Technical TEXTILES international

Spring 2024
Volume 33, Number 1

Informing the industry worldwide

Artificial intelligence and sustainable fibres in focus at *Heimtextil*

Advantages of flax fibres for composites to be showcased at *JEC World*

INSIDE:

Filament-winding machine for hydrogen-storage vessels
Sweet spot for length of yarn-shaped supercapacitors
Producing spider silk from waste polyethylene

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SPORTS WEAR PRO 2024

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Running for the first time ever – join us at Sportswear Pro 2024, from 19 – 22 March 2024, at RAI Amsterdam, The Netherlands.

If personalised sportswear, sustainable manufacturing and circular design of apparel, on-demand printing or smart wearables are on your priority list for 2024 (or even if they're in your peripheral vision as something to find out more about), Sportswear Pro is the place to be.

This exhibition is the answer to industry demand for an event exclusively dedicated to sportswear manufacturing and the possibilities in this thriving sector.

Why now? Because the production capabilities in fashion and sportswear are much broader than brands, retailers and manufacturers may realise, and we want to demonstrate the opportunities that are out there to help evolve and grow your business.

At Sportswear Pro you'll be immersed in the latest technologies for on-demand and customised production, and you'll connect with a host of experts involved at every step of the manufacturing process – from design (CAD/CAM and 3D body scanning) to production (CMT ['cut, make and trim'], bonding and knitting) and decoration (printing, engraving, embroidery and laser appliqué systems).

Alongside the exhibition is a comprehensive one-day conference programme which will see expert speakers discussing pressing topics in the sportswear market. Confirmed speakers to date include:

- Lucy Maguire, Senior Trends Editor at Vogue Business who will discuss sportswear trends and take a deep dive into the European market
- Nicole Espey, Stakeholder Manager at ITA who will explain sustainability, new developments and trends from a scientific point of view
- Richard Askam, FESPA's Personalisation Ambassador, and Serena Bonomi, Circular Innovation & Systemic Design Advisor, who will lead a panel discussion on 'The power and potential of customisation and personalisation'
- Shruti Grover, Co-founder of the Pattern Project who will chair a fireside chat covering AI and how this is shaping the future of sportswear manufacturing

You can also visit the new 'Personalise Make Wear' educational feature where you can participate in expert-guided end-to-end production tours of the latest technologies for sportswear from brands including Brother, Tajima, Klieverick and GreenTex, and attend a series of expert-led discussions.

Entry to Sportswear Pro covers access to co-located events – FESPA Global Print Expo and Personalisation Experience.

Within FESPA Global Print Expo, we will show you where sportswear and print cross paths seamlessly, giving you the opportunity to connect with a wide range of textile printing solutions providers including Berger Textiles, Brother, Premier Digital Textiles and STAHLS.

Personalisation Experience offers you a platform to explore customisation-enabling solutions which will enhance your knowledge of the personalisation opportunity in the wider sportswear apparel arena.

For more information on Sportswear Pro and to register your attendance to the exhibition and conference, visit: www.sportswearpro.com. If you register for the event before 19 February, you can save €30 on your ticket using promo code SWPA418.

Sportswear Pro isn't the finish line – it's the starting point of exciting times ahead. We'll see you there!

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Personalisation Experience

Technical TEXTILES international

Spring 2024
(Volume 33, Number 1)

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In the Editor's opinion

The year may have only just started, but it is already proving to be busy. On 9–12 January, *Heimtextil* returned to Frankfurt, Germany. With 46 000 visitors and 2800 exhibitors, marked increases on the 2023 edition, organiser Messe Frankfurt describes the show as a great a success. High on the agenda at this year's event were the impact of artificial intelligence on the home textiles industry, and the need for natural and biodegradable fibres for the manufacture of home and contract textiles (see also, page 9).

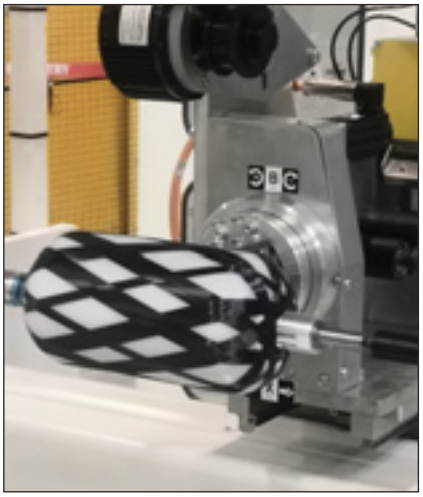
Messe Frankfurt also used the event to reveal some of its plans for the 2024 editions of the *Techtextil* and *Texprocess* exhibitions, which will be held jointly in Frankfurt on 23–26 April. Sustainability will once again be a core theme of the show, as will digital technologies that can make equipment more efficient, cutting costs for manufacturers and reducing the impact their operations have on their environment. Over 1600 exhibitors from around 50 countries will take part in the combined events and we will also be there to report on the most interesting new developments to be found on the showfloors.

Our previews of *Techtextil* and *Texprocess* will run in the Summer issue of *Technical Textiles International*; if you would like your company to be featured, please Email james@boughtonmedia.com.

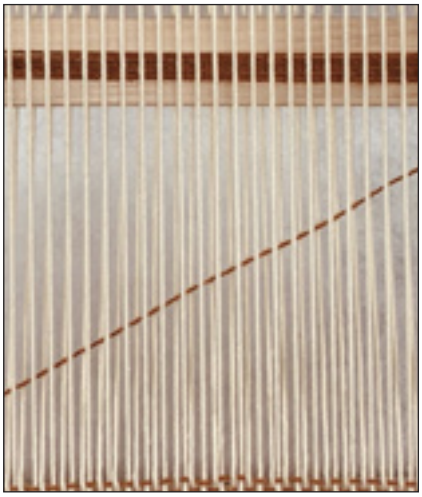
In the meantime, *JEC World* returns to Paris, France, on 5–7 March 2024. Here too, the development of technologies to reduce the environmental impact of the production of composites will be a major focus of exhibitors at the show. You can read our preview of the show, focussing on the increasing use of flax fibres in the composites industry, starting on page 14.

We hope you too have had a fruitful start to 2024 and look forward to meeting you at this year's events.

In this issue



A filament-winding machine for development of hydrogen-storage vessels (see also, page 4)



Researchers determine the sweet spot for length of yarn-shaped supercapacitors (page 18)

Technical TEXTILES international

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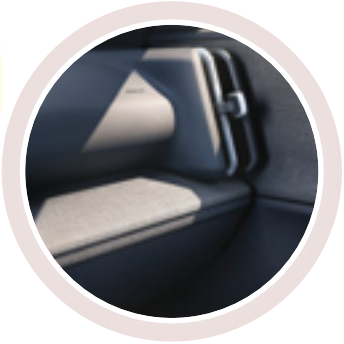
Spring 2024

On the cover:

At Heimtextil (see also, page 9), Eastman showcased a range of products made from its cellulose-acetate fibre, Naia Renew.



Flax fibre-based reinforcements (ampliTex) for composites from JEC World exhibitor Bcomp are being used for the production of trims for the interiors Volvo Cars' small, all-electric EX30 sports utility vehicle (see also, page 14)

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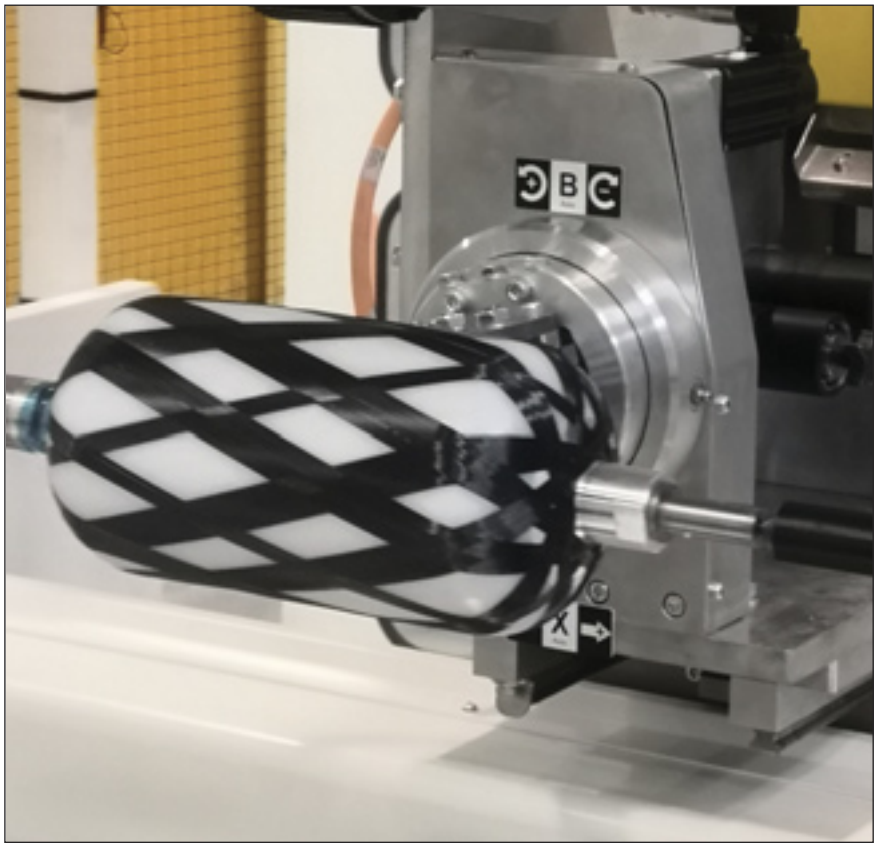
Further information at https://www.technical-textiles.net

Filament-winding machine for development of hydrogen-storage vessels



Developed by Cygnet Texkimp, of Northwich, UK, this four-axis filament-winding machine will be used by the National Composites Centre to develop vessels for the storage and transport of hydrogen.

The UK's National Composites Centre (NCC) has taken delivery of a filament-winding machine that will form part of its facility for the manufacture and testing of composite vessels for the storage and transportation of hydrogen.

Developed by Cygnet Texkimp, of Northwich, UK, the four-axis machine can wind a variety of materials, including dry fibres, towpregs, glass fibres, and combinations of fibres and resins, such as highly viscous, fast-curing resins. The Chief Executive Officer (CEO) of Cygnet Texkimp, Luke Vardy, says: "The technology we have delivered offers high levels of flexibility and capability to meet the requirements of many different filament-winding applications and support the NCC's pioneering development work."

The filament-winder is designed to wind four tows simultaneously. The feeding and winding of each tow is regulated by dedicated tension-control units and dancer arms. A customised software package, developed by Cygnet Texkimp, also allows the Bristol-based NCC to record data from the process, including winding tension and speed, resin temperature and air pressure within the mandrel.

The filament-winder is served by two four-position creels, which are designed to feed different types of fibre into the machine. A towpreg creel unwinds and guides towpreg material into the winder and is an essential part of a novel solution that isolates the tension required at the bobbin from the tension desired during the winding phase, so that the fibre is fed optimally at all times. A second, dry-fibre creel feeds fibres into the machine at low tension and with high accuracy, and is enclosed to prevent the release of airborne debris into the environment.

The machine also features two types of in-line spreading and coating system, which can be quickly and easily deployed for dry-wind applications: a temperature-controlled wet-out system with adjustable spreader bars to spread individual fibre tows for consistent resin impregnation; a coating drum and blade to control the volume of resin applied to the fibre. Both of these technologies will be investigated by the NCC for their suitability in winding applications across a range of applications.

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Zünd establishes subsidiary in São Paulo, Brazil

Zünd Systemtechnik AG has acquired its long-standing sales partner in Brazil, BG Soluções Tecnológicas, which is currently based in Porto Alegre and will now be known as Zund Brasil.

The headquarters of Zund Brasil will be relocated to São Paulo. A dedicated showroom will allow customers and interested parties to see at first-hand Zünd's digital cutting technology and will serve as a base for the company's ten employees.

BG Soluções Tecnológicas was founded in 1981 by Sergio and Paulo Guerra, and has been an official sales and service partner of Zünd Systemtechnik AG, of Altstätten, Switzerland, since 1990. Relation of the founders, Cristiano Guerra, will serve as the Chief Executive Officer (CEO) of Zund Brasil.

The CEO of Zünd Systemtechnik AG, Oliver Zünd, concludes: "Working closely with our new subsidiary will allow us to further strengthen our business in Brazil and expand our customer base."

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IPCO to show double-belt presses and scattering systems in Paris

A range of double-belt presses, precision scattering lines and continuous film casting technologies for the manufacture of composites will be shown by IPCO at *JEC World*.

The company, of Fellbach, Germany, says it is the only manufacturer capable of supplying double-belt press systems based on steel and polytetrafluoroethylene (PTFE) belts, or combinations of the two. Pilot systems based on all three types – an IPCO ThermoPress SB high-pressure line using IPCO steels, a ThermoPress TB low-pressure line based on PTFE belts and a ThermoPress CB CombiBelt unit – are available for trial and assessment at the company's 1600-m^2 test and demonstration centre near Stuttgart in Germany.

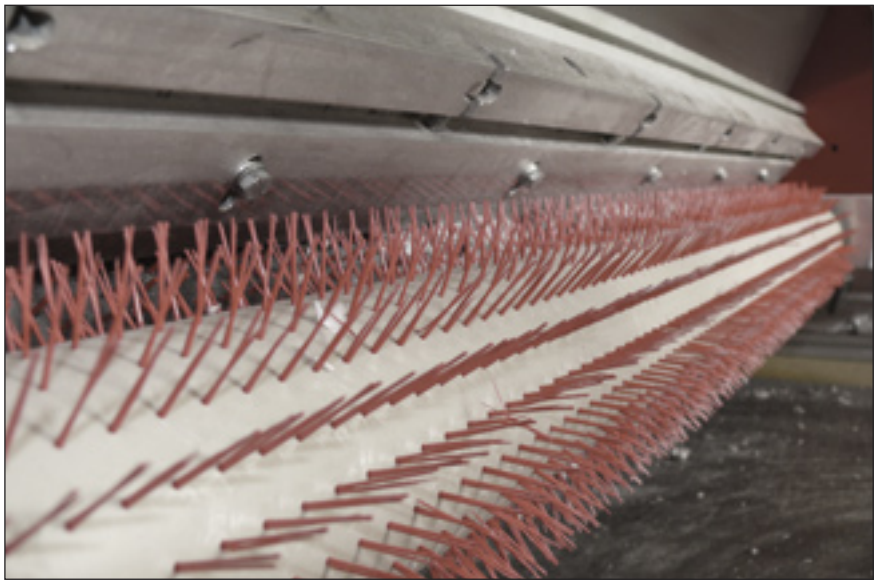
IPCO's ThermoPress double-belt press.

IPCO adds that the modular design of its ThermoPress press systems enables a range of production steps – including polymerisation, curing and cooling – to be conducted in a single, continuous process. A choice of belt types and pressure modules enables the presses to be configured to meet virtually any requirements with regard to the heat and pressure they generate.

In Stuttgart, a full range of processes can be assessed, from consolidation/calibration, lamination and impregnation, to tempering and cooling. The centre can be used to evaluate, for instance, the consolidation of pre-laminated sheets and the impregnation of fibres with resin. Resin can also be applied in powder, film or liquid form to nonwoven or felt materials.

IPCO also manufacturers a range of high-precision scattering systems that can be incorporated into production lines to scatter powder, granulate or fibres onto a carrier material before being formed by pressure and/or heat. The ScatterPro P model is a powder-scattering unit used in the production of flooring, filters, electronics and smart chips. The ScatterPro F enables the uniform scattering of fibrous materials used in the manufacture of products for the automotive, textile, recycling and construction industries.

IPCO will also showcase the benefits of its continuous film-casting units and Venturi drying systems. The quality of films produced using these units makes them suitable for use as separator membranes and ceramic tapes in energy-storage applications. The three main components of the system are a precision slot die, a polished steel belt and the Venturi dryer. The slot die coater ensures the uniform casting of the product onto a moving steel belt. The film is carried to the Venturi dryer, a technology unique to IPCO for this application and one that eliminates any risk of skin forming on the product.



IPCO's ScatterPro precision scattering system.

IPCO's main machnies for composite processing are the high-pressure ThermoPress SB systems used in the production of thermoset/thermoplastic composite materials, and hybrid ThermoPress CB CombiBelt lines, which are used to create high-pressure modules within the forming zone of PTFE belt-based double belt presses.

JEC World will take place in Paris, France, on 5–7 March 2024.

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Strong, flexible piezoelectric composite could power wearable sensors

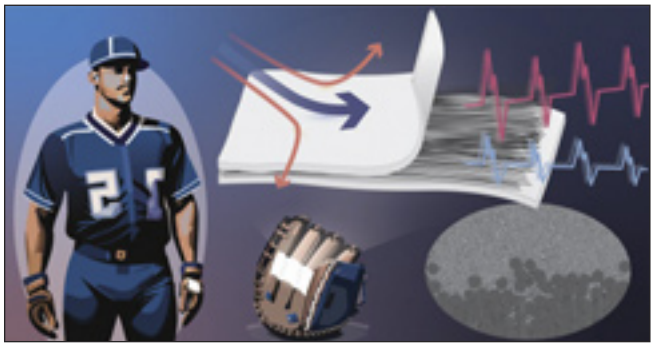

Diagram showing the design of the piezoelectric composite and its use in a baseball glove.

A strong and flexible piezoelectric composite that could generate electricity from human motion to power wearable sensors is being developed by researchers in Japan.

The researchers, from Tohoku University in Sendai and the Osaka Institute of Technology, say that their composite is more durable than conventional lead-free piezoelectric materials, making it suitable for incorporation into equipment that experiences intense mechanical loads, such as the personal protective equipment (PPE) worn during sports.

The composite comprises an epoxy resin loaded with piezoelectric potassium sodium niobite and reinforced with unidirectional carbon fibres, which act as an electrode and impart strength to the material.

In the direction of its reinforcing carbon fibres, the composite exhibits a Young's modulus of 282.5 MPa. Further, tests revealed that it remains flexible and maintains excellent piezoelectric response in its cross-fibre direction under cyclic tensile loading. It has been proven that the composite can withstand a much higher load when pulled along the fibre direction than other flexible piezoelectric materials. Additionally, when subjected to impacts and strain perpendicular to the direction of the carbon fibres, it surpasses other piezoelectric polymers in terms of its energy-output density.

A Professor at Tohoku University's Graduate School of Environmental Studies, Fumio Narita, says: "[The composite] was integrated into sports equipment and accurately detected the impact from catching a baseball and a person's step frequency. In our work, the high strength of carbon fibres was leveraged to improve the sustainability and reliability of battery-free sensors while maintaining their directional stretchability, and provides valuable insights and guidance for future research in the field of motion detection."

See also: *Small, Fabrication, evaluation, and multiscale simulation of piezoelectric composites reinforced using unidirectional carbon fibers for flexible motion sensors*, https://doi.org/10.1002/smll.202307689

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https://www.material.tohoku.ac.jp/~fukugo/en

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Large investment to be made in North Carolina textiles industry

North Carolina's textile industry is to receive funding of up to US$160 million over the next ten years from the US National Science Foundation (NSF) to spur research and development (R&D) work there.

The North Carolina Textile Innovation and Sustainability Engine is one of ten such engines to be established by the Biden government through NSF investments totalling nearly US$1.6 billion over the next decade, and will focus on identifying new ways to convert waste materials into fibres and textiles.

The North Carolina Textile Innovation and Sustainability Engine will cover central and western North Carolina and stretches into the Appalachian regions of upstate South Carolina, eastern Tennessee and southern Virginia. The region boasts the largest concentration of textile workers in the USA, with more than 27 000 working in the industry, and an additional 30 000 employees in adjacent industries, spanning almost 2000 companies in total.

The initiative will be led by The Industrial Commons (TIC), a non-profit organisation based in Morganton, North Carolina.

A core partner on the initiative will be North Carolina State University (NCSU), in Raleigh, which hosts the Zeis Textiles Extension unit, the Textile Protection and Comfort Center, and the Wilson College of Textiles. NCSU will provide development, fabrication, testing and training services to the region to help reduce the environmental impact of the textile industry. The Director of NCSU's Zeis Textiles Extension, Andre West, says: "The Engine will look for ways to capture and process post-consumer waste at scale, and then process that waste into the building blocks that can become fibres for new textiles. It will also take a broad approach that focuses on all aspects of the sustainability ecosystem."

The work undertaken through the North Carolina Textile Innovation and Sustainability Engine will also focus on increasing product durability, expanding repair capabilities to keep products in use for longer, and developing better systems and processes for textile reclamation. Other areas of research will include the development of fibre-based materials used in wind-turbine blades, the health-monitoring of roadways, bridges and structural components, and nanofibres used in battery components.

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Changes at the top for Freudenberg Performance Materials

Significant changes have been made to the Management Board of Freudenberg Performance Materials, as current Chief Executive Officer (CEO) Frank Heislitz and Chief Financial Officer (CFO) Thomas Herr have taken-up positions on the Freudenberg Group Board of Management.

From 1 January 2024, Heislitz[1] was succeeded by Andreas Raps and Herr by Marco Altherr. The Chief Technology Officer (CTO) of Weinheim, Germany-based Freudenberg Performance Materials, John McNabb, will remain in place.

From 2016 until present, Raps served as CEO of EagleBurgmann, a joint venture between the Japanese EKK Group and the Freudenberg Group. From 2004, he held several executive management positions at Freudenberg Sealing Technologies, most recently as CEO of the global Special Sealing Division.

Before joining the Freudenberg Group, Raps worked for various management consulting companies in Boston, Massachusetts, USA, Munich, Germany, and Zurich, Switzerland.

Altherr has served as CFO of Vibracoustic SE, a Freudenberg Group company, since 2020. He held various senior management positions at Freudenberg & Co KG, the technology group's holding company, from 2015 to 2020, most recently as Head of Corporate Controlling and Accounting.

See also: [1] *Technical Textiles International*, Autumn 2022, *Freudenberg Performance Materials gains strength through diversity*, page 23, https://www.technical-textiles.net/node/76828

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Berry Global to merge nonwovens business with Glatfelter

Berry Global is to spin-off the majority of its Health, Hygiene and Specialties (HH&S) segment, including its Global Nonwovens and Films business, and merge it with Glatfelter, to create a new publicly traded company. The new, yet-to-be-named company will become one of the largest manufacturers of nonwovens globally, with 8700 employees, and will have a strong focus on the healthcare and hygiene markets. Berry's current President of HH&S, Curt Begle, will serve as the Chief Executive Officer (CEO) of the new company. The merger will be completed in the second half of 2024, after which Berry's shareholders will own 90% of the new company's common shares, with Glatfelter's shareholders owning the balance.

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See also, page 1

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May 2024

NPE: The Plastics Show
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astoney@plasticsindustry.org;
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Sabine Wagner, ISPO;
Tel: +49 (89) 949-20802
sabine.wagner@messe-muenchen.de;
https://www.ispo.com

International Textile Machinery Exhibition (ITM)
4–8 June 2024
Istanbul, Turkey
Teknik Fairs Ltd Co;
Tel: +90 (212) 876-7506;
Fax: +90 (212) 876-0681;
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: +852 223-9966;
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;
Tel: +1 (770) 984-8016, x 2428;
Fax: +1 (770) 984-8023;
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: +852 223-9966;
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
Dornbirn Global Fiber Congress Office;
Tel: +43 (1) 319-2909-41;
Fax: +43 (1) 319-2909-31;
office@dornbirn-gfc.com;
http://www.dornbirn-gfc.com

CINTE Techtextil China
19–21 September 2024
Shanghai, China
Jason Taylor, Messe Frankfurt (HK) Ltd;
Tel: +852 2230-9296;
Fax: +852 2598-7919;
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-2024

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

Performance Days
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

Hygienix
18–21 November 2024
Nashville, Tennessee, USA
Tracie Leatham, INDA (Association of the Nonwoven Fabrics Industry);
Tel: +1 (919) 459-3726
tleatham@inda.org;
https://www.hygienix.org

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;
Fax: +1 (919) 459-3701;
mayers@inda.org;
https://www.ideashow.org

May 2025

Techtextil North America
6–8 May 2025
Atlanta, Georgia, USA
Kristy Meade, Show Director, Messe Frankfurt Inc;
Tel: +1 (770) 984-8016, x 2428;
Fax: +1 (770) 984-8023;
kristy.meade@usa.messefrankfurt.com;
https://techtextil-north-america.us.messefrankfurt.com

Texprocess Americas
6–8 May 2025
Atlanta, Georgia, USA
Kristy Meade, Show Director, Messe Frankfurt Inc;
Tel: +1 (770) 984-8016, x 2428;
Fax: +1 (770) 984-8023;
kristy.meade@usa.messefrankfurt.com;
https://texprocess-americas.us.messefrankfurt.com/atlanta/en.html

August 2025

International Conference on Composite Materials (ICCM)
4–8 August 2025
Baltimore, Maryland, UK
Kristen Scully, Administrative Assistant, University of Delaware Center for Composite Materials;
Tel: +1 (302) 831-8149;
Fax: +1 (302) 831-8525;
Kscully@udel.edu;
https://iccm23.or

October 2025

ITMA Asia + CITME
28–31 October 2025
Singapore,
Daphne Poon, ITMA Services;
Tel: +65 9478-9543
daphnepoon@itma.com;
https://www.itmaasia.com

May 2026

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19–22 May 2026
Geneva, Switzerland
Magali Fakhry Dufresne, Palexpo SA;
Tel: +41 (22) 761-1061
index@palexpo.ch;
https://www.indexnonwovens.com

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Forthcoming advertising features

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Winter	**BUYER'S GUIDE** **Medical textiles** **Architecture and construction** **Geotextiles** **Acoustic/thermal insulation**	Major events in 2025, including *Techtextil and Texprocess* *North America, IDEA* *and ITMA Asia + CITME*	01 November

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Advances in Textiles technology

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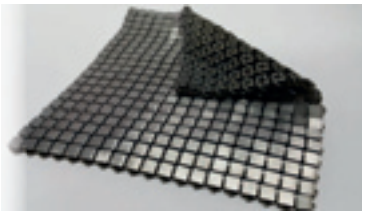
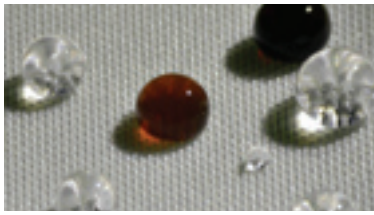

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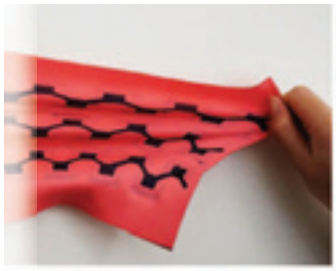


Advances in Textiles technology

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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