Technical TEXTILES international

Winter 2024
Volume 33, Number 4

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The search for alternatives to fluorocarbon-based finishes

INSIDE:

ANNUAL BUYER'S GUIDE FOR THE INDUSTRY

Printed energy grid enables wireless charging for smart textiles

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Technical TEXTILES international

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In the Editor's opinion

According to the saying (or possibly even curse), 'may you live in interesting times'. Like it or not, in the technical textiles industry, we live and work in interesting times. This time in 2023, buoyed by the impressive showing at *ITMA* in Milan, Italy, in the June of that year, I expressed cautious optimism that the technical textiles industry may return to some kind of normality in 2024. That optimism appears to have been misplaced.

The technical textiles industry, and the industry in Europe in particular, still faces some unprecedented economic, political and regulatory challenges. Geopolitical uncertainty, coupled with inflation, has created an environment where many are reluctant to invest. Dogged by high energy prices and forced to comply with increasingly stringent environmental regulations, European producers of fibres and textiles are struggling to match the prices of their competitors in Asia.

One of the great joys of this job is being able to meet and talk with you at industry events. This year, those conversations have painted a somewhat bleak picture. Industry leaders have, for instance, reported drops in revenue of 25-30%. There have been exercises in belt-tightening, such as travel bans and cuts to marketing budgets, and talks of compulsory redundancies. Such experiences have been echoed in the business news pages of this and recent issues of *Technical Textiles International*. On page 32, for instance, we report that industry stalwart Kelheim Fibres has filed for insolvency, while Honeywell is looking to divest itself of its technical textile-related operations.

As we look to 2025, are there any reasons to be more cheerful? Possibly. Dozens of elections took place across the globe in 2024. Each of these elections created a degree of general uncertainty in their respective nations and, as we know, uncertainty is the enemy of investment. There is likely to be more certainty in 2025. That said, the re-election of Donald Trump as President of the USA could throw something of a spanner in the works. Already, there are talks of tariffs and trade wars emerging from his administration-in-waiting. The technical textiles industry is truly global, and the effects of such policies could be significant. Further, it remains to be seen how a Trump presidency will handle another of the big issues affecting the industry; the conflicts in Ukraine and the Middle East.

The technical textiles industry, however, is driven by innovation and has proved itself resilient to change. This is evidenced in the two features in this issue. Starting on page 15, our US editor John McCurry speaks to the senior leadership team of Shawmut Corp, a company with over a century of experience related to adapting to changing business needs and conditions. Further, starting on page 20, we round-up the latest technologies being developed in response to the need to eliminate perfluoroalkyl and polyfluoroalkyl substances (PFAS) from textile finishes.

Whatever happens in 2025, as it enters its 34th year of continuous publication, *Technical Textiles International*, together with its sister website technical-textiles.net, will be here to keep you informed.

Technical TEXTILES international

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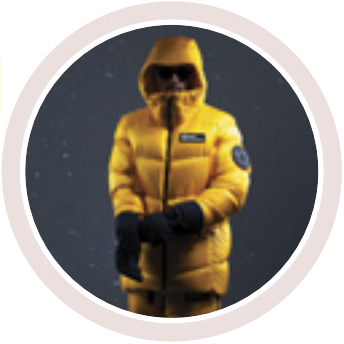
On the cover:

Starting on page 15, John McCurry talks to Shawmut Corp's senior management about the the automotive market, the company's approach to innovation and its plans for the future



Increasingly stringent regulation on the use of PFAS is driving a proliferation in development of PFAS-free alternatives to conventional textile finishes. Starting on page 20, we look at some of these alternatives in detail.

Technical TEXTILES international

Further information at https://www.technical-textiles.net

Monforts, Baldwin and Archroma form finishing alliance

An alliance has been formed between supplier of dyes and finishes, Archroma, the developer of a non-contact precision-spray finishing system (TexCoat G4), Baldwin Technology, and manufacturer of finishing machinery, Monforts, have formed an alliance to develop more environmentally friendly finishing technologies.

Through the alliance, Monforts will install a TexCoat G4 unit on a stenter frame at its Advanced Technology Center (ATC) at its headquarters in Mönchengladbach, Germany. The unit will apply finishes from Archroma of Pratteln, Switzerland. Together, the three companies will support customers in their development projects for increasing the quality and performance of their finished products, while improving the productivity and efficiency of their processes.

Baldwin Technology, of St Louis, Missouri, USA, says that the use of the TexCoat G4 for the finishing of textiles can reduce water and energy consumption by as much as 50% compared with traditional padding processes. The finish, which can be softeners, antimicrobials, durable water-repellents, flame-retardants, resins and most other water-based chemicals, is distributed uniformly across the textile surface and is applied only where it is required—on one or both sides of the fabric.

Monforts Engineer Saskia Kuhlen says: "Our ATC already houses two full Montex stenter finishing lines engineered to accommodate an extremely diverse range of processes, in addition to a Thermex range for the continuous dyeing of denim and other woven fabrics, a full colour kitchen and a number of laboratory-scale systems for smaller batch trials. It enables our customers to test their own textiles and technical fabrics under fully confidential, real production conditions and, using the results from these trials, we are also able to make recommendations for improving many fabric finishes. The new TexCoat [G4] installation will make an important contribution to what we can achieve."

Baldwin's TexCoat G4 integrated into Monforts' stenter frame, applying a fluorocarbon-free water-repellent from Archroma.

Global Marketing Segment Manager for Technical Textiles at Archroma Textile Effects, Michael Schuhmann, says: "Archroma's commitment to advancing sustainability solutions for technical textiles has led to a pivotal partnership with Baldwin[1], where the benefits of contactless precision spray combined with our solutions have helped textile manufacturers achieve greater energy and water savings."

In 2013, Monforts opened the €2.5-million Monforts Advanced Technology Centre in Mönchengladbach, Germany.

Baldwin's Vice President of Business Development for Textiles, Rick Stanford, adds that Baldwin has enjoyed a good relationship with Monforts and Archroma over the last few years.

Individually, Stanford says, "we are working hard to assist our customers to achieve their sustainability and environmental targets, but this is the first time the three companies have committed to working together with a focus on bringing transformative change to the dyeing and finishing space."

Beyond textile finishing, Monforts, Baldwin and Archroma will work together to develop a versatile offering that will include coloration concepts, and the partners plan to expand their collaboration to continuous spray-dye applications developed by Baldwin.

See also: [1]*Archroma and Baldwin Technology initiate partnership*, https://www.technical-textiles.net/node/76784

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Monforts celebrates anniversary at ITMA Asia + CITME in Shanghai

Monforts recently celebrated its 140th anniversary at a special event for staff and their families at its headquarters in Mönchengladbach, Germany.

The manufacturer of textile finishing machines says that it is building on a rich history since its foundation by August Monforts in 1884, and that it remains dedicated to the development of technologies that will ensure the future success of its textile-industry customers.

Under the motto '140 Years of Performance, Innovation and Partners', Monforts further celebrated this milestone with its representatives and customers at the *ITMA Asia + CITME* exhibition in Shanghai on 14-18 October 2024.

"We have moved over the many decades through mechanical and steam-powered technologies to the first mass-production lines, electronic drives, special machine construction and highly modular machines," observes Monforts Managing Director Gunnar Meyer. "Now we are truly in the digital age, and we are committed to investing in the digitalisation of our technology, with concepts which assure an overall quality control and energy monitoring."

Overseen by four successive generations of the Monforts family, the Monforts' range of textile machines has been significantly expanded over the decades. Monforts Montex stenters – for processes such as drying, stretching, heat-setting and coating – are now the industry standard, the company says, for the fabric-finishing industry in the sectors of denim, home textiles and technical textiles. The other key technologies in the Monforts range include DynAir relaxation dryers, Thermex continuous dyeing ranges, Monfortex compressive shrinking ranges and MontexCoat and coaTTex coating units.

In 2013, Monforts opened the €2.5-million Monforts Advanced Technology Centre (ATC) in Mönchengladbach, which it says has proved an invaluable resource to

Monforts says that its Montex stenters are now the industry standard for the fabric-finishing industry.

customers for achieving new standards in fabric finishing. Also in 2013, Monforts became a member of the CHTC Fong's Group of Hong Kong, China, which is today one of the world's largest manufacturers of textile dyeing and finishing machinery.

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Archroma launches system for commercial bio-based textile printing

Fabric that has been printed using Archroma's NTR Printing System.

Archroma, of Pratteln, Switzerland, has launched a system that it says will make bio-based pigment printing commercially possible for the first time.

Called the NTR Printing System, it uses partially renewable raw materials, is designed for safer chemistry and, Archroma claims, will help apparel and textile brands reduce their environmental footprint, while producing high-quality, durable black shades on garments.

Bio-based pigment printing is an emerging technology that is attracting major interest from brands that want to use pigments derived from natural sources, such as plants, in the production of environmentally conscious textiles. However, bio-based pigments have not yet delivered reliable colour-fastness, and colour-quality and production performance have not been sufficient to support commercial-scale production.

Archroma's NTR Printing System uses the following printing elements, which the company describe as highly efficient and robust:

- Printofix Black NTR-TF, a non-gelling pigment black with 79% renewable carbon content, designed for use in textile applications with no impact on fastness levels;
- Helizarin NTR-SS, a formaldehyde-free super-soft binder with 40% renewable carbon content[(1)], designed to ensure very good overall fastness levels;
- Luprintol Fixing Agent NTR-HF, a formaldehyde-free fixing agent with 40% renewable carbon content, designed for high wet-fastness in rubbing and laundry.

All three elements are being evaluated for compliance with globally accepted standards such as bluesign, the Global Organic Textile Standard (GOTS) and Zero Discharge of Hazardous Chemicals (ZDHC). The system also complies with major industry restricted substances list (RSL) requirements.

The system is suitable for most popular application technologies, including printing, coating and continuous pigment dyeing, showing good production efficiency. The company says that two successful bulk trials have been conducted with Textprint S. A. of Barcelona, Spain, and Jeanologia of Paterna, Spain.

"These properties make the new NTR Printing System ideal for the highly competitive denim market, where sustainability, comfort and durability are important; for knits, where very soft hand feel is essential; and [for] babywear, where both exceptional softness and safety are required," said Joaquin Femat, Market Segment Director for Printing at Archroma.

See also: [(1)]Based on ASTM D6866: *Standard test methods for determining the biobased content of solid, liquid and gaseous samples using radiocarbon analysis.*

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Antimicrobial treatment to be used in hospitality sector

1888 Mills is to supply textile products, such as bedding and towels, treated with a gold-based antibacterial and antifungal treatment from Fuze Biotech to the hospitality industry.

Fuze Biotech, of Salt Lake City, Utah, USA, says that its treatment, called Fuze, is a chemical-free, water-based solution that permanently adheres to materials without the need for binders or surfactants. The company claims that the treatment, which is applied to surfaces as a light mist in a patented embedding process, maintains its antimicrobial effect for over 100 washes in commercial laundry machines.

The Chief Executive Officer (CEO) and Chief Technology Officer (CTO) of Fuze Biotech, Andrew Peterson, says: "Replacing an existing technology with a Fuze application can reduce chemicals in our water systems by up to [22.7 t] 50 000 pounds per [914 400 m] million yards of textiles. We are the only single product known that will not create bacteria-resistant 'superbugs' while still being a wide-spectrum antibacterial biostatic agent."

1888 Mills, of Griffin, Georgia, USA, and Fuze Biotech have been working together in 1888 Mill's factories in Pakistan to test and refine processes for the application of Fuze to textiles for the hospitality industry.

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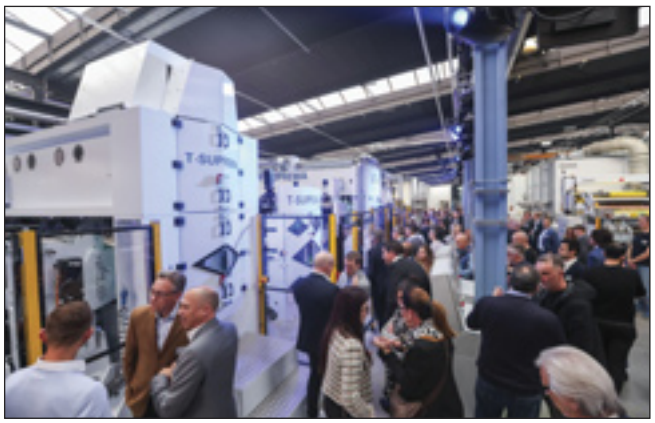
Trützschler and Texnology receive order for first needlepunching line



The partnership between Trützschler Nonwovens and Texnology Srl, and their customer, ORV Manufacturing SpA, began with this customer event at Trützschler's Nonwoven Customer and Technology Center in Egelsbach, Germany.

ORV Manufacturing SpA has placed an order for a production line (T-Suprema) for needlepunched and thermobonded polyester (PES) nonwovens for, among other applications, filter media, with Trützschler Nonwovens and Texnology Srl.

Trützschler Nonwovens, of Egelsbach, Germany, says that the multi-purpose line will be one of the largest of its kind in Europe. It is also the first T-Suprema line to be sold by Trützschler Nonwovens and Texnology Srl, of Fontaniva, Italy, since the formation of their partnership in 2022[1].

For over 75 years, ORV Manufacturing, which is part of the Peruzzo Productions Group, has produced nonwovens for a variety of applications, including clothing, furnishings, coating supports, filter media, thermal–acoustic insulation, and a variety of different products for the automotive sector. ORV Manufacturing's production sites in northern Italy are located in Carmignano di Brenta and Grantorto, while the other members of the group are active in southern Italy, Romania, Poland and Brazil.

Initial customer trials in May 2024 at Trützschler's Nonwoven Customer and Technology Center (NCTC) in Egelsbach convinced ORV Manufacturing of the versatility of the T-Suprema line. The Co-owner of Texnology, Nicola Olivo, says: "We build strong, lasting relationships with our customers to ensure consistent quality and performance. We strive to set new industry standards while implementing environmentally conscious solutions. Together, we leverage the unique strengths of each company and transform these values into high-quality products."

See also: [1]*Trützschler Nonwovens and Texnology form needlepunching alliance*, https://www.technical-textiles.net/node/76799

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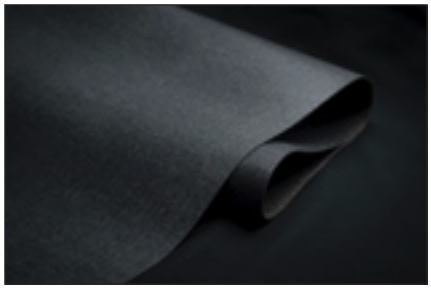
Flame-retardant nonwoven for safer electric-vehicle batteries



Lastan is a flame-resistant fabric made by air-baking an acrylic fibre at 200–300°C and is characterised by high flame-retardance and low electrical conductivity.

A flame-retardant (FR) and highly flexible nonwoven (Lastan) that can be incorporated into top covers and busbar protection sleeves to protect from thermal runaway (a cyclic, self-propagating process that causes a cascading increase in temperature) in the batteries of electric vehicles (EVs) has been launched by Asahi Kasei of Tokyo, Japan.

Currently, mineral-based materials are used to prevent EV batteries from experiencing thermal runaway, but these are heavy and brittle, and their stiffness makes them difficult to form into complicated shapes.

Lastan is a flame-resistant fabric made by air-baking an acrylic fibre at 200–300°C and is characterised by high flame-retardance and low electrical conductivity. These properties are further improved by a coating that also augments the abrasion-resistance of the fabric, which allows it to provide effective protection against particle bombardment from venting gas.

Asahi Kasei says that, when a 1300°C-flame is applied to one surface of Lastan, the temperature on the opposite surface remains below 400°C. While a limiting oxygen index (LOI) value of 27 or higher is generally considered to indicate flame-retardance, this material has an LOI value of 50 or higher. In Underwriters Laboratories' UL94 V0 flammability testing, Lastan has obtained the highest rating of 5VA. No holes are formed in Lastan even when it is exposed to a flame of 1300°C for one minute.

Further, Lastan is resistant to high-pressure impact by particles of 200–500 µm in size and provides electrical insulating capacity of up to 3.5 kV at a thickness of 1 mm.

The nonwoven is highly flexible, while maintaining its performance characteristics in sheets as thin as 0.8 mm, enabling it to be processed using ordinary tools.

Asahi Kasei exhibited Lastan at the *North American Battery Show* on 7-10 October 2024 in Detroit, Michigan, USA.

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Autoneum makes strategic acquisition in China

Autoneum is to acquire a 70% share of a leading Chinese supplier of acoustic and thermal insulation components to the domestic automotive industry, Jiangsu Huanyu Group, following the signing of an agreement by the two companies.

Autoneum, of Winterthur, Switzerland, says that the acquisition will increase the size of its customer base to include major Chinese vehicle manufacturers, such as BYD, BAIC and GAC, and will significantly increase its annual revenues. The transaction is scheduled to close in March 2025.

Established in 2001 and based in Jiangsu, China, Jiangsu Huanyu operates 14 production facilities in the immediate vicinity of car manufacturers in the north, west and southeast of China, and employs around 1100 people. It manufactures automotive components such as carpets, inner and outer dashes, headliners, trunk and interior trim, wheelhouse outer liners and insulation for engine bays and underbodies. It also supplies commercial vehicle manufacturers, supporting Autoneum's aim of growing its truck business in China. In its 2023 financial year, Jiangsu Huanyu generated revenue of around CHF130 million and is recording strong growth in 2024.

The acquisition will be carried-out in two phases. Autoneum expects that the closing of phase one, the takeover of a majority stake of 70% for a purchase price of around CHF75 million, will take place in March 2025 after approval by the authorities. For the acquisition of the remaining 30% of the share capital, Autoneum has a call option, which can be exercised in 2028.

Producing around 30 million light vehicles each year, China is the world's largest automotive market. Autoneum's Chief Executive Officer (CEO), Eelco Spoelder, says: "With its plants in the key automotive hubs in China, the company is an excellent strategic addition to Autoneum and brings us a significant step closer to our medium-term target of generating 20% of group revenue in Asia."

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Battery separator supports high charge and discharge rates

A nonwoven separator for lithium-ion batteries with high charge and discharge rates (with a C-rate, a measurement of the current at which the battery is charged or discharged, of up to 16) has been launched by Glatfelter Corp of Charlotte, North Carolina, USA.

Called OmniSep, the separator can be tailored to the needs of a given application. It can be made to be highly porous to increase ionic conductivity and the rate at which a battery can be charged, or its pore size can be made smaller to increase shelf-life. Various polymers can be used for its production to meet the temperature and safety requirements of each application. The standard grades of OmniSep, of 15 and 22 µm in thickness, are thermally stable up to 150°C, while developmental grades are stable up to 200°C, thereby eliminating the need for the ceramic coatings that are often applied to battery separators.

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DuPont files complaint with the International Trade Commission

DuPont has filed a complaint with the US International Trade Commission (ITC) against a number of Chinese companies with the aim of blocking importation of products that infringe its intellectual property (IP) related to its Tyvek brand and products.

Tyvek products are flashspun high-density polyethylene nonwovens that DuPont says are lightweight, durable and breathable, yet resistant to water, abrasion, bacterial penetration and ageing.

Dupont, of Wilmington, Delaware, USA, has filed the complaint against Xiamen Dangsheng New Materials and affiliates and Jiangsu Qingyun New Materials (known as Kingwills New Materials) and affiliates, among others. Xiamen Dangsheng New Materials is a developer and producer of high-performance fibre materials based in Xiamen, Fujian, China, and Kingwills New Materials is a producer of flash-spun metamaterial and is based in Shanghai, China.

The ITC is an independent, non-partisan federal agency based in Washington D.C. that investigates and makes determinations on proceedings involving imports claimed to injure a US domestic industry or violate US IP rights.

DuPont is asking the ITC to investigate its claims and issue a general exclusion order to bar the importation of any infringing materials into the USA. This would include all applications where the infringing material is imported as a stand-alone product or incorporated into a converted or finished product.

The Vice President & General Manager, DuPont Tyvek, David Domnisch, says: "For many decades, DuPont has been investing to deliver world-class innovation with our technology and products, which is why so many customers trust the superior quality and performance of authentic Tyvek products in their most vital applications. This is why we take actions to defend our proprietary technology advancements,

The structure of Tyvek as viewed through a microscope.

our scientists who develop them, and our customers who utilise Tyvek products in life-critical applications. We are committed to fight for fair competition, vigorously defending our IP rights when they are being infringed, and will pursue all available enforcement options in the US and other global jurisdictions."

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Trützschler Group sells carding machines to Ibrahim Fibres

Some of the nearly 200 Trützschler carding machines operated by Ibrahim Fibres of Faisalbad, Pakistan.

Textile machinery manufacturer Trützschler Group of Mönchengladbach, Germany has sold eighteen TC 30Si carding machines to Ibrahim Fibres, a producer of yarns for woven and knitted fabrics based in Faisalabad, Pakistan.

The yarns produced by Ibrahim Fibres include blends of cotton, viscose and polyester (PES) with yarn counts ranging from Ne 8 to Ne 50. The company uses its own PES to produce poly-viscose and poly-cotton combed yarn at four factories, and already operated nearly 200 Trützschler carding machines prior to this latest purchase. In total, Ibrahim Fibres manufactures 1200 t of PES staple fibre (PSF) per day and consumes around 100 t of its own material per day. The remaining material is sold to other textile manufacturers.

Trützschler and Ibrahim Fibres have had a productive relationship for over 20 years and work together on the development of solutions to processing challenges. Ibrahim Fibres recently requested from Trützschler a solution to the challenge of producing high-quality yarns from long (51 mm) PES and viscose fibres. Such fibres, which have high strength and durability, are used for luxury textiles, high-performance fabrics, fine bedding and advanced nonwoven materials. However, long fibres can be difficult to process, because they tend to wrap around or clog carding elements. They also tend to be tightly bound, which makes them difficult to open.

The result of this collaboration is what Trützschler calls an optimised TC 30Si carding machine for processing long PES and viscose fibres. The machine can process these fibres effectively owing to its large drum diameter of 1400mm, which results in an extension of carding length of 14%.

Ibrahim Fibres says that the TC 30Si also has user-friendly software and an intuitive human-machine interface, making it easy to maintain with minimal adjustments, and that it boosts productivity, reduces energy consumption, improves consistency and reduces defects.

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Chinese automotive supplier invests in plant for carpet yarns

Oerlikon Neumag says that this three-end BCF S+ system delivers production speeds and capacities reliably, and yields high-quality yarns

Chinese supplier to the automotive industry, Sailuda, is to produce bulk continuous filament (BCF) yarns for the manufacture of its carpets using a plant from Oerlikon Neumag.

Oerlikon Neumag, of Neumünster, Germany, says that Sailuda, of Shanghai, will use the recently commissioned, two-position BCF S+ plant for the production of polyamide (PA) 6 and polyethylene terephthalate (PET) monocolour BCF yarns. By opting to bring the production of the yarns in-house, Sailuda will have greater control over the production and quality of its carpets. According to the Chief Executive Officer (CEO) of Sailuda, John Zhu, the company will invest in another plant at the end of 2024. He adds that yarns produced using the new plant "have a very uniform crimp with a high degree of coverage in the carpet."

Sailuda supplies its products to international original equipment manufacturers (OEMs) such as BMW, Volvo, Volkswagen (VW) and Ford, and Chinese manufacturers of electric vehicles (EVs) such as NIO, Lixiang and SERES.

While carpet yarns have traditionally been produced in the USA and Turkey, the growth in the production of EVs in China is giving Asian carpet manufacturers a significant boost.

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Bulk continuous filament-yarn producer Sitong expands capacity

The Chinese carpet-yarn manufacturer Zhejiang Sitong New Material Technology Co Ltd (Sitong) is expanding its capacity for the production of polyester (PES) yarn with the commissioning of a bulk continuous filament (BCF) line from Oerlikon Neumag of Neumünster, Germany.

With a total production capacity of 50 kt a year, Sitong is one of the largest BCF yarn manufacturers in Asia. With the installation of an additional four spinning positions (Oerlikon's BCF S+) for PES yarn, the company from Hangzhou is responding to increasing demand for PES carpet yarns. In the future, Sitong will also use the BCF S+ positions to produce BCF yarns made of PES, polyamide (PA) 6 and polypropylene (PP). The positions performed well producing PA yarn during the commissioning process.

The owner and President of Sitong, Tang Liang, says: "Our strategy is a broad portfolio; this makes us more robust in the face of trends and market fluctuations. Since our foundation in 2002, we have relied on technology from Europe; for PES production, we only consider Oerlikon Neumag plants. We have established ourselves with our quality products in both the local and international markets; this shows that we have made the right investment decisions."

The ability to switch quickly to the cost-effective production of high-quality PA 6 yarn gives Sitong a significant competitive advantage. Tang Liang explains: "Trends are becoming increasingly short-lived. However, investing in a plant is a long-term decision. So, it is a strong argument if I can spin different polymers with the same system without sacrificing the quality of the end-product."

The Asian carpet market is currently experiencing significant growth, owing to the strengthening of the Chinese automotive sector and the resurgence in travel following the human coronavirus (covid-19) pandemic. Sales Director at Oerlikon Neumag in China, Sun Peng, concludes: "Many hotels are currently being renovated and new ones are being built. During the pandemic, many hotels were closed, but now there is a significant backlog demand."

Oerlikon Neumag says that its three-end bulk continuous filament (BCF) system (BCF S+) is extremely flexible: even when optimised for polyester yarn production, the system produces excellent polyamide 6 yarn.

André Wissenberg, Vice President and Head of Marketing, Corporate Communications and Public Affairs, Oerlikon Polymer Processing Solutions.
Tel: +49 (2191) 67-2331.
Email: andre.wissenberg@oerlikon.com;
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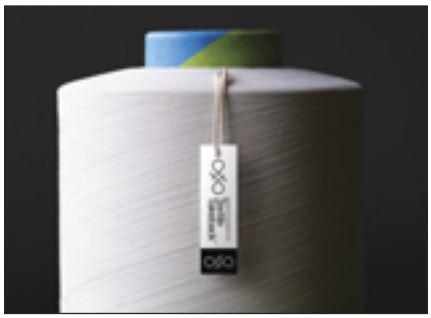
Unifi launches polyester products made using textile waste



The filament yarn, made by Unifi using polyester sourced from textile waste, can be dyed using standard processes and can be modified to be elastic, to suppress odour and to manage moisture.

A white dyeable filament yarn and a range of fibre-based insulation made in part from polyester (PES) sourced from post-consumer textile waste have been launched by Unifi of Greensboro, North Carolina, USA.

The company says that the two products are made entirely from recycled PES, at least 50% of which is reclaimed from textile waste, and demonstrate properties equivalent to products made from virgin PES. Through its Textile Takeback process, the company claims that it can recycle both global post-industrial and post-consumer textile waste, including offcuts from production patterns, seasonal items, misprints and other types of cut-and-sew waste. It adds that the technology it uses to recycle these materials protects the molecular integrity of the polymers from which they are made, making textile-to-textile recycling possible.

The filament yarn, part of Unifi's Repreve range, can be dyed using standard processes and can be modified to be elastic, to suppress odour and to manage moisture.

Called ThermaLoop, the insulation is available as down-like fibre, fibreball and padding, and is quick-drying, lightweight and machine-washable.

Both products can be certified according to Unifi's U Trust[(1)] system, which enables its customers to prove that recycled materials are used in their fabrics.

See also: [(1)]*Unifi launches products at Outdoor Retailer's Winter Market,* https://www.technical-textiles.net/node/76579

Sharon Roberts, Executive Assistant, Investor Relations, Unifi Inc.
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http://www.unifi.com

Partnership to develop odour-supressing, biodegradable textiles

Microban has formed a partnership with the developer of an additive (CiCLO), Intrinsic Advanced Materials (IAM), to develop fibres that can supress the formation of odours in textiles and will biodegrade in natural environments.

Microban, of Huntersville, North Carolina, USA, produces a range of additives that can be used to control the growth of microbes, and those that create odours in particular. According to IAM, CiCLO causes synthetic fibres to degrade in the natural environment in the same way as natural fibres. The use of CiCLO creates bio-degradable spots in the polymers from which the fibres are made, which enable naturally occurring microbes in certain environments to break them down.

IAM is a joint venture between Parkdale Advanced Materials, of Gastonia, North Carolina, and Intrinsic Textiles Group of Hayward, California, both in the USA. Vice President at Parkdale Advanced Materials, Cheryl Smyre, says: "The collaboration with Microban responds directly to market needs. It offers a dual-benefit solution that enhances textile performance during use without compromising the long-term impact on the environment."

Yihong Li, Senior Technical Manager, Textiles, Microban International.
Tel: +1 (704) 875-0806.
https://www.microban.com

Intrinsic Advanced Materials.
https://ciclotextiles.com

Teijin Frontier launches Octair high-performance insulation fibre

Teijin Frontier of Osaka, Japan, has launched Octair, a premium brand of insulation fibre for bedding and apparel.

Octair is made from a short-cut polyester (PES) fibre featuring a hollow, eight-fin cross- section with radiating protrusions. Teijin Frontier says that Octair meets growing demand for alternatives to natural feathers and the company plans to expand its use across a wide range of materials.

Solotex Octair, for example, is an insulation material that incorporates polytrimethylene terephthalate (PTT) fibres with Octair fibres. The structure of the Octair fibres creates air pockets that provide warmth, loft and lightweight properties. As a result, Solotex Octair gives insulation performance equivalent to that of the same weight of down (based on tests using 30-cm-square quilts).

The helical molecular structure of the PTT fibres gives a soft texture, elasticity and good shape-retention. Additionally, the tips of the fibres are soft, do not spread easily and reduce tangling, making the blowing process for filling pillows and clothing smoother than with conventional PES insulation.

Teijin Frontier says that Solotex Octair offers sustainability benefits through the incorporation of plant-based raw materials, and that it has begun domestic and international sales of the product.

See also: *Introducing the Octopus*, https://www.technical-textiles.net/node/49661

Multifunctional yarn spun from fibres with novel cross-sections, https://www.technical-textiles.net/node/77512

Corporate Communications, Teijin Ltd.
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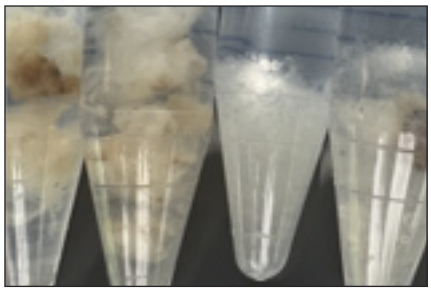
Laboratory-grown cotton start-up raises US$33 million

The developer of a cell culture-based method for producing cotton has secured US$33 million from investors after closing its latest funding round. According to Galy, of Charlestown, Massachusetts, USA, the investors in its Series-B funding round[(1)] include H&M Group, of Stokholm, Sweden, and Inditex, of Arteixo, Spain. Galy will use the financing to take its technology from the laboratory to pre-industrial scale, and to develop other plant cell-based products.

To make its cotton, Galy collects samples from plants and harvests their cells. The cells are grown in bioreactor or fermentation vessels in a cell-culture process similar to brewing. The final product is dried and harvested. Galy says that, compared with traditional methods for growing and harvesting cotton, its process cuts water consumption by 99%, carbon dioxide emissions by 77% and the amount of land required by 99%.



Laboratory-grown cotton in culture media.

The Leader of H&M Group's Circular Innovation Lab, Martin Ekenbark, says: "Galy's laboratory-grown cotton is on the verge of a breakthrough and could reduce reliance on virgin cotton if successful. We have been supporting the company's progress since [it was founded in] 2019 and are really excited to be part of this latest investment round. About 60% of the materials we source for our products is cotton and we have high ambitions that all our materials come from recycled or other sustainable sources by 2030, so partnering with Galy makes perfect sense.

See also: [(1)]Typically, companies that have gone through seed- and Series-A funding rounds have already developed substantial user bases and have proved to investors that they are prepared for success on a larger scale.

Series-B funding is used to grow the company so that it can meet increased levels of demand for its products. It is often followed by a Series-C funding round.

Luciano Bueno, Founder and Chief Executive Officer, Galy.
Email: social@galy.co;
https://www.galy.co

Teijin Frontier increases capacity for conjugate filaments

Teijin Frontier is to increase capacity for the production of conjugate filaments at its subsidiary, Teijin Polyester (Thailand) Limited (TPL) in Pathumthani, Thailand[(1)].

New spinning and drawing machines will be installed at TPL for the production of the fibres, which can be used in place of wool fibres in apparel and uniforms.

Conjugate filaments are manufactured by simultaneously spinning two different polymers from a divided spinneret to create a single fibre, and can take side-by-side or core–sheath forms.

The new equipment will start-up in September 2024 and will enable TPL to produce up to 700 t of these fibres each year.

Teijin Frontier, of Osaka, Japan, says that demand for alternatives to wool fibres has grown in recent years, owing to population growth and increasing costs for the processing of wool fibres. It has therefore been operating at near its full capacity for the production of conjugate filaments.

The conjugate filaments produced at TPL will be sold domestically and internationally in the form of raw yarns, textiles and finished products. Further, the facility will be used to manufacture any new conjugate filaments that may be developed in the future.

See also: [(1)]*Teijin Frontier opens Thai facility for production of polyester filaments*, https://www.technical-textiles.net/node/76950

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January 2025

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https://heimtextil.messefrankfurt.com

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16–19 January 2025
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Wearable Expo
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March 2025

JEC World
4–6 March 2025
Paris, France and online
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http://www.jeccomposites.com

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Yarn Expo Spring
11–13 March 2025
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https://intertextilehome.hk.messefrankfurt.com/china/en.html

Introduction to Textiles
18–20 March 2025
Manchester, UK
Robyn Ingham,Events Coordinator, The Textiles Institute;
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ringham@textileinst.org.uk;
https://www.textileinstitute.org

April 2025

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Fax: +1 (919) 459-3701;
lori@filtxpo.com;
https://www.filtxpo.com

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29 April–1 May 2025
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May 2025

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kristy.meade@usa.messefrankfurt.com;
https://techtextil-north-america.us.messefrankfurt.com

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https://texprocess-americas.us.messefrankfurt.com/atlanta/en.html

FESPA Global Print Expo
6–9 May 2025
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www.fespa.com

Outdoor by ISPO
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Munich, Germany
Sabine Wagner, ISPO;
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sabine.wagner@messe-muenchen.de;
https://www.ispo.com

June 2025

International Textile Machinery Exhibition (ITM)
9–13 June 2025
Istanbul, Turkey
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info@teknikfuarcilik.com;
https://www.itmexhibition.com/itm2024

July 2025

Nanotexnology
5–12 July 2025
Thessaloniki, Greece
Stergios Logothetidis, Chair, Nanotexnology;
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info@nanotexnology.com;
https://www.nanotexnology.com

World of Wipes
21–24 July 2025
Columbus, Ohio, USA
MIsty Ayers, Marketing Coordinator, INDA (Association of the Nonwoven Fabrics Industry);
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mayers@inda.org;
https://www.worldofwipes.org/

August 2025

International Conference on Composite Materials (ICCM)
4–8 August 2025
Baltimore, Maryland, 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

Intertextile Shanghai Home Textiles
20–22 August 2025
Shanghai, China
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September 2025

Dornbirn Global Fiber Congress
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Technical Textiles International 2025 Suppliers Directory

Listed below is a selection of some of the most important companies operating in the technical textiles industry. The listings include textile machinery manufacturers, fibre producers, yarn manufacturers, fabric knitters, nonwovens producers, dyers, finishers, chemical suppliers and other suppliers of goods and services, both to the industry and to end-users.

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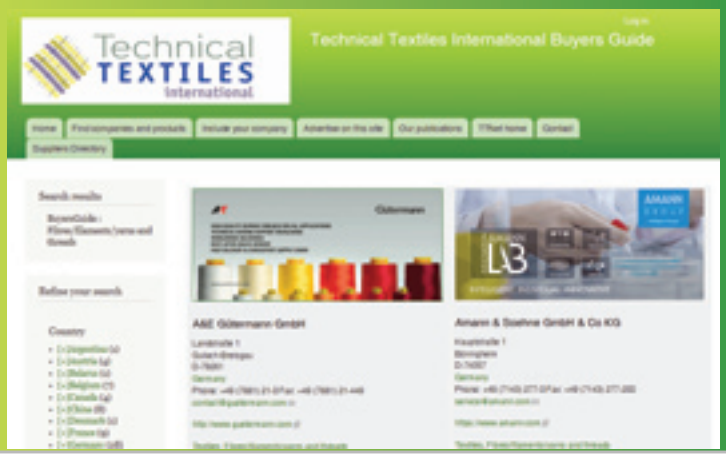

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Buyer's Guide for the Technical Textiles Industry—2025

The object of this *Buyer's Guide for the Technical Textiles Industry* is to put our readers in contact with new suppliers of products and services from around the world.

The *Buyer's Guide* is divided into two sections—an alphabetically arranged directory of the organisations, and an index of the products and services they offer. The directory, which starts on page 53, gives the organisation's full contact details (address, telephone and fax numbers), and email and Internet addresses.

The index is divided into several sections, according to the products and services offered. A full list of the sections and the pages on which they can be found is given to the right. To help readers locate suppliers local to their needs, the companies listed in each section of the index are sorted by country.

The *Buyer's Guide* will be updated and expanded for our Winter 2025 issue, as well as being available throughout 2025 on our website, see below. If you wish to add to or amend your organisation's listing, visit the website or contact the Editor: james@boughtonmedia.com

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Guangdong Jofo Group Co, Guangzhou, China.
Shandong ICD High Performance Fibre Co Ltd, Lai Wu City, China.
Ben's Land (Nanking) Baby Articles Corp Ltd, Nanjing, China.
Lenzing (Nanjing) Fibers Co Ltd, Nanjing, China.
Indorama Ventures Mobility Obernburg GmbH, Shanghai, China.
AGY, Shanghai, China.
Zhejiang Guxiandao Industrial Fibre Co Ltd, Shaoxing, China.
Unifi Textiles (Suzhou) Co (UTSC) Ltd, Suzhou, China.
FiberVisions a/s, Varde, Denmark.
ADFORS Saint-Gobain, Courbevoie, France
Porcher Industries, Badinières, France.
Kermel, Colmar, France.
R.Stat, Mornant, France.
AGY, Lyon Cedex 03, France.
Massebeuf Textiles, Pont de Labeaume, France.
Soficar, Saint Maurice Cedex, France.
Groupe Sofila, Saint-Genis Laval, France.
Tibtech, Tourcoing, France.
Gruschwitz Textilwerke AG, Leutkirch, Germany
Indorama Ventures Mobility Obernburg GmbH, Obernburg, Germany.

Johns Manville, Bobingen, Germany.

Outlast Europe GmbH, Heidenheim, Germany.

Schill + Seilacher GmbH, Böblingen, Germany

Teijin Monofilament Germany GmbH, Bobingen, Germany.
Amann & Söhne GmbH & Co KG, Bönnigheim, Germany.
A&E Gütermann, Gutach-Breisgau, Germany.
PyroTex GmbH, Hamburg, Germany.
Perlon, Bobingen, Germany
Perlon (Hahl Filaments), Munderkingen, Germany.
Advansa BV, Hamm, Germany.
Dolan GmbH, Kelheim, Germany.
Lauffenmühle GmbH & Co KG, Lauchringen, Germany.
Toray International Europe GmbH, Munich, Germany.
Cordenka GmbH, Obernburg, Germany.
W.L. Gore & Associates GmbH, Putzbrunn, Germany.
Smartfiber AG, Rudolstadt, Germany.
dorix GmbH, Selbitz/Bayern, Germany.
W. Zimmermann GmbH & Co KG, Weiler-Simmerberg, Germany.

Johns Manville, Wertheim, Germany.

SGL Carbon SE, Wiesbaden, Germany.
Indorama Ventures Mobility Obernburg GmbH, Wuppertal, Germany.
Toho Tenax Europe GmbH, Wuppertal, Germany.
Polycrest Innovations India Ltd, Chennai, India.
A.T.E. Enterprises Pvt Ltd, Coimbatore, India.
Lenzing AG (India), Coimbatore, India.
SRF Ltd, Gurgaon, India.
Alok Industries Ltd, Mumbai, India.
Arora Fibres, Mumbai, India.
Century Rayon, Mumbai, India.
DSM India Office, Mumbai, India.
Goa Glass Fibre Ltd, Bardez, India.
Reliance Industries Ltd, Mumbai, India.
Renaissance Corp Ltd, Mumbai, India.
Pasupati Spinning & Weaving Mills Ltd, New Delhi, India.
UP Twiga Fibres, New Delhi, India.
Prime Textiles Ltd, Tirupur, India.
PT South Pacific Viscose (Lenzing), Purwakarta, Indonesia.
Wellman International Ltd, Mullagh, Kells, Ireland.
Filature Miroglio, Alba, Italy.
Officine Maccaferri SpA, Bologna, Italy.
Filtes International srl, Capriolo, Italy.
Monosuisse, Emmenbrücke, Switzerland.
MIC - Manifattura Italiana Cucirini SpA, Vallese di Oppeano (VR), Italy.
Torcitura di Menaggio srl, Menaggio, Italy.
Fil Man Made Group, Signoressa di Trevignano, Italy.
Fil.Va Srl, Varese, Italy.
Radici Yarn, Villa d'Ogna, Italy.
Sakai Ovex Co Ltd, Fukui, Japan.
Teijin Techno Products Ltd, Ibaraki, Japan.
Asahi Corp, Osaka, Japan.
Asahi Kasei Fibers Corp, Osaka, Japan.
ES FiberVisions Co Ltd, Osaka, Japan.
Kaneka Corp, Osaka, Japan.
KB Seiren Ltd, Osaka, Japan.
Kuraray Co Ltd, Osaka, Japan.
Teijin Ltd, Osaka, Japan.
Teijin Techno Products Ltd, Osaka, Japan.
Toyobo Co Ltd, Osaka, Japan.
Unitika Fibers, Osaka, Japan.
JNC Corp, Tokyo, Japan.
NatureWorks Japan Ltd, Tokyo, Japan.
Sumitomo Metal Mining Co Ltd, Tokyo, Japan.
Teijin Monofilament Ltd, Tokyo, Japan.
Teijin Techno Products Ltd, Tokyo, Japan.
Toho Tenax, Tokyo, Japan.
Tokokosen Corp, Tokyo, Japan.
Toray Carbon Fibers America Inc, Tokyo, Japan.
Toray Industries Inc, Tokyo, Japan.
DREF, Banting, Malaysia.
Recron (Malaysia) Sdn Bhd, Kuala Lumpur, Malaysia.
Kolon Industries Inc, Kwacheon, South Korea.
Finetex EnE, Seoul, South Korea.
Hyosung Corp, Seoul, South Korea.
Samyang Corp, Seoul, South Korea.
Sniace SA, Madrid, Spain.
Geotexan SA, Minas de Rio Tinto, Spain.
Invista International SarL, Le Grand-Saconnex, Switzerland.
Swicofil, Emmenbrücke, Switzerland.
Chia Her Industrial Co Ltd, Taipei, Taiwan.
Far Eastern New Century Corp, Taipei, Taiwan.
Ho Yu, Taoyuan City, Taiwan.
Kings Metal Fiber Technologies Co Ltd, Taipei, Taiwan.
Lealea Enterprise Co Ltd, Taipei, Taiwan.
Tex-Ray Industrial Co Ltd, Taipei, Taiwan.
Thai Acrylic Fiber Co Ltd, Bangkok, Thailand.
Teijin Aramid BV, Arnhem, The Netherlands.
DSM, Heerlen, The Netherlands.
DSM High Performance Fibers, Heerlen, The Netherlands.
Advansa BV, Hoofddorp, The Netherlands.
Avient Protective Materials, Geelen, The Netherlands.
EuroFibers BV, Maastricht, The Netherlands.
Hacı Ömer Sabancı Holding AS, Istanbul, Turkey.
Coats, Uxbridge, UK.
IFG International Fibres Group, Huddersfield, UK.
H. Dawson Sons & Co (Wool) Ltd, Bradford, UK.
Invista Textiles UK Ltd Gloucester, UK
Recycled Carbon Fibre Ltd, Coseley, UK.
Speciality Fibres & Materials Ltd, Coventry, UK.

Technical Absorbents, Grimsby, UK.

Waxman Fibres Ltd, Elland, UK.
J&D Wilkie Ltd, Kirriemuir, UK.
Don & Low Ltd, Forfar, UK.
Lenzing Fibers (Grimsby), Grimsby, UK.
Smith & Nephew plc, London, UK.
AGY, Aiken, USA.
Stein Fibres Ltd, Albany, USA.
Lenzing Fibers Inc (Mobile), Axis, USA.
Outlast Technologies LLC, Boulder, USA.
Stein Fibers Ltd, Charlotte, USA.
Propex, Chattanooga, USA.
Metal Coated Fibers Inc, Cincinnati, USA.
Quantum Group Inc, The, Colfax, USA.
Syscom Advanced Materials Inc, Columbus, USA.
Nanocomp Technologies, Concord, USA.
Concordia Manufacturing LLC, Coventry, USA.

Johns Manville, Denver, USA.

Basofil Fibers LLC, Enka, USA.
eSpin Technologies Inc, Chattanooga, Tennessee, USA
EY Technologies, Fall River, USA.
FiberVisions Corp, Duluth, USA
Toray Carbon Fibers America Inc, Flower Mound, USA.
Kuraray America, Fort Mill, USA.
Owens Corning, Granville, USA.
Unifi Inc, Greensboro, USA.
Kentwool, Greenville, USA.
Foss Manufacturing Company LLC, Hampton, USA.
SNS NanoFiber Technology LLC, Hudson, USA.
Fiber Innovation Technology Inc, Johnson City, USA.
Ascend Performance Materials, Kennesaw, USA.
Patrick Yarn Mills, Kings Mountain, USA.
Coats Performance Materials, Charlotte, USA.
SPT Technology Inc, Minneapolis, USA.
DuPont, Moncks Corner, USA.
Honeywell International, Morristown, USA.
Kaneka America LLC, New York, USA.
Lenzing Fibers Inc, New York, USA.
Technical Fibre Products Inc, Schenectady, USA.
Zeus Inc, Orangeburg, USA.
Kentwool, Pickens, USA.
Allasso Industries Inc, Raleigh, USA.
Toho Tenax America, Rockwood, USA.
Circle, Rogers, USA.
Performance Fibers, Salisbury, USA.
Innegra Technologies, Simpsonville, USA.
Zoltek Inc, St Louis, USA.
Electro Fiber Technologies/TFP Inc, Stratford, USA.
Owens Corning, Toledo, USA.
Leigh Fibers Inc, Wellford, USA.
Invista Sàrl, Wichita, USA.
E.I. DuPont de Nemours and Co, Wilmington, USA.
ARmark Authentication Technologies LLC, York, USA.
Glatfelter, Charlotte, USA.

Buyer's Guide: Index

Woven and knitted fabrics, braids and scrims

Texinter SA Beltex, Buenos Aires, Argentina.
Getzner Textil AG, Bludenz, Austria.
TenCate Geosynthetics Austria GmbH, Linz, Austria.
TenCate Industrial Fabrics Europe, Linz, Austria.
Rue Spa Khimvolokno, Svetlogorsk, Belarus.
EOC Group, Oudenaarde, Belgium.
Sioen Industries, Ardooie, Belgium.
Sioen Felt & Filtration, Liège, Belgium.
Concordia Textiles Group, Waregem, Belgium.
Bekintex nv, Wetteren, Belgium.
Summa NV, Gistel, Belgium.
Eurtotex, Toronto, Canada.
TenCate Industrial Zhuhai Co Ltd, Zhuhai, China.
Kordárna Plus as, Velká nad Velickou, Czech Republic.
ADFORS Saint-Gobain, Courbevoie, France
Porcher Industries, Badinières, France.
Sofileta SAS, Bourgoin-Jallieu Cedex, France.
MDB Texinov, Saint Didier de la Tour, France.
Tibtech, Tourcoing, France.
Delcotex Delius GmbH & Co KG, Bielefeld, Germany.
Christian Eschler Europe AG, Balingen, Germany.
Fiberlane GmbH & Co KG, Greven, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Roma-Strickstoff-Fabrik Rolf Mayer GmbH & Co KG, Balingen, Germany.
Huesker, Gescher, Germany.
Indorama Ventures Mobility Obernburg GmbH, Obernburg, Germany.
Jumbo-Textil GmbH & Co KG, Sprockhövel, Germany.
Lauffenmühle GmbH & Co KG, Lauchringen, Germany.
Outlast Europe GmbH, Heidenheim, Germany.
Toray International Europe GmbH, Munich, Germany.
HKO Heat Protection Group, Oberhausen, Germany.
Cordenka GmbH, Obernburg, Germany.
W.L. Gore & Associates GmbH, Putzbrunn, Germany.
Pro-Belting International GmbH & Co KG, Schauenstein, Germany.
Essedea GmbH & Co KG, Wassenberg, Germany.
vombaur GmbH & Co. KG, Wuppertal, Germany.
Thrace Plastics Co SA, Alimos, Greece.
CTM Technical Textiles Ltd, Ahmedabad, India.
Polycrest Innovations India Ltd, Chennai, India.
A.T.E. Enterprises Pvt Ltd, Coimbatore, India.
SRF Ltd, Gurgaon, India.
Alok Industries Ltd, Mumbai, India.
Khosla Profil Pvt Ltd, Mumbai, India.
Kusumgar Corporates, Mumbai, India.
Reliance Industries Ltd, Mumbai, India.
S. Kumar Unitex, Mumbai, India.
Sarex Chemicals, Mumbai, India
SAATI India, Mumbai, India.
Strata Geosystems (India) Pvt Ltd, Mumbai, India.
Techfab India, Mumbai, India.
Pasupati Spinning & Weaving Mills Ltd, New Delhi, India.
Garware Wall Ropes Ltd, Pune, India.
Prime Textiles Ltd, Tirupur, India.
Proxy Biomedical Ltd, Spiddal, Ireland.
Officine Maccaferri SpA, Bologna, Italy.
Gavazzi Tessuti Tecnici SpA, Calolziocorte, Italy.
Gaetano Rossini Holding SpA, Costa Masnaga, Italy.
Sanitars SpA, Flero, Italy.
Seal SpA, Legnano, Italy.
Trelleborg Engineered Systems Italy SpA, Lodi Vecchio, Italy.
Testori Aero Supply srl, Sirone, Italy.
Manifattura Fontana Spa, Valstagna, Italy.
Sakai Ovex Co Ltd, Fukui, Japan.
Toyota Tsusho Corp, Nagoya, Japan.
Asahi Kasei Fibers Corp, Osaka, Japan.
KB Seiren Ltd, Osaka, Japan.
Teijin Ltd, Osaka, Japan.
Toyobo Co Ltd, Osaka, Japan.
Unitika Fibers, Osaka, Japan.
Toho Tenax, Tokyo, Japan.
Toray Industries Inc, Tokyo, Japan.
Fuchshuber Techno-Tex GmbH, Liechtenstein.
Recron (Malaysia) Sdn Bhd, Kuala Lumpur, Malaysia.
TenCate Geosynthetics Asia Sdn Bhd, Shah Alam, Malaysia.
Tele Textiles AS, Notodden, Norway.
A. Sampaio & Filhos – Texteis SA, Santo Tirso, Portugal.
Texiplast as, Ivanka pri Nitre, Slovak Republic.
Hyosung Corp, Seoul, South Korea.
Velcro Europe SA, Argentona, Spain.
Incabo SA, Barcelona, Spain.
SATI Grupo Textil SA, La Garriga, Spain.
Geotexan SA, Minas de Rio Tinto, Spain.
Industrial Sedó SA, Tarragona, Spain.
FOV Fabrics AB, Borås, Sweden.
Biteam AB, Gothenburg, Sweden.
Trelleborg AB, Trelleborg, Sweden.
Huber & Co AG Bandfabrik, Oberkulm, Switzerland.
Tisca Tischhauser & Co AG, Bühler, Switzerland.
Lantal Textiles, Langenthal, Switzerland.
Schoeller Textiles, Sevelen, Switzerland.
Chia Her Industrial Co Ltd, Taipei, Taiwan.
Everest Textile Co Ltd, Taipei, Taiwan.
Fabric King Textile Co Ltd, Taipei, Taiwan.
Kings Metal Fiber Technologies Co Ltd, Taipei, Taiwan.
Kingwhale Industries, Taipei, Taiwan.
Li Peng Enterprise Co Ltd, Taipei, Taiwan.
Tex-Ray Industrial Co Ltd, Taipei, Taiwan.
Formosa Taffeta Co Ltd, Touliu City, Taiwan.
Nam Liong Enterprise Co Ltd, Yung-Kang City, Taiwan.
Royal Ten Cate, Almelo, The Netherlands.
TenCate Industrial Fabrics Europe, Almelo, The Netherlands.
TenCate Outdoor Fabrics, Nijverdal, The Netherlands.
TenCate Protect bv, Nijverdal, The Netherlands.
Arville Textiles Ltd, Wetherby, UK.
James Dewhurst Ltd, Accrington, UK.
AmSafe Bridport, Bridport, UK.
Recycled Carbon Fibre Ltd, Coseley, UK.
Don & Low Ltd, Forfar, UK.
J&D Wilkie Ltd, Kirriemuir, UK.
Parker Hannifin Ltd, Hemel Hempstead, UK.
Chemviron Carbon Cloth Division, Houghton-le-Spring, UK.
Baltex, Ilkeston, UK.
Brintons Ltd, Kidderminster, UK.
Abbey England Ltd, Knutsford, UK.
GEOfabrics Ltd, Leeds, UK.
Carrington Textiles Ltd, Adlington, UK
Smith & Nephew plc, London, UK.
A. Rowe Ltd, Manchester, UK.
Toray Textiles Europe Ltd, Mansfield, UK.
Formax, Narborough, UK.
Bute Fabrics Ltd, Rothesay, UK.
Sigmatex UK, Runcorn, UK.
Culzean Textile Solutions Ltd, Stewarton, UK.
Scott & Fyfe, Tayport, UK.
Heathcoat Fabrics, Tiverton, UK.
Albany International Corp, Albany, USA.
Tapis Corp, Armonk, USA.
Bally Ribbon Mills, Bally, USA.
Farrow Medical Innovations, Bryan, USA.
Draper Knitting, Canton, USA.
Outlast Technologies LLC, Boulder, USA.
Propex, Chattanooga, USA.
Quantum Group Inc, The, Colfax, USA.
TenCate Geosynthetics Americas Commerce Facility, Commerce, USA.
TenCate Geosynthetics Americas Cornelia Facility, Cornelia, USA.
Concordia Manufacturing LLC, Coventry, USA.
Greenology USA, Dallas, USA.
Kimberly-Clark Corp, Dallas, USA.
Sefar Inc, Depew, USA.
Owens Corning, Granville, USA.
International Textile Group, Greensboro, USA.
Safety Components International, Greenville, USA.
Innovative Textiles Inc, High Point, USA.
Eastex Products Inc, Holbrook, USA.
Inman Mills, Inman, USA.
Apex Mills, Inwood, USA.
Momentum Textiles, Irvine, USA.
Knit-Rite Inc, Kansas City, USA.
Atlanta Nisseki Claf Inc, Kennesaw, USA.
Supertex Inc, Liberty, USA.
SPT Technology Inc, Minneapolis, USA.
Brookwood Companies Inc, New York, USA.
TenCate Advanced Armor USA Inc, Newark, USA.
Applied Fabric Technologies Inc, Orchard Park, USA.
Cooley Group, Pawtucket, USA.
TenCate Geosynthetics Americas, Pendergrass, USA.
TenCate Industrial Fabrics North America, Pendergrass, USA.
Eeonyx Corp, Pinole, USA.
Concept III International, Red Bank, USA.
Circle, Rogers, USA.
Innovative Textiles Inc, Rutherford, USA.
King Tech Group, San Diego, USA.
SSM Industries Inc, Spring City, USA.
Owens Corning, Toledo, USA.
TenCate Protective Fabrics North America, Union City, USA.
E.I. DuPont de Nemours and Co, Wilmington, USA.
ANCI Inc, Kennesaw, USA.

Nonwovens

Freudenberg Performance Materials, Buenos Aires, Argentina.
PGI Latin America, Pilar, Argentina.
Autex Pty Ltd, Melbourne, Australia.
Fontana International GmbH, Linz, Austria.
TenCate Geosynthetics Austria GmbH, Linz, Austria.
Rue Spa Khimvolokno, Svetlogorsk, Belarus.
Bekintex nv, Wetteren, Belgium.
EOC Group, Oudenaarde, Belgium.
Sioen Felt & Filtration, Liège, Belgium.
Summa NV, Gistel, Belgium.
Fitesa, Gravataí, Brazil.
Teadit, Rio de Janeiro, Brazil.
Guangdong Jofo Group Co, Guangzhou, China.
Jiaxing Furuisen Spunlaced Nonwovens Co Ltd, Jiaxing, China.
Low & Bonar Asia, Changzhhou, China.
Zhejiang Spread Nonwoven New Material Co Ltd, Jiaxing, China.
Winner Medical Group Inc, Shenzhen City, China.
Freudenberg Performance Materials, Suzhou, China.
Fiberweb (China) Airlaid Co Ltd, Tianjin, China.

TenCate Industrial Zhuhai Co Ltd, Zhuhai, China.
Pegas Nonwovens sro, Znojmo, Czech Republic.
Fibertex Nonwovens AS, Aalborg, Denmark.
Fibertex Personal Care AS, Aalborg, Denmark.
Aktieselskabet Schouw & Co, Aarhus, Denmark.
Ahlstrom, Tampere, Finland.
ADFORS Saint-Gobain, Courbevoie, France
Porcher Industries, Badinières, France.
Fiberweb France SAS, Biesheim, France.
Tharreau Industries, Chemillé, France.
Andritz Asselin-Thibeau, Elbeuf, France.
BWF Tec GmbH & Co KG, Hof-Gattendorf, Germany.
Johns Manville, Bobingen, Germany.
Huesker, Gescher, Germany.
Freudenberg Performance Materials, Kaiserslautern, Germany.
Freudenberg Performance Materials, Neuenburg, Germany.
Fiberweb Corovin GmbH, Peine, Germany.
Norafin Industries (Germany) GmbH, Müllheim, Germany.
TWE GmbH & Co KG, Emsdetten, Germany.
P. Glatzeder GmbH, Detmold, Germany.
Polyvlies GmbH, Hörstel, Germany
Sandler AG, Schwarzenbach/ Saale, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Indorama Ventures Mobility Obernburg GmbH, Obernburg, Germany.
IPCO Germany GmbH, Göppingen, Germany.
Johns Manville, Wertheim, Germany.
MS Ultraschall Technologie GmbH, Spaichingen, Germany.
Wacker Chemie AG, Munich, Germany.
GeoTipptex Kft, Tiszaújváros, Hungary.
Terram Geosynthetics Pvt Ltd, Ahmedabad, India.
Supreme Nonwoven Industries Pvt Ltd, Bhilad, India.
A.T.E. Enterprises Pvt Ltd, Coimbatore, India.
Supreme-Treves Pvt Ltd, Daman, India.
Reliance Industries Ltd, Mumbai, India.
Sarex Chemicals, Mumbai, India
Supreme Nonwovens Pvt Ltd, Mumbai, India.
Techfab India, Mumbai, India.
UP Twiga Fibres, New Delhi, India.
Proxy Biomedical Ltd, Spiddal, Ireland.
Avgol Ltd, Tel-Aviv, Israel.
Shalag Industries ACS Ltd, Upper Galilee, Israel.
Albis Nonwoven Fabrics, Roasio, Italy.
Farè SpA, Fagnano Olona, Italy.
Geo&Tex 2000, San Nazario, Italy.
ICAP-SIRA, Parabiago, Italy.
SICAM srl, Milan, Italy.
Tessilbrenta Srl, Pove del Grappa, Italy.
Tenotex SpA, Terno d'Isola, Italy.
Asahi Kasei Fibers Corp, Osaka, Japan.
KB Seiren Ltd, Osaka, Japan.
Toyobo Co Ltd, Osaka, Japan.
JNC Corp, Tokyo, Japan.
Japan Vilene Co, Tokyo, Japan.
DuPont Geosynthetics, Luxembourg.
TenCate Geosynthetics Asia Sdn Bhd, Shah Alam, Malaysia.
Erhardt Nonwovens, Madrid, Spain.
Tesalca–Texnovo, Barcelona, Spain.
Geotexan SA, Minas de Rio Tinto, Spain.
Fritz Landolt AG, Näfels, Switzerland.
Kingwhale Industries, Taipei, Taiwan.
KNH Enterprise Co Ltd, Taipei, Taiwan.
Freudenberg Performance Materials, Arnhem, The Netherlands.
Salvin Tekstil Sanayi ve Ticaret AS, Corlu, Turkey.
Hassan Group, Istanbul, Turkey.
Salteks Tekstil Sanayi ve Ticaret AS, Istanbul, Turkey.
IFG International Fibres Group, Huddersfield, UK
Speciality Fibers & Materials Ltd, Coventry, UK.
Don & Low Ltd, Forfar, UK.
Technical Fibre Products Ltd, Kendal, UK.
GEOfabrics Ltd, Leeds, UK.
Smith & Nephew plc, London, UK.
Fiberweb Geosynthetics Ltd, Maldon, UK.
Fiberweb plc, Richmond-on-Thames, UK.
MicroflexTechnologies, a division of Kellie Solutions Ltd, Tarporley, UK.
Nonwovens Innovation & Research Institute (NIRI) Ltd, Leeds, UK.
Scott & Fyfe, Tayport, UK
Technical Absorbents, Grimsby, UK.
Albany International Corp, Albany, USA.
Atex Inc, Gainesville, USA.
Bally Ribbon Mills, Bally, USA.
Low & Bonar North America, Enka, USA.
Stein Fibres Ltd, Albany, USA.
Tapis Corp, Armonk, USA.
Draper Knitting, Canton, USA.
Avintiv, Charlotte, USA.
Procter & Gamble Co, The, Cincinnati, USA.
TenCate Geosynthetics Americas Commerce Facility, Commerce, USA.
Nanocomp Technologies, Concord, USA.
TenCate Geosynthetics Americas Cornelia Facility, Cornelia, USA.
Kimberly-Clark Corp, Dallas, USA.
ECN Industries, Darlington, USA.
Johns Manville, Denver, USA.
Freudenberg Performance Materials, Durham, USA.
Hollingsworth & Vose Co, East Walpole, USA.
Foss Manufacturing Company LLC, Hampton, USA.
Norafin (Americas) Inc, Mills River, USA.
Apex Mills, Inwood, USA.
Polartec LLC, Lawrence, USA.
First Quality, Lewistown, USA.
Kimberly-Clark Corp, Neenah, USA.
Technical Fibre Products Inc, Schenectady, USA.
Fiberweb Inc, Old Hickory, USA.
TenCate Geosynthetics Americas, Pendergrass, USA.
Allasso Industries Inc, Raleigh, USA.
Circle, Rogers, USA.
RKW US Inc, Rome, USA.
Precision Custom Coatings LLC, Totowa, USA.
Hobbs Bonded Fibers, Waco, USA.
FitesaFiberweb Washougal Inc, Washougal, USA.
Cleaver Associates Inc, Wayne, USA.
E.I. DuPont de Nemours and Co, Wilmington, USA.
Glatfelter, Charlotte, USA.
Zeus Inc, Orangeburg, USA.

Coated and laminated textiles

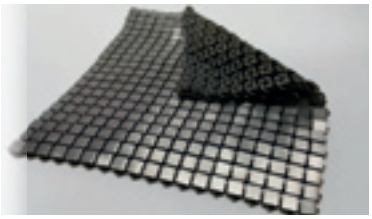
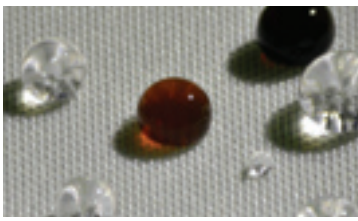
Getzner Textil AG, Bludenz, Austria.
EOC Group, Oudenaarde, Belgium.
Sioen Industries, Ardooie, Belgium.
Sioen Felt & Filtration, Liège, Belgium.
Summa NV, Gistel, Belgium.
Stedfast Inc, Granby, Canada.
Guangdong Yilong Xincai Technology Co Ltd, Foshan, China.
Zhejiang Ganglong New Material Co Ltd, Haining, China.
Zhejiang Xingyida Reinforced Material Co Ltd, Yuanhua Town, China.
Zhejiang Jinda New Materials Co Ltd, Zhejiang, China.
Diatex SAS, Saint-Genis-Laval, France.
Porcher Industries, Badinières, France.
Tharreau Industries, Chemillé, France.
Delcotex Delius GmbH & Co KG, Bielefeld, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Heytex Technical Textiles, Bramsche, Germany.
ITW Dynatec, Mettmann, Germany.
Trans-Textil GmbH, Freilassing, Germany.
Pongs Group (Technical Textiles), Mühltroff, Germany.
Indorama Ventures Mobility Obernburg GmbH, Obernburg, Germany
Johns Manville, Bobingen, Germany.
vombaur GmbH & Co. KG, Wuppertal, Germany.
Wacker Chemie AG, Munich, Germany.
Westland Gummiwerke, Melle, Germany.
CTM Technical Textiles Ltd, Ahmedabad, India.
A.T.E. Enterprises Pvt Ltd, Coimbatore, India.
SRF Ltd, Gurgaon, India.
Entremonde Polycoaters, Mumbai, India.
Khosla Profil Pvt Ltd, Mumbai, India.
Techfab India, Mumbai, India.
Climax Synthetics, Vadodara, India.
Proxy Biomedical Ltd, Spiddal, Ireland.
Fait Plast Spa, Cellatica, Italy.
OutDry Technologies Srl, Busto Arsizio, Italy.
Trelleborg Engineered Systems Italy SpA, Lodi Vecchio, Italy.
Obeikan Technical Fabrics Co Ltd, Riyadh, Saudi Arabia.
Soyon Industrial Co Ltd, Goyang Si, South Korea.
Kolon Industries Inc, Kwacheon, South Korea.
Finetex EnE, Seoul, South Korea.
Hyosung Corp, Seoul, South Korea.
Kintex Ltd, Seoul, South Korea.
Incabo SA, Barcelona, Spain.
MITSA, Tortella, Spain.
Trelleborg AB, Trelleborg, Sweden.
Lantal Textiles, Langenthal, Switzerland.

Advances in Textiles technology

New textile materials & technologies

Advances in Textiles Technology - the monthly publication delivering comprehensive coverage of new textile materials and textile related technologies.

The first publication of its kind, we've been reporting on advances in textiles technology for over 35 years, and one step ahead with relevant and timely information to benefit your business.

Advances in Textiles Technology has the latest on state-of-the-art technology for textile applications direct from the companies and institutes at the forefront of current research programmes.

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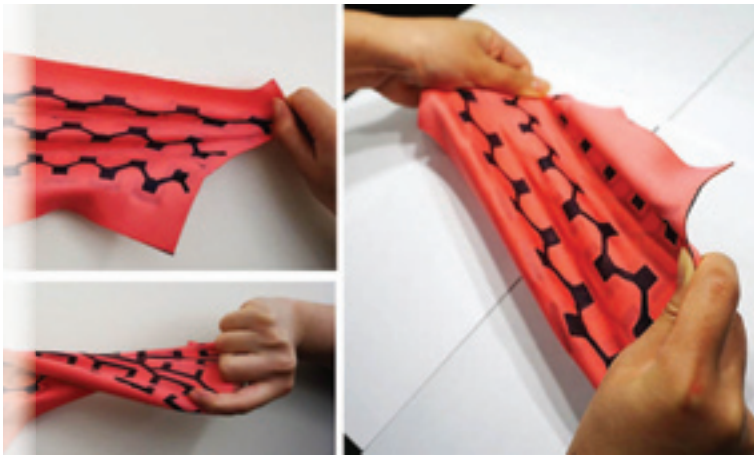


Advances in Textiles technology

February 2022

An international newsletter on textiles technology edited by: James Bakewell

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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Methods for determining the effects of strains and stresses on carbon nanotube fibres are being developed by researchers at Rice University 2

A single vented tumble dryer can discharge up to 120 million microfibres into the air each year, according to a pilot study 5

A range of durable fabrics made from pre-consumer recycled polyamide (PA) 66 fibres has been launched by Invista through its Cordura brand 3

A fibre-laying process that enables the efficient production of composite footplates and toe caps for use in footwear has been launched by Coats 7

A dual-action thermoregulating finish that reduces the temperature of surfaces to which it is applied by up to 3°C has been launched by HeiQ 4

A long, fibre-based lithium-ion battery that could be woven into fabrics is being developed by researchers at the Massachusetts Institute of Technology 10

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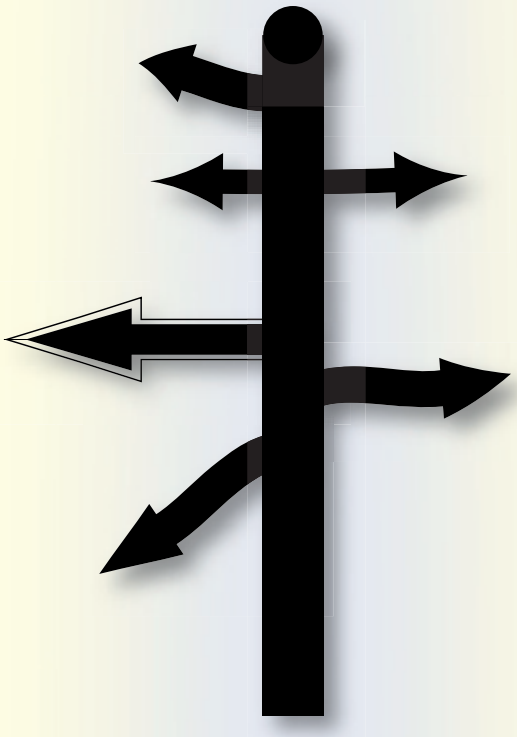

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