

Technical **TEXTILES** international

Summer 2023
Volume 32, Number 2

Informing the industry worldwide



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The latest innovations in machinery for weaving, knitting, finishing and the production of nonwovens previewed in full



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In the Editor's opinion

The machinery and equipment show *ITMA*, to be held in Milan, Italy, on 8–14 June, is a key fixture in the textiles industry's calendar. Consequently, we have dedicated the bulk of this issue to previewing the plans of some of the 1600 exhibitors that will use the show to unveil their latest developments. Across the next 40 pages, you can find out about: innovations for weaving and knitting technical fabrics (starting on page 4); solutions for the finishing, and coating and laminating of fabrics (starting on page 15); automated and efficient solutions for spinners (starting on page 25); machines for the production of performance nonwovens (starting on page 33); software and equipment for the production of technical textiles (starting on page 37). Readers can use these articles to prepare for what are sure to be a few very busy days in Milan.

In preparing the preview, three clear themes emerged.

First, much still needs to be done to reduce the impact of the textiles industry on the environment. According to recent studies, the apparel and footwear industries, for instance, account for nearly 10% of the world's greenhouse gas emissions, according to the United Nations (UN). A recent study from Consumption Research Norway found that approximately 35% of the microplastics found in the oceans originate from synthetic fabrics. Further, the textiles industry's use, and waste, of water is significant: 20% of the world's total wastewater is produced by the apparel industry, according to the UN and over 2.5 billion tonnes of water is discharged per year in China alone. A staggering 20 000 litres of water is used to produce 1 kg of cotton. It is no surprise then, that our preview is full of examples of machinery producers that are trying to enable their customers to produce more using less water and energy, and fewer raw materials, and from recycled, recyclable, bio-based and/or biodegradable feedstocks.

Second, the need for resource-efficient production is not just being driven by environmental concerns, but by the current economic climate. Producers of textiles, principally those in Europe, have over the past 12 months faced unprecedented costs for energy and raw materials. What is good for the environment is also good for the bottom line, and machinery manufacturers have responded accordingly.

Finally, the textiles industry faces a serious skills shortage and has an ageing workforce; according to a recent survey undertaken by EURATEX, 35% of workers in the textiles and clothing industry are over 50 years old. More must be done to attract young talent to the textiles industry, but in the meantime, machinery producers are working to automate their systems and connect them to the Internet and other machines, so the manufacture of textiles can take place with fewer people involved.

As this issue goes to press, *ITMA* is still over a month away and, as exhibitors continue to finalise their plans, you can keep up-to-date on our sister site, [technical-textiles.net](https://www.technical-textiles.net). Further, our team will be working on the show floor in Milan in order to look behind the numbers and public announcements, to gauge the mood of attendees and determine the trends that will shape the industry over the next four years. We look forward to seeing you there and to reporting our findings, together with all the other key developments in the industry, in the Autumn edition of *Technical Textiles International*.

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There will be more than 1600 exhibitors on the show floor at ITMA in Milan; plan your visit with Technical Textiles International's preview, starting on page 4



The 2019 edition of ITMA attracted over 105 000 visitors. Navigate the crowds at the latest edition with our our previews of machinery on show for: fabrics (page 4), finishing (page 15), spinning (page 25) and nonwovens (page 33), and associated software and equipment (page 37)



The latest technologies for weaving and knitting technical fabrics

Manufacturers of machinery for knitting and weaving save their big announcements for *ITMA* (to be held in Milan, Italy, on 8–14 June 2023) and while many will announce developments in software for the automation of their machines and their connection over the Internet, developments in hardware remain key, according to James Bakewell.



Crealet's Linked Motion Control is a personal computer-based control technology for warp-feed systems and can operate with up to 14 warp beams.

Crealet (Hall 6, Booth B306)

Crealet AG of Eschenbach, Switzerland, manufactures electronically controlled warp-feed systems for weaving machines. It says that markets for woven textiles are now more dynamic than ever, with the rate at which new products are introduced accelerating, yet the demands of its customers with regard to fabric quality have become increasingly strict.

To meet these demands, the company has developed a warp-yarn-feeding device for ribbon weaving machines that it will debut at *ITMA*. The device (the ECR system) features a system for the electronic control of rope-braking on warp beams in ribbon weaving. Crealet says that upgrading rope brakes with its ECR system keeps warp tension constant from a full to empty beam, which improves fabric quality and reduces labour requirements. Using the device, warp tension can be monitored and adjusted easily.

Crealet will also tell visitors to its stand about its customised warp let-offs for use in the manufacture of

technical and sensitive fabrics. Its customers need warp let-off devices to perform standardised processes at consistently high quality levels. Crealet Emeritus Chief Executive Officer (CEO), Andreas Wirz, says: "We are the ideal partner for the many different requirements in warp feeding. We have all the know-how and experience to optimise machine efficiency and fabric quality."

Itema Group (Hall 6, Booth B105)

Itema Group (see also, page 7) of Colzate, Italy, makes airjet, rapier and projectile looms, and will highlight its latest developments on its stand. While the company's machines are widely used for the production of traditional textiles, they are, in adapted forms, also capable of manufacturing technical textiles. Variants of the R9500 rapier, for instance, can weave glass fibre (R9500 fibreglass) and one-piece woven (OPW) airbag fabrics.

The R9500 fibreglass loom exploits its extremely sensitive whip-roller to control the tension of the warp, and has weft cutters and rapiers that are specially designed for use with glass fibres. In addition, Itema has developed a rotary spread-bar to facilitate weaving mesh fabrics. The sturdy structure of the R9500 keeps it stable when making OPW airbag fabrics at high speeds. Nevertheless, the company's engineers reinforce the components of looms intended for this application to make them even more suitable.

In 2022, the group recorded sales of €337.6 million, up by over 10% in comparison with 2021. Since the last edition of *ITMA*, in 2019, the company has made a number of acquisitions. On 29 July 2020, it completed its purchase of PTMT, which added a number of machines suitable for weaving technical fabrics to its portfolio, including the Hercules loom, which allows the operator to switch between positive and negative rapier mechanisms.



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The intention to acquire PTMT of Gandino, Italy, was announced in April 2019, when Itema Group said that the portfolio of technology it was buying would bolster its own, particularly in the market for technical fabrics. At the same time, Itema created a subsidiary, Itema Tech srl, dedicated to the manufacture of looms for weaving technical textiles, which was to be built around the acquisition.

In December 2021, it completed the acquisition of Italian producer of composite components for use in such as weaving machines and aerospace applications, Lamiflex of Ponte Nossa. Founded in 1976 by Luigina Bernini and Luigi Castelli, Lamiflex also has offices in Hong Kong, China. Itema Group says that its purchase of the company, and the combination of expertise that the deal created, will enable it to develop new composite products for the aerospace, medical and industrial sectors.

Jakob Müller (Hall 6, Booth A102)

Jakob Müller will not reveal its plans for *ITMA* until the show itself, but the supplier of systems for the ribbon and narrow-fabrics industries will be sure to place emphasis on the digital tools it is developing to work with its machinery. These will include its service portal (mymuller) and production monitoring system (Münet Master).

Karl Mayer (Hall 4, Booth B119)

Producer of warp-knitting machinery, Karl Mayer of Obertshausen, Germany, says that it will use *ITMA* to answer five of the most pressing questions it has received from its customers:

- how can I remain profitable with increasing cost pressures? ;
- how can I keep my business running despite a skills shortage?;
- how do I find new business opportunities with the existing cost pressures?;
- how do I manage the increasing pressure to be more sustainable?;
- how do I react to market requirements quickly and flexibly? .

For the production of technical textiles, including dense fabrics and meshes, the company will show its efficient weft-insertion warp-knitting machines. It says that such textiles are usually made-up of three yarn systems. The weft and filler yarns give the products their unique appearance. The knitting yarns from another guide bar fix the textile according to its construction. It says that there is no waviness in the fabrics produced on the machines, since the yarn layers lie straight at angles of 0° and 90°. Weft yarns can be inserted and fixed only in the desired locations and a wide variety of yarns can be processed on the machine. At its booth, the company will show a warp-knitted net made of biobased materials for the vertical cultivation of plants.

The company will also be able to discuss some of its recent developments. Through the *Rapid Textile* project, for instance, Karl Mayer is working to integrate additive manufacturing processes into textile production. Using Karl Mayer's process, a textile is printed directly after it has been manufactured on a warp-knitting machine. This requires the knitting



At ITMA, Karl Mayer will show what it claims to be the fastest three-bar tricot machine on the market (left). For the production of technical textiles, including dense fabrics and meshes, the company, of Obertshausen, Germany will show its efficient weft-insertion warp-knitting machines (right).

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machine to communicate directly with the in-line three-dimensional (3D)-printer's pattern system. The in-line printing head is mounted on an H-gantry and can be moved in all directions at a speed of 5 m.s⁻¹. A camera system and pattern-recognition software ensure precision during the positioning of the printing head on the 2 x 1-m printing field.

The 3D current printer can process polyurethane (PU) and silicone without heat at a speed equivalent to textile production of 85 m².h⁻¹ with a warp-knitting machine working width of 350 cm (138 inches).

Karl Mayer says that the process combines the high productivity of warp-knitting machines with the flexibility of 3D printing. By directly printing onto the fabric, large quantities of textile articles can be decorated with logos, brand designations or team names. For sportswear, partial reinforcements, such as kinesio tapes, or support areas for muscles and for stabilising movement can easily be integrated into garments. Shoes can be made more wear-resistant in areas that are under the most stress. For the automotive industry, the process could be used to integrate reinforcements into door panels, roof liners and seats.

For the production of biaxial non-crimp fabrics (NCFs), Karl Mayer has launched an updated warp-knitting machine. Using the machine, called the Biaxtronic II and designed for the manufacture of glass-fibre NCFs, wefts can be inserted in both course-oriented and non-course-oriented directions. The new weft-insertion system can handle glass fibres with a linear density of up to 2400 tex to create reinforcements with a maximum density of 500 g.m⁻². Glass mats with densities of up to 600 g.m⁻² can be integrated into these reinforcements by means of a chopping unit, while a maximum output of 1100 m².h⁻¹ can be achieved. Despite this high working speed, Karl Mayer says that the Biaxtronic II handles the fibres extremely delicately.

The company will be able to discuss a guide-bar arrangement for a double-needle-bar raschel machine that enables, among other things, the spaces between the cover surfaces of a spacer fabric to be filled with a bulked yarn – yielding voluminous fabrics with a number of novel surfaces. The cover surfaces of the

textiles – produced on an RDPJ 6/2 EL FB using a process called 4D-Knit – can be enhanced with two-tone colouring, zones of breathable mesh and pronounced relief designs. Depending on the amount of filling and the design of the reliefs, a wide range of fabrics can be produced using the process, from cosy padded fabrics to breathable textiles for functional shoes.

Karl Mayer will show an energy-efficient tricot machine with an electronic pattern drive for fast and easy pattern changes, so that changes in market demand can be responded to quickly and smaller order quantities can be produced.

Since the last edition of *ITMA*, Karl Mayer has purchased flat-knitting machinery manufacturer and compatriot, Stoll of Reutlingen. At its booth, it will therefore show a range of ADF flat-knitting machines and will promote its software for flat-knitting (knitelligence).

Finally, Karl Mayer will showcase the activities of its digital technologies company, KM.ON.

Kern-Liebers Textile (Hall 4, Booth D203)

Kern-Liebers Textile group will be represented by its three German constituents—Kern-Liebers Knitting Parts of Schramberg, Göppingen-based Saxonia and Leistner of Schwabach.

Kern-Liebers Knitting Parts has been working with flatbed knitting machine manufacturer Stoll (now part of Karl Mayer, see above) of Reutlingen, Germany, for several decades, and sells the complete range of needles and parts for the latter's CMS machines.

Saxonia, meanwhile, is a specialist in accessories for the warp-knitting industry, and sells needles, guide needles, sinkers and blocks for all warp-knitting applications. It notes that because the warp-knitting market is creating more complex products than previously, the technical requirements for these products, and in particular for blocks, are constantly increasing.

Finally, Leistner sells a comprehensive range of circular combs for cotton combing machines.

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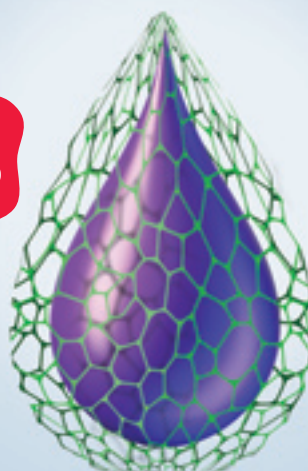
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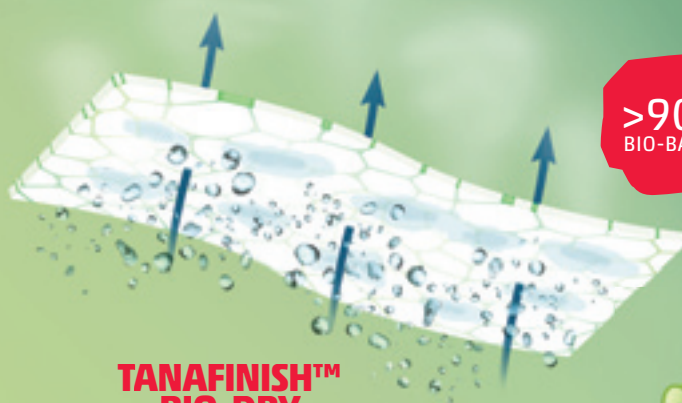
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Picanol's OptiMax-i Connect rapier weaving machine.

ETS Mallein (Hall 6, Booth B206)

With its own foundry, ETS Mallein of Corbelin, France, uses its expertise in aluminium alloys to produce beams for warping and weaving machinery. The company will exhibit aluminium cannisters that it says are stronger and more precise in terms of their geometry than previous versions. It will also be able to share details of a flange for the big barrels employed for dealing with difficult-to-process fibres such as carbon.

Picanol (Hall 6, Booth B201)

Picanol (see also, page 5) of Leper, Belgium, will be able to discuss its latest generation of airjet and rapier weaving machines, which feature numerous technologies for their automation, and the gathering and exchange of data related to their operation, and were launched in November 2021.

Speaking at the time of their launch, the company's Vice President of Weaving Machines, Johan Verstraete, said: "Following the successful launch of our digital platform PicConnect earlier [in October 2021], we have now released a new generation of weaving machines, which are known as the Connect generation. Our Connect-generation weaving machines can provide the correct data and are loaded with new and never-before-seen functionalities."

Picanol's weaving machines now have the "Connect" suffix. Its airjet weaving machines are now known as OmniPlus-i Connect and TerryPlus-i Connect, while its rapier weaving machines are now called the OptiMax-i Connect and the TerryMax-i Connect.

On the OptiMax-i Connect, Picanol has introduced a lubrication-monitoring sensor and a temperature sensor. The data they gather in combination will help the user to ensure that the gripper tapes are in optimal condition. Further, as an option, a gripper-stroke measurement sensor can be fitted, which Picanol says not only dramatically simplifies the setting of the gripper stroke, but also enables the user to realise higher machine speeds when weaving narrow widths.

Picanol's Sumo Drive machine drive has been updated with a sheet-metal package that reduces its energy consumption, an optimised oil-cooling circuit to improve its performance and a built-in sensor for monitoring its temperature.

Further, the Connect machines can be equipped with a power-monitoring module, which allows the user to keep track of the power consumption of each machine over time. Every Connect machine also has a built-in ambient-temperature and -humidity sensor, which will help the user to optimise the climate control in the weaving shed. Each machine can also be equipped with a sensor for monitoring the amount of raw materials it uses.

To enable a fast reaction to the data gathered by the many sensors on the new machines, Picanol has also updated its BlueBox control unit. A sensor dashboard screen has been developed for the BlueTouch display; with a simple touch of the screen, the current and historical power consumption, temperature, humidity, material consumption, and – on the OmniPlus-i Connect – also the air consumption of the machines can be monitored. The BlueTouch display is now also equipped with an action centre, an electronic logbook where all actions such as maintenance interventions can be logged or scheduled.

The machine manual is also now available on the BlueTouch display and with a context-based help function, the help pages related to the operation the user wants to perform appear with one touch. The built-in Internet browser even allows the user to consult, for example, on-line tutorial videos to guide them through a setting procedure.

Picanol has also introduced a variety of new tools that enable the weaving of high-quality fabrics. The harness

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frame stroke measurement system was, until recently, only available on the SmartShed machine, but it is now also available on the cambox and dobby machines. Combined with technologies for visualising and simulating the shed, it enables the user to optimise their shed settings without losing any time or taking any risks. Finally, a fully fledged access-control system not only limits the access to certain pages and settings depending on the user, but also allows a tailored dashboard to be established for each user profile.

Quality Machines Textiles BV (Hall 6, Booth B114)

In 2015, QMatex BV was established in Waragem, Belgium, to exploit the double-shed formation found in wire looms in the development of looms for the production of technical textiles. The company is able to custom-build individual looms to the requirements of its customers.

In its relatively short history, QMatex has already developed looms for the production of:

- lightweight, flexible fabrics woven from fine yarns and with defined water-permeability, for the production of medical implants that are compact and resilient enough to be inserted into the human body using stents;
- heavy fabrics of 7.5 cm in thickness and 2 m in width for thermal insulation. This 36-t loom can generate a beat-up force of 180 000 N, so that wefts can be inserted above one another and features a horizontal take-up to support the weight of the woven fabrics;
- spacer fabrics for the filtration of fine oil. The tolerance for the holes in the fabric is 0.02 mm.

Shima Seiki Manufacturing Ltd (Hall 4, Booth D209)

Computerised knitting machine manufacturer Shima Seiki Manufacturing of Wakayama, Japan, will likely show a comprehensive range of knitting machines (Wholegarment), computerised flat-knitting machines, graphic design systems and digital technologies at its booth at *ITMA*.

At *Techtextil*, which took place in Frankfurt, Germany, on 21–24 June 2022, the company demonstrated a prototype weft-knitting machine that uses an inlay technique for the production of hybrid textiles that combine the stretch characteristics of knitted fabrics

with the stability of woven textiles. In these fabrics, a warp yarn can be inserted to produce three-dimensional (3D) preforms. The company says that, in comparison with conventional methods for the production of preforms, the approach cuts costs associated with post-processing, including time, material and labour. Its yarn-unwinding technology, meanwhile, ensures that yarns are fed to the machine reliably and at the correct tension.

In Germany, Shima Seiki also demonstrated its SDS-One Apex4 3D CAD system, which enables virtual prototypes of knitted fabrics to be created—minimising the amount of time and material consumed in the physical production of prototypes. When approved, the data from the virtual prototype can be imported into a machine for immediate knitting, significantly reducing lead times compared with conventional approaches.

Stäubli (Hall 6, Booth A201)

Founded in 1892, Stäubli of Pfäffikon, Switzerland, manufactures high-speed shedding and weaving-preparation machinery. The company's machines are used for the production of such as one-piece woven (OPW) airbags, custom fabrics for use in lightweight construction and artificial grass. At *ITMA*, the company will introduce the latest versions of its extensive range of weaving technologies, including cam motions, dobbies and jacquards, and drawing-in, leasing and warp-tying machines.

Speaking at a press conference organised by industry association Swiss Textile Machinery held in Berne, Switzerland, on 16–18 March 2023, Stäubli's Global Head of Marketing for Textiles, Fritz Legler, said: "Our technologies are based on more than 2200 granted or pending patents and are already used on approaching 70 000 weaving machines worldwide. Our latest developments for textile production also draw on the company's wide experience in robotics, and digitalisation and process efficiency are intertwined – the better you control the process the more sustainable you are."

Visitors to the company's booth will be able to see the latest version of Stäubli's Safir S60 automatic drawing-in system with its Active Warp Control 2.0



yarn-recognition and -management system, together with its latest 1600/1700 cam motions and S3000/S3200 electronic rotary dobbies. These machines now consume less oil than previous iterations and therefore require fewer oil changes.

Also on-show will be the energy-efficient PRO series of jacquard machines, which were launched at the end of 2022 and can be used for the production of flat, terry or OPW fabrics. They are available in formats ranging from 4608 hooks (LX PRO) to 25 600 hooks (LXXL PRO) and feature systems for synchronised hook lifting during high-speed weaving. Three complete jacquard systems will be in operation at the show in Milan, together with the latest Alpha carpet weaving system, which has been fitted with a number of newly developed components.

Vandewiele Sweden AB (Hall 10, Booth B201)

IRO AB (Vandewiele Sweden AB) from Ulricehamn, Sweden, is a maker of weft-yarn feeds and tension controllers, and a member of the Vandewiele Group (see also, Inside front cover) of Marke, Belgium.

Stäubli's Global Head of Marketing for Textiles, Fritz Legler.



At ITMA, the company will launch its fourth generation of yarn feeders (X4), which feature integrated displays that enable settings and any alarms to be monitored easily. The X4 feeders are available in three variants; with an integrated Tension Display (TED); with integrated Active Tension Control (ATC); with Quick release.

The TED makes it easy to reproduce weft-tension settings from one machine to another, enabling fast start-ups the next time the same article is woven. The position of the S-Flex Tensioner is constantly monitored by an internal sensor, even if an adjustment is made when the machine is off.

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With the ATC, the required tension can be set and monitored easily on an integrated display. Once set, yarn tension is constantly and accurately measured by the ATC sensor unit, which sends signals to the ATC operator unit. In this way, the system constantly regulates itself to ensure that consistent yarn tension is maintained during the weaving process. Quick release provides a quick and easy way to change the brush-ring or tensioner.

IRO will also launch iroonline.com, an Internet platform for ordering textile accessories.

Further, IRO will be able to discuss an efficient weaving-machine feeder it has developed for use in the production of reinforcements for composites. When weaving fibres such as carbon, glass and aramids, as well as thermoplastic tapes, for reinforcement fabrics, it is essential that there is no twist in the feed, which IRO says its new machine guarantees. The ZTF Zero Twist Feeder keeps the tape yarns or fibre tows constantly stretched to avoid the risks of any snarls or twisting. The unit can accommodate tapes in widths up to 10 mm, weights up to 7 kg and insertion lengths of up to 3.4 m. It is equipped with a buffer arm that is synchronised with the movement of the rapier on a weaving machine to deliver the exact amount of yarn from the bobbin required for the weft insertion. A tension and sensor arm ensures that constant yarn tension is maintained during the entire insertion cycle.

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Sustainable technologies for finishing, and coating and laminating

Suppliers of chemicals and builders of machinery for the finishing, and the coating and laminating of technical textiles will present technologies designed to minimise the environmental impact of manufacturing processes at *ITMA* (to be held in Milan, Italy, on 8–14 June 2023). James Bakewell picks out some highlights.

AGC Plasma Technology Solutions (Hall 18, Booth A207a)

Supplier of industrial vacuum-coating equipment, AGC Plasma Technology Solutions, will be able to tell visitors to its booth about a roll-to-roll pilot line for the coating of textiles that it has installed at its demonstration centre in Lauenförde, Germany. The company says that vacuum-coating processes can be used to apply nanoscale layers of metals, oxides and nitrides to the surfaces of textiles to make them thermally reflective, electrically conductive, and/or water- and oil-repellent. It adds that the processes are energy-efficient and do not require the use of water and solvents, but – despite their widescale use in the glass industry – they have seen limited application in the technical-textiles industry.

AGC Plasma Technology Solutions' roll-to-roll pilot line for the vacuum-coating of textiles at its demonstration centre in Lauenförde, Germany.

With its pilot line, AGC Plasma Technology Solutions will demonstrate the potential of vacuum-coating technology to prospective customers through the manufacture of



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proof-of-concept and prototype products. The line is capable of applying thin-film coatings to textiles of up to 1.6 m in width using physical vapour deposition (PVD) and/or plasma-enhanced chemical vapour deposition (PECVD) processes.

Alchemie Technology (Hall 7, Booth D308)

Alchemie says that textile dyeing is the second-largest cause of water pollution globally and is the largest single source of carbon dioxide (CO₂) emissions from the textile industry. Using its Endeavour waterless dyeing system, which it will showcase at ITMA, the company claims that garment manufacturers can dye their textiles without producing contaminated wastewater, dramatically reduce the size of their carbon footprints and cut costs by 50% compared with traditional dyeing technologies. In the last twelve months, Alchemie has installed a demonstration Endeavour line at JSRTEX Group of Taipei, Taiwan⁽¹⁾, and is looking to install similar lines in other locations around the world.

Also on-show will be Alchemie's Novara digital finishing system⁽²⁾. The company says that Novara delivers the throughput of conventional coating technologies and the precision of digital finishing to enable new product designs and radically reduce the cost of producing technical textiles. The technology enables one- or two-sided functional coatings to be applied to numerous substrates, including polyester (PES), polyamide (PA), cotton, wool and blends with basis weights of 50–1000 g.m⁻², at pattern resolutions

of 500 µm, or 50 dots per inch (dpi), only where they are needed—reducing material consumption.

Delivered as a standalone machine or as a module that can be retrofitted to existing textile lines, Novara includes an integrated infra-red (IR) system for drying water-based coatings. Further, fluid supply to the system is automated and the fluid can be changed in less than five minutes.

A. Monforts Textilmaschinen GmbH & Co KG (Hall 18, Booth B106)

Monforts of Mönchengladbach, Germany, will showcase the significant advances it has made in its system for the sustainable continuous dyeing of woven fabrics and yarns (Thermex).

Over 900 Monforts Thermex hot-flue dyeing systems are currently operational in countries such as Bangladesh, Brazil, China, India, Mexico, Pakistan and Turkey, with around 150 of them using Monforts' Econtrol and Econtrol T-CA processes.

Econtrol is a continuous process for the dyeing of woven cotton and other cellulosic fabrics. Using it, reactive dyestuffs are fixed into fabrics in a one-step dyeing and drying process using a controlled combination of steam and air. The entire pad-dry process takes just two-to-three minutes at a temperature of 120–130°C and a relative humidity volume of 25–30%.

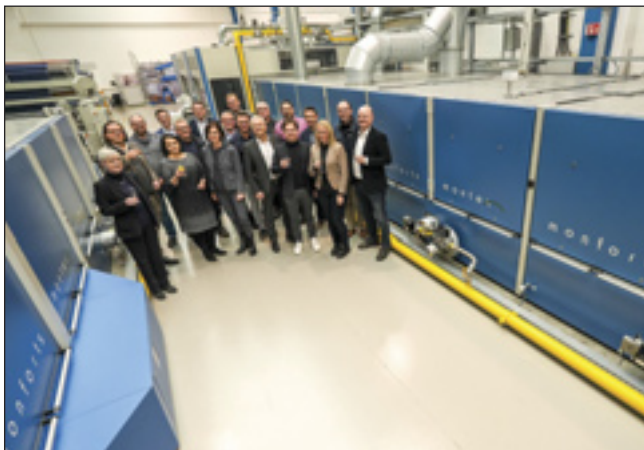
Monforts Textile Technologies Engineer Jonas Beisel says: "Econtrol ensures excellent reproducibility of all colours, improved dye penetration on difficult fabrics and no risk of the browning of the fibres due to the low fixation temperature."

Further, in contrast to other processes, no salt is used and no steamer is required for a separate fixation step. The process is urea-free and no smoke or deposits are generated. Direct feedback of the dyeing results eliminates batching time to guarantee good reproducibility from the laboratory to bulk production, and an immediate wash-off is also unnecessary, allowing for flexible production planning.

The Econtrol process is suitable for imparting pale-to-dark shades to fabrics with good fastness and



A Thermex line recently installed by Monforts in Italy.



Members and associates of the WasserSTOFF consortium at the launch meeting of the new project at the Monforts Advanced Technology Center in Mönchengladbach, Germany.

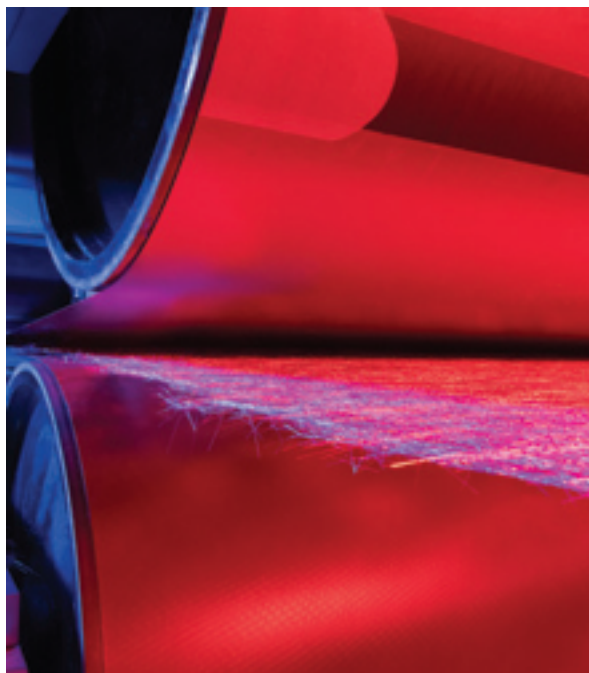
has proved a particularly versatile dyeing method for denim manufacturers.

Monforts Head of Denim, Hans Wroblowski, says: "Differentiation is the key in the highly competitive denim-fabrics industry, whether that is through the successful incorporation of new fibres, accommodating new fabric constructions or exploring the many options for how to treat them at the finishing stage, to gain a market advantage". He adds that these latest Monforts lines allow users to be extremely versatile and respond quickly to market demand, while also allowing for very short production runs.

Monforts is also organising two free-to-attend seminars and discussions on the potential of green hydrogen as a new energy source for textile finishing, drying and related processes.

The seminars will take place at the company's booth on 9 June at 11am, and 12 June, also at 11am, and all are welcome.

Monforts is currently leading a consortium of industrial partners and universities in the three-year *WasserSTOFF* project, which was launched in November 2022 and is exploring the potential of green hydrogen as a source of energy for industry. The target of the German government-funded project is to establish the extent to which hydrogen can be used as an alternative heating source for textile finishing processes. This will



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first involve tests using laboratory equipment and the results will then be transferred to a stenter frame at the Monforts Advanced Technology Center (ATC) in Mönchengladbach.

Monforts' Managing Director, Gunnar Meyer, says: "Everybody knows that textile finishing is a high-energy consuming process. To make this process more efficient, Monforts already offers several solutions, but as a technology leader, we are also rising to the challenge of exploring alternative heating options to be ready for the future."

To be considered "green", hydrogen must be produced using a zero-carbon process that is powered by renewable energy sources, such as wind or solar. Currently, the cleanest method of hydrogen production is electrolysis, using an electrically powered electrolyser to separate water molecules into hydrogen and oxygen. The purity of the hydrogen is also important, and impurities must be removed via a separation process.

Monforts Textile Technologies Engineer, Jonas Beisel, continues: "Despite all its advantages, there are

obstacles to overcome on the way to widespread, economically feasible green-hydrogen use. Until there are widely available, reliable and economical sources of this clean power, the cost of producing it will remain prohibitive. The infrastructure is not yet there, and hydrogen also has a tendency to make steel brittle and subject to fracture, which is something that requires further investigation in both its transportation and use in industrial processing."

At its ATC, Monforts will be carrying-out intensive tests and trials to assess the reliability of both processes and final products when different natural-gas and hydrogen mixtures – up to 100% green hydrogen – are employed. The results will be analysed by the consortium partners, because there are many parameters that at this stage remain unknown.

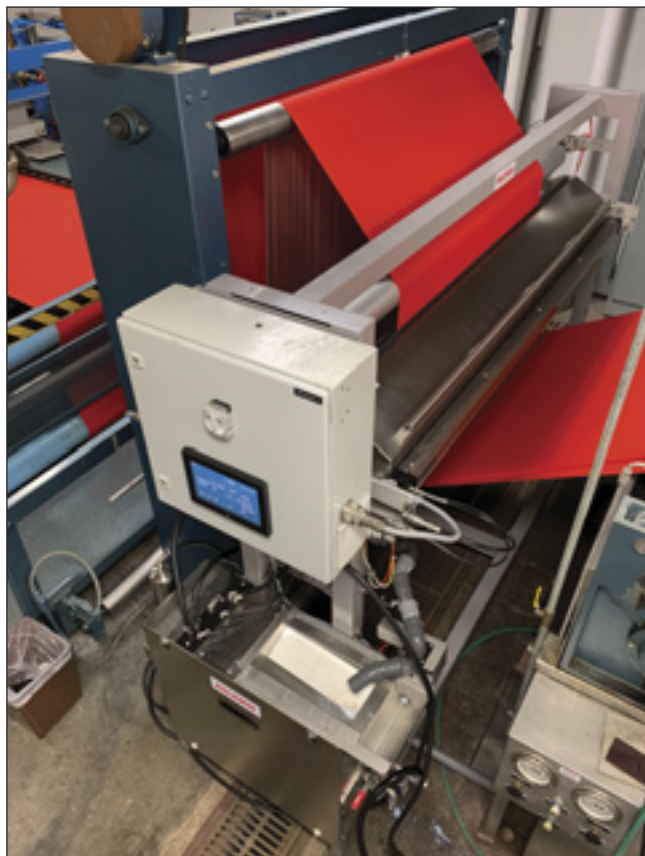
The aim, Beisel adds, is to reduce carbon dioxide emissions and – following the rising prices and industry turbulence experienced by manufacturers over the past year or so – to reduce further the dependency on natural gas.

Baldwin Technology (Hall 4, Booth C205)

Baldwin Technology of St Louis, Missouri, USA, will use *ITMA* to promote its non-contact precision-spray finishing system (TexCoat G4), the use of which it says can reduce water consumption by as much as 50% compared with traditional padding processes.

Baldwin says that the TexCoat G4 has numerous advantages over conventional methods for applying finishes to textiles. The finish is distributed uniformly across the textile surface and is applied only where it is required—on one or both sides of the fabric. This is highly beneficial when, for example, applying water-repellents to laminated fabrics, as it eliminates the problem of the finish affecting the quality of the adhesion layer.

Further, the non-contact technology prevents the dilution of the finish in wet-on-wet processes, allowing full control of coverage rates. In addition, with no bath-



A non-contact precision-spray finishing system (TexCoat G4) from Baldwin at North Carolina State University in Raleigh, USA.



contamination during the finishing process, there is no downtime during colour or fabric changeovers.

The company claims that when using TexCoat G4, all of the oversprayed finish is recycled and none is wasted during changeovers of chemicals, colour or fabric. As only the necessary amount of finish is applied to the fabric, a reduced wet pick-up level of 50% can be achieved, leading to a 50% reduction in water- and energy-consumption. The low wet pick-up levels together with a single-side spray application enable combined processes and can completely eliminate drying steps, such as for laminated fabrics and in the finishing of upholstery textiles.

The company has been working with Archroma, of Pratteln, Switzerland, to test the suitability of the Swiss company's finishes for processing using the system. These finishes include a perfluorinated compound (PFC)-free soil-repellent (Smartrepel Hydro SR), and antimicrobials that are free from metal and inorganic particles, such as Sanitized T 20-19 and TH 15-14, both

of which Archroma launched at *Techtextil* in Frankfurt, Germany, on 21–24 June 2022.

Benninger (Hall 18, Booth A201)

Uzwil, Switzerland-based Benninger AG will showcase three of its latest developments, including a highly efficient jet-dyeing machine (Fabricmaster).

The company says that the cold pad batch (CPB) dyeing process, which consumes little salt and is less energy-intensive than other processes, is becoming increasingly popular in tropical and subtropical regions, which has led it to adapt its CPB systems for these climates. Central to the systems is the Benninger Küsters Dyepad, which the company will be presenting at the show.

It will also show its singeing machine (SingeRay), which is equipped with two burners and a double-nozzle strip. The silicon carbide burning chambers ensure complete combustion, and a constant burner temperature.

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Brückner Textile Technologies (Hall 18, Booth A101)

Brückner Textile Technologies (see also, page 19) of Leonberg, Germany, is a specialist in coating and finishing lines for textiles and nonwovens.

At the recent *INDEX* exhibition, which took place in Geneva, Switzerland, on 18–21 April 2023, the company highlighted its ovens for the drying and consolidation of nonwovens. The company will tell visitors to its booth about systems that it has recently supplied to its customers, including those for the heat-setting of geotextiles, finishing lines for the production of medical nonwovens and thermofusion lines for the bonding of voluminous nonwovens for the furniture industry.

Brückner will be able to discuss the latest developments at its Technology Center in Leonberg. At the start of 2023, for instance, the company added a flow-through belt oven to its range of test machines there to support its customers, and particularly those in the nonwovens industry. It says that, owing to its short length, the compact thermotreatment line is suitable for simulating fast-running processes with short dwell times at moderate test speeds. The electrically heated unit is equipped with sensors for measuring the local system pressures, air volumes, air temperatures, material-surface temperature and the humidity of the process air.

The company will also be able to talk about a range of energy-efficient technologies for the finishing of textiles. The company has, for instance, developed a

stenter with a double heating system. Depending on the availability of fuel, the stenter can be operated using gas or oil, or in combinations with steam or renewable sources of energy. This means that the chances of production delays associated with energy shortages can be minimised.

Further, Brückner has developed a system that monitors the settings of an entire finishing line and immediately signals deviations from default values to the machine operator, as well as storing them in the production history logbook. A new simulation tool also helps the machine operator to achieve the highest possible productivity and/or energy-savings. In addition, suggestions for spare parts are displayed after certain intervals, and alerts for upcoming maintenance tasks are provided, which can be retrieved on mobile devices.

Finally, the company will be able to discuss systems that reduce the amount of chemicals consumed during coating processes. Its Eco-Coat unit, for instance, can apply a variety of coatings to either side of a fabric, allowing for the production of functionalised textiles. Using an engraved roller, a single-sided application of up to 100 g.m⁻² can be achieved using the system, which also features a very small liquor reservoir that ensures that minimal quantities of wastewater are produced when changing batches or liquors. As less water needs to be evaporated in the subsequent drying process than, for example, in the case of impregnation in a water bath, energy consumption is also reduced.



Brückner's Eco-Coat unit can apply a variety of coatings to either side of the fabric allowing for the production of functionalised textiles.

DyStar (Hall 5, Booth B201)

DyStar Singapore will present dyeing technology that it claims will help its customers save on water, energy, waste, greenhouse-gas emissions and process time.

The company will showcase a number of its dyeing processes (Cadira), including:

- Cadira Polyester, a technology that enables environmentally friendly exhaust processing of polyester (PES) fibres with its Dianix dyes and Sera auxiliaries;
- Cadira Reactive, a dyeing technology for cellulosic fibres;



- Cadira Vat, a new technology for vat exhaust dyeing, which the company claims significantly reduces dyeing time, and energy and water consumption, and with a new reduction agent, reduces sulfur load in the resulting wastewater by up to 85%;
- Cadira Wool;
- Cadira Denim, a dyeing technique for indigo that reduces or eliminates salt freight in wastewater streams;
- Cadira Laundry, through which a variety of effects on denim can be achieved.

DyStar will also highlight a dye designed to meet the high wet-fastness requirements for sportswear, apparel and workwear (Dianix XF/XF2/SF), and dyes made to meet the high light-fastness requirements of automotive textiles, home furnishings and outdoor textiles (Dianix AM/HLA).

In addition, the company will present updates to its range of inks for digital printing (Jettex).



An industrial-scale installation of imogo's Dye-Max spray-dyeing technology is currently being commissioned.

imogo (Hall 18, Booth B105)

Limhamn, Sweden-based imogo has developed spray-dyeing technology (Dye-Max) and claims that its use can slash the consumption of fresh water, energy and chemicals, as well as reduce wastewater, by as much as 90%, when compared with conventional jet-dyeing processes.

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The Dye-Max application unit is a closed chamber containing a series of spray cassettes with precision nozzles for accurate and consistent coverage, each nozzle working in combination with a patented valve that controls the volume of chemical applied.

The chamber also has an exhaust system and droplet separator to ensure that the environment around the unit is kept clean. There is one set of spray cassettes for each of the three separate dye-dispersion feed lines and they can be easily exchanged, without the need for tools, in less than one minute. This allows for extremely fast changeovers between colours, because the operator simply needs to insert a new cassette. Unlike existing processes, there is no need for a lengthy, thorough cleaning of the chamber each time and, because the spray cassettes are interchangeable, all maintenance on them can be performed off-line.

At *ITMA*, a Mini-Max laboratory unit – which can be used in conjunction with Dye-Max installations for pre-determining application volumes and colour matching – will demonstrate the principles of imogo's technology. imogo says that an industrial-scale installation of Dye-Max is currently being commissioned and that further details will be announced prior to the show.

IPCO Germany GmbH (Hall 10, Booth B310)

IPCO Germany GmbH (see also, page 17) of Göppingen, Germany, is a supplier of double-belt presses and scattering units for the production of single-layered and multi-layered products, including

technical textiles, nonwovens and composites. The company's modular press systems are based on polytetrafluoroethylene (PTFE), stainless-steel and carbon-steel belts, and can combine a number of processes – heating, pressing, cooling and tempering – in one efficient, continuous line.

The company will use the exhibition to tell visitors to its booth about its range of pilot systems at its productivity centre in Göppingen, where it can work with its customers on the research, development and prototyping of new materials.

Santex Rimar Group (Hall 18, Booth A110)

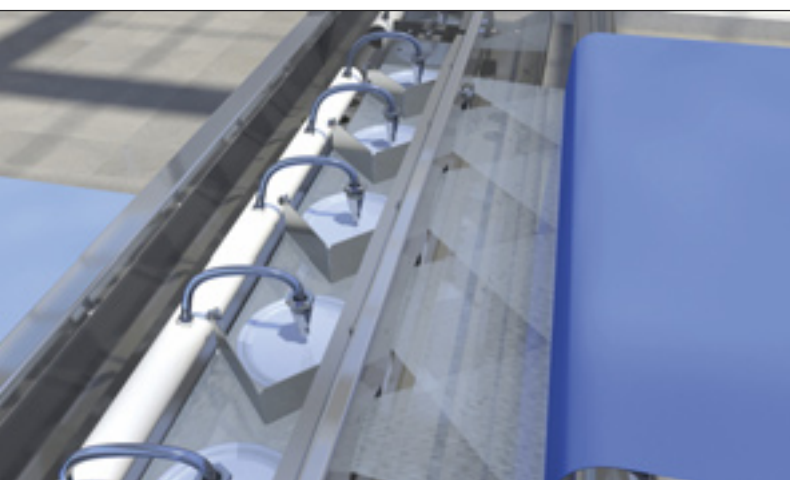
Santex Rimar Group of Vicenza, Italy, consists of:

- Cavitec, a specialist in prepregs for composites;
- Isotex, which makes coating, printing and embossing machinery;
- Santex Rimar AG, which makes machinery for finishing knitted fabrics;
- SMIT, a manufacturer of rapier looms used to make technical textiles such as airbags, glass-fibre fabrics and conveyor belts;
- Sperotto Rimar, which makes machinery for finishing textiles;
- Solwa, a specialist in environmental technologies, including water treatments.

Santex Rimar AG, of Tobel, Switzerland, will show its stenter frame (Santaframe) in combination with its felt belt compacting machine (Santacompact) for the finishing of high-quality, open-width knitted and woven fabrics.

Tanatex (Hall 5, Booth A205)

Tanatex Chemicals (see also, page 9) of Ede, The Netherlands, will show a range of products (Biolutions) made using bio-based raw materials, such as corn, and linseed- and castor oil, that are not used for the production of food. The range includes Mesitol Bio-Fix, a bio-based and vegan-friendly after-treatment for polyamide (PA) and its blends. The treatment is free from bisphenol, phenol and formaldehyde; these substances have been replaced to create a product that is 87% bio-based. The company will also show a moisture-management agent for synthetics that is over 90% bio-based.



Weitmann & Konrad (Weko) has a technology (Weko-Neo) that uses rotating atomisers to generate sprays of chemicals.



Weko – Weitmann & Konrad (Hall 14, Booth B103a)

Weko – Weitmann & Konrad GmbH & Co KG (see also, page 13) is a specialist in the selection and integration of non-contacting systems for the application of small amounts of functional additives/finishes during production. Based in Leinfelden-Echterdingen, Germany, the company offers test services at its technical centre.

A highlight of its exhibit will be the Weko-ProTec system for applying functional fluids for the finishing of webs. The company will say the system applies the finishes reliably and reproducibly. It also has an encapsulated unit allowing users to handle safely substances that should not be exposed to the working environment.

At *ITMA 2019* in Barcelona, Spain, on 20–26 June, Weko introduced a non-contact precision application system (Weko-Neo).

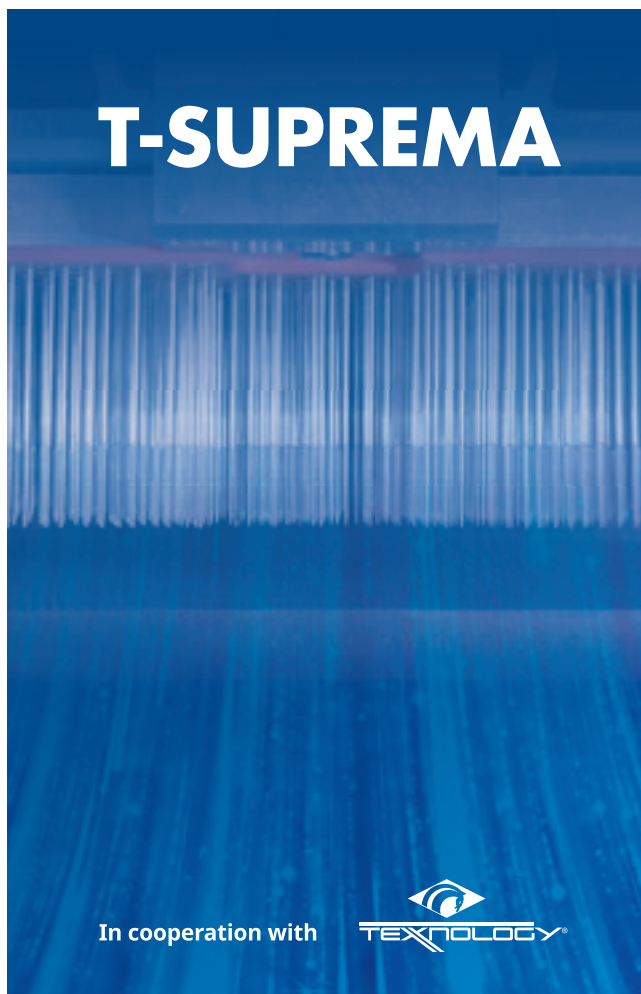
Weko-Neo is designed for installation at the entrance or exit of a stenter frame and used for denim processes, such as fixation, resin and flat finishing, lustre or brilliance enhancement, softening, tinting and over-dyeing. Chemicals are supplied to rapidly rotating discs and dispersed by centrifugal forces to form a uniform, ultra-fine aerosol, which falls on the material.

Common functional finishes applied by the system include flame-protection agents, hydrophilic/hydrophobic finishes, antimicrobial treatments and silicones, as well as more traditional ones such as softeners.

Zimmer Austria (Hall 7, Booth E105)

With sites in Klagenfurt and Kufstein, Zimmer Austria produces machines for the digital printing and functionalisation, flat-screen and rotary screen-printing, coating, steaming, washing and drying of textiles and carpets.

On its 400-m² booth, the company will show its Colaris digital inkjet printer that features its Colaris Vision camera detection system and its STR System Wenk Rotary Screen Stripping and Ironing Machine. Both



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machines will be running. Further, Zimmer Austria will show several coating and screen-printing lines, together with a variety of rotary screen-printing heads and squeegee devices.

These exhibits will be complemented by a comprehensive set of coated and digitally printed textiles, including technical textiles, military camouflage prints, printed webbing, transportation fabrics, home textiles and various carpet flooring products.

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⁽²⁾*Pandemic leads to early launch for Alchemie finishing technology*, <https://www.technical-textiles.net/node/75549>

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Sustainable, automated and efficient solutions for spinners

Like the rest of the technical textiles industry, producers of fibres, filaments and yarns are facing price pressures, skill shortages, and stringent environmental regulations and legislation. At *ITMA* (8–14 June 2023 in Milan, Italy), manufacturers of machinery for this sector will present innovative solutions to these problems. James Bakewell selects some of the most interesting developments.

Fibre Extrusion Technology (Hall 1, Booth A101)

Leeds, UK-based supplier of laboratory- and pilot-scale meltspinning systems, Fibre Extrusion Technology (FET) Ltd, heads to *ITMA* on the back of its most lucrative year in terms of revenue.

The company's Managing Director, Richard Slack, says: "Sales revenue for 2022 has easily beaten our previous high and the research projects we have collaborated on have become increasingly challenging in terms of technical specification."

Projects completed by FET during 2022 include:

- the installation of a multifilament meltspinning line for Senbis Polymer Innovations, of Emmen, The Netherlands, enabling the company to make fibres from recycled polymers and biopolymers;
- the installation of a FET-200LAB wetspinning system at the University of Manchester in the UK;
- the installation of a FET-103 monofilament line at Rheon Labs of London, UK, for the development of fibres that dynamically stiffen when exposed to strain⁽¹⁾.

The company says that its newly opened Fibre Development Centre features laboratory systems worth over £1.5 million⁽²⁾ that will enable it to trial the manufacture of fibres from a variety of polymers. It

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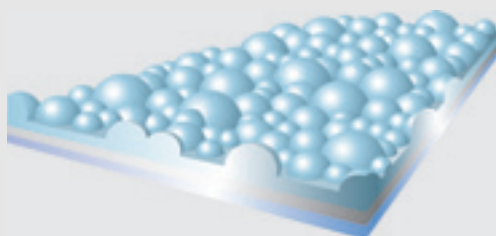
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worked with three new polymers for clients in 2022 and several more are lined-up in 2023, which is expected to bring the total of different polymer types its machines can process in multifilament, mono-filament and nonwoven formats to more than 40.

Gneuss (Hall 9, Booth D302)

Gneuss, of Bad Oeynhausen, Germany, will highlight a system capable of recycling polyethylene terephthalate (PET) partially oriented yarn (POY). The company has installed a version of the OMNIboost Recycling System at its technical centre in Bad Oeynhausen where, during K 2022 (held in Düsseldorf, Germany, on 19–26 October), it invited guests to observe the machine in action. The PET POY waste being processed had a residual moisture content of 6% and an intrinsic viscosity (IV) of 0.64 dl.g^{-1} . This material was fed into the system at a rate of 150 kg.h^{-1} and, using the Gneuss liquid-melt-phase IV booster, its viscosity was increased to 0.66 dl.g^{-1} within minutes.

The OMNIboost Recycling System has been designed to recycle both post-industrial and post-consumer PET

Fibre Extrusion Technology's system for the production of spunbond nonwovens.

waste with low bulk densities, such as waste fibres and thin films.

The material to be processed is fed into the Gneuss 3C Rotary Feeder, which cuts and compacts the material and transports it directly into the Multi Rotation Section (MRS) Extruder screw, which has a number of satellite screws. The satellite screws rotate in the opposite direction to the main screw, increasing the surface area of the screw considerably, which ensures good degassing performance during the melt phase. It also serves to decontaminate post-consumer recycled PET to food-contact standards, eliminating the need for the material to be subjected to a thermal pre-treatment prior to extrusion.

After passing through the extruder, the polymer melt is filtered by the Gneuss RSFgenius Melt Filtration System, which can work well even on highly contaminated material. The polymer then flows into the Gneuss JUMP liquid phase IV booster reactor. The viscosity of the melt is measured both at the inlet and outlet of the reactor, and is increased to the required level by regulating the vacuum, residence time and surface-area exchange rate in the reactor vessel.

With a constant output viscosity, the material can then be fed to a production process, such as fibre spinning, for example, while still in the melt phase.

Kelheim Fibres (Hall 2, Booth D206)

Kelheim Fibres will show a wide range of its highly functional and biodegradable cellulose fibres.

For the production of nonwovens, Kelheim Fibres has developed several products that are made from wood pulp derived from certified and sustainably managed forests. These are particularly suitable for the manufacture of absorbent hygiene products (AHPs). Galaxy, for example, is a trilobal viscose fibre that absorbs 25–30% more fluid than cotton or standard viscose fibres⁽³⁾, making it suitable for the manufacture of such as acquisition distribution layers (ADLs) for diapers. Bramante⁽⁴⁾, meanwhile, is a viscose fibre with a hollow cross-section where fluid can be stored and can be used for the production of absorbent cores for diapers.



Kelheim Fibres says that Bramante not only delivers an excellent absorption capacity, but also a moisture-retention level of 260%—in contrast to 50% in cotton fibres. The liquid remains inside the fibre, even under pressure. Olea is a hydrophobic viscose fibre that can be used for the cover- and back-sheets of hygiene products.

Kelheim's range of speciality fibres for textile applications, meanwhile, comprises spun-dyed fibres, a flat fibre (Viloft) that creates small air pockets in a textile, rendering it highly breathable and comfortable, a fibre (Viseta) that is 50% finer than silk and imparts a flowing drape and a soft touch to fabrics made from it, and others.

Lenzing (Hall 2, Booth E212)

By 2024, Lenzing plans for more than 75% of its sales of fibres to be accounted for by its wood-based, biodegradable speciality products in the Tencel, Ecovero and Veocel brands, many of which it will show at *ITMA*.



Gneuss' OMNIboost Recycling System at its technical centre in Bad Oeynhausen, Germany.

In 2022, the company celebrated the construction of a production plant for its Tencel-branded lyocell fibre in Prachinburi, Thailand. The company, which specialises in cellulosic fibres and has its headquarters in Lenzing, Austria, says that the facility has an annual production

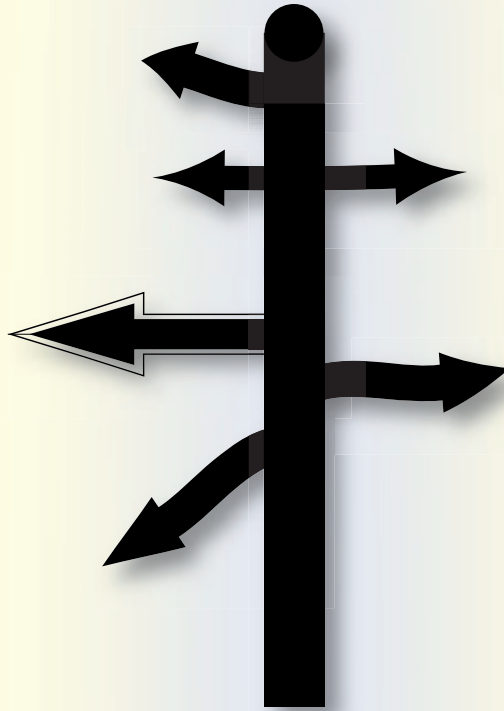


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Bekaert—metal and metal alloy-yarns for smart textiles

Founded in 1880 and with its headquarters in Belgium, Bekaert describes itself as a global market and technology leader in the material science of steel wire-transformation and coating technologies, and has 27 000 employees. In recent years, the company has been finding innovative applications for its metal/metal-alloy yarns in smart textiles, reports James Bakewell.

For more than 40 years, Bekaert has been developing, making and supplying metal/metal-alloy fibres, and textile products made from them, including yarns, braids, cables, knits, woven fabrics and nonwovens.

The company's yarns have been typically used for antistatic and electromagnetic interference (EMI)-shielding applications, and to improve the cut-resistance of such as protective gloves and garments. Since around 2010, however, they are increasingly being used in the production of smart textiles.

To produce its yarns, Bekaert spins bundles of fibres or filaments using conventional processes. If the bundle



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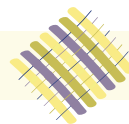
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Tel: +49 (89) 949-20802
sabine.wagner@messe-muenchen.de;
<https://www.ispo.com>

Aircraft Interiors Expo

6–8 June 2023
Hamburg, Germany
Polly Magraw, Reed Exhibitions Ltd;
Tel: +44 (20) 8271-2174
polly.magraw@rxglobal.com;
<https://www.aircraftinteriorsexpo.com>

GO Wipes Europe

7 June 2023
Online
Ellie Baker, Events and Sponsorship
Sales, Smithers;
Tel: +44 (1372) 802291
ebaker@smithers.com;
<https://www.go-wipes.com>

ITMA

8–14 June 2023
Milan, Italy
ITMA Services;
Tel: +65 6849-9368
info@itma.com;
<https://itma.com>

The Global Digital Textile Conference

10 June 2023
Milan, Italy
World Textile Information Network;
Tel: +44 (113) 819-8155
info@wtin.com;
<https://gdtc.wtin.com>

July 2023

Nanotextology

1–8 July 2023
Thessaloniki, Greece
Sergios Logothetidis, Chair,
Nanotextology;
Tel: +30 (231) 099-8174
info@nanotextology.com;
<https://www.nanotextology.com>

The Textile Institute World Conference

3–6 July 2023
Huddersfield, UK
Robyn Ingham, Events Coordinator,
The Textiles Institute;
Tel: +44 (161) 237-118
ringham@textileinst.org.uk;
<https://www.textileinstitute.org>

World of Wipes

17–20 July 2023
Atlanta, Georgia, USA
Misty Ayers, Marketing Coordinator,
INDA (Association of the Nonwoven
Fabrics Industry);
Tel: +1 (919) 459-3712
mayers@inda.org;
<https://www.worldofwipes.org>

International Conference on Composite Materials (ICCM)

30 July–4 August 2023
Belfast, UK
Kristen Scully, Administrative Assistant,
University of Delaware Center for
Composite Materials;
Tel: +1 (302) 831-8149;
Fax: +1 (302) 831-8525;
Kscully@udel.edu;
<https://iccm23.org>

August 2023

Intertextile Shanghai Home Textiles

16–18 August 2023
Shanghai, China
Rita Li, Messe Frankfurt (HK) Ltd;
Tel: +852 223-9966;
Fax: +852 2598-8771;
rita.li@hongkong.messefrankfurt.com;
<https://intertextilehome.hk.messefrankfurt.com/china/en.html>

FESPA Mexico

17–19 August 2023
Mexico City, Mexico
Leighona Aris, FESPA;
Tel: +44 (1737) 228160
Leighona.Aris@fespa.com;
<https://www.fespa.com>

September 2023

International Composites Summit

6–7 September 2023
Milton Keynes, UK
Composites UK;
Tel: +44 (1442) 817502
info@fpcc-conference.com;
<https://compositesuk.co.uk/events/international-composites-summit>

Research, Innovation and Science for Engineered Fabrics (RISE) 2023

12–13 September 2023
Raleigh, North Carolina, USA
Misty Ayers, Marketing Coordinator,
INDA (Association of the Nonwoven
Fabrics Industry);
Tel: +1 (919) 459-3712
mayers@inda.org;
<https://www.riseconf.net>

Textile Discovery Summit

12–14 September 2023
Greenville, South Carolina, USA
Kim Nicholson, AATCC;
Tel: +1 (919) 549-8141
education-dept@aatcc.org;
<https://aatcc.org/events>

Dornbirn Global Fiber Congress

13–15 September 2023
Dornbirn, Austria
Dornbirn Global Fiber Congress Office;
Tel: +43 (1) 319-2909-41;
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office@dornbirn-gfc.com;
<http://www.dornbirn-gfc.com>

The Emergency Services Show

19–20 September 2022
Birmingham, UK
David Brown, Event Director,
Nineteen Group;
Tel: +44 (20) 8947-9177
dbrown@nineteengroup.com;
<https://www.emergencyuk.com>

CINTE Techtextil China

19–21 September 2023
Shanghai, China
Jason Taylor, Messe Frankfurt (HK) Ltd;
Tel: +852 2230-9296;
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jason.taylor@hongkong.messefrankfurt.com;
<https://cinte-techtextil-china.hk.messefrankfurt.com/shanghai/en.html>

October 2023

Performance Days

4–5 October 2023
Munich, Germany
Design and Development GmbH
Textile Consult;
Tel: 49 (89) 9394-6060
info@performancedays.com;
<https://www.performancedays.com>

FiltXPO

10–12 October 2023
Chicago, Illinois, USA
Lori Reynolds, Director of Events,
INDA (Association of the Nonwoven
Fabrics Industry);
Tel: +1 (919) 459-3716;
Fax: +1 (919) 459-3701;
lori@filtxpo.com;
<https://www.filtxpo.com>

Textile Rental Services Association (TRSA) 110th Annual Conference

10–12 October 2023
Naples, Florida, USA
Susie Jackson, Textile Rental
Services Association;



Tel: +1 (540) 632-1933
sjackson@trsa.org;
<https://web.cvent.com/event/c071cff4-6692-45ed-ab36-198fe47e456a/summary>

Outlook

18–20 October 2023
 Algarve, Portugal
 Delphine Rens, Marketing and Communications Coordinator, EDANA;
 Tel: +32 (2) 740-1822;
 Fax: +32 (2) 733-3518;
delphine.rens@edana.org;
<https://www.edana.org/events/outlook/outlook-2023>

November 2023

Advanced Engineering

1–2 November 2023
 Birmingham, UK
 Alison Willis, Divisional Director, Easy Fairs;
 Tel: +44 (20) 3196-4303
alison.willis@easyfairs.com;
<https://www.advancedengineeringuk.com>

Advanced Textiles Expo

1–3 November 2023
 Orlando, Florida, USA
 Amy Collins, Advanced Textiles Association;
 Tel: +1 651 225 6970
amy.collins@textiles.org;
<https://www.textiles.org/event/ifai-expo-2023>

PCIAW Summit

7–9 November 2023
 Porto, Portugal
 Yvette Ashby, Chief Executive Officer, Professional Clothing Industry Association Worldwide;
 Tel: +44 (1908) 411415
yvette@pciaw.org;
<https://pciaw.org/summit/>

Railway Interior Innovation Summit

8–9 November 2023
 Vienna, Austria
 Andreas Wibowo, Business Development Manager, Red Cabin;
 Tel: +49 (162) 256-7382
andreas.wibowo@redcabin.de;
<http://redcabin.de>

Hygienix

13–16 November 2023
 New Orleans, Louisiana, USA
 Tracie Leatham, INDA (Association of the Nonwoven Fabrics Industry);
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tleatham@inda.org;
<https://www.hygienix.org>

Space Tech Expo Europe

14–16 November 2023
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 Gordon McHattie, Event Director, Smarter Shows;
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daphnepoon@itma.com;
<https://www.itmaasia.com>

26th Annual Carbon Fiber Conference

28–30 November 2023
 Salt Lake City, Utah, USA
 Tara Grogan, Conference Manager, Gardner Business Media, Inc;
tgrogan@gardnerweb.com;
<https://www.carbonfiberevent.com>

ISPO Munich

28–30 November 2023
 Munich, Germany
 Sabine Wagner, ISPO;
 Tel: +49 (89) 949-20802
sabine.wagner@messe-muenchen.de;
<https://www.ispo.com/en/munich>

Aachen-Dresden-Denkendorf International Textile Conference

30 November–1 December 2023
 Aachen, Germany
 Sabine Keller, Deutsche Institute für Textil- und Faserforschung Denkendorf (DITF);
 Tel: +49 (711) 9340-505
add-itc-2020@ditf.de;
<https://www.aachen-dresden-denkendorf.de/en/itc>

January 2024

Heimtextil

9–12 January 2024
 Frankfurt, Germany
 Bettina Bär, Messe Frankfurt Exhibition GmbH;
 Tel: +49 (69) 7575-6096
bettina.baer@messefrankfurt.com;
<https://heimtextil.messefrankfurt.com>

Domotex

11–14 January 2024
 Hannover, Germany
 Sonia Wedell-Castellano, Deutsche Messe;
 Tel: +49 (511) 893-32130
info@messe.de;
<https://www.domotex.de>

Wearable Expo

24–26 January 2024
 Tokyo, Japan
 Reed Exhibitions Japan Ltd;
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wearable-eng@reedexpo.co.jp;
<https://www.wearable-expo.jp>

March 2024

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5–7 March 2024
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boudjemia@jeccomposites.com;
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April 2024

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9–12 April 2024
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9–12 April 2024
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May 2024

NPE: The Plastics Show

6–10 May 2024
 Orlando, Florida, USA
 Ashley Stoney, Plastics Industry Association;
 Tel: +1 (202) 974-5210;
 Fax: +1 (202) 296-7005;
astoney@plasticsindustry.org;
<http://www.npe.org>



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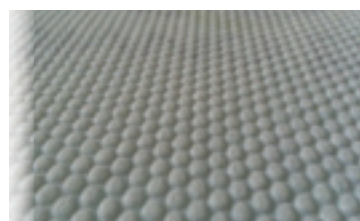
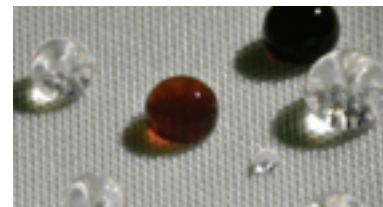
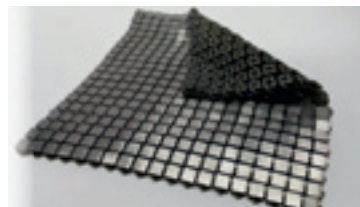
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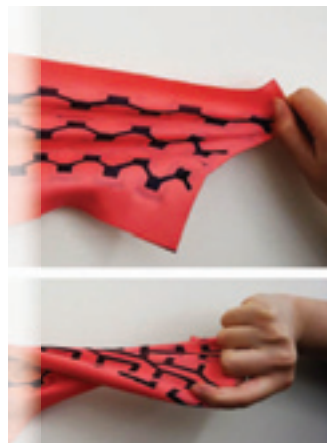
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Fibres, filaments and yarns

Artificial silk door-pulls feature on Mercedes-Benz concept car

Novel, sustainable door-pulls made from artificial silk fibre are being used by Mercedes-Benz of Stuttgart, Germany, in its latest concept car, the Vision EQXX. The carmaker has designed Vision EQXX to highlight ways in which luxury vehicles can be produced using technologies that are more environmentally sustainable than conventional approaches.

The artificial silk fibre is called BioSteel and is produced by AMSilk of Planegg, Germany. The company says that the fibres are biodegradable and recyclable, and no waste is generated during their manufacture. It adds that BioSteel demonstrates mechanical properties

The door pulls for the Vision EQXX concept car from Mercedes-Benz are made from BioSteel artificial silk fibres.

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