSENTIAL modules. These solutions provide employees at different levels of a spinning mill – from machine operators to management – with data and insights to support production decisions and process optimization.



The universal compacting solution COMPACT4.
© 2026 Rieter

NEW BENCHMARKS IN COMPACT SPINNING AND COMBING PREPARATION

A major exhibit will be the COMPACT4 compacting solution. Developed to combine flexibility, reliability and spinning efficiency, the system features a fine-tuned spinning geometry designed to produce compact yarns of consistently high quality. Low maintenance requirements, reduced downtime and low energy consumption contribute to its overall cost-effectiveness in daily mill operation.

Rieter will also present the latest generation of its combing preparation technology. The OMEGAlap E 40 achieves a production rate of 800 kg/h, representing an increase of 33% compared with its predecessor. The higher output is enabled by rapid lap changing, while energy consumption is reduced by 30% and compressed air consumption by 63%.

Easy maintenance and cleaning further simplify operation.

HIGHER PRODUCTIVITY IN ROTOR SPINNING

The rotor spinning machine R 70 has been developed to increase productivity while maintaining yarn quality. Depending on the application, productivity gains of between 7 and 15% can be achieved.

The machine is designed to process high shares of non-virgin material blends at full production speed. Advanced fiber-guiding and air-guiding components support stable operation, while pneumatic rotor cleaning at every piecing contributes to consistent yarn quality. Energy consumption can be reduced by up to 10% through low-vacuum technology, and the machine's accessible design simplifies maintenance and servicing.



Leading the way in combing preparation with the OMEGAlap E 40. © 2026 Rieter

MESDAN HIGHLIGHTS TESTING AND YARN JOINING EXPERTISE

ARTIFICIAL INTELLIGENCE IN FIBER PREPARATION

Artificial intelligence is playing an increasingly important role in spinning preparation, and the card C 81 demonstrates how digital technologies can support process optimization.

Two key developments are the Carding Gap Control (CGC) and the Trash Level Monitor (TLM). CGC helps create optimal conditions for nep reduction and yarn quality, while TLM continuously monitors trash levels when processing natural fibers. Together, the systems help maximize fiber yield and carding performance. Both technologies are also available as retrofit solutions for existing installations.

TECHNOLOGIES FOR RECYCLED FIBERS

Another focus area is the processing of recycled fibers. Rieter continues to work closely with partners and fiber manufacturers to improve the spinning performance of recycled raw materials.

According to the company, the latest technological developments significantly increase both the efficiency and quality of converting textile waste into new yarns, supporting a more circular textile value chain and expanding the possibilities for high-quality yarn production from recycled



AI solutions for most productive card C 81
© 2026 Rieter

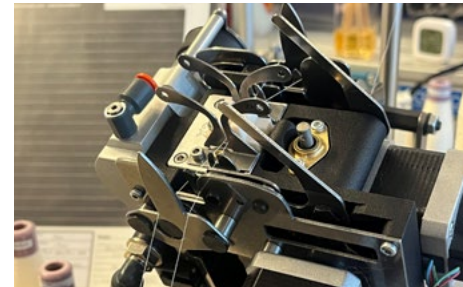


Latest technological expertise in spinning recycled fibers
© 2026 Rieter

materials.02, while Barmag will be located in Hall 7 / Booth 704. Together, the companies will showcase technologies and services covering a broad spectrum of spinning applications for natural and man-made fibres.

www.rieter.com

Mesdan S.p.A. will present its latest textile testing and yarn joining technologies at the booth of its Turkish agent SARTEKS MAKINA in Hall 7 / Booth 701A. The Italian company, a specialist in yarn joining solutions and textile testing equipment, will place particular emphasis on its EVENEXT evenness tester and the BURSTMATIC II bursting strength tester.



Seamless Splicer © 2026 Mesdan

A key exhibit will be the new EVENEXT, the latest generation of evenness testers for natural and man-made spun yarns, as well as sliver and roving. Equipped with a hairiness sensor, ceramic sensors and new software, the system is designed to deliver high accuracy and consistent results while reducing the influence of ambient conditions. Its modular design also allows future upgrades, including automatic cop changing and automatic testing from up to 24 bobbins.

Mesdan will also showcase the BURSTMATIC II, a pneumatic testing system for measuring the bursting strength of woven and knitted fabrics. The equipment can additionally perform release-and-extension cycle tests and can be fitted with interchangeable domes to accommodate a wide range of international and proprietary testing methods.

Beyond these highlights, Mesdan offers comprehensive laboratory solutions for spinning, weaving, knitting, dyeing and printing mills, as well as for research institutes, garment manufacturers and retailers. The company's portfolio also includes a broad range of yarn joining technologies for applications ranging from winding, twisting and dyeing to weaving, knitting and technical textile production.

mesdan.com



EVENEXT evenness tester © 2026 MESDAN

BB ENGINEERING HIGHLIGHTS

PATENTED FILTRATION TECHNOLOGY AND RECYCLING SOLUTIONS

BB Engineering will present its latest developments in man-made fiber and recycling technology in Hall 7 / Booth 704, where the company will once again exhibit together with its parent company Barmag and its representative Tekstil Servis. The German machine manufacturer will showcase its complete portfolio, ranging from individual components such as extruders and filters to complete systems for synthetic fiber spinning, air-texturing and PET recycling.

A particular highlight will be the new patented ValuePack spin pack, which combines two established filtration principles in a single solution. In addition, visitors will be able to learn more about the VarioFil® compact spinning system and the recently introduced COBRA® filter.

VALUEPACK COMBINES FILTRATION AND HOMOGENIZATION

With the new ValuePack, BB Engineering introduces a spin pack that combines the advantages of conventional sand packs and filter candle systems. Traditionally, spin packs have used either metal powder filtration or filter candles, each offering specific benefits depending on the application.

Filter candles provide a large filtration area and were originally developed for recycling applications, while sand packs are valued for their homogeneity and are widely used

with virgin materials. BB Engineering's patented solution combines both approaches in a two-stage filtration process.

The melt first passes through a filter candle, where it is filtered over a large surface area down to 15 µm. It then flows through a sand chamber, where homogenization and shearing take place. According to BB Engineering, this combination results in improved temperature and viscosity homogeneity, enhanced spinning performance and higher yarn quality across a broad range of applications.

The ValuePack also features pressure-independent forced sealing, preventing leaks that can occur with self-sealing systems while providing a larger process window. Existing installations can be retrofitted to accommodate the new spin pack.

VARIOFIL® CONTINUES TO ATTRACT STRONG INTEREST

Another key exhibit will be the VarioFil® compact spinning system, which has become one of BB Engineering's most established solutions. The system combines a compact footprint with production flexibility and consistent yarn quality.

According to the company, Türkiye has become the largest market for VarioFil®, with more than 60 systems installed since its in-

roduction. Fibers and yarns produced on these systems are used in a wide variety of applications, including apparel, carpets and automotive textiles such as seat covers and seat belts.

VarioFil® is designed for the production of POY, FDY, HTY, LSY and HMY yarns from all common polymers. Production capacities of up to 450 kg/h per extruder can be achieved. The system is also capable of processing recycled PET and even bottle flakes directly into POY or FDY yarns.

COBRA® FILTER EXPANDS RECYCLING CAPABILITIES

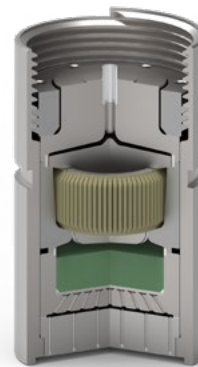
BB Engineering will also showcase its COBRA® filter, which was first introduced at the Plastics Recycling Show Europe and K 2025. The system was developed to address increasing contamination levels in recycling

processes while simplifying operation and reducing running costs.

The filter combines continuous large-area filtration with automated intermediate cleaning. Two filter cartridges with automatic switching ensure uninterrupted operation, even under demanding processing conditions. According to the company, the system can handle contamination levels that would challenge conventional candle filters or screen changers.

An integrated cleaning system extends the service life of the filter media while reducing operational effort, melt loss and energy consumption. At the same time, no chemicals are required for the cleaning process. Designed for both coarse and fine filtration, COBRA® can be used in PET recycling as well as in synthetic fiber spinning applications. The system can also be integrated into existing production lines as a retrofit solution.

With the ValuePack, VarioFil® and COBRA®, BB Engineering will present technologies that address key requirements in synthetic fiber production and recycling, ranging from improved melt quality and spinning performance to efficient filtration and the processing of recycled materials.



ValuePack © 2026 BB Engineering

bbeng.de

SAVIO WILL PRESENT ITS FLAGSHIP TECHNOLOGIES IN SMART WINDING AND SPINNING TECHNOLOGIES

Savio will present a selection of its latest winding and spinning technologies at the Vandewiele Group booth in Hall 7, Booth 710A. They will showcase solutions designed to help textile manufacturers improve productivity, yarn quality and process efficiency while responding to growing demands for automation, digitalization and sustainable production. Among the highlights are the Proxima Smartconer®, the Phoenix Assembly Winder and the Lybra Smartspinner®.

The textile industry continues to operate in a challenging environment. Rising cost pressure, increasing quality requirements and the need for greater flexibility are driving mills to modernize existing operations and invest in smarter production technologies. Against this backdrop, Savio's latest developments focus on combining productivity gains with lower operating costs and enhanced process transparency.

SMART WINDING WITH DIGITAL INTELLIGENCE

One of the key technologies on display will be the Proxima Smartconer®, Savio's latest winding platform. Developed to combine high productivity with low energy consumption, the machine is available in a wide range of configurations, from fully automatic systems to manual feeding, cone-to-cone processing, Duo Lot solutions and large-bobbin feeding for the carded wool sector.

Beyond its mechanical capabilities, Proxima reflects the growing importance of digital technologies in textile manufacturing. The platform incorporates AI-supported functions and is connected to Savio Insight, a web-based monitoring system that enables remote machine setup, production tracking and real-time performance analysis. By combining automation, process transparency and energy-saving features, Proxima supports more efficient and data-driven winding operations.

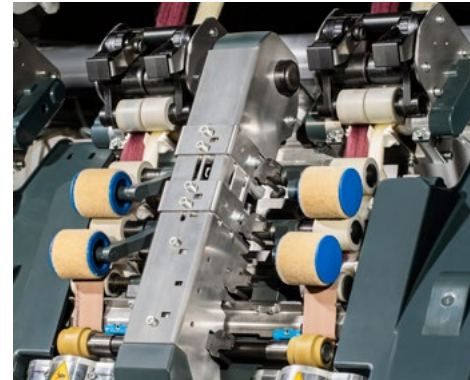
HIGH-PERFORMANCE ASSEMBLY WINDING

Savio will also present the Phoenix Assembly Winder, designed for discontinuous fibre yarns ranging from Ne 1 to Ne 140. The machine combines high productivity with consistent package quality and low operating costs.

With yarn take-up speeds of up to 1,000 m/min, Phoenix is suited for demanding production environments where efficiency and process reliability are critical. The integrated Savio Multicone digital thread guide simplifies machine setup and optimizes package formation, contributing to improved downstream performance in Two-for-One twisting applications.

FLEXIBLE SPINNING WITH THE MULTI BLEND SYSTEM

Another highlight will be the Lybra Smartspinner®, Savio's air-jet spinning technology for applications such as knitting, home textiles and sunshade fabrics. The system focuses on flexibility, efficiency and material innovation.



Lybra Smartspinner® © 2026 Savio



Phoenix Assembly Winder © 2026 Savio

A distinguishing feature of Lybra is its Multi Blend System, which allows two slivers to be fed directly into the spinning chamber. This enables manufacturers to adjust blends in real time while reducing preparation requirements. The technology also opens new possibilities for creating unique material combinations, colour effects and mélange yarns. By combining versatility with high production efficiency, Lybra supports manufacturers seeking greater differentiation and lower processing costs.

RESPONDING TO EVOLVING MARKET REQUIREMENTS

The technologies presented by Savio address several of the key challenges facing textile manufacturers today. Greater automation, digital connectivity, energy efficiency and production flexibility are becoming increasingly important as mills seek to improve competitiveness while maintaining product quality and controlling costs.

With its latest winding and spinning solutions, Savio aims to support manufacturers in modernizing their operations and creating more efficient, flexible and sustainable production environments.

www.saviospa.com

USTER FOCUSES ON DATA-DRIVEN QUALITY MANAGEMENT FROM FIBER TO FABRIC

At Hall 7 / Booth 714B, Uster will showcase solutions designed to help textile manufacturers gain greater control over raw materials, improve quality consistency and increase production efficiency. A particular focus will be on data-driven raw material management, advanced fiber testing and the latest developments in automated fabric inspection.

TURNING RAW MATERIAL DATA INTO PRODUCTION ADVANTAGES

As raw material costs remain under pressure and recycled fibers become increasingly important, many spinning mills are looking for better ways to manage fiber quality and blending processes. Uster will therefore place its FiberQ raw material management solution at the center of its ITM presentation.



Measuring fiber quality parameters with Uster HVI
© 2026 Uster Technologies

Part of the Uster 360Q ecosystem, FiberQ provides transparency across raw material inventories and supports more systematic blend preparation and quality management. The foundation for this approach is reliable fiber data. Uster HVI testing enables spinning mills to evaluate critical parameters such as micronaire and supports laydown management by helping mills maintain consistent fiber characteristics across bale mixes. Since variations in micronaire can lead to barré effects, yarn strength inconsistencies and quality claims, controlling these parameters from the very beginning of the process is essential.

Building on this foundation, FiberQ combines fiber testing results with inventory and production data, allowing mills to manage not only micronaire but multiple fiber characteristics simultaneously. Automated algorithms support more consistent laydowns, reduce manual effort and help optimize raw material utilization while maintaining quality targets throughout production.

A practical example comes from the Turkish denim producer ORTA. The company uses FiberQ to support the processing of recycled fibers alongside regenerative and organic cotton. According to ORTA, the system has improved blend consistency, reduced quality variations and contributed to more stable production processes.

Better control of critical parameters such as micronaire and color has also helped reduce the risk of shade variations in downstream processing.

AFIS 6 EXPANDS FIBER PROCESS CONTROL

Another highlight at the Uster stand will be AFIS 6, the latest generation of the company's fiber analysis technology. The system extends fiber testing beyond traditional cotton applications and enables detailed analysis of man-made fibers and blends within a single platform.

Visitors to ITM 2026 will be able to learn more about the latest enhancements to AFIS 6, further strengthening its role as a tool for modern fiber process control.

SIMPLIFYING AUTOMATED FABRIC INSPECTION

Uster will also highlight FABRIQ VISION 2, its newest automated fabric inspection system. The solution has been developed to make the transition from manual to automated inspection significantly easier while continuing to leverage the expertise of existing quality personnel.

AI-supported setup procedures, simplified workflows and advanced defect classification enable faster article changes and more reliable inspection results. The system aims to help fabric manufacturers improve yield, reduce claims and strengthen



USTER FABRIQ VISION 2 © 2026 Uster Technologies

quality assurance without increasing operational complexity. As quality requirements continue to rise across the textile industry, FABRIQ VISION 2 represents Uster's latest step toward making automated inspection more accessible and practical for everyday mill operations.

Together, FiberQ, AFIS 6 and FABRIQ VISION 2 demonstrate Uster's strategy of connecting quality management across the entire textile process – from raw material selection and fiber testing to yarn production and final fabric inspection.

www.uster.com

KARL MAYER PRESENTS SOLUTIONS FOR NEW OPPORTUNITIES

KARL MAYER will welcome visitors to Hall 3 / Booth 303A with a presentation focused on warp knitting, warp preparation and technical textiles. Against a challenging market backdrop, the company will showcase technologies, textile developments and application concepts designed to help customers strengthen their competitiveness and explore new business opportunities.

The presentation combines machinery, textile innovations and application expertise, covering current developments in warp knitting as well as solutions for warp preparation and denim production.

HKS 4-M EL ECO DEMONSTRATES FLEXIBILITY AND EFFICIENCY

One of the main attractions at the stand will be a live demonstration of the HKS 4-M EL ECO. The machine combines high efficiency with flexibility and has been developed to respond quickly to changing market requirements.

At the exhibition, the machine will produce an outerwear fabric featuring a distinctive crepe-on-crepe effect. The textured appearance is created through a combination of a crinkled fabric ground and textile strips with a wrinkled look, demonstrating the machine's ability to produce fashion-oriented fabrics with attractive surface effects.

TEXTILE INNOVATIONS FOR A WIDE RANGE OF APPLICATIONS

A textile innovation show will present developments in tricot, lace and weft-inserted fabrics that are particularly relevant to the Turkish market. Among the exhibits will be velour, corduroy and upholstery fabrics as well as terry warp knits produced on tricot machines. Visitors will also be able to discover curtains and apparel fabrics produced on the latest TM WEFT generation, featuring expanded patterning possibilities through upgraded weft insertion technology.

Further highlights include lightweight sports and athleisure fabrics produced on the HKS 2-SE, open-mesh curtain solutions from the HKS 3-M EL PLUS and fashion fabrics made from TENCEL™ Lyocell and Modal fibres with Micro Technology. The presentation will also feature shade nets produced on the new RS 2 Net machine, which attracted considerable attention at Techtextil 2026, as well as Eyelash Lace with four-way stretch produced on a TEXTRONIC® Multibar Jacquard Raschel machine. Selected technical textiles will complete the display.

Many of these developments are supported by the recently opened TEXTILE INNOVATION CENTER in Obertshausen, where customers can test machines and develop new products together with KARL MAYER specialists.



HKS 4-M EL ECO © 2026 KARL MAYER

PROVEN SOLUTIONS FOR WARP PREPARATION

In the field of warp preparation, KARL MAYER will focus on the PROWARP® sectional warping machine and the MULTI-MATIC warp sampling machine. Both systems are well established in the Turkish market and are widely used for efficient warp preparation processes.

The company will also present its PRO-DYE® indigo dyeing technology for both slasher and rope dyeing applications.

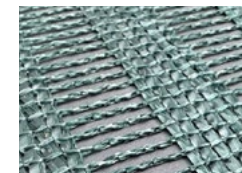
The PRODYE®-S enables darker indigo shades with only eight dyeing boxes while reducing dye bath volume. According to KARL MAYER, the system can reduce hydrosulfite and caustic soda consumption by up to 20% through an efficient indigo circulation concept and the closed design of the dyeing vats.

For rope dyeing applications, the PRO-DYE®-R achieves darker indigo shades with nine dyeing boxes while offering similar chemical savings. The system also supports higher output during rebeaming through precise tension control and programmable coilers.

SUPPORTING CUSTOMERS WITH TECHNOLOGY AND INNOVATION

With production technologies, textile innovations and application-focused developments, KARL MAYER's presentation highlights the company's commitment to supporting customers in adapting to changing market requirements and identifying new business opportunities.

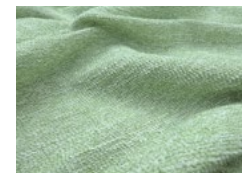
www.karlmayer.com



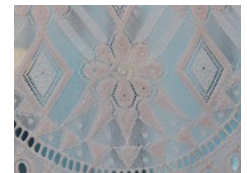
Shade-Net
© 2026 KARL MAYER



Velours
© 2026 KARL MAYER



Warp Knit with Weft Insertion fabric
© 2026 KARL MAYER



Eyelash Lace with 4-way stretch
© 2026 KARL MAYER

STÄUBLI SHOWCASES

WEAVING PREPARATION, SHEDDING AND JACQUARD TECHNOLOGIES

Stäubli Textile will present a comprehensive portfolio of weaving technologies in Hall 8 / Booth 803. The company's exhibit will cover weaving preparation systems, electronic cam motions and dobbies, Jacquard solutions and digital services designed to enhance efficiency, process stability and fabric quality across a wide range of weaving applications.

Türkiye remains one of the world's leading textile and apparel manufacturing countries, serving markets ranging from denim and home textiles to technical fabrics and carpets. To meet increasing requirements for productivity, flexibility and reliability, manufacturers continue to invest in advanced weaving technologies. Stäubli's latest solutions address these needs across the entire weaving process.

EFFICIENT WARP PREPARATION AND KNOTTING

A key highlight will be the SAFIR PRO S47 automatic drawing-in machine. Developed for standard fabrics, denim, technical textiles and applications involving coarse or fancy yarns, the system combines drawing-in speeds of up to 190 ends per minute with high flexibility and process reliability. Active Warp Control 2.0 supports consistent performance, while the machine is suitable for a broad

range of weaving configurations, including complex multilayer applications.

Stäubli will also present the TIEPRO warp knotting machine. Designed for universal use with standard warp yarns, the system features a yarn separation concept without separating needles. According to the company, this enables efficient and economical automatic knotting across a wide range of warp sheets.

Proven solutions for high-speed weaving In the area of shedding technology, visitors will be able to explore several Stäubli systems developed for demanding weaving applications.



Stäubli S1792 cam motion © 2026 Stäubli



Stäubli SAFIR PRO S47v high-speed automatic drawing-in machine © 2026 Stäubli

The S1792 cam motion is designed for continuous operation and consistent fabric quality at high production speeds. Equipped with ten lifting units, it is particularly suited for plain-weave production on air-jet and rapier weaving machines and can reach speeds of up to 1,400 rpm in selected applications.

Another focus will be the electronic rotary dobby S3060. Designed for flexible operation across a broad range of weaving styles, the system combines robust construction with precise shed formation and reliable high-speed performance. Stäubli positions the S3060 as a versatile solution for mills seeking efficiency, stable production and consistent fabric quality.

The electronic rotary dobby S3280 complements the portfolio with a design optimized for high-speed air-jet and rapier weaving applications. Its robustness and versatility make it particularly suitable for demanding denim production environments.



Stäubli TIEPRO warp knotting machine © 2026 Stäubli

PICANOL HIGHLIGHTS

WEAVING PERFORMANCE, EFFICIENCY AND DIGITALIZATION



Stäubli SX PRO Jacquard machine © 2026 Stäubli

JACQUARD SOLUTIONS FOR DEMANDING FABRICS

Stäubli will also highlight its latest Jacquard technologies. The SX PRO Jacquard machine combines high lifting capacity, precision and durability for the production of complex patterns and premium fabrics. Applications include terry fabrics, upholstery, tapestries, silk fabrics, apparel textiles, seat covers and technical textiles.

For velvet and technical fabric production, the company offers the SX PRO V, LX PRO V and LXL PRO V Jacquard machines.

These systems are designed to provide precise, vibration-free shedding while maintaining reliable performance under demanding operating conditions. Features such as optimized sealing, efficient ventilation and easy accessibility support long-term operation with minimal maintenance requirements.



Stäubli electronic rotary dobby S3060 © 2026 Stäubli

Complementing the Jacquard range is the GA500 Jacquard harness. Designed to ensure precise and stable transmission between the Jacquard machine and warp threads, the system contributes to consistent fabric quality across a wide range of weaving widths and applications.

DIGITAL SUPPORT THROUGHOUT THE MACHINE LIFECYCLE

In addition to its machinery portfolio, Stäubli will present MyStäubli, the company's digital customer platform. The system provides access to technical documentation, spare parts identification, service requests and machine-related information.

By bringing together weaving preparation, shedding, Jacquard technologies and digital services, Stäubli will demonstrate solutions designed to support efficient and reliable weaving operations across a broad spectrum of textile applications.

www.staubli.com

Picanol Picanol will present its latest weaving technologies in Hall 8 / Booth 802, showcasing solutions designed to combine high performance, fabric quality and energy efficiency. The company's presentation will focus on its Ultimax rapier weaving machines, the latest generation of the OmniPlus-i Connect airjet platform and the digital possibilities offered by PicConnect.

A key highlight will be the Ultimax rapier weaving machine, developed to deliver high weaving performance while maintaining excellent fabric quality. At the exhibition, two Ultimax machines will be in operation: one producing denim fabrics and another weaving fancy voile fabrics. The denim machine will be configured for recycled yarn applications and equipped with technologies designed to support flexible and reliable production. The voile application will demonstrate the machine's capabilities in processing lightweight fabrics with demanding yarn combinations and decorative effects.

Another major attraction will be the latest generation of the OmniPlus-i Connect airjet weaving machine. Introduced at the end of 2025, the platform incorporates a redesigned machine concept aimed at reducing energy consumption while maintaining productivity. Central to this development is the EcoBoost technology, which

enables energy savings of up to 1.5 kW per machine. At the exhibition, the OmniPlus-i Connect-2-P will be weaving poplin fabrics and will feature technologies such as EcoBoost, EcoWeft and AirMaster for reduced energy and air consumption.

Visitors will also be able to explore PicConnect, Picanol's centralized digital platform that brings together machine data, monitoring tools and service functions. Now enhanced with AI-powered capabilities, the system enables users to visualize production data, machine performance, energy consumption and operational efficiency through customizable dashboards and reporting tools.

Through its combination of rapier and airjet weaving technologies, energy-saving innovations and advanced digital connectivity, Picanol will demonstrate solutions designed to support efficient and intelligent weaving operations.



Picanol Ultimax 8 r 360 fancy voile © 2026 Picanol

www.picanol.be

ITEMA HIGHLIGHTS

WEAVING TECHNOLOGY, FABRICS AND CUSTOMER SUPPORT

Itema will welcome visitors in Hall 8 / Booth 806D with an exhibition concept designed to showcase the company's expertise across the entire weaving value chain. The stand will combine advanced weaving solutions, OEM spare parts services and a textile gallery featuring fabrics produced by Itema customers around the world.

The concept places equal emphasis on weaving technology and the fabrics produced with it. By bringing together machinery solutions, customer applications and service offerings, Itema aims to demonstrate the value created throughout the weaving process, from machine performance to the finished textile.

TEXTILE GALLERY SHOWCASES CUSTOMER ACHIEVEMENTS

At the center of the stand will be an immersive textile gallery displaying a curated collection of fabrics woven on Itema machines. The exhibit will allow visitors to explore the versatility and textile capabilities of the company's weaving technology across a wide range of applications and market segments.

The fabrics on display originate from collections developed by Itema customers for international brands. Many feature particularly sophisticated textile characteristics, including complex fabric constructions and the use of delicate, pre-

cious or recycled yarns. The gallery is intended to highlight the diversity of fabrics that can be produced on Itema weaving machines and the results achieved by customers worldwide.

FOCUS ON WEAVING INNOVATIONS

Alongside the textile gallery, Itema will present selected weaving solutions developed to support efficiency and performance in modern weaving operations. Among the featured technologies are the MEC-T mechanical tuckers and the iSAVER® waste selvage removal system, available for up to six colours. Designed to support more sustainable weaving processes, the iSAVER® system contributes

to optimized resource utilization while improving operational efficiency. By focusing on both fabric quality and production performance, the weaving solutions area will demonstrate how technological developments can contribute to improved process results throughout the weaving mill.

GENUINE SPARE PARTS AND DIGITAL SERVICES

A dedicated section of the stand will be devoted to Itema's OEM spare parts portfolio, including components for legacy Itema brands. The company will highlight the role of genuine spare parts in maintaining machine reliability, productivity and long-term performance. The HelloItema customer portal provides access to the company's integrated spare parts ecosystem. Through this platform, customers can manage spare parts requirements and access support services designed to maximize machine uptime and operational continuity.

LONG-STANDING COMMITMENT TO THE TURKISH MARKET

Türkiye remains one of Itema's most important markets, with the company serving customers across a broad range of textile segments including curtains, home textiles, apparel, denim and technical fabrics.



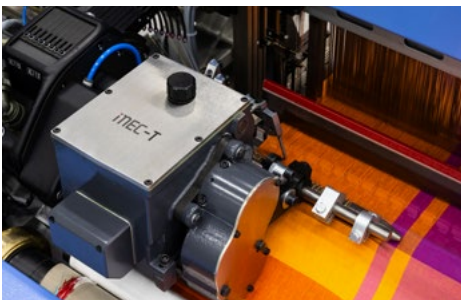
The new R9500EVO © 2026 ItemaGroup

VANDEWIELE HIGHLIGHTS INTEGRATED SOLUTIONS FOR WEAVING AND CARPET PRODUCTION

Through its local organization, IteMa Türkiye provides technical support, on-site service and OEM spare parts availability. According to the company, these services help customers reduce unplanned downtime and maintain safe and reliable mill operations.

Commenting on the exhibition, Pamir Özaltan, Managing Director of IteMa Türkiye, emphasized the importance of ITM as an opportunity to meet customers and partners and further strengthen long-standing relationships within the Turkish textile industry.

Matteo Mutti, IteMa Group Chief Sales & Service Officer and Head of Textile Innovation at IteMab, added that the company's presentation is intended to highlight both the results achieved by customers and the value created throughout the weaving process.



MEC-T MechanicalTuckers © 2026 IteMa



IteMa iSAVEReco © 2026 IteMa

With its combination of customer fabrics, weaving technologies and service solutions, IteMa's presence in Hall 8 / Booth 806D will focus on the practical outcomes that can be achieved across the entire weaving value chain.

www.itemagroup.com

Under the theme "Textile Innovations Together", the Vandewiele Group will present technologies from its brands Vandewiele, Savio, IRO and BMSvision in Hall 7 / Booth 710A. The company's presentation will focus on integrated solutions designed to support efficiency, flexibility and productivity across a wide range of textile applications.

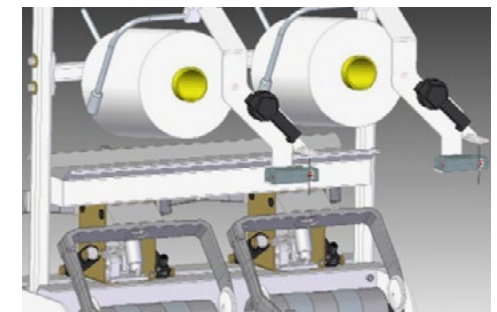
One of the main highlights will be a new cabler and twister technology for DTY, ATY and FDY yarns. Developed particularly for carpet applications, the system addresses the growing use of finer denier yarns for softer surfaces, enhanced touch and new visual effects. According to Vandewiele, the technology enables the efficient processing of finer dtex yarns in a single-stage operation while maintaining high quality standards and production flexibility.

In the velvet segment, the company will showcase its next-generation cut & loop velvet technology. Based on Vandewiele's established 3-rapier weaving concept, the VSi23 servo dobby and VSi33 jacquard machines are designed to deliver higher productivity while supporting dense fabrics, increased pile heights and a broad range of yarn types, including PP and PET. Visitors will also be able to discover the latest developments from Bonas in jacquard weaving technology.

Alongside the existing Ji range, Vandewiele will introduce the new JiM model, covering capacities from 6,144 to 7,680 hooks. Features such as preventive maintenance functions, energy management and diagnostic capabilities are designed to improve machine performance and reliability.

Another focus area will be IRO Gauge Parts for tufting machines. The range includes modular and individual components that influence carpet structure, appearance and feel, with customized solutions available for specific customer requirements.

The Vandewiele Group aims to demonstrate how integrated machinery concepts can support the development of differentiated textile products while helping manufacturers optimize production processes.



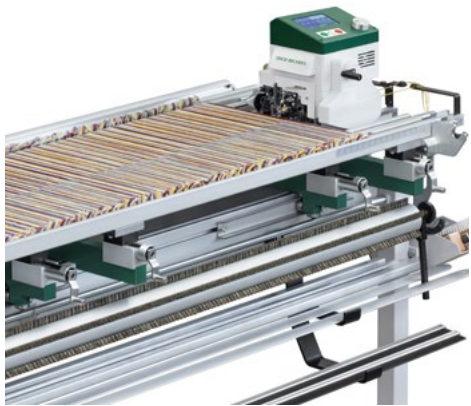
New cabler and twister technology for DTY, ATY and FDY yarns © 2026 VANDEWIELE

www.vandewiele.com

GROZ-BECKERT SHOWCASES INNOVATIONS FOR KNITTING, WEAVING AND NONWOVENS

Groz-Beckert will present a broad range of innovations for knitting, weaving and nonwovens in Hall 3 / Booth 304B. The company's latest developments are designed to support greater efficiency, precision and process reliability across textile production, addressing the requirements of both established and emerging applications.

The presentation will span multiple textile technologies, from circular and flat knitting to weaving preparation and nonwovens production, highlighting solutions that help manufacturers optimize productivity and process performance.



KnotMaster © 2026 Groz-Beckert

NEW DEVELOPMENTS FOR KNITTING APPLICATIONS

In the Circular Knitting segment, Groz-Beckert will focus on the LCmax™, the latest generation of energy-saving needles. Featuring a wave-shaped shank geometry, the needle has been developed to reduce friction and optimize energy efficiency while maintaining high machine performance.

For Flat Knitting applications, the company will showcase two specialized needle solutions. The SAN™ TT has been developed for particularly tight loops and is suitable for technical and medical textile applications. The SAN™ FY, meanwhile, is designed for processing uneven effect yarns and supports a consistent fabric appearance even in demanding knitted structures.

Visitors interested in hosiery production will be able to learn more about the dur™ needles, which are designed for durability and precision in the manufacture of fine legwear products.

The Warp Knitting segment will feature Groz-Beckert's continuously expanding module portfolio. These solutions are designed to support precision, stability and efficiency during loop formation pro-

cesses and reflect the company's ongoing development activities in warp knitting technology.

EFFICIENT SOLUTIONS FOR WEAVING PREPARATION

In the Weaving product area, Groz-Beckert will highlight the KnotMaster tying machine. Developed for efficient and flexible weaving preparation, the system combines a modular design with a compact footprint.

The KnotMaster supports rapid warp changes and reduced processing times, helping weaving mills improve productivity and operational flexibility. According to the company, the system is capable of handling both complex patterns and demanding upholstery yarns while covering a wide range of standard and special applications. Live demonstrations at the booth will provide visitors with an opportunity to experience the machine in operation.



Groz-Beckert Knitting LCmax © 2026 Groz-Beckert



Groz-Beckert Knitting SAN FY © 2026 Groz-Beckert



Groz-Beckert Knitting Vo DUR © 2026 Groz-Beckert



Groz-Beckert Knitting SAN TT © 2026 Groz-Beckert



Heald Grobra Grobinox © 2026 Groz-Beckert



Groz-Beckert Nonwovens CB Barb © 2026 Groz-Beckert

Complementing the KnotMaster, Groz-Beckert will present its portfolio of reeds, healds and drop wires. The products are designed for a broad variety of weaving applications and can be adapted to different production requirements.

Another highlight will be the PosiLeno® system. The solution offers extensive patterning possibilities and high flexibility while supporting optimized shed formation movements. Its simple installation is intended to facilitate integration into existing weaving operations.



Wap knitting module © 2026 Groz-Beckert

FOCUS ON NONWOVENS PRODUCTION

The Nonwovens division will present several developments aimed at improving productivity and process control in nonwoven manufacturing. Among the innovations on display is a needle developed to significantly reduce insertion and removal times.

Groz-Beckert will also showcase its Digital Ecosystem, which is designed to support the optimization and automation of production processes. In addition, visitors will be able to learn more about the company's mounting service for the Nonwovens Carding product group and discover the newly developed CB-barb felting needle.

TECHNOLOGIES ACROSS THE TEXTILE VALUE CHAIN

With solutions for knitting, weaving and nonwovens applications, Groz-Beckert's presentation will demonstrate the breadth of its technology portfolio. From advanced needle designs and warp knitting modules to weaving preparation systems and digital solutions for nonwovens production, the company will highlight innovations developed to support efficient and reliable textile manufacturing processes.

www.groz-beckert.com

SHIMA SEIKI SHOWCASES

INTEGRATED KNITWEAR PRODUCTION

SHIMA SEIKI will present a comprehensive portfolio of computerized flat knitting machines, digital design solutions and automated cutting technology in Hall 3 / Booth 312A. Together with its Turkish representative TETAS IC VE DIS TICARET A.S., the Japanese technology specialist aims to demonstrate how digital workflows can connect design, knitting and production within a more efficient and sustainable manufacturing process.

A major focus will be on the company's WHOLEGARMENT® technology, which enables complete garments to be knitted in one piece without linking or sewing. The technology has gained increasing attention as manufacturers seek to reduce labour requirements, improve flexibility and minimize material waste. Among the highlights will be the MACH2@XS153 WHOLEGARMENT® machine with SHIMA SEIKI's SlideNeedle™ technology, alongside additional WHOLEGARMENT® models for different gauge ranges and applications.

The exhibit will also feature computerized flat knitting machines for shaped knitting, including the N.SVR@122 and two N.SSR@ models that will be shown in Türkiye for the first time. The SFG@20 seamless glove knitting machine completes the knitting technology lineup.

Beyond machine technology, SHIMA SEIKI will demonstrate its digital design and production software solutions. APEXFiz® supports the entire workflow from yarn development and product design to production planning, while virtual sampling capabilities help reduce development time, costs and material consumption. Additional software tools enable automatic conversion of designs into machine data and provide real-time production monitoring.

To illustrate the complete workflow from design to finished product, SHIMA SEIKI will also present its P-CAM@223 computerized cutting machine. The system is designed for precise multi-ply cutting and complements the company's integrated approach to digital textile manufacturing.



MACH2VS183 © 2026 SHIMA SEIKI

www.shimaseiki.com

MONFORTS HIGHLIGHTS FINISHING TECHNOLOGIES AND TECHNICAL TEXTILE OPPORTUNITIES



Monforts Montex stenters are still the industry standard for the fabric finishing industry © 2026 Monforts

Türkiye remains one of the most important markets for textile finishing, coating and continuous dyeing technologies, and Monforts will use its presence in Hall 11 / Booth 1117D to showcase solutions for both established textile sectors and emerging technical textile applications. Alongside its proven finishing and dyeing technologies, the company will place a particular focus on opportunities arising from the growing demand for technical textiles.

Supported locally by its long-standing representative Neotek, Monforts continues to serve customers across a broad spectrum of textile industries, from denim and home textiles to increasingly specialized technical applications.

PROVEN TECHNOLOGIES FOR DYEING AND FINISHING

At the center of the Monforts portfolio are the Montex stenters, which remain widely used for drying, stretching, heat-setting and coating processes.

According to the company, Montex systems continue to offer advantages in terms of production throughput as well as energy efficiency and energy savings.

For continuous dyeing applications, Monforts will highlight its Thermex ranges. The systems are designed to combine high productivity with uniform dye penetration and consistent colour reproducibility across long production runs.

A key process associated with Thermex is the Econtrol® process for reactive dyes, developed jointly by Monforts and DyStar. The one-pass pad-dry-wash process combines drying and fixation in a simplified continuous operation and has become an established solution for applications requiring flexibility and efficient processing of smaller lot sizes.

Additional technologies within the Monforts portfolio include the DynAir relaxation dryer and the Monfortex compressive shrinking range. The company points to numerous installations in Türkiye in recent years, including projects at Altoteks, Altun, İlay Textile, Kücükler, Kipas Denim, Palmiye, Seher and Rose Fabric.

EXTENDING MACHINE LIFE THROUGH RETROFITS

One area of growing importance for Monforts is the modernization of existing production lines. Due to the long service life and robust construction of many Monforts installations, customers are increasingly investing in retrofit solutions rather than complete replacements.

The company offers a range of upgrade packages that go beyond standard spare parts replacement. These include the Energy Tower heat recovery system, which recovers thermal energy from exhaust air streams, and the Eco Booster, a heat recovery solution that can be integrated into existing Montex stenters.

Another option is the Matex Eco Applicator, which provides an alternative to conventional padding processes and is designed to reduce energy and resource consumption. Together with other retrofit modules, these solutions allow textile manufacturers to improve the performance and efficiency of existing machinery while extending operational life.

GROWING OPPORTUNITIES IN TECHNICAL TEXTILES

Beyond conventional textile finishing, Monforts sees considerable potential in



The Matex Eco Applicator is one of a number of energy and resource saving modules available for retrofitting.
© 2026 Monforts

technical textiles. The company will therefore also highlight its coating technologies, including the MontexCoat, coaTTex and VertiDry systems. These technologies enable textile manufacturers to add functionality and performance characteristics to textile substrates, opening opportunities in a variety of technical end-use markets. Applications range from tents, awnings, sailcloth and blackout blinds to automotive interiors, filtration media, flame-retardant barrier fabrics and reinforcement materials for composite structures.

According to Monforts, these developments offer textile producers new possibilities for diversification and value creation by addressing markets that increasingly require specialized textile performance rather than standard fabric properties.

A KEY MEETING POINT FOR REGIONAL TEXTILE MARKETS

For Monforts, ITM is not only an important event for the Turkish textile industry but also a meeting point for customers from across the wider region. In addition to visitors from Türkiye, the company expects interest from textile manufacturers throughout the Middle East, Central Asia and South Asia.

By combining proven finishing technologies, energy-saving retrofit solutions and advanced coating systems, Monforts aims to demonstrate how textile manufacturers can improve efficiency while exploring new opportunities in technical textile markets.

www.monforts.de

SETEX CONNECTS

PRODUCTION, QUALITY AND ENERGY MANAGEMENT

SETEX will present solutions that help textile manufacturers use production data more effectively in daily dyeing and finishing operations. In Hall 11 / Booth 1109C and at the Textile Solutions Group presence in Hall 6 / Booth 604D, the company will showcase technologies that connect machine control, production planning, quality monitoring and energy management within existing mill structures.



FabricInspector Portable © 2026 SETEX

A central element of the presentation is the OrgaTEX X3 Manufacturing Execution System (MES). The platform combines machine data, planning information and process parameters to support recipe management, dynamic scheduling and KPI-based performance monitoring. According to SETEX, this provides production teams with greater transparency and supports faster decision-making.

The company will also highlight its E390x and C390x controller platforms, which collect and structure process and energy data from dyeing machines and continuous finishing lines. This information can be used for performance analysis, batch comparison and process optimization.

Quality assurance is addressed through FabricInspector Portable and CamCOUNT. While FabricInspector Portable

enables rapid, non-destructive checks directly on the shop floor, CamCOUNT provides optical online measurement of parameters such as thread density, distortion and shrinkage during production.

Another focus is energy management. By linking energy consumption directly to batches, machine states and process phases, SETEX helps manufacturers identify optimization potential and improve resource efficiency.

With its combination of MES, machine control, quality monitoring and energy management solutions, SETEX will demonstrate how production data can support more efficient and transparent dyeing and finishing operations.

www.setex-germany.com

KARL MAYER OPENS TEXTILE INNOVATION CENTER



With the official opening of its new Textile Innovation Center (TIC) in Obertshausen, Germany, KARL MAYER has sent a strong signal of confidence in the future of the textile industry. Around 220 customers, brand representatives, and partners from across the global textile value chain attended the inauguration and gained first-hand insights into the company's new innovation platform.

Under the motto "We believe in the value of textiles," company representatives highlighted the long-term significance of the investment. Karl Josef Mayer, Member of the Supervisory Board and representative of the owner family, emphasized KARL MAYER's confidence in the future of the textile industry and the company's commitment to investing in innovation and new business opportunities.

CEO Lutz Wolf described the new center as an important milestone in KARL MAYER's strategic development. The TIC has been designed as a place where ideas can be transformed into market-relevant solutions through close cooperation with customers and partners. Open exchange, creativity, and collaboration are at the heart of the concept.



Ribbon cutting © 2026 KARL MAYER



"Live your motto" © 2026 KARL MAYER

A highlight of the opening event was the keynote presentation by Vishnu Prakash Muthusamy, Lead Textile & Material Development Engineer at New Balance Athletics. He demonstrated how advanced warp knitting technologies are enabling innovative developments in modern footwear applications.

The Textile Innovation Center is part of KARL MAYER's global innovation network, which also includes facilities in China and Japan. Together, these centers combine expertise in materials, processes, machine technology, and textile applications while addressing both regional and global market requirements.

Covering approximately 5,000 square meters, the new facility provides an environment for rapid textile development—from initial concepts and prototyping through to industrial implementation. According to KARL MAYER, the TIC is the only facility in the industry that combines technologies from Warp Knit, Warp Preparation, and Technical Textiles within one integrated platform.

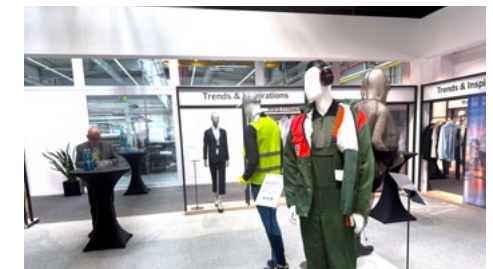


Machines © 2026 KARL MAYER

With the new center, KARL MAYER aims to strengthen collaboration across the textile value chain and provide customers and partners with a platform to accelerate the development of market-ready innovations. Particular attention is being given to future-oriented segments such as technical textiles, sports and footwear applications, as well as modern workwear solutions.

The new Textile Innovation Center represents the visible expression of KARL MAYER's future innovation strategy. During the opening week, textile.4U had the opportunity to speak with CEO Lutz Wolf and Karl Josef Mayer about the company's strategic direction, the challenges facing the global textile industry, and the role of innovation in future growth. These interviews follow in the next pages.

www.karlmayer.com



Showroom © 2026 TexData International

A middle-aged man with short, thinning brown hair is shown from the chest up, facing slightly to the left. He is wearing a dark blue blazer over a light blue and white checkered button-down shirt. His hands are raised in a gesturing motion, with his fingers spread. He is wearing a gold ring on his left ring finger. The background is a blurred industrial setting, likely a factory, with various pieces of machinery and a teal vertical pillar. The lighting is bright and even.

“We need to move away from the price trap and return to a value-driven mindset.”

Interview *by Oliver Schmidt*

Karl Josef Mayer
Representative of the Mayer family
and Member of the Supervisory
Board

KARL MAYER TEXTILMASCHINEN

With its new Textile Innovation Center, KARL MAYER is sending a strong signal for innovation, collaboration, and the future of textile applications. In this interview, Karl Josef Mayer discusses new opportunities in warp knitting, the processing of staple fibres, recycling, the changing role of machinery manufacturers, and why the textile industry must once again focus more strongly on the value of textiles.

1. The Textile Innovation Center as a strategic platform

Mr. Mayer, the Textile Innovation Center was created on your initiative and is intended to foster creativity and new textile applications. How satisfied are you after the opening – and where do you already see concrete potential?

Overall, I am extremely satisfied. The Textile Innovation Center has essentially become exactly what I had envisioned. One particularly important moment for me was the employee day at the beginning. We first introduced all employees to the building and the opportunities it offers because it was important to demonstrate that we are investing in this location and creating long-term prospects here. The feedback was overwhelmingly positive,

especially from colleagues who had already been involved in textile development before.

We have also received very positive responses from customers and visitors. Everyone who enters the building immediately recognises the potential and opportunities. The Inspiration Hub, the showroom and the machinery area have all turned out exactly as we planned. For me, however, the real work only begins now – after the grand opening. The next step is to integrate additional technologies and machine types, such as double needle bar machines or the weft insertion technology for fashion and other applications. Together with our customers, we want to develop concrete projects and create new products and markets.

I strongly believe in collaborative innovation. My motto has always been: "R&D is 1-2-3." Ideally, you bring three partners to the table – for example the fibre producer, KARL MAYER and the customer, or alternatively the machine manufacturer, the customer and the brand. If such a team works together on strategically important textile developments, real business potential can emerge. That is why I am convinced that the Textile Innovation Center will become far more than just a new building. For me, it is the starting point of a long-term innovation initiative designed to generate sustainable ideas, applications and business opportunities.

2. New applications, staple fibres and textile innovation

At the Textile Innovation Center, you are focusing strongly on new textile applications – from staple fibres to fashion and footwear. Where do you currently see the most exciting development areas for warp knitting technology?

One key topic for us is clearly the processing of staple fibres. We see this as one of the most important strategic development areas for the future. Today, only a limited number of warp knitters process cotton on warp knitting machines because the process is still technologically very demanding.

In many cases, specially prepared, high-quality cotton fibres are required, which makes the process expensive.

Our goal is therefore to make this processing significantly easier and more economical. We need to reduce the technological barriers and further develop the machines so that staple fibres can also be processed efficiently in medium-price market segments. If we succeed, KARL MAYER will create an entirely new technological platform.

Particularly with regard to sustainability and recycling, we see considerable potential here. The ability to process a wide range of fibre types – including recycled materials – will become increasingly important for the textile industry.

Another exciting field is our weft insertion technology. Today, it is used primarily in technical textiles. At the same time, we see significant opportunities to transfer this technology into new application areas such as fashion & apparel, footwear and other functional textile products.

This is exactly where we see a major opportunity: transferring technologies originally developed for technical textiles into entirely new markets and enabling completely new textile solutions. Many of these opportunities have hardly been explored so far.

3. Transformation of the textile industry

The textile industry is currently under enormous pressure to transform – from sustainability and recycling to global competitive pressure. Where do you see the greatest challenges for the industry today?

One of the biggest challenges, in my view, is the enormous global volume of textiles and the question of how we can deal with it more responsibly in the future. Today, textiles are produced, consumed and discarded in huge quantities. As an industry, we urgently need to find ways to return textiles into circular systems – in other words, to take materials back, recycle them and reuse them.

At the same time, we must restore a stronger appreciation for the value of textiles. The vision of KARL MAYER is not “We believe in the value of textiles” by accident. When textiles increasingly become disposable products, quality, innovation and ultimately the entire value chain lose importance. I therefore believe that politics, industry and associations must work together to reduce this fast-fashion and throwaway mentality. Higher-quality textiles that are used longer not only reduce waste, but also create greater value throughout the industry.

The greatest opportunity, in my opinion, lies above all in technology. The key questions are how fibres can be recycled, how recycled materials can be processed efficiently on machinery, and how functioning textile circular systems can be organised logistically. This, for me, is the real transformation process for the textile industry: combining high-quality textile products with new technologies, recycling solutions and a stronger focus on value creation.



TexData Editor-in-Chief Oliver Schmidt in conversation with Karl Josef Mayer, Representative of the Mayer family and Member of the Supervisory Board, during the opening of the Textile Innovation Center. © 2026 TexData International

4. From machinery manufacturer to innovation partner

With the Textile Innovation Center, KARL MAYER is positioning itself even more strongly as a co-creator of new applications and markets. Is the role of the machinery manufacturer changing as a result?

Innovation will not succeed without our customers and without the market participants who are close to consumers. That is why we see ourselves as co-creators, but always together with customers, brands and partners throughout the value chain. This is precisely why KARL MAYER has structured its strategy around Customer Value, Innovation Power and Operational Excellence.

„We want to give young people the opportunity to engage deeply with the textile industry and build practical textile expertise.“

The Textile Innovation Center is only one part of a much broader innovation initiative. In addition, we have established Product Innovation Teams and Production Innovation Teams that work specifically on new materials, manufacturing technologies and additional customer value.

Of course, KARL MAYER has always helped shape developments to some extent. However, we now want to take on this role much more actively and communicate it more clearly. We want to demonstrate that we are prepared to develop new ideas, textile solutions and applications together with partners – and to invest resources and capital into these developments. Because innovation means movement. If we stand still, we will lose our competitiveness in the long term. Many companies in the textile industry are currently looking for ways to move beyond pure price competition and to differentiate themselves again through innovation, quality and added value.

That is why we deliberately see the Textile Innovation Center not just as a platform for warp knitting, but for the textile industry as a whole – from technical textiles and warp preparation to potential collaborations with fashion brands and other industry partners.

5. Knowledge, education and textile expertise

You also speak very clearly about the loss of textile know-how in Europe. What role should education, institutes and young talent play in the Textile Innovation Center in the future?

For me, this is a crucial issue. When industrial structures disappear, the people with textile know-how eventually disappear as well. Yet this expertise is essential for developing new textile products, materials and applications. If knowledge about fibres, textile surfaces, finishing or processing is lost, brands and product developers ultimately lose the foundation for genuine innovation.

„I firmly believe that innovation can only truly be driven forward when people understand and experience technologies, materials and textile processes themselves.“

Today, many companies focus heavily on cost optimisation and production efficiency. But true textile innovation can only emerge where deep technical understanding still exists.

That is why the Textile Innovation Center is also intended to be a place for education, exchange and practical experience. We want to give young people the opportunity to engage deeply with the textile industry and build practical textile expertise. From my own experience, I know how important this practical knowledge is. I firmly believe that innovation can only truly be driven forward when people understand and experience technologies, materials and textile processes themselves.

This is why we want to offer students and young talents targeted opportunities to gain practical experience – through internships, projects and direct collaboration with our teams. Many young people today are not even aware of the opportunities the textile industry offers. This is where we want to create new perspectives.

Research institutes also play an important role. They are a central part of the textile network and help drive new technologies, standards and applications. For this reason, we also see the Textile Innovation Center as a platform for collaboration with institutes and re-

search organisations. Because if Europe wants to maintain its textile innovation strength, it needs not only new machinery and technologies, but above all people with textile expertise, experience and enthusiasm for the industry.

6. Looking ahead

What role should the Textile Innovation Center play in the long term for KARL MAYER – but also for the textile industry as a whole?

In the long term, the Textile Innovation Center is intended to become far more than just a development site for new machinery or textile technologies. We see it as an open platform where different players from across the textile industry can come together – customers, brands, institutes, developers, designers and technology partners.

Our goal is not only to discuss new textile solutions and applications theoretically, but to develop and test them together in practice.

The Textile Innovation Center provides the machinery, the space, the expertise and the willingness to actively engage in such projects. When the right partners come together and we believe in an idea, we want to support these developments actively.

At the same time, it is important to us that the Textile Innovation Center is not focused solely on warp knitting. We are also looking at warp preparation, technical textiles and many other fields.

The intention is clearly to address the textile industry as a whole and to explore how new applications, materials and markets can emerge.

I can also imagine the Textile Innovation Center becoming a venue for workshops, symposiums and industry discussions involving brands, companies, institutes and other market participants. Because the center was created from an industry perspective, it can become a very practical environment for discussing the future of textile applications.

Of course, such an initiative also has to become sustainable economically in the long term. But not every measure or project has to generate immediate profit. There is also a certain degree of idealism involved. For us, the important thing is to create impulses, bring people together and initiate developments that can eventually lead to new textile products, applications and business opportunities.

Mr Mayer, thank you very much for the interesting insights and the interview.



“The future of warp knitting lies in complex textile solutions”

Interview

Lutz Wolf

CEO
KARL MAYER TEXTILMASCHINEN

by Oliver Schmidt

As the new CEO of KARL MAYER, Lutz Wolf discusses increasing competitive pressure from China, the need for faster innovation cycles and why he sees major future opportunities for warp knitting technologies in complex textile applications, integrated processes and collaborative innovation. He also explains the strategic role of the new Textile Innovation Center in developing future textile concepts and market-driven solutions together with brands, customers and technology partners.

1. New market realities and strategic direction

Mr Wolf, KARL MAYER is widely regarded as the global market leader in warp knitting machines. You are now the company's new CEO. Where do you want to lead the company over the next five years?

KARL MAYER has a strong tradition and remains the clear industry leader in warp knitting. At the same time, the market has changed dramatically over the past eight to ten years – both on the customer side and on the competitive side. In particular, we are seeing increasingly strong and aggressive competition emerging from China. As a company, we need to adapt to this new reality.

For me, three points are particularly important. First, we need to further strengthen our market and technology intelligence. We must understand very precisely

where innovation gaps are emerging and what kind of added value our customers will require in the future. Only then can we consistently align our development activities with customer value. The second point is speed. Traditional development cycles in German mechanical engineering are no longer sufficient today. We need to become faster, make clearer decisions and identify much earlier when a project no longer offers the right perspective. The third point remains our clear positioning through quality and economic efficiency. KARL MAYER will never compete on the basis of the lowest price. Our ambition is to enable our customers to achieve profitable and sustainable production over the long term. Competitive total cost of ownership across the entire machine lifecycle is therefore essential.

Over the next five years, we want to further strengthen our position as the industry leader in warp knitting.

At the same time, we also want to look beyond our traditional markets and explore applications in which warp knitting technology can increasingly compete with other fabric formation technologies such as weaving or circular knitting. We see highly attractive growth opportunities in these areas for the future.

2. Competition and technological positioning

Where do you currently feel the greatest competitive pressure – from direct competition between machine builders or from alternative fabric formation technologies such as weaving and circular knitting?

In the traditional warp knitting sector, we are clearly experiencing massive and continuously growing competition from China. Practically all internationally visible and serious competitors now originate from China. And we also have to acknowledge that some of these companies have made considerable technological progress. That is exactly why we are currently investing heavily in strengthening our competitiveness. In the tricot sector alone, we have introduced four new machine innovations in China. With these developments, we want to demonstrate not only to competitors, but above all to our customers, that KARL MAYER continues to set technological benchmarks.

Of course, there is a great deal of copying in the market. That is why it is essential to remain technologically dynamic and to continuously drive innovation forward. With the strategic realignment we are cur-

rently implementing, we believe we are very well positioned for this challenge.

When we look at alternative technologies such as weaving or circular knitting, we do not necessarily see them as a direct threat to our existing business. These markets are significantly larger than the traditional warp knitting market. For us, the more exciting question is where warp knitting technology itself can gain market share in the future. Especially in industrial applications, our machines offer enormous productivity advantages. The challenge is to combine this high performance with new materials or staple fibres such as natural yarns. This is where we currently see highly interesting development opportunities. The greatest potential lies wherever complex textile structures are required. In our view, this is precisely where major opportunities for future textile innovation emerge.

3. Opportunities for warp knitting technologies

Why do you see major future opportunities for warp knitting technologies particularly in these complex applications and integrated processes?

The more complex textile applications become, the more effectively we can leverage the technological advantages of warp knitting. This is exactly where we see major future opportunities for our technologies. With modern multi-bar and jacquard systems and advanced lapping technique functions, structures and designs can now be integrated directly within a single process.

Many aspects that would require several processing steps with other technologies can be realised in one single operation. This opens up completely new possibilities – both functionally and aesthetically.

We see enormous potential particularly in the field of design fabrics. If certain textile effects and structures can be transferred to new applications, entirely new opportunities arise for brands and product developers. This creates new possibilities for designs, material properties and textile functionalities. In addition, our machines offer extremely high productivity and performance especially in industrial applications. The challenge is to combine this technological strength with new materials or staple fibres such as natural yarns. This is precisely where we currently see highly promising development opportunities.

For us, the future of warp knitting therefore lies not only in higher productivity, but increasingly in the ability to economically realise more complex and innovative textile solutions.

4. Speed, Innovation and New Development Approaches

You speak about significantly increasing implementation speed in development processes. How is this changing the innovation culture at KARL MAYER?

Today, markets are moving much faster than they did just a few years ago. As a result, we also need to accelerate our development and decision-making processes

consistently. Traditional development cycles, which were common in German mechanical engineering for many years, are no longer sufficient in their current form.

For us, this means working in a more focused and more disciplined way. Projects cannot constantly be questioned again or restarted from scratch. Of course, clear decision points are necessary within development processes, but at the same time we must recognise much earlier which ideas have real potential – and which do not.



TexData Editor-in-Chief Oliver Schmidt in conversation with Lutz Wolf, CEO of KARL MAYER, during the opening of the Textile Innovation Center. © 2026 TexData International

One important principle for us is “fail early”. If it becomes clear at an early stage that a project no longer offers the right perspective, we need the courage to stop it again.

Only in this way can we concentrate our development resources on the topics that are truly relevant for our customers and for future growth.

In parallel, this is not only about speed. The key is to consistently align innovations with concrete customer benefits. Our task is to develop technological solutions that enable our customers to remain competitive and profitable over the long term.

Especially in a market environment characterised by rapidly growing competition, this combination of innovation speed, technological differentiation and clear customer orientation is becoming increasingly important.

„As long as people continue to value high-quality, innovative and functional textiles, we also see strong long-term potential for our technologies.“

5. The Textile Innovation Center as a platform

What specific role does the Textile Innovation Center play in developing new textile applications and innovations together with customers, brands and technology partners?

For us, the Textile Innovation Center plays a central strategic role. It is about far more than simply creating a new building or development centre. We deliberately want to create a space where different perspectives come together and where new textile solutions can be developed collaboratively.

At the core is the conviction that textiles will continue to hold significant value in the future – technologically, functionally and emotionally. As long as people continue to value high-quality, innovative and functional textiles, we also see strong long-term potential for our technologies. This is exactly why we bring together different areas of expertise within our Textile Innovation Center.

On the one hand, there are brands and the consumer market with their requirements, trends and design ideas. On the other hand, we have our textile technologists, who understand the possibilities offered by modern textile structures. And the third component consists of our mechanical engineering experts, who are able to translate these ideas into technological solutions.

The goal is a truly collaborative development process. Together, we want to develop new textile concepts, integrate functions and create textiles and applications that have not previously existed in this form. This is not only about individual machines, but about the entire value chain – from the initial idea and textile implementation through to later commercialisation.

The Textile Innovation Center is therefore intended to be a place for collaboration, inspiration and exchange. This is exactly where we see major potential for future textile innovations.

6. Investment restraint and market cycles

Many companies are currently reporting noticeable investment restraint in the market. How do you view the current situation in the textile machinery sector – and which factors are currently influencing your customers' investment decisions most strongly?

„Experience shows that industries and markets eventually adapt even to difficult geopolitical situations.“

From my perspective, the textile machinery market has already been going through a difficult phase for several years. Essentially, we have been experiencing prolonged market weakness since ITMA 2019 in Barcelona. There was a brief upswing directly after the pandemic in 2021, but afterwards the market stabilised again at a relatively low level.

In addition, the market environment has changed significantly. Competition from China has become much stronger and the fast fashion segment has expanded massively. Although this is not our strategic target segment, it still strongly influences overall market dynamics.

In recent months, however, we had the impression that investment willingness was gradually starting to recover. Discussions about replacement investments and new technologies became much more intensive. Many customers understand that they need to further develop and differentiate technologically.

Then came the strong escalation surrounding the Iran conflict and the associated increase in oil prices. Since our customers depend heavily on synthetic yarns, this has a direct impact on their business. Higher raw material prices initially mean significantly higher financing requirements for yarn purchases. As a result, many companies postpone investments in new machinery. In addition, there is the general uncertainty.

As long as energy prices and geopolitical conditions remain highly volatile, many

companies lack the predictability required for larger investments. From a business perspective, this is understandable.

Nevertheless, I remain fundamentally optimistic. Experience shows that industries and markets eventually adapt even to difficult geopolitical situations. The key factor is that planning reliability gradually returns. Once this happens, many of the investment projects currently on hold will move forward again. We see good conditions for this overall, not least because we are currently active in the market with several new machine developments and a very dynamic innovation pipeline. The market response has been very positive.

7. Differentiation, technology and future markets

Which strategic responses is KARL MAYER deriving from this market environment – technological differentiation, new applications for warp knitted fabrics or additional services along the value chain?

From our perspective, we need to address all of these areas simultaneously. The market has become more complex and pure machine performance alone is no longer sufficient for sustainable differentiation.

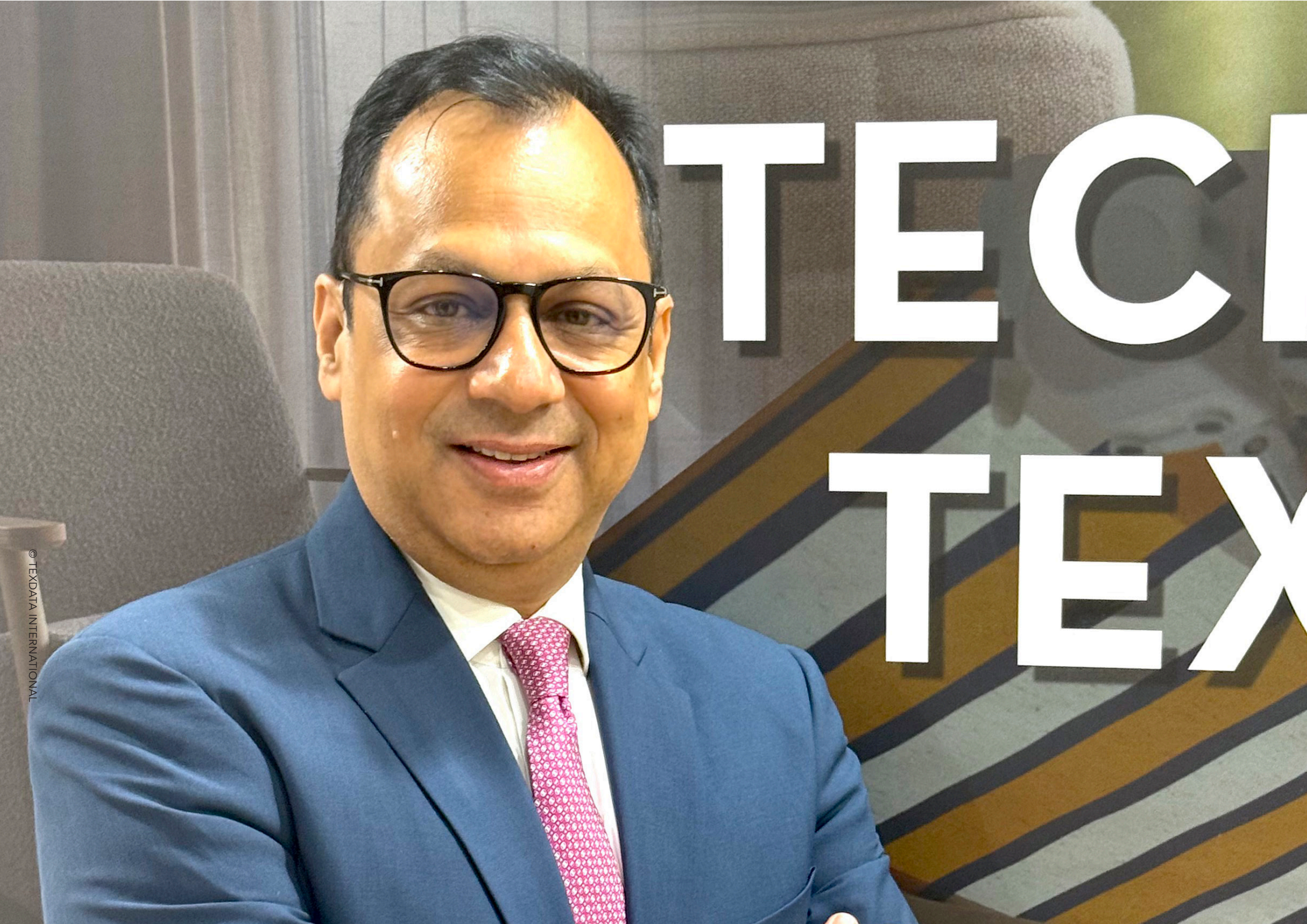
One key focus remains technological differentiation. Today, our customers are looking for ways to distinguish themselves more clearly from competitors – whether through productivity, quality, new textile functions or innovative designs. This is exactly where we focus our development activities.

At the same time, we see significant potential in new applications for warp knitting technologies. Particularly interesting are areas where complex textile structures, high functionality or integrated processes are required. This is where we can leverage our technological strengths most effectively and also enter applications that have traditionally been dominated by other fabric formation technologies.

In addition, collaboration along the value chain is becoming increasingly important. Innovation today no longer emerges in isolation within mechanical engineering alone. That is why we deliberately focus on close cooperation with brands, textile developers, technology partners and customers. The Textile Innovation Center was created precisely for this purpose.

Our goal is to further enhance the value of textiles. As long as the market continues to demand innovative, functional and high-quality textiles, we see strong long-term opportunities for our technologies. Ultimately, this is not only about individual machines, but about new textile concepts and the ability to develop innovation together with the market.

Mr Wolf, thank you very much for the interesting insights and the interview.



TECH

TEX

“ We have multiple companies and divisions operating in textiles, and we decided to integrate them into one platform. ”

Interview

Kapil Agrawal

**Business Head Textiles, Acrylic Fibres & Overseas Spinning
ADITYA BIRLA GROUP**

by Oliver Schmidt

At Techtex 2026, the Aditya Birla Group presented its textile activities as a unified platform for the first time. In this interview, Kapil Agrawal, Business Head Textiles, Acrylic Fibres & Overseas Spinning, explains how the group is expanding from traditional textile products towards integrated technical textile solutions, circularity and higher-value applications – and outlines the role India could play in scaling fibre-to-fibre recycling in the years ahead.

Mr Agrawal, the Aditya Birla Group is presenting its full technical textiles portfolio at Techtextil for the first time. This reflects your transformation from a traditional textile player into a solutions-driven, sustainability-led partner for high-performance and safety-critical applications. How do you define this transformation in concrete terms – and what is your expected timeline?

First of all, let me briefly introduce the Aditya Birla Group. We operate in 41 countries, with a turnover of about USD 67 billion and a market capitalisation of around USD 112 billion. We are active in more than 20 sectors, from cement and paints to fashion, telecom and aluminum, with around 227,500 employees across locations.

Textiles have been a foundation of our group since around 1947. Today, our textile business represents around USD 5 billion. The idea of bringing our textile activities together emerged about two years ago. We have multiple companies and divisions operating in textiles, and we decided to integrate them into one platform. What you see today is the result of that process.

In addition to our strength in commodities, our focus is also moving

towards growing in specialty and technical textiles. Beyond the product itself, customers look for confidence and trust in a partner, and this is something the Aditya Birla Group stands for. We work closely with our value chain partners to develop solutions together. A second key element is research and development.



TexData Editor-in-Chief Oliver Schmidt in conversation with Kapil Agrawal, Business Head Textiles, Acrylic Fibres & Overseas Spinning ADITYA BIRLA GROUP, at Techtextil 2026 in Frankfurt. © 2026 TexData International

We have three world-class facilities in India and invest significantly in new products. For example, we are active in circularity, with fibres developed in Thailand on an acrylic basis, known as ReGen, and further developments in India. The third element is our financial strength, which allows us to invest and scale our business.

Are there already products on the booth that clearly reflect this shift from a textile company to an integrated group?

We have always been active in textiles through different entities. What we are presenting now is a one-stop platform for our customers. It covers applications in protective apparel, automotive applications, tyre cord, home textiles and other segments. When you walk through the booth, you see solutions across several technical textile areas where we are already present.

„In my view, the main shift is in integrated solutions.“

Within technical textiles, where do you currently see the biggest shifts towards higher value creation – at the material level, in applications, or in integrated solutions?

In my view, the main shift is in integrated solutions. It is about understanding the challenges of the industry and the end users, and then working backwards to provide solutions. That is where the major value addition happens.

Can you share a concrete example where you have already moved into a higher value segment?

We have recently developed FR products, which represent a move up in the value chain. We are also a major spinning company in Germany, Europe along with working with leading fibre suppliers globally.

What do you see as your key competitive advantages in these higher value segments?

The first is our strength in research and development and our ability to innovate. The second is our presence across the entire value chain, from fibre to spinning and weaving to processing and finishing.

This allows us to offer integrated solutions. The third is our investment in people, through training and development. And finally, there is the trust factor. The Aditya Birla Group is known for consistency and quality, and this combination gives us an advantage.

„ The Aditya Birla Group is known for consistency and quality, and this combination gives us an advantage“

You mentioned integrated textile platforms. What does this mean in concrete terms in your case – and why are such models becoming increasingly important?

For us, an integrated textile platform means offering the entire solution at one place. We can cover fibre, yarn, fabric and apparel. Customers can work with us to develop solutions for their specific end-use requirements across the full value chain.

Is this an area where you see particular strengths and further growth potential for your group?

Yes, definitely. We see this as a clear strength and a growth area. Instead of working with each step of the value chain separately, we want to work directly with end users and provide complete solutions. That is where we see strong potential.

Sustainability remains one of the key topics in the textile industry, particularly in relation to CO₂ reduction and regulatory requirements. How do you position your company in this context, and what concrete contribution can you make at scale?

All our companies have defined targets for carbon emissions, including net zero. One of our factories in Indonesia already operates on 100% renewable energy. We have also introduced recycled fibres, including ReGen in acrylic, and established a mechanical recycling plant in India for post-consumer waste.

Our focus is on promoting circularity alongside carbon reduction. We are evaluating further investments in recycling facilities, particularly in Asia, as we see strong potential in this area.

What role can your group, and India as a whole, play in scaling fibre-to-fibre recycling solutions?

Traceability is one important aspect. We already use platforms to trace our fibres from pulp to garment. At the same time, we are working on recycling post-consumer waste and developing the necessary ecosystem for collection. This is currently a major gap. Without efficient collection systems, large-scale recycling is difficult.

Do you see an opportunity to support the European Union in achieving its recycling targets?

We are currently evaluating investments in recycling facilities in Asia that would process post-consumer waste. At the same time, we are developing systems for collection and logistics.

Are you also considering investments in Europe?

It is too early to comment. Large-scale recycling of post-consumer waste is still a challenge, and there are very few industrial-scale examples.

Looking ahead, how do you see your company's role in the global technical textiles industry evolving over the next three to five years?

The global technical textiles market is currently around USD 200 billion. We want to focus on key areas such as protective apparel, automotive textiles, home textiles with FR applications, as well as applications for Indutech and Geotech. These are the segments where we see strong growth potential.

Mr Agrawal, thank you very much for the interesting insights and the interview.

FUTUREWEAVING: CONCEPTS FOR INDIVIDUAL WEAVING MACHINE OPTIMISATION

Intelligent weaving machine enclosures as the basis for energy-efficient, safe and digitalised weaving processes

AUTHORS: VARQHA BAGWAN,
UNIV.-PROF. PROF. H. C. (MGU) DR.-ING. THOMAS GRIES

WEAVING TODAY: GREAT POTENTIAL, LITTLE TRANSPARENCY

Entering a modern weaving mill is an impressive experience. Air-jet weaving machines reach weft insertion rates of up to 1,100 picks per minute, making them among the most productive weaving systems available [1]. Yet behind this productivity lies a structural problem. The machine does not know what is happening inside itself.

Current monitoring systems capture primarily external parameters such as production speed, machine stops and weft insertion success. What happens inside the machine, namely pressure profiles at main and relay nozzles, airflow patterns in the shed or thermal loads from mechanical friction, remains largely invisible. This is precisely where the FutureWeaving research project of ITA at RWTH Aachen University comes in, with an integrated approach combining machine-level sensor technology, Digital Twin modelling and localised climate control.

COMPRESSED AIR, HEAT AND NOISE: THE HIDDEN COSTS OF AIR-JET WEAVING

Air-jet weaving machines are among the most energy-intensive technologies the textile industry has to offer. Compressed air is by far the largest energy consumer of an air-jet loom, with the relay nozzles alone accounting for up to 80 percent of the total compressed air used in weft insertion [2, 3]. Every optimisation of the pneumatic processes has a direct impact on operating costs.

Alongside compressed air consumption, heat and noise represent two further burdens that are frequently underestimated in day-to-day operations. The electrical energy generated in the drive motors and pneumatic systems is almost entirely converted into heat and released into the production space [4]. Conventional central hall air conditioning is fundamentally inefficient in this context. Decentralising the climate control units shortens the transport distances of conditioned air, enabling substantial energy savings [4].

Furthermore, local hotspots in the machine area can only be compensated with a slow response time by central systems, and the entire hall must be driven to a higher humidity level just to safeguard the critical points at the machines [4].

Noise is the third problem and the most immediately felt by the workforce. Studies show that 47.3 percent of textile workers in weaving mills suffer from respiratory diseases and 31.8 percent from hearing damage. Fibre fly and persistent noise levels shape everyday life in many weaving rooms [5].

THE „DIGITAL SKIN“: SEEING WHAT WAS PREVIOUSLY INVISIBLE

FutureWeaving pursues a multi-stage solution approach. The starting point is the instrumentation of the machine itself, specifically the Dornier A1 air-jet weaving machine at ITA, with a dense network of sensors referred to as the „Digital Skin“.

The concept of the digital skin applies the principle of distributed sensor technology to the machine surface and enclosure. Temperature and humidity sensors capture the microclimate directly in the shed and in the casing. MEMS microphones and accelerometers measure sound and vibration in real time.



Fig. 1: Fully encapsulated Dornier A1 air-jet loom at ITA, RWTH Aachen (Source & Copyright: ITA)

Research into the energy efficiency of air-jet weaving has shown that the aerodynamic behaviour of relay nozzles cannot be fully captured without detailed measurement technology [1]. FutureWeaving therefore deploys high-frequency pressure sensors at the main and relay nozzles to record the pneumatics of weft insertion with previously unattainable resolution.

These data are merged with signals from the machine controller (PLC), production data and energy measurements. The result is a new data foundation that describes the internal machine state in a depth not previously possible.

THE DIGITAL TWIN: A SIMULATION THAT THINKS AHEAD

On this data foundation, a Digital Twin of the weaving machine is developed, a dynamic, data-driven simulation model that is continuously updated with real-time data. A Digital Twin is far more than a three-dimensional CAD model. It combines physical simulation models such as CFD-based flow and pressure models in the shed as well as analytical yarn acceleration and drag models with learning algorithms including LSTM networks, temporal CNNs and hybrid physics-AI models.

In practice, this means the machine operator should in future have access to a tool that not only records process parameters but interprets them in a predictive manner. If pressure profiles at the relay nozzles change or valves work inefficiently, the model should detect the deviation before the yarn break occurs.

Optimisation recommendations for nozzle pressure, valve timing and air distribution could then be derived directly. The goal is a production management approach that identifies problems before they arise [6].

MACHINE-INTEGRATED CLIMATE CONTROL: EFFICIENCY THROUGH ENCAPSULATION

A second development strand of the project addresses the climate control problem directly. The solution lies in the full encapsulation of the weaving machine combined with an integrated, decentralised HVAC unit. The principle is physically compelling. Instead of conditioning the entire production hall, only the critical air volume around the yarn path is conditioned. This drastically reduces pressure losses in the duct network and enables precise real-time control [4]. Using the so-called Dry-Fog process, in which water is atomised into droplets of less than ten micrometres in diameter, adiabatic cooling is achieved directly at the heat source, without wetting machine components or causing corrosion.

The energy savings potential is considerable. Calculations based on the Dornier A1 show savings of 70 to over 80 percent compared to central hall air conditioning, a range confirmed by manufacturer data for commercially available systems [7]. A further practical advantage of the decentralised concept lies in its flexibility. Since each weaving machine is climatized individually, different fibres can be processed simultaneously in a single weaving mill without the specific climate conditions of one fibre type interfering with those of another. Cotton, for example, requires a

relative humidity of 70 to 85 percent, while synthetic fibres can be processed at 60 to 70 percent [7]. A central system cannot simultaneously meet these different requirements within the same hall. As an additional benefit, the enclosure attenuates noise and fibre fly, directly improving working conditions and making the weaving mill a more attractive workplace.

OUTLOOK: THE SELF-OPTIMISING WEAVING MACHINE

FutureWeaving looks further ahead. The medium-term horizon is a weaving machine that optimises itself in a closed control loop. Sensor data flow into the Digital Twin, which generates recommendations that are automatically translated into machine parameters via PLC coupling, from pressures and timings through to climate parameters. In parallel, noise attenuation and controlled microclimate within the enclosure structurally improve working conditions.

In the longer term, the technology could give rise to a new production architecture, the textile weaving microfactory. A fully encapsulated, sensor-equipped and digitally networked weaving machine that monitors and optimises itself would no longer necessarily be tied to the infrastructure of a large production hall. Such modules could be operated in a decentralised, demand-oriented manner with minimal staffing, a model that could open up new perspectives particularly for high-wage manufacturing locations in Europe.

The project is aimed at weaving mills that are looking not only for efficiency gains but also

for planning reliability and future viability. Those who understand what is happening inside their machines can optimise them in a targeted way, and that is the real competitive advantage.

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PROCESSING OF BIO-BASED POLYMERS IN TEXTILE TECHNOLOGY

- CHALLENGES AND APPROACHES AT THE INSTITUTE OF TEXTILE TECHNOLOGY OF RWTH AACHEN UNIVERSITY

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The transformation toward sustainable materials in the textile industry is gaining increasing importance due to environmental and regulatory pressures. While synthetic fibers derived from fossil resources currently dominate global fiber production, bio-based polymers offer a renewable alternative with the potential to reduce environmental impact. However, these materials often exhibit processing limitations, such as narrow thermal stability ranges, reduced mechanical strength, or incompatibility with existing production systems.

The Institut für Textiltechnik of RWTH Aachen University (ITA) conducts systematic research on the processing and application of bio-based polymers in textile production. The aim is to integrate these materials into established process chains—from polymer processing through yarn production to textile surface manufacturing—while meeting the specific performance requirements of various application sectors.

MELT SPINNING AND YARN PROCESSING OF BIO-BASED POLYMERS

One core research area is melt spinning of filament yarns from bio-based thermoplastics. Pilot-scale spinning equipment at ITA enables the processing of commercially available polymers such as polylactic acid (PLA), bio-based polyamides (e.g., PA 4.10, 10.10, 12), and partially bio-based PET under near-industrial conditions. Different polymers present distinct challenges: PLA, for example, exhibits significant shrinkage behavior, which can lead to problems

during bobbin formation. Bio-based polyamides typically offer improved thermal resistance but vary in terms of viscosity and moisture absorption behavior, influencing spinnability and downstream processing. At ITA, real-time process monitoring—including melt pressure, temperature control, and yarn tension—is used to ensure process stability and product consistency. Post-spinning steps such as false-twist or air texturing are used to modify yarn bulk and elasticity for specific end uses.



Fig. 1: A spool of filament yarn spun at the ITA from bio-based polyamide (Source & Copyright ©: ITA)

TEXTILE SURFACE FORMATION AND STRUCTURE DEVELOPMENT

Bio-based filament yarns are further processed into textile structures using industrial-scale machinery. The ITA covers a broad range of textile manufacturing technologies, including: Weaving for interior and technical textiles, knitting for apparel and sportswear, braiding for automotive and structural components. Each application sector imposes specific mechanical and functional demands. For example, stretchability and moisture management are critical in sportswear, while dimensional stability and abrasion resistance are key in upholstery textiles. Yarn behavior during processing must therefore be matched with the appropriate textile technology and process settings.

MATERIAL TESTING AND FINISHING

To evaluate the performance of bio-based textile structures, the ITA employs a wide range of standardized and application-specific testing methods. In addition to mechanical properties such as tear and abrasion resistance, tensile strength and elongation, also e.g., air permeability and flammability are evaluated depending on the target application. In addition, the dyeability and finishability of bio-based fibers are a major focus.

Initial studies show that for example for bio-based polyamides, dye uptake behavior can differ significantly. This requires the development of adjusted dyeing protocols and finishing techniques tailored to the specific polymer system.

SYSTEM INTEGRATION AND SUSTAINABILITY ASSESSMENT

In addition to technical feasibility, scalability and sustainability assessment are also central components of the research work. Bio-based materials must not only be functional, but also economically and ecologically viable for integration into existing manufacturing systems. The ITA works with comparative product life cycle assessments to evaluate the carbon footprint, primary energy consumption and material efficiency of bio-based textiles in comparison to fossil-based reference products. This shows that complete replacement is only feasible if processes, material use and logistics are optimised at the same time.

CONCLUSION AND OUTLOOK

Processing bio-based polymers in textile applications is technically feasible but requires a material-specific and process-integrated approach. Experience at the ITA has shown that especially bio-based polyamides are promising

candidates for various textile technologies. The ability to adapt processing conditions and monitor quality in real time is crucial for achieving consistent product performance.

Future research will focus on improving long-term durability, functional finishing, and the integration of bio-based yarns into advanced textile systems, including functional clothing, technical textiles or hybrid composite materials. Standardized environmental assessments and enhanced material availability will further support the transition toward sustainable fiber solutions.

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SHAPE MEMORY POLYMER FIBRES FOR TEXTILE SHADING SYSTEMS

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INTRODUCTION

The development of textiles made from shape memory polymer fibres marks a revolutionary step in bridging science fiction and real-world applications. As part of the SmartShade project, an adaptive sun shading system is being developed that utilises the unique capabilities of these fibres. In response to solar radiation and heat, the fibres can change shape, providing a basis for more sustainable and efficient shading systems.

SHAPE MEMORY POLYMER FIBRES FOR TEXTILE TECHNOLOGY

Shape memory polymers, also known as SMPs, are a game-changer for textile technology. Unlike shape memory alloys, which are based on phase transitions from martensite to austenite, the shape memory effect in polymers is based on their molecular structure.

This structure consists of two key components: netpoints, which provide the polymer with its permanent shape, and switches, which respond to various stimuli.

This results in a wide range of activation methods. While heat is the most common trigger, electromagnetic fields, as well as moisture or light, can also induce a shape change.

The shape memory effect in SMPs is achieved through a two-step process: programming and recovery. During the programming phase, the SMP assumes a temporary shape under the influence of a specific stimulus, such as heat or an electric current. This shape is "stored" in the memory of the polymer until it is reactivated by renewed exposure to the stimulus. The polymer then relaxes, "remembers" its original shape and returns to it.

The further development of these materials opens up a wide range of application possibilities, as demonstrated by the SmartShade project. In this research project, adaptive sun shading textiles are produced from synthetic SMP fibres. These textiles respond intelligently to solar radiation, enabling automatic adjustment of shading levels. The aim is to create a sustainable and efficient alternative to conventional shading systems.

By expanding the spectrum of triggering stimuli and optimising polymer structures, SMPs enable practical innovations for various engineering disciplines.

MELT SPINNING OF SHAPE MEMORY POLYMER FIBRES FOR INTELLIGENT SHADING SYSTEMS

Among the various manufacturing processes for shape memory polymer fibres, melt spinning is an economically viable option. However, this process, carried out at the Institut für Textiltechnik of RWTH Aachen University, is complex and requires individual adaptation to the materials used and their respective application. Various manufacturing parameters significantly influence properties such as tensile strength, extensibility, and specific shape memory characteristics, in particular shape fixity and shape recovery.

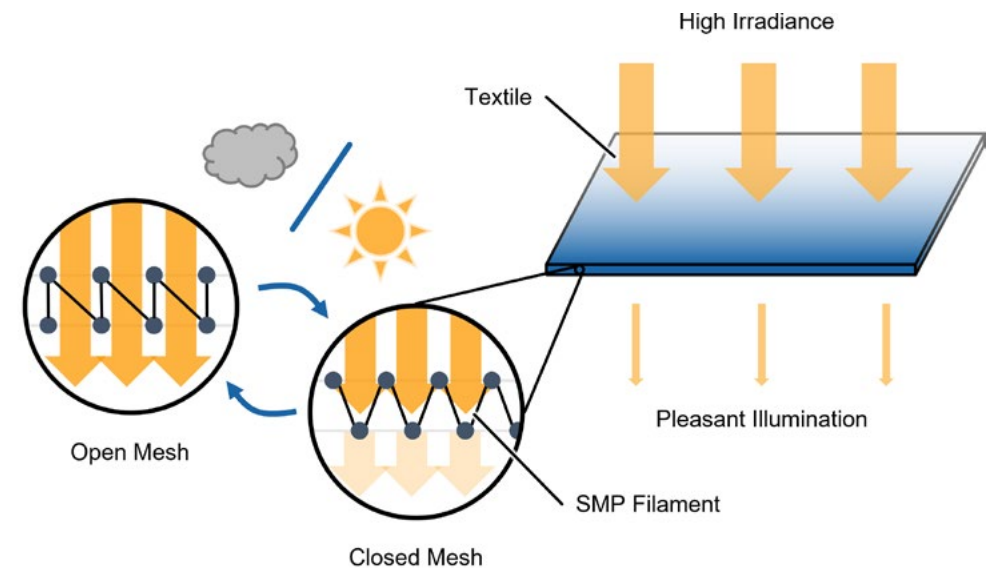


Figure 1: Approach of the Smart Shade project (Source & copyright: ITA)

Above all, the drawing and relaxation stages in the melt-spinning process play a key role in determining the final fibre properties.

In addition to the complexity of the melt spinning process, another crucial step is the functionalisation of the fibres with surface-modified cellulose nanocrystals, or CNCs. In collaboration with the Canadian company Applied Quantum Materials Inc., the aim is to improve both the shape memory and mechanical properties while integrating new functions into the intelligent shading system.

The CNCs are incorporated into the shape-memory polymer matrix and reinforce the polymer's mechanical strength, resulting in unique anisotropic effects. A specific surface modification of the CNCs increases their compatibility with the shape memory polymer and provides additional benefits, such as UV protection, water repellency, antibacterial properties, and conductivity. This functionalisation not only optimises the mechanical properties of the fibres but is also crucial for the performance and durability of the material as a shading system.

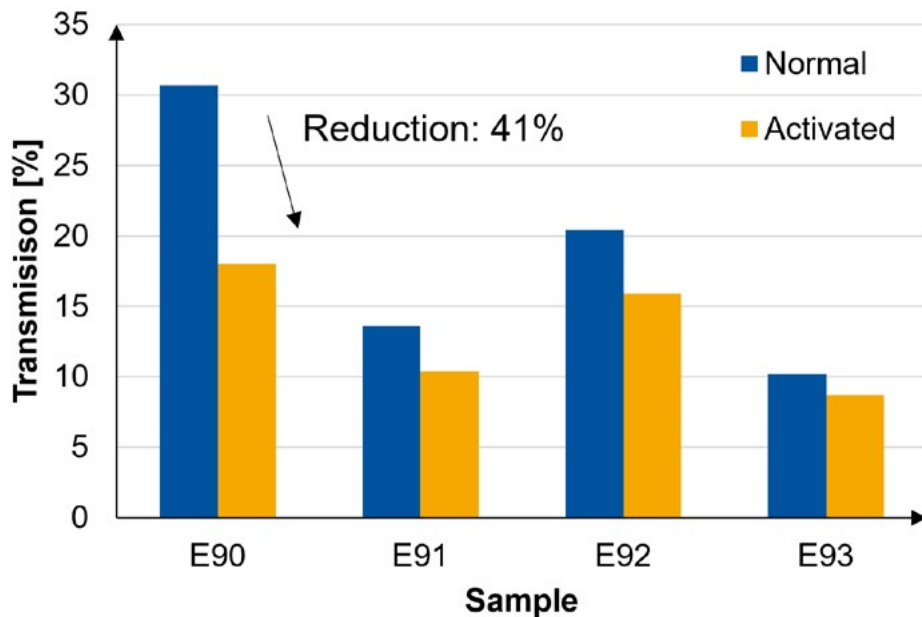


Figure 2: Change in transmission of the shading system after activation of the shape memory effect (Source & copyright: ITA)

PRODUCTION OF ADAPTIVE SHADING SYSTEMS BY WARP-KNITTING

After the successful production of the functionalised shape memory polymer fibres, the decisive warp-knitting stage is carried out by TEC-KNIT CreativCenter für technische Textilien GmbH. This step involves a specialised knitting process in which the individual fibres are processed into a textile surface in a function-oriented manner. The result is an adaptive sun-shading textile capable of dynamically adjusting its shading properties in response to varying levels of solar radiation.

Results show a reduction in transmission of up to 41% after activation of the shape memory effect, depending on the textile structure. This innovative textile forms the core of the SmartShade system and offers a sustainable, efficient alternative to traditional shading methods. This development impressively demonstrates the technology's transformative potential.

CONCLUSION

The development of the adaptive sun shading textile within the SmartShade project represents a fascinating synthesis of advanced materials science and applied engineering.

It leverages the specific properties of shape-memory polymer fibres, refined through the integration of cellulose nanocrystals, and combines them with advanced knitting technologies. The SmartShade project not only represents technological progress but also marks a breakthrough in sustainable innovation by meeting both economic and ecological requirements.

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WARP-KNITTED PCL NETS: DEGRADABLE TEXTILE STRUCTURES FOR REGENERATIVE MEDICINE

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ORGAN SHORTAGE MEETS TEXTILE INNOVATION

Every year, hundreds of patients in Germany await a liver transplant with no prospect of receiving a donor organ in time. In 2025, 1517 new registrations on the transplant waiting list were faced with only 870 donors [1].

This shortage is the result of a fundamental biological bottleneck: donor organs are scarce, and a sufficient compatibility between donor and recipient must be ensured. This is exactly the gap tissue engineering aims to fill. The approach involves culturing functional cells outside the body on a supporting structure (scaffold), which is then implanted to augment or replace damaged tissue. The scaffold structure in particular is the subject of ongoing research, and textile manufacturing methods are playing an increasingly important role in this field.

THE LIVER: DEMANDING IN EVERY RESPECT

The liver is not only the largest internal organ in the human body, but also one of the

most metabolically active. It metabolizes nutrients, filters harmful substances, and produces vital proteins. Alcohol, obesity, or viral infections can permanently impair these functions, potentially leading in end-stage disease to liver cirrhosis or liver failure. In the short term, liver dialysis can bridge the dysfunction; in the long term, transplantation is often the only option.

Correspondingly high demands are placed on any tissue engineering scaffold intended to perform in this environment. The mechanical properties of the scaffold must closely match those of native liver tissue. Under tensile loading, the liver exhibits a failure stress of approximately 40 kPa and a failure strain of around 35% [2].

At the same time, the scaffold must be biocompatible and degradable over a defined period. Ideally, the degradation process is paced to allow natural healing, without releasing toxic by-products.

3D STRUCTURE MADE OF POLY-ε- CAPROLACTONE – BIOCOMPATIBLE, DEGRADABLE, VOLUMETRIC

For the present study, poly-ε-caprolactone (PCL) was selected as the base material. This is a synthetic, biodegradable polymer with a decades-long track record in medical technology. PCL degrades hydrolytically over a period of up to two years, producing mildly acidic, well-tolerated by-products. For the production of the warp-knitted fabrics, PCL multifilament yarn with a linear density of 55 dtex and 8 individual filaments from EMS-Griltech is used.

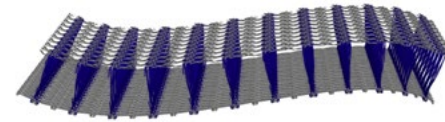


Figure 1: Warp-knitted spacer fabric consisting of two cover layers (gray) and a pile-yarn-system (blue) © ITA/RWTH Aachen

To realise a three-dimensional scaffold structure, the developed PCL nets are used as the cover layers of a spacer fabric. Spacer fabrics consist of two textile cover layers connected by a pile yarn system. The volume spanned between the cover layers can be filled with hydrogels, providing the cells with a suitable growth environment.

FROM STITCH TO FUNCTION: COMPARING WARP-KNITTED STRUCTURES THE SYSTEMATICS OF THE 12 NET VARIANTS

In warp knitting, two guide bars and the basic pattern element „stitch“ already allow a wide variety of structures to be realised.

This potential was used for this study. Of the defined parameter space (two bars, stitches only), net variants were developed that differ in their structural architecture. The underlying structure alternates tricot segments with the diagonally running segments of an atlas. For production and analysis, 12 nets were selected.

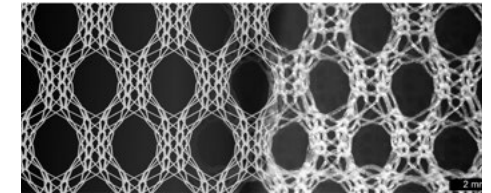


Figure 2: Stitch structure of a warp-knitted PCL-multifilament net. Left simulation, right light-microscopy © ITA/RWTH Aachen

The differences between the variants directly affect porosity and pore geometry, and thus the biologically relevant capacity for cell colonisation and further processing. For instance, fabrics with one stitch in the tricot segment exhibit significantly smaller pore areas than fabrics with more stitches in the tricot segment. With one stitch in the tricot segment, pore areas of approximately 1 mm² were achieved, while seven stitches in the tricot segment yielded pore areas of approximately 11 mm². This high degree of variability has direct consequences both for further biological processing (e.g. in vitro) and for the nutrient supply of cultured cells. The varying distances between two pores, ranging from 0.3 mm to 11 mm, also influence the suitability of the fabric as a scaffold in cell culture.

| Designparameter | Description | Values |
|--|---|--|
| Number of stitches in the tricot segment | The tricot segments form the lateral boundaries of a pore in the mesh. A warp yarn alternately forms the right and left lateral boundary of a pore, which is why only odd numbers of stitches can occur. | 1; 3; 5; 7 |
| Number of stitches in the atlas segment | The atlas segments define the vertical distance between two pores. The warp yarns run diagonally through the fabric. There are no technical design restrictions regarding the number of stitches, however the machine's maximum bar displacement must be taken into account. | 1; 2; 3; 4 |
| Underlap length in the atlas segment | The underlap length and the number of stitches in the atlas segment determine the horizontal distance between two pores. A longer underlap length causes the warp yarns to be inserted more flatly into the fabric. Here, too, the machine's maximum bar displacement sets the limit. | 1; 2 |
| Threading | The threading is determined by the design parameters "Number of stitches in the atlas segment" and "Underlap length in the atlas segment." A special case was considered in which two threadings can be used with the same design parameters. The threading also serves as a measure of the number of warp threads per unit of width. | 1 in 1 out ; 3 in 1 out ; 7 in 1 out ; 11 in 1 out ; 15 in 1 out |

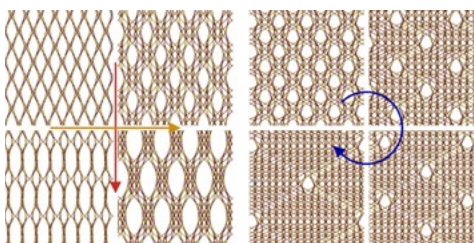


Figure 3: 2-bar net variations; increasing warp-yarns (yellow), increasing tricot segments (red), increasing atlas segments (blue) © ITA/RWTH Aachen

MECHANICAL PROPERTIES: WHAT THE STRUCTURE DELIVERS

For in-vivo application, mechanics are just as critical as biology. The implanted scaffold must be able to withstand the physiological forces acting on liver tissue without permanently failing or mechanically stressing the cells.

The twelve net variants were mechanically characterised by uniaxial tensile testing in reference to DIN EN ISO 13934-1, in

both the longitudinal and transverse directions. In the longitudinal direction, failure line loads of 1.2 N/mm to 2.7 N/mm were achieved; in the transverse direction, values ranged from 0.3 N/mm to 2.3 N/mm. In the transverse direction, fabrics with an underlap length of 2 in the atlas segment showed significantly higher failure line loads than those with an underlap length of 1. This effect was not significant in the longitudinal direction. Furthermore, the failure line load in the transverse direction decreases with increasing pore size. When embedded in a collagen gel, well established in cell culture, with a layer thickness of 1 mm, failure stresses of up to 2,700 kPa can be achieved by the fabric.

TEXTILE TECHNOLOGY AS A KEY TECHNOLOGY IN MEDICINE

This study demonstrates that knitted fabrics made from degradable materials can make an important contribution to addressing medical challenges. The extraordinary de-

sign freedom offered by the warp knitting technology enables a targeted response to both biological and mechanical requirements.

PCL multifilament yarns can be processed with precision on industrial machines. The warp-knitted nets can be embedded as a reinforcing component in hydrogels (e.g. gelatine or collagen), which in turn provide the biological growth environment. This interplay between hydrogel and textile support structure addresses a central challenge in tissue engineering: cell compatibility and mechanical load-bearing capacity are not mutually exclusive — they are complementary.

Subsequent studies will investigate the combination of the nets with gelatine gel as well as their degradation behaviour. The nets will also be examined as cover layers of spacer fabrics, with the aim of constructing three-dimensional scaffolds for tissue engineering.

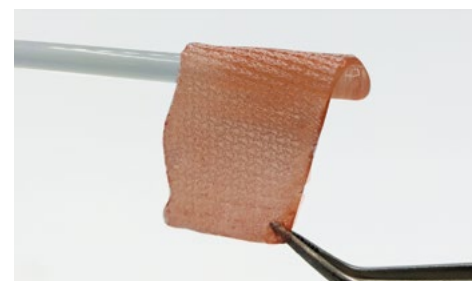


Figure 4: Warp-knitted net with hydrogel (thickness ca. 1 mm) as cell culture matrix © ITA/RWTH Aachen

FROM RESEARCH TO APPLICATION

The path from a laboratory structure to a clinically deployable implant is still long. Yet the foundations have been laid: a reproducible manufacturing process, an established and scalable material, and a robust mechanical characterisation profile. For the textile industry, this carries a clear message: medical textiles are not a niche market of the future, but a growing field of application in the present. Those who invest today in expertise in biocompatible, degradable fibre structures will position themselves at one of the most exciting intersections of material science, medical engineering, and textile manufacturing.

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