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WISA

PERFORMANCE SPORTS MATERIALS



Change of gear for membranes

Better farming, better wool

Complex questions about microfibres

THE INTERNATIONAL MAGAZINE FOR PERFORMANCE & SPORTS MATERIALS

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Front cover: With membranes on the move, French outerwear brand Picture Organic Clothing, uses BenQ's new Xpore laminate in its collections.

IMAGE: PICTURE ORGANIC CLOTHING

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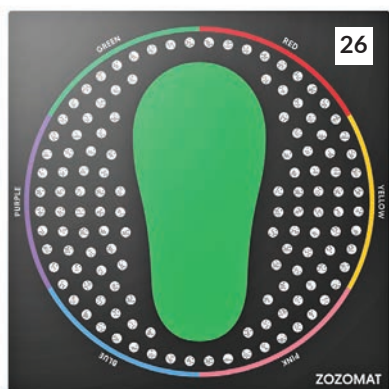
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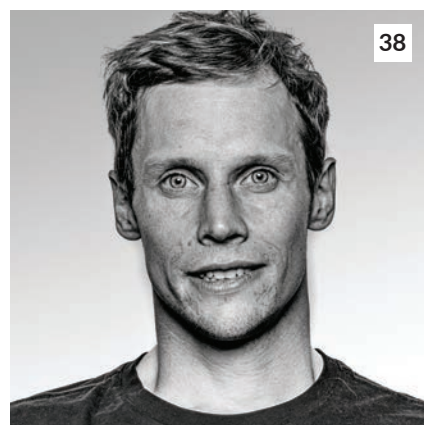
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Global news

France Sporting goods retail and manufacturing group Decathlon has announced a new agreement with the National Basketball Association (NBA), under which it will become an official NBA licensee in Africa, Asia, Europe, the Middle East and Latin America. This is the first time Decathlon has entered into an agreement of this kind with any of the major North American sports leagues.

UK The executive chairman of JD Sports, Peter Cowgill, has said the retail group will consider opening a new distribution centre in the European Union, creating around 1,000 new jobs. He said the new trading arrangements with the European Union following the UK's exit were costing JD Sports "double-digit millions". The group sources sports shoes and clothing from Asia and distributes them to its stores in the EU from a distribution centre in Rochdale, near Manchester.

Italy Specialist warp knit seamless fabric developer Cifra has moved into the swimwear sector with a range of quick-drying snag-resistant products. The Italian company's speciality is creating seamless garments that fit naturally to the body by using a single piece with various knitted 'zones'. It uses body-mapping technology to create the mesh holes over heat zones, providing breathability and cooling.

Finland Speedo is the new main partner of the Finnish Swimming Association and swim teams, alongside sports retailer Intersport Sello. The multi-year agreement includes the launch of two online stores: Speedo Team ProShop, designed for active swimming sport enthusiasts, and Ui Elämäsi Kuntoon [Swim for your Life], designed for the recreational swimmer.

Austria Non-profit group CDP, which campaigns to encourage companies and governments to reduce greenhouse gas emissions, safeguard water resources and protect forests, has given recognition to the work fibre manufacturer Lenzing is doing in these areas. It has placed Lenzing on its 'A List' for two of the three areas – tackling climate change and protecting forests.

Spain Sustainability-focused clothing brand Ecoalf has secured a new financing agreement with Eurofactor, part of the Crédit Agricole financial services group. Under the agreement, Eurofactor will advance funds to Ecoalf and will have collection rights on a proportion of the payments owed to the Spanish company. Ecoalf founder, Javier Goyeneche, said the new arrangement could be expanded in future and would help fund the company's growth.

Portugal Yarn producer Tearfil will develop staple yarns for the apparel industry using Sorona fibres, following a new agreement with DuPont Sorona. Tearfil chief executive, Maria de Belém Machado, said that the company believes collaboration to be the key ingredient in creating high-quality products. "Our magic is only possible thanks to our trusted fibre and technology partners," she said.

Morocco Twenty-eight textile workers died in a workshop in the city of Tangier in February. Reports say the victims included four sisters from a family in Fez. The facility, which was in the basement of a residential building, 15 minutes from the city centre, flooded after torrential rain. There were also reports of a short-circuit and it is not clear which of these incidents caused the fatalities.

Tunisia Trade body the Professional Clothing Industry Association Worldwide (PCIAW) has hosted a webinar with the aim of encouraging clothing brands in the UK to build new ties with textile and apparel manufacturers in Tunisia. Chief executive, Yvette Ashby, said she thought Tunisia's proximity and established textile manufacturing industry could help "revivify supply chains across the UK". Tunisia's ambassador to the UK, Nabil Ben Khedher, and the UK's ambassador to Tunisia, Edward Oakden, both took part in the discussion.

China Sportswear group Xtep is to establish a new operations centre in Shanghai. It entered into agreement with a property company in February to acquire a site covering around 11,000 square-metres close to Hongqiao Airport. Xtep will use the site to set up showrooms and offices. It said it had chosen Shanghai as the location because the city's status as a major finance and business centre in China would give it access to "top talent".

- Fujian-headquartered sports group Anta has invested around \$92 million in a production base in Sichuan province. The base will be home to factories, warehouses and workers' dormitories, among other related buildings, within a total planned land area of roughly 185,000 square-metres. It is expected that the first phase of construction will be completed by October 2022; the base will eventually employ between 3,000 and 5,000 people.

US Invista brand Cordura has launched a digital 'fabric finder', a platform that provides mills and brands with a showcase of its latest collections. The library will include a selection from its 2,500 fabrics and creates a "virtual space for designers and makers to connect with the Cordura team".



Bangladesh Global Fashion Agenda has announced the participation of over 30 fashion brands, manufacturers and recyclers in its Circular Fashion Partnership, including Peak Performance, Marks & Spencer, H&M Group, Beximco, Renewcell and Lenzing. The cross-sectorial project is led by Global Fashion Agenda, in collaboration with partners Reverse Resources, The Bangladesh Garment Manufacturers and Exporters Association (BGMEA) and P4G.

Japan Sports brand Asics has become the first Japanese company to join the Fashion Pact. It made the announcement in mid-December. Thirty-two fashion and textile companies signed the Fashion Pact in August 2019 as a new commitment to protecting climate, biodiversity and the oceans of the world. A year after its foundation, the group announced that its membership had nearly doubled to 60 organisations, representing around 200 brands. It said this equated to about one-third of the global fashion industry.

Taiwan Textiles manufacturer Kingwhale has joined the RE100 global initiative, pledging to use only renewable electricity by 2040. Kingwhale is a vertically integrated company, controlling the entire production process from fibre spinning to garment construction. The RE100, led by non-profit The Climate Group, aims to accelerate change towards zero-carbon at scale. The Climate Group said: "We hope more companies will follow this lead and join RE100."

India India's finance minister has announced a 10% duty on cotton imports in a bid to boost the country's cotton farmers. Nirmala Sitharaman also announced a series of mega textile parks – seven in the next three years – that she said would make India's textile sector more competitive. However, while India is the world's largest cotton producing country, the news has come as a blow for some manufacturers and textiles companies that rely on overseas cotton.

Hong Kong Apparel and footwear group VF Corporation has announced that it will move the centre of its brand operations in Asia from Hong Kong to Shanghai. The group said it already employs around 900 office and retail associates in Shanghai. Its Asia product supply hub will move away from Hong Kong, relocating to Singapore. It will also set up a shared service centre for the region in Kuala Lumpur. VF said the moves will begin in April and continue over the next 12 to 18 months.

People



In his own name

Basketball star **Stephen Curry** launched an own-name footwear, apparel and accessories brand in December in partnership with Under Armour. A percentage of the Curry brand's annual revenues will be invested in under-resourced communities.

By 2025, it aims to create at least 20 safe places to play, support 125 programmes that impact young athletes, and deliver opportunities to train more than 15,000 coaches, with the intention of making an overall impact on more than 100,000 young people.

Stephen Curry explained that he wanted to “unlock play” for children in disadvantaged communities, explaining that more than 70% of children and teenagers from low-income households in the US take part in no organised sport and that those that do participate are six times more likely to stop because of financial costs. 🌐

Arc'teryx appoints chief executive

Canadian outdoor brand Arc'teryx has appointed **Stuart Haselden** as its chief executive officer. He takes up the role with immediate effect and brings two decades of experience in senior roles at clothing companies Lululemon, J.Crew and Saks. Most recently, he was chief executive of lifestyle brand Away.

He described Arc'teryx as “an inspiring brand that represents the pinnacle of design innovation”. He replaces **Jon Hoerauf**, who was brand president; the role of chief executive at Arc'teryx is new. Chief executive of parent group Amer Sports, **James Zheng**, said the reason for making the appointment was that Arc'teryx was entering a new phase of growth. 🌐

Appointments complete Rhenoflex management team

Shoe component manufacturer Rhenoflex has made three senior appointments in recent weeks.

Stefan Walther, who has lived and worked in China since 2014, has taken over as the company's chief sales officer for Asia Pacific and will be based in Dongguan. In parallel, experienced outdoor footwear sales and marketing executive, **Tres Riordan**, has become Rhenoflex's sales and marketing director for North America, based in Santa Barbara, California.

Working at the company's headquarters in Ludwigshafen, **Peter Seng** is the new head of global sourcing. Chief executive, **Frank Böttcher**, said these appointments meant the management team at Rhenoflex was now complete. 🌐

Well known industry figure becomes MD of insulation provider

Wool insulation developer HDWool has named **Simon Whitmarsh-Knight** as its new managing director. Mr Whitmarsh-Knight joins the company after almost three years at fibre group Hyosung. Before that, he spent almost nine years working in various senior positions at Invista. HDWool is a spin-off from wool producer H Dawson. It aims to encourage outdoor brands to use wool in insulation layers in garments. 🌐

Board moves at EOG

The European Outdoor Group has confirmed **Mark Held** as its president for a second term; **Matt Gowar** (Equip) and **Hans-Hermann Deters** (Sport2000) have been elected to the board, while association treasurer **Michel Gogniat** (Ternua), **Oliver Pabst** (Mammut) and **Mathias Zaggi** (W.L. Gore & Associates) were re-elected for second terms. **John Jansen** (KEEN), **Rainer Angstl** (Sporthaus Schuster) and **Ryan Gellert** (Patagonia) have stepped down. 🌐

New brand, new director

New outdoor brand Artilect has appointed a former North Face product manager as director of technical design and development. **Sonia Lunardon** joins design director **Erica Cahn** and co-founder and co-CEO **Trent Bush** on the growing Artilect design team. The brand is based in Colorado. 🌐

Performance changes

Textile chemicals producer BASF has announced that the current president of its performance chemicals division, **Anup Kothari**, has taken responsibility for the company's nutrition and health division this February. BASF's senior vice-president for automotive coatings, **Thomas Kloster**, will take charge of performance chemicals in addition to his current responsibilities. 🌐

Positive move

Sportswear group Pentland brand has hired **Sara Brennan** as ‘positive business’ director, a new role that reflects a focus on “people and planet”. Pentland Brands chief executive, Ms Brennan joined the UK group as head of corporate responsibility in January 2019 and has further embedded sustainability across the organisation. 🌐

Columbia creates chief digital information officer role

Outdoor group Columbia Sportswear has appointed **Skip Potter** to the newly created role of chief digital information officer. He will take up the post on April 1 and will become an executive vice-president of the company. Mr Potter has spent four years as Nike's chief technology officer and, before that, worked for financial services provider Capital One and for British Telecom.

Chief executive, **Tim Boyle**, said this was a continuation of the transformation of the business, adding that "elevating" Columbia's digital capabilities would be a critical component of the success of the group in the years ahead. 🌐

Messe Frankfurt evens things up for Techtextil

Event organiser Messe Frankfurt has confirmed new dates for the next Techtextil and Texprocess exhibitions in Frankfurt. They will continue to run every other year, with April 9-12, 2024 already confirmed as the follow-up dates. The cycle for the biennial events, therefore, will switch from odd to even years.

Messe Frankfurt vice-president for textile events, **Olaf Schmidt**, said he was pleased to be able to confirm new dates soon after the cancellation of the original 2021 dates. He explained that a "biennial event cycle" for the two fairs had proved to be in the best interests of the sector. "We have decided to maintain this rhythm," he said. 🌐

Senior appointments at Wolverine World Wide

Outdoor footwear group Wolverine World Wide announced two senior appointments at the start of the year. It has hired the global head of digital business at Reebok, **Matt Blonder**, placing him in the role of Wolverine's president of global e-commerce.

Wolverine said it had set itself "the bold goal" of achieving \$500 million in global e-commerce revenue for 2021 and that Matt Blonder's track record made him the ideal person to lead "this ongoing digital transformation".

The group has also made **Jim Zwiers** president of its global operations group, responsible for portfolio-wide sourcing, logistics, distribution, customer service, and information technology.

Mr Zwiers has been president of Wolverine's international group since 2014 and has spent almost 23 years in total working for the group. He will succeed **Mike Jeppesen** in this new role. Mr Jeppesen is to retire after more than 33 years in the footwear industry, the last nine of which have been with Wolverine World Wide. 🌐

Changes at the top for FENC

Taiwanese textiles and yarns group Far Eastern New Century (FENC) has appointed a chief operating officer to boost the growth of its textiles business.

MJ Wu will be in charge of the tech textiles and spun yarn divisions.

Eric Wu, the president of the textiles division, has retired, although he will continue to assist the chairman. His replacement will be announced in due course. 🌐

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Industry & Innovation



Hat-trick of innovations in new adidas football boot

Adidas has launched a new version of its Copa football boot, incorporating a range of technological innovations.

Analysis work that went into the design of the new boot, the Copa Sense, focused on mapping a variety of different sole shapes so that the team at adidas could form a fuller understanding of the parts of the foot that connect most frequently with the ball.

This led to the creation of Sensepods, an innovation designed to eliminate “negative space” around the ankle and the Achilles. This involves placing foam elements on the inside of the heel of the boot, helping to create what adidas calls “a seamless connection between boot and foot”.

Copa Sense boots also have Touchpods, placed on the medial and the lateral sides of the boot. These are designed to absorb energy from the ball at the points where it most frequently connects to the boot.

A third innovation is Softstuds. For this, adidas has injected softer material into two medial forefoot studs so that they will bend upon impact with the ball. 🌐

Sympatex switches to 25% bio materials

More than 25% of the raw materials used in Sympatex’s membranes will be converted to renewable raw materials during this year, following several years of research. The bio-based Arnitel, made by DSM, originates from various organic waste streams and will not compromise the performance; breathability, water- and windproofness will remain the same and it will also remain fully recyclable at the end of its lifecycle, according to the company.

DSM, Sympatex’s long-standing raw material partner, is in the process of converting its production facilities to renewable electricity sources, as a result of an ongoing drive to reduce the carbon footprint of its products and operations. This will help Sympatex to reach another milestone on the road to climate neutrality several years earlier than planned. 🌐

Lectra aims to boost Industry 4.0 offering with Gerber acquisition

Cutting technology provider Lectra has announced its intention to acquire US-based rival Gerber Technology. It said that if it completes the acquisition, it would be able to enhance its offering of “Industry 4.0 technology that will enable customers to boost the productivity and profitability of their operations”.

Combining the businesses would occur “at an opportune time” for both companies and for their customers, Lectra has stated. Together, the two companies would have a large installed base of product development software and automated cutting solutions, with a worldwide presence and “a long list of prestigious customers”.

At the same time, consolidating the two companies’ research and development capabilities would enable the combined entity to accelerate development of Industry 4.0 technologies and help customers get the benefit of these innovations. 🌐

Texon boxes clever

Shoe component supplier Texon has reengineered its Sportflex box toe puff with a minimum of 50% recycled content, up from around 4%. The move forms part of Texon’s sustainability drive and its ambition to become a zero-waste business by 2025. Box toe puffs are inserted into shoes, between the lining and the upper, to help the footwear retain its form. Sportflex is an extruded material that is used to create soft, flexible toes in lightweight footwear and athletic shoes.

Separate sale

DuPont announced at the beginning of February that the merger of its Nutrition & Biosciences segment with flavours and fragrances company IFF, which it announced in December 2019, has been completed. DuPont Biomaterials was not part of the deal. It has confirmed to WSA that it expects to sell its Biomaterials business, which includes bio-based polymers brand Sorona, in the first half of this year. 🌐

Porous progress

Insulation maker PrimaLoft is boosting the post-consumer recycled content in its PrimaLoft Cross Core Series with one version increasing from 35% to 90%. The Cross Core platform fuses PrimaLoft fibres with aerogel, a highly porous, lightweight structure that is composed of more than 95% air. 🌐

Recycled yarn boost

South Korea-based TK Chemical is set to increase its production of K-rPET-derived yarn ten times over this year, local media have reported. The company recently announced plans to boost its use of domestic recycled raw materials from 145 tonnes in 2020 to between 1,800 to 2,600 tonnes in 2021. 🌐

Plastic-to-plastic recycling

Eastman Chemical Company is planning to build what it says will be one of the world’s largest plastic-to-plastic molecular recycling facilities at its site in Kingsport, Tennessee. Through methanolysis, the facility will convert polyester waste that often ends up in landfills and waterways, with Eastman investing around \$250 million over the next two years. 🌐

On the button

Textile research and testing organisation Hohenstein has received accreditation from the German federal government to assess textiles for Germany's Grüner Knopf (Green Button) label. Green Button certification is awarded to companies that achieve a high level of environmental and social responsibility; they are then entitled to put Green Button labels on qualifying products. The government has said it hopes in time to make the certification available globally. 🌐

Silver lining

Swiss textile innovator HeiQ and Spanish synthetic fibre manufacturer Nylstar have teamed up for an antiviral and antimicrobial textile, a winner of an ISPO Textrends Award for the best product in the baselayer category. Meryl Skinlife Force combines Viroblock Permanent, based on silver-ion antimicrobial properties, and Nylstar's hydrogen-based technology. The silver particles are added directly into the raw polymer of the yarn. 🌐

Cotton milestone

A joint project to "create a common language" to screen for the potential presence of genetically modified (GM) cotton has reached what it calls a milestone; 14 labs, in China, Germany, India, the Netherlands and Portugal, have passed the proficiency test for detecting GM.

In November, GOTS said it had "substantial documentary evidence" confirming "systemic fraud" on the part of some Indian cotton producers. GOTS said that all future raw material transaction certificates entering its supply chain will be scrutinised for authenticity. 🌐

Hyosung TNC launches G3H10 clothing collection

South Korea-based fibre producer Hyosung TNC has launched G3H10, a branded, "eco-friendly" clothing collection of its own, following a successful crowdfunding campaign via the Wadiz platform.

The intention behind the move is to showcase garments made using a combination of Hyosung's Regen yarn and organic cotton, local media said.

Charcoal-, ivory- and olive-coloured hoodies and sweatshirts are G3H10's initial products, with the first 500 participants in the Wadiz campaign also receiving a Hyosung-made mask, created with proprietary antibacterial fibres. 🌐

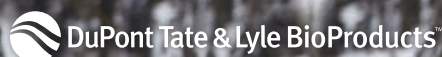
Tech innovation hub

Japanese high-performance fibre developer Teijin has established a European Sustainable Technology Innovation Centre (ESTIC) in Arnhem, the Netherlands. ESTIC is a research and development facility "tasked with developing technologies for a more sustainable world", the company said. The facility will act as an international research hub for Teijin's "environmental value solutions". 🌐

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Backtrack

17.02.2021

Regenerative agriculture aims to reap wider benefits

Pangaia launches biobased C-Fiber

Confirmed: Reebok is for sale

New Zealand partners celebrate 'first regenerative wool platform'

16.02.2021

Refined consumer focus helps Haglöfs coast 2020

Wild versus conservative: Noah x Barbour

15.02.2021

Brands eager to change the industry, Fair Wear Foundation says

12.02.2021

Reebok shifts focus from running to walking

Healthy Seas unveils 2020 progress

Ted Ligety joins KJUS' product innovations team

Ice walls come down permanently at Ellis Brigham stores

11.02.2021

Allied launches 'ultra-high-performance' recycled down

Challenges continue for Under Armour

10.02.2021

VF's strategy could remove 100 million plastic bags annually

Coats commits to net-zero emissions by 2050

09.02.2021

Byborre unveils outdoors-inspired Edition9 materials

Nike snaps up start-up to add digital momentum

Wool Lab marks 10th anniversary with digitised version

More than 30,000 trade visitors to first digital ISPO

08.02.2021

Discovery mode: spotlighting 'indie' running gear

Bluesign on the future of sustainable chemicals

Limitations on space make it impossible for us to run more than a carefully selected sample of industry news in WSA. However, we publish hundreds more stories on www.sportstextiles.com, one of the most comprehensive archives of news anywhere on the web for textiles, apparel, footwear and equipment for sports and outdoor. Below are just some of the headlines that have appeared on the site in recent weeks.

05.02.2021

Li-Ning teases limited edition Way of Wade shoes for CNY

04.02.2021

South Korean environment minister checks on K-rPET's progress

03.02.2021

The North Face launches 'K-Eco' line in South Korea

Running, training and bikes console Intersport

Lululemon report finds global wellbeing is lacking

02.02.2021

How adidas "won" 2021 Chinese New Year marketing

Campaign launches to celebrate 30 years of Polartec

Bergans collaboration scoops top Scandinavian Outdoor Award

01.02.2021

Investor aims to help French brand expand globally

JD Sports in new US move

10 'green' textile factories make Zhejiang list

Bemis chooses Susterra for partially plant-based adhesives

29.01.2021

Zhejiang Runtu obtains Oeko-Tex 'eco passport'

Ellen MacArthur Foundation publishes circular goals

28.01.2021

Lidl backing boosts Cotton made in Africa

Nike, Stüssy and 'ethically harvested' plant dyes

27.01.2021

Recovery in orders continues for Rieter

ThruDark unveils SF Raid waterproof trousers

Rocky Brands buys performance footwear portfolio

26.01.2021

ISPO names 2021's top products

Fashion For Good programme leads to pilot cotton project

White Mountaineering meets Millet

Endura's tree planting success enables CO₂ pledge

25.01.2021

Performance Days announces new event

No rainy seasons for Y-3 plus Gore-Tex

Between London and Tokyo: Raeburn x Onward Advanced System

22.01.2021

Asics: 'a sound mind in a sound body'

Brand revamp for growing Infinited Fiber Company

Ortovox's sourcing practices praised by Fair Wear

21.01.2021

500-plus exhibitors gear up for IPSO online

Charity auction for dresses that use Spinnova bio-fibre

20.01.2021

Partners to launch pilot for lyocell fibre from microbial cellulose

Converse collections celebrate basketball history

The North Face and Hyosung establish 'recycling ecosystem'

know THE SCORE





Dubbed its most innovative and sustainable waterproof-breathable technology to date, Helly Hansen's Lifa Infinity Pro jacket features a polypropylene film developed by Trenchant Textiles, bonded to a polypropylene face and back fabrics.

CREDIT: HELLY HANSEN

Change of gear for membranes

A basic feature of performance outerwear is its ability to block rain and wind while letting moisture out. This was a key breakthrough introduced in the 1970s by Bob Gore, who passed away last year, and it is the defining feature of Gore-Tex fabrics. First-generation membranes tended to favour weather protection over wearer comfort, waterproofness over breathability. Over the years, the focus has gradually shifted to greater air permeability and moisture transfer for more active uses. These incremental tweaks in performance and in ever-finer market segmentations were the main news in this field. Change is in the air as a new generation of companies introduces more sustainable solutions, new polymers and manufacturing methods.

New options in polymers

Polyolefin and polypropylene are two of the new polymers in waterproof-breathable materials, expanding on the tradition of polyurethane (PU) and expanded PTFE (e-PTFE). Taiwanese tech conglomerate BenQ Materials has transposed a film technology found in computers and TVs to textiles to launch Xpore, an ultralight nanoporous membrane made from a polyolefin weighing a mere 5 to 6 grammes per square-metre and 12 microns thick. "Xpore is not only a membrane technology but also an adhesive and lamination technology," says Rex Lee, head of the company's performance textiles business unit. The film and adhesive are manufactured without solvents, offering a more eco-friendly process compared to similar materials, he says. Its performances are in line with industry standards, with waterproof levels that can go from 10K to 30K and even 50K (mm water column, ISO811), and breathability in the order of 10K (moisture permeability measured in grammes per square-metre per 24 hours, JIS-L1099A1), the company states. Launched in early 2020, Xpore has been adopted by French eco-brand Picture Organic Clothing. The company is currently seeking to introduce a 2.5-layer laminate.

Trenchant Textiles, also based in Taiwan, is another new player in the world of waterproof-breathable materials. It has chosen polypropylene for its Intrepid membrane. "Polypropylene polymer science has changed

After years of incremental improvements in the performance properties of waterproof-breathable membranes, radical new technologies are coming to market.

Manufactured without solvents, made from biobased materials or offering mono-material design possibilities, they are ushering in a new era of sustainable innovation.

significantly in the last three decades. Key patents expired in the late 1990s and early 2000s, which has made possible a second coming for polypropylene," CEO, Matt Cleary, tells WSA.

"Due to its crystallinity, polypropylene presents a homogenous and spherical porous structure that is ideally suited to blocking water and letting moisture pass through," says Mr Cleary. "It has a unique biomorphic structure that is achieved without the use of solvents." The ratio of matter to void in Intrepid is approximately 84%, meaning that it consists of far more air than material. Measuring 18 microns thick, it is remarkably light, weighing just four grammes per square-metre. Furthermore, if a brand chooses to bond an Intrepid film to a polypropylene face fabric with a suitably tight weave, it may not require a DWR treatment to offer protection from rain, the company claims.

This is exactly what Norwegian outerwear brand Helly Hansen has chosen to do in its new Lifa Infinity Pro range, launched last year with the polypropylene membrane. "It is a ground-breaking material that requires no additional chemical DWR and it aligns perfectly with our core Lifa-branded fibre," said Helly Hansen category manager Philip Tavel at launch. "We have solved a problem that the entire outdoor industry has been looking at for years: to create a high-performance garment without using a fluorocarbon DWR finish." The brand chose a dope-dyed face fabric to further reduce water and chemical use.



Always on the lookout for new eco-responsible fabrics, French outerwear brand Picture Organic Clothing has introduced BenQ's new Xpore laminate in its collections.

CREDIT: PICTURE ORGANIC CLOTHING

"This high-profile launch gives us a substantial base for development," says Sandra Cleary, Trenchant Textiles' chief operating officer. The possibility of creating a laminate in a single type of polymer is attracting the attention of companies looking to develop high-performance mono-material outerwear.

Mono-material laminates

KTC Lab, a division of China-based clothing manufacturer KTC, is looking to develop a range of sustainable and recyclable skiwear that will be available for rent from swissrent, a company with 31 dealers in 22 locations in Switzerland. "Skiwear is often worn just one week a year. It makes sense to rent these types of clothes, and in that case, we need a solution for them when they can no longer be worn," says Monika Rausch, an independent designer and project manager for KTC Lab. A mono-material laminate would be easier to recycle than conventional multi-component ones.

The company is testing several options, including Trenchant Textiles' Intrepid membrane. "The advantage of polypropylene is that it may not need a DWR finish, and this is a polymer that can be injection-moulded to manufacture trims, zippers and buttons," says Ms Rausch. But the lack of an established collection and recycling system for polypropylene makes it less attractive, in the short term, compared to polyester. KTC Lab has another ongoing research project to develop performance skiwear using only recycled or recyclable polyester-based materials with wear2wear, a consortium of European companies seeking to close the loop in textiles and apparel.

Whatever the option, adhesives remain an issue, as polyurethane is the go-to solution for bonding. "Polyurethane is the most common adhesive and it is also present in fibre form to provide stretch and recovery. Mechanical stretch

can only go so far," the designer says, even though she believes it can be avoided in skiwear with clever tailoring.

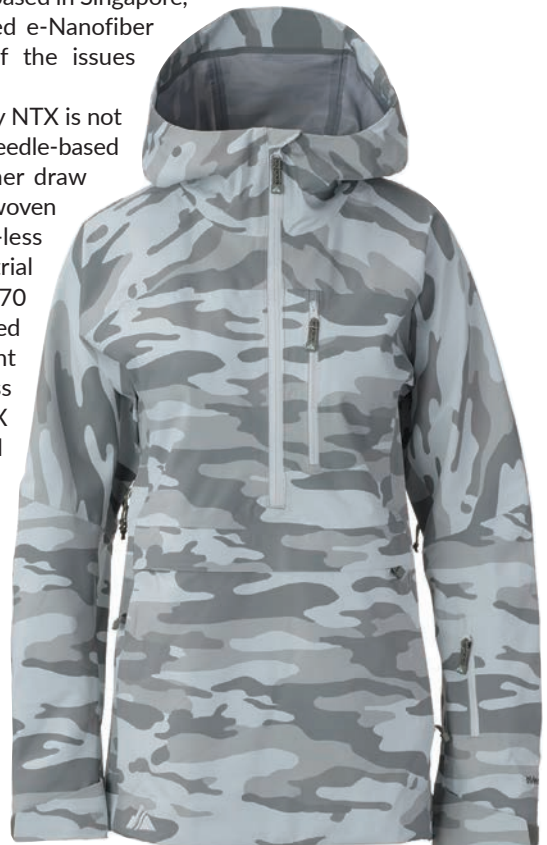
Improving on electrospinning

The success of The North Face's Futurelight launch in 2019 has attracted attention to electrospun membranes. These types of materials have a highly porous, nonwoven structure, which makes them very breathable. They will be less watertight, by nature, and have been slow to come to market. NTX, a company based in Singapore, believes its newly developed e-Nanofiber technology solves some of the issues relating to electrospinning.

The process developed by NTX is not based on multiple-nozzle needle-based systems that 'spray' or rather draw out a polymer to form a nonwoven film, but on a needle-less process, used in industrial filtration. "Our method is 70 times faster than needle-based methods and seven or eight times faster than needle-less ones," says Jeffrey Hsu, NTX chief innovation and marketing officer. "As there are no nozzles, there is no clogging," he points out. In addition to the "electrical control of the electrospinning process" that makes its e-Nanofiber

Based in Aspen, Colorado, Strafe Outerwear has lined its jacket with an air-permeable eVent DV Flex fabric.

CREDIT: STRAFE



unique, he says: “Our core innovation lies in a new extruder ‘driver’ that substantially increases surface area for fast ‘spinning.’”

NTX says the performance characteristics of its e-Nanofiber film can be tuned to adjust breathability and waterproofness. “These are, as always, a matter of compromise. Our process produces a highly air-permeable film, we can achieve greater waterproof capability by layering more nanofibre,” says Mr Hsu. He expects it to be launched by a performance sportswear brand in late 2021.

NTX’s e-Nanofiber process can also make face masks, currently in high demand. A new company based in Amsterdam, NTEU, was founded in December 2020 with European partners, to address this market. “Our system is a modular one; NTX e-Nanofiber can manufacture materials for soundproofing, filtration, PPE masks and membranes,” says Mr Hsu.

Biobased raw materials

During his studies at ETH Zurich, Dr Mario Stucki developed a new manufacturing process for membranes and founded Dimpora with fellow student Dr Anna Beltzung. The patent-pending technology has won Fashion For Good and Global Change awards, and is being introduced by Swiss eco-brand Rotauf this winter. This first iteration of the eco pur branded membrane is made from polyurethane, but the young company is exploring other polymers, including a biobased solution currently in tests by “a major sports brand,” says Dr Beltzung, Dimpora’s chief technology officer. The sustainability-minded company also plans to develop polyester and polypropylene versions to make it possible to create mono-material performance clothing. “We are screening different potential polymers, but we need to find the sweet-spot between waterproofness and breathability,” she says. A solvent-free manufacturing process for membranes is also in R&D at Dimpora.

Under new ownership, eVent fabrics, which commercialises an expanded PTFE film, is also working with new raw materials. In June 2020, Parker Performance Materials, which acquired the eVent brand in 2017, sold this business unit to Performax Pro, a company based in Hong Kong and founded by eVent managers, including Chad Kelly. “This is a decision we took with Parker a few years ago as we were looking to join a company that shared our vision,” he tells WSA. eVent continues to source its ePTFE from Parker, but the company is now free to investigate other raw materials, including a biosourced polymer it launched in early 2020.

The new reference, eVent Bio, is made from castor bean oil, which, says Mr Kelly, is a non-food crop that does not require much water to grow. The plant-based polymer is blended with nylon, in a solvent- and PFC-free manufacturing process. “It doesn’t compete in the same performance category as ePTFE but offers more stretch and a greener solution, besides opening up space for the



brand to grow,” he says. The new bio eVent has a waterproof level of 10K and 10-15K breathability. eVent is also in the final stages of developing a hyper-breathable membrane.

Interest in renewable plant-based biopolymers is growing. German membrane manufacturer Sympatex has just announced a shift to its polyester based membrane which will now include 25% biosourced content, based on Arnitel, made by DSM. In the US, W. L. Gore has partnered with Checkerspot, a biotech company that uses microalgae to make biobased oils. The partnership’s official goal is to develop a biobased DWR, which the industry is in dire need of, but it could also, conceivably, lead to a new biotech waterproof-breathable film.

As new players introduce novel materials, manufacturing methods and end-of-life solutions to provide performance outerwear with a more sustainable profile, the world of waterproof-breathable laminates appears to be changing gears. It is not inconceivable that the established players share a similar outlook.

Swiss outdoor brand Mammut is the first brand to use the new partially biobased Sympatex membrane.

CREDIT: SYMPATEX

A NEW CHEMISTRY FOR DWRs?

UK-based LiquidNano, a developer of nanoscale silica-dioxide coatings, is preparing to launch a non-PFC durable water repellent (DWR) finish. First developed to provide glass touchscreens and windshields with added strength, scratch resistance and water repellency, the technology could be used to create a water-repellent surface on fabrics, the company says. Its solution does not alter a fabric’s hand feel, as the nanoscale SiO₂ bonds to individual filaments. LiquidNano’s newly created fabric division, DiOX, plans to launch four different finishes for textiles. The range features two hydrophobic formulas, one based on nano silica-dioxide alone, the other combines SiO₂ with C6 to offer oleophobic properties. The company claims that this “hybrid” formula uses 50% less C6 than other C6 DWRs. A hydrophilic stain release finish and an antibacterial and antiviral treatment are also in the works.

Well known for its unique performance properties, wool may be a source of broader positive impacts as growers around the world begin to implement regenerative agricultural practices. The quality of a sheep's wool fibres depends on the animal's health and wellbeing. These form an integral part of the programmes that are rolling out.

Regenerative wool

The contribution of sheep to mitigating global warming is not the first thing that comes to mind when assessing the performance characteristics and sustainable nature of wool. The fibre has edged out polyester in a number of market segments for its ability to absorb moisture without becoming clammy, to thermoregulate the body in varying temperature conditions and to do so without generating unpleasant odours. For this reason, clothes made from wool tend to be washed less often and worn longer, further reducing their environmental footprint. To these well-established properties, the natural fibre could contribute a new series of benefits as farmers shift to regenerative agriculture.

HD Wool is the first company to offer regenerative agriculture-certified wool in its range of thermal insulations for outerwear. The UK-based wool specialist has partnered with the Savory Institute, an organisation founded in 2009 by Allan Savory to promote the practice of regenerative farming, believing it to be capable of "reversing climate change before it is too late". HD

Wool has adopted its certification system, Land to Market, which monitors soil health, biodiversity and ecosystem function based on a methodology known as Ecological Outcome Verification (EOV).

Working closely with wool growers in the UK, HD wool had previously joined forces with Perthshire-based wool buyer Brannach Olann to establish the WoolKeepers programme. Launched in 2019, this "farm gate to shop front" supply chain system provides traceability and transparency to brands and guarantees growers price stability. "It is not a certification scheme per se, but an assurance platform and promotion mechanism for small, isolated farmers, some of whom apply regenerative agricultural practices and whose stewardship is focused on the wellbeing of their sheep," says HD Wool CEO, Jo Dawson.

A fundamental aspect of the programme is to ensure that farmers receive a fair price for their wool. "Helping farmers to turn a profit encourages them to grow better wool," he says. For brands, Woolkeepers offers an opportunity to market a positive story, backed by imagery and videos. A QR code on the finished product will trace it back to

Icelandic sheep have developed a specific type of wool that protects them from the island's rigorous climate. Istex is a cooperative organisation that processes their fleece and seeks new markets for the wool.

CREDIT: ISTEX



the farms from which the wool was sourced. Since its inception, some 600 farmers have joined the programme, producing 520 tonnes of wool in 2020. Mr Dawson believes there is potential to expand Woolkeepers beyond the UK to other wool-growing countries.

The New Zealand Merino Company (NZM) has just released its own regenerative agriculture platform under the ZQRX label. The Christchurch-based organisation says 167 wool growers have joined the programme, representing some 2.4 million acres (more than one million hectares) in New Zealand. “ZQRX is the start of a global movement toward brands, businesses and growers working together to address critical global issues such as climate change and biodiversity loss. We dream of a day when all wool is farmed with regenerative practices,” said NZM CEO, John Brakenridge, in a statement. Icebreaker, Smartwool and Allbirds are the first brands to support the programme.

In Australia, the biggest producer of wool in the world, a similar move is under way with SustainaWOOL, an integrity scheme that covers animal welfare and land management. This programme was initially set up in 2015 by Italian wool specialists Successori Reda and Vitale Barberis Canonico to secure high-quality wool and best practices. In 2019, ownership was transferred to the Australian Wool Exchange (AWEX). The programme now has over 1,000 members, representing 10% of Australia’s wool clip. SustainaWOOL-certified wool is traced from farm to preparer; each bale must be labelled, correctly classified, and traceable using electronic bale labels.

SustainaWOOL seeks to improve practices at all levels, from grazing to shearing. “Our farmers are well aware that good animal stewardship gives better results. Twenty years ago, their main focus was productivity, they now seek to improve quality and conditions, and are more inclined to be audited. This is part of a broader transition from commodity to demand-driven social responsibility. Ethical and social issues are front and centre,” says SustainaWOOL programme manager, Dr Paul Swan.

The Responsible Wool Standard (RWS), a certification system managed by the Textile Exchange, has included new biodiversity requirements and social welfare in its latest version, introduced in March 2020. The number of certified farms has grown from 95 in 2017 to 745 in 2019, the organisation states in a market report for 2020. New South Wales farm Gostwyck in is one of the new members of this club. The property had no trouble meeting the criteria to achieve RWS certification and is often cited as an example of best practice in the country.

“You are what you eat, be you a sheep or a human. If the grass is of good quality, you will have happy and healthy sheep, and to grow quality grass, you need to look after the biology of the soil,” Gostwyck owner, Philip Attard, tells WSA. This, he says, is the basis of regenerative agricultural and



grazing. “We haven’t implemented these measures to qualify for a specific certification system. We do it because it is fundamental to quality wool and to sustain our business. We started managing soil and grass 20 years ago, before regenerative agricultural was trendy.”

As can be expected, his approach to animal welfare follows the same high standards. “We have been taking great care of our animals from the very beginning,” he says. The grower has not mulesed a lamb since 2005. Other operations, such as tail-docking and castration, are applied with an anaesthetic and pain-reducing tools. “Our staff is trained to minimise any source of stress,” he says.

Breeding out flystrike

In response to the evolution of consumer attitudes towards animal welfare, many sports apparel brands have committed to sourcing only non-mulesed wool. On farms in Australia, and to a lesser extent in New Zealand, this procedure of shearing the breech area of lambs to reduce the risk (and pain) of flystrike is slowly being phased out. In 2004, the Australian wool industry pledged to eliminate it by the end of 2010, but dropped the plan in 2009. The New Zealand industry began addressing the issue in 2007 and an official ban came into effect in 2018.

The Australian industry’s commitment to phase out mulesing by 2010 was, in retrospect “hopelessly optimistic,” says Dr Swan. “The industry has invested heavily in alternative technologies, without much success,” he concedes. One of the more promising solutions being investigated is to breed out flystrike through genetics so as to rear ‘plain-bodied’ Merino sheep. These will have no, or only slight skin folds in the body, removing the need for mulesing. “But the normal generation interval for Merino sheep is at

Wool specialist HD Wool promotes regenerative agriculture in a partnership with the Savory Institute alongside its traceable and local Woolkeepers programme.

CREDIT: HD WOOL

least two years,” Dr Swan points out, suggesting that it will take time to fully address the issue across many flocks.

Australian growers have switched to non-surgical solutions to reduce bleeding and discomfort, one of these being the freezing of the breech area. “I am not against these methods, as it could stop farmers from mulesing, but any treatment applied to the animals should be clearly indicated,” points out Mr Attard.

Since 2001, Australian wool growers have invested AU\$74.5 million (around \$58 million) into research and development that focuses on the health and welfare of their sheep, says Dr Jane Littlejohn, general manager for research at Australian Wool Innovation (AWI). “The development and wide industry adoption of pain relief for mulesing has increased from 0% in 2006, when the first analgesia product became available, to more than 86% in 2020,” she says, whilst 17,000 people have been trained in best-practice shearing and wool handling since 2015.

“At present, roughly one in every six bales sold in Australia is non-mulesed. The proportion is rising as price premiums for this type of wool increase,” says Dr Swan, who believes the rate of change will accelerate in the coming years. He adds that the sustainaWOOL framework was recently revised to better address the issue of pain relief for tail-docking and castration. “We have recommended to all our growers and supply chain partners that irrespective of whether mulesing occurs or not, pain relief should be provided for tail-docking and castration, and will look to make it a requirement in the coming 12 months.”

Regenerative sheep

Farming methods are also evolving to improve soil health, as Dr Littlejohn at AWI points out: “Australian wool growers have been leaders in the development and implementation of regenerative farming to support the environment and ecosystem health of their properties. Many Australian wool growers work with national initiatives such as Greening Australia and Landcare to restore ecosystem health and actively regenerate farmland. The industry is also currently developing a Sheep Sustainability Framework that will outline the initiatives and metrics for wool growers and the wider industry to measure the impact their stewardship practices have on the environment.”

SustainaWOOL will also be revised to better address regenerative agricultural methods. “The challenge for us is to validate positive environmental change over time on more than 1,000 individual properties and address difficult-to-assess indicators such as biodiversity. The next iteration of our grower manual, due in June, will contain significant developments in this area,” says Dr Swan.

Back in the UK, Jo Dawson believes that sheep and nature make a perfect match. “They contribute in many ways to carbon capture and healthy soil. They are powerful fertilisers, and can sequester

more carbon than they emit. If well managed, specifically with regards to flock movement, sheep can enhance the water cycle as their cloven hooves break up soil and push dung underground to fertilise soil, thus preventing topsoil loss during heavy rainfall and promoting the growth of roots. If roots are healthier, the grass will be more resilient, and the roots will provide more nutrients and minerals to the animals,” he says. This helps avoid the use of pesticides, reduces cost, and improves biodiversity, “it is all a part of a healthy ecosystem and it is good for business”. He insists that well-managed flocks have the potential to help reverse climate warming.

Innovation is up

In addition to introducing the first Regenerative Agriculture certified wool, HD Wool has also expanded its range of products with a lighter-weight insulation (75 gsm) that is said to be softer and more suited to all-season clothing.

Novel non-woven products are in development, Matthias Boehme, a wool specialist and consultant, tells WSA. He is working on a fine open-structured non-woven to make an ultra light insulation that could weigh less than 45 gsm. “It offers the same performance as an insulation three times heavier, and its non-woven structure makes it less costly and faster to manufacture,” he says.

Mr Boehme has helped Lavalan, a division of German wool specialist Baur Vliestoffe, develop local wool supply chains in Europe, and has recently set his eyes on Icelandic wool. “Icelandic sheep have adapted to the island’s hostile environment by developing a coarse cover hair and very fine hair close to the body,” he says. He is working with Icelandic wool trader Istex to

Cornwall-based surf brand Finisterre has lined its Biosmock with Woolkeeper and regenerative certified HD Wool. The synthetic PFC-free outer shell is said to be biodegradable on land and in the sea. It won an ISPO award in 2021.

CREDIT: FINISTERRE



develop a novel faux fur made in natural wool. “It is manufactured on vintage machines that are still in operation in Italy. They bind wool slivers on to a cotton substrate,” he says. The result is a novel sheepskin-like material that can be used in clothing and home textiles.

Istex is a vertical organisation that processes 99% of all Icelandic wool – farmers own 80% of the company. Its spinning facility produces knitting yarns to make the famed local sweaters. “The sheep that were brought here a thousand years ago by the Vikings are unique as they have never been crossed with other breeds,” says Eugène Pilard, Istex process manager. The sheep are allowed to roam freely in the summer months and their wool (and meat) can be considered organic, he says, as almost no chemicals are applied either on animals or land. “Icelandic people tend to let nature do her thing; the climate is so rough here, that there is no other way to do things,” he points out.

Seamless knitting

At The Woolmark Company, recent developments include seamless and whole garment knitting technologies that reduce textile waste and increase wearer comfort. For performance applications, an ultrasonic bonding tape is now available. “It creates strong, impermeable seams for complete wind and rain resistant wool-containing garments,” says Julie Davies, general manager for processing innovation for The Woolmark Company. She also mentions the Optim fibre-stretching technology that creates a wind- and water-resistant 100% wool fabric with no chemical finishes.

Icebreaker, now a VF brand, has been instrumental in promoting wool for performance clothing and it has also committed to long-term contracts with wool growers in New Zealand since 2017. In addition to pledging to go plastic-free by 2023 it is also supporting regenerative practices in farming and is part of NZM’s new ZQRX platform. “Regenerative agriculture is good for biodiversity and it can have a massive impact on carbon capture,” said Julian Lings, VF’s sustainability manager at a talk organised by ISPO. In its goal to remove all plastics and synthetics, the brand has increased the proportion of natural fibres in its collections from 84% in 2018 to 87% in 2019, of which 83% is merino wool, he said.

In 2017, The North Face, another VF brand, partnered with Fibershed to make beanies from regenerative wool sourced from the California-based organisation that develops regional and regenerative fibre systems with independent farmers. Despite its high price tag, \$60 for a beanie, it sold very well. “It was a tremendous success, and we received very positive consumer reaction. This was a real unlock for the brand,” said Mr Lings at a webinar organised by C.L.A.S.S. on regenerative agriculture.

Timberland, another VF-owned brand, has committed to shift all of the natural materials it uses, namely leather, cotton, rubber and sugar



cane, to suppliers applying regenerative farming by 2030. It has partnered with the Savory Institute to meet these goals.

Of all the natural fibres, wool is the one that has the best performance profile for activewear applications. If, at farm level, regenerative agriculture is applied to sheep grazing, its contribution to sustainability could take on a whole new dimension. For brands that support this shift, it is an opportunity to promote materials that are not only more sustainable but also have a positive impact on the health of the planet. 

Australian yogawear brand Nagnata has partnered with the Woolmark Company to create a seamless activewear collection made from Australian merino wool.

CREDIT: THE WOOLMARK COMPANY



Prada has collaborated with The Woolmark Company to develop high-performance garments for the Luna Rossa Prada Pirelli Official Sailing Team Uniform.

CREDIT: THE WOOLMARK COMPANY



Moves to minimise microfibre shedding

Piece by piece, or rather report by report, thanks to academic research and industry organisations, a body of evidence on textiles and microparticle pollution is coming together. But many gaps in the puzzle remain. Understanding the role that textiles and apparel play in their proliferation is particularly difficult as these minute fragments are hard to collect and isolate, their composition is not always easy to identify with precision, and there is scant research on the sequence of events that carries them from factory, wastewater treatment plant, washing machine or garment itself (who knows?) to the remote, natural locations across the globe where they are being found.

Before the science sorts out the intricacies of the phenomenon, the textile industry can only conjecture. Intuitively, it is suspected that spun yarns would be more prone to releasing microparticles than continuous filament yarns. A spun yarn is made from short staple fibres that have either been cut from longer continuous filaments or are short by nature, as is the case with cotton and wool. It is believed that they might be

Much is still unknown concerning the source and impact of microfibre pollution from textiles and apparel and levels of concern remain high. While collecting and testing protocols are in development in laboratories to further the science, it is in the mills that the search for possible solutions is taking place.

more liable to break away from the twists of a yarn. UK organisation The Microfibre Consortium (TMC) has tested many fabrics; its research does not confirm this hypothesis.

Using a test method developed by TMC and considered “a reliable and robust method to quantify fibre fragmentation from textile fabrics,” as Dr Mark Sumner of the University of Leeds said in a TMC statement, his team found that: “Fragmentation is a complex process that is

Santini chose a Polartec Power Air fabric to create a thermal jacket offering both high performance and reduced fibre-shedding. It is part of the Italian brand's UCI racewear collection and won a Polartec Apex award.

CREDIT: POLARTEC / SANTINI

affected by materials, fibres, yarn structure, fabric structure and finishing processes. Simple statements that one fabric type is worse than another ignore this complexity and mislead product development teams. For example, when testing two fabrics which appear to be the same, in that they are both knitted filament polyester, Fabric B had over 30 times more fibre fragmentation than Fabric A. There is much more work needed to fully understand how fabric material and structural factors influence fragmentation”.

Spinning new solutions

The search for solutions is, nonetheless, on. As anticipated, yarns and fabrics that profess to reduce the risk of fibre fragmentation base their claims on the use of continuous filaments.

Polyamide specialist Nylstar, based in Blanes, Spain, is introducing what it calls a ‘zero microfibre release’ Meryl yarn. It is made using the company’s hydrogen technology. “This special spinning process creates a strong bond between the hydrogen molecules, and this bond will be more difficult to break down,” Nylstar marketing manager, Zuzana Vaskova, tells WSA. “It is a slower production process than was used in the 1980s. It allows us to spin higher-quality and more sustainable filament yarns. These yarns have a very good hand-feel, and do not need any chemical additives or softeners, which makes them more sustainable.” Garments made from this Meryl yarn will therefore last longer and presumably shed fewer microfibrils when washed and worn.

To support this claim, Nylstar works with Leitat, an innovation laboratory also based in Catalonia, which has the equipment to measure microfibre release into air or water. “Customers can have their fabrics tested in the lab to certify that they release no microparticles,” says Ms Vaskova. Leitat is a part of the Cross-Industry Agreement (CIA) network, an initiative launched in 2018 by five industry organisations, from sports (FESI and EOG), textiles (CIRFS, Euratex) and the detergent sector (AISE) to tackle microplastics released from fabrics. It has recently published an update on its research and announced that a harmonised test method had been developed and handed over to the European Committee for Standardisation (CEN). It may lead to an official normalised testing method in the EU by the end of the year.

Brazilian spinner Airjet Global also claims to have developed a spinning process that reduces fibre fragmentation. The patent-pending method, which it has branded Clean Ocean, can work at large scale and is specifically designed for blended fibres, such as polyester or polyamide combined with other synthetic fibres or with cotton, cellulose or other plant-based fibres. Without revealing the technical details, Airjet Global CEO, Fernando Marin, says it is the result of 10 years of research and development, and that it reinforces the physical connections between fibres so as to reduce the risk of releasing particles. The company tests its yarns by subjecting 10 cm swatches of



fabric made from its blends of cotton, polyester, elastane and others to a rotating cylinder filled with steel balls. “Our research shows that fewer fibres are released than with fabrics made from conventional cotton-polyester spun yarns,” says Mr Marin.

“It is complex and expensive to modify spinning machines to change composition or even yarn count,” he tells WSA. “But our method is quite flexible and adaptative. We can produce yarns in relatively small quantities (around 30 kg) and we can switch easily from a 100% cotton yarn to a 50% polyester-50% cotton or 80% polyester-20% cotton. We can also test new bio-fibres or mixes with technical fibres such as silver, Kevlar or carbon.” Airjet Global produces two main product ranges: BioCell yarns are made from fibres that are believed to biodegrade in landfill and LoopCell yarns, made from virgin or chemical recycled fibres (mainly synthetic) that can be further recycled.

Fabric engineering

In 2018, Polartec launched Power Air, a solution developed by the US-based performance knit manufacturer to offer both thermal insulation and reduced microfibre shedding. “It provides advanced thermal efficiency but sheds up to five times less than other premium mid-layer fabrics,” says Doug Kelliher, VP of product development for the Milliken-owned company. “While all fabrics will shed fibres over time, Polartec Power Air is a step forward in reducing the environmental impact of what we make and wear.” The fabric was chosen by Houdini to make a seasonless and versatile jacket, whose monomaterial design the Swedish brand has made available on an open-source basis through its Project Mono Air (see article in WSA Nov/Dec 2020). Houdini is one of the brands blazing new trails in sustainability, and it also

Meryl Skinlife Force with HeiQ Viroblock Permanent was voted the best product by ISPO Textrends for 2021. It is made from Nylstar’s zero microfibre release yarn and has an exceptionally soft hand-feel.

CREDIT: ISPO TEXTRENDS

stands out for its readiness to share its research.

Adoption of Polartec Power Air has been high, Eric Yung, international vice-president for Polartec, tells us. “The first brands to show interest came from the outdoor sector, but snowsports, cycling and lifestyle brands were quick to integrate it into their collections. For those brands that feel concerned, we have a solution that we have spent quite some time developing and we have a reliable test to back it,” he says.

Innovation in tools and systems

The fibre reinforcement system in development at Natural Fiber Welding, a company based in Peoria, Illinois, could also be a solution to reduce microfibre leaching. Its process “welds” short or staple cotton and cellulose fibres to make high-performance yarns or fabrics, which it sees as an alternative to polyester. “NFW provides cellulose with the performance necessary to displace polyester,” company founder and CEO, Dr Luke Haverhals, states.

Zyosh, a company based in Barcelona, which is part of textile group Augusto Bellini, has devised a system and smart label for companies concerned about the issue and to help raise awareness at consumer level. The system is based on assessing microfibre release from individual fabrics that are tested in a lab. The tag then keeps track of how many times an item of clothing has been laundered by changing colour. “At this stage of our knowledge, we have focused on the fabric itself, its composition and construction, and on the effect of home laundering,” says Pepe Costa, Zyosh founder and CEO. Launched late last year, the concept is designed for textile manufacturers and clothing brands or retailers. Zyosh says it is in advanced discussions with brands.

Though the science is still out on many aspects of this issue, the European Union has already mentioned microfibre pollution from textiles in its Green Deal and Circular Economy programmes. A distinction is being made between primary and secondary microparticles. The former are intentionally added, such as microbeads in cosmetics and cleaning products, while the latter are unintentionally released, which is the case for textiles. “These are much more complicated to address,” points out Mauro Scalia, Euratex director of sustainability. “It is easier to remove an ingredient than to avoid something unintentional. Furthermore, we do not yet have enough information and data to fully understand the phenomenon.” As mentioned above, developing a consensus around a test method is a first step in the right direction. Euratex, as part of the CIA, has supported research in this area. The creation of a recognised testing protocol will also help TMC, which has joined the CIA network, build up its fabric database on fibre fragmentation.

TMC’s own test protocol, ‘Quantification of fibre release from fabrics during domestic laundering’, was made available to the consortium’s members in 2020. “Member labs and approved third-party testing labs have been using



this method since April last year to test submitted fabrics,” TMC managing director, Sophie Mather, said in an emailed statement. Some 200 fabrics have already gone through the process. “We are collaborating with members to test more fabrics, in specific research areas, that will provide the consortium with the data depth needed to produce conclusive industry statements,” she says. TMC membership includes some 40-plus organisations and sports apparel brands, from adidas to Vaude.

As the search for a better understanding of fibre fragmentation continues, some companies are mindfully taking measures to manufacture higher-quality products, as seen at Nylstar, Airjet Global, Polartec and Natural Fiber Welding. These yarns and fabrics will presumably be used to make higher-quality garments that last longer. They might also shed fewer microfibres. As a first measure to minimise microparticle release, it could be a fairly simple solution for a particularly complex issue. 🌱

Polartec Power Air made in recycled polyester and designed to limit fibre fragmentation is the key fabric in the Project Mono Air Houdi, an open-source design by Swedish brand Houdini.

CREDIT: HOUDINI

The smart tag created by Zyosh keeps track of potential fibre-release by changing colour when an item of clothing has been washed, based on laboratory testing of the fabric.

CREDIT: ZYOSH



less contamination



more collaboration



RISE TO THE CHALLENGE

The Hong Kong Research Institute of Textile and Apparel (HKRITA) has announced a new, five-year collaboration with the H&M Foundation. They have chosen 'Planet First' as the theme for this new chapter in their work together to drive further sustainable development in the textile and fashion industry.

Solutions for a changing world

Major change is coming to the textile and apparel sector whether consumers and brands like it or not. This is the conclusion that partners The Hong Kong Research Institute of Textile and Apparel (HKRITA) and the H&M Foundation, an independent, non-profit global foundation funded by the main owners of fashion retail group H&M, have come to after working together since 2016.

The two groups announced at the end of 2020 that they are extending their partnership for a further five years and will “scale up” their ambitions. They are launching a new programme of initiatives called Planet First. HKRITA will conduct research on current and new technologies and look into the possibilities for commercialising them. H&M Foundation will invest \$12 million in the programme; further support will come from the Hong Kong government's Innovation and Technology Fund taking the overall budget to as much as \$100 million.

“Our goal is to find technologies and solutions that we can openly share with the industry to ensure rapid scaling and a positive impact,” says HKRITA chief executive, Edwin Keh. Garment-to-garment recycling machines are among the achievements of the existing partnership so far. One has been operating in Hong Kong for some time and a second opened in an H&M store in Stockholm in the autumn of 2020. Calling them “Green Machines”, Mr Keh explains that, while the Hong Kong unit has been operating at a capacity of 150 kilogrammes of clothing per day, the Stockholm version is a scaled-up, industrial system that will have a daily capacity of 1.5 tonnes [see panel].

In all, between 2016 and 2020, the partners completed 11 projects, generating 24 distinct pieces of intellectual property

Recycled polyester jogging pants and top from clothing brand Monki, the first garments to result from the Green Machine fibre recycling initiative

CREDIT: MONKI



and winning ten global awards along the way. Four projects are ongoing and will carry forward into the Planet First programme out of what Mr Keh calls a desire to scale up and develop real-world applications.

Pain-points

Innovation lead at the H&M Foundation, Erik Bang, says he believes further exciting results will come in the course of the next five years of this relationship. He describes both organisations as being “very impatient” for progress and “not afraid to take risks” on the road to achieving it. “Planet First will be, to our knowledge, the largest programme in the industry,” Mr Bang says. “We are talking about a full \$100 million to develop solutions and address systemic pain-points for the fashion industry.”

Innovations the two partners will seek to take forward include a new type of cellulose sourced from algae. Their hope is that the algae and other natural sources can become replacements for some of the more energy-intensive materials the apparel industry uses at the moment while also helping to clean up some of the wastewater that factories generate.

Other new types of cellulose can come from recycled content in general and from the Green Machines in particular. Mr Keh has already shown the market a prototype T-shirt made from 80% recycled fibres, with 50% of all the material in the garment coming from the Green Machine. “The output from the Green Machine is at no price premium to virgin comparables,” he says, “and its performance is as good.”

There are also prototype versions of clothing made from entirely new materials, including a T-shirt that absorbs CO₂ as the wearer walks around. One T-shirt can absorb around 33% of the CO₂ that a tree absorbs every day, the HKRITA chief executive explains. “We see this as a way for the industry to become carbon-neutral,” he says, “and move towards becoming carbon-negative.” These T-shirts will come to market in the course of this year. He adds that all of the intellectual property arising from Planet First will remain with the Hong Kong-based non-profit institute and, therefore, become available to “all collaborators”. He adds: “Speed, impact and scale will continue to be the hallmark of what we do in the next five years as we create an open platform for solving the big challenges facing our industry and our world.”

Regeneration game

Erik Bang explains that this must lead to a regeneration of resources. Any time we use and enjoy a product, we must leave behind a world that is “a little bit better”, he says. He adds: “This is the only resilient insurance we can have against the inescapable consequences of climate change and biodiversity loss.” Examples will include technologies that can make sure the water exiting a factory after treatment is cleaner than the water coming in, and ideas such as the

“Change is imminent whether we like it or not, whether we decide to do anything about it or not,”

ERIK BANG, H&M FOUNDATION



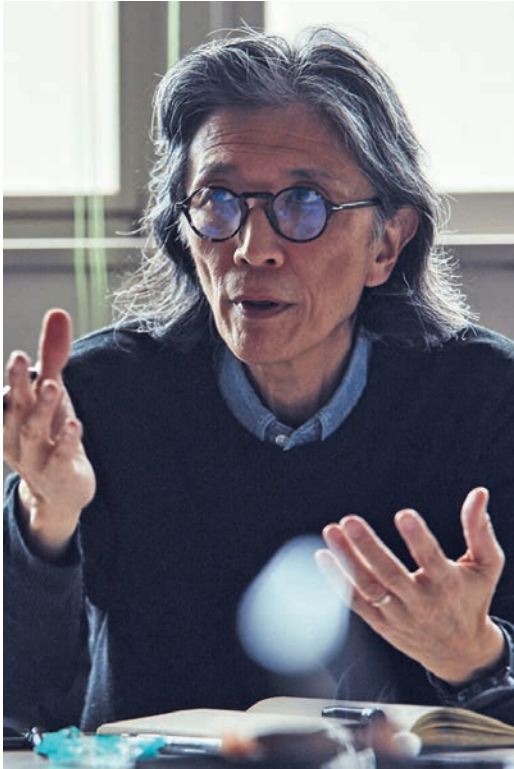
CO₂-absorbing T-shirt, which he describes as “a visionary garment”.

In keeping with this, the aims of Planet First will be to encourage innovation in regenerative farming, production processes, wastewater treatment, the sequestration of carbon and other areas.

There is, he argues, a lack of access to help from industry and to the equipment necessary to test and pilot good ideas. “This is holding change back,” he continues. “Because Planet First is so well funded, we will build a joint-lab, a collaborative, physical space with equipment and a whole miniature factory. Here, innovators and start-ups will be able to come in and demonstrate how their ideas will work in a real environment.” Companies already established in the industry will receive invitations to visit, too, to help build up not just a supply of new ideas, but demand for them, through brands that are willing to become Planet First partners. Their reward will be an opportunity to scout new solutions and try them out. “Coming up with solutions only takes us halfway there,” Mr Bang says. “The second half is to have these solutions adopted in the real world. We don’t want this to end up as a scientific exercise but for it to develop real solutions.”

Erik Bang, innovation lead at the H&M Foundation, says we are living in the most decisive decade in human history.

CREDITS: H&M FOUNDATION



Chief executive of HKRITA, Edwin Keh, has called on clothing brands and innovators to contribute to a new joint-lab in Hong Kong, part of the Planet First initiative.

CREDITS: HKRITA-H&M FOUNDATION

Most decisive decade in history

The joint-lab will be in Hong Kong; HKRITA is engaged in recruiting as many founding members as possible, then it will carry out design work, move in existing equipment and install some new resources. "It's a work in progress," says Edwin Keh, "but Hong Kong is a good place for us to do this because we want to solve challenges up and down the supply chain. Hong Kong is ideal because we have manufacturing, retail and distribution here; we sit on everyone's supply chain."

Erik Bang's assessment is that we are now living in a decade that will prove to be "the most decisive" in human history. It is ten years until the deadline for meeting the United Nations' Sustainable Development Goals. To demonstrate that ten years is not a long time, he points out that it is already more than five years since 196 state parties adopted the Paris Agreement on climate change. It is almost 15 years since former US vice-president and presidential candidate Al Gore released 'An Inconvenient Truth'.

"We really can't kick this can down the road any further," Mr Bang continues. "It's not a long-term problem but a near-term crisis that we face. Change is imminent whether we like it or not, whether we decide to do anything about it or not. The world as we know it will change and I think it's fair to say that the change we are about to see from climate change will make all these months of covid-19 seem like a walk in the park." He goes on to talk about the urgency of this presenting an

opportunity to make a difference, an opportunity for his organisation and for HKRITA, but for others in the industry too. He says an "inspiring momentum" is building up behind the demands for change and that addressing the technical and structural pain-points will help this momentum grow stronger.

For Edwin Keh, the key point is that consumers will be looking for reasons to buy as they emerge from the pandemic. Offering sustainable products is to give them a good reason. One motivation for brands to think about sustainability, circularity and climate change in the midst of the pandemic, he argues, is that this will help them prove themselves "relevant to what it is people are concerned about". He adds: "The brands that win out of this pandemic will be the ones that proceed with purpose and with these aspirations." 🌍

GREEN MACHINE LEARNING

The Green Machines that the HKRITA and H&M Foundation partnership has delivered so far, one in Hong Kong and one in Stockholm, use a hydrothermal process that fully separates the cotton and polyester in blends into new fibres in the case of the polyester and a cellulose powder in the case of the cotton. The process is gentle, which allows the fibres to retain their properties. When this partnership launched in 2016, the two organisations say that there was no such method in place for recycling clothing made from poly-cotton blends, as so many garments are.

They pay great credit to a research team at the Faculty of Textile Science and Technology at Shinshu University in Japan, led by Professor Kanji Kanjiwara, whose work led to the hydrothermal process breakthrough.

As a result, the Green Machines work using only heat, water, pressure and "a biodegradable green chemical". These are reused in a closed-loop system, creating no secondary pollution.

So far, the polyester fibres that the Green Machines are producing are going into new clothing. HKRITA chief executive, Edwin Keh, explains: "We saw this as a great opportunity to offer recycled product with no compromise on quality." A big part of the challenge is that virgin polyester is cheap. This, in the words of H&M Foundation's lead on innovation, Erik Bang, makes it difficult to come up with a viable alternative. But, in 2020, Monki, a Swedish fashion brand that became part of the H&M group a dozen years ago, released an inaugural clothing collection made from these Green Machine fibres, a world first.

As for the cellulose powder that the recycled cotton produces, the partners will work on ways to use this in clothing too as part of the new Planet First programme, but other uses are possible as well: for example, they believe the powder can help improve cotton farming.



Output from the Green Machine is recycled polyester fibre and a cellulose powder from cotton fibres.

CREDITS: HKRITA-H&M FOUNDATION



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The look of Aetrex's Albert 2 is partly inspired by Apple's aesthetic, which Mr Schwartz considers to be the "gold standard" in design.

CREDIT: AETREX



Best tech forward

National lockdowns have left many physical shops shuttered around the world, leading to a rise in augmented reality (AR)-enabled virtual try-ons and other forms of technology-forward, digital interactions. Out of necessity, adoption of e-commerce (especially m-commerce or mobile shopping) has accelerated on account of the pandemic. Retailers that are abreast of this trend are keen to boost profitable customer engagement with products ahead of purchase – not only to drive conversion, but also to mitigate against ever-escalating online return rates.

In a report released last June, Boston Consulting Group (BCG) estimated that 14% of consumers in the US and 17% in China had bought fashion (at all price points) online for the first time due to covid-19's devastating impact on the global physical retail landscape in the first half of last year. By December, however, BCG partner, managing director and global head of luxury, Sarah Willersdorf, approximated that three-quarters of customer service calls to luxury brands, alone, were motivated by returns (or delivery) queries.



NEWCOMERS

Hassle-free returns come at a cost but have never been more in vogue than in the current covid-19 era, for both retailers and shoppers. Technology providers are working hard to ease the burden by improving consumers' chances of choosing the right size from the outset.

Prone to returns

Prior to the surge in online shopping prompted by the pandemic, online sales amounted to some \$427 billion in 2019, and returns were \$41 billion, of which footwear and apparel accounted for 28% according to a report by Apriss Retail, a returns fraud detection service. Also in 2019, CEO and co-founder of returns management enterprise Happy Returns, David Sobie,

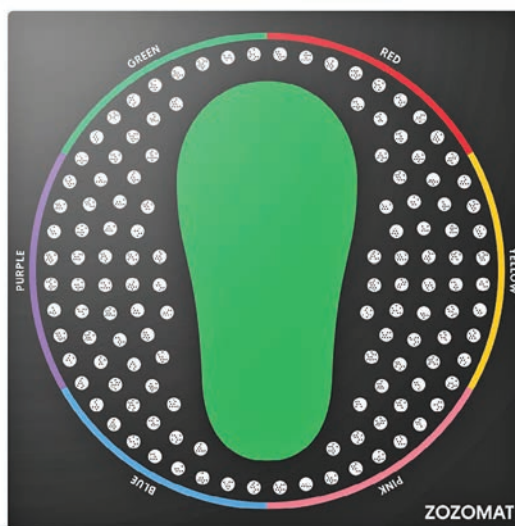
suggested that online shoppers return around 15-40% of their purchases on average, compared to approximately 5-10% of merchandise purchased in-store. While apparel bought online is especially prone to returns, according to GlobalWebIndex data, owing to some e-commerce shoppers' practice of 'bracketing' (ordering the same item in multiple sizes, only to return those pieces that don't fit), footwear does not fall far from the clothing tree.

As pointed out to WSA by VP of measurement projects at Zozo (the parent company behind Zozotown, Japan's leading online fashion retailer), Takayasu Yamada, the inability to try on footwear prior to purchase makes buying – and selling – footwear online “exceptionally challenging”. Mr Yamada views bracketing as unsustainable for e-retailers such as Zozotown, which he says is particularly committed to solving sizing-related shopping problems for its customers, in order to keep product returns low. (Zozo independently measures all units purchased from suppliers, for example, which enables Zozotown to make sizing recommendations to its Japan-based shoppers with a greater degree of confidence.)

Welcome mat

The company's foot measuring Zozomat device, a printed mat released exclusively via Zozotown in June 2019, is a testament to this. Designed to solve the sizing-related challenges posed by purchasing footwear online, including returns, roughly 1.4 million Zozomats had been distributed throughout Japan as of last November. First conceived as Bluetooth-enabled “smart socks” with woven sensors, Zozo later found a printed mat to be more accurate and cost-effective.

Over 1.3 million people have so far scanned their feet using the Zozomat and its linked Zozotown app, which wirelessly supports and records the foot-measuring process. Data

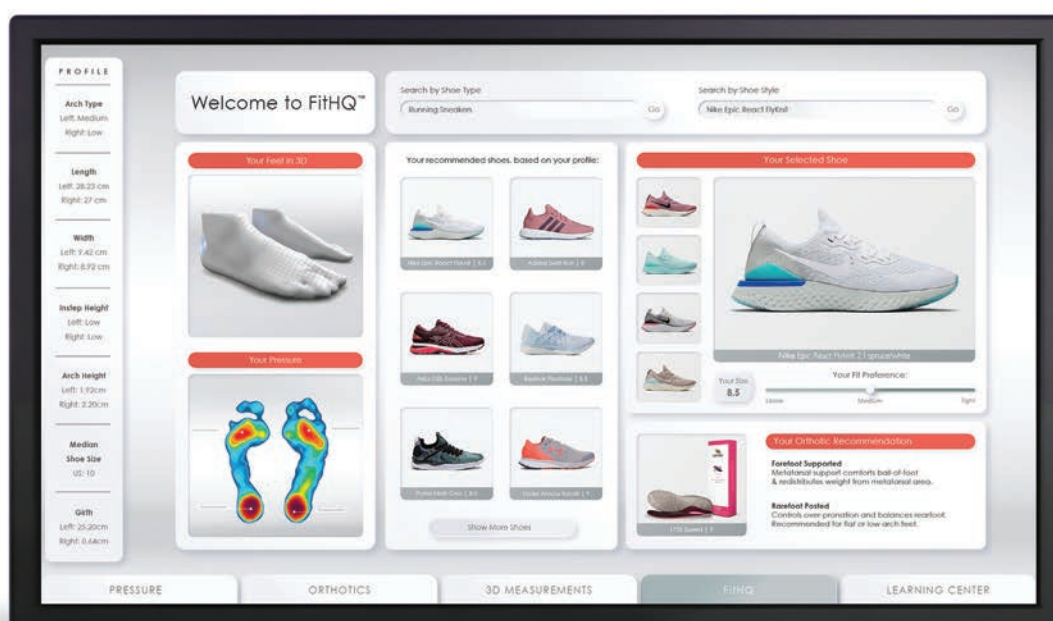


Lightweight and portable, the Zozomat is ideal for personal use at home.

CREDIT: ZOZO

collected from these foot scans has subsequently been used to support the sizing recommendation of “well over 1,000” shoe models sold by the company, with this figure expected to continue to rise substantially. Zozo can even map what an “average” Japanese foot looks like mathematically based on the scan data, which can then be used by footwear brands to design better-fitting products for the Japanese market, Mr Yamada says.

In comparison to non-Zozomat-compatible shoes, the return rate for Zozomat-compatible footwear is 36.9% less. What is more, Zozo has been able to track that around 25% of customers who have purchased footwear after scanning their feet using the mat are first-time shoe buyers on Zozotown, suggesting a keen appetite in Japan, at least, for technology-driven home body-measuring devices. Illustrating this, the company released its Zozosuit 2 technology in October. Designed to incorporate over 20,000 fiducial markers, compared to the 450 markers featured on the suit's original version, the



Aetrex's AI-powered FitHQ empowers users to access and make purchasing decisions based on their unique foot data from their phone, tablet or computer.

CREDIT: AETREX

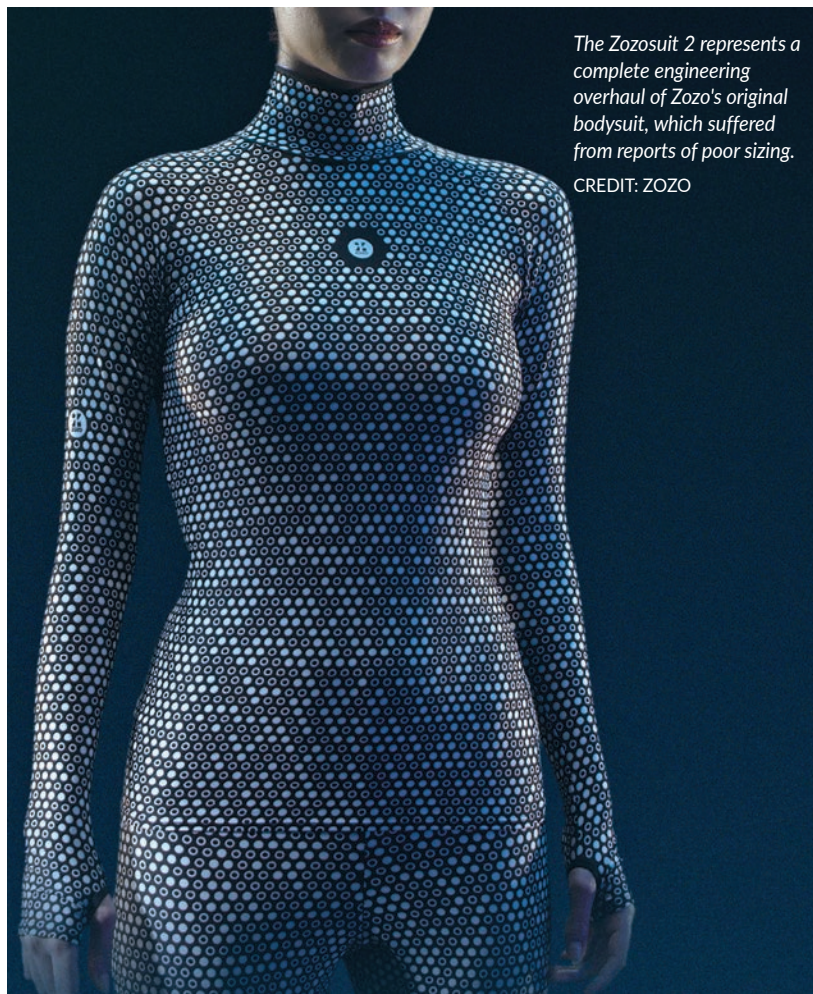
stretchy Zozosuit 2 factors in limb movement, cluttered backgrounds and even poor lighting to ensure increased accuracy when recording full-body measurements.

Accurate and complete

US-based Aetrex, which describes itself as the global leader in foot-scanning technology and orthotics, but also specialises in comfort shoes, today sees around 57% of its sales come from its technology and orthotics divisions combined. Its latest foot-scanning device, Albert 2, is set to launch in stores across North America this February. Covid or no covid, Albert 2 is primarily designed to help retailers “solve today’s challenges” by providing in-store customers with “accurate and complete” foot information (including 3D sizing and pressure underfoot data) in 20 seconds or less, CEO of Aetrex, Larry Schwartz, tells WSA. Servicing remotely and helping to reduce returns through finding the right fit “on the first try” are all central components to this ambitious plan.

When WSA spoke to Mr Schwartz in late 2020, Aetrex was in the middle of updating its mobile app, in order to achieve “an at-home experience in line with Albert 2”. Currently, its mobile technology can capture foot size measurements, but it is unable to read customers’ pressure underfoot as they would experience when stepping onto an Albert 2 device in a physical store, Mr Schwartz says. (To Albert 2’s in-store users, Aetrex supplies its proprietary, artificial intelligence [AI]-enabled FitHQ technology, which allows customers to access their unique 3D footprint data from any digital device and shop their best fitting Aetrex orthotic or other footwear by brand, style and size.)

BCG predicts that consumers will be choosier about when they shop, what they shop for and how much they spend going forward, as a direct consequence of the coronavirus crisis, with



The Zozosuit 2 represents a complete engineering overhaul of Zozo's original bodysuit, which suffered from reports of poor sizing.

CREDIT: ZOZO

digital channels in key markets making up a larger proportion of total sales. How retailers and digital disruptors respond to these shifts, both during and post covid-19, will map their rise or fall. Returns – an inevitable, innate part of shopping – will not be eliminated, but retailers who put their best (home-friendly) tech forward can make returns less of a problem.



The in-store Albert 2 also captures underfoot pressure data. CREDIT: AETREX



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Shortly before he became seriously ill last summer, ultrarunner Tommy Rivers Puzey (Tommy Rivs) lent his expertise during the development of the running shoe.

ALL CREDITS: CRAFT

Distance learning

Swedish sportswear brand Craft has launched a new running shoe, the CTM Ultra Carbon, which it describes as “ultra-innovative”. Its durability and grip on a wide variety of surfaces mean the shoe is destined to break new ground and set new personal records across the world, according to the brand.

Explaining this claim, the brand’s product and marketing director, Daniel Högling, says Craft spent years in the laboratory obsessing (his choice of word) over aspects such as energy-return and heel-drop. In the end, this work led to the durability and versatility the company was looking for in a shoe that he insists will help runners gain vital seconds, perhaps even minutes over longer distances. “If you are competing at extreme distances,” Mr Högling says, “this is your shoe.”

Lug love

A three-piece, lugged traction rubber outsole, the Ultra Trac, contributes to this. The different shapes and the configuration of the lugs help with landing and with toe-off traction, and provide grip on varied surfaces. This outsole is designed to be lightweight, flexible and to maintain high levels of durability.



FOOTWEAR TECHNOLOGY

Durability, an outsole too provide grip on a wide variety of terrain types, a split in the carbon plate and the insight and expertise of ultrarunner Tommy Rivs combine to make a new shoe from Craft a product of interest for long-distance runners.

The construction of the shoe also combines a proprietary, lightweight ethylene-vinyl acetate-based material called Vault Foam in the midsole with a carbon plate for energy-return. The carbon plate is also a proprietary component, which the Swedish company has called the Ultra Carbon Plate.

One point the brand makes about this is that the carbon fibre in the plate is carefully sourced from specialist suppliers and that its thinness makes it work “almost like a trampoline” in terms of energy-return. “It’s crucial how you put the

fibres together to get the exact stiffness, torsion, proportions, flex-points and weight you are looking for," Daniel Högling says. "We tested several versions during the development process."

Split vote

There is a split in the plate, which allows a runner's big toe to press on the medial side while the other toes press on the lateral side. According to Craft, the benefit of this is that it creates torsion and, as a result, provides added rebound. The brand says it wanted "an aggressive shape" for the carbon plate. This was one of the areas in which it benefited from working on this design with well-known trail runner, ultramarathoner and physical therapist Tommy Rivers Puzey. This happened before the athlete, known in the running community as Tommy Rivs, became ill with cancer in July 2020. "At first Tommy felt the carbon plate was too stiff, torsion-wise, during the field tests," Mr Högling continues.

Bearing in mind that ultra-distance races often involve quick turns on difficult terrain, they came up with the split-toe design, which makes the torsion less stiff in the forefoot but represents no compromise on the forward drive that a carbon plate can give.

Tommy Rivs began his dialogue with Craft about shoes several years ago and began working formally with the Swedish brand in 2019. "We had the idea of making the most versatile carbon-plate running shoe on the planet," Mr Högling says, "and to take it to an extreme fastest-known-time (FKT) challenge, but those plans changed due to Tommy's health conditions. He contributed a massive amount of insight to the research and development process and performed a number of field-tests on prototypes. He is still in direct dialogue with our research and development team. He is a fighter."

Whole system

Mr Högling explains that the considerations developers need to bear in mind when working on shoes for ultra-distance running differ only



The shape and the configuration of the lugs on the sole are designed to help runners keep their grip on a variety of surfaces.

slightly from the requirements for standard-performance running shoes. "The sole profile, the foam technology, the weight, the toe-off geometrics, the last, the upper and, in this specific case, also the carbon plate need to come together as one piece," he says. "They all need to work as a system together. For ultra-distances, what we found was the midsole profile and geometrics can help the runner a lot, if designed in an optimal way."

Combining the carbon plate profile, the rocker shape and various other details have led, Craft believes, to a design that can help runners save energy; their muscles work more efficiently during the run, the product director says. As mentioned above, durability, because the distances are longer, and grip that adapts to various types of terrain were other points of focus. 

Craft says its new CTM Ultra Carbon shoe incorporates lessons it has learned about the ways in which midsole profile and geometrics can help runners.



“The thought of experiencing that valley without any ice makes me sad, but it also motivates me,”

ALICE MARTIN, MAMMUT



Plans on ice

Switzerland-based outdoor brand Mammut has announced a plan to present all of its sustainability and corporate responsibility activity under the single, thematic umbrella of 'Together For Glaciers'. Speaking at ISPO Munich Online 2021 in February, the brand's corporate responsibility manager, Alice Martin, said Mammut had taken the decision to do this after calculating its carbon footprint and seeing from its analysis the need to set "even clearer priorities".

Ms Martin talks about having been fascinated by glaciers herself since childhood, describing them as majestic places where snow stayed all year round. They, and the mountains that surround them, remain an important source of inspiration for her. "They form a landscape in which we grow beyond ourselves," she says. The Aletsch glacier in the Swiss canton of Valais, the largest glacier in the Alps, is a good example.

Time running out

She has crossed it several times on the way to climbing mountains such as the Aletschhorn on the western side. She may have imagined that this glacier and others would always remain as they were when she visited, but scientific modelling predicts that the Aletsch will have melted completely by the end of this century if climate change continues at the rate we have seen in recent years.



SUSTAINABILITY

Swiss outdoor brand Mammut is concentrating all of its work on sustainability under a new umbrella term, Together For Glaciers. It says that melting glaciers serve as a reminder that, if we are to stop climate change from causing irrevocable damage to our way of life, time is running out.

Even taking what she calls "severe measures" at a global level and achieving the goals of the Paris Agreement (to limit global temperature increases to less than 1.5°C above pre-industrial levels), most of the glacier will be lost. "As an outdoor brand, and as individuals who love the outdoors, climate change hits us in our innermost being," she says. "The thought of experiencing that valley without any ice makes me sad, but it also motivates me."

For Alice Martin, glaciers are a symbol of the challenge that companies and consumers face, a visible reminder that time is running out and that reducing CO₂ emissions is urgent. She also points out that facing these challenges is "a team sport"; none of us can solve them alone.

A Mammut expedition on the Aletsch glacier in Switzerland.

ALL CREDITS: MAMMUT



A Mammut baselayer top in organic cotton. The brand is aiming to make all of its cotton organic by 2025.

Guiding principles

Head of corporate responsibility for the brand, Adrian Huber, explains that Mammut began focusing closely on sustainability in 2002. The basic principles it set out for itself were that it wanted to work with best available technology, to the highest industry standards and with the best partners it could find. It also decided to take a systemic approach to make sure initiatives it put in place would make an impact across the whole of the company. It also realised there was a need to set key performance indicators and targets, to measure what it was doing and to report the results of its efforts transparently.

In 2008, Mammut became the first outdoor brand to join the Fair Wear Foundation, the independent non-profit organisation that aims to improve working conditions in the clothing industry. One year later, it began a switch from conventional cotton to organic. On this, Mr Huber says the benefits of organic cotton are clear: it requires no pesticides and, therefore, if brands choose to use it and farmers grow it in response to that demand, it means fewer hazardous chemicals in the supply chain. Another milestone came in 2013 when Mammut was able to declare that the organic cotton T-shirts it was offering customers were now climate-neutral. One million T-shirts later, this commitment is still in place today.

Natural hat-trick

Around the same time, the company became a member of bluesign to make sure the chemicals in use in its supply chain and in its products are non-hazardous. It also embarked on an initiative to use recycled polyester instead of virgin. It

signed up to the Responsible Down Standard in 2015, referring to it as “a breakthrough and an important step toward ethical and completely transparent down supply chains”. It followed this a year later by committing to the Responsible Wool Standard.

It completed a hat-trick of measures to show it procures animal-derived fibres carefully by sourcing more than 80% of the leather for its footwear from German tanner Josef Heinen, using its Terracare leather, which produces lower carbon emissions, less waste and uses 40% less water than the industry standard. “Heinen is a fourth-generation family company that is entirely transparent and has adopted the highest social and environmental practices,” Mr Huber says.

For the sake of comparison

To help it keep to the commitment to measure its impact and to keep track of progress, Mammut is a member of the Sustainable Apparel Coalition (SAC). It is fair to say that confidence in the Higg Materials Sustainability Index (MSI), which the SAC launched in 2012 to help companies assess the sustainability of materials for use in footwear and garments, has been higher than it is at the moment. It has faced criticism for its perceived tendency to favour fossil-fuel-based fibres over natural ones and for a lack of transparency over the methodology it uses to calculate environmental impact. However, Adrian Huber makes a valid point when he says: “The Higg provides a set of tools to measure performance throughout the value chain. All members, and there are more than 200, use the same tools, the same methodology. This allows us to compare ourselves to others, to benchmark.”

On signing up to the United Nations ‘Fashion Industry Charter for Climate Action’ in 2018, Mammut took what the head of corporate responsibility refers to as 16 “sub-commitments”, all with a view to aligning itself with the Paris Agreement. One of the outcomes of this is that it has now committed to reducing its greenhouse gas emissions by at least 30% in the next ten years and to become climate-neutral by 2050. It is using the figures it captured for that year, 2018, as a baseline.

An Alvra hiking shoe. More than 80% of the leather Mammut uses in its footwear is from German tanner Josef Heinen's Terracare range.



Scope for improvement

It measured its total emissions for the year at 58,000 tonnes of CO₂-equivalent. Of these, Mammut found that 3% of the total were scope-one emissions, which is to say direct emissions from company-owned and -controlled resources. For scope-two, reflecting its indirect emissions from the energy it consumed that year, the figure was 2% of the total. This means that 95% of the 58,000 tonnes of CO₂-equivalent that Mammut took responsibility for in 2018 were scope-three, indirect emissions from upstream and downstream supply-chain partners.

It was no surprise to Adrian Huber that activities Mammut does not own contributed such a large proportion or that the biggest contributor within scope three was materials. A roadmap it has drawn up to meet the target of a 30% reduction within ten years keeps in place its existing commitments to organic cotton, recycled polyester and others. The roadmap also includes new ideas, some of which the company “had to dig deep” to come up with, Mr Huber says. Renting rather than buying products and repairing them rather than throwing them away when damage occurs are two examples of this. Another is a project called Close The Loop, in which Mammut has sourced discarded climbing ropes and used the fibres to produce a new range of functional baselayer garments. This idea, which represents Mammut's entry into the circular economy, won the ISPO Award for outdoor apparel in 2021 (see panel).

The company wants the whole world to be “moved by the mountains”, Adrian Huber continues and he explains that it is prepared to enter the realm of politics to achieve this. It is supporting the ‘Glacier Initiative’ in its home country. This is an attempt to anchor the Paris Agreement into Switzerland's constitution. Citizens will vote on this in a referendum next year.

One step at a time

Before ten years are up Mammut hopes to see clear signs that it is on the way to meeting its target of a 30% reduction and its longer-term aim of becoming climate-neutral. Alice Martin explains that, by 2025, it wants 95% of all the fabrics it uses to be bluesign-approved and 95% of the synthetic fibres it uses to be recycled. By the same date, it wants 100% of the cotton it consumes to be organic.

She gives extra insight into the challenges involved in the switch to recycled synthetic fibres. The polyester in Mammut's current collections is 38% recycled. Its target for next year is 40%. This will leave plenty to do to lift this proportion to 95% three years later. Work is already under way to achieve this and it is clear already that low-hanging fruit is sparse.

In the summer of 2020, the company decided to look into the possibility of making a new version of its Lenni long-sleeved hiking shirt using recycled fibres. Its current material mix is 68% virgin polyester and 32% virgin polyamide. Initial

attempts have had to undergo substantial testing by third parties to make sure the new idea will work in terms of colour, tear-strength, pilling, snagging and other parameters. This takes time. Armed with the results of these tests, the Swiss brand then had to go back and forth with its partner garment manufacturer before satisfying itself that it could put a process in place to bring the new, recycled version of the Lenni to market. It will go ahead and do this now, but it will be the summer of 2022 before consumers can buy the new product, two years after work started. It's a trek, but that's what glaciers invite us to undertake. 🏔️

ROPE HOPE

There are a number of aspects of Mammut's Close The Loop initiative that make it an ideal entry for the brand into a brave new world of the circular economy. It is not just that it has now found a way to use discarded climbing ropes to make functional baselayer garments, thereby boosting its use of recycled fibres and moving further along a path towards cutting its carbon emissions by 30% within ten years. The story is even more circular than that.

Mammut started out in 1862 as a manufacturer of ropes for use in the mountains. Ropes were its route into the outdoor business, before there was an outdoor business, giving extra meaning to Close The Loop, one of the winners at the ISPO Awards in 2021.

The company still makes ropes for climbers. Safety is always a top priority in the mountains and competitive climbing professionals, mountain guides and other frequent users can easily need new ropes five or six times per year, with few options over what to do with the old ones. Repeat sales are attractive for any company, but Mammut has carried out in-depth analysis of its environmental impact and when it calculated that ropes were contributing 14% of its total greenhouse gas emissions, it stepped up its search for a use for its old rope. Close The Loop is the answer.

It set up 50 collection points at its stores and at gyms across Switzerland at which climbers dropped off several hundred used ropes within a few months. These made their way first to Mammut headquarters in Seon and, from there, to partner company Aquafil. Specifically, the material went to the plant in Slovenia at which the yarn manufacturer is using repurposed fishing nets and other waste to make its Econyl nylon 6.6 product. Mammut then used the Econyl to construct its Close The Loop baselayers.

It has said that 300 ropes were enough to generate 750 kilos of yarn. It has calculated a 70% saving in the carbon emissions associated in making the garments using this method instead of using virgin materials. It will now aim to expand the initiative.

Climbing ropes contribute 14% of the company's greenhouse gas emissions. This led it to launch its new Close The Loop initiative, winner of an ISPO Award in 2021.



A partnership involving an outdoor brand, its zipper supplier and a technology platform aims to establish closer, cloud-enabled connections between consumers and the companies that provide their clothing.

Keeping pace with circular connectivity

Details of a collaboration between Stockholm-based Houdini Sportswear, US Internet of Things (IoT) platform Eon and the world's largest zipper manufacturer, YKK, have emerged. Unlocking next-level garment circularity through gadget-free, embedded product connectivity was the central theme of a keynote discussion between Houdini's head of product and design, Jesper Danielsson, Eon's director of connected products, Elyse Tosi and sustainability lead at YKK, Brian La Plante during ISPO Munich Online in early February..

Achieving cloud-based circularity across the textiles and apparel industry may once have required blue-sky thinking. Not today, though, says YKK's Mr La Plante, who foresees connected, circular garments taking up a large area of the apparel landscape in the not-too-distant future. Along with partners Eon and Houdini, the zipper-maker envisions playing a significant role in this bold new world, where cloud-enabled products will trigger deeper brand-buyer connections, beyond the traditionally linear retail model.

The co-creators' view is that connected garments can help enable a circular economy. Ms Tosi reveals how Eon's initial approach was to fix YKK's Near Field Communication (NFC) Touchlink zipper to Houdini's One Parka jacket to

Houdini intends to enable a seamlessly integrated, circular offering with the digitally activated One Parka.

ALL CREDITS: HOUDINI SPORTSWEAR



establish a “digital identity” in the cloud for each unit. YKK developed the interactive zipper, which employs the same technology that powers contactless payment capabilities on smartphones, in partnership with US-based wearable technology company Lifekey. By tapping the zipper against their smartphones, users can view on their screens information about the garment, allowing brands like Houdini to set aside hangtags and activate a greater degree of interaction between brand and buyer.

Ability to speak

Ms Tosi says Eon’s intention behind taking the One Parka online is to endow the garment with the ability to speak to a variety of audiences, including Houdini itself and its customers, plus circular partners, she says. This will in turn empower operators to monitor the product’s lifecycle from inception, through its use by the wearer, then into circular systems such as resale or recycling. This will work by harnessing real-time data exchange and material-level visibility.

A pilot version of Eon’s CircularID protocol, which Ms Tosi describes as essentially the language of connected products, is in use in the Houdini project. This should help facilitate the scaling up of its technology. Embedding an identifier into garments solves the problem of a lack of proper identification of products, she says, and offers ongoing customer interaction for resale partners and recyclers. Connected products can unify stakeholders within the circular value chain because they enable communication.

Feedback loops

Houdini’s goal is to develop a relationship-driven economy, with in-built, continuous cloud-based feedback loops that help both brand and user know each other better, as in a “synergy, like in nature”, as Mr Danielsson describes it.

Herein lies a next-level user experience based on two-way communication and understanding (or co-creation), he says. If the brand can help – and inspire – its customers to better comprehend their own consumption patterns, they may be increasingly likely to lead a more sustainable lifestyle overall. “This is where the change is needed,” he says. Such connectivity will also allow Houdini to take full producer’s responsibility: “Making circular products doesn’t help if we don’t know where they are or where they will end up.” Existing products, if brought back, will be retrofitted with the same trackable Touchlink zipper, ensuring nothing goes to waste from the brand’s vantagepoint.

Circular 2022

For Mr Danielsson, this is all part of optimising a seamless brand experience for engaged buyers. In short, going beyond zero impact to contribute to the world, as opposed to taking from its resources. By 2022, all Houdini-made goods will be circular, he says, but for him the real question is: how can they eventually become a positive? He

“Making circular products doesn’t help if we don’t know where they are or where they will end up”

JESPER DANIELSSON, HOUDINI SPORTSWEAR



describes the brand’s supply chain as being like an ecosystem, where its “high-performance circular products” are not only made to be rented out and reused, but also intended to catalyse wider customer and industry behavioural shifts. The outerwear company wants to go further than simply motivating customers to reconnect with nature through its essay-like emails, fireside talks and hangouts, he says.

Houdini, which has been recycling garments since 2006, wants to impact long-lasting, circular changes. The brand aspires to “evolve and repair the mistakes of overconsumption” and “get back to what’s meaningful, to the experience”, Mr Danielsson states, through activating digitally enhanced connections with customers. How this cloud-enabled version of the One Parka will perform at retail and beyond remains to be seen. What is certain, though, is that as the brand embraces new terrain, it won’t be leaving any units behind. 

By incorporating YKK’s NFC Touchlink zipper, Houdini garments remain visible throughout their lifecycle, supporting trackable, connected circularity.

Icebreaker's transparency efforts include a cradle-to-grave analysis of its natural base layer.

CREDIT: ICEBREAKER



Nature's champion

New Zealand-based outdoor brand Icebreaker has unveiled a strategy to become plastic free by 2023, which is true to its philosophy of remaining close to nature, and its love of merino wool. However, the brand does still use some synthetics for performance attributes: 13% of materials are not natural, according to its latest sustainability report, Move to Nature. It removed 59 styles from its collection because they did not align to the new brand purpose, and is seeking alternatives to synthetics.

The company is also raising awareness of the impact of microplastics and microfibres in waterways and the ocean, partly through a sponsorship of Ben Lecomte, who swam 350 nautical miles through the Great Pacific Garbage Patch. As part of this, it promotes to consumers that natural fibres need washing less often, and therefore reduce their impact on the environment. How do Icebreaker's strategies and goals fit in with being part of the wider US-based VF Corp group of brands? We ask Julian Lings, senior sustainability manager for outdoor brands at VF Corporation (He is also a keen triathlete).

Which breakthroughs or programmes that Icebreaker has implemented over the past few years are the most important?

At the heart of Icebreaker is a belief that nature provides the answers. For 25 years we have developed clothing based on natural fibres as an alternative to plastic-based synthetic



DIALOGUE

Julian Lings, senior sustainability manager for outdoor brands at VF Corporation.

apparel. In recent years, we've made significant strides in transitioning to 100% natural materials in our products and have set the ambitious goal to have 100% plastic-free materials by 2023. To do this, we've been at the forefront of finding new natural alternatives to materials such as elastane and nylon, and incorporating these innovations into our product line.

We also believe in doing business in a better way. A critically important aspect of this is working in partnership with our wool supply chain to drive positive environmental and social change throughout the value chain. We've invested in long term partnerships with our key merino growers since the 1990s, but in 2018 we went even further by pioneering the Icebreaker Growers Club. This is an industry-first initiative that establishes 10-year supply contracts with our growers. This provides the growers with the security to invest in their businesses, their land, their animals, and their people. It secures Icebreaker's supply of consistent, high-quality merino fibre. The 10-year contracts strengthen our relationships but also radically transform on-farm economics.





Icebreaker has set a target of being plastic free by 2023. Why was this timeframe decided on, and which will be the most difficult plastics to phase out?

Our 2023 goal is an ambitious one. However, goals should be challenging and uncomfortable if we are to innovate and drive the right type of progress in our business and the wider industry. We are approaching it in two ways.

Firstly, by switching out of synthetic yarns where it's possible to do so without compromising on the performance and durability of the garment. Secondly, we are undertaking pioneering work to find natural alternatives to certain synthetic materials that offer specific performance characteristics. As with all innovation, this is by no means a simple, linear, and straightforward process. However, we truly believe in the importance of reaching our end goal to move to natural, and will successfully innovate to reach that target.

Martino Scabbia Guerrini, VF's executive vice-president, believes natural fibres will become more important in the future, as consumers will want these fibres next to the skin. How does being part of VF shape Icebreaker's strategy?

Icebreaker and VF are both aligned on the pressing need to drive sustainable change across the textile industry. Icebreaker is fully supportive of VF's Made for Change sustainability goals, and the industry leading Science Based Targets that are at the centre of the Corporation's sustainability strategy. Indeed, by 2021, Icebreaker will be setting its own Science Based Targets to align with those of VF.

We are proud of the role we play as a brand in the portfolio contributing to positive change, including working with the other brands to help them focus more and more on natural fibre solutions. Icebreaker has been a catalyst for developing VF Corporation's Natural Materials Platform. This is a working group across VF Corporation brands to work with industry experts on creating natural solutions for apparel.

Do you think the pandemic will have a lasting effect on how consumers and brands view their clothing and relationship to the planet?

In the wake of the pandemic, we will continue to listen carefully to our customers, as people everywhere rethink and rebuild what they need in their new normals. Our responsibility is to respond to these changes too in a more meaningful way, to challenge the status quo and to bring natural solutions that are truly better for the planet and people.

What are your personal hopes for the future in terms of the apparel industry in general?

We are at a vital juncture where the industry must decide whether to take on the critically important responsibility of setting the far-reaching goals required to limit global warming in line with

“We are undertaking pioneering work to find natural alternatives to certain synthetic materials that offer specific performance characteristics.”

JULIAN LINGS, VF CORPORATION



CREDIT: MATHIS DUMAS

the targets set out in the Paris Climate Change Agreement. The moment of action is now. My hope is that brands, and the industry as a whole, will rise to this challenge. For Icebreaker, we believe that the move to natural will be a vitally important part of this. My hope is that the apparel industry will come with us on the journey as we continue to pioneer this critical shift. 🌱

“Icebreaker has been a catalyst for developing VF Corporation's Natural Materials Platform.”

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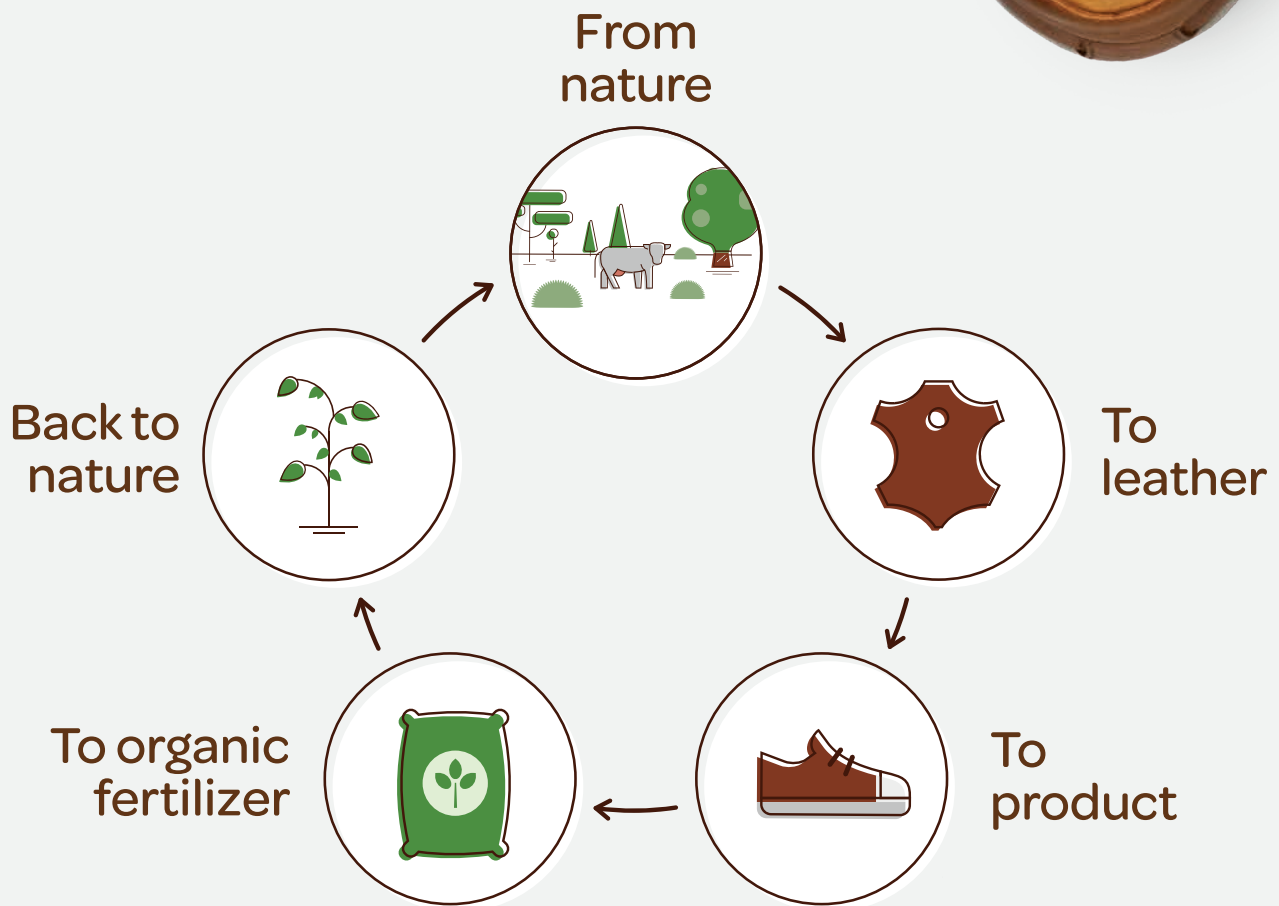
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