Technical TEXTILES international

Winter 2023
Volume 32, Number 4

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Coating could enable natural-fibre geotextiles

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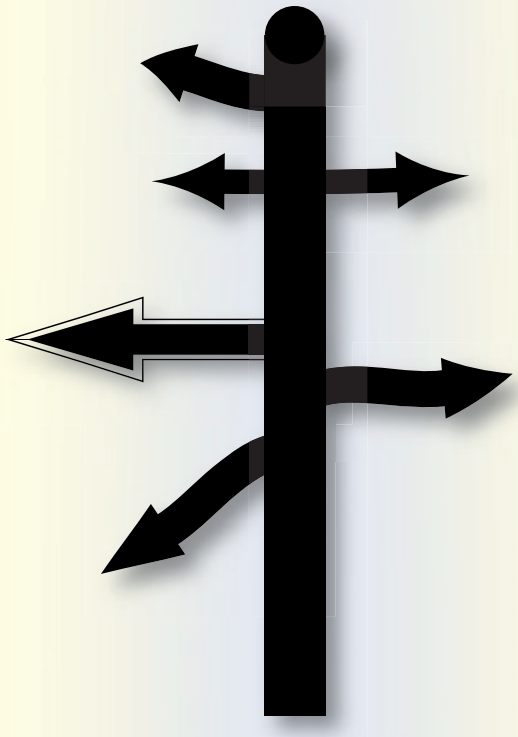

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In the Editor's opinion

If 2021 was defined by the human coronavirus (covid-19) pandemic and 2022 the global energy crisis, perhaps 2023 can be characterised by the resurgence of some optimism. Certainly, the triumphant reprise of *ITMA* to Milan, Italy, on 8–14 June did much to suggest that, despite the unprecedented challenges faced by the technical textiles industry over the past three years, and continued geopolitical and economic instability, we might be returning to some sense of normality.

Of course, there are complex problems that still need to be solved. This year, building on its *Strategy for Sustainable and Circular Textiles*, the European Union (EU) proposed rules to make producers responsible for the full lifecycle of textile products and to support the sustainable management of textile waste across the trading bloc. It believes the rules will accelerate the development of technologies and systems for the collection, sorting, re-use and recycling of textile products. As Adrian Wilson reports from the *Dornbirn Global Fiber Congress*, however, producers of technical textiles face a unique set of challenges in setting-up these systems (see also, page 9).

While establishing systems for the collection of end-of-life apparel is difficult enough, the collection of technical textiles presents another problem all together. The range of applications for technical textiles is incredibly broad, and the collection of these materials at the end of their useful lives will require a correspondingly wide variety of systems. As Adrian notes, certain industries, such as workwear and automotive, already have robust and well-connected supply chains, but both must do much to establish fully functioning take-back operations.

Some apparel might be suitable for re-use, but this is often not the case for technical textiles, which usually come to the end of their useful lives because they are damaged; they do not go out of fashion like apparel. They are frequently integrated into complex products, such as cars, making disassembly challenging. Cars are often shredded, making the collection of any fibrous or plastic components from them very difficult. Technical textiles used for medical applications are usually contaminated and, as such, must be incinerated.

The sheer diversity of the materials used for the production of technical textiles, and the wide range of additives, coatings and finishes they are often enhanced with, can make their recycling challenging. That said, the high value of the material that could be recovered from technical textiles, such as aramids from protective clothing and workwear fabrics, polyamide (PA) from tyres and floorcoverings, and carbon fibres from composites, could make their recycling more economically attractive. Indeed, the composites industry has been wrestling with the challenge of reclaiming carbon fibres from scrap reinforced plastics for at least the last 15 years, and several companies are reporting successes (see, for instance, page 25).

These are just a handful of the challenges faced by those looking to recycle technical textiles. As we look forward to 2024, potential solutions to these problems will likely be particularly evident at *Techtextil* and *Texprocess*, which return to Frankfurt, Germany, on 23–26 April. As it enters its 33rd 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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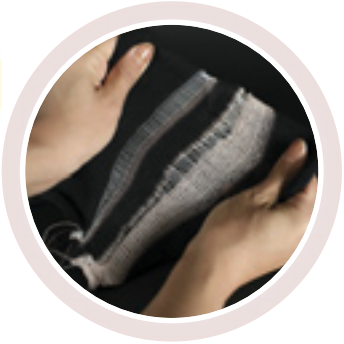
On the cover:

Nonwovens Editor Adrian Wilson attended the Dornbirn Global Fibre Congress and heard that the recovery and recycling of technical textiles are far from easy. His report starts on page 9

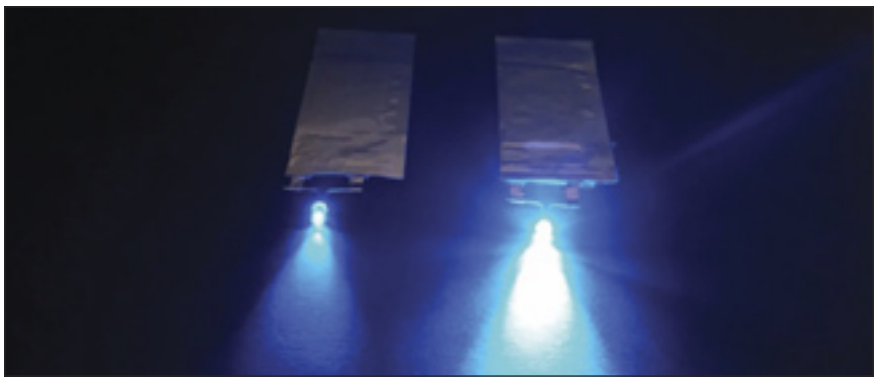


A liquid-crystal polymer fibre that changes shape in response to thermal stimuli is being used to weave self-actuating fabrics by researchers in the USA. Turn to page 19 to find-out more.

Technical TEXTILES international

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

Further funding for commercialisation of fleece-based current-collectors



Light-emitting diodes powered by standard (left) and Batene fleece-based (right) battery cells containing the same amount of active material.

A company working to commercialise metal fleece-based current-collectors that could increase the energy-densities and charging speeds of lithium-ion (Li-ion) batteries has secured further funding.

Batene GmbH, of Stuttgart, Germany, will receive roughly €830 000 from the Economic Committee of the Baden-Württemberg State Parliament. In late 2022, the company also secured €10 million in seed funding from a panel of investors lead by Ocean Zero LLC of New York City, USA, bookshop owner Christer von der Burg, and the founder and Chief Executive Officer (CEO) of Candela Technology (which makes hydrofoil electric boats and vessels and is based in Stokholm, Sweden), Gustav Hasselskog.

The core of Batene's technology is based on a process developed by the Director at the Max Planck Institute for Medical Research, Joachim Spatz, that enables very fine metallic fibres to be produced, for which the company has been granted exclusive rights. The metallic fibres, which are highly electrically conductive, are converted into a dense, conductive metal mesh and filled with active materials that enable them to act as current-collectors for either anodes or cathodes in Li-ion batteries.

In comparison with conventional foil-based current-collectors, the metal fleeces make it possible to increase the thickness of battery cells by ten times, to more than two millimetres. The thicker cells make more efficient use of the active materials; these materials account for only about 60% of the weight of conventional batteries. The metal fleece reduces the metal content of batteries to one-tenth and increases the proportion of active materials to the total battery weight to over 90%.

As the metal fleeces have a significantly larger surface area than conventional current-collectors, batteries employing them can be charged and discharged much faster. Further, the metal fleece reduces the electrical resistance of the electrodes and increases their mechanical stability, making the batteries safer. They could also be used in other types of battery, such as the lithium metal solid-state batteries or the sodium-ion batteries currently under development.

The Co-founder and CEO of Batene, Martin Möller, says: "The granted funding gives our technology a decisive boost and supports our path to market-readiness."

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Recyclable polyethylene terephthalate materials for automotive seating

To source recycled materials for EcoSphere Trim Foundation, Magna has partnered with TWE Group. TWE's rePEaT range features nonwovens made from recycled PET, and natural and biodegradable fibres.

A range of recyclable polyethylene terephthalate (PET) foam and trim materials for automotive seating has been launched by Magna International of Aurora, Ontario, Canada.

The company says that the monomaterial products in its Melt Recyclable Foam and Trim range look and feel the same as conventional materials. Chief Engineer, Seating Innovation, at Magna International, Carrie Young, adds: "This unique product family enables our seating materials to be repurposed and re-used in the creation of new polyester products, contributing to a circular economy approach. Our technology offers automakers a game-changing opportunity to enhance sustainability without compromising on comfort, quality or performance."

Magna EcoSphere Trim Foundation is part of the Melt Recyclable Foam and Trim range. Trim foundation can be found in every automotive seat and is laminated to the back of trim materials to provide support and ensure their good appearance. To source recycled materials for EcoSphere Trim Foundation, Magna International has partnered with TWE Group, which specialises in the manufacture of technical textiles and nonwovens and is based in Emsdetten, Germany. TWE's rePEaT range features nonwovens made from recycled PET, and natural and biodegradable fibres.

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https://www.twe-group.com

Autoneum nominated for award for recycled wheelhouse liners

Autoneum has developed technologies that enable it to convert polyolefins recovered from discarded car bumpers into lightweight and durable outer liners for automotive wheelhouses.

The company, of Winterthur, Switzerland, says that, in addition to exploiting previously unusable waste as a raw material, the production of the liners (called Re-Liner) requires significantly less energy than the manufacture of conventional alternatives. For this development, Autoneum has been selected as one of the finalists for the *2023 Automotive News PACE Awards*. The winners will be announced at a ceremony in early 2024.

The Vice President of Product Development and Engineering at Autoneum North America, Dan Moler, says: "With Re-Liner, we took advantage of our company's existing capacity on carpet extrusion lines to produce an innovative, lightweight, yet stiff material."

The waste polyolefins are used as the core of Re-Liner, which has a nonwoven top layer made from recycled fibres. Moler continues: "Lightweight, durable and sustainable wheelhouse outer liners based on this technology are expected to reduce waste generated by bumper covers by nearly one-million kilogrammes in 2023."

The core pf Autoneum's Re-Liner outer liner for automotive wheelhouses is made from polyolefins recovered from discarded car bumpers.

In 2019, Autoneum launched Alpha-Liner, a lightweight PET fibre-based nonwoven wheelarch liner that absorbs tyre noise[(1)]. The acoustic absorption of the compression- mouldable Alpha-Liner can be tailored to specific models of car. This is achieved by changing the porosity of a thin plastic coating that is applied to the liner on its tyre-facing side. Autoneum claims that its Alpha-Liner wheelarch liners are easy to clean, resistant to stone chipping and ice accumulation, and are lighter than conventional plastic liners, contributing to increased driving range for electric vehicles.

See also: [(1)]*Absorbing tyre noise with nonwoven wheelarch liners*, https://www.technical-textiles.net/node/74987

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Nonwovens Institute expands laboratory for testing of filter media

The Nonwovens Institute's Filtration Testing Lab houses a range of instruments for the testing of face masks and respirators, and filter media for automotive, high-efficiency particulate air, and heating, ventilation and air-conditioning applications.

A range of instruments for the testing of face masks and respirators, and filter media for automotive, high-efficiency particulate air (HEPA), and heating, ventilation and air-conditioning (HVAC) applications, has been installed by the Nonwovens Institute (NWI) at its Filtration Testing Lab.

The NWI, which is based at North Carolina State University (NCSU) in Raleigh, USA, says that the laboratory is accredited according to the 17025 standard[(1)] from the Geneva, Switzerland-based International Organization for Standardization (ISO). The laboratory's compliance with this standard enables it to meet US National Institute for Occupational Safety and Health (NIOSH) requirements for testing materials used in respirators. Further, the laboratory is fitted with equipment to perform testing according to the F2299 standard[(2)] from ASTM International of West Conshohocken, Pennsylvania, USA. This standard lays-out testing methods for evaluating the filtration efficiency of materials when exposed to aerosol particles of 0.1–5.0 µm in size.

At its Analytical and Physical Testing Lab, the NWI is able to conduct more than 60 further tests on nonwovens. The institute exhibited at *FiltXPO*, which took place in Chicago, Illinois, USA, on 10–12 October 2023.

See also: [(1)]ISO/IEC 17025 - *General requirements for the competence of testing and calibration laboratories*, https://www.iso.org/ISO-IEC-17025-testing-and-calibration-laboratories.html

[(2)]ASTM F2299/F2299M-03(2017) - *Standard test method for determining the initial efficiency of materials used in medical face masks to penetration by particulates using latex spheres*, https://www.astm.org/f2299_f2299m-03r17.html

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Fibre-based pasting material for lead-acid batteries

A hybrid pasting material made from cellulosic and polymeric fibres for use in lead-acid batteries has been launched by Ahlstrom (see also, pages 33-38) of Helsinki, Finland.

Pasting materials are laminated onto the electrodes of the lead-acid batteries used to power, for instance, vehicles, in order to stabilise the active materials and to prevent the formation of lead dust.

Ahlstrom says that its hybrid pasting material, a wet-laid nonwoven, is more uniform and is easier to handle than conventional pasting materials. Its synthetic content promotes the adhesion of the active material to the surface of the battery plates after its natural-fibre content has dissolved in the battery acid. Ahlstrom says that this stabilises the active material, allowing for higher rates of cycling and increasing battery life, and making the recycling of batteries easier, as the polymer materials can be removed easily.

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Ahlstrom starts-up calendering and embossing equipment in South Korea

Equipment for the calendering and embossing of synthetic filer media, in order to improve its mechanical strength and reduce the amount by which it impedes flows of air and liquid, has been started-up by Ahlstrom (see also, pages 33-38) at its facility in Hyun Poong, South Korea[(1)].

The company, of Helsinki, Finland, says that by improving the strength of the filter media, it can extend its service life. This reduces costs and environmental impacts associated with filter-replacement for users, and limits the risk of system failures. The media can be used for filtering air, water, oil and fuel.

Ahlstrom has announced investments of over €100 million in its filtration business over the last five years.

See also: [(1)]*Ahlstrom invests in filter-media production in South Korea*, https://www.technical-textiles.net/node/77138

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Ahlstrom starts-up US line for glass-fibre nonwovens

Ahlstrom (see also, pages 33-38) has completed work on a new line for the production of glass-fibre nonwovens for construction applications at its plant in Madisonville, Kentucky, USA[(1)].

The company, of Helsinki, Finland, says that the nonwovens from the line will be used in the manufacture of luxury vinyl floor tiles and vinyl sheets. The Vice President of the company's Glass Fiber Tissue business, Pekka Helynranta, says: "This new platform will further strengthen our leadership in this field by consolidating our global position in flooring applications, but also by giving us a unique platform to expand into other glass-fibre-tissue applications, in particular for industrial filtration." Since 2018, Ahlstrom has invested over US$100 million in the Madisonville site.

See also: [(1)]*Ahlstrom-Munksjö to invest in US line for glass-fibre nonwovens*, https://www.technical-textiles.net/node/76226

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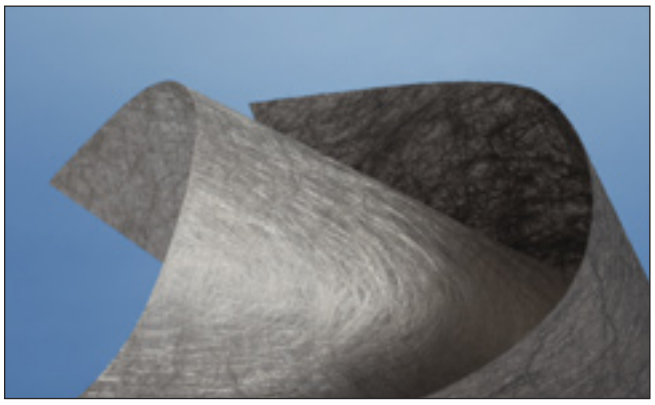
Freudenberg expands range of resource-efficient carpet backings



Colback ECO-R and Lutradur ECO-R contain recycled contents of 51–90% by weight and are suitable for use as backings for carpet tiles, broadloom carpet, dust-control mats and automotive mats.

A pair of spunbond nonwoven carpet backings that contain a significant proportion of recycled material has been launched by Freudenberg Performance Materials, of Weinheim, Germany.

The two materials join Colback ECO and Lutradur ECO in the company's ECO range of carpet backings, which were unveiled in April 2023[(1)].

Freudenberg Performance Materials says that the manufacture of its Colback ECO and Lutradur ECO products consumes less material than the manufacture of conventional nonwoven carpet backings, as the diameter of the filaments used in these fabrics is 30% smaller.

The latest additions to the range, Colback ECO-R and Lutradur ECO-R contain recycled contents of 51–90% by weight and are suitable for use as backings for carpet tiles, broadloom carpet, dust-control mats and automotive mats.

The Director of Freudenberg's Europe, the Middle East and Africa (EMEA) carpet business, with responsibility for New Business Development and Sustainability, Albert Hammerschmied, says: "With the extended ECO range, Freudenberg now offers a variety of different solutions supporting carpet manufacturers in making sustainable choices to suit their ambitions and processes."

See also: [(1)]*Freudenberg launches resource-efficient carpet backings*, https://www.technical-textiles.net/node/77136

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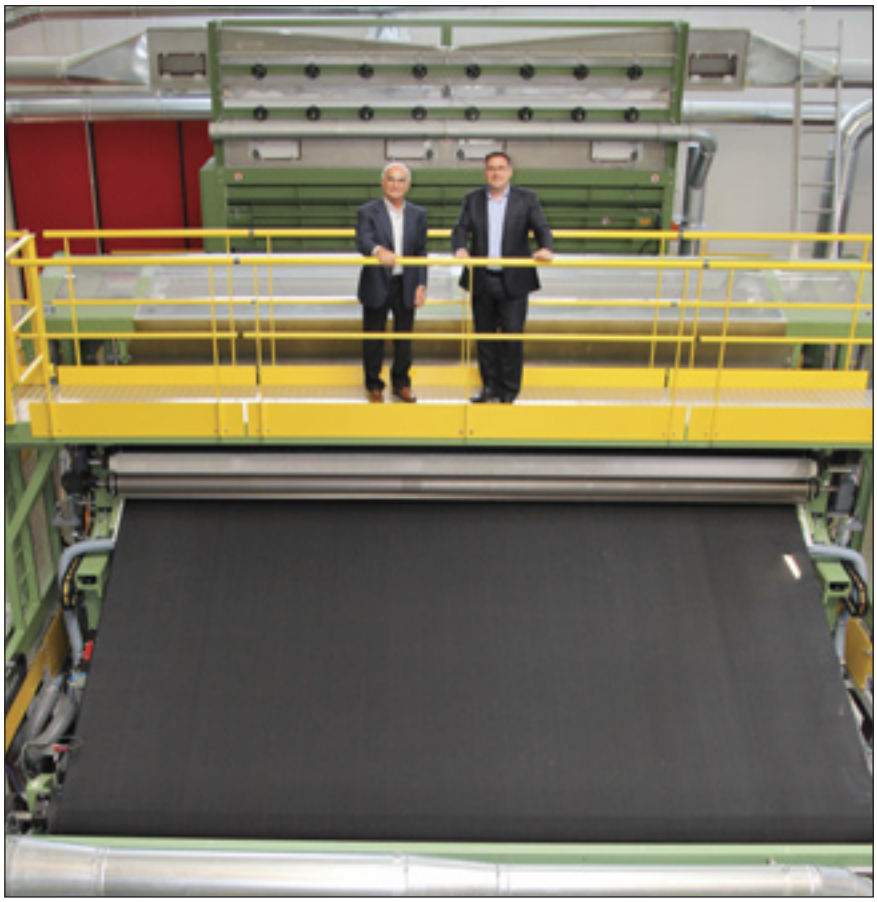
Andritz starts-up extra-wide carding machine for Italian producer



The Chief Executive Officer of Albis International, Gianni Boscolo (left), and the Managing Director of Andritz Asselin-Thibeau, Fabien Ravier (right).

An extra-wide carding machine and opening/blending line has been started-up by Andritz Group (see also, pages 33-38) at Albis International Srl's facility in Roasio, Italy, where it will be used to produce nonwovens for hygiene and medical applications.

Andritz, of Graz, Austria, says that, with its working width of 5.10 m, the carding machine allows for the manufacture of high-quality nonwovens, such as Albis' Curacell. Curacell is a multilayer composite nonwoven that can be produced in areal densities of 35–70 g.m^{-2} using a water-free process, and is able to absorb over seven times its own weight in liquid. The Chief Executive Officer (CEO) of Roasio-based Albis, Gianni Boscolo, says that the reliability of Andritz's machinery was a key factor in his decision to invest. Albis, a privately owned group founded in 1995 by Boscolo, supplies nonwovens to the hygiene, medical, personal care, filtration and agriculture markets.

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Nonwovens Innovation & Research Institute opens new headquarters

The Nonwovens Innovation & Research Institute (NIRI) has moved to a new headquarters in Leeds, UK, that is twice the size of its previous base in the city.

The company has invested £1.2 million in the move to the new facility, which is called Innovation House, and features seven laboratories and a wide range of equipment, much of which is unique.

The founder of NIRI, Chris Fowler, says: "This move will help enable us to deliver our three-year strategy for growth, with: the expansion of our functional chemistry, formulation and polymer-engineering capabilities; recruitment of 20 additional technical-textile scientists; acquisition of complimentary operations; the expansion of our US and [European Union] EU presence. Having successfully proven our model we will soon be seeking the right investment partner to accelerate our growth and deliver positive impact to more organisations across the globe".

The Nonwovens Innovation & Research Institute (NIRI)'s newly opened Innovation House in Leeds, UK.

Much of NIRI's work centres on helping its customers to reduce the impact that their products have on the environment.

Fowler continues: "NIRI helps companies reduce reliance on plastics and meet new regulatory standards. We help reduce the environmental impact of numerous products for clients across a host of sectors, with [research and development] R&D and commercial solutions to improve biodegradability, compostability, dispersibility, [and] end-of-life disassembly, working towards a truly circular economy."

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End-of-life options for technical textiles explored in Dornbirn

Despite some very well-established and streamlined supply chains, the recovery and recycling of technical textiles is still far from easy, according to Nonwovens Editor Adrian Wilson, reporting from the *Dornbirn Global Fiber Congress (GFC)*.

In theory, the establishment of systems for the recovery and re-use of many technical textiles should be much simpler to achieve than setting-up similar systems for apparel.

As previously reported in this magazine[1], manufacturers of apparel are facing increasing legislative pressures to reduce the environmental impact of the more-than 100 billion garments that they produce globally each year. Indeed, in the European Union (EU), the problem of dealing with waste garments will be proportionately thrown back at the companies putting the products on the market through the *Waste Framework Directive*. In the EU from 2025, over seven million tonnes of waste textiles will need to be collected each year, which will

The Managing Director of the Austrian Fibers Institute (AUT), Friedrich Weninger (left), opens the 2023 Dornbirn Global Fiber Congress.

Eastman Chemical's Market Development Manager, Anders Ludvigsen, told delgates about the company's work recycling tufted polyester carpets for the automotive industry.

be paid for by manufacturers via the introduction of an extended producer responsibility (EPR) scheme. This could create a 32-Mt mountain of waste by 2030 unless there is very urgent action.

Differing legislation

Manufacturers serving markets such as the automotive industry or the rental workwear sector, however, have well-established and streamlined supply chains – if not yet take-back schemes – which should make closing the loop on the waste that they generate comparably easier than it is for producers of apparel.

Further, depending on their end-use, the recycling of technical textiles could fall under different EU legislation from the *Waste Framework Directive*. In July 2023, for example, the European Commission (EC) published its proposal for a directive that will mandate targets for the re-use, recycling and recovery of plastic and fibres waste from the more-than six million vehicles that are scrapped in the EU each year.

At the *62nd Dornbirn Global Fiber Congress (GFC)* conference in Austria on 13–15 September 2023, however, it was made plain by representatives serving the automotive and workwear industries that to increase recycling rates for the technical textiles used in these sectors will be far from easy.

Eastman Chemical

Eastman Chemical is investing around US$2.25 billion in molecular recycling technologies that can convert hard-to-recycle waste into, for instance, polyethylene terephthalate (PET) resins. These, in turn, can be used for the production of fibres and filaments that are indistinguishable from their fossil-fuel-based equivalents.

Its first recycling plant is based on a process called methanolysis and is already operational in Kingsport, Tennessee, USA (where the company also has its headquarters), and will have the capacity to recycle 110 kt of waste when fully ramped-up[(2)].

Eastman Chemical has more than three decades of experience of the methanolysis process. Its use with polyester (PES) waste is especially significant, because low-quality PES waste cannot be recycled mechanically and so would otherwise be diverted to landfills, incinerated or end-up in the environment. Using methanolysis, PES waste can instead be recycled into high-quality PES suitable for use in several applications.

The company plans to start-up a second plant in Port-Jérôme-sur-Seine, France, in 2026. It will be able to recycle 110 kt of waste in its first phase of development, rising to 200 kt in its second phase of development. The company also plans to have a third plant at a location yet to be decided in the USA operational by 2026.

Automotive carpets

Eastman Chemical is now partnering with carmakers, tier-one suppliers and spinners of PES to establish supply chains for the waste to serve as feedstock for the new plants, including the tufted carpets used in automotive interiors.

At *Dornbirn GFC*, Eastman Chemical's Market Development Manager, Anders Ludvigsen, explained that tufted carpets have a four-layer construction comprising a face layer, a primary backing, an adhesive layer and a secondary backing. These carpets have, until recently, mainly been made from polyamide (PA), but a shift is now underway to PES, owing to lower costs and its better environmental credentials, both in terms of its performance in life-cycle analysis (LCA) studies and its recycling potential.

A partner of Eastman Chemical that is a tier-one supplier to the automotive industry is now producing monomaterial tufted carpets using bulk continuous

filament (BCF) PET yarns, PET/coPET nonwoven backings and a polyethylene terephthalate glycol (PETG) adhesive, containing a specified recycled content of 50%. In establishing a circular system for series production, the calculation is that Eastman Chemical would take back 6 kg of carpet trim and scrap from the production of each carpet, and then 14 kg of carpet from a vehicle at the end of its life – although the two collections would be many years apart.

Even with such a monomaterial PET construction, the recycling of the carpets is not straightforward. "The PES family is based on the reactions of acids and glycols and not all polymers are the same", Ludvigsen said. "As modifications increase, so do the recycling challenges. Additives, colorants and finishing treatments add further complications."

Fortunately, Eastman Chemical's molecular recycling technology extracts the monomers monoethylene glycol (MEG) and dimethyl terephthalate (DMT) from the PET while removing the contamination that cannot be eliminated by mechanical recycling.

Shredder residue

Eastman Chemical has recently reported on another project in the USA, where metals, tyres and glass currently account for 80–90% of the materials recycled from end-of-life vehicles through traditional mechanical recycling streams.

The other 10–20% is rather tragically referred to as automotive shredder residue (ASR) and consists of mixed plastic and other materials that today generally end-up in landfills or are recovered through waste-to-energy technologies. These include the many nonwoven components employed in vehicles – EDANA lists 42 separate applications for them – as well as other technical textiles, such as cords and belts.

Feedstock

Eastman Chemical worked with the United States Automotive Materials Partnership (USAMP), the automotive recycler Padnos and global automotive interiors supplier Yanfeng on a project to recycle plastic from ASR.

In a keynote presentation, the Managing Partner of consultancy and engineering company Gherzi, Giuseppe Gherzi, summarised the major changes that lie ahead for the global textile and nonwovens industry.

In the project, Padnos, of Holland, Michigan, USA, supplied a plastic-rich fraction of ASR for use as a feedstock for Eastman Chemical's carbon renewal technology (CRT). Eastman Chemical successfully demonstrated that ASR feedstock can be converted into a synthesis gas (syngas), which can then be used downstream in the production of its PES and cellulosic thermoplastics. Resins from this production process were refined further and then supplied to Yanfeng, of Novi, Michigan, USA, and moulded into demonstration components that meet the requirements of the carmakers Ford, General Motors (GM) and Stellantis.

Workwear

On the face of it, Laval, France-based mechanical recycler of textiles, Renaissance Textile, would appear to have some distinct advantages when it comes to the supply of its waste input materials, yet also sees sorting as a major obstacle.

Renaissance Textile is backed by European producer of fabrics for workwear, Klopman International, of Frosinone, Italy, and its parent company, Laval-based military and tactical clothing specialist, TDV Industries. Klopman plans to establish agreements with its customers through which it will receive and recycle their end-of-life garments. Klopman will use the material generated to produce high-quality fabrics. Not only will this reduce the environmental impact of the production of workwear, but it will solidify the supply chain for workwear fabrics in Europe. Currently, 85% of such fabrics are sourced from outside the continent.

Renaissance Textile claims to have become the first French company dedicated to the recycling of end-of-life textiles after it started-up its 12 000-m^2 plant in Laval in 2022[3]. At the plant, garments are grouped, sorted and then transformed into raw material. In January 2022, a line comprising equipment for the opening of post-consumer recycled fibres and their mixing with virgin fibres was installed at the plant. These fibres can then be spun into yarns for the manufacture of new textiles. The line was designed by Cours, France-based Laroche (which was acquired by Andritz of Graz, Austria (see also, pages 33-38) in early 2021) in close partnership with Renaissance Textile.

Targets

At *Dornbirn GFC*, Klopman's Marketing Manager, Thomas Sieber, said that Renaissance Textile has set annual targets that will see it recycling 3 kt of textiles in 2023 and 12 kt by 2026 – allowing for the annual production of 42 million new garments by then.

At present, the plant is recycling white and unbleached cotton and PES waste clothing, and by 2025, Renaissance Textile anticipates that it will also be able to accommodate coloured textiles.

Rental pressure

Given that Klopman rents much of its workwear to customers, the fabrics that its uses must be of the highest quality, even those made using recycled materials. "Our business today is 98% workwear, with a focus on fabrics that fit the needs of the global workwear rental industry," Sieber explained. "Renting and industrial washing is a completely different concept to retail. With rental, we are talking about the lifetime of the garment and total cost of ownership, which demand a completely different approach both to the design and the product itself."

Rented workwear must endure between 50-100 wash cycles in industrial conditions over its usable life. "We have partners washing in 300-kW machines with a lot of chemicals and a lot of loading, putting tremendous pressure on the fabrics," Sieber said. "So, when we are talking now about circularity, whatever we do, our

fabrics need at the minimum to have the same performance level as the original virgin product. Everything we make is performance-driven and that is the reason we cannot have any compromises, since it would kill the basic rental concept."

In 2018, the partners started to work with Andritz and developed a mechanical recycling concept enabling the full end-of-life garments to be loaded into the tearing machine, where the hard and soft parts are automatically separated, so that the fibre can be recovered and re-used again in spinning and weaving processes.

"Our customers renting workwear know what a bib-and-brace cost 25 years ago and also what it should cost tomorrow and the day after, so we have no chance to make higher margins, meaning the recycling has to be cost-efficient," Sieber said. "This can only be achieved with a high degree of automation and a high degree of the utilisation of the feedstock for the process. Already, from 1 kg of an end-of-life garment, we have been able to obtain 85% as re-usable fibres and everything else is the hard waste."

Circular

Sieber added that the laundry industry is in itself operating in a circular way. "This is an absolute advantage in terms of logistics and how we can bring back the garments compared to the challenges the retailers face," he said. "Laundry garments are not sold directly to consumer markets and come back every week to be washed and serviced and repaired, so a laundry company is naturally interested in a long lifetime and durability, because whenever a garment is no longer usable, they have to change it. If a garment continues to be used for three years instead of one, that is gross margin and profit at the end of the day.

"The bad news is that these laundries know everything about the products when they are in service, but have no interest once they pass that point, so one of the keys in the future for us is in the sorting process – how clean we can make the feedstock for recycling. This will be one of the biggest investments for us in the coming years."

Markets

In a keynote presentation at *Dornbirn GFC*, Giuseppe Gherzi, Managing Partner of Zurich, Switzerland-based

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Events diary

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;
Tel: +81 (3) 3349-8502;
Fax: +81 (3) 3349-4900;
wearable-eng@reedexpo.co.jp;
https://www.wearable-expo.jp

March 2024

JEC World
5–7 March 2024
Paris, France and online
Farah Boudjemia, JEC Composites;
Tel: +33 (1) 5836-4399;
Fax: +33 (1) 5836-1513;
boudjemia@jeccomposites.com;
http://www.jeccomposites.com

Yarn Expo Spring
6–8 March 2024
Shanghai, China
Rita Li, Messe Frankfurt (HK) Ltd;
Tel: +852 2230-9966;
Fax: +852 2598-8771;
rita.li@hongkong.messefrankfurt.com;
https://intertextilehome.hk.messefrankfurt.com/china/en.html

FESPA Global Print Expo
19–22 March 2024
Amsterdam, The Netherlands
Leighona Aris, FESPA;
Tel: +44 (1737) 228160
Leighona.Aris@Fespa.com;
www.fespa.com

Performance Days
20–21 March 2024
Munich, Germany
Design and Development GmbH
Textile Consult;
Tel: +49 (89) 9394-6060
info@performancedays.com;
https://www.performancedays.com

Introduction to Textiles
26–28 March 2024
Manchester, UK
Robyn Ingham, Events Coordinator, The Textiles Institute;
Tel: +44 (161) 237-1188
ringham@textileinst.org.uk;
https://www.textileinstitute.org

April 2024

Railway Interior Innovation Summit
16–18 April 2024
Montreal, Québec, Canada
Andreas Wibowo, Business Development Manager, Red Cabin;
Tel: +49 (162) 256-7382
andreas.wibowo@redcabin.de;
http://redcabin.de

Techtextil
23–26 April 2024
Frankfurt, Germany
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Tel: +49 (69) 7575-6157;
Fax: +49 (69) 7575-6781;
ivonne.seifert@messefrankfurt.com;
https://techtextil.messefrankfurt.com

Texprocess
23–26 April 2024
Frankfurt, Germany
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Tel: +49 (69) 7575-6157;
Fax: +49 (69) 7575-6781;
ivonne.seifert@messefrankfurt.com;
https://texprocess.messefrankfurt.com

FiltXPO
29 April–1 May 2024
Miami Beach, Florida, 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

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

Aircraft Interiors Expo
28–30 May 2024
Hamburg, Germany
Polly Magraw, Reed Exhibitions Ltd;
Tel: +44 (20) 8271-2174.
polly.magraw@rxglobal.com;
https://www.aircraftinteriorsexpo.com

June 2024

Outdoor by ISPO
3–5 June 2024
Munich, Germany
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https://www.ispo.com

International Textile Machinery Exhibition (ITM)
4–8 June 2024
Istanbul, Turkey
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info@teknikfuarcilik.com;
https://www.itmexhibition.com/itm2024

World of Wipes
17–20 June 2024
Minneapolis, Minnesotta, USA
MIsty Ayers, Marketing Coordinator, INDA (Association of the Nonwoven Fabrics Industry);
Tel: +1 (919) 459-3712
mayers@inda.org;
https://www.worldofwipes.org

Nanotexnology
29 June–6 July 2024
Thessaloniki, Greece
Stergios Logothetidis, Chair, Nanotexnology;
Tel: +30 (231) 099-8174
info@nanotexnology.com;
https://www.nanotexnology.com

August 2024

Intertextile Shanghai Home Textiles
14–16 August 2024
Shanghai, China
Rita Li, Messe Frankfurt (HK) Ltd;
Tel: +852 2230-9966;
Fax: +852 2598-8771;
rita.li@hongkong.messefrankfurt.com;
https://intertextilehome.hk.messefrankfurt.com/china/en.html

Techtextil North America
20–22 August 2024
Raliegh, North Carolina, USA
Kristy Meade, Show Director, Messe

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

Yarn Expo Autumn
27–29 August 2024
Shanghai, China
Rita Li, Messe Frankfurt (HK) Ltd;
Tel: +852 2230-9966;
Fax: +852 2598-8771;
rita.li@hongkong.messefrankfurt.com;
https://intertextilehome.hk.messefrankfurt.com/china/en.html

September 2024

International Composites Summit
4–5 September 2024
Milton Keynes, UK
Composites UK;
Tel: +44 (1442) 817502
info@fpcc-conference.com;
https://compositesuk.co.uk/events/international-composites-summit

Dornbirn Global Fiber Congress
11–13 September 2024
Dornbirn, Austria
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office@dornbirn-gfc.com;
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CINTE Techtextil China
19–21 September 2024
Shanghai, China
Jason Taylor, Messe Frankfurt (HK) Ltd;
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jason.taylor@hongkong.messefrankfurt.com;
https://cinte-techtextil-china.hk.messefrankfurt.com/shanghai/en.html

Advanced Textiles Expo
24–26 September 2024
Anaheim, California, USA
Amy Collins, Advanced Textiles Association;
Tel: +1 651 225 6970
amy.collins@textiles.org;
https://www.textiles.org/event/ifai-expo-2023

Outlook
24–26 September 2024
Rome, Italy
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-2022

Textile Rental Services Association (TRSA) 111th Annual Conference
24–26 September 2024
Colorado Springs, Colorado, 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

FESPA Mexico
26–28 September 2024
Mexico City, Mexico
Leighona Aris, FESPA;
Tel: +44 (1737) 228160
Leighona.Aris@Fespa.com;
https://www.fespa.com

October 2024

Research, Innovation and Science for Engineered Fabrics (RISE) 2024
1–2 October 2024
Raleigh, North Calrolina, 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
6–8 October 2024
Savannah, Georgia, USA
Kim Nicholson, AATCC;
Tel: +1 (919) 549-8141
education-dept@aatcc.org;
https://aatcc.org/events

ITMA Asia + CITME
14–18 October 2024
Shanghai, China
Daphne Poon, ITMA Services;
Tel: +65 9478-9543
daphnepoon@itma.com;
https://www.itmaasia.com

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23–24 October 2024
Munich, Germany
Design and Development GmbH Textile Consult;
Tel: +49 (89) 9394-6060
info@performancedays.com;
https://www.performancedays.com

Advanced Engineering
30–31 October 2024
Birmingham, UK
Alison Willis, Divisional Director, Easy Fairs;
Tel: +44 (20) 3196-4303
alison.willis@easyfairs.com;
https://www.advancedengineeringuk.com

November 2024

Filtech 2024
12–14 November 2024
Cologne, Germany
Suzanne Abetz, Filtech Exhibitions Germany;
Tel: +49 (2132) 935760
info@filtech.de;
http://www.filtech.de

April 2025

IDEA
29 April–1 May 2025
Miami Beach, Florida, USA
Misty Ayers, INDA (Association of the Nonwoven Fabrics Industry);
Tel: +1 (919) 459-3712;
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mayers@inda.org;
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6–8 May 2025
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Fax: +1 (770) 984-8023;
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https://texprocess-americas.us.messefrankfurt.com

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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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Website: www.andritz.com/dan-web

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Phone: +39 (0)85 820 601 Email: diatec@andritz.com
Website: www.andritz.com/nonwoven

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ANDRITZ Küsters GmbH
Eduard-Küsters-Str. 1, 47805 Krefeld / Germany
Phone: +49-2151-34-0 Email: kuesters.nonwoven@andritz.com
Website: www.andritz.com/nonwoven

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ANDRITZ Laroche SA
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Phone: +33 4 74 89 84 85 Email: laroche@andritz.com
Website: www.andritz.com/laroche

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Website: www.andritz.com/nonwoven

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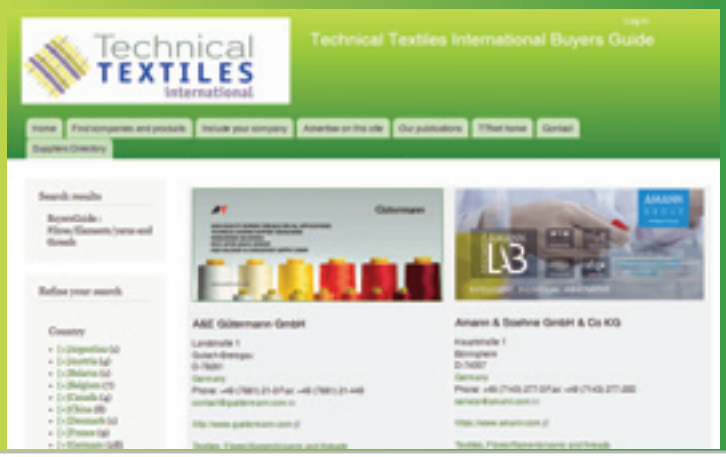

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Narrow fabric machinery
Nonwoven machinery
Other production machinery
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Control/testing machinery
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Buyer's Guide for the Technical Textiles Industry—2024

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 2024 issue, as well as being available throughout 2024 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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TEXTILES

FIBRES, FILAMENTS, YARNS AND THREADS

Tel Rad Cuyo, Buenos Aires, Argentina.
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Lenzing AG, Lenzing, Austria.
Lenzing Plastics GmbH, Lenzing, Austria.
Lenzing Technik GmbH, Lenzing, Austria.
Rue Spa Khimvolokno, Svetlogorsk, Belarus.
Beaulieu Fibres International, Wielsbeke, Belgium
Sioen Industries, Ardooie, Belgium.
Xentrys, Gent, Belgium.
Sioen Felt & Filtration, Liège, Belgium.
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Beaulieu Fibres International, Wielsbeke, Belgium.
Luxilon Industries NV, Wijnegem, Belgium.
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Ben's Land (Nanking) Baby Articles Corp Ltd, Nanjing, China.
Lenzing (Nanjing) Fibers Co Ltd, Nanjing, China.
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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.
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Officine Maccaferri SpA, Bologna, Italy.
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Fil Man Made Group, Signoressa di Trevignano, Italy.
Fil.Va Srl, Varese, Italy.
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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.

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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.
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.
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, Helsinki, 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.
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.
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.

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AG Cilander, Herisau, Switzerland
Schoeller Textiles, Sevelen, Switzerland.
Everest Textile Co Ltd, Taipei, Taiwan.
Nam Liong Enterprise Co Ltd, Yung-Kang City, Taiwan.
Rivertex Technical Fabrics Group, Culemborg, The Netherlands
TenCate Outdoor Fabrics, Nijverdal, The Netherlands.
Hassan Group, Istanbul, Turkey.
Arville Textiles Ltd, Wetherby, UK
Abbey England Ltd, Knutsford, UK.
Dunlop Coated Textiles, Manchester, UK.
Whitford Ltd, Runcorn, UK.
ABC Industries Inc, Warsaw, USA.
Aurora Specialty Textiles Group, Aurora, USA.
Mesa Industries, Cincinnati, USA.
Tri Vantage, Cleveland, USA.
Value Vinyls Inc, Grand Prairie, USA.
Safety Components International, Greenville, USA.
Eastex Products Inc, Holbrook, USA.
Momentum Textiles, Irvine, USA.
Supertex Inc, Liberty, USA.
Pennel USA, Mount Pleasant, USA.
Brookwood Companies Inc, New York, USA.
TenCate Advanced Armor USA Inc, Newark, USA.
Vestagen Technical Textiles LLC, Orlando, USA.
Cooley Group, Pawtucket, USA.
Innovative Surface Technologies Inc, Saint Paul, USA.
New Pig Corp, Tipton, USA.
Precision Custom Coatings LLC, Totowa, USA.
Glatfelter, Charlotte, USA.

Composites

Lineo NV, Meulebeke, Belgium.
Diatex SAS, Saint-Genis-Laval, France.
Porcher Industries, Badinières, France.
Innobat, Clapiers, France.
Soficar, Saint Maurice Cedex, France.
Tibtech, Tourcoing, France.
Delcotex Delius GmbH & Co KG, Bielefeld, Germany.
Cevotec GmbH, Taufkirchen bei München, Germany.
Covestro AG, Leverkusen, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Indorama Ventures Mobility Obernburg GmbH, Obernburg, Germany.
IPCO Germany GmbH, Göppingen, Germany.
Johns Manville, Wertheim, Germany.
Sandler AG, Schwarzenbach/Saale, Germany.
Toray International Europe GmbH, Munich, Germany.
Trans-Textil GmbH, Freilassing, Germany.
vombaur GmbH & Co KG, Wuppertal, Germany.
Strata Geosystems (India) Pvt Ltd, Mumbai, India.
Sakai Ovex Co Ltd, Fukui, Japan.
Unitika Fibers, Osaka, Japan.
Toho Tenax, Tokyo, Japan.
Prepreg – Advanced Composite Materials, Moscow, Russia.
Oxeon AB, Borås, Sweden.
Thai Acrylic Fiber Co Ltd, Bangkok, Thailand.
Royal Ten Cate, Almelo, The Netherlands.
TenCate Advanced Composites, Nijverdal, The Netherlands.
Hassan Group, Istanbul, Turkey.
J&D Wilkie Ltd, Kirriemuir, UK.
GEOfabrics Ltd, Leeds, UK.
Gurit (UK), Newport, UK.
Sigmatex UK, Runcorn, UK.
Cygnet Texkimp, Northwich, UK.
Culzean Textile Solutions Ltd, Stewarton, UK.
Scott & Fyfe, Tayport, UK.
Coats, Uxbridge, UK.
Albany International Corp, Albany, USA.
Bally Ribbon Mills, Bally, USA.
Coats Performance Materials, Charlotte, USA
Oxeon Inc, Chicago, USA.
Propex, Chattanooga, USA.
Concordia Manufacturing LLC, Coventry, USA.
Hollingsworth & Vose Co, East Walpole, USA.
TenCate Advanced Composites USA Inc, Fairfield, USA.
Materials Innovation Technology, Fletcher, USA.
Owens Corning, Granville, USA.
SPT Technology Inc, Minneapolis, USA.
TenCate Advanced Composites USA Inc, Morgan Hill, USA.
Kaneka America LLC, New York, USA.
Cooley Group, Pawtucket, USA.
Hardwire LLC, Pocomoke City, USA.
Allasso Industries Inc, Raleigh, USA.
Circle, Rogers, USA.
Milliken & Co, Spartanburg, USA.

Raw materials

Total Petrochemicals SA, Brussels, Belgium.
Albemarle Europe sprl, Louvain-la-Neuve Sud, Belgium.
Nano-Tex Inc, Maaseik, Belgium.
EOC Group, Oudenaarde, Belgium.
ExxonMobil Chemical, Machelen, Belgium.
Fixatti NV, Nazareth, Belgium.
Braskem SA, São Paulo, Brazil.
Thomson Research Associates, Toronto, Canada.
China National Bluestar (Group) Co Ltd, Beijing, China.
Ben's Land (Nanking) Baby Articles Corp Ltd, Nanjing, China.
DM Reflective Material, Zhejiang, China.
Arkema, Colombes Cedex, France.
Bluestar Silicones France SAS, Lyon, France.
Prochimir, Pouzauges France.
Daikin Chemical Europe GmbH, Düsseldorf, Germany.
Pulcra Chemicals GmbH, Geretsried, Germany.
Rudolf GmbH, Geretsried, Germany.
Nordenia Deutschland Gronau GmbH, Gronau, Germany.
Wacker Chemie AG, Munich, Germany.
Bozzetto GmbH, Krefeld, Germany.
Eckart GmbH, Hartenstein, Germany.
Schill + Seilacher GmbH, Böblingen, Germany
Transfertex GmbH & Co/Thermodruck, Kleinostheim, Germany.
Trans-Textil GmbH, Freilassing, Germany.
Covestro AG, Leverkusen, Germany.
Follmann, Minden, Germany.
Pongs Group (Technical Textiles), Mühltroff, Germany.
Bio-Gate AG, Nuremberg, Germany.
CHT Germany GmbH, Oyten, Germany.
Baybox eK, Pfronten, Germany.
W.L. Gore & Associates GmbH, Pleinfield, Germany.
W.L. Gore & Associates (Medical Fabrics) GmbH, Putzbrunn, Germany.
W.L. Gore & Associates GmbH, Putzbrunn, Germany.
dorix GmbH, Selbitz/Bayern, Germany.
Q-mo solar AG, Teltow, Germany.
Sympatex Technologies GmbH, Unterföhring, Germany.
Zschimmer & Schwarz GmbH & Co KG, Lahnstein, Germany
Basell Asia Pacific Ltd, Causeway Bay, Hong Kong.
SRF Ltd, Gurgaon, India.
Haldia Petrochemicals Ltd, Kolkata, India.
Rossari Biotech Ltd, Mumbai, India.
SAATI India, Mumbai, India.
Sarex Chemicals, Mumbai, India
Climax Synthetics, Vadodara, India.
Saint-Gobain Performance Plastics, Kilrush, Ireland.
ICL Industrial Products, Beer Sheva, Israel.
ICAP-SIRA, Parabiago, Italy.
Novotex Italiana SpA, Gaggiano, Italy.
Seal SpA, Legnano, Italy.
Novamont SpA, Novara, Italy.
Nicca Chemical Co Ltd, Fukui, Japan.
Kaneka Corp, Osaka, Japan.
Teijin Ltd, Osaka, Japan.
Toyobo Co Ltd, Osaka, Japan.
Unitika Fibers, Osaka, Japan.
Achilles Corp, Tokyo, Japan.
Kao Corp, Tokyo, Japan.
Tokokosen Corp, Tokyo, Japan.
Huntsman (Singapore) Pte Ltd, Singapore.
Sensing Tex SL, Barcelona, Spain.
Morchem, Las Franqueses del Vallés (Barcelona), Spain.
Polygiene AB, Malmö, Sweden.
HeiQ Materials AG, Bad Zurzach, Switzerland.
Huntsman Textile Effects, Basel, Switzerland.
Sanitized AG, Burgdorf, Switzerland.
EMS-Chemie AG, Domat/Ems, Switzerland.
EMS-Griltech, Domat/Ems, Switzerland.
TexTrace AG, Frick, Switzerland.
EMS-Chemie Holding AG, Herrliberg, Switzerland.
Archroma Technical Textiles LLC, Reinach, Switzerland.
Beyond Surface Technologies, Prattein, Switzerland.
Pontacol AG, Schmitten, Switzerland
Schoeller Technologies AG, Sevelen, Switzerland.
Schoeller Textiles, Sevelen, Switzerland.
Ding Zing Chemical Products Co Ltd, Kaohsiung, Taiwan.
Tiong Liong Industrial Co Ltd, Taichung, Taiwan.
Yeu Ming Tai Chemical Industrial Co Ltd, Taichung, Taiwan.
U-Long Prosperity Co Ltd, Tai-Pao, Taiwan.
Chia Her Industrial Co Ltd, Taipei, Taiwan.
Saha Pathanapibul plc, Bangkok, Thailand.
ICL Industrial Products, Amsterdam, The Netherlands.
DSM, Heerlen, The Netherlands.
Stahl Holdings BV, Waalwijk, The Netherlands
Tanatex Chemicals BV, Ede, The Netherlands.
Devan Chemicals, Ambergate, UK.
Dow Corning Ltd, Barry, UK.
LJ Specialities Ltd, Chesterfield, UK.
Dailys Ltd, Ellesmere Port, UK.
Technical Absorbents, Grimsby, UK.
Beyond Surface Technologies, Halifax, UK.
Green Chemicals plc, Leeds, UK.
W.L. Gore & Associates (UK) Ltd, Livingston, UK.
Chemtura Manufacturing UK Ltd, Manchester, UK.
DyStar UK Ltd, Manchester, UK.
Lubrizol Advanced Materials UK Ltd, Manchester, UK.
Thor Specialities (UK) Ltd, Northwich, UK.
Dartex Coatings Ltd, Nottingham, UK.
Peratech Ltd, Richmond, UK.
Purification Products Ltd, Shipley, UK.
MicroflexTechnologies, a division of Kellie Solutions Ltd, Tarporley, UK.
Cytec Engineered Materials Inc, Wrexham, UK.
BigSky Technolologies LLC, USA.
Adherent Technologies Inc, Albuquerque, USA.
Air Products and Chemicals Inc, Allentown, USA.
Solvay Advanced Polymers LLC, Alpharetta, USA.
NanoHorizons Inc, Bellefonte, USA.
Chasm Technologies Inc, Canton, USA.
Huntsman Textile Effects, Charlotte, USA.
Zyvex Performance Materials, Columbus, USA.
Huntsman Textile Effects, Dalton, USA.
Bluestar Silicones Corp, East Brunswick, USA.
W.L. Gore & Associates Inc, Elkton, USA.
W.L. Gore & Associates Inc, Medical Products Division, Flagstaff, USA.
Value Vinyls Inc, Grand Prairie, USA.
Argotec Inc, Greenfield, USA.
Insect Shield LLD, Greensboro, USA.
Huntsman Textile Effects, High Point, USA.
Eastex Products Inc, Holbrook, USA.
LyondellBasell Industries, Houston, USA.
NanoRidge Materials Inc, Houston, USA.
Ascend Performance Materials, Kennesaw, USA.

Chemtura Corp, Middlebury, USA.
Aegis Environments, Midland, USA.
Dow Corning, Midland, USA.
NatureWorks LLC, Minnetonka, USA.
Honeywell International, Morristown, USA.
Kaneka America LLC, New York, USA.
W.L. Gore & Associates Inc, Newark, USA.
SouthWest NanoTechnologies Inc, Norman, USA.
Vestagen Technical Textiles LLC, Orlando, USA.
Avery Dennison Specialty Tape Division, Painesville, USA.
Biosafe Inc, Pittsburgh, USA.
Tredegar Film Products Corp, Richmond, USA.
RKW US Inc, Rome, USA.
Imerys Performance Minerals, Roswell, USA.
Bemis, Shirley, USA.
NEI Corp, Somerset, USA.
Weyerhaeuser Co, South Federal Way, USA.
Milliken & Co, Spartanburg, USA.
3M, St Paul, USA.
H.B. Fuller Co, St Paul, USA.
EMS-Griltech Americas, Sumter, USA.
Sciessent, Wakefield, USA.
E.I. DuPont de Nemours and Co, Wilmington, USA.

MACHINERY

MANUFACTURERS OF MACHINERY FOR MAKING FIBRES, FILAMENTS, YARNS AND THREADS

SML Maschinen-gesellschaft mbH, Redlham, Austria.
Starlinger & Co GmbH, Vienna, Austria.
Gualchierani Baling Systems nv, Menen, Belgium.
Valvan Baling Systems nv, Menen, Belgium.
Lenzing Engineering & Technical Services (Nanjing) Co Ltd, Nanjing, China.
Formfiber Denmark, Galten, Denmark.
GF Machinery sro, Brno, Czech Republic.
NSC Fibre to Yarn, Guebwiller Cedex, France.
Fil Control SA, Montbron, France.
Superba Textiles Systems, Mulhouse Cedex, France.
Verdol, Valence, France.
DIENES Apparatebau GmbH, Mühlheim am Main, Germany.
Mozart AG, Solingen, Germany.
Gneuß Kunststofftechnik GmbH, Bad Oeynhausen, Germany.
DiloTemafa, Bergisch Gladbach, Germany.
Beteiligung GmbH, Bonn, Germany.
Georg Sahm GmbH & Co KG, Eschwege, Germany.
Mainsite Technologies GmbH, Obernburg, Germany.
Schlafhorst Zweig-niederlassung der Saurer Germany GmbH & Co KG, Übach-Palenberg, Germany.
Oerlikon Nonwoven, Neumünster, Germany.
Oerlikon Textile GmbH & Co KG, Remscheid, Germany.
Saurer Technologies GmbH & Co KG, Kempten, Germany.
STC Spinnzwirn GmbH, Chemnitz, Germany.
Trützschler Spinning/ Trützschler GmbH & Co KG, Mönchengladbach, Germany.
Trützschler Card Clothing GmbH, Neubulach, Germany.
Reimotec Maschinen-und Anlagenbau GmbH, Lampertheim, Germany.
Inditech International, Mumbai, India.
Farè SpA, Fagnano Olona, Italy.
LGL Electronics SpA, Gandino, Italy.
Loptex SRL, Montano Lucino, Italy.
Mesdan SpA, Puegnago del Garda, Italy.
Ramina Srl, Grantorto, Italy.
Burckhardt of Switzerland AG, Basel, Switzerland.
Habasit AG, Reinach, Switzerland.
Saurer Components, Wattwil, Switzerland.
Rieter Group, Winterthur, Switzerland.
Rieter Management AG, Winterthur, Switzerland.
Santex AG, Tobel, Switzerland.
Trützschler Switzerland AG, Winterthur, Switzerland.
Diversified Systems—Alexco, Greenville, USA.
NanoStatics LLC, Circleville, USA.
Biax-Fiberfilm Corp, Greenville, USA.
Nonwoven Technologies Inc, Oyster Bay, USA.
Hills Inc, West Melbourne, USA.

MANUFACTURERS OF MACHINERY FOR MAKING NANOFIBRES

Elmarco, Liberec, Czech Republic.
DIENES Apparatebau GmbH, Mühlheim am Main, Germany.
Nanoval GmbH & Co, Berlin, Germany.
Diversified Systems—Alexco, Greenville, USA.
Fiberio Tech Corp, Edinburg, USA.
Xanofi, Raleigh, USA.

MANUFACTURERS OF MACHINERY FOR MAKING KNITTED FABRICS

Groz-Beckert KG, Albstadt, Germany.
Karl Mayer Group, Stoll Textil-maschinenfabrik GmbH, Obertshausen, Germany.
Comez SpA, Cilavegna, Italy.
Diversified Systems—Alexco, Greenville, USA.

MANUFACTURERS OF MACHINERY FOR MAKING NARROW FABRICS

Zimmer Maschinenbau GmbH Digital Printing Systems, Kufstein, Austria.
Mageba Textilmaschinen GmbH & Co KG, Bernkastel-Kues, Germany.
Comez SpA, Cilavegna, Italy.
Insitute of Narrow Fabrics, Frick, Switzerland.
Jakob Müller AG, Frick, Switzerland.
Diversified Systems—Alexco, Greenville, USA.

MANUFACTURERS OF MACHINERY FOR MAKING NONWOVEN FABRICS

Andritz Dan-Web A/S, Galten, Denmark.
SML Maschinen-gesellschaft mbH, Redlham, Austria.
Formfiber Denmark, Galten, Denmark.
Andritz Laroche SA, Cours, France.
Andritz Asselin-Thibeau SAS, Elbeuf, France.
Andritz Perfojet, Montbonnot, France.
Spoolex, Roche la Molière, France.
A. Monforts Textilmaschinen GmbH & Co KG, Moenchengladbach, Germany.
Graute GmbH, Senden, Germany.
Groz-Beckert KG, Albstadt, Germany.
Nanoval GmbH & Co, Berlin, Germany.
Beteiligung GmbH, Bonn, Germany.
DiloSpinnbau, Bremen, Germany.
Karl Mayer Group, Technische Textilien GmbH, Chemnitz, Germany.
Trützschler Nonwovens GmbH, Dülmen, Germany.
Dilo Systems GmbH, Eberbach, Germany.
Trützschler Nonwovens GmbH, Egelsbach, Germany.
Andritz Küsters GmbH, Krefeld, Germany.
Autefa Solutions, Friedberg, Germany.
Trützschler Card Clothing GmbH, Neubulach, Germany.
Oerlikon Nonwoven, Neumünster, Germany.
Oerlikon Textile GmbH & Co KG, Remscheid, Germany.
Reifenhauser Reicofil, Troisdorf, Germany.
Mozart AG, Solingen, Germany.
Winkler+Dünnebier GmbH, Neuwied, Germany.
A. Celli Nonwovens, Porcari, Italy.
Andritz Diatec srl, Collecorvino, Italy.
Farè SpA, Fagnano Olona, Italy.
Loptex SRL, Montano Lucino, Italy.
Ramina Srl, Grantorto, Italy.
SICAM srl, Milan, Italy.
Santex AG, Tobel, Switzerland.
Tatham Ltd, Bradford, UK.
Diversified Systems—Alexco, Greenville, USA.
Dilo Inc, Charlotte, USA.
Biax-Fiberfilm Corp, Greenville, USA.
Nonwoven Technologies Inc, Oyster Bay, USA.

MANUFACTURERS OF MACHINERY FOR MAKING WOVEN FABRICS

Starlinger & Co GmbH, Vienna, Austria.
Picanol nv, Ieper, Belgium.
GF Machinery sro, Brno, Czech Republic.
Mallein, Corbelin, France.
Groz-Beckert KG, Albstadt, Germany.
Lindauer Dornier GmbH, Lindau, Germany.
Karl Mayer Group, Technische Textilien GmbH, Chemnitz, Germany.
Karl Mayer Group, Stoll Textil-maschinenfabrik GmbH, Obertshausen, Germany.
Stäubli Bayreuth GmbH, Bayreuth, Germany.
Inditech International, Mumbai, India.
Itema SpA, Colzate, Italy
Smit Spa STP Srl, Schio, Italy.
ITOCHU SysTech Corp, Osaka, Japan.
Crealet AG, Eschenbach, Switzerland.
Benninger Co Ltd, Uzwil, Switzerland.
Diversified Systems—Alexco, Greenville, USA.

MANUFACTURERS OF OTHER MACHINERY FOR MAKING TEXTILES

SML Maschinen-gesellschaft mbH, Redlham, Austria.
Starlinger & Co GmbH, Vienna, Austria.
Gualchierani Baling Systems nv, Menen, Belgium.
Valvan Baling Systems nv, Menen, Belgium.
Lenzing Engineering & Technical Services (Nanjing) Co Ltd, Nanjing, China.
Mauser Spezial, Taicang, China.
Aesa Air Engineering SA, Thann Cedex, France.
Rousselet-Robatel SA, Annonay, France.
H. Petit & Cie, Aubenas Cedex, France.
Mallein, Corbelin, France.
Barbier Ebelmann SAS, Eloyes, France.
Schaeffer Productique, Pfastatt Le Chateau, France.
Roll Concept, Roche la Molière, France.
DIENES Apparatebau GmbH, Mühlheim am Main, Germany.
Groz-Beckert KG, Albstadt, Germany.
assyst GmbH, Aschheim-Dornach, Germany.
Erhardt+Leimer GmbH, Stadtbergen, Germany.
Dürkopp Adler AG, Bielefeld, Germany.
IPCO Germany GmbH, Göppingen, Germany
Mozart AG, Solingen, Germany.
Brother Internationale Industriemaschinen GmbH, Emmerich am Rhein, Germany.
Voith Paper Holding GmbH & Co KG, Heidenheim, Germany.

Buyer's Guide: Index

Pfaff Industriesysteme und Maschinen AG, Kaiserslautern, Germany.
Nähmaschinenfabrik, Emil Stutznäcker GmbH & Co KG, Köln, Germany.
Tajima GmbH, Winterlingen-Benzingen, Germany.
Winder Works Maschinenbau GmbH, Senden, Germany.
Dell'Orco & Villani, Capalle, Italy.
Martin Group srl, Florence, Italy.
SICAM srl, Milan, Italy.
Fusè Carlo SpA, Magenta, Italy.
Ergotron SAS, Marano Ticino, Italy.
ITOCHU SysTech Corp, Osaka, Japan.
Zuiko Co Ltd, Settsu, Japan.
Sunstar Co Ltd, Incheon, Korea.
Winder Works, Luxembourg.
Baldwin Technology, Arlöv, Sweden
Eton Systems AB, Gånghester, Sweden.
Santex AG, Tobel, Switzerland.
Benninger Co Ltd, Uzwil, Switzerland.
Habasit AG, Reinach, Switzerland.
Tatham Ltd, Bradford, UK.
Just Rollers plc, Cwmbran, UK.
Diversified Systems—Alexco, Greenville, USA.
Lang Ligon & Co Inc, Greenville, USA.

Manufacturers of machinery for converting and finishing textiles

Alexium International Group Ltd, Perth, Australia.
Zimmer Maschinenbau GmbH Screen & Coating Systems, Klagenfurt, Austria.
Zimmer Maschinenbau GmbH Digital Printing Systems, Kufstein, Austria.
SML Maschinen-gesellschaft mbH, Redlham, Austria.
Gerber Technology, Zaventem, Belgium.
Summa NV, Gistel, Belgium.
Pyradia Inc, Longueuil, Canada.
Virtek Vision International, Waterloo, Canada.
Mauser Spezial, Taicang, China.
Alliance Machines Textiles, Les Echets–Miribel, France.
Calemard, Roche la Molière, France.
Callebaut de Blicquy, Tourcoing, France.
Decoup+, Roche la Molière, France.
Dollfus & Muller, Mulhouse Cedex 2, France.
Lectra, Paris, France.
Roll Concept, Roche la Molière, France.
Spoolex, Roche la Molière, France.
Superba Textiles Systems, Mulhouse, France.
assyst GmbH, Aschheim-Dornach, Germany.
Winkler+Dünnebier GmbH, Neuwied, Germany.
DIENES Apparatebau GmbH, Mühlheim am Main, Germany.
Dürkopp Adler AG, Bielefeld, Germany.
Erhardt+Leimer GmbH, Stadtbergen, Germany.
Coatema Coating Machinery GmbH, Dormagen, Germany.
Brother Internationale Industriemaschinen GmbH, Emmerich am Rhein, Germany.
Brisay Maschinen GmbH, Grossostheim/Ringheim, Germany.
Herrmann Ultraschalltechnik GmbH & Co KG, Karlsbad, Germany.
Kroenert GmbH & Co KG, Hamburg, Germany
Lectra, Ismaning, Germany.
Pfaff Industriesysteme und Maschinen AG, Kaiserslautern, Germany.
Edelmann Technology GmbH & Co KG, Kleinwallstadt, Germany.
MS Ultraschall Technologie GmbH, Spaichingen, Germany.
Nähmaschinenfabrik, Emil Stutznäcker GmbH & Co KG, Köln, Germany.
Veit GmbH, Landsberg am Lech, Germany.
Lacom Vertriebs GmbH, Lauchheim, Germany.
Brückner Textile Technologies GmbH & Co KG, Leonberg, Germany.
STC Spinnzwirn GmbH, Chemnitz, Germany.
Topcut Bullmer GmbH, Mehrstetten, Germany.
A. Monforts Textilmaschinen GmbH & Co KG, Moenchengladbach, Germany.
WEKO Weitmann & Konrad GmbH & Co KG, Leinfelden-Echterdingen, Germany.
Nanogate, Quierschied-Göttelborn, Germany.
Mozart AG, Solingen, Germany.
Schobertechnologies GmbH, Eberdingen, Germany.
Tajima GmbH, Winterlingen-Benzingen, Germany.
Westland Gummiwerke, Melle, Germany.
Xorella, Schwäbisch Hall, Germany.
Inditech International, Mumbai, India.
SAATI India, Mumbai, India.
A. Celli Nonwovens, Porcari, Italy.
Bierrebi Italia Srl, Sasso Marconi, Italy.
J-Teck3, Albese con Cassano, Italy.
Martin Group srl, Florence, Italy.
Ramina Srl, Grantorto, Italy.
Reggiani Macchine SpA, Grassobbio, Italy.
Seal SpA, Legnano, Italy.
SICAM srl, Milan, Italy.
Fusè Carlo SpA, Magenta, Italy.
Biancalani SpA, Prato, Italy.
Grinp Srl, Turin, Italy.
Testa SpA, Zanica, Italy.
ITOCHU SysTech Corp, Osaka, Japan.
Sunstar Co Ltd, Incheon, South Korea.
Baldwin Technology, Arlöv, Sweden
Santex AG, Tobel, Switzerland
Benninger Co Ltd, Uzwil, Switzerland.
Burckhardt of Switzerland AG, Basel, Switzerland.
Werner Mathis AG, Zurich, Switzerland.
Zünd Systemtechnik AG, Altstätten, Switzerland
Osiris Digital Printing, Hengelo, The Netherlands.
Klieverik Heli BV, Oldenzaal, The Netherlands.
Cygnet Texkimp, Northwich, UK.
P2i Ltd, Abingdon, UK.
Richard Hough Ltd, Bolton, UK.
Lectra Ltd, Bradford, UK.
Just Rollers plc, Cwmbran, UK.
Xennia Technology Ltd, Letchworth, UK.
AVA CAD/CAM Group Ltd, Macclesfield, UK.
GerberTechnology Ltd, Manchester, UK.
Parex Mather Ltd, Manchester, UK
Surface Innovations Ltd, Wolsingham, UK.
C.A. Litzler Co Inc, Cleveland, USA.
Diversified Systems—Alexco, Greenville, USA.
Werner Mathis USA Inc, Concord, USA.
Morrison Textile Machinery Co, Fort Lawn, USA.
Biax-Fiberfilm Corp, Greenville, USA.
APJet Inc, Santa Fe, USA.
P2i Inc, Savannah, USA.
Zimmer Austria Inc, Spartanburg, USA.
Gerber Technology, Tolland, USA.
Sonobond Ultrasonics, West Chester, USA.

Manufacturers of machinery for control, testing, inspection and monitoring

Lenzing Instruments GmbH & Co KG, Gampern, Austria.
Roctest Ltd, Saint-Lambert, Canada.
Beta LaserMike Asia (NDC Technologies), Shanghai, China.
Schaeffer Productique, Pfastatt Le Chateau, France.
Beta LaserMike Germany (NDC Technologies), Dortmund, Germany.
emtec Electronic GmbH, Leipzig, Germany
Erhardt+Leimer GmbH, Stadtbergen, Germany.
FILK Freiberg Institute gGmbH, Freiberg, Germany.
Mahlo GmbH + Co KG, Saal/Donau, Germany.
Textechno Herbert Stein GmbH & Co KG, Moenchengladbach, Germany.
Canalair Service Srl, Ponte Nossa (BG), Italy.
Mesdan SpA, Puegnago del Garda, Italy.
X-Rite Europe GmbH, Regensdorf, Switzerland.
Textest AG, Schwerzenbach, Switzerland.
Tatham Ltd, Bradford, UK.
James Heal & Co Ltd, Halifax, UK.
VeriVide Ltd, Leicester, UK.
NDC Technologies, Maldon, UK.
ChromaShare, Manchester, UK.
Mecmesin Ltd, Slinfold, UK.
Beta LaserMike Europe (NDC Technologies, Marlow, UK.
Testometric, Rochdale, UK.
Wira Instrumentation Ltd, Bradford, UK.
Q-Lab Corp, Cleveland, USA.
Beta LaserMike Americas (NDC Technologies), Dayton, USA.
Diversified Systems—Alexco, Greenville, USA.
Measured Solutions Inc, Greenville, USA.
Advanced Testing Instruments, Greer, USA.
AccuSentry Inc, Marietta, USA.
BigC, Torrance, USA.

Manufacturers of machinery for recycling

Starlinger & Co GmbH, Vienna, Austria.
Andritz Laroche SA, Cours, France.
Dilo Systems GmbH, Eberbach, Germany.
Dell'Orco & Villani, Capalle, Italy.
Loptex SRL, Montano Lucino, Italy.
Diversified Systems—Alexco, Greenville, USA.
Zimmer Austria Inc, Spartanburg, USA.

MARKETS

Agriculture and horticulture

TenCate Industrial Fabrics Europe, Linz, Austria.
Beaulieu Technical Textiles SA, Comines-Warneton, Belgium.
Conwed Plastics, Genk, Belgium.
Pegas Nonwovens sro, Znojmo, Czech Republic.
Diatex SAS, Saint-Genis-Laval, France.
MDB Texinov, Saint Didier de la Tour, France.
Dolan GmbH, Kelheim, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Huesker, Gescher, Germany.
Entremonde Polycoaters, Mumbai, India.
Garware Wall Ropes Ltd, Pune, India.
Climax Synthetics, Vadodara, India.
Farè SpA, Fagnano Olona, Italy.
ICAP-SIRA, Parabiago, Italy.
Soyon Industrial Co Ltd, Goyang Si, South Korea.
TenCate Industrial Fabrics Europe, Almelo, The Netherlands.
Erhardt Nonwovens, Madrid, Spain.
Don & Low Ltd, Forfar, UK.
Scott & Fyfe, Tayport, UK.
Atex Inc, Gainesville, USA.
Samson Rope, Ferndale, USA.
Gehring Tricot Corp, Garden City, USA.
Conwed Plastics, Minneapolis, USA.
TenCate Industrial Fabrics North America, Pendergrass, USA.

Architecture, building and construction

MakMax Australia, Eagle Farm, Australia.
Conwed Plastics, Genk, Belgium.

EOC Group, Oudenaarde, Belgium.
Lineo NV, Meulebeke, Belgium.
Concordia Textiles, Waregem, Belgium.
Zhejiang Ganglong New Material Co Ltd, Haining, China.
Fiberweb (China) Airlaid Co Ltd, Tianjin, China.
Zhejiang Xingyida Reinforced Material Co Ltd, Yuanhua Town, China.
Zhejiang Jinda New Materials Co Ltd, Zhejiang, China.
ADFORS Saint-Gobain, Courbevoie, France
ANCI SAS, Aix-en-Provence, France.
Porcher Industries, Badinières, France.
Fiberweb France SAS, Biesheim, France.
Tharreau Industries, Chemillé, France.
Innobat, Clapiers, France.
MDB Texinov, Saint Didier de la Tour, France.
R.Stat, Mornant, France.
Delcotex Delius GmbH & Co KG, Bielefeld, Germany.
Dolan GmbH, Kelheim, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Fiberweb Corovin GmbH, Peine, Germany.
Johns Manville, Bobingen, Germany.
Heytex Technical Textiles, Bramsche, Germany.
Huesker, Gescher, Germany.
Sandler AG, Schwarzenbach/ Saale, Germany.
Entremonde Polycoaters, Mumbai, India.
Gavazzi Tessuti Tecnici, Calolziocorte, Italy.
ICAP-SIRA, Parabiago, Italy.
Tessilbrenta Srl, Pove del Grappa, Italy.
Tenotex SpA, Terno d'Isola, Italy.
FitesaFiberweb Mexico SA de CV, San Luis Potosi, Mexico.
Texiplast as, Ivanka pri Nitre, Slovak Republic.
Soyon Industrial Co Ltd, Goyang Si, South Korea.
Kintex Ltd, Seoul, South Korea.
Erhardt Nonwovens, Madrid, Spain.
Industrial Sedó SA, Tarragona, Spain.
Tisca Tischhauser & Co AG, Bühler, Switzerland.
Fritz Landolt AG, Näfels, Switzerland.
Freudenberg Performance Materials, Arnhem, The Netherlands.
Rivertex Technical Fabrics Group, Culemborg, The Netherlands
TenCate Outdoor Fabrics, Nijverdal, The Netherlands.
Salteks Tekstil Sanayi ve Ticaret AS, Istanbul, Turkey.
Don & Low Ltd, Forfar, UK.
Dunlop Coated Textiles, Manchester, UK.
Atex Inc, Gainesville, USA.
Propex, Chattanooga, USA.
Tri Vantage, Cleveland, USA.
Sefar Inc, Depew, USA.
Atlanta Nisseki Claf Inc, Kennesaw, USA.
First Quality, Lewistown, USA.
Conwed Plastics, Minneapolis, USA.
Fiberweb Inc, Old Hickory, USA.
FitesaFiberweb Washougal Inc, Washougal, USA.
ANCI Inc, Kennesaw, USA.

Clothing technology and garments

Bekintex nv, Wetteren, Belgium.
Nano-Tex Inc, Maaseik, Belgium.
Régitex Inc, Saint-Joseph, Canada.
Eurtotex, Toronto, Canada.
Li Ning Co Ltd, Shanghai, China.
Tharreau Industries, Chemillé, France.
Christian Eschler Europe AG, Balingen, Germany.
Delcotex Delius GmbH & Co KG, Bielefeld, Germany.
Freudenberg Performance Materials, Weinheim, Germany.
Trans-Textil GmbH, Freilassing, Germany.
Supreme Nonwoven Industries Pvt Ltd, Bhilad, India.
Polycrest Innovations India Ltd, Chennai, India.
Supreme-Treves Pvt Ltd, Daman, India.
Alok Industries Ltd, Mumbai, India.
S. Kumar Unitex, Mumbai, India.
Supreme Nonwovens Pvt Ltd, Mumbai, India.
Geo&Tex 2000, San Nazario, Italy.
ICAP-SIRA, Parabiago, Italy.
KB Seiren Ltd, Osaka, Japan.
Unitika Fibers, Osaka, Japan.
Fiorima SA, Braga, Portugal.
Finetex EnE, Seoul, South Korea.
FOV Fabrics AB, Borås, Sweden.
Fritz Landolt AG, Näfels, Switzerland.
Rivertex Technical Fabrics Group, Culemborg, The Netherlands
Tanatex Chemicals BV, Ede, The Netherlands.
Fabric King Textile Co Ltd, Taipei, Taiwan.
Ho Yu, Taoyuan City, Taiwan.
Tex-Ray Industrial Co Ltd, Taipei, Taiwan.
Thai Acrylic Fiber Co Ltd, Bangkok, Thailand.
Salteks Tekstil Sanayi ve Ticaret AS, Istanbul, Turkey.
Teknik Ltd, Istanbul, Turkey.
Dunlop Coated Textiles, Manchester, UK.
Survival-One, Aberdeen, UK.
A. Rowe Ltd, Manchester, UK.
Heathcoat Fabrics, Tiverton, UK.
Draper Knitting, Canton, USA.
International Textile Group, Greensboro, USA.
Polartec LLC, Lawrence, USA.
Supertex Inc, Liberty, USA.
Skechers USA Inc, Manhattan Beach, USA.
QIO Systems Inc, New York, USA.
FITS Sock Co, Niota, USA.
point6, Steamboat Springs, USA.
Precision Custom Coatings LLC, Totowa, USA.

Domestic/textiles for the home

Autex Pty Ltd, Melbourne, Australia.
Beaulieu Technical Textiles SA, Comines-Warneton, Belgium.
EOC Group, Oudenaarde, Belgium.
Xentrys, Gent, Belgium.
Nano-Tex Inc, Maaseik, Belgium.
Concordia Textiles Group, Waregem, Belgium.
Régitex Inc, Saint-Joseph, Canada.
Jiaxing Furuisen Spunlaced Nonwovens Co Ltd, Jiaxing, China.
Pegas Nonwovens sro, Znojmo, Czech Republic.
R.Stat, Mornant, France.
Dilo Systems GmbH, Eberbach, Germany.
dorix GmbH, Selbitz/Bayern, Germany.
Indorama Ventures Mobility Obernburg GmbH, Obernburg, Germany.
Sandler AG, Schwarzenbach/ Saale, Germany.
Trans-Textil GmbH, Freilassing, Germany.
Alok Industries Ltd, Mumbai, India.
Reliance Industries Ltd, Mumbai, India.
Geo&Tex 2000, San Nazario, Italy.
Gaetano Rossini Holding SpA, Costa Masnaga, Italy.
ICAP-SIRA, Parabiago, Italy.
Tessilbrenta Srl, Pove del Grappa, Italy.
Erhardt Nonwovens, Madrid, Spain.
MITSA, Tortella, Spain.
Tisca Tischhauser & Co AG, Bühler, Switzerland.
Fritz Landolt AG, Näfels, Switzerland.
Everest Textile Co Ltd, Taipei, Taiwan.
Salteks Tekstil Sanayi ve Ticaret AS, Istanbul, Turkey.
Teknik Ltd, Istanbul, Turkey.
Dunlop Coated Textiles, Manchester, UK.
Don & Low Ltd, Forfar, UK.
Brintons Ltd, Kidderminster, UK.
Bute Fabrics Ltd, Rothesay, UK.
Scott & Fyfe, Tayport, UK.
Aurora Specialty Textiles Group Inc, Aurora, USA.
Propex, Chattanooga, USA.
Concordia Manufacturing LLC, Coventry, USA.
CleanBrands LLC, East Providence, USA.
Basofil Fibers LLC, Enka, USA.
Inman Mills, Inman, USA.
Supertex Inc, Liberty, USA.
Milliken & Co, Spartanburg, USA.
Precision Custom Coatings LLC, Totowa, USA.

Environmental uses

EcoQuest Ltd, South Perth, Australia.
Lineo NV, Meulebeke, Belgium.
Zhejiang Spread Nonwoven New Material Co Ltd, Jiaxin, China.
Ben's Land (Nanking) Baby Articles Corp Ltd, Nanjing, China.
Innobat, Clapiers, France.
BWF Tec GmbH & Co KG, Hof-Gattendorf, Germany.

Advances in Textiles technology

New textile materials & technologies

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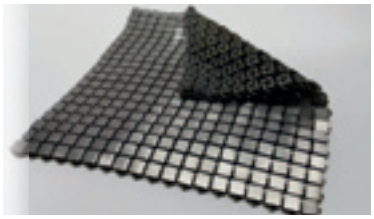
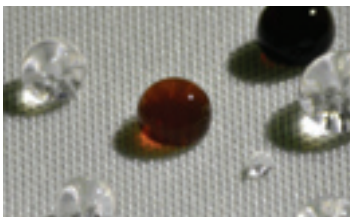

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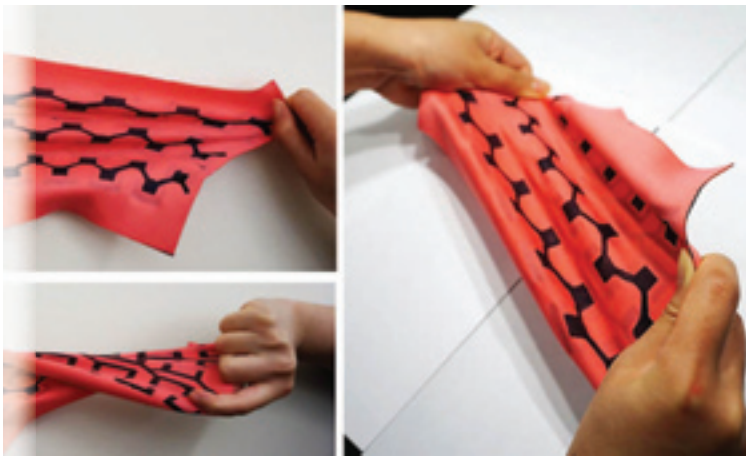


Advances in Textiles technology

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.

Highlights this month: full contents listing on page 2...

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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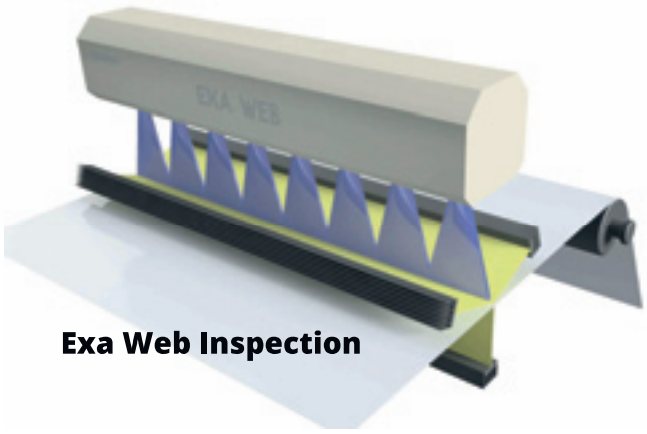

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