

SNIW

December 2021 / January 2022

SUSTAINABLE NONWOVENS

Pressure on plastic

Exploring circular solutions for the nonwovens supply chain



Unlocking potential

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1: THE GENERATION AND AQUATIC BIODEGRADATION OF MICROFIBERES PRODUCED FROM LAUNDERING FABRICS. Zambrano, M., et al. NC State University, Raleigh, NC, USA. Cotton Incorporated, Cary, NC, USA.* 76% in waste water after 250 days with continued degradation projected. 2: Accumulation of Microplastic on Shorelines Worldwide: Sources and Sinks. Mark Anthony Browne, et al. Environmental Science & Technology 2011 45 (21), 9175-9179. DOI: 10.1021/es201811s

Meltblown plots a greener future

The global market for meltblown nonwovens has been fundamentally reshaped by the experience of Covid-19 with demand for vital products like face masks and medical PPE prompting an increase in meltblown sales from US\$809 million in 2019 to \$1.68 billion in 2020.

As this process has become a primary concern for nonwovens producers and converters, it is profiled in depth in a new dedicated Smithers study, which charts the radical changes that have characterised the market since the beginning of 2020.

Looking back to the first days of the pandemic, we can now see how professional and medical-grade PPE – especially N95 medical face masks – became a vital commodity. Demand increased nearly 10-fold from 14,400 tonnes in 2019 to 121,800 tonnes in 2020, while other medical meltblown applications rose five-fold. This led to meltblown production sites running at near-full or overcapacity; and other production facilities, like SMS, being switched over to meltblown manufacture. During the period, a host of new lines have also been commissioned worldwide to raise capacity and ensure domestic availability.

In many ways, fluctuations in the market were inevitable, particularly as the urgent nature of the Covid threat peaked, flattened, and in some regions, dipped. Despite this, a return to restrictions in some countries, and the overhanging thread of increased restrictions in others, coupled with residual fears over Covid and the need to establish strategic stockpiles against similar outbreaks in the future, mean that demand is expected to remain well above pre-pandemic levels through to 2026. A total of 302,700 tonnes, or 5.07 billion square metres, with a sales value of \$1.17 billion will be sold in that year, Smithers says.

The experience has therefore brought a major – if temporary – shift in the meltblown markets. The importance of face mask media has led to the fine fibre meltblowns (4 micron or less) overtaking

coarser standard fibre meltblowns (4-15 microns). Simultaneously, the rise in demand for disposable products have seen these overtake durable meltblown nonwovens as the main market application – disposables' share rose from 40% in 2019, to 64.6% of total consumption in 2020. Though a return of the pre-Covid mix of durables and disposables is forecast by 2026.

For many durable meltblown producers, the temporary closure of end-use industries like construction and automotive production, impacted sales. While some lines were repurposed in the short term the market will benefit in the future from new infrastructure spending plans and the desire for improve fine mesh filtration media.

One other factor that will emerge over the five-year forecast period is the need for greater sustainability in nonwovens. Performance requirements mean meltblowns will continue to rely almost exclusively on plastic feedstocks, especially polypropylene. It represents 91% of meltblown materials in 2021, with only minor shares for other polymer types.

Across 2021-2026 there is potential to integrate bio-based polymers, including some more biodegradable grades. Other advances in waste reduction, lower basis weight materials, and use of recycled polymers are also options. For meltblown nonwovens these are not anticipated to have a significant impact before 2026. These products may ultimately benefit from technologies developed for other nonwoven processes, but meltblown also will continue to be a segment defined by performance.



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Price starts from £160.00 including global airmail delivery
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ISSN: 2049-9043



www.mclnews.com

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NONWOVENS NEWS

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Bast Fibre acquires German processing facility

VICTORIA - Bast Fibre Technologies, the manufacturer of speciality natural fibres for the global nonwoven industry, has announced the acquisition of Faser Veredlung Tönisvorst (FVT), an ISO 9001 certified textile processing facility located in Tönisvorst Germany.

The purchase will enable BFT to immediately increase capacity to meet customer demand for its sustainable bast fibres whilst also providing a firm platform for expansion and continued growth.

The deal is also in-keeping with BFT's strategy of establishing low carbon, regional supply chains by sourcing, producing, and selling within specific regions. With over twenty years of fibre processing experience, FVT is located within close proximity to

major European centres for bast crop cultivation and nonwoven fabric construction. The facility is also currently being expanded with the installation of specialty refining equipment specifically designed to optimize natural bast fibres for use in a variety of nonwoven applications.

"We are excited to have FVT as a part of our company," said BFT president, Jim Posa. "FVT has a long history of working with natural fibres and this acquisition has accelerated our transition towards becoming a fully integrated manufacturing company. FVT has consistently produced the highest quality bast fibres for BFT, so it was a logical step to bring this capability in house. Europe is leading the way on single-use plastic reduction

Sustainable spunmelt focus for new Fitesa line

SIMPSONVILLE – Fitesa is to install a new multibeam Reicofil 5 spunmelt line in Europe, with start-up planned for the second quarter of 2023.

It is one of a number of new Reicofil 5 lines scheduled in response to the continued boom in demand for absorbent hygiene products (AHPs) across the world, as was evident at the recent INDEX nonwovens show in Geneva (October 19-22).

The new machine for Fitesa will be installed at one of the company's current facilities in Europe and will be equipped to produce full high loft and standard spunmelt products, using a variety of sustainable raw materials including bioPE and PLA.

"This line will be a state-of-the-art machine capable of serving the growing demand for sustainable spunmelt products," said Michael Baumgartner, Fitesa's senior vice-president for Europe and China. "Once the machine is online, we will ramp up production from our pilot lines which significantly increases our ability to supply the market with softer products and increased circular and green content produced locally in Europe."

"This investment will contribute to changing the sustainability profile of the spunmelt nonwovens industry," added Fernanda Gastal, Fitesa's vice-president of procurement and marketing. "It is one of three areas where we believe we can make a significant impact – innovative technology offering, environmentally friendly raw materials and the reduction of greenhouse gas emissions in our operations."

Fitesa has been producing nonwovens from biobased polymers since the early 2010s, including 100% biobased spunbond materials.

Fitesa Sweden recently received ISCC Plus certification, which endorses the company's ability to commercialise biobased and circular materials under the mass balance concept.

Fitesa is one of the world's largest nonwovens and films manufacturers with a broad range of technologies, including spunbond, spunmelt, meltblown, carded, airlaid, films and elastics. Headquartered in Porto Alegre, Brazil, it employs over 2,600 people in 23 manufacturing locations in 13 countries.



strategies and the ability to produce these fibres in Europe will become increasingly important for the production of truly sustainable nonwovens in wipes, hygiene products and more.”

The Tönisvorst operation is positioned in the heart of the EU nonwoven belt in an historic textile complex established over 140 years ago. With a rich history of textile processing, this campus has been renewed and modernized in recent years and now hosts a mix of manufacturing and service-based industries. In the coming months the facility will be upgraded to optimize the production of cost effective, high performance natural bast fibres for customers looking to accelerate their sustainability goals with BFT’s tree-free, plastic-free alternatives. The facility is also ideally equipped for rapid prototyping and product development of novel fibre modifications to develop natural fibre solutions that meet customers’ specific requirements.

“We are very pleased to be joining the BFT team of companies,” added Managing Director and former owner, Thomas Krahl. “At the core of both our businesses are the shared values of environmental protection and quality. We are strong advocates for natural hemp and linen fibres and we value the opportunity to strengthen these offerings. BFT is an industry leader in the production of these fibres for the high-end nonwoven marketplace and we look forward to playing an important role in the industry’s growing transition away from plastic fibre.”

Berry strikes PureCycle deal

EVANSVILLE - Berry Global has announced an agreement with PureCycle that will provide Berry with PureCycle’s Ultra-Pure Recycled (UPR) advanced recycled resin.

The agreement is the latest in a growing list of advanced recycling material sourcing announcements from Berry as it looks to meet growing consumer demand for more environmentally friendly products and is the company’s second based in North America.

In support of a circular economy, Berry uses advanced recycling to provide an outlet for difficult-to-recycle materials to be given a second life in the form of food-grade packaging. While post-consumer resin often lacks the high-clarity customers desire, circular resins from advanced recycling boast exceptional clarity.

PureCycle’s ground-breaking patented recycling process, separates colour, odour, and contaminants from plastic waste feedstock to transform it into ultra-pure recycled polypropylene. The recycling service converts waste plastic into virgin-like plastic fully closing the loop on the reuse of recycled plastics while making recycled polypropylene more accessible at scale to companies desiring to use a sustainable, recycled resin.

The material will be supplied to Berry in summer 2023 for manufacturing at one of Berry’s ISCC PLUS certified facilities, providing customers with maximum traceability for the materials. Berry previously announced its first three facilities in North America to achieve ISCC PLUS certification.

The latest research cited by Berry shows that given the option



Andritz supplies spunlace line for Welspun

GRAZ - Andritz has received an order from Welspun Advanced Materials, India, to deliver a complete neXline spunlace line for the production of nonwoven roll goods and wipes for their new plant in Hyderabad, Telangana.

The line, which has a capacity of up to three tons per hour, is scheduled to start up in fourth quarter of 2021.

The Andritz high-capacity spunlace line will process various types of synthetic or natural fibres, such as polyester, viscose and cotton. The final products will have fabric weights ranging from 25 to 120 gsm, which covers a range of applications. This neXline spunlace line also offers the option to integrate a third component from a selection of smart layers, enabling Welspun to also manufacture products for the health care and hygiene sectors.

Welcoming the deal, Cherian Thomas, CEO of Welspun Advanced Textiles, said: “We believe that the global demand for disposable products will show solid growth as economies and consumers become more hygiene- and environment-conscious. Our choice of Andritz as our partner matches our shared view, which has a bias towards sustainable technologies. Andritz’s neXline spunlace can provide savings on energy and water with the technology delivered. Welspun focuses on sustainability, and our site itself is being developed in compliance with the Indian Green Building Certification.”

Welspun, a major global exporter of home textiles, already has a number of nonwoven production lines in operation, including needlepunch and spunlace equipment. With its new plant in Telangana, Welspun will significantly increase its existing spunlace capacity and also maintain a broad range of applications as the final products are used in hygiene, home care and industrial cleaning. The new, advanced facility is a 100,000 sqm greenfield development that is part of a larger 1,500,000 sqm industrial complex also accommodating the Welspun floorings facility.

to buy products with recyclable or compostable packaging, 47 per cent of Americans opt for recyclable products as their first choice, and 20 per cent prefer compostable products. 77 per cent of Americans are also concerned about the environmental impact of products they buy, and 78 per cent are more likely to purchase a product that is clearly labeled as environmentally friendly.

“Customers look to Berry for unique ways to meet their ambitious sustainability goals. Through our access to advanced recycled resin and technical expertise, Berry is a dependable partner for customers in the implementation of sustainable solutions,” said Tom Salmon, Berry’s Chairman and CEO. “By using our relationships with top suppliers and the latest technologies, we bring our customers premier access to in-demand circular resins.”

Precision eyes compostable meltblown market

WINNIPEG - Medical device manufacturer Precision ADM has acquired Roswell Downhole Technologies, Canada's largest producer of meltblown fabric for medical filtration applications.

Together, the companies aim to manufacture Canada's first supply of 100% compostable nonwoven fabrics using sustainably sourced biopolymers for use in personal protective equipment (PPE) production domestically and for export to global manufacturers.

By October 2021, the two companies will be operating a high-volume, automation-driven, nonwoven manufacturing



Oxygen-delignified fluff pulp is bleach free

HELSINKI – Producers of absorbent hygiene products are now trialing NaturaFluff Eco, a new fluff pulp grade from Stora Enso which enables them to offer consumers products that are natural, safe to use and have a low environmental footprint.

NaturaFluff Eco, which is made from wood from sustainably managed forests and is fully biodegradable, is an oxygen-delignified fluff pulp, which means that no bleaching chemicals are used in its production. As a result, the fluff pulp has a warm, natural beige colour and a roughly 30% lower carbon footprint in comparison to traditional fluff pulp, without compromising on product performance.

It can be used in hygiene applications, such as baby care, feminine care, and adult incontinence care products as well as airlaid materials such as napkins, table-tops and various pads

"By removing bleaching from the production process and only treating the pulp with oxygen to remove lignin, we have produced a fluff pulp with a significantly lower carbon footprint, while still providing the excellent performance properties of our regular fluff pulp," said Kirsu Seppäläinen, senior vice-president of marketing, competitive intelligence and product management at Stora Enso's Biomaterials division. "This new pulp grade fulfills all the requirements of a purely natural raw material. It is made from wood and comes. Its light beige hue clearly communicates the natural source of its origin.

Stora Enso produces its fluff pulp, including NaturaFluff Eco, at its Skutskär Mill in Sweden, where the first commercial volumes have recently been completed.

All Stora Enso's NaturaFluff pulp grades fulfill the requirements of all common eco-labels such as the EU Eco label, Nordic Swan and Blue Angel, among others. Stora Enso's fluff pulp is FSC and PEFC certified.

plant in Calgary, Alberta, and scaling up a manufacturing plant in Winnipeg, Manitoba. These plants will produce a full suite of compostable surgical medical masks, gowns, and other necessary medical PPE, air and water filtration products, and personal hygiene products.

The investment will create up to 350 high paid net new direct jobs in the Prairie region and will have the capacity to supply compostable, nonwoven fabric for other domestic and international manufacturers, representing a net new economic export impact of approximately US\$2billion within the next ten years.

"As a company, we have responded to COVID-19 by developing and manufacturing the highest quality and most cost-effective medical equipment in our country's time of need," said Martin Petrak, chief executive officer of Precision ADM. "By coming together with Roswell DHT, we will better serve Canada and emerge even stronger beyond the pandemic while reducing our carbon footprint and reduce greenhouse gas emissions throughout our product life cycle."

Roswell is currently operating at a capacity of 58 metric tonnes per month output of meltblown filter media. To date there have been approximately 160 million masks produced in Canada with Roswell's nonwoven fabric.

Recycled certification for Piana

CARTERSVILLE - Piana Group has achieved certification to the Recycled Claim Standard for its Piana Nonwovens facilities.

The RCS is an internationally recognized standard that verifies recycled content and tracks it throughout the supply chain to the final product.

Developed by Textile Exchange, a global non-profit organization advancing preferred fibres and materials, RCS certification has increased the use of recycled content across the textile industry. A recycled content claim may only be made for materials that have been recovered or otherwise diverted from the solid waste stream.

The certification process requires partners to meet standard compliance at each stage of the supply chain, beginning with the raw material (or recycling) suppliers and ending with the final seller in a business-to-business transaction.

"This RCS certification is a great step forward in Piana Technology's overarching goal to achieve sustainability in our materials and the circularity of our products," said Piana Technology's Sustainability Manager, Michael Savarie.

"We will now have peace of mind knowing that the materials we source have fewer impacts than their conventional counterparts, pushing us forward in our sustainability mission. By reaching RCS certification, Piana Nonwovens joins a growing group of environmentally responsible organizations on the path to sustainability."

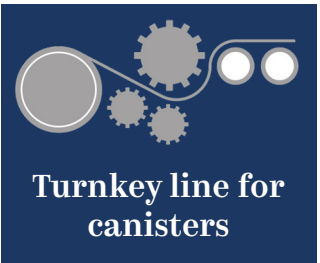
The newly certified facilities in Cartersville, GA and San Luis, AZ are qualified to receive, produce, and sell RCS products that adhere to the standards' strict requirements. This allows for the integration of recycled inputs into the ecologically sound manufacturing practices and operations at Piana Nonwovens.]

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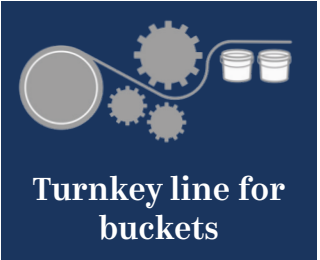
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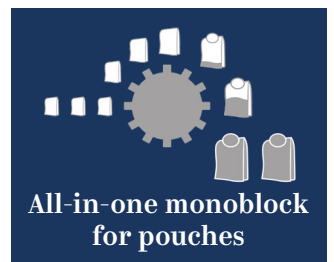
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Glatfelter completes Jacob Holm deal

CHARLOTTE – Glatfelter Corporation has completed its acquisition of Jacob Holm, the leading manufacturer of spunlace nonwoven fabrics, for approximately US\$302 million.

The acquisition will increase Glatfelter's diversification into a range of complementary segments serving the growing sustainable wipes, healthcare and hygiene categories.

As part of the deal, Glatfelter has acquired four additional manufacturing sites, one converting operation, and six sales offices located in the Americas, Europe, and Asia, and approximately 760 employees worldwide.

"We are very pleased to be closing on the acquisition and



Hello Bello opens new diaper factory

WACO - Hello Bello has opened its first US diaper factory in Waco, Texas, establishing the firm as the only independent diaper company in the US to manufacture their own diapers from design to delivery. This new diaper distribution and manufacturing facility will create nearly 200 new jobs for the region, as well as providing greater sustainability (in production and distribution) and best-in-class quality control, while also keeping costs lower for the consumer.

The decision to open and operate in Waco is based on the location's central geography for its direct-to-consumer customers, retail and premium supply partners; providing logistical efficiencies and significant reduction in freight. Hello Bello plans to source a majority of raw materials from local and regional premium U.S. supply partners, which will improve reliability, flexibility and cost efficiency, ultimately improving the company's overall carbon footprint.

"We started this company with a simple mission to provide access to premium products for all; ensuring that parents never have to sacrifice on quality or choose between their baby or their budget," said company co-CEO Kristen Bell. "By having this extraordinary (and very colorful) factory, we will be able to reduce our carbon footprint, create US jobs, provide superior quality control and produce a best-in-class product for all families."

Hello Bello, known for its premium and affordable products, manufactures and distributes over 100 family essentials, including diapers, wipes, toiletries, cleaning supplies, seasonal goods and more to leading retailers across North America, including Walmart.

adding Jacob Holm's premium quality spunlace and advanced fibre products to Glatfelter's portfolio of industry-leading airlaid and composite fibers products," said Dante C. Parrini, chairman and chief executive officer of Glatfelter, adding that Jacob Holm's broad product offerings, including the Sontara brand, and blue-chip customer base will expand Glatfelter's portfolio to include surgical drapes and gowns, wound care, critical cleaning materials, face masks, facial wipes and cosmetic masks.

"We look forward to leveraging the combined talents of the Jacob Holm and Glatfelter employees to better serve customers, accelerate the innovation of sustainable engineered materials, and achieve significant value-creation. In addition, we will be well positioned to achieve meaningful economies of scale and synergies in the areas of sourcing, operational excellence, capital deployment and general and administrative costs."

Jacob Holm generated \$401 million of net sales and \$42.5 million of adjusted EBITDA for the twelve-month period ended June 30, 2021. Glatfelter believes these results included a benefit from COVID-related demand estimated to be between \$10 million and \$15 million of adjusted EBITDA. This acquisition is expected to yield approximately \$20 million of annual synergies within 24 months.

Ahlstrom-Munksjö new testing capabilities

HELSINKI - Ahlstrom-Munksjö has developed new capabilities to test gas adsorption performance at its Pont-Evêque R&D center in France, part of the company's strategy to invest and grow in the electric vehicle and industrial filtration markets.

The investment is targeted at assisting strategic, high-priority R&D projects to develop next generation molecular filters for fuel cell air intake filters, premium cabin air filters (for EV and ICE), and clean room environments.

Gas adsorption performance is the primary technical feature of molecular filter media, with specific products designed to treat gaseous pollutants, therefore the decision was taken to have internal capability installed at Ahlstrom-Munksjö.

The new capability will enable Ahlstrom-Munksjö to speed up both product development and technical customer support, in addition to being able to insource quality control tests, the company said.

Ahlstrom-Munksjö has recently announced the launch of an enhanced portfolio for electric vehicles, delivering additional high-performance solutions for cabin air and transmission filtration.

Testing will also play an important role in supporting future FiltEV launches.

The new equipment is under the responsibility of the Filtration R&D team in Pont-Evêque, with the capability to run tests with ammonia (NH₃), sulfur dioxide (SO₂), and nitrogen oxides (NO_x), according to ISO10121-1/2 and DIN71460-2 industry standards.

The test bench was specifically designed and customized to meet Ahlstrom-Munksjö's technical needs, as well as aligning with good practices for safety and the environment.

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Plan for a new PLA chain in the USA

CHICAGO & SEOUL – South Korean diversified chemical company LG Chem is teaming up with ADM to explore the US-based production of lactic acid to meet growing demand for a wide variety of plant-based products, including bioplastics.

The two companies are taking steps towards launching a joint venture in early 2022 to build and operate a US-based facility to produce high-purity corn-based lactic acid on a commercial scale.

In addition, the companies will collaborate on a second joint venture that will use the lactic acid to produce and commercialise polylactic acid (PLA).

“Consumers today are increasingly prioritising environmentally-friendly, responsibly-produced products when they make buying decisions,” said Juan Luciano CEO at Chicago-headquartered ADM.

“For non-nutrition customers, our BioSolutions growth platform is using our product streams to grow our presence in sustainable, higher-margin demand areas as wide ranging as pharmaceuticals and personal care, textiles, paper products, and even adhesives for helicopters. Today’s agreement is yet another way in which we’re delivering on growth opportunities in plant-based solutions. We’re excited to work with a global leader like LG Chem to expand US production of lactic acid and continue to expand our capabilities to meet growing demand for responsibly-produced products.”

“The establishment of a joint venture with ADM would be the beginning of a new journey, formalizing our cooperation and advancing us toward a sustainable business structure for the benefit of the environment and society,” added Hak Cheol Shin. “Once the joint venture is established, LG Chem would receive a stable supply of raw materials needed to enter the bioplastics market in earnest. As a part of our sustainable business strategy, LG Chem plans to accelerate the commercialisation of biodegradable resins that can contribute to solving environmental problems such as climate change and waste plastics. As a leading company in sustainability, LG Chem will actively seek new ways to contribute to carbon-neutral growth.”

In 2019, the companies signed a joint development agreement (JDA) to secure mass production technology to create biobased acrylic acid, which can be used for the manufacture of superabsorbent polymers used in diapers and other hygiene products.

Danimer receives grant to expand PHA research

BAINBRIDGE - Bioplastics company Danimer Scientific has received a US\$400,000 grant from the United Soybean Board to expand the company’s evaluation of high-oleic soybean oil (HOSO) as a feedstock in the production of PHA biodegradable biopolymer.

The grant marks the continuation of Danimer’s collaboration with the United Soybean Board after the successful completion of a one-year project to develop a practical model for using HOSO as a feedstock in manufacturing Nodax, Danimer’s signature PHA, which is used to create a wide variety of products. The second year of the project will focus on scaling up the use of HOSO on a commercial level.

“HOSO is readily available material in the United States, likely making it a viable and cost-effective feedstock in the production of Nodax,” said Phil Van Trump, Chief Science and Technology Officer of Danimer. “We are pleased with the results of our first year collaborating with the United Soybean Board, and we thank them for their continued partnership in finding sustainable ways to meet rising demand for biodegradable products.”

High-oleic soybeans are grown exclusively in the U.S., and the oil produced from the crop provides increased functionality and improved shelf life for applications across the food and manufacturing industries.

“The first year of our research has produced excellent results that show HOSO is a viable feedstock in the manufacture of Nodax,” said Carol Leggett, PhD, Director of Microbiology at Danimer. “As we continue to expand the commercial production of Nodax, HOSO is expected to serve as a valuable tool to strengthen our supply chain and bottom line. The progress we’ve made to this point would not have been possible without the collaboration of the Omni Tech International, SmithBucklin, and the United Soybean Board and their farmer members.”

Earlier this year, Danimer announced plans to double the anticipated capacity of Nodax PHA from 125 million to 250 million finished pounds. Currently in the pre-construction engineering stage, the plant will now come online in two phases, with an initial three fermenters expected to be operational in mid-2023 and a second three in early 2024.

Nodax PHA was initially developed at Procter & Gamble and has many advantages as a new plastic, and not least for nonwoven products. It shows rapid biodegradation under both aerobic and anaerobic conditions and has polyolefin-like thermo-mechanical properties in terms of strength, flexibility, ductility, toughness and elasticity, and polyester-like physical properties in terms of compatibility with additives and other fibres in polymer blends

Properly compounded Nodax resins can be spun into fibres in a manner very similar to polypropylene, to make totally bio and marine degradable nonwoven products.

Authenticity guaranteed with Veocel Beauty

LENZING – The Veocel Beauty brand has launched an identification system for Lenzing Lyocell Skin, Fine Skin and Micro Skin fibres for facial sheet masks to address the increasing need for transparency and traceability in materials used in beauty products,

It is hoped the system will provide unparalleled traceability and quality assurance as the facial sheet mask market continues to grow and is forecasted to reach a value of \$14 billion by 2030.

“In recent years we have been witnessing an evolution within the beauty industry, from merely focusing on the quality of nonwoven fabric to ensuring authenticity and transparency of fibre materials used in facial sheet masks,” said Jürgen Eizinger, vice president of Lenzing’s global nonwovens business. “With the introduction of the Single-Use Plastics Directive in the European Union earlier this year, the launch of our fibre identification system is timely. As brands become more aware of the importance of supply chain transparency and set it as a priority for their business model and reputation, we anticipate it will play a key role in the success of our Veocel Beauty brand going forwards.”

Made in Austria, the fibres are of botanic origin, biodegradable and compostable. Nonwoven fabrics made of Lyocell Skin fibre types also feature patented translucency technology which offers naturally smooth and more translucent facial sheet masks. The fibres are also certified carbon neutral.]



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- 01 x wet wipe line, Kansan, Type: KNM-IO-4200, Line contains modules for soaking, folding and cutting. YOC: 2007
- 01 x wet wipe line, Protner, Type: Multi NW-HOL, Production line for wet-wipe production with Amotek FB-WDX, YOC: 2008
- 01 x automatic stacking, bagging and packaging for light-inco products - Alpha System S.r.l., VLH1 + MCF100PLH, YOC: 2009
- 01 x bagging & sealing unit, Amotek, Type: PB-127DX, Packing machine for sanitary pads, YOC: 1996
- 02 x MGA folding machine, Type: P300 - folding style 4/4 with Beck F1040S packing machine, YOC: 2007
- 02 x MGA folding machine, Type: P350 - folding style 4/4 with Beck F1040S packing machine, YOC: 2011

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The fibre identification system can identify fibres in the final products, providing quality control and authenticity assurance for brands against inferior counterfeit products. Products verified by the system also provide consumers with an added level of assurance that materials used in their beauty products are certified clean and made of genuine premium eco-friendly fibres.

“Around the globe, an especially in the Asia Pacific region,

we have been hearing a lot about the use of counterfeit materials in beauty product manufacturing sectors,” said Steven Tsai, Lenzing’s senior regional commercial director for nonwovens in Asia. “Brands and consumers are also more cautious about the negative health impacts of possible counterfeit materials used in their daily care products. We are now able to identify and verify the usage of these Lyocell fibres, reinforcing the Veocel Beauty brand as a label of trust.”

Closed loop partnership for Kelheim and Renewcell

Kelheim - Speciality viscose fibre manufacturer Kelheim Fibres has signed a Letter of Intent with Renewcell for a long-term commercial collaboration to add a crucial missing link for a circular economy for textiles in Europe.

Through its patented process, Renewcell is able to upcycle cellulosic textile waste, such as cotton clothes, transforming it into a high quality new material called Circulose. Together, the two companies will collaborate on developing commercial scale production of superior quality viscose fibres from up to 10,000 tonnes of Circulose per year.

In a joint statement, the two companies said that the collaboration paved the way toward a fully European closed loop in which textile waste is collected, recycled and regenerated into new Circulose fibres for people that want to reduce their fashion footprint significantly.

“European fashion consumption has great impact on climate and the environment globally. It also contributes to tremendous amounts of waste going into landfill and incinerators either in Europe or abroad after export. We will now work with Kelheim

to prevent waste and reduce the need for virgin resources, while also enabling a fully regional supply of low impact circular fibers for textiles,” said Patrik Lundstrom, CEO of Renewcell. “We are thrilled for the opportunity to work closely with a partner like Kelheim, who is at the leading edge of innovation and sustainability in this industry.”

Craig Barker, CEO at Kelheim Fibre added: “We see an excellent fit between our two companies, not only on the technical side. With Renewcell we have found a highly professional partner who shares our vision for future forward technologies that enable full circularity in the textile chain. Finding the answers to the challenges of our times is what drives us every day.

“Our recycled cellulose fibre solution made of Renewcell’s Circulose and manufactured using environmentally sound processes at our Kelheim plant is an answer to the fashion industry’s need for sustainable, resource and waste reducing solutions, and a more regional and reliable supply chain.”

See interview on page 33

Chargeurs partners with made-to-order platform

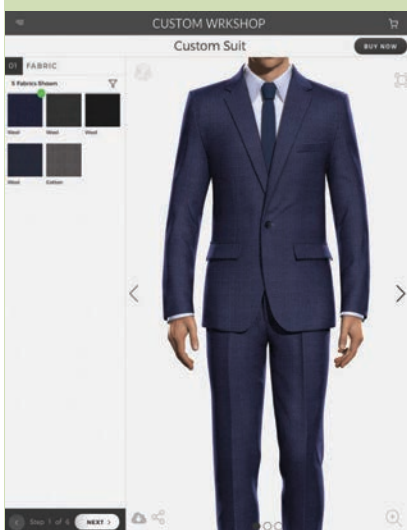
NEW YORK - Chargeurs PCC Fashion Technologies, the world’s largest apparel interlinings manufacturer, has launched a partnership with Custom Wrkshop, an on-demand platform for customization and made-to-order apparel, shoes and accessories.

Under the agreement, Chargeurs PCC will become the exclusive supplier of sustainable interlinings and inner components to Custom Wrkshop’s network of customers and represent Custom Wrkshop as a technology offering to its own global network of more than 6,000 customers and partners.

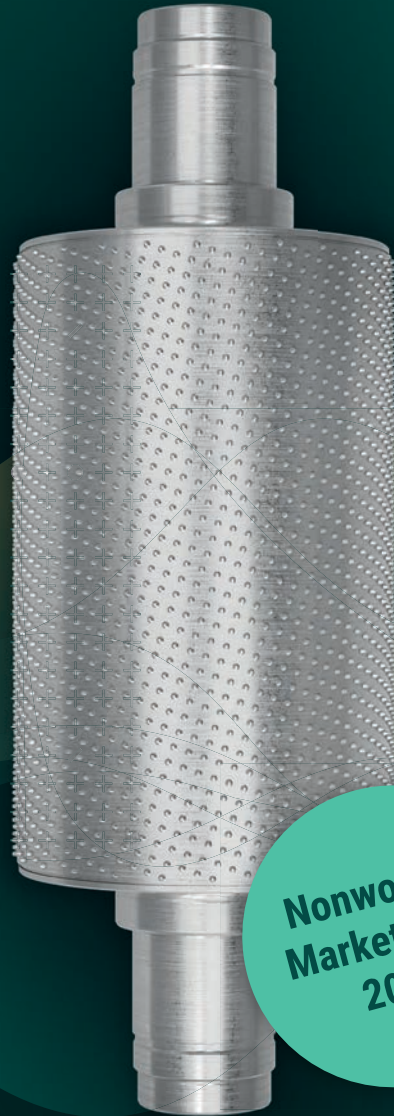
Custom Wrkshop provides front- and back-end digitization tools that enable consumers to customize garments and receive them directly from manufacturers in about two weeks. By partnering with Custom Wrkshop, Chargeurs says it is building on its early sustainability investments and cementing its leadership as a full-circle digital company driving sustainability and flexibility at every stage of production, from design, development and manufacturing to marketing and selling.

“Made-to-order manufacturing is one of the most sustainable options available to the fashion industry and consumers, as it eliminates materials waste, overproduction and costly returns due to poor fit,” said Audrey Petit, Managing Director of Chargeurs PCC Fashion Technologies. “We’re extremely proud to partner with Custom Wrkshop to supply our sustainable interlinings and inner components to its customers and enable conscious manufacturing through its global network of fully digitized factory partners. In addition, we will be offering Custom Wrkshop’s innovative plug-and-play software to our own customers, allowing them to easily add a module connected to digitized manufacturing facilities to their e-commerce stores so their end customers can create made-to-order pieces.”

The Custom Wrkshop platform provides brands with back-end connections to digitized manufacturing facilities across the globe, helping solve overproduction and inventory shipping challenges. For designers of garments, footwear, bags and accessories, the platform’s real-time costing engine is said to provide full visibility into cost during the design process, reducing the use of materials while boosting speed to market.



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Origin joins Alliance to End Plastic Waste

WEST SACRAMENTO – Origin Materials has joined the Alliance to End Plastic Waste, a global non-profit organisation.

The company has developed a platform for turning the carbon found in inexpensive, plentiful, non-food biomass such as sustainable wood residues into useful materials while capturing carbon in the process. Origin's carbon-negative PET is physically and chemically identical to fossil-based PET. Additionally, compared with fossil-based PET, Origin PET is equally recyclable within the existing infrastructure, which is critical to creating a circular economy with a significantly reduced carbon footprint.

According to Origin, its patented technology platform can help revolutionise the production of a wide range of end products, including clothing, textiles, plastics, packaging, car parts, tires, carpeting, toys, as well as nonwovens. In addition, the technology platform is expected to provide stable pricing largely decoupled from the petroleum supply chain, which is exposed to more volatility than supply chains based on sustainable wood residues. Origin's patented drop-in core technology, economics and carbon impact are supported by a growing list of major global customers and investors.

Members of the Alliance to End Plastic Waste include industry leaders across the plastics value chain, working towards a common goal of developing, deploying and scaling solutions to end plastic waste in the environment. As a member, Origin will work with fellow members to drive innovation and build a sustainable and circular global plastic value chain. Since plastics are widely used for their functional advantages, companies are aggressively seeking net zero or low carbon sustainable solutions to fossil-based plastics.

"Stakeholders across the manufacturing sector and end product markets recognise that to create a sustainable, circular economy, we must aggressively decarbonise the global plastics supply chain to mitigate the climate impact of plastic," said Origin Materials co-CEO Rich Riley. "We are excited to join together with the Alliance to End Plastic Waste to drive awareness and technical expertise of carbon-negative innovations in reducing the footprint of plastics."

Bostik launches new sustainable products

WAUWATOSA - Bostik, the adhesive solutions division of Arkema, has announced the launch of Nuplaviva, a series of new products formulated to meet disposable hygiene article manufacturers' needs for adhesives with renewable content.

As sustainability becomes a greater area of focus throughout the disposable hygiene industry, bringing these adhesives to market now allows Bostik to further support the corporate social responsibility (CSR) efforts of producers for baby care, feminine hygiene, and adult incontinence products.

Nuplaviva construction adhesives, initially with 50% and 75% bio-sourced content respectively, provide the same performance and ease of processability expected from Bostik's traditional adhesive formulations, the company said.

"During the research and development stages of Nuplaviva, it was important we designed an end-product that, although bio-based, article manufacturers did not need to make any changes to their equipment or processes to use," explained Christophe Morel-Fourrier, Bostik's Global Marketing Manager, Market Insights and Sustainable Innovation. "Exacting the formulas to meet the demands of high line speeds added another layer of complexity. But our researchers were successful in meeting expectations for behaviour and performance with both Nuplaviva 50 and Nuplaviva 75."

Compatibility with respect to substrate usage in various diaper, pad, and pull-on pant designs was a priority for Bostik's R&D department as they explored and experimented with the Nuplaviva formulations. The new adhesives are said to work well with traditional substrates, but testing has also proven they complement the use of a variety of more sustainable substrates. This allows article producers to further advance their sustainable development objectives.

"Adding bio-sourced content to our adhesives reduces our dependency—and ultimately our customers' dependency—on the use of fossil carbon," Morel-Fourrier added. "Resource conservation is at the heart of our circular model. Bostik as a whole is making efforts to modify its own manufacturing process, so it is more efficient, less energy intensive, and generates less waste."

Unifrax completes Lydall deal

MANCHESTER - Unifrax, the manufacturer of high-performance specialty materials focused on thermal management, specialty filtration and battery materials, has completed its US\$1.3 billion acquisition of Lydall, Inc.

The combined company will be led by John Dandolph as president and chief executive officer.

"The Unifrax-Lydall combination creates a one-of-a-kind specialty materials platform capable of driving transformative impact in the spaces we all care about, areas including fossil

fuel reduction, improved energy storage, and cleaner air," Dandolph said. "With our expanded portfolio and nearly doubled global footprint, we are poised to deliver even more cutting-edge, market-leading products and innovation to customers around the world. We're just getting started, and we're excited about the opportunities ahead."

The \$62.10 per share offer was backed by private equity firm Clearlake Capital Group. "We're proud to support a company that is dedicated to developing solutions for a cleaner, more sustainable society," José E. Feliciano, co-founder and

managing partner at Clearlake, and Colin Leonard, partner at Clearlake, said in a joint statement. "The addition of Lydall's people, technologies, and assets to the Unifrax portfolio creates a true market leader. With the support of Clearlake's O.P.S. framework, we are confident that Unifrax will continue to grow strategically both organically and through acquisitions, while shaping the future of the industry."

With 23 manufacturing locations around the globe, Lydall is likely to benefit from the growth in clean air filtration and electric vehicle adoption, along with other suitable markets globally.

Oerlikon and A.Celli set up technological partnership

NEUMUENSTER – Oerlikon Nonwoven and A.Celli Nonwovens have formed a strategic collaboration for the production of solutions dedicated to A.Celli's festooning technology, a key process for the management of soft, thick and memory-effect materials.

The partnership will see the development of new machines, which will be part of the A.Celli F-LINE family of multifunctional lines. These systems will support the already tested A.Celli technology dedicated to spooling, thereby completing the range of solutions dedicated to the management of soft materials.

"Oerlikon Nonwoven has many technologies ready to increase and develop the production capacity of our customers and A.Celli is the ideal partner to give concrete development to this potential," said Rainer Straub, President of the Business Line Oerlikon Nonwoven.

Alessandro Celli, CEO of A.Celli Nonwovens, added: "This strategic partnership with Oerlikon Nonwoven allows us to further extend our range of solutions. We wanted to combine the techno-

logical values of two links in the same supply chain: from the manufacturer of substrates lines to the ones of integrated end-of-line and intralogistics solutions. With this synergy we aim to strengthen our position as a reference company in a hygienic market that is increasingly attentive to the search for eco-compatible, innovative and differentiated nonwoven."

As for all the other solutions offered by A.Celli, the new line dedicated to festooning will also be engineered and produced in Italy.

"Collaborating with A.Celli to create a quality Italian integrated production system for our customers makes us proud," said Fabio Zampollo, CEO of TKW Materials, the Joint Venture partner of Oerlikon Nonwoven. "Since we know that the future will be challenging for all market participants involved and that technological excellence will primarily also be created in partnerships across the value chain, we believe that bringing the best teammate on board is already the right decision today."

Thomas Herrmann receives Entrepreneur award

KARLSBAD - Thomas Herrmann, chairman of the Management Board of ultrasonic welding specialist Herrmann Ultraschall has been named as Entrepreneur Of The Year 2021 by Ernst & Young.

Herrmann was named in the Innovation category with the jury acknowledging his creativity and commitment as entrepreneur within the German SME sector. "This award belongs to the global Herrmann Ultraschall team. My thanks go to all 600 colleagues," said a delighted Thomas Herrmann at the award ceremony.

Herrmann Ultraschall impressed the jury with its pioneering spirit, which has repeatedly produced innovative major advancements in ultrasonic welding. With a strategic focus on internationalization and modern personnel development, Thomas Herrmann has given the company an essential boost. Above all, Herrmann Ultraschall's Why, Bonding – More Than Materials, is worthy of note; it's not just about bonding materials, but also about strong connections between people, according to jury member Natalie Mekelburger (Coroplast Fritz Müller GmbH & Co. KG), who presented the award

in Berlin on November 4.

A total of 36 entrepreneurs reached the finals this year. An independent jury of experts selected the winners in the categories "family business", "innovation", "sustainability" and "young companies". The evaluation criteria included the sustainability of the business model, innovation, transformation, employee management and social responsibility.

Thomas Herrmann, who studied mechanical engineering, took over global management in 2007 from his father Walter, who founded the company in 1961. Prior to that, he had built up the first big subsidiary in the USA. With him, global employee numbers and sales have quadrupled. This is also thanks to the major intercompany cultural change, the "Culture Journey," which he initiated at the beginning of 2017.

The company now operates 26 locations in 20 countries supplying solutions for a range of industries including automotive, medical, hygiene and packaging.



Thomas Herrmann (center) receives his Entrepreneur Of The Year award. Also present (from left to right): Manfred Wittenstein (Chairman of the jury), Natalie Mekelburger (Coroplast Fritz Müller GmbH & Co. KG), Judith Rakers (Host) and Wolfgang Glauner (EY). Photo: © Matthias Rübey

Evolon certified to the highest standards

COLMAR – Freudenberg’s Evolon fabrics are known for combining high performance technical properties with numerous ecological benefits in many durable applications. According to the independent Oeko-Tex institute, they also meet the most stringent requirements in terms of sustainability and health and safety.

Freudenberg in Colmar, France, recently received the STeP by Oeko-Tex label for Evolon along with the Made in Green label.

Certificates awarded by the independent institute are highly trusted by the textile industry because they are 100% transparent and independent. For manufacturers, they are confirmation of ecologically and socially responsible production and products – a quality characteristic that plays a growing role in the purchasing decisions of companies.

By awarding the STeP (Sustainable Leather and Textile Production) label, the Oeko-Tex institute certified environmentally friendly production processes, a high level of health and safety and socially responsible working conditions at the



Freudenberg site in Colmar. The company scored top marks and reached the highest grade of certification, Level 3, for “exemplary implementation of best practices”.

“Evolon fabrics have already held the Standard 100 by Oeko-Tex label for more than twenty years,” said Achraf Khedimi, head of global sales for Evolon. “This is one of the world’s best-known certificates confirming that textiles have been tested for harmful substances. Evolon meets the most stringent requirements, and is ranked in product class I for suitability for baby skin contact.”

As a result of the combination of STeP and Standard 100 certificates, Evolon meets all the requirements for the Made In Green label. This proves that a product has been tested for harmful substances and manufactured using sustainable processes under socially responsible working conditions. The certificate also confirms the complete traceability of all materials and a transparent supply chain, and thus offers consumers the highest level of safety.

Last but not least, compliance with Detox to Zero by Oeko-Tex criteria is fully achieved as part of the SteP certification. This covers chemicals management and wastewater quality, following an initiative of Greenpeace which aims at eliminating harmful substances in the textile industry.

Berry achieves first North America ISCC PLUS

EVANSVILLE - Berry Global has announced its first three sites in North America to achieve the International Sustainability and Carbon Certification (ISCC) PLUS designation to support its growing North America based customer demand for more sustainable packaging.

With many brand owners searching for pathways to achieve their sustainability goals, inclusive of renewable or recycled material use in their packaging, Berry’s ISCC PLUS certified facilities can provide customers with assurance of a product’s material composition. These materials meet the ISCC’s standards for recycled, renewable, and recycled-renewable materials, providing traceability along the supply chain, verifying that certified companies meet high environmental and social standards.

“We are on a journey to a circular, net-zero economy. ISCC PLUS certification is a critical milestone on that journey because it allows Berry to provide our customers products made from certified circular plastic. By using mass balance, ISCC PLUS certification also helps accelerate the transition by allowing recycled and/or renewable feed stocks to be processed on the same world-scale assets as traditional resins while supporting the long-term vision of decoupling from virgin fossil fuel use,” said Diane Marret, Director of Sustainability for Berry’s North American Consumer Packaging Division.

The company’s facilities in Evansville, Indiana; Nashville, Tennessee; and Odon, Indiana, have been awarded the certificate from SCS Global Services. Processes currently located at the newly-certified sites include thermoforming, injection molding, lamination, blown film, and cast extrusion. Products made in these facilities primarily serve the food, beverage, foodservice, personal care, and healthcare markets and include products such as primary rigid and flexible packaging, breathable films for surgical garments, and hygiene products such as baby diapers, feminine care, and adult incontinence.

Dutch PPE opts for Borealis Borneowables

AMSTERDAM - Dutch PPE Solutions, a joint venture of VDL Group and Royal DSM, says it is now producing carbon neutral meltblown fabric for facemasks following its use of raw materials from Borealis.

Borealis is providing the company with renewable polypropylene from its Borneowables range of circular polyolefins, supporting them in reducing the climate impact of meltblown production. The raw material is made from bio-based feedstock derived entirely from waste and residue streams and has ISCC PLUS certification

According to Dutch PPE, making its filter materials with Borneowables and green electricity enables it to significantly lower its carbon footprint.

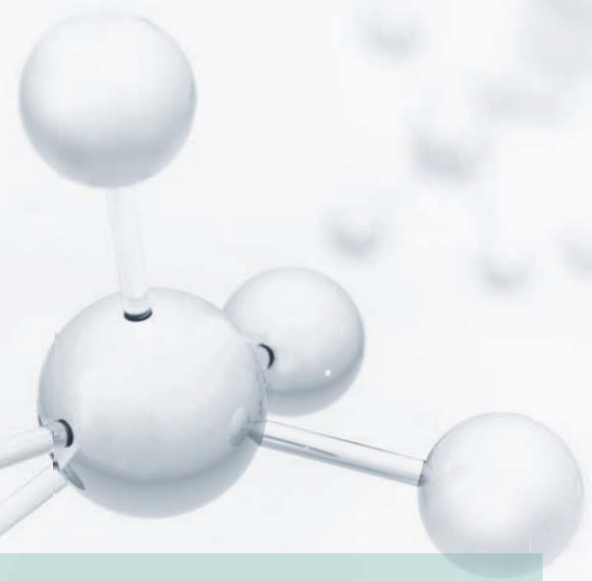
“In the Netherlands, we produce high-quality medical face masks and meltblown filter material with priority to serve healthcare workers and the local industry. With Borealis as a partner, we significantly lower our carbon footprint at the same time,” said Mark Bakermans, managing director Dutch PPE Solutions.

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- Visit to the VTT Research Center and to Valmet
- Posters exhibition
- Tabletop exhibition area
- Student grants
- Visit to the Metsä Group centre Pro Nemus (on 10th May)

The Nonwovens Innovation Academy (NIA), hosted by VTT Technical Research Center, brings together an interdisciplinary mix of academics, students, scientists, engineers and industry experts, to encourage the development of technical understanding and research to support innovation and growth in the nonwovens and related industries.

The conference will focus on innovations in:

- Sustainability
 - Sustainable materials
 - Biomaterials
 - Moving towards zero-waste (recycling: mechanical, chemical)
- Technologies
 - Industry 4.0 in nonwovens
 - Automatization
 - Process simulations
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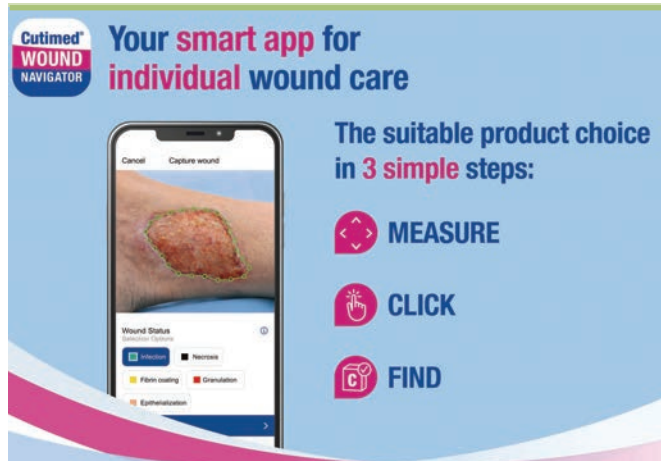
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circularity, Borealis' Bornevables are made from second-generation raw materials such as waste and residues from vegetable oil refining and used cooking oils.

Borealis' Bornevables products are ISCC PLUS certified in accordance with mass balance requirements, confirming the authenticity as renewable materials and traceability from raw materials to finished product.



Essity digital solution for wound management

STOCKHOLM - Hygiene and health company Essity has launched Cutimed Wound Navigator, a new digital solution for wound assessment. To provide patients with the right and most suitable care, the innovative mobile app records key wound characteristics, generates an assessment and helps healthcare professionals to select the appropriate wound product.

Essity has accelerated the digital transformation in all parts of its business. This latest addition, the Cutimed Wound Navigator, supports in assessing and documenting wounds via a simple interface, including the ability to capture an image, from which wound measurements are automatically determined. The result of an assessment can be summarized and extracted in a digital report generated in the app to simplify wound documentation. "At Essity we are dedicated to improving well-being through leading hygiene and health solutions. With the Cutimed Wound Navigator app, we are fulfilling an unmet need in the clinical workflow by simplifying wound documentation. Our goal is to provide support to healthcare professionals in wound assessment and product selection while at the same time improving consistency of care," said Ulrika Kolsrud, President Health and Medical Solutions at Essity.

The Cutimed Wound Navigator app, which is available on both iOS and Android, will initially launch in Germany and will be launched in additional countries in 2022.

The development of the software is a collaboration between Essity and Imito AG, a Swiss healthcare start-up. The collaboration was enabled through Essity Ventures, a strategic initiative of Essity that aspires to partner with innovative health and hygiene start-ups and entrepreneurs. Cutimed is a brand within Essity's medical solutions business and provides products and solutions especially developed for the management of chronic and complex wounds, covering all stages of the healing process.

"We are delighted that together with Dutch PPE Solutions, we are able to provide a solution that contributes towards safety and a better climate outcome," added Trevor Davis, head of Marketing Consumer Products at Borealis. "Thanks to our Bornevables range, we are able to help customers meet their sustainability goals while maintaining the existing quality standards of their products, which is in the true spirit of EverMinds."

Registration open for Techtexil NA and Texprocess

Georgia - Techtexil North America and Texprocess Americas will return to the Georgia World Congress Center in Atlanta, Georgia May 17-19, 2022.

Those who register prior to Friday, February 18, 2022 will have the opportunity for substantial cost savings on exhibit hall, symposium and special event purchases.

The co-located events will bring decision makers from all of the major industries that touch technical textiles, nonwovens, sewn products, equipment and technology together in one place to experience the latest innovations.

With a single badge, visitors gain access to the show floors of both shows, including 500+ exhibiting companies, international media outlets and pavilions representing top contributors to the global textile industry, providing unparalleled exposure to new business opportunities and potential partnerships.

Running concurrently with the show floor, the Techtexil North America and Texprocess Americas Symposia will each feature expert-led sessions on pivotal advancements, research and technology for the textile, nonwovens, and sewn products industries. One, two, and three day passes to each show's symposium can be purchased through online registration.

The shows will each offer a wealth of additional educational and special features including The Studio and The Academy, with more information to be released in the coming months.

Visitors are encouraged to register in advance not only for financial savings but to ensure a seat in the Symposium, and for minimal wait times during on-site badge pickup. The Official Techtexil North America & Texprocess Americas Reception will take place on the second evening of the show, May 18, 2022 and does have a capacity limit, so all parties are encouraged to purchase tickets in advance.

For more information on the upcoming edition of Techtexil North America and Texprocess Americas, May 17-19, 2022 in Atlanta, Georgia, please visit the show's joint website - <https://techtexil-texprocess.us.messefrankfurt.com/atlanta/en.html>.

To receive the latest updates and announcements, from show features to new exhibitors to educational content and more, subscribe to Techtexil North America for specific updates - https://www.pages04.net/messefrankfurtinc/TTNA_SUBS/

Techtexil North America is Incorporated with ATME-I. Texprocess Americas is Co-produced by SPESA.



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2021... a year in nonwovens



"Will the coronavirus just be a little flaw in our inevitable progress? I really don't think so – I think it will stay with us. For much of history, crisis has been a normal state, but this is a special one – not a war, and not something relatively minor in the greater scheme of things like the financial crisis, but something that has resonance in every layer of life. Society stopped, and that is new. In the Hong Kong virus of the 1970s in which many thousands of people also died, nobody would have thought of just stopping everything. The dynamics of change are that for every trend there eventually comes a counter trend leading to the next step of the process, where something different has to happen. This is where we are."

Matthias Horx, Zukunftsinstitut, Frankfurt

Globalisation won't return as we knew it and most likely peaked around 2015-16, but full industrial decoupling from China is virtually impossible because there is no other country with the scale and structure. There will still be greater regionalisation which will lead to higher costs, with an emphasis on resilience over efficiency, more industries deemed 'strategic', and shifts in supply chain management."

Robert Ward, International Institute for Strategic Studies



"We have developed a plant-based product which degrades completely naturally at end of life. It's actually an edible material, unlike most of the polysaccharide materials out there at the moment which require crosslinking. It's a scientific breakthrough that comes from the high performance of protein."

CEO Simon Hombersley, CEO, Xampla



"There was a lot of talk by European governments about becoming self-sufficient in facemasks and meltblown fabrics during the shortages last year, but we have been frustrated by what's subsequently happened. Norway is not in the European Union, but follows its procurement policies and it appears there's a fear of not breaking any laws in respect of international trade, but this is always based on only price in the end. No other criteria are taken into account. This was a real opportunity to secure European jobs and knowledge, as well as self-sufficiency in essential PPE, but it hasn't been taken – even in Germany, where new companies have been heavily subsidised, sourcing is taking place internationally and is based purely on price. Facemask machines are now being scrapped as a result."



Liudmila Ilyukhina, founder, Naukatek



“Nanofibres are already widely used for cell cultivation and in growing meat, it is necessary to have a scaffold in order to achieve a steak-like structure, otherwise, the meat would just be like a mush of cells. Other possible solutions for this application have proved too expensive but now thanks to our proprietary technology we can make cultured meat a reality at competitive prices. Gelatex has already developed an edible plant-based scaffold that supports muscle-tissue formation. It has a unique 3D structure and works with many cell lines, meaning it can be used to make pork, beef or fish, and it is the most scalable and affordable solution available for cultured meat now. We are already testing with eleven cultured meat companies and many of them are already customers.”

Mari-Ann Meigo Fonseca, Gelatex co-founder.



“Our scientific community has a worldwide leadership on the development of biodegradable materials, but at the moment they are not usable by industry, because there is a new and absurd European initiative – the Single-Use Plastics Directive.”

Roberto Cingolami, Italy's Ecological Transition Minister



“We’re very excited to bring our patented bio-based formulation derived from algae into the realm of spunlaid nonwovens. The opportunities to utilise our technology in Avgol’s sustainable component materials and bring colour and the skin wellness attributes of algae-derived products into personal care items is an opportunity to reduce human impact around the world on a large scale.”

Renana Krebs, CEO, Algaeing

“Brands have become a lot more active in going beyond the fact that PLA biopolymer is a green solution and its performance characteristics. We’ve started to see big changes due to a combination of active consumers, NGOs and legislation such as the European Single Use Plastics (SUP) Directive.”

Rich Altice, president and CEO, NatureWorks





“In terms of size, the packaging industry is bigger than the fibres industry but there are many synergies between the two, for instance on the feedstocks – we are basically using the same raw materials, whether cellulosics or synthetics, and at the end of the day, we will fight for them. There are also a lot of similarities in process technologies, especially on the synthetics side. We face the same issues, so there can be a lot of mutual learning. There’s also an overlap in applications. The fibres and nonwovens industries can learn a lot on the circular economy, where packaging is really advanced in terms of what they are doing, such as the fragmentation of different coloured films for recycling and re-use. Sometimes company approaches can be a bit too linear and cross-industry cooperation is now called for.”

Friedrich Weninger, managing director of the Austrian Fibres Institute and Dornbirn-GFC



“The supply chain’s problems are not insurmountable and what’s needed are young people with the passion and the urgency and the will to make the necessary changes happen. Many brands and corporations have set long-term sustainability goals aiming to be carbon neutral by 2050, for example, but these are decided on by older men who know it will be the next generation’s problem because they’ll be retired. We need radical aspirational goals from the younger generation now, and to quickly move these goals from being aspirational to tactical. If we set much shorter goals and only achieve 50% success, that’s still better than goals for 2050 requiring no immediate action.”

Edwin Keh, CEO, The Hong Kong Research Institute of Textiles and Apparel (HKRITA)



“Nonwovens production is already highly automated and much less labour intensive than conventional textile manufacturing, partly because there are fewer process steps involved to begin with. For many years now, however, integrated manufacturing lines have also been supplied from single suppliers making high automation a prerequisite. Benefits in process control, tighter tolerances, less waste, better key performance indicators, faster start-ups and grade changes have all been made due to advancements in Industry 4.0 closed-loop feedback systems and process control technologies. The nonwovens industry learned much during 2020, due to the general shortages of nonwoven-based facemasks and PPE – the need for speed was paramount and new technologies and entire supply chains were established in just weeks when normally they would take many months.”

Dave Rousse, president, INDA, The International Nonwovens and Disposables Association



“There is a lot of lip service currently being given to circularity but there is not as much true recycling going on as consumers think. A single recycling step of turning waste plastic into park benches which then go to landfill is not enough – achieving quality that is just like virgin PP with the same regulatory approvals, and restoring it to products with no trade-offs in an endless cycle, is the goal of PureCycle Technologies. The three main challenges are removing contamination, colour and malodour. The plastics waste stream consists of a huge diversity of different plastics in different forms, so pulling a single polymer out of it profitably is extremely tricky. A key advantage of our process is its simplicity. With far fewer steps than pyrolysis, it consumes a lot less energy and ultimately is much more cost effective.”

John Layman, Procter & Gamble head of corporate R&D and founding inventor of PureCycle Technologies (PCT)



“Mass balance is a crucial bridge between today’s large scale linear economy and the more sustainable circular economy of the future. Since chemically recycled or bio-based feedstocks are typically blended in the manufacturing complex, physical segregation of recycled content is often practically and economically unfeasible. The mass balance approach makes it possible to track the amount and sustainability characteristics of circular and/or bio-based content in the value chain and attribute it, based on verifiable bookkeeping.”

Mark Vester, global circular economy leader, SABIC.(PCT)



“Around 80% of all carbon impact is in the making of new products. All of a brand’s retail spaces, distribution centers and offices, and its corporate travel, amount to less than 1% of its carbon footprint. A brand can put solar panels on all of its stores and offices but not make a dent on the issue. It is production that is the problem. The reason brands can achieve positive 70-80% growth is down to an enormous infrastructure, mostly in Asia, that is designed just to serve. I’d like to see all public companies introducing a production reduction metric in their reports, but at the moment we’re not at the stage of being able to show revenues increasing and production decreasing. This should be the aim.”

Jeff Denby, co-founder, The Renewal Workshop



Pilot success for compostable diapers

A two-year pilot program in France has demonstrated the feasibility of a compostable diaper supply chain.

A collaboration between French diaper manufacturer Cellulose de Brocéliande, a subsidiary of Agromousquetaires, and North Carolina-based materials producer, Tethis, is now aiming to bring the first known compostable diaper to market.

The aim of the program, branded Couches Fertiles (Fertile Diapers) and operated by a company called Les Alchimistes, has demonstrated the sustainable, controlled and full-cycle process of compostable diapers, from use, to collection and then to disposal, in a variety of institutions in Paris, France.

According to a report from the US Environmental Protection Agency, an estimated 20 billion disposable diapers accumulate in landfills in the US alone, with Europe representing even larger amounts of similar waste. Europe, on the other hand, leads in global efforts to increase causes supporting a circular economy for consumer products through policies such as the Paris Agreement. However, the goals of these policies require organizations to prioritize actions to reduce carbon, thereby engaging in waste management practices including composting, recycling, and zero-waste initiatives.

While many components of diapers have been made compostable, the absorbent material that makes the diaper work has been made from environmentally persistent polymers, called polyacrylates. To date, there has been no bio-based alternative with the performance and economics necessary to make a compostable diaper work at scale, members of the research team said.

To create a realistic and authentic solution eliminating ecologically

destructive diaper waste, the companies recognized tackling a longstanding and difficult problem would mean developing a multi-pronged strategy starting with product development.

The team at Cellulose de Brocéliande sought a way to make a functional diaper composed of sustainable materials. The company identified Tethis as a key contributor for the trial, in which Tethis provided the novel ingredient, and the expertise to embed it within their innovative and specially designed diapers maximizing effectiveness of the materials. Tethis develops and manufactures superabsorbent materials built from plant-based feedstock sources. Its proprietary, plastic-free, compostable super-absorbents allow product brands and manufacturers to move to more genuinely eco-conscious products while keeping overall performance comfortably and cost-effectively, the company says. For its part in this unique collaboration, it provided the breakthrough absorption technology for the compostable diapers while Cellulose de Brocéliande developed an innovative design and manufactured the diapers. Les Alchimistes managed the distribution, collection and evaluation of the program – from the distribution of diapers to the evaluation of their performance through to converting the used products to industrial compost.

“Our technology addresses a well-known ecological nightmare for society, but that to date has had no effective solution,” said Robin Weitkamp, CEO at Tethis. “The partnership is one of my proudest achievements, as we have demonstrated the successful use of our



material within the first mass consumer trial of compostable diapers to market for a more environmentally conscious future with a partner that is driven to make it a commercial reality.”

In conjunction with Paris City Hall and the Ministry of Ecological Transition, Couches Fertiles demonstrated cradle-to-cradle sustainability of the diapers by partnering with nurseries over two years.

Couche Fertiles provided thousands of diapers to nurseries to verify the diapers were effective for use. The nursery staff confirmed the compostable diapers being tested were just as suitable as other standard diapers. Disposal of the diapers was also successful with Les Alchimistes, leading the collection and the successful composting of the diapers in a controlled, industrial environment.

Over the past two years more than 15,000 diapers have been successfully composted, demonstrating the viability of converting baby diapers from a landfill or incinerated waste and into a useful, safe and eco-friendly consumer product.

As the pilot program accelerates, Cellulose de Brocéliande and Tethis are expanding their collaboration to evaluate the next steps to bring the compostable diapers to the market in Europe at commercial scale. **SNW**

SPONSORED CONTENT











Birla Purocel offers innovative fibre solutions for nonwovens

Purocel EcoDry for Sustainable Hygiene Products:

Purocel EcoDry is a biodegradable & compostable Viscose fibre with engineered hydrophobicity specially crafted for sustainable absorbent hygiene products (AHPs). It helps create super soft nonwovens for top sheet application in AHPs like sanitary pads that keep the user skin dry at the same time allowing fluids to get transferred to the core of AHPs. The fibre is fully sustainable in nature making it possible to have eco-friendly hygiene products meeting required performance.

Viscose Staple Fibre by nature is a hydrophilic fibre. Our innovation Purocel EcoDry is a specialty Viscose staple fibre which has been carefully designed with just optimum hydrophobicity to get the desired properties in the top sheet application of AHPs like sanitary pads or panty liners. Purocel EcoDry Fibre provides perfect balance between the two most critical properties required in the absorbent hygiene product like rate of absorption as well as wetback or rewet.

Purocel EcoDry Viscose fibre provides the perfect combination of the biodegradability & compostability of natural fibres as well as performance of synthetic plastic/oil based fibres as shown below.

Advantages of Viscose over Plastic/Synthetic and Cotton for Absorbent Hygiene Products (AHPs)		
Alternative Materials – Benefits & Challenges		
Cotton	Regenerated Cellulose (Viscose)	Plastic/ Synthetic
 Fully Biodegradable	 Fully Biodegradable	 Non Biodegradable
 Biodegradability 14 Weeks	 Biodegradability & Weeks	 Biodegradability 400+ Years
 Contamination Possibility	 Contamination Free	 Contamination Free
 Limited Engineering Possibilities for Multiple Uses	 Engineering Possibilities for Multiple Uses	 Engineering Possibilities for Multiple Uses
Regenerated Cellulose combines the advantage of being a cellulosic fibre with engineering capability equivalent to plastic & synthetics		

Purocel Eco for Building Traceable Sustainable Products:

Presenting Purocel Eco, an eco-enhanced viscose fibre with built-in molecular tracer for 100% transparency. End consumers can now trace the origin and journey of the end products like wipes with a simple QR code scan, so they can be assured that the products are sourced sustainably.

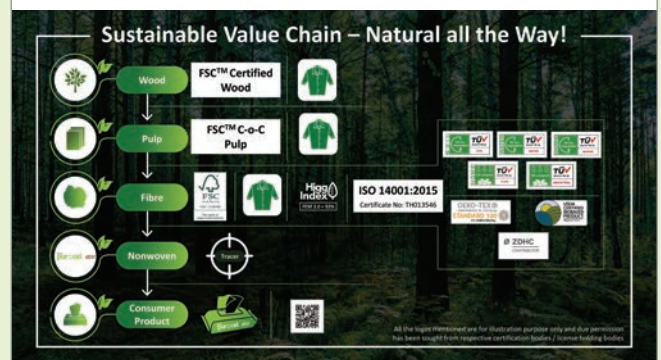
Purocel Eco is world's first to provide such feature in Nonwoven industry. It has been infused with a unique proprietary tracer which can be identified at any stage like fibre, fabric or end product across the nonwoven value chain.

Apart from traceability, Purocel Eco offers host of sustainability credentials as below:

- Purocel Eco is sourced from FSC® certified sustainable forests, thus conserving biodiversity, saving endangered forests and increasing overall green cover
- Purocel Eco is produced in an EU BAT compliant manufacturing facility meeting which meets the most stringent European emission norms for Viscose fibres
- Purocel Eco has been manufactured in a manufacturing facility having best-in-class Higg FEM (3.0) index of 93% as of 2019
- Purocel Eco promises 65% lower greenhouse gas emissions, 75% lower water emissions, uses more than 50% of renewable energy source and follows closed loop production process wherein more than 90% Sulfur used in the process is recovered & recycled making it even more sustainable

Note: Comparing against generic Viscose fibres

Purocel Eco for Transparent & Sustainable Value Chain



Purocel Plus Fibres for 100% Viscose-based Wipes:

Presenting specialized fibres for sustainable cellulosic wipes – Compliant with EU single-use plastics directive.

Specially crafted viscose fibres to enable the switch from plastic based fibres to sustainable 100% cellulosic fibres while maintaining good process-ability and wipe properties:

1. EU SUPd Compliant
2. Fully Biodegradable & Compostable
(Certified by TUV Austria)
3. Enhanced process-ability
4. Improved wiping performance

We've embarked on a journey towards 100% Viscose-based wipes and our innovative fibre offerings are intended to fast-track this journey for a better tomorrow!

For more information:

www.purocel.com
purocel@adityabirla.com

INDEX closes to great acclaim

A range of new applications and innovations took centre stage at Index 20, a clear indication of the resilience and resourcefulness of the nonwovens industry in the wake of the Covid-19 pandemic.

INDEX 20, the world's largest nonwovens exhibition, held in Geneva from 19-22 October 2021, closed a resounding success, featuring over 500 exhibitors across more than 45,000 m² of exhibition space.

"With over 9,300 visitor entries over the four days, and an overwhelming sentiment among exhibitors of an unexpected attendance and quality of key decision-makers from across the globe, we are told by all those we have met that this is undoubtedly a resounding success under the circumstances," said Pierre Wiertz, General Manager of EDANA.

Following a record year for nonwovens production in Greater Europe, with a growth of 7.2% in 2020 to reach 3,075,615 tonnes (largely due to the highest ever demand for materials intensively used to fight the pandemic) this was the first opportunity in 4 years for the community of professionals from across the whole supply chain to meet in person.

The visitor count was even more remarkable considering that over a thousand further professionals joined the on-line version of INDEX, as the show was presented for the first time ever in a hybrid format, allowing exhibitors to march their live with virtual stands featuring their products and services.

"We are delighted to note that this "augmented reality" offer was so well received, and since the Swapcard platform which supported this was accessible to the 2500 pre-registered

delegates for several weeks after the event, as well as any other new visitors, those who missed the numerous side events such as the 6 Sector seminars, or wished to prolong their contacts with exhibitors, could continue to benefit from INDEX in an innovative way," said Magali Fakhry Dufresne, INDEX Exhibition Director, PALEXPO.

"Our business contacts at INDEX are usually all about long-term relationships and contracts, with additional new opportunities a plus; for this edition it has been first and foremost a matter of once again meeting business partners face to face after so many videocalls, and the pleasant surprise is that over all the result has exceeded our expectations. The level of engagement and quality of visitor makes INDEX a vital business development tool for industry players of all sizes, it

remains the flagship exhibition of the nonwovens industry," added Mikael Staal Axelsen, CEO of Fibertex Nonwovens.

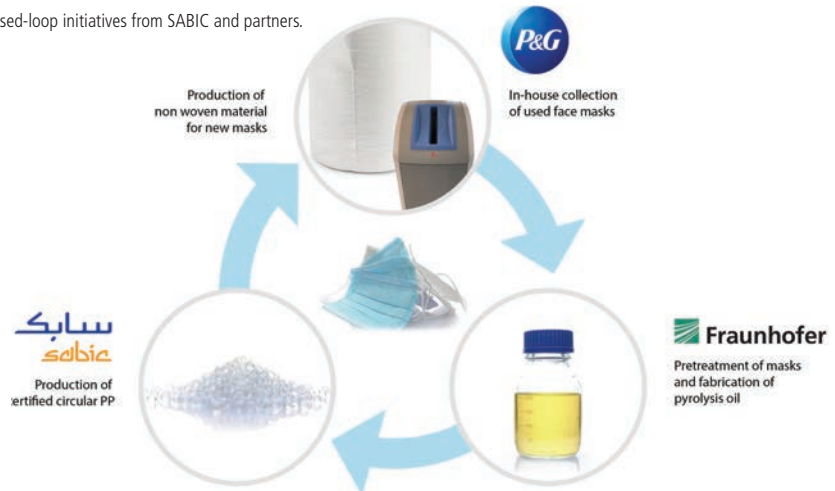
Sustainable solutions from Sabic

Sabic's newly formed Hygiene & Healthcare segment of its Petrochemicals business showcased its extensive portfolio of Purecares polypropylene (PP) and polyethylene (PE) polymers for high-purity nonwovens and hygiene films.

The company's exhibit also featured enabling solutions developed with partners to address the issue of plastic waste and support the transformation of the industry towards a circular economy with closed-loop initiatives and certified circular polymers under its Trucircle portfolio and services.

"Our new Hygiene & Healthcare

Closed-loop initiatives from SABIC and partners.



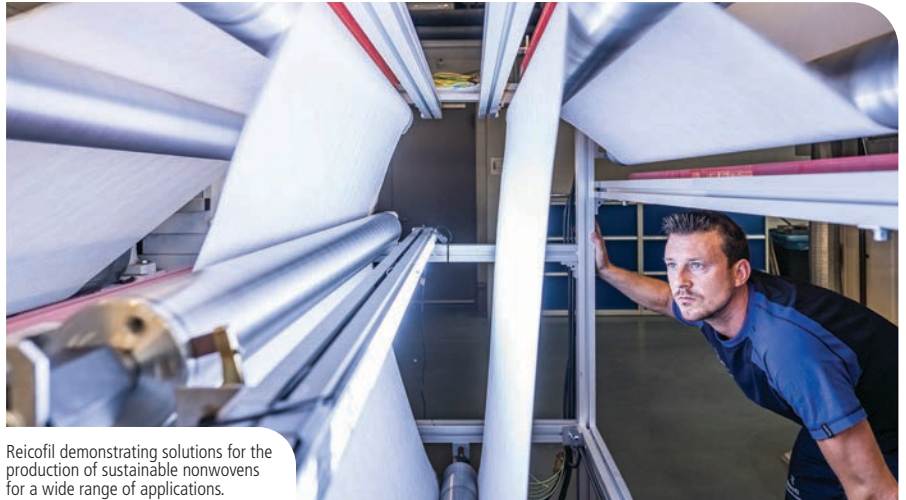
market solution organization will aligns our efforts to support our customers' needs in this industry more effectively," said Abdullah Al-Otaibi, General Manager ETP & Market Solutions, Sabic Petrochemicals. "The new setup will drive tailored technology platforms and advanced product developments for customers who require this advanced, differentiated performance. At the same time, it will help us maintain and strengthen our competitive lead by accelerating the pace of innovation to respond to market trends more quickly."

Highlights on display included dedicated PP and PE grades for lightweight nonwoven fabrics using the latest spunbond and meltblown processes, and a new ultra-high melt flow PP product engineered for meltblown fibres in nonwoven fabrics. The nonwoven focus was complemented by industry proven polyolefins for cast and blown film applications in hygiene webs and laminates, providing desirable back and top sheet properties such as water tightness, breathability and elasticity.

In addition, Sabic also presented ISCC Plus certified fibre and film polymers based on circular and renewable PP and PE polymer technology as part of the its Trucircle portfolio for advancing the transformation of the plastics industry from a linear to a circular economy. Examples of this comprehensive initiative include collaborations with various market leaders in the field. Together with Fibertex Personal Care, for example, one of the world's largest manufacturers of spunbond nonwovens for the hygiene industry, Sabic is creating a range of high-purity nonwovens for the hygiene market using ISCC PLUS certified circular PP polymer derived from post-consumer plastic waste. In another project, Fraunhofer Institute, SABIC and Procter & Gamble (P&G) joined forces to develop and demonstrate the feasibility of an advanced close-loop recycling process for used nonwoven facemasks.

Living nonwovens with Reicofil

Reifenhauser Reicofil exhibited under the slogan Living Nonwovens, with the nonwoven line specialist demonstrating



Reicofil demonstrating solutions for the production of sustainable nonwovens for a wide range of applications.

solutions for the production of sustainable nonwovens for a wide range of applications.

As Markus Muller, sales director at Reifenhauser Reicofil noted, sustainable nonwoven production starts with the amount of material used - the less raw material needed, the better. The Reicofil 5x line series specialises in this application and achieves fabric weights of 8 gsm (grams per square metre) or less through efficient downgauging, including on 1000 m/min composite lines containing three spunbond beams.

In addition, Reicofil customers can reduce the use of fossil raw materials on request by processing biobased raw materials as an ecological alternative - for example for diapers. The topsheet material, made of bulky, soft, and industrially compostable high-loft nonwovens, meets maximum hygiene requirements at the same time.

"Nonwovens often accompany us from the first to the last day of our lives. In diapers, face masks or air filters, the material contributes to our well-being, safety, and comfort. Nonwovens are close to our skin so they deserve only the highest quality. This is what we stand for, this is what we live for," Muller said. "We also assist our customers to sustainably produce nonwovens from biobased raw materials or recycled material to leverage the global shift in sustainability as an opportunity."

For industrial applications, high-strength nonwovens can be processed from up to 90% PET flakes from post-consumer waste, a combination of sustainability and high-performance nonwovens.

For the medical sector, the line manufacturer was also exhibiting its leading solutions for high-barrier medical protective clothing as well as meltblown nonwovens for face masks.

"Reicofil technology guarantees maximum safety, with filtration efficiencies of up to 99% (N99 / FFP3 standard), minimum quality fluctuations, and extremely high line availability at the same time," the company said. "With the current RF5 machine generation, Reicofil also sets benchmarks in terms of quality, performance, availability, efficiency, and machine intelligence - for challenging applications in hygiene, medical, and industrial sectors."

Investkonsult welcomes quality visitorship

Investkonsult Sweden – the specialised broker and consultant for nonwoven and absorbent hygiene producers - hailed the success of INDEX 20, highlighting how the high quality visitorship was supplemented by a number of new entrants to the sector.

"For us, INDEX was indeed a very nice reminder of how sparkling and alive this business is; it was fantastic to see old friends, customers and colleagues again," Johan Berlin, Investkonsult Sweden, said, adding that despite the slightly lower number of attendees, the company still felt it was a success. "Actually the lower number of people did not matter that much to us, specifically, as we had better quality visitors, and most importantly, we could actually spend time with them, without feeling that we had to rush into another meeting." »

He continued: "However, the one thing that I guess stood out the most for us, was the fact that we did get the chance to meet some of the 'new faces' in the business, companies and people that we have been frequently in touch with over the past 18 months, be it for consulting about meltblown or any other matter, but to actually meet with those

people face to face for the first time, was a pleasure. Now, we're already looking forward to a fun-packed and intensive year in 2022, with IDEA, Outlook, the International Nonwovens Symposium and many more shows!"

Investconsult Sweden is the world's only machinery broker and consultant specialized in serving clients in two very

close segments – the nonwovens producers as well as the absorbent hygiene producers. This gives the company a unique position in surveying the supply chain in large parts of the industry. The company's consulting is often employed for pre and post M&A assessments, as well as second opinions on M&As – often engaged by the larger accounting firms such as Ernst & Young, PwC, etc.



Suzano brings carbon capture target closer

Suzano, the world's leading eucalyptus pulp producer, is bringing forward its goal of removing 40 million tons of carbon from the air by 2030 to 2025.

The new five-year target will be supported by the expansion of the company's forest covering which will involve both an uplift in commercial planting operations and setting aside new designated conservation areas that were previously anthropised.

Alongside these improvements, Suzano will maintain its focus on reducing carbon emissions across its own operations and supply chain and will continue to improve its forest management to avoid losses in its operations, maximise productivity and increase carbon removal.

"Revising the target from 2030 to 2025 underlines our belief that addressing climate change must be a priority," said Walter Schalka, CEO of Suzano.

Suzano maintains that in order for concrete targets for reducing carbon emissions to be achieved in the long-term, governments, companies and society must set and meet short and medium-term targets. The company has been participating in a series of events and meetings with other companies, Brazilian government representatives and global leaders to address the topics that will be discussed at the United Nations Climate Change Conference (COP26), which will be attended by Suzano representatives.

At INDEX, Suzano promoted Eucafluff as the only eucalyptus-based fluff pulp for personal hygiene items such as diapers and sanitary napkins.

The key benefits provided by this fibre are a higher liquid absorption and retention in product cores and greater comfort and discretion to the end user. These benefits are due to the high compressibility of the eucalyptus fibre – a feature that also provides associated benefits such as a reduction in packaging size, transportation and storage costs.

In May this year, the company announced the construction of a new multi-billion dollar pulp plant with annual production capacity of 2.3 million tons. The \$2.8 billion project is one of the largest private-sector investments currently under development in Brazil.

Also in May, Woodspin – Suzano's partnership with Spinnova – selected a site and started the construction of its first plant in Jyväskylä, Finland.

Spinnova's sustainable cellulosic fibre is expected to be available from the plant by the end of 2022 as a result of the €22 million investment and Woodspin's goal is to be producing one million tons of it annually within ten years.

Imagine greener with H.B. Fuller

Adhesives supplier H.B. Fuller was in Geneva demonstrating how its next generation technologies and solutions can reduce the overall ecological footprint and support manufacturers' overall equipment effectiveness and regulatory goals.

Being Eco-consciousness is more and more a reality and a major global trend, the company says. In fact, what began as a differentiator driven mainly by startups has now become a global effort by brand owners in the hygiene industry. At the show, H.B. Fuller was highlighting the three ways the company is supporting manufacturers' efforts in driving sustainability and efficiency efforts for the benefit of consumers and the planet. These are:

Imagine Greener - H.B. Fuller's latest sustainable developments, including high-performance bonding solutions for more demanding natural substrates and adhesives with an increase in bio-based content.

Discover Cleaner - to help hygiene manufacturers address the rising demand for ingredient transparency and safety driven by consumer groups and non-governmental organizations. The ultimate goal is to help manufacturers deliver safe articles that are not only compliant, but are at even lower limits versus industry Substance of Interest (SOI) targets.

Deliver Leaner - a range of innovative adhesives and service solutions that raise production line efficiencies and enable a leaner manufacturing process for increased productivity.

Visitros could also discover more about H.B. Fuller's latest packaging solution for wetness indicator technology, higher

mileage products, lower application temperature grades and automated delivery system to simplify the adhesive handling process.

IMA showcases packaging portfolio

The IMA Tissue & Nonwoven Group made its debut at INDEX 20 with its latest range of sustainable solutions for the safe production of disinfecting wet wipes and the recyclable packaging of nonwovens.

With its 60 year history and a presence in 80 Countries, the company covers a range of options in the packaging industry, covering several markets from pharmaceutical, food & dairy, personal care, throughout to automation.

IMA Tissue & Nonwoven is IMA's cluster of companies that includes five companies that together, offer complete lines for wet wipe and face mask converting and packing and for the nonwovens packaging markets.

TMC – Tissue Machinery Company was at the show with a new machine for the sustainable packaging of diapers. D-NAMIC is a new automatic stacker and bagger for baby & adult diapers, as well as light incontinence and bed under pads. With a very compact footprint, this machine features high-speed output up to 75 bags/minute. The machine can run with either plastic or paper-based films, both recyclable and in accordance with sustainability practices. Perfect completion of the line is reached with TMC's bundler: D-BUND, a diaper bundler tailored for each manufacturer's needs, up to 12 cycles per minute, overwrapping diaper bags in neat, tight, completely sealed bundles ready for transport and distribution.

Teknoweb Converting operates in the wet and dry wipes and face masks sector and at the show was demonstrating its machinery for IPA alcohol processing, compliant to explosion proof regulations. These include the use of sustainable raw material e and dispersible solutions at up to 300 stacks per minute.

Teknoweb also supplies face mask converter systems: IMA Face 400 and IMA Face 400D, which are dedicated to the production of surgical face masks and respirators (FFP2/N95).

Pioneers in the design of flow wrapping solutions for reclosable wipes packs, IMA ILAPAK offered the Delta WW OF-HSX flow wrapper for wet wipes. This machine is full ATEX compliant and ready for sustainable packaging, running up to 170 packs per minute with traditional laminated films and up to 130 packs per minute with fully recyclable materials.

Also on show was the IMA Perfect Pack, which combines functional packaging solutions with maximum flexibility such as machines for the automatic sealing of wipes in sachets.

Six brands, one focus

An extensive range of recycled and biodegradable fibre solutions for nonwovens was showcased by Hygiene Fibers Group of Indorama Ventures (IVL).

The combination of polymers, technologies, processes and global reach supported by the Hygiene Fibers Group – one of three business segments that make up Indorama Ventures – uniquely positions it within the hygiene industry to meet increasingly challenging market demand for innovative sustainable solutions within the hygiene sector.

Across the six brands and companies that make up Hygiene Fibers Group – Auriga, Avgol, FiberVisions, Indorama Asia, Trevira and Wellman International – sustainability and supporting customers to achieve circular objectives is now paramount.

At INDEX, the group launched CiCLO,

a technology which allows polyester and other synthetic materials to biodegrade like natural materials do in wastewater treatment plant sludge, sea water and landfill conditions, reducing synthetic microfibre pollution generated during washing, and minimising plastic accumulation in landfills caused by discarded textiles.

Several hygiene fibres brands, including Wellman, Trevira and Auriga, have been working closely with the CiCLO technology over the past 12 months, with a focus on sustainable PET and rPET staple fibre and filament solutions in areas where recycling is particularly challenging, such as hygiene, home textiles and automotive applications.

Trevira also introduced a new range of bicomponent fibres based on PLA and PBS (polybutylene succinate). Both biopolymers offer an exceptional technological opportunity in terms of environmental care and sustainability, while delivering optimum performance. Like PLA, PBS is recyclable and up to 100% biodegradable under industrial conditions.

Wellman International meanwhile offers an extensive range of 100% recycled, accredited PET fibres under the Deja brand platform, while polyolefin producers FiberVisions, ES-Fibervisions and spunmelt leader Avgol, have partnered with UK-based Polymateria to commercially harness its biotransformation technology. This patented technology alters the properties of polyolefins to make them biodegradable



Hygiene Fibers Group of Indorama Ventures (IVL) showcased solutions for nonwovens.

in a natural process. Other polyolefin innovations include biosurfactant and biocolourant developments from Avgol, while FiberVisions is progressing sustainable design solutions, including lightweight, high performance, reduced carbon solutions.

Converting to sustainability

Converting technology specialist W+D BICMA Hygiene Solutions was at INDEX with its latest solutions aimed at meeting the rising demand for more sustainable solutions in hygiene product packaging.

“Developing green, sustainable solutions is an urgent must for all of us in the industry and we at W+D BICMA Hygiene Solutions not only take this task very seriously, but deliver answers to these urging questions,” Marc Wolpers, W+D vice president, Sales & Market Development, Hygiene Solutions, said at the show. “Hygiene products are still mostly single-use disposable products and as such do not have a good ecological footprint. Therefore, the pressure on such products is even higher to be at least ecologically acceptable with regard to plastic waste, waste in general, and CO₂ balance. Reducing waste and avoiding plastic and other fuel-based raw materials is essential.”

Wolpers also highlighted how it was necessary to consider the entire supply chain and the overall life-cycle of the product. Home-composting biodegradability of the entire product and all its packaging materials (bag/carton and single-wrap material) would be the best solution, he said, while industrial biodegradability or recyclability remain the second-best choice.

Importantly, Wolpers also noted that as well as the ecological aspect, the increasing insecurity of the availability of traditional raw materials in the global market is also a key trigger for the industry to source new alternatives, which are renewable and easier to access. For manufacturers with multiple production lines, W+D BICMA Hygiene Solutions says the choice is straightforward; they may convert one line to the new product concept and keep the other ones for the old style. In the event of only one production line, however, it is more challenging as the old and the new concepts need to be integrated.

“W+D BICMA Hygiene Solutions is an expert in finding smart solutions for such machine upgrades and the interest of our customers is quite high,” Wolpers added. “With Green Manta, the previous PE individual packaging of a sanitary napkin or a light incontinence product is replaced by a neat, flat paper bag, similar to an envelope, to avoid plastic.”

The new Green Manta module brings together W+D’s Mail Solutions and BICMA’s Hygiene Solutions’ technology to create an environmentally friendly and efficient individual wrapping made of paper. “The environmental benefit of Green Manta is high; for a sanitary napkin, the new concept saves about 25 million square metres of plastic film in the course of one year – corresponding to an area of almost 3,500 soccer fields,” Wolpers said, adding that this type of packaging is suitable for panty shields, sanitary napkins, and products for light incontinence.

W+D BICMA offers this concept for its own production lines, and as retrofits for existing machines of all brands.

Medtecs debuts medical equipment

Medtecs, the Taiwanese provider of PPE and hospital services, made its debut at the show with its range of solutions for daily protection needs in the current and post-pandemic era.

The company says it has long been committed to expanding its market share overseas and now has facilities and offices established throughout North America, Europe, and Southeast Asia for the supply of surgical face masks, isolation gowns, coveralls, fly jackets, medical face masks, and anti-viral sprays. It has also been committed to relieving worldwide shortage of medical supplies during challenging times and in 2020, optimized its production process and delivery service, expanding its production, logistics, and warehousing capabilities to the key US market.

The company’s philosophy of ‘safeguarding every tomorrow’ is incorporated into its three main product lines of medical protective equipment, all of which were on show during INDEX 20. These included: CoverU series, surgical/ medical face masks, and Medtecs Shield collections.

Product showcase highlights included:

- CoverU disposable coverall (with/without tape)
- CoverU disposable coveralls are made with PPSB and air-permeable PE for breathability and water resistance, which effectively shield healthcare workers from contact with contagious body fluids. This product passed synthetic blood permeability test and has been certified for Cat. III Type 6(B) in the EU and ASTM F1670



Converting technology specialist W+D BICMA Hygiene Solutions was at INDEX with its latest solutions.

Medtecs displayed its range of solutions for daily protection needs in the current and post-pandemic era.



High-end components for complex applications

Reifenhauser Enka Tecnica exhibited its wide range of replacement components for spunbond, meltblown, and composite lines, high-end technology, which is designed to be 100% compatible with all globally installed lines.

Producers of nonwovens worldwide install Enka Tecnica components to manufacture products for complex applications in hygiene, medical or filtration to provide them with access to new profitable markets. Visitors to the booth were able to gain insight into the entire range of products, from meltblown and spunbond spinnerets to meltblown cassettes and complete meltblown spinning beams designed with an energy concept optimized for sustainability.

As Wilfried Schiffer, managing director of Reifenhauser Enka Tecnica notes, the quality of die tips and capillaries assures consistent product quality and precision,)

- and ASTM F1671 in the U.S.
- CoverU fly jacket (for adults/children)
- CoverU fly jackets are made with four layers of nonwoven SMMS, and have passed Level 1 certification of AAMI, capable of blocking fluids, suspended solids, and dust in the air. CoverU fly jacket features a half-body design, equipped with a transparent face shield to provide total upper body

- protection. Compared to a coverall, the fly jacket is easier to put on and take off, making it a more accessible protective gear for the general public.
- Surgical/ medical face mask. Medtecs' surgical and medical face masks are dual-certified for ASTM Level 1 in the U.S. and EN14683 Type IIR in Europe with a bacterial filtration efficiency (BFE) of 99%.

Unique spunbond technology

The UK's Fibre Extrusion Technology (FET) introduced its new lab-scale spunbond system at INDEX 20.

Complementing the company's successful meltblown technology, the new spunbond range provides unprecedented opportunities for the scaled development of new nonwoven fabrics based on a wide range of fibres and polymers, including bicomponents.

The market availability of this new technology is particularly timely, given the industry's current preoccupation with the development of new substrates based on biopolymers, sustainable resins or recycled fibres. FET has already supplied one of these new spunbond lines to University of Leeds in the UK, and a second, in combination with a meltblown line, to the University of Erlangen-Nuremberg in Germany.

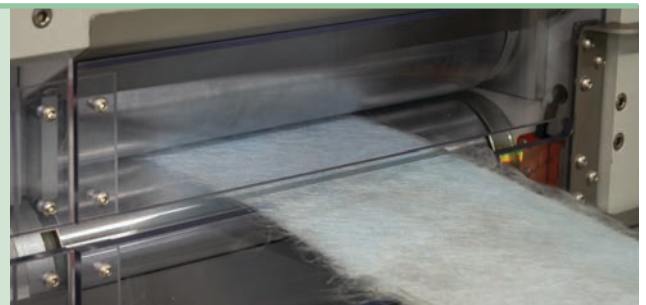
"Our new spunbond technology is unique in providing the ability to process a wide range of polymers, including those normally not considered appropriate for the spunbond process, at the scale required to fully explore material combinations and bring new products to market," said FET managing director Richard Slack. "FET has built on its melt spinning expertise to develop a true laboratory scale spunbond system."

Steve Russell, Professor of Textile Materials and Technology at University of Leeds, agreed. "Our new spunbond line from FET forms part of a wider investment in facilities to support fundamental, academic research on future manufacturing, where the focus is on studying the small-scale processing of unconventional polymers and additive mixes to form spunbond fabrics with multifunctional properties," he said. "Key to this research is developing the underlying process-structure-performance relationships, based on the measured data, to provide a detailed understanding of how final fabric performance can be controlled during processing."

Many exciting materials developed in academic research struggle to progress beyond the bench as a result of compatibility issues with key manufacturing processes such as spunbond, he added.

"By leveraging mono, core-sheath and island-in-the-sea bicomponent technology, the Leeds team is working with polymer and biomaterial research scientists, engineers and clinicians to explore the incorporation of unusual materials in spunbond fabrics, potentially widening applications," Russell said. "The new spunbond system is perfectly suited to our academic research work, and is already proving itself to be extremely versatile and intuitive to use."

"We look forward to discussing the possibilities of this versatile new system with interested parties at INDEX in Geneva," Richard Slack concluded. "It is capable of processing pure polymer with no requirement for processing aids or additives, to obtain a wide range of structural and mechanical properties, and there are numerous options for the post-processing of the webs."



Reifenhauser Enka Tecnica exhibited its wide range of replacement components for spunbond, meltblown, and composite lines, high-end technology.



allowing producers to meet their tolerance specifications reliably and avoid scrap at the same time.

“We manufacture all components precisely to customer specifications to guarantee their seamless integration into existing line technologies,” Schiffer explained. “Our components help producers to increase both product quality and profit on their lines. It doesn’t always have to be a new component either - a refresh can often be the more economically feasible and sustainable choice.”

With its refresh service for refurbishing used components, Enka Tecnica says that as well as a cost-efficient alternative to new parts, its also offers extremely fast delivery times, a factor that is often decisive to maintain daily production targets. Visitors to Geneva were able to see the quality of refresh components displayed at the booth - a meltblown

and a spunbond spinneret, half of which has been refurbished. They were able to see the condition of the capillary holes before and after the refresh through a microscope.

A further highlight included jet strips for hydroentangling nonwovens. Depending on the application, they are offered in Smart, Advanced, and Premium versions and have a special unique selling point – the strips are fully hardened, whereas competitor products usually only have a hardened surface, the company says. This quality advantage results in significantly longer service lives, which is why they are also known on the market as “The World’s Hardest Strips”.

Successful show for Dilo

As the show closed, DiloGroup thanked all its customers and interested parties for visiting the Dilo booth in Geneva.

“Despite the existing worldwide Covid, we were able to welcome a great number of well-known faces as well as meet new contacts, among them the most important nonwovens producers from across the world in all application areas: hygiene and lightweight nonwovens, technical textiles and needled nonwovens including geotextiles, filter media and automotive,” Dilo said. “The interest in using resource saving plant engineering, energy saving and the processing of natural fibres remains.”

Dilo presented its latest developments for industry 4.0. This included systematic plant monitoring and analysis of machine data equipment, which allows simplified operation and more effective production. This smart system was illustrated with the aid of live analysis of the performance, quality and availability parameters of the production lines at the company’s Textile Research Centre.

“The new Hyperpunch Alpha, HyperTex and 3D-Lofter production systems were also showcased with the aid of videos which led to a very positive response from the many different producers that are interested in running trials at the Dilo Textile Research Centre to further explore these subjects,” Dilo added. “These highlights and further new developments were the basis for fruitful technical discussions.” **SNW**



As the show closed, DiloGroup thanked all its customers and interested parties for visiting the Dilo booth in Geneva.



Jessica Franken, INDA's director of government affairs, outlined an explosion of anti-plastics bills now arising in the USA at both federal and state level.

Pressure on plastics

The agenda at INDA's RISE 2021 virtual conference was pretty much dictated by the current pressure on plastics, in any shape or form reports consulting editor **Adrian Wilson**

Material science developments for sustainable products and increasing circularity were inevitably key themes at the RISE – Research, Innovation & Science for Engineered Fabrics – conference, organised by INDA which took place from September 28-30th.

Government and NGO challenges to the single-use plastic and absorbent hygiene products markets were also discussed in detail.

Proposed bills

Following the European Union's Single-Use Plastics Directive (SUPD), which came into effect in its initial phase earlier in 2021, Jessica Franken, INDA's director of government affairs, outlined the explosion of bills at both federal and

state level that are now arising in the USA, proposing various broad-based actions against plastics and including calls for, among other things, bans, Extended Producer Responsibility (EPR) and recycled content specifications.

"It is not just the plastics-consuming industries these bills are taking aim at, they are looking to regulate and limit a broader class of materials," Franken said. "This is a fast-moving issue and it's

“ Legislation against plastics is a fast-moving issue and it's moving in a lot of directions at once and evolving on a daily basis in the USA. ”

Jessica Franken, INDA

moving in a lot of directions at once and evolving on a daily basis. The EU's SUPD has been a good thing for North America in providing guidance."

Several federal-level bills in preparation include the Save our Seas, Recycle, and Recover acts.

The Clean Future Act, introduced in February, is a sweeping 900-page document that includes proposals for halting new permits for the production of plastics and also calls for specific labelling on non-flushable wipes.

The Break Free from Plastics bill is equally extensive, proposing EPR be imposed on paper, packaging and single-use wipes manufacturers, in addition to a standardised labelling system which would require a total overhaul of the USA's solid waste infrastructure. »

Franken said the likelihood of these bills going through was slight, given the US government's current priorities taking precedence – not least its \$3.5 trillion infrastructure regeneration package.

State level

The real action, she added, is at state level, since federal initiatives move much more slowly. The California Circular Economy and Plastic Pollution Act would originally have implicated all single-use plastics but has now been narrowed down to food serviceware and packaging. It has not yet been enacted but has significant majority support, as does the Calrecycle programme aimed at increasing the content of renewable, recyclable and compostable content in products.

In Maine, meanwhile, EPR on the paper and packaging industries – with some exceptions – has been passed into law and a similar bill is going through in Oregon.

While not including nonwovens, Franken said such broad-based bills will create ripple effects across many supply chains and many other states are now considering similar action.

Methanolysis

Parts of the nonwovens supply chain are moving fast in response to these

pressures, and in a major development at the start of 2021, Eastman Chemical announced plans to build one of the world's largest plastic-to-plastic molecular recycling facilities at its site in Kingsport, Tennessee, with completion expected in 2022.

Through the methanolysis process, it will convert over 100,000 metric tons of plastic waste that cannot be recycled by current mechanical methods annually into new speciality plastics.

Jon Woods, Eastman's general manager for textiles and nonwovens said the company is investing approximately \$250 million in the Kingsport methanolysis facility, which will produce premium, high-quality speciality plastics made with recycled content.

Eastman's process of using plastic waste as the main feedstock is a true

material-to-material solution and will not only reduce the company's use of fossil feedstocks, but also reduce its greenhouse gas emissions by 20-30% relative to fossil feedstocks.

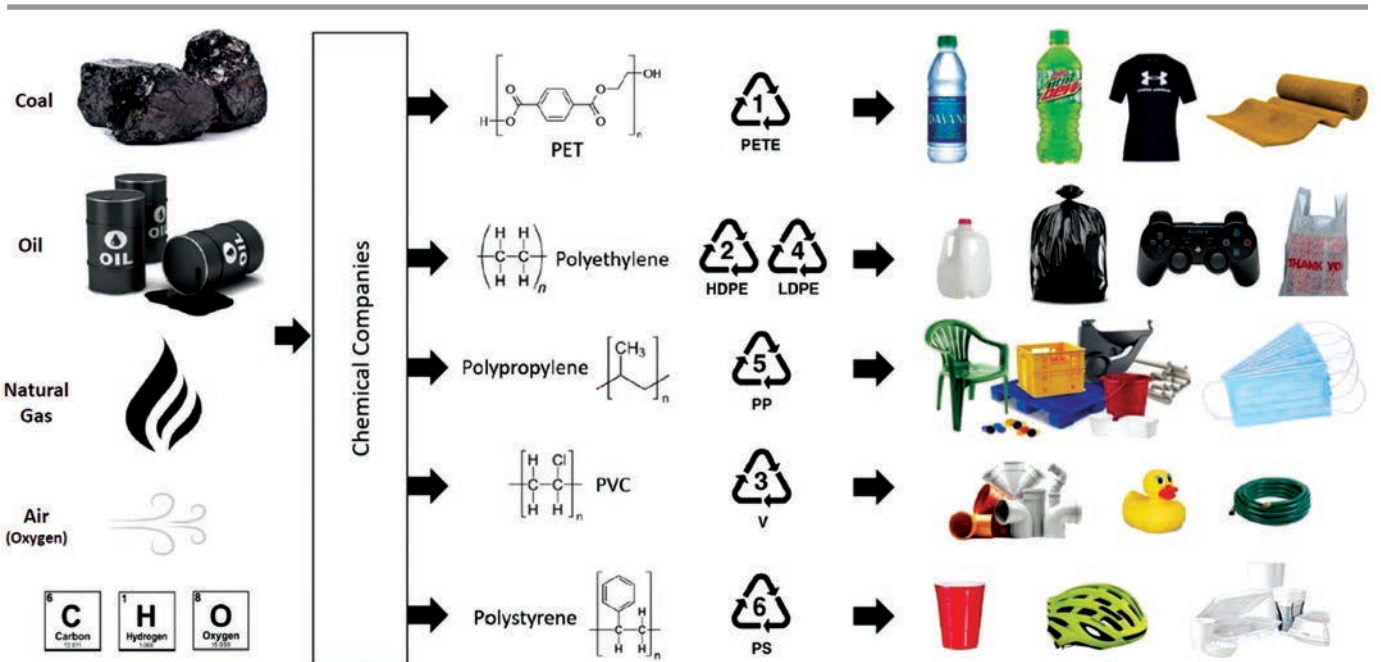
Eastman has pioneered methanolysis technology at commercial scale and has more than three decades of expertise in this recycling process. PET polyester renewal is an especially impactful solution, as low-quality polyester waste that cannot be mechanically recycled and would typically be diverted to landfills, incineration or end up in the environment, can instead be recycled into high-quality polyesters suitable for use in a variety of end-use applications.

Combination

A combination of both mechanical and molecular recycling will be required to deal with the world's plastic waste problem, Woods said. Mechanical recycling has its limitations in requiring a pure input stream, typically single polymer products, but molecular recycling is about taking products back to their molecular building blocks to be reassembled into new products, with the potential to enable infinite value to be created.

The Kingsport plant will be completed by the end of 2022 and is a major part of

“Mechanical recycling has its limitations in requiring a pure input stream, typically single polymer products, but molecular recycling is about taking products back to their molecular building blocks.”
Jon Woods, Eastman



Plastics are largely made from carbon, hydrogen and oxygen. Eastman's methanolysis catalytic process employs high-temperature and high-pressure methanol to decompose PET back to its monomers for reuse.

“The umbrella term ‘green products’ that consumers are increasingly calling for can now mean a lot of different things.”

*Jeff Duggan,
Fiber Innovation Technology*

a comprehensive plan by the company to recycle more than 250,000 tons of plastic waste annually by 2030 via molecular recycling technologies. The company has committed to recycling more than 125,000 tons by 2025 and now has an agreement with Procter & Gamble to further accelerate the transformation of plastic packaging and collaborate on circular recycling solutions.

Biopolymers

Jeff Duggan, vice-president of research for Fiber Innovation Technology (FIT) based in Johnson City, Tennessee, provided a useful overview of the biopolymers available for nonwovens manufacturers and their somewhat confusing range of differing properties.

FIT has been involved in the development of biopolymers since it first worked on processing PLA over 20 years ago and since then, interest has risen to an unprecedented level.

The umbrella term ‘green products’ that consumers are increasingly calling for can now mean a lot of different things Duggan said. It could, for instance, be in response to the need to reduce carbon footprint, or an attempt to avoid the landfilling or incineration of products at end of life. It could equally be in reaction to the issue of microplastics, marine plastics accumulation, malignant materials in the environment, the depletion of limited resources or resource security, and even social equitability.

Repercussions

Seeking to address any one of these issues often causes repercussions elsewhere, Duggan said, and the highest expectation for a single product needs to be identified from the outset.

He added that biopolymers seem ideal

in being biodegradable and made from plants, but in the real world the crops are grown with hazardous chemicals and fossil fuels are burned in growing the plants and producing the polymers, so ‘zero carbon footprint’ can never be truly claimed.

The carbon in a product itself may come close to zero, however, and cradle-to-cradle analysis reveals biopolymer products have lower carbon footprints than oil-based products. The circularity potential of the biodegradable biopolymers is often seen as ideal.

Durable biopolymers, however, are not biodegradable so could still end up in landfill or the oceans.

Duggan split the available fibres for nonwovens into four basic categories:

- Legacy polymers made from oil and not biodegradable.
- Polymers made from oil that are biodegradable.
- Biodegradable biopolymers made from biological sources.
- Biobased polymers that are not biodegradable.

Bio-PET

He noted that Coca Cola’s Plant Bottle is now being produced in greater volumes for drinks bottles and has transitioned from being initially around 20% bio-based to recently being 100% bio-based.

It has a melting temperature of 255°C but is expensive and available in only limited quantities. It is unlikely to become more readily available given Coca Cola’s intention to produce 100% of its bottles with bio-PET.

Duggan said that in the longer term, bio-PET could in any case be displaced by PEF (polyethylene furanoate) which is 100% biobased with a melt temperature of 230°C.

Its key advantage in the production of bottles is its improved vapour barrier – which is not a useful property in nonwovens production – and Coca Cola is also investing heavily in its development.

PEF can be produced in existing PET plants, just by changing the feedstock, and it can be recycled in existing PET streams, so no new infrastructure is required for its adoption. The initial process for its production was expensive

but this has been remedied by a new processing method developed at ETH Zurich in Switzerland.

Duggan said that while initial capacity will be for bottles, its use in nonwovens and textiles is likely as capacity expands.

Nodax

Duggan’s list included PHA, and Danimer Scientific’s director of materials technology Michael Mang, explained that the company’s Nodax PHA is a bio-based and biodegradable aliphatic polyester made by the bacterial fermentation of renewable biomass, such as vegetable oils, sugars etc.

It shows rapid biodegradation under both aerobic and anaerobic conditions and has polyolefin-like thermo-mechanical properties in terms of strength, flexibility, ductility, toughness and elasticity, and polyester-like physical properties in terms of compatibility with additives and other fibres in polymer blends

Nodax has a copolymer medium-chain-length branched structure for enhanced performance, including a lower melting temperature than other PHAs, minimised thermal degradation, good melt viscosity and easy control in extrusion processing.

By changing the comonomer content of Nodax, properties can be adjusted for specific applications – from very soft films to hard utensils and bottles.

Properly compounded Nodax resins can be spun into fibres in a manner very similar to polypropylene, to make totally bio and marine degradable nonwoven products.

Continuous development with undisclosed key partners in this respect are currently in progress, Mang said.

Competitive

Nodax can be produced within a price range which is competitive with petroleum-based plastics, thanks to the judicious choice of cheap, efficient and locally available carbon sources such as vegetable oil from winter canola, the discovery of a high yield microorganism and the ongoing advancement of bacterial fermentation technology.

In March 2021, Danimer Scientific announced plans to double the anticipated annual capacity of its new greenfield Nodax plant which only]

became operational at the start of 2020, from 125 million to 250 million finished pounds – and based on current demand still expects that all capacity will be completely sold out.

The expansion will come online in two phases, with an initial three fermenters expected to be operational in mid-2023 and a second three in early 2024.

Danimer reported sales up 46% to \$47.3 million in 2020, driven by stronger demand and additional PHA production capacity at the Winchester plant.

Nodax PHA was initially developed at Procter & Gamble and has many advantages as a new plastic, and not least for nonwoven products.

Machine learning

Kimberly-Clark Corporation has been employing machine learning (ML) to rapidly develop polymer formulations from PHAs that will be suitable for conventional spunmelt nonwoven processes.

Bryan Haynes, K-C's technical director for global nonwovens, explained that the corporation is working with Matmerize, a start-up from the Ramprasad Group at Georgia Tech, and RWDC Industries.

Matmerize has developed a software programme called Polymrise for the accelerated development of polymers and formulations powered by ML, with the aim of putting an end to expensive trial and error material development cycles.

K-C announced a partnership with biotech company RWDC Industries, based in Athens, Georgia, in June this year, to advance sustainable technology for consumer products, specifically using Solon – RWDC's PHA source material.

"The nonwovens industry needs solutions that can scale to existing nonwovens manufacturing processes and it's impossible to run fibres with regenerated cellulose dope on existing nonwoven machines," Haynes said. "The nonwovens industry has been tuned for using polypropylene over decades of manufacturing experience.

With the Matmerize Polymrise programme, K-C started with a candidate list of polymers and used Polymrise to select the best experiments in order to run tests on a much smaller list.

Polymrise can predict a range of polymer properties using dozens of

“The nonwovens industry needs solutions that can scale to existing manufacturing and has been tuned for using polypropylene over decades of manufacturing experience.”

Bryan Haynes, Kimberly-Clark

available stock models. This allowed K-C to easily build custom property prediction models for polymers and formulations using its proprietary data, including existing machine process parameter inputs such as operating temperature, pressure, etc., as well as polymer formulation data.

The system screened over 20,000 polymer formulations using trained ML models and determined which polymer formulation parameters did not impact the target performance variable by further exploring 2,421 formulations.

It then identified 18 new polymer formulations that were predicted to exceed a set performance target variable by 30% and 18,671 new formulations were tested by controlling certain aspects of the overall polymer formulation.

Canopy Respirator

In other areas of research and development, PPE naturally continues to be a major driver, and Canopy, based in Katonah, New York, claimed the Innovation Award at RISE 2021 for its Canopy Respirator.

The company was formed in direct response to the facemask shortages of

2020 by Joe Rosenberg, who assembled a disparate team of experts from different fields to work on eliminating the discomfort, cost and waste associated with N95 respirators.

The resulting Canopy Respirator is very different to existing products.

Its patented core combines a high-performance filter and lens in an interchangeable cartridge, fitting nearly three times the surface area of a disposable N95 media into a transparent, no-fog, scratch-resistant lens. Designed for durability, protection and breathability, the core provides considerably more space to breathe without requiring impractical UV-C or Bluetooth assistance.

Biocompatibility

Its two-sizes-fit-all, form-fitting seal is made from platinum-cured silicone and has undergone extensive biocompatibility testing to ensure it doesn't irritate the skin – even after a twelve-hour shift. Specially-designed wings and an under-the-chin design maintain an air-tight seal, allowing the wearer to smile fully.

The straps have been designed to address top clinician complaints. A splash-guard shields the core from direct exposure to fluids, while cantilevered silicone tubes do not touch the face, leaving space for eyewear instead of causing skin abrasions.

Canopy is a 100% thermoplastic product based entirely on mechanical filtration with no electrostatic requirement, and is constructed from feather-light yet ultra-strength materials that are simple to wipe down with common disinfectants.

Canopy, based in Katonah, New York, claimed the Innovation Award at RISE for its Canopy Respirator.





“Our respirator has been tested for 480 hours of use and showed no degradation in that time,” Rosenberg said. “In clinical settings, electrostatically-charged masks can degrade and when they need to be cleaned, half of the filtration effect can disappear.”

Closed-loop facemasks

Peter Dziezok, head of Procter & Gamble’s head of open innovation in Germany, provided further details of its circular economy pilot project with the Fraunhofer Institute UMSICHT in Germany and SABIC, to demonstrate the feasibility of the closed-loop recycling of single-use facemasks.

With the Covid-19 pandemic, the use of billions of disposable facemasks has raised environmental concerns especially when they are discarded in public spaces.

Apart from the challenge of dealing with such huge volumes of essential



Nonwovens production at P&G’s innovation line at in Cincinnati as part of the recent closed-loop recycling of single-use facemasks project.

personal healthcare items, simply throwing the used masks away for disposal on landfill sites or in incineration plants represents a loss of valuable feedstock for new material.

As part of the pilot project, P&G collected used facemasks worn by employees or given to visitors at its manufacturing and research sites in Germany. To help demonstrate a potential step change, special collection bins were set up, and the collected used masks were sent to Fraunhofer for further processing in a dedicated research pyrolysis plant.

The masks were first automatically shredded and then thermochemically converted to pyrolysis oil. Pyrolysis breaks the plastic down into molecular fragments under pressure and heat, which will also destroy any residual pollutants or pathogens. Using this method it is possible to produce

feedstock for new plastics in virgin quality that can also meet the requirements for medical products.

The pyrolysis oil was then sent to SABIC in Germany to be used as feedstock for the production of new PP resin. The resins were produced using the widely recognised principle of mass balance to combine the alternative feedstock with fossil-based feedstock in the production process. Mass balance is considered a crucial bridge between today’s large scale linear economy and the more sustainable circular economy of the future, which today is operated on a smaller scale but is expected to grow quickly.

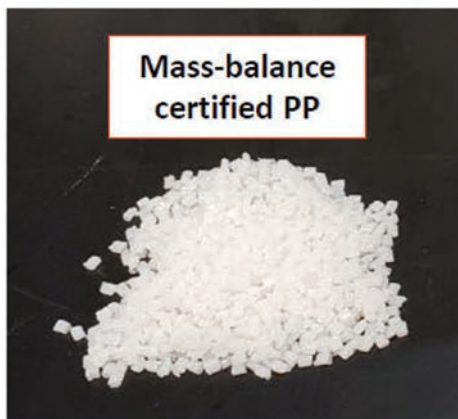
To close the loop, the PP polymer was supplied to P&G in Cincinnati, where it was processed into nonwovens fibres.

Further work is needed but the results so far have been very encouraging, Dziezok said. **SNW**

Pyrolysis oil is replacing Naphtha at SABIC’s cracker in Geleen, Netherlands.



TRUCIRCLE™ PORTFOLIO



In
conversation
with...

Kelheim Fibres

SNW talks to Matthew North, Commercial Director at Kelheim Fibres.

Sustainable Nonwovens: Please could you tell us a little about the activities of Kelheim Fibres?

Matthew North: Kelheim Fibres has long been recognized as a leading manufacturer of specialty viscose fibres. We have been in existence for more than 85 years and currently produce about 90,000 tonnes of viscose fibres per year.

Our fibres are used worldwide in nonwovens, textiles, speciality papers and technical applications. Over the last 40 years, we have made a name for ourselves in the hygiene sector with various speciality fibres, not least with our Galaxy, which is the world market leader in tampon fibres.

But we have also been able to deliver successful fibre innovations in other areas time and again. Our declared goal is to offer tailor-made solutions that enable a healthy lifestyle while preserving the environment for future generations.

This includes developing fibres that can replace synthetic fibres in various applications while offering the same performance, especially for single-use products. At the same time, we are working on sustainable reusable solutions that are a real and powerful alternative to single use products. And finally, we are working on the use of alternative and more resource-efficient raw materials.

SNW: How has Kelheim reacted to the growing demand for a more sustainable nonwoven industry?

MN: Sustainability has been a key issue for us for many years. Textile consumers have been aware of the often-negative effects of the textile industry for some time now and calls for change have been getting progressively louder.

In contrast to textiles, topics like



Matthew North, Commercial Director at Kelheim Fibres.

feminine hygiene or adult incontinence are unfortunately still often seen as taboo. In my view, this is the reason that for a long time there was also no talk about the huge amounts of waste and other negative environmental impacts that hygiene products - and especially those intended for convenient single use - cause.

But now, environmental problems such as the pollution of our oceans with plastic have simply become so pressing that no one can bury their head in the sand any longer.

Our viscose fibres offer the ideal prerequisites for environmentally friendly solutions in this area; they are made from the renewable raw material wood, are completely biodegradable and are manufactured in an environmentally friendly process in Germany, where the strictest environmental regulations apply.

Environmental protection has always been a central issue for us – and we have further expanded our efforts in this area in recent years. Excellent scores in various sustainability ratings such as the Canopy Hot Button Report or the EcoVadis CSR Rating confirm the success of the measures we have implemented. Finally, at the beginning of 2021 we became the first viscose fibre manufacturer

worldwide to be validated according to the strict Eco-Management and Audit Scheme of the European Union (EMAS).

SNW: Kelheim recently announced a long-term commercial collaboration with Renewcell to add a crucial missing link for the circular economy. Can you tell our readers a little bit of the background to this partnership?

MN: With the renewable raw material wood, we already have an environmentally sound, renewable input for our fibres. However, a recycled raw material is of course even more resource-efficient than one that is renewable. Therefore, we have been looking for a partner for several years who can supply us with such a raw material in sufficient quantity and reliable quality to ensure large-scale production in the long term.

In Renewcell we have now found the right partner. Not only do the pure facts and figures fit - the Renewcell team is highly professional, sharing our passion for seeking innovative solutions to the challenges of our time.

SNW: What are the major benefits that Kelheim, and therefore your customers, will hope to see from this collaboration?

MN: Based on the information currently available, we expect viscose fibres made from recycled textiles will have a lower carbon footprint than viscose fibres made from virgin wood. This is an advantage for all (end) customers who want to contribute to the protection of our climate and our environment as a whole with their personal consumption. At the same time, these customers do not have to sacrifice performance, because we will remain true to our

quality standards, which have made us a valued partner in the industry for more than 85 years.

Another advantage: the ongoing pandemic and its side-effects have highlighted the vulnerabilities of our globally connected economy and put the focus on more regional and more reliable supply chains. Our collaboration with Renewcell paves the way towards a fully European closed loop in which textile waste is collected, recycled, and regenerated into new fibres.

SNW: Kelheim also recently signed up to the ZDHC programme, 'Roadmap to Zero'. Can you explain Kelheim's thinking behind this commitment?

MN: Our status as a contributor to ZDHC is another building block on our road to even more sustainable fibre production. The ZDHC guidelines provide producers of Man-made Cellulosic Fibres (MMCF) with uniform criteria for measuring indicators such as wastewater, air emissions and other process-related parameters.

ZDHC gives us access to a range of best practices in chemical management and gives us the opportunity to network and learn from each other with like-minded industry partners. At the same time, we can bring in our own know-how and actively contribute to shaping a greener future for our industry.

SNW: Earlier this year, the European Commission confirmed that viscose-based fibre products have been determined to not be chemically modified and therefore are not included in the Single-Use Plastics Directive. What does this mean for Kelheim and for the bio-based fibre sector in general? In particular, does the sector have to do more to explain to consumers that biodegradable hygiene products are the equal of their synthetic counterparts in terms of performance?

MN: For Kelheim and for all producers of viscose fibres, the EC decision – which is not just a political decision but based on scientifically proven facts - is an important milestone.

Thanks to their natural properties (e.g.

absorbency, softness, skin-friendliness), viscose fibres have played an essential role in the hygiene sector for many years. Nevertheless, most hygiene products - and these are often single-use products - still contain synthetic fibres.

The crux of the matter is precisely the performance of the product. Consumers want an environmentally friendly alternative but will only buy it if the performance is at least comparable to that of the synthetic product. Especially in such a sensitive area as hygiene, this is crucial.

In contrast to natural fibres, which are available already in fibre form and can only be treated on the surface, we can engineer the properties of our fibres depending on the application they are intended for by specifically intervening in the production process.

In this way, we achieve performance values that are on a par with those of synthetic alternatives. One example is our AHP project, which has already received a lot of recognition this year and was nominated for the German Sustainability Award.

As part of this project, we customised different viscose special fibres for the various layers of a sanitary napkin. Here, each layer has to fulfil a specific task - quickly wicking fluid away from the skin or permanently storing fluid – and accordingly, the fibres have to be designed differently to fulfil this task.

The combination of nature and performance is necessary to convince customers in the long-term. With innovative fibres that enable sustainable product solutions we make it easy for end customers to choose the bio-based alternative.

SNW: The flushability of wipes is a key issue when it comes to waste prevention. What steps does Kelheim take to give its customers confidence that your fibres for biodegradable wet wipes realistically dissolve in water?

MN: Flushability has two aspects that are inextricably linked. On the one hand, the construction of the wipe must disperse so quickly in the wastewater system that no blockages occur. Our short cut fibres enable - in combination with modern production technology -

the production of wet wipes that fulfil that aspect completely.

But it is not enough just to disperse the wipes mechanically! The wipes or their components end up in the toilet, in the wastewater treatment plants and finally in our rivers and oceans. And this is the second aspect; flushable wipes must also be fully biodegradable, otherwise the environment becomes polluted with plastics and microplastics. Unfortunately, this aspect is often forgotten.

We have been working on flushability for 15 years, long before there were any binding guidelines. We have done a lot of testing in our own laboratories and pilot plants, and we even undertook a real field test together with our local wastewater authority. In the meantime, there is the "Flushability Guidelines of INDA / EDANA", in line with which our VILOFT fibres allow truly flushable to be produced. Our products are successful in managing the balancing act between retaining the stability of the fabric during use and its subsequent complete dispersion.

SNW: In addition to sustainability, what, in your view, are the other key trends currently influencing the nonwovens industry?

MN: One of the most important trends in the nonwovens industry - and in other sectors - is certainly the wellbeing trend. The consumers' need for products that enhance their health and well-being has been strengthened by the pandemic.

At the same time, people want smart products that offer them additional functional benefits. Since we can functionalise our fibres during the production process, they can already lay the foundation for such an additional functional benefit in the end product.

One example for the combination of wellbeing and functionality is Celliant Viscose: thanks to the infrared technology integrated into the fibre, Celliant Viscose improves local blood circulation and oxygen supply to the cells - and thus ensures better physical performance, faster recovery, and better sleep. What is already successful in textiles today can also offer added benefits in various nonwovens application, for example in cosmetic facial masks. **SNW**

Unlocking the potential of chemical recycling

Investments in chemical recycling solutions that will ultimately benefit nonwovens production are increasing significantly.

Eastman Chemical now has an agreement with Procter & Gamble to further accelerate the transformation of plastic packaging and collaborate on circular recycling solutions.

The company plans to build one of the world's largest plastic-to-plastic molecular recycling facilities at its site in Kingsport, Tennessee, with completion expected in 2022. Through methanolysis, this world-scale facility will convert polyester waste into durable products, creating an optimized circular economy.

Eastman is investing approximately \$250 million in the facility, which will use over 100,000 metric tons of plastic waste annually that cannot be recycled by current mechanical methods to produce premium, high-quality speciality plastics made with recycled content.

Eastman's process of using plastic waste as the main feedstock is a true material-to-material solution and will not only reduce the company's use of fossil feedstocks, but also reduce its greenhouse gas emissions by 20-30% relative to fossil feedstocks.

Eastman was one of the pioneers in developing methanolysis technology at commercial scale and has more than three decades of expertise in this recycling process. Polyester renewal is an especially

impactful solution, as low-quality polyester waste that cannot be mechanically recycled and would typically be diverted to landfills, incineration or end up in the environment can instead be recycled into high-quality polyesters suitable for use in a variety of end-use applications.

"While this announcement is an important step, it is just part of the company's overall circular economy strategy," the company said, adding that Eastman is actively working on next steps forward with its circular economy initiatives including partnerships and direct investments in Europe.

The facility, which is expected to be mechanically complete by year-end 2022, will contribute to the company achieving its ambitious sustainability commitments for addressing the plastic waste crisis, which includes recycling more than 500 million pounds of plastic waste annually by 2030 via molecular recycling technologies. The company has committed to recycling more than 250 million pounds of plastic waste annually by 2025.

"Eliminating waste plastic from our environment is a complex global challenge that requires a comprehensive, collaborative approach across the entire plastics lifecycle," added vice president of R&D P Ellen Drechsler.

In addition to the packaging innovation, P&G and Eastman will collaborate on initiatives addressing the infrastructure needed to increase plastic recycling rates. These efforts will complement the current recycling streams in the United States and enable additional recycling options for consumers eager to help solve the plastic waste problem. The two companies will work to expand the collection of hard-to-recycle plastics which will be used to create new materials via Eastman's molecular recycling technologies.

"Eastman is excited to have Procter & Gamble as a partner to put molecular recycling into practice," said Scott Ballard, Eastman's division president of plastics. "Together, we can create value from waste and show the world what's possible through innovation. The value created will help drive the critical changes in our recycling infrastructure that are necessary to solve the plastic waste crisis."

Purification

With 20 years' worth of output from its plant in Ohio already pre-sold, PureCycle Technologies is now firming up plans to build a polypropylene (PP) recycling facility in South Korea, in partnership with SK Global Chemical.

PureCycle uses proprietary technology

Eastman's Kingsport facility.



to recycle waste PP into ultra-pure polypropylene resin (UPRP) for applications spanning absorbent hygiene and other consumer goods, automotive, building and construction and industrial uses. The company can process a wide range of waste polypropylene with varying levels of contamination and effectively removes contaminants, including colour and odour, to create an ultra-pure polypropylene resin. Its technology is based on a global license for the patented solvent-based purification recycling technology developed by Procter & Gamble.

“Partnering with the leading recycling waste company in South Korea is a major milestone for PureCycle,” said PureCycle CEO Mike Otworth. “We are bringing together a premier team of experts to achieve our goal of recycling one billion pounds of PP waste by 2025. The sad reality is that ninety-one per cent of plastic waste is not recycled. That is exactly why our work with SK Global Chemical will be incredibly important to reducing plastic waste and helping society view plastic as an infinitely sustainable material.

“At SK Global Chemical, we are focused on leading circular systems for plastics with top-notch technology, and that is why PureCycle is the perfect partner for us to continue this focus and amplify our goals,” added Na Kyung-soo, CEO of SK Global Chemical.

The agreement will lead to the development of solvent-based recycling operations in Asia Pacific and add to the facility locations already growing across the United States.

Construction of PureCycle’s flagship recycling facility in Ironton, Ohio, is well underway and expected to begin commercial production in the fourth quarter of 2022. In July the company announced in July the location for the first cluster facility in Augusta, Georgia. The 200-acre location in Augusta Corporate Park will create over 80 manufacturing jobs with an initial \$440 million investment to primarily fund three lines of 130 million pounds of capacity during Phase 1 of the project.

Feedstock

In Europe, Borealis has signed an agreement with Renasci Oostende Recycling to acquire the entire chemically



PureCycle uses proprietary technology to recycle waste PP into ultra-pure polypropylene resin.



Renasci plant in Oostende Belgium.

recycled feedstock output from its high-tech recycling centre in Oostende, Belgium.

With the projected 20kT output/year delivered to Borealis, this agreement will enable Borealis to become one of the leading global suppliers of chemically recycled base chemicals and polyolefins.

The portfolio of Borcycle C is a result of the transformation of plastic waste into circular high-performance products and applications. As a complement to mechanical recycling, chemical recycling has an important role to play in closing the material loop on plastics circularity. This is because plastic waste streams of lower quality can be recycled chemically into high-quality material. In fact, products manufactured with chemically recycled feedstock, offer the same performance levels as products produced with fossil-based feedstock. This allows for the production of high-end polyolefin-based applications, including healthcare and food packaging materials subject to stringent quality and safety regulations that cannot always be met using mechanically recycled materials.

The waste feedstock processed at

Renasci’s ISCC PLUS-certified recycling centre is mainly derived from dried household waste and some industrial waste. In a first step, the waste is sorted multiple times to extract the best value plastic material for mechanical recycling. The waste feedstock, which cannot be mechanically recycled, is then chemically recycled; this chemically-recycled feedstock will be subsequently processed in the Borealis steam crackers, initially at its production location in Porvoo, Finland. The Borealis Porvoo location’s recent ISCC PLUS certification – the global standard for certified recycled and bio-based materials – enables mass balance production of renewable and chemically recycled products.

“Our agreement with Renasci is a welcome complement to the OMV ReOil chemical recycling project,” said Martijn van Koten, Borealis executive vice president Base Chemicals and Operations. “Life demands progress. We notice a strong increase in demand for chemically recycled products. Borealis and OMV aim to increase supply of these more circular base chemicals and polyolefins in order to

help our customers deliver on their own sustainability targets.”

“In the true spirit of EverMinds we accelerate action to plastics circularity through collaboration,” added Lucrèce Foufopoulos, Borealis executive vice president Polyolefins, Innovation & Technology and Circular Economy Solutions. “The cooperation with Renasci allows us to offer our customers and partners virgin-like polyolefins from chemically recycled post-consumer waste in material quantities effective this quarter. This is how we re-invent for more sustainable living, and expand our portfolio with a Borcycle C offering.”

“This agreement with Borealis will enable us to completely and truly close the circular loop on plastics,” said Kristof Beuren, Renasci COO. “The challenge was to find an enclosing solution for this type of waste, and together we achieved it.”

Enzymes

A more sustainable approach for recycling PET polyester may be to use enzymes.

This is the theory of researchers from the US Department of Energy’s (DOE’s) National Renewable Energy Laboratory (NREL) and the UK’s University of Portsmouth.

They are part of a consortium called BOTTLE – Bio-Optimised Technologies to keep Thermoplastics out of Landfills and the Environment.

BOTTLE is striving to address the problem of plastic pollution via two approaches:

- To develop energy-efficient, cost-effective and scalable recycling and upcycling technologies.
- To design modern plastics to be recyclable by design.

The consortium’s new research paper addresses the challenge of plastic recyclability. While images of discarded bottles floating in oceans and other waterways provide a visual reminder of the problems posed by plastic waste, the lesser-considered issue remains what to do with the PET used to manufacture textiles for clothing and fibres for carpet.

The researchers have modelled a conceptual recycling facility that would take in a fraction of the three million metric tons of PET consumed annually in the United States.



NREL enzymatic PET recycling can achieve cost parity with the production of virgin PET.

“From all the plastics that were produced since the 1950s, less than 10% has ever been recycled. If we can capture that space – textiles, carpet fibres, and other PET waste plastics that are not currently recycled – it could be a true game-changer.”

Avantika Singh, NREL.

The enzymatic recycling process breaks down PET into its two building blocks, terephthalic acid (TPA) and ethylene glycol. Compared to conventional fossil-based production routes, the research team determined the enzymatic recycling process can reduce total supply-chain energy use by 69-83% and greenhouse gas emissions by 17-43% per kilogram of TPA. Additionally, an economy-wide comparison of virgin TPA and recycled TPA in the United States shows that the environmental and socioeconomic effects of the two processes are not distributed equally across the supply chain. The proposed recycling process can reduce environmental impacts by up to 95%, while generating up to 45% more socioeconomic benefits, including local jobs at the material recovery facilities.

The study also predicts that enzymatic PET recycling can achieve cost parity with the production of virgin PET, highlighting its potential to decarbonize PET manufacturing, in addition to enabling the recycling of waste PET-rich feedstocks, such as clothing and carpets.

The concept, if further developed and implemented at scale, could lead to new opportunities for PET recycling and create a mechanism for recycling textiles and other materials also made from PET that are not recycled today.

PET ranks among the most abundantly produced synthetic polymers in the world, with 82 million metric tons produced annually and roughly 54% of it used in the manufacture of textiles for clothing and carpet.

“From all the plastics that were produced since the 1950s, less than 10% has ever been recycled,” said Avantika Singh, a chemical engineer at NREL. “If we can capture that space – textiles, carpet fibres, and other PET waste plastics that are not currently recycled – it could be a true game-changer.”

Fabric

US biotechnology company LanzaTech has partnered with lululemon athletica, an athletic apparel company headquartered in Vancouver, Canada, to create the world’s first yarn and fabric using recycled carbon emissions that would otherwise be emitted to the atmosphere as pollution.

Illinois-based LanzaTech has developed a solution to produce ethanol from waste carbon sources and is working with partners India Glycols Limited (IGL) and Taiwan’s Far Eastern New Century (FENC) to convert the ethanol to polyester.

Recycling carbon is a fundamental element of the circular economy, which will keep fossil carbon in the ground, reducing pollution and fossil fuel usage when used to make polyester. With a lower carbon footprint, this innovation could transform lululemon’s products and the apparel industry.

“We must radically change how we source, utilise and dispose of carbon,” said LanzaTech CEO Jennifer Holmgren. “Carbon recycling enables companies like lululemon to continue to move away from virgin fossil resources, bring circularity to their products, and achieve

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LanzaTech has developed a solution to produce ethanol from waste carbon sources.



DeltaFlow viscosity modifiers are being launched by Milliken & Company.

their climate change goals around carbon reduction. We call this being carbon smart.”

“We know sustainable innovation will play a key role in the future of retail and apparel, and we are excited to be at the forefront of an innovative technology,” added Ted Dagnese, chief supply chain officer at lululemon “Our partnership with LanzaTech will help lululemon deliver on our Impact Agenda goals to make 100% of our products with sustainable materials and end-of- use solutions, moving us toward a circular ecosystem by 2030.”

In October 2020, lululemon released its first Impact Agenda, outlining its multi-year strategies to address critical social and environmental issues with 12 goals to drive progress. The partnership with LanzaTech is one of the many ways lululemon is focused on bringing new technologies to the business.

LanzaTech’s process sources carbon from different types of feedstocks, from industrial emissions to syngas from gasified agricultural or household waste (including textile waste) and atmospheric CO₂. The gas stream is fermented by LanzaTech’s special microorganisms into ethanol or other chemicals. The process is like traditional fermentation, except instead of sugars and yeast, it uses the carbon contained in waste gases and the microorganisms.

The process of capturing and recycling carbon before it is released in the atmosphere is an innovation that LanzaTech has already brought to airlines and home care companies, and now textile production.

FENC Topgreen Bio3-PET fibre made from LanzaTech’s ethanol is described as a waste-gas-based polyester with not

only the same appearance but also the same properties and functionality of virgin polyester.

Industrial emissions, such as those from a steel mill, would otherwise be combusted and emitted as GHGs and particulate emissions. By capturing these and reusing the carbon to make yarn, the finished garments not only have a lower carbon footprint but ensure community pollution levels are reduced.

If these chemicals are made into new products such as textiles, once these products reach the end of their useful life and become waste, they can be gasified and fermented by LanzaTech’s process. In this sense, the pathway promotes circularity, keeping the carbon in the material cycle.

“Since initially connecting LanzaTech’s Taiwanese joint-venture setup with a pilot plant in Taiwan, I believed this waste-gas-based polyester formation would be a sustainable solution for the polyester industry,” said Dr Fanny Liao, EVP of RD at FENC.

With expertise in synthetic biology, bioinformatics, artificial intelligence and machine learning coupled with engineering, LanzaTech has created a platform that converts waste carbon into new everyday products that would otherwise come from virgin fossil resources. LanzaTech’s first commercial scale gas fermentation plant has produced over 20 million gallons of ethanol which is the equivalent of keeping over 120,000 metric tons of CO₂ from the atmosphere. Additional plants are under construction globally.

Flow rate

In Belgium, DeltaFlow viscosity modifiers are being launched by Milliken &

Company specifically to help polypropylene (PP) recyclers.

A solid concentrate, it can be used to increase the melt flow rate of recycled PP (rPP) for the extrusion and injection moulding processes. It is supplied in free-flowing pellets, which makes the product easy to feed, safe to handle and dust free.

DeltaFlow-optimised resins allow for lower processing temperatures, which can enable converters to reduce cycle times, boost productivity and improve processability.

Brand owners stand to benefit as well, because DeltaFlow enables recycled PP to feasibly replace virgin resin in many end-use applications. This allows brands to use more rPP in their products, helping them to meet their sustainability goals.

The new concentrate complements Milliken’s existing family of DeltaMax performance modifiers for PP that enhance the physical properties and melt flow of rPP resins by allowing recyclers and converters to optimise their formulations and blends machine-side.

Milliken currently produces the DeltaFlow products in Germany in concentrations of two, five and 10% to meet varying applications and equipment requirements.

“Milliken & Company remains committed to supporting the plastics recycling industry with advanced polymer additives that allow for the increased use of recycled content by improving the properties of the recycled PP resin itself,” said Tugce Asici-van Houselt, Milliken EMEA sales manager for plastic additives. “DeltaFlow viscosity modifiers are just the latest example of this effort, which in turn, contributes to the industry’s ongoing push to promote sustainability.” **SNW**

Sustaining the fizz

A new 100% bio-PET will scale for Coca-Cola.

In a development that in the future could prove very significant for the nonwovens industry, Coca-Cola has unveiled its first-ever beverage bottle made from 100% plant-based plastic, excluding the cap and label.

It has also been made using technologies that are ready for commercial scale.

The prototype bottle comes more than a decade after the company's PlantBottle debuted as the world's first recyclable PET plastic bottle made with up to 30% plant-based material. A limited run of approximately 900 of the prototype 100% pet bottles have been produced.

"We have been working with technology partners for many years to develop the right technologies to create a bottle with 100% plant-based content – aiming for the lowest possible carbon footprint – and it's exciting that we have reached a point where these technologies exist and can be scaled by participants in the value chain," said Nancy Quan, chief technical and innovation officer AT Coca-Cola.

PET, the world's most recycled plastic, comprises two molecules – approximately 30% monoethylene glycol (MEG) and 70% terephthalic acid (PTA). The original PlantBottle, introduced in 2009, includes MEG from sugarcane, but the PTA has been from oil-based sources until now. PlantBottle packaging looks, functions and recycles like traditional PET but has a lighter footprint on the planet and its resources.

Coca-Cola's new prototype plant-based bottle is made from plant-based paraxylene (bPX) – using a new process by Virent – which has been converted to plant-based terephthalic acid (bPTA). As the first beverage packaging material resulting from bPX produced at demonstration scale, this new technology signals a step-change in the commercial viability of the biomaterial. The bPX for this bottle was produced using sugar

from corn, though the process lends itself to flexibility in feedstock.

The second breakthrough technology, which The Coca-Cola Company co-owns with Changchun Meihe Science and Technology, streamlines the bMEG production process and also allows for flexibility in feedstock, meaning more types of renewable materials can be used. Typically, bMEG is produced by converting sugarcane or corn into bioethanol as an intermediate, which is subsequently converted to bioethylene glycol. Now, sugar sources can directly produce MEG, resulting in a simpler process.

UPM, the technology's first licensee, is currently building a full-scale commercial facility in Germany to convert certified, sustainably sourced hardwood feedstock taken from sawmill and other wood industry side-streams to bMEG. This marks a significant milestone toward the commercialization of the technology.

"The inherent challenge with going through bioethanol is that you are competing with fuel," said Dana Breed, global R&D director at Coca-Cola. "We needed a next-generation MEG solution that addressed this challenge, but also one that could use second generation feedstock like forestry waste or agricultural byproducts. Our goal for plant-based PET is to use surplus agricultural products to minimise carbon footprint, so the combination of technologies brought by the partners for commercialization is an ideal fit with this strategy."

In 2015, Coca-Cola unveiled its first prototype for a 100% bio-based PlantBottle at the Milan Expo using lab-scale production methods to produce bPX. This next-generation 100% plant-based bottle, however, has been made using new technologies to produce both biochemicals that make the bottle and are ready for commercial scaling.

"Our goal is to develop sustainable solutions for the entire industry,"



A limited run of approximately 900 of the prototype 100% pet bottles have been produced.

Breed said. "We want other companies to join us and move forward, collectively. We don't see renewable or recycled content as areas where we want competitive advantage."

Since introducing PlantBottle, Coca-Cola has allowed non-competitive companies to use the technology and brand in their products – from Heinz Ketchup to the fabric interior in Ford Fusion hybrid cars. In 2018, the company opened up the PlantBottle IP more broadly to competitors in the beverage industry to scale up demand and drive down pricing.

In Europe and Japan, Coca-Cola, with its bottling partners, aims to eliminate the use of oil-based virgin PET from plastic bottles altogether by 2030, using only recycled or renewable materials. While the majority of plastic packaging material will come from mechanically recycled content, some "virgin" material will still be needed to maintain quality standards. Coca-Cola is investing in and driving innovation to boost the supply of feedstock from renewable technologies as well as from enhanced recycling technologies. Enhanced recycling "upcycles" previously used PET plastics of any quality to high quality, food grade PET. **SNW**

Decarbonising the fashion industry

Melt-spinning trials at NIRI are playing a key role in a renewable textiles project.

The Nonwovens Innovation and Research Institute (NIRI) has announced it is working with the UK-based Fashion for Good's Renewable Carbon Textiles Project to investigate, test and validate the potential for PHA polymers to disrupt the fashion supply chain and decarbonise the sector.

While the potential benefits for fashion are evident, the melt-spinning trials at NIRI and the broader research may well have significant impact on a wide range of industries such as nonwovens.

As a bio-based, marine and soil compostable alternative to fossil-fuel derived polyester fibres, it is hoped that PHA polymers could become a game-changer for the fashion industry, given their performance characteristics – many of which will be investigated and developed over the course of the project.

Members of the consortium will, over the coming months, ship their PHA formulations to NIRI for melt-spinning trials, a challenging but critical stage of the project. As commercial melt-spinning trials have not been extensively undertaken with these PHA polymer formulations previously, the manufacturing and technical assessments to compare and evaluate polymer formulations is vital.

Validating the technical feasibility of the output will be crucial in determining how to bring the technologies to scale and NIRI's expertise, commercial focus and ongoing investment in new technology, makes them the ideal partners for this critical stage of the project – transferring technology from research to commercial feasibility.

The trials will be conducted primarily using NIRI's state of the

art filament extruder. This has the capability of delivering high specification technical filaments for functional textile materials, as well as high performance composites and medical devices, which can extrude thermoplastic polymers with melting points of up to 400°C.

Performance

In addition to processing sustainable resins, such as PHA and PLA, NIRI has the capabilities to extrude a range of polymers including resorbable, performance and engineered polymers, e.g. PHBH, PBS, PBAT, PEF, Bio-PE and Bio-PP.

These polymers are being developed for various applications including medical, hygiene, food and beverage, filtration, automotive and wipes. The extrusion facilities at NIRI are designed specifically for detailed investigation into extruded textile materials, ideal for R&D and fundamental to the successful outcome of the Renewable Carbon Textiles Project.

Once the project has reached completion in late 2022, Fashion for Good will publish their report, which could potentially reveal

valuable insights for many other sectors, including automotive, filtration, medical and food and beverage.

Commenting on NIRI's pivotal role in the project, Dr Matthew Tipper, CEO at NIRI, said: "This project is an extension of our current research into sustainability. Developing sustainable and circular processes and materials is a key aspect of our core values at NIRI. The potential for carbon emission reduction through biosynthetics, produced from renewable sources, alongside assessing the end-of-life circularity, is at the heart of the project. However, technical performance will be vital to demonstrating the value and viability of PHA in fashion and wider sectors.

He continued: "Through our combined expertise of over 300 years in textile science, our technical team are ideally placed to undertake a detailed investigation into this area of sustainability. We are confident our vast experience in the rapid development of innovative and commercially viable products and novel IP for our customers, will prove invaluable to the project's outcomes. As the findings are released to the fashion sector, we expect them to be of great interest to other industries, especially where net zero is already having a major impact."

Spun out of University of Leeds in 2005 to focus on applied research, industrial innovation and project development in nonwovens, NIRI employs more than 20 multidisciplinary personnel and has recently invested significantly in new facilities including: a textile and fibre engineering laboratory; industrial specification nonwoven plant, and comprehensive testing and analysis facilities. NIRI has successfully delivered over 450 projects for more than 200 clients, worldwide. **SNW**



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Sustainability drives spunlace

A need for more sustainable nonwovens and high demands from the hygiene industry are driving the spunlace sector.



The elevated consumption of disinfecting wipes due to COVID-19, and plastics-free demand from governments and consumers and growth in industrial wipes are creating high demand for spunlace nonwoven materials through 2026, according to new research from Smithers.

The report by veteran Smithers author Phil Mango, *The Future of Spunlace Nonwovens through 2026*, sees increasing demand for sustainable nonwovens, of which spunlace is a major contributor.

The largest end use for spunlace nonwovens by far is wipes; the pandemic-related surge in disinfecting wipes even increased this. In 2021, wipes account for 64.7% of all spunlace consumption in tonnes. The global consumption of spunlace nonwovens in 2021 is 1.6 million tonnes or 39.6 billion m², valued at US\$7.8 billion. Growth rates for 2021–26 are forecast at 9.1% (tonnes), 8.1% (m²), and 9.1% (\$), the Smithers’ study reports. The most common type of spunlace is the standard card-card spunlace, which in 2021 accounts for about 76.0% of all spunlace volume consumed.

Wipes are already the major end-use

for spunlace, and spunlace is the major nonwoven used in wipes. The global drive to reduce/eliminate plastics in wipes has spawned several new spunlace variants by 2021; this will continue to keep spunlace the dominant nonwoven for wipes through 2026. By 2026, wipes will grow its share of spunlace nonwovens consumption to 65.6%.

The report also highlights how COVID-19 has been a short-term market driver that has had its primary effect in 2020-21. Most spunlace containing disposable products either saw significant increases in demand due to COVID-19 (for example, disinfecting wipes) or at least normal to slightly higher demand (baby wipes, feminine hygiene components).

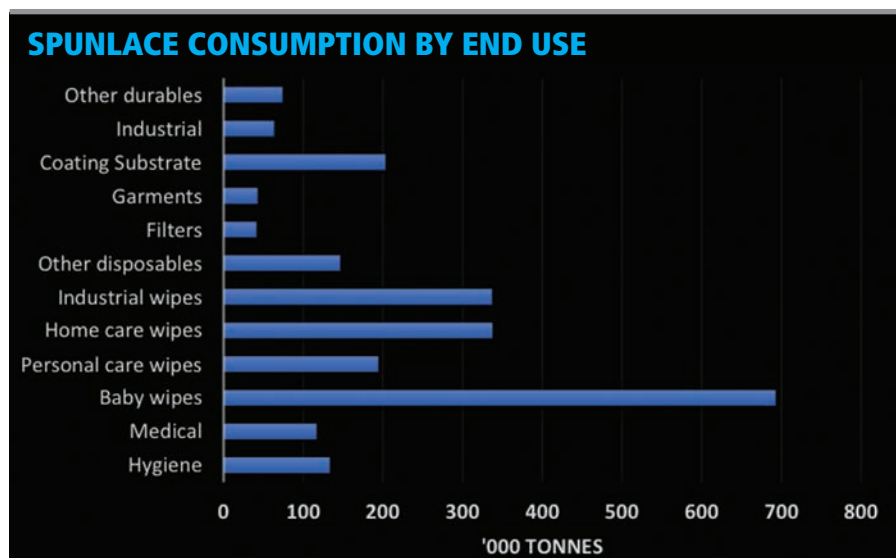
Mango further notes that 2020-21 are not stable years for spunlace. Demand is recovering from significant surges in 2020 and early 2021 to a “correction” in demand in late 2021-22, back to more historical rates. The year 2020 saw margins well above the maximum average margin of 25% for some products and regions, while late 2021 is experiencing margins near the lower end of the range as end users work off bloated inventories.

The years 2022-26 should see margins return to more normal rates.

One of the most significant drivers of the last decade is the drive to reduce/eliminate plastics in wipes and other nonwoven products. While the European Union’s single use plastics directive was the catalyst, the report highlights how the reduction of plastics in nonwovens has become a global driver, especially for spunlace. Producers are working to develop more sustainable options to replace polypropylene, especially spunbond PP in SP spunlace. Here, PLA and PHA, though both “plastics” are under evaluation. PHAs especially, being biodegradable even in marine environments, may be useful in the future. The global demand for more sustainable products will accelerate to 2026.

Multiple standards for flushable nonwovens have now been developed with the nonwoven and wastewater industries agreeing on the contents of GD4, IWGFS, Safe2Flush. The INDA/EDANA Guidance Document for Assessing the Flushability of Nonwoven Disposable Products, has become more rigorous in trying to develop testing which will accurately simulate a wipe’s behavior in various wastewater treatment systems, including septic tank systems and low lying geographical regions systems (for example, the Netherlands in Europe, New Orleans in the US). Most flushable wipes products in 2021 have undergone repeated testing and are qualified as compliant.

Flushability is not a major desire for baby wipes; they are not primarily used near a toilet and typically are disposed of with the diaper. INDA/EDANA are concerned that if some baby wipes are marketed as flushable, the consumer may flush non-flushable baby wipes. Still, plastics-free baby wipes are of interest and spunlace variants like WLS, CP wet, and HEA are all useful in this market. **SNW**



Freudenberg paves way for sustainable woundcare

WEINHEIM - Freudenberg Performance Materials has developed new prototypes using its silicone coated foam technology for wound care including a bordered dressing with a silicone adhesive border.

Freudenberg offers its healthcare customers two solutions to design sustainable wound plasters. These plasters use bio-based raw materials that allow biodegradation in an industrial composting setting after the product has been used.

M 1701 for traditional woundcare plasters comprises 100% polylactic acid derived from natural resources and offers good woundcare characteristics.

Also available is M 1714 with superior absorption for more challenging wounds, which consists of a mix of bio-based fibres derived from

natural sources and exhibits a smooth wound contact layer. The product has been evaluated for industrial compostability and conforms with ISO 13432, which facilitates the application for certificates concerning product biodegradability.

In addition, Freudenberg Performance Materials' silicone coated foams with their patent-protected technology combine the sustainable aspects with a number of improved features.

Reducing the number of process steps in wound dressing manufacture reduces production complexity, thereby avoiding waste, saving energy and simplifying the supply chain, the company says. At the same time, the solution maintains all the advantages of a pure foam dressing without a



Nonwoven fabric from 100% textile waste

HELSINKI - A collaboration between Suominen and Infinited Fiber Company has resulted in a nonwoven sheet made from 100% textile waste.

The sheet is made with Infinited Fiber Company's regenerated fibre Infinna, which is biodegradable, plastic-free fibre and made from discarded cotton-rich textiles, making it a resource-efficient alternative to the conventional materials used in single-use nonwovens, such as polyester and viscose. Suominen's President and CEO Petri Helsky said the fabric was developed through collaborative R&D efforts by Suominen and Infinited, whose shared values include sustainability and circularity. "Suominen aims to differentiate with innovation and sustainability," he said. "We see high potential in using recycled materials and are very excited to be able to support and participate in the development of Infinna for nonwoven applications."

Infinited Fiber Company co-founder and CEO Petri Alava added: "Introducing materials that are made from resources that already exist – like discarded textiles – is a way of bringing circularity to the single-use nonwovens market. The material we have created with Suominen demonstrates a more sustainable future for nonwovens, and we look forward to continuing our close collaboration and co-development work in the years ahead."

The nonwoven sheet co-created by the two Finnish companies points to the goals of biodegradability and plastic-free. These are now key focus points for the nonwovens industry, driven by the European Commission's single-use plastics directive and increasing pressure from retailers and consumers looking for more sustainable, circular options in single-use items.



silicone layer, such as free swelling and prevention of exudate pooling in the wound bed, while eliminating the disadvantages of solutions with standard silicone adhesive layers. Seen from a nursing perspective, advantages include higher flexibility that enables optimal

wound bed contouring and the reduced risk of infection due to the prevention of exudate pooling.

FPM has also unveiled prototypes featuring this technology in the form of a bordered dressing with a silicone adhesive border. The option to select an extra-strong

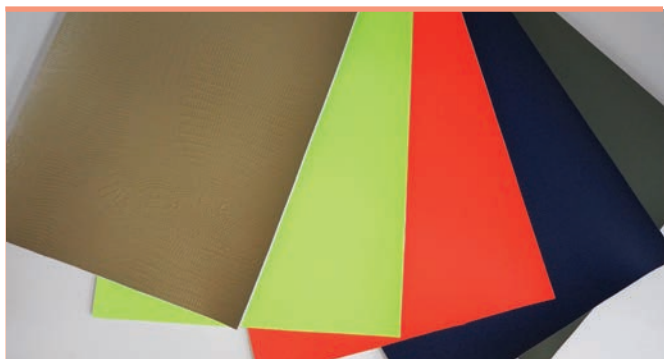
silicone border complements these product benefits. This enables longer wear times, thus generating less waste, as well as offering more effective cleansing results and greater patient comfort.

Also new is a hydrophilic debridement foam which, being soft and flexible throughout, including at the edges, is said to be ideal for cleansing deep

and hard-to-reach wounds.

Thanks to its large pores, the foam also easily picks up fibrin coatings and dried exudate and unlike conventional textile construction, there is no risk of fibres being left behind in the wound.

The hydrophilic PU foam also achieves a better cleansing result with reduced pressure, thereby increasing patient comfort.



Teijin success with antibacterial artificial leather

TOKYO – Antibacterial and antiviral processing technology for general textile products has been developed for practical uses, but it has previously proved difficult to maintain these properties when processed into artificial leather.

Now, Japan's Teijin Cordley has succeeded in developing a new artificial leather incorporating a long-lasting antibacterial agent.

The company commenced sales of the new material in October this year, with initial versions designed for the manufacture of children's satchels. Subsequent versions will additionally be suitable for sporting goods such as shoes and leather balls. The sales target is 30,000 meters in fiscal 2021 and 580,000 meters in fiscal 2024.

Leveraging Teijin Cordley's unique surface treatment technology, the new antibacterial and antiviral artificial leather can be treated with the same process as conventional artificial leathers such as natural-like, enamel and nubuck artificial leathers, and can be used in a wide range of applications.

In addition, products using the new leather material are created using recycled polyester raw materials.

The long-lasting antibacterial agent on the new artificial leather's surface has enabled it to gain SIAA antibacterial processing and SIAA antiviral processing certification.

The technology in the antibacterial agent was originally developed to control the growth of microorganisms such as mould in the confined spaces of submarines, and is effective against various kinds of bacteria, mould and viruses. In addition, it has the potential to treat a variety of materials such as fibres and hard materials, and has been used in applications including apparel and humidifying filters for air purifiers.

Ahlstrom-Munksjö adds to filtration portfolio

STOCKHOLM - Ahlstrom-Munksjö has added to its FiltEV portfolio for electric vehicles, which is aimed at delivering additional high performance filtration solutions for this key growth segment.

The new filtration media solutions are designed to complement the products launched in May, which included filtration solutions for cabin air, transmission and cooling systems.

"I am very pleased to introduce our enhanced and expanded range of products from the FiltEV platform," said Cedric Vallet, Head of Business Development, Industrial Filtration & New Vehicles. "Through the enhancement of our cabin air portfolio, we are offering new filtration solutions delivering better protection for passengers. Better protection against fine particulates, thanks to HEPA media particulate efficiency, and against harmful gases and odours, thanks to increased absorption of a wide range of molecules."

"Through the expansion of

our transmission portfolio, we are offering new filtration solutions delivering longer service intervals and optimized processability for our customers. We will continue to further expand the FiltEV platform, also including fuel cell air intake, over the coming months."

It is estimated that only-electric vehicles will represent 25% of light vehicles production in 2030.

The addressable annual market opportunity for filtration media used in electric vehicles is expected to grow at around 35% per year up until 2030, reaching approximately €100 million.

"We are making progress to ensure Ahlstrom-Munksjö becomes the leader of filtration solutions to the electric vehicle market," added Daniele Borlatto, executive vice president, Filtration & Performance Solutions. "Launching new filtration solutions, with added customer benefits for cabin air and transmission, reinforces our strategic commitment to this market."

Driving clean with Mann+Hummel

LUDWIGSBURG - Filtration specialist Mann+Hummel has been working with car manufacturer Mercedes-Benz to develop two fine dust particle filters that offset the vehicle's particulate emissions by more than 50%.

The two filters, a front-end module and underbody solution, are equipped on the

Mercedes Benz Van technology demonstrator, the Sustaineer (Sustainability Pioneer), providing a tangible impression of just how sustainability in urban delivery operations may look in the future.

"We are very pleased to be part of such a promising project that uses different

Eleather introduces metallic range

PETERBOROUGH – UK-headquartered engineered leather manufacturer Eleather has launched a new metallic material collection for a wide range of markets spanning applications from transport to lifestyle.

Consisting of ten colours, the metallic collection embraces burnished blends that carry soft and warm tones throughout, creating a subtle, luxurious sheen. It is available via ELEather's Design for Good portal and aims to provide more versatility for designers wishing to use sustainable alternatives to traditional leather, synthetic leathers or even fabrics.

"We've been working extremely hard in the last few years to demonstrate to the design community that our sustainable leather alternative unlocks a whole new world of creative possibilities for them," said Nicola Fox, ELEather's Head of Design. "Through the use of our trend collections, grain collection and now the metallic collection, the options for ELEather materials in terms of texture, colour, and finish are endless."

ELEather materials are made from leather offcuts collected from tanneries that would otherwise be sent to landfill. The company has developed a unique, patented manufacturing process based on adapted nonwovens processes that results in materials that are more durable yet equally as luxurious as traditional leather at a fraction of the environmental cost.

At www.design4good.co.uk designers can browse through the company's catalogue of textures and access rendering files to visualise the use of the materials in their own projects.



solutions to improve air quality. Our two fine dust particle filters significantly improve the fine dust balance. The poorer the air quality, the more effective is the filtration," explained Markus Kolczyk, vice president, Original Equipment Global Engineering at Mann+Hummel. "Laboratory tests and simulations confirmed this effect several times. Emission-free driving and delivery in the inner city are therefore within reach."

The underbody fine dust particle filter is located in the area of the rear axle. This is exactly where one of the biggest concentrations of particulate matter in the vicinity of the vehicle can be

found. The passive filter traps the particles stirred up by the moving van and other vehicles. An optimised air duct system ensures the best possible cleansing effect. The filter needs to be replaced once a year.

The second filter is integrated in the frontend module and works in combination with the existing extractor fan to filter fine particles from the air. This means that it not only purifies the air using the airflow around the vehicle when driving, but also filters particulates from the surrounding air when the vehicle is travelling at low speed or being charged while stationary.

Additionally, the vehicle is

fitted with a fine particle sensor. This can measure the concentration of fine particles in the air and control the filtration level accordingly in order to maintain a target state. This also allows the vehicle to be used as a mobile monitoring station. The filter elements can easily be removed and replaced during annual servicing.

The frontend module and underbody filters reduce fine

particulate emissions in the direct vicinity of the vehicle up to a particle size of ten micrometres (PM10) by over 50% – 35% during charging and 15% while driving. The efficiency of the filtration system increases further when there is a higher level of particle pollution. This means that in urban areas with poorer air quality, far greater quantities of fine particles can be filtered out.



Ecoriginals expands into US market

LOS ANGELES - Ecoriginals, the Australia-based manufacturer of plastic-neutral diapers and wipes is to expand into the United States market.

Ecoriginals' diapers are 90% plant-based and are said to be up to 40% more absorbent than standard disposable diapers.

Each actual layer in Ecoriginals' diapers is 100% plant-based, meaning everywhere that touches baby's skin is made from all

natural materials. There are only two small areas around the tabs and leg cuffs that are not yet 100% natural - but the brand is tracking to design these out by 2023, creating the first-ever 100% eco diaper.

Ecoriginals diapers also arrive wrapped in 100% home compostable packaging.

"Since 2011, Ecoriginals has been a must-have for Australian parents as they do their best to navigate parenthood in an eco-friendly way," said Janice Clarke, ▶

Managing Director, Ecoriginals. “We are thrilled to bring the world’s cleanest and greenest diaper to U.S. parents and do our bit to reduce the waste created by disposable diapers and wipes.”

Ecoriginals’ Plantcell diapers ensure that moisture is trapped away from skin in the central core leaving the diaper soft and gentle on delicate skin. They also have dry to touch natural layers to protect from rashes and

irritation and breathable fibres which allow airflow from natural top sheet to natural back sheet.

The Ecoriginals’ wipes 100% plant-based and completely compostable. Made from natural, soft bamboo, the wipes biodegrade in as little as three weeks, are manufactured in New Zealand using renewable energy, an include no alcohol, no chlorine, no phthalates or parabens.



Dual protection with MOF/fibre material

EVANSTON – A versatile composite fabric that can deactivate both biological threats, such as the coronavirus that causes Covid-19, and chemical threats, such as those used in chemical warfare, has been developed at Northwestern University.

The material is also reusable and can be restored to its original state after the fabric has been exposed to threats by a simple bleach treatment.

“Having a bifunctional material that has the ability to deactivate both chemical and biological toxic agents is crucial since the complexity to integrate multiple materials to do the job is high,” said Northwestern’s Omar Farha, an expert in

metal-organic frameworks, or MOFs, which is the basis for the technology.

Farha, a Professor of Chemistry at the Weinberg College of Arts and Sciences, is a member of Northwestern’s International Institute for Nanotechnology. The MOF/fibre composite builds on an earlier study in which his team created a nanomaterial that deactivates toxic nerve agents. With some small manipulations, the researchers were able to also incorporate antiviral and antibacterial agents into the material.

“MOFs are sophisticated bath sponges,” Farha said. “The nano-sized materials are designed with a lot of holes that can capture gases, vapors and other agents the way a sponge captures water. In the new composite fabric, the cavities of the MOFs have catalysts that can deactivate toxic chemicals, viruses and bacteria. The porous nanomaterial can be easily coated on textile fibres.

The researchers found that the MOF/fibre composite exhibited rapid activity against SARS-CoV-2 and both gram-negative bacteria (*E. coli*) and gram-positive bacteria (*S. aureus*). The active chlorine-loaded MOF/fibre composite also rapidly degraded sulphur mustard gas and its chemical simulant (2-chloroethyl ethyl sulfide, CEES). The nanopores of the MOF material coated on the textile are wide enough to allow sweat and water to escape.

The composite material is scalable, Farha added, as it only requires basic textile processing equipment.

Ahlstrom-Munksjö expands Reliance brand

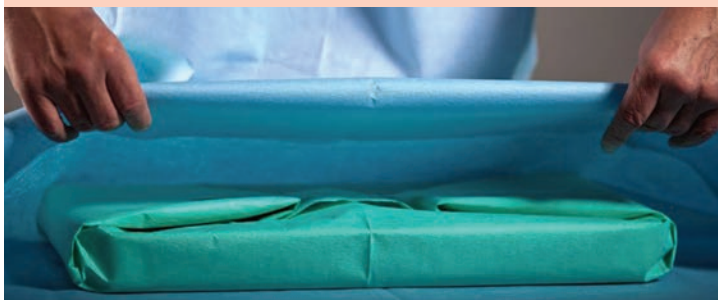
STOCKHOLM - Ahlstrom-Munksjö has expanded its Reliance portfolio to now include its historical Dextex range of wetlaid nonwoven sterilization wraps.

Ahlstrom-Munksjö’s sterile barrier systems are designed to offer excellent bacterial barrier thanks to cellulosic fibers that create a tortuous path for excellent sterility maintenance of surgical instruments up to the point of use. The high-performance sterilization wraps also play a key role in the prevention of hospital-acquired infections, protecting patients’ health.

Dextex wetlaid sterilization wraps have a long history of use in the sterilization industry and are well recognized throughout the globe for their reliable performance. In an effort to facilitate its customers and help their businesses succeed, Ahlstrom-Munksjö has now decided to harmonize the portfolio in the United States under its globally recognized Reliance brand. The move will see a name change for its sheeted wetlaid sterilization wrap products manufactured at the Medical business plant in Windsor Locks and sold in the United States to Reliance Dextex.

In addition to sterilization wraps for terminally sterilized medical devices, the Reliance Dextex brand includes overwrap for single use Custom Procedure Trays (CPT) and tray liners for moisture absorption and protection of the tray.

“The Dextex brand joins our current Reliance Solo and Tandem brand of SMS sterilization wraps and reflects one of the most technologically diverse portfolios of sterile barrier systems in the industry. The constant improvement to our products, quality and capabilities are a clear reflection of our commitment of continuous support to our customers and global healthcare,” said Lionel Bonte, VP Medical business at Ahlstrom-Munksjö.



All new materials packaged include this new name on all labels and corresponding documentation. In addition, all boxes of sheeted wetlaid wrap will include a reformatted Instructions for Use (IFU) document reflecting the name change.

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Micrillon bicomponents for infection prevention

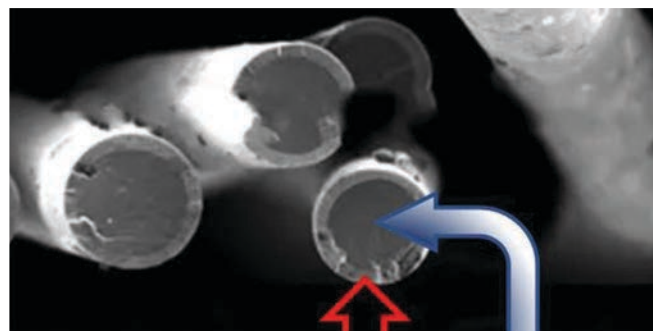
SMOKIE – Micrillon is a new additive made by Illinois-headquartered UMF Corporation in bicomponent microfibres that can be converted into a wide range of long-lasting, reusable products, including towels, cubicle curtains, socks, gloves, walk-off mats, reusable N95 rated face masks and colour-coded microfibre cleaning products.

Leading manufacturers are using these high performance microfibres in materials targeting infection prevention in hospitals, hotels, cruise lines, long term care, and many other industries.

“The introduction of Micrillon microfibre puts an end, once and for all, to any question about recontamination related to reusable products,” said UMF Corporation CEO George Clarke. “Some manufacturers and distributors of disposable products – including cubicle curtains, microfibre mops, and wipers – have generated controversy around the risk of reusable products, such as microfibre wipers recontaminating a patient room, even after being laundered. This ignores the fact that after laundering, wipers used in hospitals are immersed in an EPA-registered disinfectant before use – effectively killing bacteria and inactivating viruses.”

Micrillon is a rechargeable polymer additive that can be incorporated into manmade fibres, films and plastics and then charged with chlorine molecules. The chemistry recharges for the life of the product and will not leach into the environment. When microbes come into contact with a Micrillon surface, they are eliminated and viruses are inactivated.

The range of Micrillon fibres, including sheath and core, bicomponent segmented pie, and hollow core segmented pie, demonstrate significant antiviral properties against Human



Coronavirus, which causes Covid-19, and Human Influenza A H1N1 virus in just minutes. Micrillon

also demonstrates 100% antibacterial elimination of *Staphylococcus aureus* (MRSA) and *E. coli* 0157:H7.

“UMF has dedicated significant time and resources developing the unrivaled Micrillon cleaning system,” added Clarke. “Micrillon products can physically remove everything from a surface and absorb it into the textile, where the disinfectant dwell time exceeds that required to inactivate and kill microbes. These durable, reusable products are cost effective and sustainable. They significantly reduce the burden on the medical products waste stream.”

“We had the opportunity to test Micrillon technology and our results demonstrated significant antimicrobial activity against various pathogens,” said Dr Mina Izadjoo, president and chief science officer at leading contract services organisation Integrated Pharma Services. “Our testing and evaluation may lead to the advancement of much-needed infection control measures against hard-to-treat and drug-resistant pathogens.”

Hydraspun Regal receives Fine to Flush certification

HELSINKI - Suominen’s Hydraspun Regal has received the Fine to Flush Manufacturer’s Generic Certificate from Water UK, the second of the Finnish company’s products to gain the accreditation.

Hydraspun Regal was developed to meet the increasing need for flushable wipes that are dispersible according to the Water UK’s flushability standard.

“Hydraspun Regal has been developed to broaden our portfolio with the product meets the latest dispersibility standards in the UK, and it has passed Fine to Flush standards. Receiving yet another Fine to Flush certification from the Water UK is a remarkable achievement for Suominen,” said Johanna Kivistö, Manager, Category Management, Europe. Hydraspun Regal is made of plastic free and biodegradable raw materials, containing only cellulosic fibres. It also has a low-level carbon footprint due to its high pulp content.

Suominen was the first nonwoven substrate manufacturer to receive the Fine to Flush Manufacturer’s Generic Certificate from Water UK. The first certification was granted for Hydraspun Royal in Spring 2020.

INDA and EDANA publish global market report

CARY & BRUSSELS - A new report published by the two leading nonwoven trade associations forecasts strong market demand for nonwovens materials through the next five years, according to the joint publication from EDANA and INDA’s Global Nonwoven Markets Report, A Comprehensive Survey and Outlook, 2020–2025.

This is the seventh edition of the report, formerly titled Worldwide Outlook for the Nonwovens Industry, and is available for purchase from both INDA and EDANA.

This comprehensive report provides in-depth information and analysis of the global nonwoven macro drivers, supply and demand, and regional trade. Among the highlights of the report:

In the historical period (2010–2020) production increased 6.2% annually, led by growth in the spunlaid processes and drylaid hydroentanglement.

China led the growth in production, adding an additional 4.7 million tonnes from the end of 2010 through to the end of 2020, representing a 11.5% annual growth rate.

Across the nonwoven end use segments, the wipes, filtration, medical segments expanded at the fastest rates, given the industry's rapid response to provide materials that keep the surfaces we touch clean, protect the air we breathe, and provide a barrier to keep our bodies safe.

"The worldwide nonwovens industry's prospects are excellent and it remains an exciting industry in which to be involved," said the report's co-authors Jacques Prigneaux, Market Analysis and Economic Affairs Director at EDANA and Brad Kalil, Director of Market Intelligence and Economic Affairs at INDA.

The report includes detailed regional information and forecasts on production, technology and investment requirements for North America, Greater Europe, Asia and the South America region. The report further features regional views of economic growth, population, product by end use, and trade flows. Other key topics include raw material usage and a detailed appendix.

"As strategic partners, INDA and EDANA are committed to promoting the sustained growth of the nonwovens industry. This report provides the industry's best estimates on future demand by the key nonwoven segments and it is predicated on sound macro-economic analysis," said INDA President Dave Rousse. "This Global Nonwoven Markets Report is an essential planning resource for all those involved in global strategic planning for nonwovens throughout the supply chain."

EDANA General Manager Pierre Wiertz added: "With the remarkable growth and global success of nonwovens, both industry insiders among our member companies and outsiders, from financial analysts to potential investors, require more than ever reliable sources of market information as well as forward-looking data. This new report issued by our two leading nonwovens industry associations builds on decades of experience, and of close observation and direct data collection from hundreds of companies."

The report is available for purchase now and delivery starting on September 30, 2021. For more information or to purchase, contact:

- INDA: <https://imsw.indana.org/store/searchresults.aspx?categoryid=2>
- EDANA: <https://www.edana.org/publications/statistics-nonwovens-report>

New flushability standard for China

JIAXING – The China National Textile and Apparel Council (CNTAC) has officially released its Test Method and Evaluation for the Flushability of Disposable Sanitary Nonwoven Materials (GB/T 40181-2021).

The standard applies to biodegradable and dispersible disposable sanitary nonwoven materials and specifies the test method and evaluation. American Hygienics Corporation (AHC), headquartered in Jiaxing, Zhejiang, played a leading role in its drafting.

"We've learned a lot from what's going on in more advanced markets of where they have undergone problems with the mislabelling of such products that don't comply with regulations or make false claims," said Nilesh Parmar, CEO and founder of



Andritz to supply a neXline wetlace hybrid line to Albaad

GENEVA - International technology group Andritz has received an order from Albaad Massuot Yitzhak Ltd. to supply a neXline wetlace hybrid line for their Dimona facilities, Israel.

The announcement of the deal was made at the INDEX exhibition, which is taking place this week in Geneva. The line will produce a wide variety of pulp-based wet wipes and is scheduled for start-up during the third quarter 2023.

The state-of-the-art neXline wetlace hybrid is described as the perfect combination of inline drylaid and wetlaid web forming with hydroentanglement and drying, including quality control equipment and a Metris Industry 4.0 package. All components will be delivered by Andritz and are designed to produce the highest quality fabrics, including biodegradable, carded-pulp and flushable/dispersible nonwovens for end uses as wipes.

Tobias Schäfer, vice president, Sales at Andritz Nonwoven, commented: "Our innovative production line gives Albaad enormous flexibility in the production of wipes. In addition, the Metris digitalization package by Andritz will provide Albaad with highly efficient and smart operation." Dan Mesika, CEO and president of Albaad, added: "We are dedicated to developing new products – such as eco-friendly, biodegradable wipes. As pioneering manufacturers of our Hydrofine flushable wipes, we are committed to environmental sustainability. Thanks to the new Andritz line, we will enlarge the product portfolio at our Dimona production site with innovative fabrics and high efficiency."

Albaad is one of the world's three largest wet wipe manufacturers, supplying wipes for a range of sectors. The company runs production facilities on three continents, each equipped with the latest technologies, producing spunlace and flushable fabrics in its facilities as well as purchasing from other roll goods suppliers in order to support production of a wide variety of wipes.

AHC. "There has been no real flushability regulation to date, so this standard is necessary for future growth. With a proper standard in place, the industry will be regulated and policed. I am extremely honoured that AHC could be part of this and we are confident that this standard will soon become widely adopted."

AHC is one of the largest manufacturers of wet wipes in Asia with two manufacturing facilities and a gross annual output of over a billion wipes a year.

People

Berry Global has announced its Chairman and CEO, Tom Salmon, has accepted the appointment as an Officer of the



Tom Salmon.

Alliance to End Plastic Waste (Alliance), a global non-profit organization. As a founding member and first converter to join the Alliance, Berry continues its leadership role to help convene a global network of over 80 member companies and partners in the mission to end plastic waste in the environment.

Salmon continues to stand behind the power of plastics, known for its versatility, innovation, and lower overall environmental impact than other packaging alternatives*. Through his leadership, he will help guide the Alliance's decision-making on global projects that are sustainable, circular, and scalable businesses.

"The selection of representatives across the sectors signifies the necessary collaboration across the plastics value chain," said Salmon. "Ending plastic waste is only achievable when organizations partner to increase infrastructure, educate, and provide circular solutions to give plastic multiple lives."

The Alliance aims to advance a circular economy for plastic waste by developing, deploying, and scaling solutions across four strategic pillars – infrastructure, innovation, education and engagement, and cleanup.

"Tom has been a clear voice on how the plastics value chain can transform to become more sustainable and circular, which are essential shifts if we are to tackle the challenge of plastic waste holistically. I look forward to the work we can accomplish together to advance a circular economy for plastic waste," says Jacob Duer, president and CEO of the Alliance.

The **Mann+Hummel Group** has announced that after over 30 years with Tri-Dim Filter Corporation, president Mark King will step back from his responsibilities. He transitions into an advisor role with immediate effect and will continue to cooperate closely with the company to

support the Mann+Hummel Life Sciences & Environment team with his valuable expertise. Shawn Windley, president Commercial & Industrial Division at Pamlico Air, has been appointed as his successor.

King assumed leadership of Tri-Dim in 2018, where he played a crucial role in the acquisition of the company by Mann+Hummel, a leading global expert for filtration solutions. Throughout his career, King served in a variety of leadership roles, beginning as a southern regional manager for Tri-Dim Filter Corporation.

Shawn Windley joined the Mann+Hummel Group when the filtration expert made a strategic investment in Pamlico Air earlier this year. Together with the Mann+Hummel subsidiary Tri-Dim, the U.S. manufacturer and provider of high-quality air filter products for mainly the retail and wholesale market enhances Mann+Hummel's air filtration business capabilities in North America.

INDA has presented the Lifetime Achievement Award to Nick Santoleri, COO of Rockline Industries.



Nick Santoleri.

Santoleri was named COO of the wipes converter one year ago after 20 years with the company. He entered the wipes industry in 1980 at Scott Paper as a co-op student at Drexel University. At Scott, he worked on the first branded flushable wipes. Later in his career, he worked on the first refillable baby wipe pack at Kimberly-Clark. Over the course of his career, he has been involved with the installation of 16 new lines, four greenfield facilities and over two dozen nonwoven-based products.

Crediting the people he has worked with over the years, Santoleri said: "This is not an individual award. There is no way anyone can do what they do without the support and vision of this industry."

The **China Nonwovens and Industrial Textiles Association (CNITA)** held the Fifth Member Congress and the celebration ceremony of its 20th anniversary in Beijing where it reviewed and approved the report of the Fourth

Council, and elected the Fifth Council.

Ms. Li Guimei was elected as the President of CNITA.



Li Guimei.

Zhu Xiuse, Duan Shoujiang, and Ji Jianbing were elected as the Vice-presidents, Li Yuhao was elected as the Chief-engineer, and Zhu Xiuse as the Secretary-general. The first session of Board of Supervisors was also established. Mr. Li Lingshen, ex-president of CNITA was elected as the Chairman of the Board of Supervisors.

"In the past 10 years, under the leadership of Mr. Li Lingshen, CNITA has made remarkable achievements, and the number of member companies reached more than 900. Now the baton of CNITA is passed to me. I will take on the responsibility of safeguarding the interests of the industry, meeting the needs of member companies, and promoting the development of the industry. I will work with all my colleagues to promote the high-quality development of the industrial textile industry through our innovative work and services." the newly elected President Li Guimei said.

Li Lingshen added: "The newly elected Board of Directors marks that CNITA has entered a new stage. The team of officers are composed of outstanding persons. It is a team that is completely trustworthy."

He also reviewed his experience as the President of CNITA over the past ten years and suggested that the industry should adhere to the perspective of globalization in the future to form an industrial ecosystem that is interconnected, efficient and synergistic with application fields.

The **Procter & Gamble Company** has announced that at its 2021 Annual Meeting of Shareholders, Christopher Kempczinski, president and chief executive officer of McDonald's Corporation, was newly elected to its Board of Directors, effective immediately.

P&G shareholders elected all 12 P&G Director nominees, including Mr. Kempczinski and 11 incumbent Directors, with each receiving more than 90% support according to preliminary voting results.




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6-7

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7 -10

Fabric Property Development And Characterization Course

Professional Development training
The Nonwovens Institute (NWI) at NC State University

Web: <https://www.inda.org/training/advanced-training.php>

January 2022

11-14

Heimtextil 2021

Messe Frankfurt,
Frankfurt
Germany

<https://heimtextil.messefrankfurt.com>

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Learn or refresh your basics on nonwovens

Online course

Web: <https://www.edana.org/trainings/nonwovens-learning-cycle/nonwovens-introduction>

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INDA Elementary Nonwovens Training Course

Professional Development training
INDA Headquarters
Cary, NC
United States

Web: <https://www.inda.org/training/elementary-training.php>

February 2022

16-18

Everything you need to know about nonwovens

Intermediate Training Course

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Brussels

Web: <https://www.edana.org/trainings/nonwovens-learning-cycle/nonwovens-intermediate-course>

22

MENA Symposium

Middle-East and North Africa
Nonwovens Symposium
and Exhibition

Park Hyatt

Dubai

Web: <https://www.edana.org/events/nonwovens-symposium/mena-nonwovens-symposium>

March 2022

1

Introduction To Spunbond And Meltblown Technology

Professional Development training
The Nonwovens Institute,

NC State University

Raleigh, NC,

United States

Web: <https://www.inda.org/training/advanced-training.php>

8-10

JEC World. International

Composites Show.

Paris Nord Villpointe

France

Web: www.jeccomposites.com

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FiltXPO 2022

FiltXpo Conference

Miami Beach Convention Center

Web: <https://www.filtxpo.com>

28-31

IDEA

Miami Beach

Miami, Florida

Web: <https://www.ideashow.org>

May 2022

11-12

Nonwovens Innovation Academy

Jyväskylä, Finland / Hybrid

Web: <https://www.edana.org/events/nonwovens-innovation-academy/nia-2022>

17-19

Techtextil USA

Atlanta, Georgia

Web: <http://www.techtextilna.com>

June 2022

21-24

Techtextil

Frankfurt

<https://techtextil.messefrankfurt.com/frankfurt/en.html>

Although every care is taken over the compilation of this diary to ensure accuracy of the dates, these can sometimes be changed due to local circumstances. It is therefore advisable to check with the appropriate organisers before travel arrangements are made.



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