

ISSUE 4: 2021

BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

# insideDenim

Cool and  
consistent

Replay at 40



Enzyme engineering at work / Closing the cotton loop

Japan's woven washi / Spinnova's denim proposition / Kingpins round-up

# Contents



**Cover** Replay's latest collection includes recycled fabrics and organic cotton.

PHOTO: REPLAY JEANS

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**03** Editor Clare Grainger says the progress in using waste is gathering pace, as the industry turns its talents towards circularity.

**06** **Global news** Ideas and initiatives from around the world.

**04** **Guest comment: Kerry Bannigan**

The founder of Conscious Fashion Campaign believes in the power of the Sustainable Development Goals.

**08** **Industry News**

A round-up of recent launches and developments from across the supply chain.

## THE SCIENCE BEHIND THE STYLE

**10** **Catalysts of change**

Developments in enzyme technology are enabling safer and cleaner ways to treat and finish garments.

**16** **A new cotton cycle**

Mills and manufacturers are looking at offcuts, cotton fluff and old jeans not as waste but as a precious resource.



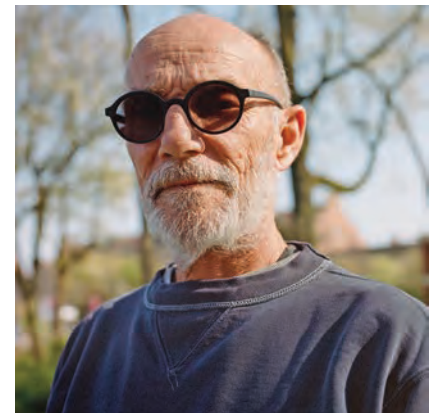
## DENIM IN-DEPTH

**20** **Jean Genie: Piero Turk**

Innovation at mill level is more complex than people realise, says the denim designer and consultant.

**24** **Disruptive dyeing idea**

Finnish company Spinnova is preparing to launch a pre-dyed yarn.



**26 Organic growth**

The demand for organic cotton is growing steadily, despite a few hiccups along the way.

**30 Dialogue: Matteo Sinigaglia**

Replay's CEO says staying flexible and consistent is key to weathering any storm.

**32 Dialogue: Hiro Yoshikawa**

Painstaking research has gone into Washi Jeans, made with traditional Japanese paper.

**36 Redesign reaches the market**

More than 70 mills, manufacturers and brands have been diligently working on their Jeans Redesign collections.

**38 These aren't just any jeans**

UK-based retailer M&S has unveiled a denim strategy that has its heart rooted in the laundries.

**40 Factory talk**

Tilman Wrobel reminisces about a trip to Morocco to visit New Wash, and we round up some of the latest developments that mills presented at Kingpins24.

**48 Clocking On**

Artist Ian Berry reveals a second wind drives his most creative and inspired denim-driven masterpieces.

**Advert Index**

<b>Advance Denim</b>	23
<b>Garmon</b>	13
<b>ISKO</b>	BC
<b>Première Vision</b>	45
<b>Sharabati</b>	29
<b>WSA</b>	IBC

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# Meet the team



## **Clare Grainger** Editor

With two decades of experience in publications, including ten years covering the global trade sectors of technical performance textiles, footwear and leather, Clare has now focused her journalistic skills specifically on the denim world. Her editorial and specialist knowledge of the sports and financial worlds also enables Clare to add a further dimension to Inside Denim's coverage of the denim arena.

## **Jo Tait** Associate publisher

Jo has over 20 years' publishing experience in both print and digital media, developing effective marketing strategies, with commercial focus for global clients including those in the performance textiles and footwear industries.



## **Sophie Bramel** Technical editor

Sophie is one of the most respected technical journalists in the global textile industry. With a career spanning over three decades there is little that she does not know about fabric and more specifically performance fabrics; her passion and enthusiasm are infectious.

## **Stephen Tierney** Consultant editor

Stephen has been a writer for 30 years, working on projects for newspapers, government departments, and an extensive range of private-sector organisations. An award winning journalist, he has edited specialist trade and technical magazines. He also has specialist knowledge of international supply chains and logistical issues.



## **Charlotte Robson** Assistant content developer

Charlotte's writing career began with a residency at a UK gallery. Since then, she has published on art, fashion, materials and footwear, including for *World Footwear*, *World Leather* and *WSA* magazines. After living and studying in both Shanghai and Seoul, she maintains a keen interest in the latest industry developments from China and South Korea.



# Renewed impetus to see waste as a resource

**G**reat to hear announcements about the upcoming physical denim fairs, which will hopefully take place this time around. Everyone is itching to meet and share ideas again, and see and feel the fabrics and developments companies have been so busy working on. Despite the outside turmoil, progress in the supply chain continues: testing new blends, lower-impact washes and dyes, and discovering fresh ways to design and construct the world's favourite garments.

Heading into the laundries, one of the most interesting segments of the supply chain, we take a look at some of the recent developments with enzymes. These natural entities can offer a milder alternative to stonewashing and bleaching and are a focus for a number of the chemicals players.

Even in the relatively short period since *Inside Denim's* launch, we have seen so much progress on using waste: better ways to break down the material, faster and more efficient sorting processes, investments in machinery, stronger blends and increased recycled content. We look at the topic in detail in this issue's Science Behind the Style section, as well as part of our Kingpins24 round-up, and hear from the Ellen MacArthur Foundation about progress in its Jeans Redesign initiative.

Piero Turk, our Jean Genie, says the leaps mills are making in this field are impressive, and circular thinking is something that will become increasingly important. He has a wide-lens view, as he has been in the industry long enough to remember the introduction of sandblasting and stonewashing. I too have been around long enough to see big changes, albeit in journalism: at my first reporting job, the newspaper didn't even have a website! Although, I'm not quite old enough to have worked on the original metal typesetters, like some former colleagues. During 10 years of writing about fashion and textiles, I've witnessed huge progress on sustainability issues, with forward-thinking companies showing how vital it is to move the market before the consumer demands it; something Kerry Bannigan appeals for in her Guest Comment about the Sustainable Development Goals.

*“There has been so much progress: better ways to break down material, more efficient sorting processes, investments in machinery and increased recycled content”*

Not to give my age bracket away, but something else that is nearing 40 is Italian brand Replay, whose CEO Matteo Sinigaglia discusses sports, sustainability and success in Dialogue. He points out that jeans will soon be as important as they ever were. “People still care about having something relevant for them,” he says. “We try to do what we are good at: bringing innovations.” If the pipeline of developments we have seen recently is anything to go by, that's certainly something the supply chain supports. And it will be fantastic for everyone to see these developments in person in the upcoming months.■

**Clare Grainger**

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*Kerry Bannigan is the founder of the Conscious Fashion Campaign, founding member and executive producer of the SDG Media Zone and president at the PVBLIC Foundation. Her portfolio spans over 14 years of programming, event production and high-level partnerships with brands, governments and United Nations agencies.*

ALL PHOTOS: CONSCIOUS FASHION CAMPAIGN

# SDGs are the framework for the future

**C**ovid-19 brought significant disruption to the fashion industry, and denim in particular, through its impact on manufacturers, retailers and supply chains. However, in light of this turmoil, the pandemic has also elevated the opportunity for progressive change as it has forced stakeholders to rethink their traditional ways of working. As the denim industry looks to rebuild, it is a critical time to realign ourselves with responsible practices that will sustain both our people and the planet for years to come.

In this process, the UN's Sustainable Development Goals (SDGs) are a guiding framework that should be used by the denim industry as they embark on their resilient recovery and beyond. Launched in 2015, these global calls to action represent 17 critical areas in need of change, including gender equality, climate action, responsible consumption and production, reduced inequalities, and life below water. Recognising the urgent need for change, the goals have an intended target of 2030.

In support of this global agenda, the Conscious Fashion Campaign was established. In collaboration with the United Nations Office for Partnerships, the campaign accelerates global fashion industry action in support of the SDGs. Through advocacy, education

## GUEST COMMENT

**Kerry Bannigan**, founder of the Conscious Fashion Campaign, believes the denim industry can be a key driver of social, economic and environmental change through its adoption of the Sustainable Development Goals.

and engagement the campaign mobilises industry stakeholders to advance solutions for social, economic and environmental change.

In an effort to target the denim industry specifically, the Conscious Fashion Campaign has established an ongoing collaborative partnership with Kingpins Show, the information and innovation network and trade show organiser, which organises events in Amsterdam, Hong Kong, Guangzhou, Hangzhou and London. Through this relationship, the Conscious Fashion Campaign has brought SDG workshops, knowledge hubs and panel discussions to the regular forum, attracting participants from Ralph Lauren, Tommy Hilfiger and G-Star Raw.

Along with this, we have also partnered with Transformers Foundation, which provides a thus-far missing platform to the jeans and denim supply chain and a central point of contact for consumers, brands, NGOs and media who want to learn more about ethics and sustainable innovation in the industry. Through this collaboration, the Conscious Fashion Campaign supported the integration of the SDGs into the programming for Transformers ED, which is an education series for those who wish to learn about the denim supply chain.

**“It is critical we seize the opportunity to rebuild and realign our future”**



Throughout these partnerships, we have connected with industry stakeholders who are truly leading positive change within the denim industry. These initiatives, such as those led by Lenzing, are listed on the newly launched Conscious Fashion and Lifestyle Network, an online platform for industry stakeholders, governments and NGOs to showcase actions, report progress and share solutions accelerating sectors' contributions to deliver the SDGs by 2030. As the network continues to expand, it welcomes registrations from all relevant industry initiatives which are supporting the advancement of the SDGs within the fashion and lifestyle sectors.

It is important to note that while significant progress continues to be made, we still have far to go. For example, data from the United Nations Environment Programme shows that after taking cotton production, manufacturer, transport and washing into account, it takes 3,781 litres of water to make one pair of jeans. This process equates to around 33.4 kilogrammes of carbon emitted, which is like driving for 111 kilometres. All for just one pair of jeans.

There are further challenges existing in the denim industry. These include common instances of water pollution and contamination, promotion of fast fashion products, energy intensive manufacturing methods and unethical labour practices. Left



unaddressed, these risk the advancement of the SDGs, including SDG #6 Clean Water and Sanitation, SDG #8 Decent Work and Economic Growth, and SDG #12 Responsible Consumption and Production.

Despite these challenges, we know that if engaged properly, the denim industry is well positioned to accelerate the SDGs given its scale and global connectivity. In support of this potential, it is critical that we seize the opportunity that the pandemic has provided to rebuild and realign our future towards one that is sustainable and resilient for all. ■

*Conscious Fashion Campaign organises seminars for the denim industry at Kingpins.*

# Global News

**Netherlands** Stony Creek Colors, a provider of natural indigo, has been named among innovators that will benefit from Fashion for Good's accelerator programme. The Netherlands-based hub helps companies to scale their technologies. A number have relevance to the denim industry, working with blendable fibres, dyeing techniques and 'leather alternatives'.

**UK** Levi's Vintage Clothing (LVC) has taken inspiration from the acid house and indie music scene and fashion emanating from Manchester, England, in the late 1980s for a collection that includes oversized jumpers and baggy jeans. LVC design director Paul O'Neil said: "I was a big fan of that music, which is one of the reasons I went to university in Manchester in the 90s."

**Italy** Only The Brave (OTB) Foundation, the charitable arm of Diesel owner OTB Group, has worked with local partners to open the largest covid-19 vaccination centre in Veneto region. Built in just 10 working days, the centre will service around 120,000 people, offering 4,000 vaccine doses per day.

**Denmark** Fashion group Bestseller, owner of denim brands Jack & Jones and JJXX, has partnered with the Danish Technological Institute on ReSuit (Recycling Technologies and Sustainable Textile Product Design) in a project aimed at driving the recycling of all textile waste in Denmark. The three-year project is supported by a grant of €1.7 million from Innovation Fund Denmark.

**France** A textile industry body in France, UIT, has warned the prices of raw materials and of freight are soaring. UIT said polyester is between 50% and 80% higher than a year ago and recycled polyester fibre 60% higher. Cotton is 35% more expensive than five months ago, while organic cotton is double the price it was a year ago, it said. Linen has risen by 25% since September while wool is 10% higher.

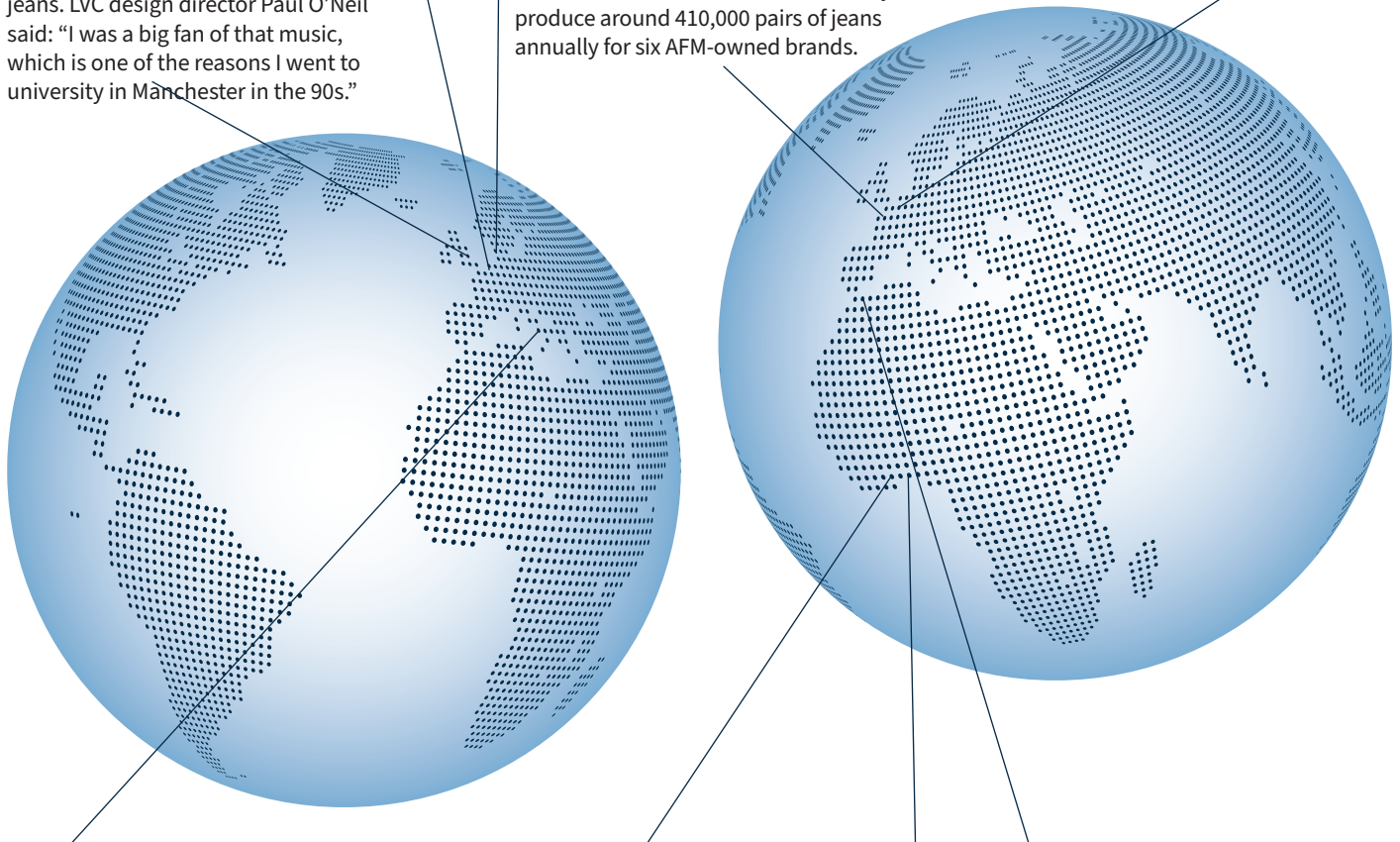
- France's Association Familiale Mulliez (AFM), the holding company for the Mulliez family, is opening a jeans factory in Neuville-en-Ferrain. Named FashionCube Denim Center, the factory will produce around 410,000 pairs of jeans annually for six AFM-owned brands.

**Belgium** Start-up Resortecs, which has developed dissolvable stitching thread and heat-dismountable rivets, has raised €966,000 from investors to build its first industrial disassembling oven. The oven will be housed at PurFi Manufacturing, which will work with Resortecs to dismantle garments and then 'recycle' the cotton and polyester.

**Ivory Coast** The French government is investing €68.5 million to help boost cotton production in Ivory Coast, supporting 120,000 farmers. The Ivorian agriculture ministry forecasts cotton production of 500,000 tonnes for the 2020/21 season compared with 490,000 tonnes the year before.

**Morocco** The Moroccan Denim and Fashion Cluster (MDFC) is organising a support programme for businesses to grow their companies and boost exports. The Ideas Worth Stitching programme includes training on brand identity, design, the supply chain and digital marketing. Start-ups can gain access to industry mentorships.

**Benin** Producers of Cotton made in Africa (CmiA) describe a leap in demand during 2020, with 60 retailers and brands bringing more than 276 million CmiA-labelled textiles to market – a 120% increase over the previous year. CmiA's supply chain partners increased by 58% to 217 spinning mills and fabric producers in 20 countries.



**China** Plans for Weilai Cotton (which means future cotton) have progressed, according to local press. First initiated two years ago, Weilai reportedly received a significant boost when China Fashion Association and Modern Seeds Development Fund, both state-backed organisations, joined its ranks.

**US** Two denim and jeans makers have said owning US manufacturing facilities gives them a foothold in an important market. Vietnam's Saitex has opened a jeans-making facility in Vermont, CA, which relies heavily on automation. Pakistan's Artistic Milliners has bought a denim factory in Los Angeles, now known as Star Fades International, turning it into a design and production hub based on Industry 4.0 principles.

- More than 300 companies have signed up to the US Cotton Trust Protocol in six months. The protocol is a voluntary sustainability programme designed to document best practices being used by American cotton producers.

**Japan** Denim consultant Yuji Honzawa, known in Japan as “Dr Denim”, has opened a showroom in Tokyo's Akihabara district to showcase his collection of samples and vintage denim. Mr Honzawa spent decades with Levi's Japan and Japanese brand Edwin, before starting an American workwear-inspired brand, Red Card, in 2009.



**Turkey** Turkish denim mill Kipas has set ambitious targets of becoming carbon neutral by 2025 and carbon positive by 2030, a plan which will be helped by the planting of 500,000 trees. The company is reducing its carbon footprint by sourcing all energy from renewable sources and using a process that neutralises wastewater with carbon dioxide.

**Space** The next SpaceX Commercial Resupply Service, which delivers supplies and equipment to the International Space Station, will also include an experiment that aims to further understanding of cotton root systems and enable the development of more robust cotton that requires less water and fewer pesticides. Retailer Target is funding the investigation, which will look at how root system architecture affects plant resilience to stress, water-use efficiency and carbon sequestration.



**Bangladesh** Denim Expert has been shortlisted for a Thomson Reuters Foundation Stop Slavery Enterprise Award. Managing director Mostafiz Uddin said: “Workers are the drivers of the fashion industry, but their rights are often ignored. We are committed to ensuring the rights and wellbeing of our workers, as well as a decent work environment.”

**Guatemala** Guatemala City's New Denim Project, a design lab focused on circularity, has collaborated with US brand Outerknown on a collection created using recycled cotton and fibre from denim scraps. Pre-consumer denim is supplied by local clothing factories. Each piece has been made with 30-80% recycled cotton, with no added dyes.

**Australia** Retailer General Pants Co and social enterprise Circular Centre have launched a denim redesign competition. As a result of General Pants Co's “denim amnesty”, over 1,000 pieces of pre-owned denim are available for designers to choose from. Leftover offcuts will be used for carpet, underlay and acoustic panels.

**Global** The US Department of Agriculture has forecast record global supply for the 2021/22 cotton season as recovery from the pandemic continues. Global consumption is expected to grow 3.5% to almost 122 million bales, higher than the pre-pandemic 2018/19 level. However, lingering disruptions are expected to keep use below the 2017/18 level.

# Industry News

## Jeanologia takes cues from automotive for robot system



Technology company Jeanologia has launched a system that has been three years in the making and which it describes as “the future of textile manufacturing”.

The Handman combines two robots and eight lasers and, when worked by two operatives, can finish 10,000 jeans per day, according to the company. It said the system is easy to load, automatically positions garments, is quick and precise and the garments are then carried to bins.

Enrique Silla, CEO of Jeanologia, said the industry should look to sectors such as automotive, which use a lot of automation and robots in production.

Jeanologia has also worked with chemicals groups Devan and Archroma on water reduction. Devan assessed how its products could be applied using Jeanologia’s e-Flow technology to reduce water and ensure the correct amount of chemistry stays in the garments.

Archroma conducted tests to improve the fastness and reduce the temperature of its Pad-Ox dyeing process. The Swiss and Spanish teams developed a way to apply the process at room temperature, while improving fastnesses and allowing higher contrasts after washdown. The companies said the binder-free technology leads to articles that are softer and have greater colour durability and solidity against rubbing. ■

## Mills embrace with ‘indigo from inside out’

Following the launch of Lenzing’s Tencel with Indigo Technology – where indigo pigment is applied directly to the fibres – global business development director Tricia Carey gave an update on the challenge it had laid down to mills to create interesting new fabrics and blends.

She said mills – including Cone, Candiani, Bossa, Orta, AFM, Soorty, Artistic Milliners, Blue Diamond and In the Loop – had embraced the challenge: “We are excited to see the results.”

Produced in Austria, predominantly from beechwood derived from sustainably managed wood sources, the offering has been designated BioPreferred by the United States Department of Agriculture. Lenzing claims that as indigo is already added to the fibre, this creates a 99% water saving, uses 80% fewer chemicals and gives a 99% energy saving compared with traditional rope dyed indigo yarn. The colour retention is superior through dry and wet crocking and rubbing, wash-down effects can be achieved and it remains fast for consumer washing, it said.

Günther Widler, head of technology in denim at chemicals group DyStar, said: “This specially commissioned indigo pigment is based on more than a decade of our working experiences on indigo synthesis in Germany.” ■

### Tonello and Rudolf boost lasers

New laser effects through the combination of Tonello’s THE Laser and Rudolf Hub1922’s Laser Smoother have been announced. The effects are “more natural” and closer to those realised through manual scraping, the companies stated, with the efficiency of processes increased. Rudolf said the process is cheaper or comparable in cost to potassium permanganate.

### Lycra aims to reuse garments

Following the Lycra Company’s launch of Coolmax EcoMade and Thermolite EcoMade fibres made from 100% pre-consumer waste, its global sustainability director, Jean Hegedus, has explained more. Lycra is working with performance-fabric makers in China, as a consistent supply is vital. “Our partner looks for 100% polyester, or at least 90%, to make it as efficient as possible,” she said. In the future, the company will look to use post-consumer as well as pre-consumer waste.

### Coreva available to all

Milan-based denim producer Candiani has made its Coreva stretch technology available to all clients. After launching the biodegradable yarn with partner Denham the Jeanmaker in 2019, only a select group of brands including Stella McCartney, Closed, Kings of Indigo and Hiut Denim had been permitted to use the technology. Coreva is made from organic cotton wrapped around a natural rubber core.

### Cordura debuts hemp denim

Following a decade of its “durable denim” technology, Invista brand Cordura has launched a hemp denim blend alongside Pakistan-based mill Artistic Milliners. The mill will offer stretch denims, made with French hemp, weighing 11 and 12 ounces. Cordura described the fabric as having natural abrasion resistance, a soft comfort handle and the slub characteristics of hemp.

### Sharabati invests in spinning

Sharabati Denim has created an additional open-end spinning line at its site in Kadirli, Turkey. It will produce an extra 25 tonnes of cotton and natural fibre blends per day. Open yarn spinning can work with shorter fibres, so the mill will be able to boost recycled content. It also takes less time, which could equate to a 50% energy saving and 15% raw material saving, compared with using ring yarn, it said. ■



PHOTO: DENIMX

## DenimX offers solution for all waste

Materials and design specialist DenimX has launched a range of products that uses post-consumer and post-industrial denim waste, addressing the issue of landfill-bound material. The Dutch company's latest designs are injection-moulded hangers that incorporate the distinctive blue from the dyed fibres, and tiles made from denim and coffee waste, which are suitable for shop fittings and table tops.

Industrial designer Marc Meijers founded the company in 2017, wanting to use his materials know-how to address the problem of textiles waste. An estimated £140 million worth of clothing is sent to landfill each year in the UK alone, according to the Waste and Resources Action Programme.

One of the advantages from a waste perspective, Mr Meijers told *Inside Denim*, is that while the longer fibres are needed when adding recycled content to make new jeans, every bit of waste can be accounted for in this process, including blends that are difficult to separate. "There's already a lot done with the textiles-to-textiles waste, which is very good and we encourage that, but in this case we can use the waste that has no other use."

The binders are mainly bio-based polymers, but a range of materials including recycled plastic can be used, as well as other textile fibres. This means properties can be tailored to suit different end-uses, including lamps, chairs and home accessories.

Previous projects include a collaboration with Nike in the Netherlands, where DenimX supplied acoustic panels for the office in its logistics centre, and a tie-up with the Dutch Ministry of Defence, making motorbike panels from old army uniforms.

Mr Meijers says that while small-scale projects can be fun, it is the bigger-volume partnerships and a combination of recycling initiatives that will help make a dent in the mountains of waste. "We need all these initiatives working together in order to deal with this problem," he said. ■

## Aqualess Mission could slash water use

Chemicals group Officina +39 has launched "the Aqualess Mission" – three products that combine to reduce by three quarters the amount of water typically used in denim and garment laundry processes, according to the Italian company.

It suggests traditional systems use about 52 litres of water for a pair of jeans, while Officina+39's system uses 12.5 litres.

Its CEO, Andrea Venier, commented that reducing water usage fits in with the UN's Sustainable Development Goals.

The three products are: Remover BC, a laser booster that increases the laser effect on indigo or dischargeable dyestuff, saving time and energy and preventing fabric tearing; Aqualess Aged, which creates abrasion effects; and Oz-One Powder, a way to bleach and distress without chlorine and permanganate. ■

### Isko achieves Bluesign approval

Turkish denim mill Isko has become the only mill in Europe currently to have Bluesign approval for a range of denim fabrics. Bluesign Technologies is a Swiss company that monitors the chain from chemical formulation. Isko describes it as a "hard-won honour". Articles are made from bluesign-approved chemicals and raw materials, and are manufactured with a minimum impact on people and the environment.

### Unspun launches '3D visualiser'

Robotics and digital apparel company Unspun has launched a "3D visualiser". The technology uses algorithms to create an "avatar" following a 30-second body scan, around which jeans are designed. The company says this could reduce carbon emissions "through automated, localised and intentional manufacturing".

### ADM and Recover ink partnership

Karachi-based Artistic Denim Mills (ADM) and Recover, a Spanish producer of "low impact" recycled cotton fibre and blends, have partnered on a multi-year initiative to develop denim blends using Recover's Global Recycled Standard-certified fibre. Next steps involve Recover installing its fibre production equipment within ADM's new facilities in Pakistan, which will have the capacity to make 100,000 kilograms of yarn each day.

### New zero-wastewater dye system

Fashion group Ralph Lauren has introduced a scalable zero-wastewater cotton dyeing system following a project with Dow, Jeanologia, Huntsman Textile Effects and Corob, a specialist in dispensing and mixing solutions. Ralph Lauren claims it can provide a more efficient way to colour cotton at any point during garment manufacturing, rather than at the outset, meaning colour decisions can be made later in the process.

### Flax and Loom seeks fairness

A new UK brand, Flax and Loom, that puts emphasis on sustainably grown fibres and on fair wages has launched its first ranges. Owner Phil Wildbore said: "It's not possible to have great quality and well-looked after workers at some of the price points of the high street and supermarkets. There needs to be an enlightenment. We want to help people understand why they should pay more." ■



# Catalysts of change

**T**hese engineered biological entities, enzymes, do their job diligently, one task at a time. Their ability to break down molecules, oxidise, digest, remove toxins and more makes them key catalysts in many natural processes, from the making of cheese and beer to our own human metabolism. A common ingredient in detergents, their use in various preparing and finishing phases in the textile industry has grown continuously in the past decades.

In the world of denim, they offer more efficient and more sustainable, safer and milder alternatives to the traditional, and toxic, chemicals and materials used in bleaching and stonewashing, from sodium hypochlorite and potassium permanganate (PP) to pumice stones. As a result of ongoing research and development by the companies operating in this field, these clean and green agents of change for laundries are available in new formats and formulations. This past March, Kaiser Tekstil rolled out Lava Cell NSY, promoted as an alternative to stonewashing that can be conducted at room temperature and without water. It is based on a new formulation developed by Dystar with enzymes provided by Novozymes. In February, Garmon Chemicals introduced its first family of 'Kemzymes', made by the company's owner Kemin Industries, and presented as a replacement for pumice stones.

Enzyme-based processes can generate the worn-in look and feel of traditional bleaching and stonewashing without damaging the denim fabric and in near-waterless conditions. These milder, safer and more sustainable alternatives to some of the harshest chemicals and processes used in garment washing could make some of the industry's worst pain points history.

## New solutions

It was only a matter of time before Garmon, based in the Republic of San Marino, developed its own enzyme-based solutions, as Kemin Industries, its owner since 2018, is an expert in the field. The company has been working on developing a cellulase enzyme solution for the denim industry for the past three years, Kimberly Nelson, president of Kemin Textile Auxiliaries, tells *Inside Denim*. The first range includes four products, in two concentrations and in two ready-to-use powder granular formats, designed to cover the needs of laundries throughout the world.

*Kaiser's latest enzyme process, Lava Cell NSY, is both an accelerator for denim stone washing and an auxiliary for stonewashed effects. It accelerates the mechanical abrasion of denim at room temperature and in waterless conditions.*

PHOTO: KAISER TEKSTIL

“These stonewashing enzymes are not only an alternative but a true replacement to pumice stones,” says Ms Nelson, adding that they offer a more sustainable solution, as they are drawn from a natural resource and can be used at room temperature. She also insists on higher process efficiency, as they eliminate the need for pumice stones and the operations related to their use. Pumice stones may be powerful abrasive agents, but they break down in washing machines and the garments treated need to be washed and rinsed numerous times to remove the volcanic dust. This is not the end either, as their presence in sludge poses yet other challenges.

Garmon’s innovation pipeline to 2025 has pretty much been set, says Ms Nelson, but remains mostly under cover. “We plan, before anything else, to expand and improve the Kemzymes line, leveraging the feedback from our customers.” The first generation products are said to be 20% more efficient with regards to abrasion than some of the most popular enzymes in the market, she says, as found in comparative technical tests.

It can be expected that other biocatalyst solutions for denims, knitwear and various fashion industry needs will be forthcoming. Ms Nelson says the company will be “deeply exploring bleaching solutions to offer a true replacement and not just an alternative”. As the instigator of the diversification of the family-owned-and-operated company into textiles and denim, and granddaughter of Kemin’s founders, Ms Nelson believes strongly in the potential for enzyme-based solutions for laundries. “Denim is a huge industry, but it also has very specific needs. Denim will never disappear, if anything, it is a growing market, and we are not afraid to invest in this sector.”

### Less water and less risks

As the global distributor for Dystar’s laundry auxiliaries, Istanbul-based Kaiser Tekstil has an extensive network in the denim industry and a thorough understanding of its needs. With Lava Zyme NBF, it introduced what it says is a safer and more sustainable alternative to bleaching agents potassium permanganate and sodium hypochlorite. “It provides a single, unique enzymatic bleaching solution for local and full bleached looks and gives perfect results as a permanganate replacement on pure indigo fabrics,” says Kaiser Tekstil sales and marketing director Serdar Demircioğlu.

In tandem with a machine manufacturer, a special sealed robotic spraying device was developed that isolates the application process to ensure a safer environment for workers and remove any risk of inhalation. “This concept not only replaces dirty chemistry with a cleaner and greener one, it also protects the health of the workers,” he says. The enzyme solution, he further points out, is used in low liquor ratios and, as opposed to traditional chemistry, does not damage the fabric. “We all know that garment durability is an important feature of sustainability and our enzymatic bleaching system creates a bleached look without relation to the actual level of bleaching. This makes the Lava Zyme NBF system much more sustainable compared to traditional or chemical bleaching,” he adds.



*With Lava Zyme NBF and Lava Con NAF (based on enzymes supplied by Novozymes), Kaiser introduced a local enzymatic bleaching system designed to replace hypochlorite or potassium permanganate and which can be applied using a fully automated system to ensure worker safety.*

PHOTO: KAISER TEKSTIL

The latest enzyme-based process introduced by Kaiser, Lava Cell NSY, is promoted as a waterless solution. This is something of a stretch, as it is applied on wet clothes, but there is no need to add water when the enzymes are sprayed into the tumbler. “Lava Cell NSY is both an accelerator for denim stone washing and an auxiliary for stonewashed effects. The product accelerates the mechanical abrasion of denim at room temperature and in waterless conditions,” says Mr Demircioğlu.

A supplier to some 30 different industries, Copenhagen-based Novozymes is a leading producer of enzymes that has developed specific solutions for the denim industry. The company claims that laundries can reduce their water and energy usage by up to 90% by switching to enzymes under its DeniSafe concept. “Conventional denim washing can consume anywhere from 60 to 90 litres per jeans. When one considers that six billion pair of jeans are made globally every year, its impact on water resources is clearly unsustainable, and saving water is critical,” says İlhan Simsek, commercial head of technical industries at Novozymes.

Besides water, energy and time savings, he says enzymes-based solutions can help laundries reduce the need for hazardous chemicals and address sludge issues related to the use of potassium permanganate and pumice stones. The shorter and lower temperature processes reduce CO<sub>2</sub> emissions, as enzymatic bleaching eliminates the need for curing or neutralisation, he adds. These low impact solutions also contribute to safer working conditions. “We don’t sell enzymes in powder form to avoid exposure to airborne particles during application. Our encapsulated enzyme technology reduces this risk,” he says.

### Game-changing formats

Soko Chimica, a supplier of auxiliaries for the textile industry, has played a prominent role in developing novel enzyme-based solutions. The Florence-based family-owned company develops these in its own innovation lab, and this is where, in the early 2010s, it began to investigate new ways of using enzymes. “We began to rethink the application process itself,” Matteo Urbini, grandson of the company founder, tells *Inside Denim*. He believes it is important not only to develop new chemicals, but also ensure they can be applied in industrial equipment. “Many opportunities for innovation are based on evolution in machinery, especially when it comes to washing,” he says.

The company’s first innovative move into enzymes was to develop a washing machine-based stonewashing solution in which the enzymes are sprayed on garments directly in the drum through a nebulising device that is added to the machine. This patented solution officially launched in 2013 is not waterless per se, says Mr Urbini, but rather uses “less water”. It has since inspired similar developments across the market.



A few years later, Soko Chimica developed and patented another novel format for enzyme solutions with the launch of a tablet system, presented at ITMA in 2019. “At the time, we were looking for the next industry standard, as we thought that spraying had reached its peak. We saw a new opportunity in the creation of a single product covering the full process from raw to washed,” he says. The tablet format requires even less water than the spraying process, as it reduces the number of stages, from stonewashing to cleaning, all interspersed with rinsing cycles, that are needed to treat items of clothing. “All processes are done in a single bath using two different tablets that are added in subsequent stages, with a low liquor ratio (1:5), and without requiring any draining of the tumbler, just rinsing at the final phase,” he says.

This June, the company will be announcing the launch of a new enzyme-based product that is designed to be used with synthetic pumice stones. “It will generate an abrasion and clean look alternative to real pumice to create a more authentic aesthetic,” he says. Another new product in the pipeline is a more sustainable chemical process (not based on enzymes) to replace PP, which will also be launched in June. This patent-pending solution will usher in a brand-new concept without using oxidising products as alternatives to PP. The company’s strategy, he insists, is to develop products that are immediately applicable using existing machinery. “The production side is essential, beyond the aesthetics. If you solve a problem, the industry will adopt it,” he says.

*Garmon now offers its own enzyme-based stonewashing solution known as Kemzymes, made from a cellulase specially developed for this purpose by its owner Kemin, an expert in enzymes.*

PHOTO: GARMON CHEMICALS/  
KEMIN



# *smart foam*

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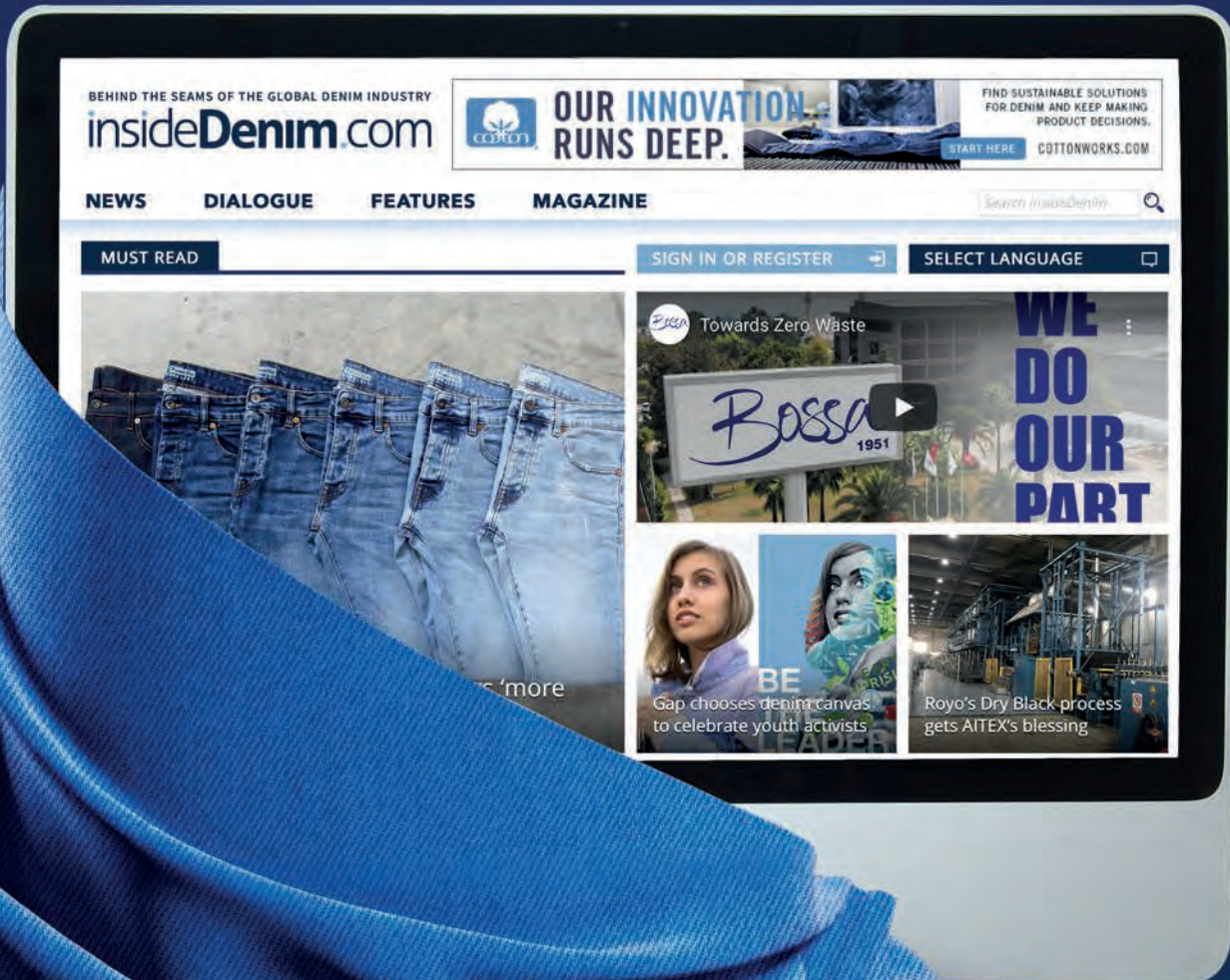
In 2020 the use of *smart foam* helped the denim finishing industry to save 4,500,000 liters of water. In 2021, help us to make this number even bigger: join the *smart foam* revolution!



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*Tonello's Core technology is designed to ensure the safe application of enzymes without water inside the drum. The company pairs this treatment with its patented ECOfree 2 technology, which uses ozone in both water and air to achieve the desired aesthetics with minimal environmental impacts.*

PHOTO: TONELLO

### More sustainable jeans

Enzymes are what Mr Urbini calls 'good players': "they are natural, they are considered chemicals but have a very low impact and they are a part of nature". They have contributed to lowering water consumption and reducing the need for pumice stones. "Water, harmful chemicals and sludge are major pain points for the denim industry. Today we have a solution to make jeans more sustainable with biodegradable enzymes that can fully replace traditional methods," says Mr Simsek, adding that Novozymes' LiveLong is specifically designed to make fabrics last longer, and look better. He points out that potassium permanganate may soon be banned under upcoming European Union REACH regulations.

The Jeans Redesign Guidelines, compiled by the Ellen MacArthur Foundation, recommends phasing out PP not only because it is dangerous but also to make garments last longer. In the participation report it publishes, the number of brands that have pledged to phase out the toxic chemistry was up from only three in 2019 to 19 in the 2021 edition. Confirming this trend, Mr Demircioğlu believes that PP usage will go down, its market share may be in the 10-20% range within the next two to three years.

"Enzymes enable milder processes at lower temperatures, they save energy and ultimately make the denim industry more sustainable. Our replacements for permanganate, hypochlorite and pumice stones have made laundries much more sustainable than before and we can thank enzymes for that," he says. Another positive evolution is the reduction of liquor ratios, which he says have gone from 1:10 to 1:2 or 1:3, leading to huge savings.

For Tonello, a maker of garment finishing machines based in Italy, huge progress has been made in the field of enzymes, specifically in the possibility of applying them at room temperature, which Alice Tonello, head of marketing and R&D, says is a very positive evolution for the industry. The company's Up system, which uses enzymes, offers at least 50% water reduction. But the most innovative application is its Core technology, which she says is the first one to be certified for the safe application of enzymes.

From water and energy savings to a reduced use of harmful chemicals and safer working conditions, enzymes address some of the denim industry's most critical environmental and social impacts. All thanks to these natural, and industrious, catalysts of change. ■

*With the introduction of the first sprayed applications and as the inventor of a tablet format enzyme-based process, Soko Chimica has a history of innovation in denim finishing.*

PHOTO: SOKO CHIMICA



The upcycling of deadstock is the ‘new black’ for many an eco-conscious brand. But a bigger trend is under way, behind the scenes and across large parts of the denim supply chain, to reduce and recycle post-industrial and post-consumer waste. New appreciation for what is increasingly considered an unused resource is paving the way for what could be the fashion industry’s first circular economy at scale.

# A new cotton cycle

Charities love denim. For goodwill organisations that collect used clothing the world over it is a prized item in the painstaking process of extracting value from piles and piles of unwanted goods. Jeans are relatively easy to identify and segregate out of a stream of not so interesting and highly heterogenous stuff. A vintage pair of jeans can bring in good money if suitable for resale. If not, these mostly monomaterial and monocolour clothes will readily be redirected to a recycling facility where anything made in cotton is in high demand.

In the factories that spin yarns, weave fabrics, cut and sew clothing and in the laundries that turn them into finished goods, a certain amount of raw material

goes to waste as well as all products that do not meet quality standards. These are now increasingly recycled back into production, as part of the zero waste policies that are being implemented by many, if not all, manufacturing facilities. This new thinking can also be called “process optimisation”, as Ann Runnel, the CEO and founder of Reverse Resources, wrote in a blog post earlier this year. The organisation, which seeks to build a new business model for post-industrial waste in the apparel industry, believes that half of the spinning waste and most of the overstock and deadstock fabrics from mills and garment factories are so highly reusable that they should not even be considered “waste”.

*Turkish mill Bossa says that 1,000 old denim jeans can be turned into 2,000 metres of 20% post-consumer recycled denim blended fabric.*

PHOTO: BOSSA



## New in-house logistics

However efficient a mill is, each stage of the garment making process inevitably generates a portion of unusable or leftover material, and pressure to increase recycled content is now giving these secondary resources new cachet. Isko, based in Turkey, says that when raw cotton is spun into yarn, typically 10% is lost. Ten or fifteen years ago, companies would not mention the reintegration of spinning waste into their products, now the reused fluff is as precious as organic cotton!

Increasingly, vertical mills are setting up their own in-house waste processing facilities, as has done Soorty. The Pakistan-based company's in-house plant can recycle 10 tonnes of material per day from its spinning, fabric manufacturing and garment making activities. It has recently invested in new machinery to address growing demand, which is now 300 tonnes yearly, Eda Dikmen, marketing manager, tells *Inside Denim*. It also buys used jeans on international markets, which include charities, says Umer Tahir Rana, Soorty's senior manager marketing.

Ironically, the process of recycling used clothing generates its own leftovers. Jeans made in blends with elastane or polyester must be removed from the feedstock, as well as all trimmings. These time-consuming operations must also be reduced to a minimum to keep costs in line with market expectations. "We need to be very, very picky during the sorting and preparation stages, as we cannot accept any impurities for spinning. Ideally, we need 100% cotton jeans," says Mr Rana. Once the post-industrial and post-consumer cotton waste is shredded back into fibres, they have endured great mechanical stress, and will need to be blended with a majority of longer fibre virgin cotton to improve the quality of the yarn. Soorty's recycled cotton yarns can contain anywhere from 5-20% recycled cotton, depending on brand specifications. "Adding more recycled content may compromise the ability of the product to survive washing processes," he says, adding that it is essential to "offer our customers durable products that will last."

Turkish mill Orta Anadolu has committed to a zero-waste policy and works in close partnership with Turkish used clothing collector and processor Gama. "We send them our textile waste, post-industrial fibres sorted by polymer or composition and colour, as well as cutting waste, which Gama recycles into new cotton yarns," Sebla Önder, the company's sustainability manager, said, speaking at a webinar on circularity organised by Kingpins. This organisation has allowed Orta to generate 650,000 kgs of recycled cotton last year and it expects to reach 1 million kilos this year.



As part of its strategy to close the loop, Turkish mill Bossa has implemented a zero-waste policy since 2019, says Özge Özsoy, head of marketing. The company uses pre-consumer waste obtained from leftover raw materials generated in the fabric and garment production process. It is also collaborating with its customers and municipalities in Turkey to collect old jeans. In its 2020 sustainability report, the amount of recycled cotton represented 9% of its total production, and it plans to bring this proportion to 15% this year.

To increase its production of post-consumer recycled (PCR) cotton fibres, Sharabati Denim has recently added an open-end spinning line on its site in Kadirli, Turkey, as it says this spinning method tolerates shorter fibres.

As part of its "Passion for Denim, Passion for Life" mantra, Çalik Denim has invested heavily in reprocessing waste. "Our E-Denim concept is a candidate to be the most sustainable product in the industry as it was developed with circular design in mind," says Serhat Karaduman, the company's deputy general manager. "As the amount of recycled fibre increases in ring yarn production, there is a decrease in ring yarn product quality. To keep the quality and recycled material content high, we use 100% recycled open-end yarn as the core and integrate it into a ring yarn. This step is followed by wrapping the core yarn with recycled good-quality cotton to produce the ring yarn. In addition to this, we add recycled Tencel to the yarn to achieve the maximum amount of recycled content that can be technically made in ring spinning." With this innovative and patented process, the percentage of recycled content in a Super Stretch E-denim fabric can reach up to 40-45%, the company says.

*Soorty has set up a sophisticated approach to post-industrial waste management; from yarn to fabric to garment, it is collected and tracked to be respun.*

PHOTO: SOORTY

### Designing out waste

Denim mills are making progress in reusing their own waste, but to increase the portion of a used garment that can be recycled requires that brands do their part by designing out unnecessary elements. A pioneer in this thinking, Dutch brand Mud Jeans has purposely reduced the number of buttons and rivets, and does not sew a leather patch on the back. These are some of the measures that increase the proportion of used jeans that can be recycled into fibre. The Jeans Redesign project launched by the Ellen MacArthur Foundation tackles this issue point-by-point in its guidelines.

Mud Jeans has been applying circular thinking since its foundation in 2013. Its two main fabrics blend GOTS-certified organic cotton with post-consumer waste (PCR) cotton, the stretch version has 23% PCR and 2% elastane, whilst its rigid fabric is made with 40% PCR. The waste is processed and spun back into yarns by Recover and woven into denim by Tejidos Royo, both companies based in Spain. Cutting, sewing and garment finishing is done by Usetex International, on a single site in Tunisia, which further reduces the environmental impact of the products the brand sells.

The strength of Mud's circular system is its small supply chain, says Laura Vicaria, Mud Jeans CSR manager. "We know that the majority of our reduced impact is due to the use of recycled fibre, as cotton farming has a big impact that is avoided by using recycled cotton and organic cotton," she says, drawing on the brand's 2019 Life Cycle Assessment (LCA). She is now preparing the next edition.

Mud Jeans now uses stainless steel buttons, which she says was necessary to obtain Nordic Swan certification, and the clothes are sewn with a polycotton thread. "We are looking for a more sustainable alternative, maybe in the lines of a biodegradable polyester sewing thread, but it would need to have the necessary strength for denim garments," says Ms Vicaria. "We want our jeans to be sustainable but also high quality and well made so they last long, can become vintage and will be easy to recycle."

The other key element of Mud Jeans' circular system is its leasing programme in which customers pay a monthly fee and can return the product after one year of use. In 2020, for the first time, half of the brands' clients rented their jeans. "Our founder, Bert van Son, says the cultural timing is now more conducive to leasing, thanks in part to online platforms such as Netflix," says Ms Vicaria.

Despite the leasing and take-back programmes it has set up, the brand does not collect enough jeans for its own recycled cotton needs. This is where collective initiatives can make a difference.



*“E-Denim was developed with circular design in mind”*

SERHAT KARADUMAN, ÇALIK DENIM

### Local loops

As seen at Mud Jeans, at Orta with Gama in Turkey and at The Denim Project in Guatemala, the creation of local recycling loops is slowly scaling up the process of closing the loop. The Reverse Resources Software as a Service (SaaS) platform aims to track and trace post-industrial cutting waste to buyers seeking either to reuse, resell or recycle it, which it believes could unlock a \$15 billion market. "We see this as a way to 'bend' the current waste supply chain into a circular model and provide a viable business for all parties involved," says Marieke Kokkelink, sales and research lead for Reverse Resources.

Its innovative platform has been set up in Bangladesh. Known as The Circular Fashion Partnership, it is led by Global Fashion Agenda, Reverse Resources (RR) and The Bangladesh Garment Manufacturers and Exporters Association (BGMEA). It is also supported by 17 global brands who are collaborating with RR to mobilise garment manufacturing facilities to join. "We train their staff to better manage waste and segregate off cuts from cutting tables," says Ms Kokkelink. These fabric scraps, sorted by composition and colour at the factory, are picked up by waste collectors, who will remove any remaining contaminants, log the 'merchandise' on the platform and take care of billing and shipping. "We are striving to make this stage of the process more transparent, as in the informal economy, there can be up to four or five intermediaries involved in this 'market'. Our goal is to make them the logistics managers of the process," she says. Once sorted and quantified, recyclers can place their orders on the RR platform. Brands can also have a clearer picture of the waste their production generates, and trace it, the start of a transition to a circular model. "This system creates a business case for all the players in the system, ensures higher quality waste and reduces cost," she says. Information provided by the platform can be used for CSR reporting and GRS (the Global Recycled Standard) certification.

This programme follows up on an earlier project in the Mediterranean region, launched in 2019 and known as SwitchMed. A tender set up by the United Nations Industrial Development Organisation (UNIDO), it involves denim manufacturers based in Morocco and Tunisia and brand partners Nudie Jeans, Diesel and PVH. A full year was necessary to map out waste, and recycling trials are now under way. “We expect demand to be upwards of 200,000 tonnes, and supply could be around 360,000 tonnes yearly,” says Ms Kokkelink.

While Europe may not have the manufacturing infrastructure of other regions to generate post-industrial waste, it is where key players in a possible circular economy are based, namely the brands, the consumers and the companies investing in recycling technologies. A number of projects are seeking to build up closed loop connections, as is Accelerating Circularity in the USA and The Denim Deal, part of the Dutch government’s Green Deal Circular Denim programme. It has attracted 30 international partners seeking to make post-consumer recycling the “new norm” within the denim industry. Fibersort, an automated sorting machine developed by Valvan and Wieland Textiles, both based in the Netherlands, is an important element of the programme as the machine should speed up and reduce the cost of segregation. Denim manufacturers Bossa, Çalik, Ereks and Orta Anadolu are members, along with Gama. Brands involved in the programme include Mud Jeans, Scotch & Soda, Kings Of Indigo, House of Denim, Kuyichi and PVH. They have pledged to produce three million jeans garments containing at least 20% PCR cotton.

### Looking ahead

Mud Jeans has already identified the next stage of its circular design ethos. “Our long-term goal, and the most exciting, is the Road to 100. We plan to make jeans from 100% post-consumer recycled cotton by mixing fibres that are mechanically and chemically recycled,” says Ms Vicaria. She says the company has reached the limit of mechanical recycling with its 40% PCR cotton content, and the only way forward is to include cotton that is chemically recycled back into fibre. The brand is working with Saxion University, in the Netherlands, to develop and scale up a process that turns cotton fabrics into manmade cellulosic fibres, a project funded by Tech for Future. “This would make it possible to reach 100% recycled content,” she says. While the pandemic has slowed progress, the first samples are expected to be delivered by the end of the current year.

*When Bert van Son founded Mud Jeans and launched its leasing programme in 2013, the trend to rent instead of own was far from common, but growing awareness is leading to wider acceptance, the company says.*

PHOTO: MUD JEANS



*“We want our jeans to be sustainable but also high quality and well made so they last long, can become vintage and will be easy to recycle”*

LAURA VICARIA, MUD JEANS

Many companies are working on chemical recycling processes that regenerate cotton-rich used clothing into viscose or lyocell, or any other manmade cellulosic fibre (MMCF). But, as these technologies scale up, they will add to the demand for used cotton clothing, possibly reducing available feedstock for mechanical recycling. It is as yet unknown which of the two methods, mechanical or chemical, has a better environmental profile. It is believed that mechanical recycling is less energy, water and chemical intensive, but the shorter fibres generated by mechanical processing limits their reuse as they must be strengthened with the addition longer fibre virgin cotton.

The presence of elastane is another challenge in the recycling of post-consumer goods. It is believed that 80% of jeans currently produced contain elastane fibres. Ms Vicaria says limiting elastane content to 2% is an acceptable threshold. Higher stretch yarn content will pose problems. In the highly time-consuming process of recycling waste, especially post-consumer, anything that slows it down or impacts its quality will clog the wheels of closed loop recycling. ■



Denim expert **Piero Turk** sees further potential in ozone and recycled fibres but wishes there was a greater understanding of the people and processes behind clothing manufacture. He works hard on his collaborations with some of the leading brands, mills and suppliers – but makes sure he also takes time out to relax.

# “It’s the start of a **new future** for garment finishes”

**Q What are your priorities when thinking about designing new fabrics or effects? Is it tricky to create new designs for every customer?**

**A** I’m not interested in innovations by themselves. Everything we develop must answer to two questions. First, is it beautiful? This can mean many things: you want to use the new denim, you want the new wash in your collection. Second, is it useful? Can this new development help brands or retailers to create more business? If you go to Kingpins, you have thousands of new developments, new washes, but do we need so many? Not really. Innovation has to bring something new that can open the door for other new developments.

Creating new designs and developments for every customer can be difficult because you have to develop things that are on-trend – you can’t think “I won’t develop a wide-leg pant for this client as I have for the other” – but it also needs to be original. So that can be difficult but, after so many years, I can manage!

**Is there anything you wish customers had a better understanding of, when it comes to how jeans are made?**

There are two important things I would like people to understand better. First, how long it takes and how difficult it is to create a new denim or a new wash – a new style is easier. Creating a new colour in indigo, and any other development, takes a lot of time and a lot of tests. Sometimes people don’t understand that enough. If that was clearer, it would help our industry. Otherwise, people are always pushing to have cheaper prices and there isn’t enough margin for investments or for innovations.

Second, to have a greater understanding of or desire for transparency. When we buy clothes, we don’t know anything, except where it is made, and sometimes that is fake! For instance, if a company makes a shirt in China but imports it without labels and buttons, and finishes it in Italy, they can put ‘Made in Italy’ on the label, but in reality it is not. We only know the composition of the fabric and where it’s made, but the supply chain is unclear. Where does the cotton come from and how about the quality? Long fibres are more expensive. We should offer more information.

For example, a Turkish denim mill can give all the details – the process, the cotton, information on the farms that use regenerative agriculture, how much water is saved in the dye process – in a QR code that the consumer can see, but big retailers don’t want to highlight these products in case their other products stand out. It has to come as a whole, otherwise we will never change. European communities should decide on the hangtags or label. Nowadays, you can buy jeans in some countries cheaper than a McDonalds meal – how can that be?

**If there was no limit on budget, what would your ideal jeans look like?**

They would be 100% recycled cotton, or at least recycled cotton blended with other sustainable fibres (I’m not keen on the word sustainable!), perhaps recycled Tencel. Really good-quality recycled cotton is expensive, because you have to select where the cotton is from and it needs to be properly processed and spun to make it strong enough. There are mills that can do 100% – dyed like a normal cotton and looks like a normal cotton.

In terms of washes or finishes, I like unwashed jeans, but if it has to be washed, it must at least be done with new technologies, with new washing machines that use a small amount of water. Or if you want to wash more, using new technologies and avoiding dangerous chemicals. This can be much more expensive than a normal jean.

*“People are always pushing to have cheaper prices and there isn't enough margin for investments”*



*Piero Turk has worked as a designer and creative consultant for some of the world's leading mills and brands, including Replay, Lee, Trussardi Jeans, Cerruti Jeans, Edwin, Guess, AG by Adriano Goldschmied, Hilfiger Denim, Pepe Jeans, Orta Anadolu and Bossa.*

PHOTO: PIERO TURK

**In terms of new ideas or developments, which ones do you think have staying power?**

The biggest impact is the R&D that many denim mills are doing in terms of recycled fibres: how to blend them and find the perfect balance between recycled and strength. They are working out how to blend recycled cotton with cellulosic fibres like Tencel or viscose.

A few years ago, you couldn't really use recycled cotton because the quality was poor and you couldn't source it properly, but now we see it all the time, many people have it in at least part of their collection. I find this more interesting than anything else, because it can be used in any quality product, in super stretch or rigid.

**Which recent technologies have made the most impact at mill level?**

In terms of washes, it's not new, but the use of ozone in the last few years is having a big impact. We have really good technologies but it is an ongoing process because you still have some problems, but it has opened a door to the future. I'm old enough to remember when we started stone wash, and slowly we learnt which stones are better, as well as when we started sandblasting.

Now it's the start of a new future for garment finishes. I believe if all the companies that develop the technology work with chemicals companies on the dyestuff and with the denim mills, they can create a new range of products that will save a lot of water and chemicals.

**Looking down the supply chain, how do your relationships with the chemicals makers and technology groups help ideas come to life?**

I am very lucky to work with Tonello and Rudolf Group. Both companies have a similar background and are very truthful.

Rudolf is investing a lot in developing chemicals that are not made from oil, but are plant based. They want to move away from the slavery of the oil, and that is very important. They are developing really interesting things in water saving. For instance, around 50% of water consumption in the lifecycle of a pair of jeans comes from the fibre, around 7% is from making the denim and just 3% of water is the finishing. The other 40% is home washes. Rudolf is working on chemicals that help you to wash your jeans less, saving water and energy at home.

Tonello has developed a range of lasers that cover the whole process: the creation, the design, using the laser on the pant, making the whole process easier for everybody. It gives every country and every factory the opportunity to create the looks without having the most experienced laser designer. It can also read where the pant is, and that's a big step.

*“The most important advice is to be curious, and understand how the process works”*

They are also the only company that can combine ozone in air and water. That gives a lot of opportunities. With those technologies you can bleach down a pant and it stays pale but bright. Normally, if you use just ozone in air, and bleach down, it comes out much more greyish. So, they are bringing ozone to a new level.

Giving these companies a designer's point of view on what we'd like to do with those technologies and chemicals is very interesting. It helps me to understand how to work in those areas, and helps them understand what a designer, brand and consumer would like to see on finished garments.

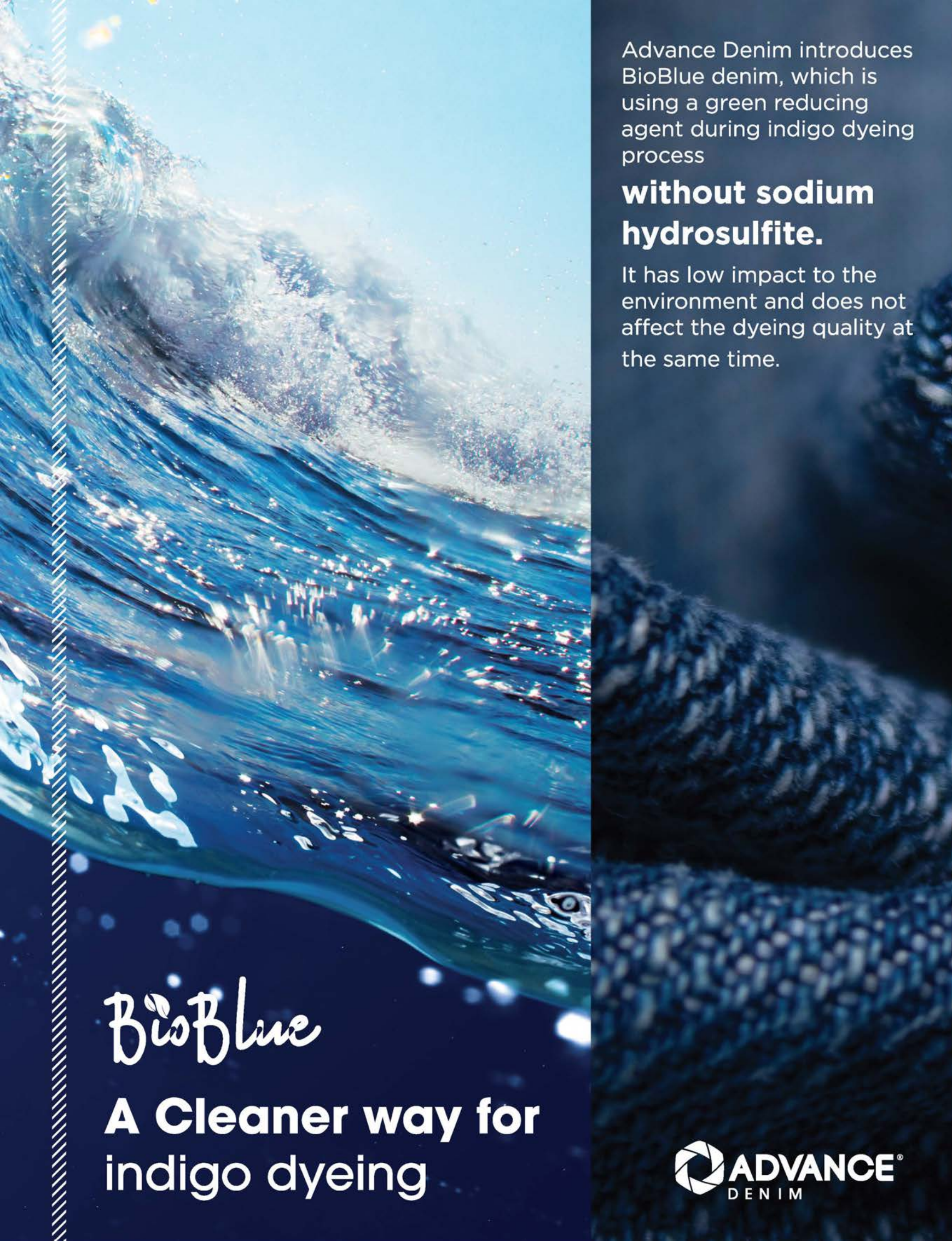
**What do you teach the team working for you, particularly younger workers, about how to be a good denim technician?**

The most important advice is to be curious, to understand how the process works. And to move our denim industry towards being more sustainable on all counts. We can use technologies that pollute less and use less water, but sometimes the people who make the garments are not paid enough to have a decent life. You have to combine those things: the social part and the ecological part.

**What would happen on your ideal day?**

In my studio it's forbidden to work too late. What cannot be done today can be done tomorrow. My ideal day would begin with finding inspiration from somewhere unexpected. Sometimes I look at something, read a book or have a conversation and I find something that amazes me.

In the afternoon, I would walk in the sunshine with my wife and my dogs in the countryside. Then I would love to have dinner with my son and daughter. I'm a single father and, with covid, it's been more than a year since we've been able to have a meal in a restaurant together. That would be an ideal day. ■



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# Disruptive dyeing idea

**A** partnership announced last year between fibre producer Spinnova and dyestuffs manufacturer Kemira has the potential to make an impact on the environmental footprint of the denim industry. The companies, both from Finland, have been working together on a method for “inherent” dyeing that they say could be “disruptively sustainable” for the textile and apparel industry, including denim.

Key to this is the fibre that Spinnova produces. The company, launched as a spin-off from the VTT Technical Research Centre of Finland in 2014, turns wood fibres into yarn “without complex chemical processes” and without dissolving anything. Its feedstock is micro-fibrillated cellulose (MFC) from paper-grade wood pulp. Its technique is based on fibre-suspension flows, mechanically pulping the fibres and controlling the flow in such a way as to form a yarn. After going through a drying process, the yarn is ready for spinning.

“It’s very simple,” says chief technology officer and co-founder, Juha Salmela. “It’s the combination of those two factors, the raw material sourcing and the technology we use, that makes this work.” It is, however, clearly more difficult to achieve than he makes it sound; otherwise all fibre producers would become “disruptively sustainable”.

A promising partnership between two Finnish companies could supply denim manufacturers with a high-performing, pre-dyed warp yarn, allowing them to skip the indigo dyeing process altogether and go straight to weaving.

In addition to sustainability, he insists that Spinnova has always sought to provide products that work. Rather than making fibres with special properties such as those of spider silk or carbon fibre, the company set out to make a difference to the mainstream, global textile industry by producing a fibre with properties like cotton’s and a price-point like cotton’s.

## Early adopters

Fashion retail groups H&M and Bestseller have been among the early adopters that have given Spinnova confidence that it is on the right track. Bestseller, the parent group of brands such as Jack & Jones, Vero Moda, Selected and Mamalicious, has described the materials that its textile manufacturing partners can produce from Spinnova yarns as “revolutionary”. For its part, H&M has recognised the role Spinnova’s products can play in blends with other fibres, including cotton.

*A visual of Spinnova’s new factory, currently under construction in the university city of Jyväskylä. This facility will help the company increase its production capacity to one million tonnes of fibre per year.*

ALL PHOTOS: SPINNOVA

These big-name partnerships are the fruit of years of proof-of-concept work. Lifecycle assessment results show figures for carbon footprint and water consumption that are “minimal compared to anything else”, Mr Salmela says. Plus, tests have shown that fabrics made from the company’s fibres have additional benefits, including high levels of thermo-insulation, moisture management and antimicrobial properties.

### The process remains the same

Its work with Kemira shows that it’s possible to incorporate dyeing “in the main colours” into the Spinnova process seamlessly. Juha Salmela, making it sound simple again, describes it as being “like dropping an ink pellet into a big tank full of MFC and mixing it a little”. All the dye is absorbed into the fibrils of the MFC and the fibre then goes through exactly the same extrusion and drying process as non-dyed fibre. A small amount of curing time is necessary, but other than that the process is the same, with no extra energy and no extra water required.

“It’s the same method as Kemira uses to dye pulp and paper in an environmentally friendly way,” he says. Spinnova’s fibre is particularly suited to bringing this into textiles because it is made without dissolving anything. Mr Salmela explains that manmade cellulose production usually requires the raw material to be dissolved back to the polymer stage first, with regeneration of the fibres taking place after that.

Dyeing the polymers is not possible and, therefore, dyeing in these mainstream processes normally takes place at the fabric stage. Some manufacturers have begun dope-dyeing at the regenerated fibre stage. They are making a great success of this, Mr Salmela points out, particularly in applications such as intimate apparel, but this comes at the cost of extra washing cycles. “They cannot do it at the stage at which we do it,” he says, “the raw material stage.”



Even though the Spinnova fibre will, after this, be dyed a particular colour, the fibre will keep its mechanical properties and preserve another of the benefits Spinnova claims – recyclability. “In some cases, the quality of our fibre can even improve with recycling,” the chief technology officer says.

### Indigo included

Although the range of colours that Spinnova can use with the Kemira inherent dyeing technique is limited, indigo dyeing is one of the possibilities. For this reason, Dr Shahriare Mahmood, who became the sustainability director of Spinnova in 2020, says he believes there is good potential for using the company’s fibre and the new inherent dyeing method to make a positive impression on the denim market.

His previous roles include working in the denim industry in research and development and sustainability positions. “It will work,” he says. “There is no question about it.” The indigo idea has now progressed to testing the colour-fastness and rub-fastness of the resulting fabric, and examining any impact on knitting or weaving.

### Straight to weaving

He foresees savings for denim manufacturers in time, money, energy, water and chemicals. They can use a Spinnova fibre that is already indigo-dyed as the warp yarn, and combine it effectively in the weft with a fibre of their choice, including cotton. “Manufacturers will go straight to weaving with the dyed Spinnova warp yarn, completely skipping the indigo-dyeing process,” he says. “This will have a really significant environmental impact.”

In terms of look and feel, fabric development tests so far show that denim made using Spinnova has what Dr Mahmood refers to as the right level of “roughness” and an absence of the shininess that many lyocell and viscose fibres have, making it better able to emulate cotton or linen. It will be no more than a matter of months now before Spinnova-based fabrics are available for denim brands to try for themselves in sample collections of jeans, he says. He believes the idea of using Spinnova in this way will be ground-breaking. ■

*(Above:) Denim fabric made using Spinnova’s indigo-dyed yarn in the warp.*

*(Below left:) Chief technology officer and co-founder, Juha Salmela.*

*(Below right:) Spinnova sustainability director, Dr Shahriare Mahmood.*

‘Natural’ cotton has had a tumultuous 12 months, with supply from China restricted and fraud discovered in India. However, demand is increasing and supply is racing to keep up: the latest recorded crop was the second highest on record.

# Organic growth

**O**rganic cotton and related standards are touted as the ‘golden standard’ by some companies, which is why it is surprising that only around 1% of the world’s cotton production is organic (although this is a figure that is hard to verify). In 2020, the demand from brands and retailers increased significantly but supply has been hit by a double whammy: bans on using cotton from Xinjiang, the Chinese region surrounded by controversy over alleged forced labour, and then by the announcement that the Global Organic Textiles Standard (GOTS) had discovered fraud in the supply chain in India.

Perhaps in response to earlier supply issues, 2020 saw the largest number of organisations registering under GOTS in its history. There were more than 10,300 certified facilities in 2020, an increase of 34% over 2019. Sixteen GOTS-approved certification bodies reported that over three million people in more than 72 countries were working in GOTS certified facilities.

GOTS is a stringent voluntary global standard for the post-harvest processing (including spinning, knitting, weaving, dyeing and manufacturing) of apparel and home textiles made with certified organic fibre (such as organic cotton and organic wool), and includes both environmental and social criteria. Key provisions include a ban on the use of genetically modified organisms (GMOs), hazardous chemicals and child labour, while requiring strong social compliance management systems and strict wastewater treatment practices. The Organic Content Standard (OCS) provides chain of custody from farm level and also saw a leap, with 48% more registrations during 2020.

*The GOTS standard covers the processing, manufacturing, packaging, labelling, trading and distribution of all textiles made from at least 70% certified organic fibres.*

PHOTO: GOTS



## India blip

But, if standards are voluntary, how can buyers be sure of organic cotton's authenticity? In November, GOTS announced it had obtained evidence of fraud on the part of some Indian cotton producers. In the course of the surveillance audits by GOTS' accreditation body IOAS (International Organic Accreditation Service) false raw cotton transaction certificates were detected. The false templates, with faked QR codes, led to a cloned website.

"GOTS acted quickly and as far as we can see, none of the fraudulent cotton entered into the supply chain," Christopher Stopes, GOTS' representative in the UK, tells *Inside Denim*. The organisation issued certification bans, terminated some contracts and informed the approved independent certification bodies so that they could cancel the false transaction certificates to prevent affected goods from being sold with the GOTS label.

"Although it represented a small proportion of the Indian organic cotton harvest, as can often happen with supply chain disruption, the traders, to cover their positions, say it's hard to get hold of and prices have increased. Although it's not for me to make a judgment on trade, it's possible that this led to a spike in prices that doesn't really reflect the reality," says Mr Stopes. "On the other side, if GOTS-certified operators have grown by 34% this year, then clearly there's a lot more demand, and demand in a supply-constrained market inevitably results in higher prices."

Cotton prices can vary, and are affected by factors including government policies, global stockpiles, demand, climate and even the price of purified terephthalic acid (PTA), the raw material used to make polyester. Mr Stopes believes it is important that purchasers agree fair prices and have long-term commitments.

A move away from commodity cotton to a networked community is also something the US-based Textile Exchange is campaigning for. It estimates the price differential for organic is somewhere between 5% and 20%, but can be as little as 1% or as much as 100%.

"You can't just play the spot market, particularly not for organic, as it might not be there when you want it – you need long-term relationships," says Mr Stopes. "Commercial decisions aren't something that GOTS can intervene on. What we can do is get rid of the source of fraud and continuously improve our systems. That we detected the fraud shows our system works."



## Social fairness

However, no one in the clothing or materials markets can overlook the biggest source of recent upset in the cotton markets, namely the allegations that some people from the Uighur Muslim population in Xinjiang are being forced to pick cotton and are being kept in 'camps' – something China strongly denies. This led to brands and organisations – such as The Better Cotton Initiative (BCI), Patagonia, Nike and H&M – pulling away from cotton, textiles or garments sourced from the region. There has also been a coordinated effort by the European Union, UK, US and Canada to impose sanctions on Chinese officials over alleged human rights abuses. China has retaliated with sanctions on European officials, some Chinese consumers and retailers have boycotted Western companies, and brands have moved away from BCI.

China is the world's second-largest supplier of cotton, and the majority of that comes from Xinjiang, so the knock-on effects are reverberating through the market as companies scramble to find new suppliers. However, the situation is rapidly changing and is taking an increasingly political slant over recent weeks, so it is difficult to gain a clear and current picture.

(Above:) Cone Denim is seeing "tremendous interest" in organic cotton. It can offer blends between 15% and 100%.

PHOTO: CONE DENIM

(Below:) The label grade 'organic' requires at least 95% organic fibres and 'made with organic materials' requires at least 70%.

PHOTO: GOTS



GOTS has a restriction to exclude raw material if there is evidence of violation of labour rights. The sixth version of the GOTS standard, published last year, sets stricter ecological and social criteria. These include requirements on fair pay: certified companies will have to calculate the gap of paid wages to 'living wages' and work towards closing the gap.

GOTS has also put in place steps to improve transparency, introducing a requirement, as of last October, for the sourcing country, region, state or province to be made visible on transaction certificates. "A new, centralised database that GOTS is working on will allow web-based end-to-end traceability, to enable faster, more transparent checking and fraud prevention," adds Mr Stopes.

### Covid uncertainty

Textile Exchange's 2020 Organic Cotton Market Report shows an increase of 31% in organic cotton production in the 2018/19 season over 2017/18 (which itself grew 56%), making it the second-largest harvest on record after 2009/10. By far the largest producer was India (51%) followed by China (17%), with Turkey and Kyrgyzstan producing 10% each. More than 222,130 farmers grew 239,800 metric tons of organic cotton in 19 countries on 418,900 hectares.

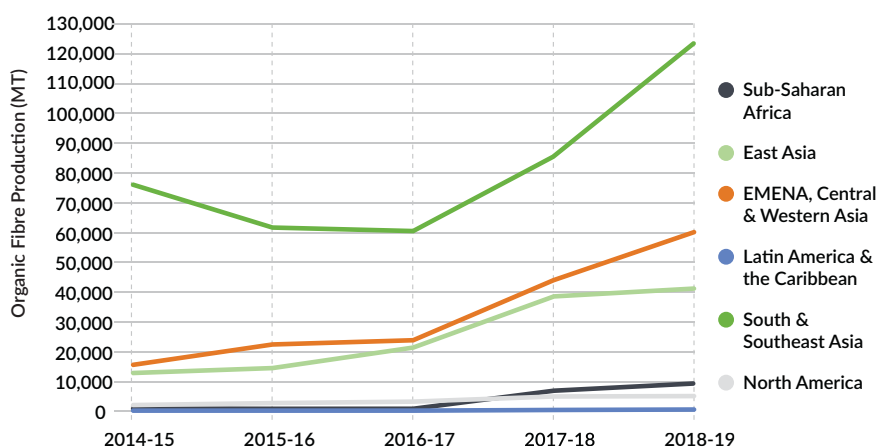
The leaps in certified facilities in the past year are impressive given the covid-19 pandemic has put a high degree of uncertainty into the market, which is not something that works well with farming. On a practical level, it has resulted in poor linkages between non-GMO seed companies, dealers and farmers, and training has been cancelled in lockdowns. Some recertification dates have been extended, and virtual audits have been temporarily allowed under certain circumstances.

US mill Cone Denim started its OCS cotton collections 10 years ago, and is on track to have used 1.3m kg by the end of this year. Steve Maggard, president of Cone Denim, explains that supplies of certified organic cotton are currently limited. "We have worked aggressively with our suppliers to secure additional inventory," he says. "Limited supply is available across Cone's global platform, with greater availability out of our China mill."

### Biodiversity focus

At the heart of the organic movement is a move towards a more natural way of working, consuming and living. We are hearing more about addressing biodiversity loss associated with pesticides, as the groundswell around regenerative farming techniques grows (see *Inside Denim* Issue 3). 'Regenerative' covers many aspects of farming and can improve yields and diversify crops, while improving soil health, and does not need to be organic.

### Regional organic cotton production (MT) - Five year trend



Perhaps consumers are familiar with the concept of 'organic' from the food market, but the nuances of some other cotton standards are sometimes harder to understand. Its continued growth will be reliant on brands and retailers believing in their ability to pass on the message and benefits, and being willing to pay the higher prices – as well as using a high enough percentage in the blend.

In the UK, new rules affecting a collaboration between GOTS and the Organic Trade Board will mean increased promotion of organic textiles to consumers over the next few years. However, with the majority of the cotton seed market controlled by GM groups, according to GOTS, and farmers locked into contracts, the move to non-GMO is likely to be slow. "There is a growing recognition by consumers that sustainability is important," concludes Mr Stopes. "Organic offers a way for them to make a difference in their purchasing decisions and not be party to the greenwash that is so prevalent in the fashion industry." ■

*Organic cotton production by region.*

PHOTO: TEXTILE EXCHANGE

### 'In conversion' takes the pressure off

To circumvent some of the supply issues, a growing part of GOTS and OCS allows for land that is in conversion to organic. It can take up to three years for a farm to change its systems and build soil health through rotational crops. "Some purchasers see this represents an opportunity: it helps make good what is a tight supply of organic cotton, customers understand you can't be organic overnight, and it enables the farmer to earn a better living during what can be a costly conversion period," explains Mr Stopes. Of 55,833 hectares of land in-conversion to organic during the 2018/19 season, India and Pakistan are leading the way. Pakistan imposed bans on products from India in 2019, after New Delhi revoked the special status of its portion of the long-disputed Kashmir region claimed by both countries. This led to some supply issues, now exacerbated by problems in Xinjiang. Pakistan's 398 MT of fibre grown on 781 hectares in the 2018/19 harvest year was the country's first certified organic crop. This was a result of the partnership between WWF Pakistan, Laudes Foundation (formerly C&A Foundation), the Directorate of Agriculture Extension, non-profit organisations, and denim groups Artistic Milliners and Soorty Enterprises. They are working with thousands of growers in Baluchistan Province to build organic cotton cultivation, with Artistic and Soorty saying the projects will help farmers in many aspects of their lives.

# WASTE NØT

**REDUCE,  
RE-USE,  
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Post and Pre Consumer Cotton  
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Organic Cotton

Natural Fiber

Water Saving Indigo Dye  
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**SHARABATI  
DENIM**



As the premium Italian jeans brand prepares to celebrate four decades in business, its CEO **Matteo Sinigaglia** tells *Inside Denim* the key to longevity is consistency and authenticity.

# Replay toasts to the next 40

**Q** Replay invests heavily in R&D. How important is sustainability, and how does this show through the way the fabrics and garments are made?

**A** Since 2012, Replay has had a big focus on finding new technologies and new ways to make more sustainable products. We did that because it is such an important issue, and it has become a main pillar of our strategy and part of our culture. People want to live in a better environment and they are very conscious about the impact products and actions can have. Reports show that sustainability is one of the core motivations for buying a product for six out of 10 people.

In the past, it was not very easy to show sustainable actions in the product, because it's down to the way you treat it – using technology, the materials and through the production itself, for instance using waste and recycling raw materials.

We approach sustainability through technology – using lasers and Cloud technology, which saves water and lowers chemical impact – as well as through using organic cotton. We have also recently introduced Replay Reused, where we use cotton that would ordinarily be thrown away postproduction, recycled PET bottles and reuse denim fabrics to give them a new life.

The next stage is to make sustainability more visible and we are introducing a new project in the next few months that uses natural pigment. We have tried to merge natural colours, like landscapes, with indigo, which will be quite new. It will be an important topic.

**Replay is synonymous with high quality denim. How does it stand out from competitors and keep customers loyal?**

We try our best in terms of selection of materials and partners, offering a consistent and coherent product. Of course, the consumer has the final say. From our data, they appreciate what we're doing but we are always motivated to do better.



Denim is an interesting business. There are very few companies that can last over 40 years. Our strengths lie in consistency plus our culture in terms of how we make the product. Denim is the item you use most in your wardrobe and it's part of your life, so it's quite easy to judge whether a fit or a quality doesn't work.

**Replay has a strong connection with football (as well as rugby and F1), which is unusual for a denim company. Why is the connection with sports important?**

Sport, in terms of performance, is beautiful to watch, but it also represents a very inclusive community. It's genderless and ageless, and it's one of the most contemporary communities you can find. We decided this was a good arena to be part of and it fits with our idea of being an inclusive brand.

**“We will come back to regular life, in terms of socialising, and denim will be as important as it was before”**

**Puma CEO Bjørn Gulden said Replay was one of his favourite brands. How did the project with Puma come about?**

Firstly, I would say that Bjørn Gulden has very good taste! The idea was about inclusivity. Denim and sports work together, and we thought our ability to do eco-sustainable washes and use it for sneakers would be something cool. Bjorn and I have been friends for many years, so we decided to see what could happen.

The product had a very defined aesthetic. We selected an iconic design from their side and iconic washes from our side and it came out an original product that merged denim culture with streetwear culture.

**Many high-end brands are investing in China as an important area for growth. Is it a big focus for Replay?**

I lived in that part of the world for many years, so I know it well. We have great business partners in China. China is a very mature market as far as luxury is concerned. Strategically, it's very important. We are not investing thinking about tomorrow, we are thinking on a mid-term timeframe: brand awareness, positioning the team. It will be a very interesting market for premium denim in three to four years' time.

**Almost every business has been hit hard by the pandemic, with store closures and falling sales. How did Replay adapt?**

The pandemic has affected everyone. Our way to handle it was to be as flexible as possible and to try to react to the unknown. I don't believe it's over, we still have some time to adapt. We have to take it as it is. The pandemic is something that had a start and will have an end. We do not change our mid-term vision because of an event – even though it's a massive event – we build in flexibility, so we can service the market at the right time.

Although some of our stores are closed, we try to be very close to the trade, and we try to do what we are good at: bringing innovations. I believe people still care about having something relevant for them. At a certain point we will come back to regular life, in terms of socialising, and denim will be as important as it was before.



In terms of innovation, wellness is one of our focuses, and we did this with Hyperflex. We try to deliver measurable innovation, which means, once you wear them, you can recognise that they are better than a standard product. We are very focused on wellness and sustainability. They both offer an opportunity for us to develop more.

*The headquarters of Replay-owner Fashion Box are based in a 25,000 square-metre building in Asolo, Italy.*

ALL PHOTOS: REPLAY JEANS

**Replay will be celebrating its 40th anniversary this year. Why do you think the brand is still so strong after four decades, and is the anniversary being marked in any way?**

The reason Replay has lasted for 40 years is because it's always had very good people behind it. Business is done by people. There is also a touch of luck – in life, you have to have some luck. But more than that, it is a very consistent brand. For 40 years it has never tried to be something else, it's always focused on being real and transparent.

For the 40-year anniversary, we have created some special jeans: as they were made and worn in 1981 and how they are made and worn today. We have created a unique package to show what we have achieved over 40 years. We couldn't plan a party, as we aren't sure about the restrictions, but we will be planning some activities from September.

**What are your hopes for the future of the denim business?**

I believe we have an incredible chance: denim could be the 'eco king' of the future. It is a product that is fundamental to everybody's life. As a company, we do our best, and I'm very optimistic that the denim industry will do the same. There is so much more to do that I feel very positive. ■



**Ikeme Eshemokhai** in conversation with **Hiro Yoshikawa**, founder of Washi Jeans. Mr Yoshikawa understands the value of craftsmanship, hard work and patience: his new jeans collection, created using traditional Japanese washi paper, has been 21 years in the making

# A new twist on Japanese denim

## Q Can you tell us about yourself and your background.

A I am from an 18th generation traditional Japanese brewing family, our sake is called Taiko Sake. Because I am the second son, my brother had the main responsibility of taking care of the sake brewery. I, on the other hand, had the opportunity to leave home after I finished university to travel around the world and discover what I liked. I found denim and now my passion and my life is all about denim. I am also helping my family to sell sake outside of Japan now.

## What was your first denim memory? And how did that make you pursue a career in the denim industry?

When I started working in the fashion industry 31 years ago I had zero knowledge about denim and washes. I produced a totally wrong colour when I took care of a Japanese brand's production. The client had requested a dark colour but I washed it into a lighter colour. They were very unhappy and wanted me to take full responsibility for the production. However, a few weeks later, this same client called me and said they were so happy to have sold out of all the jeans. They said the colour I had made was not in the market yet and people loved it. That saved my life.

It was my first and biggest "fail" and from then on I started taking denim very seriously. I put my whole energy into only denim items and focused on working in denim.

## The washi paper process is very unusual for jeans. Can you tell us what the material brings to the jeans, and why you chose it?

In my 200 year-old family history we have used lots of Japanese washi paper, for example, for account books, Shoji paper walls and Kakejiku (Japanese hanging scrolls). Japanese washi paper has also been used in the making of sake labels since 1672. I was luckily surrounded by washi paper since the day I was born. I decided to produce jeans using this washi Japanese paper in 2000 due to its unique characteristics.



PHOTOS: WASHI JEANS/IKEME ESEMOKHAI

Washi is born from a natural material; it has special characteristics such as being anti-bacterial, having shape memory, temperature control and UV protection, as well as being quick drying.

## Have you encountered any challenges?

The creation of washi fabric has been particularly difficult. Since 2000 I have been trying to develop and perfect washi paper. Paper needs to be turned into yarn. It took me around seven years to develop the paper into paper thread. This paper yarn is called Washi No.6 Paper and is made in Okayama, Japan. After I achieved making the yarn, I needed to make the fabric. But I only liked selvedge. It took another three years to produce selvedge washi paper fabric. My brand Washi launched in 2012. I have been adjusting the fabric for another eight years and now it is finally time to officially launch the new collection in June 2021. Overall, it took 21 years of preparation.

*“The best sake or jeans are always made by hand. There is human heart inside these products”*



**What inspires your creative process?**

Everyday life. My experiences. Very often I get inspired when I am dreaming or when I am taking a shower. Sometimes, creating alone is difficult, so sometimes I like to collaborate with other people or brands to exchange and brainstorm new ideas.

**Talking about creative collaborations, who would you love to work with?**

I would love to collaborate with brands who are environmentally friendly and saving the earth.

**What has been the most memorable experience in your career?**

Besides my Washi story, I have been producing jeans for many major jeans brands for the past 31 years. Overall, all of it has been a very valuable experience, allowing me to study from the fabric to the final product, as well as some of the sales side. Without

those experiences, I don't think I would have the career I have today. I fully appreciate all the brands that gave me the chance to experience working on their denim production and design. It's a collective experience in my past that created my today.

**How have your experiences shaped the way you work?**

I spent a lot of time inside the sake brewery when I was small, and witnessed the workers working so hard from morning until midnight. Sake-making requires lots of skill and is almost the same as taking care of a newborn baby as you have to watch sake for almost 24 hours a day, non-stop. The sake in my family brewery is all hand-made and not using any modern machines for the past 17 generations until now. There were over 10,000 sake breweries in Japan 50 years ago but now there are less than 3,000. My family business is one of the 3,000.

*Hiro Yoshikawa, founder of Washi Jeans.*

PHOTO: WASHI JEANS



From this valuable experience, my mindset has never depended on new technology and new machinery. I understood that the denim world changes quickly and is dominated by modern technology. However, if you look back, sake and denim history are very similar.

The best sake or jeans are always made by hand. There is human heart inside these products. In Japan, we had many nice jean factories 50 years ago. However, only a few are left now. If we don't protect this industry, this environment will disappear soon.

Washi will always protect and try to save the industry. Washi will be 100% made in Japan and we will protect the people in the denim industry.

#### **What would you tell young people about the denim industry?**

Denim is not an item to wear once and then throw away. It is very special: the rope dyed indigo, weaving on vintage weaving machines, sewing on a Union Special [sewing machine]. A wash can comprise of over 20 different processes by hand, there are also amazing metal trims. Jeans have history, and craftsmen have created very nice vintage denim in the last century.

Once you have found your own pair of jeans that you love, these jeans will be for life and will become part of your skin.

However, young people rarely take the time to understand old vintage jeans nowadays. Therefore, by setting up my small brand Washi, and through the experience in Washi House (our creative house), I want young people to be able to see, feel and experience the value of vintage jeans and the history of denim. And they also have the chance to see the progress of new ideas I am working on.

#### **What are your plans for the brand?**

We will launch a new jean fit called Hishi, using a new paper material, Washi No.6 Paper, in June 2021. The new collection is called 'Life on Earth'. We renewed the concept and are using our own washi paper for the whole collection. After the launch, we will explain and share the experience of real Japanese paper jeans with everyone. We have two lines, one is Shizen (meaning nature), and another one is Rikisaku (meaning craftsmanship), which are made to order.



*WASHI limited-edition jeans are made using over 15 different models of vintage sewing machines with in-house developed buttons and Japanese core yarn sewing thread.*

PHOTOS: WASHI JEANS

Washi is an environmentally friendly brand. All the trimmings, such as pocketing, labelling, etc. are made in organic cotton. We also worked hard on the technological development of indigo rope-dyed cotton warp yarn in the fabric.

We use eco-dyeing, it's an environmentally friendly dyeing system. Normal indigo dyeing uses a large amount of hot water and a cleaning agent in the pre-treatment and post-treatment processes. The eco-dyeing system reduces the environmental burden by reducing these. The selvedge fabric weft uses Washi No.6 Paper, the warp uses Eco Cotton.

#### **How do you relax?**

I work Monday to Sunday, from 9am to midnight. I will drink my family sake, Taiko Sake, to have a little break when I am tired.■

*Ikeme Eshemokhai is a multi-product designer, strategist and consultant with special expertise in the field of denim. She has over 15 years of experience and a record of commercial success among some of the world's leading brands. She is currently working as a consultant with mills, brands and manufacturers on innovation and advancing sustainability objectives.*

Washi Jeans website, [www.washihouse.com](http://www.washihouse.com), will launch on June 11.



f t  
i 4,500+

globe 3,000+

## We're growing!

It's been 18 months since we published our first issue and despite the pandemic we are growing and growing fast! We are so pleased so many of you are subscribing to and liking our content. Amongst the challenges there's further positives as we connect with industry professionals quite literally all over the world. In less than a year we have over 3,000 registered website users and an organic 4,500 following across our social media channels, we're hearing loud and

clear that our 'science behind the seams' approach to reporting on the industry is welcome and appreciated. We've so much more to come!

If you haven't already you can sign up to [www.insidedenim.com](http://www.insidedenim.com) **FREE** and access our technical articles and features. We'll also send you a weekly newsletter to keep you up to date.

If you are interested in raising the profile of your business to our global industry professional audience in either our magazine or digitally on our website, email: [jo@worldtrades.co.uk](mailto:jo@worldtrades.co.uk)

Putting jeans to work may seem like nothing new. But, reforming such an enduring garment to fit the principles of a circular economy, such as those championed by the Ellen MacArthur Foundation, is no easy task for the denim supply chain.

# Redesign reaches the market

“The right to make a dollar at any cost is seldom challenged,” wrote American author, conservationist and marine biologist Rachel Carson in *Silent Spring*, first published in 1962. Widely considered to be the foundational text for subsequent environmental movements in the US and Europe, at least, the banning of the synthetic insecticide dichlorodiphenyltrichloroethane (DDT) by the US Environmental Protection Agency in 1972 was, for many, attributable to the contemporary popularity of Ms Carson’s eco-conscious findings, which also met with pushback from chemical companies. Living in an era of fast or even rapid fashion today, the true cost (to borrow the name of the 2015 documentary on *Fast Fashion* directed by Andrew Morgan) of jeans manufacturing, alone, is increasingly being considered – and, crucially, acted upon – by key industry players.

## Blueprints

According to a 2018 report by just-style.com, cited by Ellen MacArthur Foundation (EMF), the global jeans market was worth \$57 billion in 2018, with this figure expected to reach \$60 billion by 2022. In its own oft-cited 2017 study, *A new textiles economy: redesigning fashion’s future*, the foundation’s then circular fibres initiative (now *Make Fashion Circular*) quoted data from an earlier publication by market research firm Euromonitor International, which showed that between 2000 and 2015 the average utilisation of clothing – ie, the number of times each garment is worn before the end of its useful ‘life’ – decreased by 36%. The same data suggested that this drop could be as great as 70% for China-based consumers.

*Jeans Redesign branded denim should contain at least 98% cellulose-based fibres, preferably cultivated as a result of regenerative farming practices.*

PHOTO: REFORMATION



The UK-based, pro-circularity EMF estimates that less than 1% of the materials used to make clothing are recycled into new apparel, including recycling after use and the recycling of factory off-cuts – a figure that could be as low as 0.1%. These figures go some way in presenting what it describes as the current take-make-waste extractive industrial model writ large. Jeans, as ubiquitous as clothing comes, play no small part in this. Cue EMF's Jeans Redesign initiative, which takes the humble denim garment as its genesis, with the end goal to establish a scalable circular design framework compatible with the fashion industry as a whole.

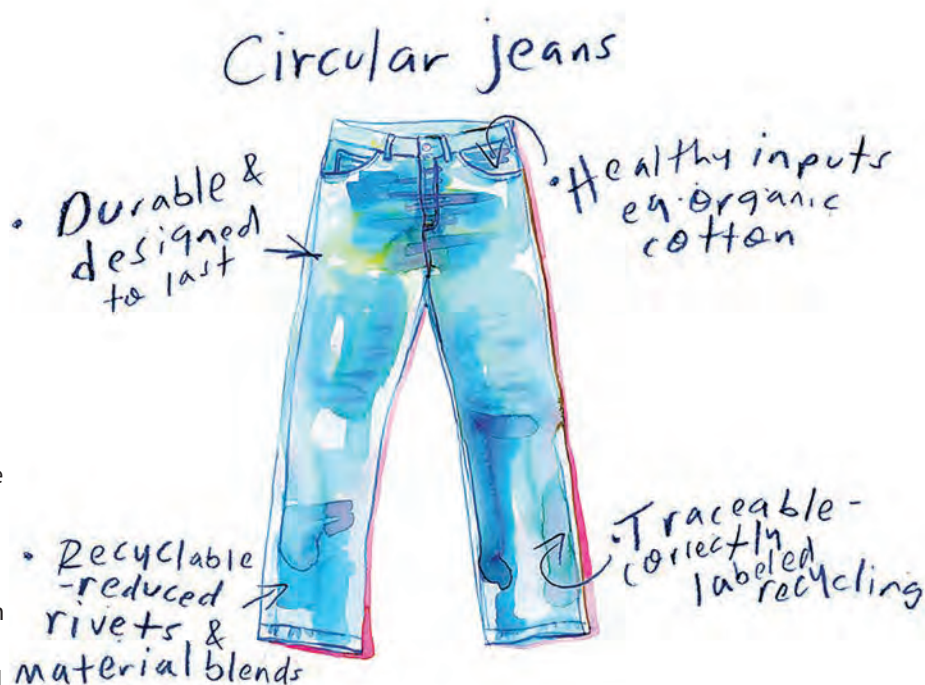
Respect for the health, safety and rights of all people involved at all levels of fashion is a prerequisite for participation, combined with a commitment to the improvement of working conditions across the global manufacturing sector. Beyond this, the Jeans Redesign guidelines provide minimum standards for jeans in four areas: durability, material health, recyclability and traceability. Key takeaways include that articles produced according to the guidelines should withstand 30 home washings at a minimum (while still meeting original durability requirements), clear product care labels must be incorporated, jeans should be made with a minimum of 98% cellulose-based fibres by weight (and these fibres should be sourced either from regenerative farming or, if unavailable, organic or transitional methods), metal rivets should preferably be designed out and all jeans should be free of hazardous chemicals and conventional electroplating. Stone finishing, potassium permanganate (PP) and sandblasting are prohibited.

At least 75 brands, garment manufacturers, fabric mills and laundries committed to redesigning their jeans following the project's launch. Reportedly, 650,000 new pairs will have been made according to the guidelines' specifications by the end of this May.

### Cuts and transitions

Chiara Catgiu, senior research analyst for EMF's Make Fashion Circular team, tells *Inside Denim* that the guidelines were warmly welcomed by the denim industry. Acknowledging that, generally speaking, Jeans Redesign-approved trims and, the stretch factor have posed the greatest challenges for participants thus far, Ms Catgiu emphasises the need for industry-wide communication and "alignment" regarding the main hurdles to innovation in circular design, particularly as the initiative looks set to continue advancing beyond the May deadline. By taking such a collaborative approach, faster progress can be made with solving any issues that arise, thereby ensuring that "all jeans" can be manufactured using circular systems, processes and values, she says.

When asked about a workaround for mills for whom organic cotton (the preferred option while regenerative cellulose fibre production increases) is in short supply, Ms Catgiu highlights in-conversion or



transitional cotton as a viable alternative. "This is an opportunity to build momentum and encourage the industry to move forward," she stresses. "By getting started with jeans, we can show what's possible and develop the knowledge and experience that will help us to achieve even more in the future." Jeans were chosen for EMF's first run at redesign due to the comparative ease of recycling them, the analyst adds, thanks to commercial chemical and mechanical recycling facilities appropriate to the composition of denim jeans.

### Creative disruption

At the time of going to press, only Lee, Wrangler, Guess, Outerknown, Nu-In, Frank and Oak, American Eagle Outfitters and Atelier & Repairs are yet to launch their redesigned jeans, according to EMF. Others, including Reformation, Tommy Hilfiger, Frame, Bestseller, Gap, Organic Basics, Mud Jeans, Unspun, Outland and BAM Bamboo Clothing have already taken their Jeans Redesign-branded denim to market. Fittingly, founder and creative director of the London-headquartered Fashion Revolution campaign, Orsola de Castro, captured the spirit of this new wave in a report released by EMF in February: "We all love our jeans, so let's all wear jeans that love us back – by respecting the people who make them and the resources from which they are made." ■

(Top:) A new, closed-loop style of jeans, carefully fashioned for post-linear living, is ready for action.

PHOTO: ELLEN MACARTHUR FOUNDATION

(Below:) The guidelines have been designed for making a fashion statement.

PHOTO: TOMMY HILFIGER



UK-based retailer M&S has spent two years revamping its denim fabrics, dyes and wash processes, and is rolling the new standards out across all its ranges.

# These aren't just any jeans

**A**dvances in technology and chemicals, and new evidence that sustainability increasingly matters to its customers are among reasons Marks and Spencer chose two years ago to embark on a complete overhaul of its denim collections. The UK-based retailer sought to make improvements in fabrics, chemicals and wash processes, working with its mill and laundry partners to set and meet new targets.

M&S describes denim as one of its most popular “hero categories”. It reportedly sells one in 10 pairs of jeans in the UK and has seen continued demand for denim throughout the pandemic, in particular for its bestselling jeggings, of which it sells two pairs every minute. Earlier this year, it launched 46 websites in new markets, expanding its online reach and enabling “millions more” customers to purchase its products, with the Sienna Straight Leg Jean topping its bestseller list across multiple international markets.

Choices of raw materials, dye and wash selection can have a big impact on the footprint of every garment, according to senior sustainability manager Cerian Atwell. “That’s why we chose to look at denim,” she tells *Inside Denim*, “as we could have a positive impact with simple actions.”

M&S worked with technology company Jeanologia, using its Environmental Impact Measuring (EIM) software to track each style against four metrics: water, energy, chemical impact and worker impact. The partners worked on reducing water using a combination of new machinery, eliminating some of the wash steps and encouraging the adoption of water recycling technology.



# “Increasing the sustainability attributes doesn’t necessarily impact price”

CERIAN ATWELL, M&S SENIOR SUSTAINABILITY MANAGER

It is phasing out powdered indigo and adopting pre-reduced indigo, which uses less water and fewer chemicals at mill level. Another target has been to eliminate potassium permanganate spray, which has a high impact profile when it comes to the environment, as well as health concerns for workers, particularly if they do not use the right protective equipment, says Ms Atwell. “More than half the styles that were sprayed for our spring 21 range used an alternative, lower-impact spray.”

## Adding efficiency

Often when more sustainable technologies are adopted, it is a balancing act of where any extra costs are absorbed – by the mills, laundries, retailers or consumers. M&S’s customer surveys showed people do not necessarily want to pay more for their clothes, but still expect the company to source with care. “One of the promises we make is ‘trusted value,’” she says. “We don’t necessarily see that if we increase the sustainability attributes that that will impact the price. We do so much work in the background, we need to share that with our customers.”

Ms Atwell believes laundries are open to investing in newer technology because it is more efficient. “Ten or 15 years ago the technology didn’t exist, but because technology is improving, the laundries are modernising. So, it’s a combination of new technology and improvements in chemistry combining to make it the right time to do this.”

Following an initial scoping project, it took a further two seasons to scale the new standards to the full denim programme and this season the retailer was able to make its specific claims, backed by data, and launch a big marketing campaign. More than five million pieces of denim were measured through the EIM software program in 2020, and those for autumn-winter 2021 are currently in production.

## Future proof

In terms of fabrics, most cotton is sourced through the Better Cotton Initiative – the company estimates 18 billion litres of water was saved through its sourcing of BCI (compared with conventional cotton) in 2019. Before the covid-19 pandemic, the team regularly attended fabric fairs but now rely on presentations from key suppliers. “For the new technologies in raw materials and chemistries, we normally invite suppliers to present these to us and then we set up projects with our partners to trial them,” says Ms Atwell.

The next steps include completing the transition away from potassium permanganate spray and considering newer chemistries. “We are also looking at circular principles and how they can be applied; fibre-to-fibre recycling as well as how the jeans are designed, so they can be recycled at the end of their life,” adds Ms Atwell. “Our work with denim isn’t done yet.”



*The new standards apply across all segments: women’s, men’s and childrenswear.*

ALL PHOTOS: M&S

## FACTORY TALK: NEW WASH

Tilmann Wröbel takes us on a historic trip to Morocco, to discover a laundry that places emphasis on skill and collaboration.

# A welcome as warm as the climate

**M**orocco, Casablanca... In the early 1990s I managed a part of the design team at the French brand Chipie, a company that was famous for its creative denim developments. For those who know, it was the Chevignon / C-17 / Bonaventure / Big Star French denim era.

Jean-Michel Signoles, the iconic boss, asked us designers to try to start developing denim in Morocco. You have to remember that in those days, there were denim garment manufacturing facilities and laundries located next to our office in south of France. Worse, coming from a haute couture design background on Avenue Montaigne in Paris, the furthest I previously had to travel for developments was from the sixth floor to the first floor and back (using the elevator, of course!).



*New Wash's skilled staff have ensured high-quality work since the 1980s.*

PHOTOS: NEW WASH / SHUTTERSTOCK.COM

In Morocco in the 1980s and 90s, we felt like we were travelling the world when first flying there for denim manufacturing – with massive apprehension, completely doubtful of the denim laundry skills we would find. But (as well as Atlantic Denim with Dris and Leila), all we found were nice people, a lovely country and great food... if perhaps there was initially a lot to improve in terms of denim manufacturing. However, things would change quickly, transforming Morocco into one of the most skilful countries for denim developments.



### Growing potential

During the 1980s, Monsieur Hamida Anwar was running a small laundry in the centre of Casablanca, specialising in cleaning blankets and garments of all kinds. He noticed the sudden potential for industrial denim developments in his country. Being a smart and well-connected business developer, he opened a small laundry outside of Casablanca, and started washing jeans.

Years later, his sons Mohamed and Hafid invested in the sustainable developments of what then became New Wash as we know it today. Thanks to the years of hard work, New Wash is one of Morocco's largest integrated industrial groups for denim and sportswear, and has difficult-to-obtain certifications such as GOTS, OCS, OEKO-TEX and GRS. Like many Moroccan companies, the group has kept its great links to the French denim market and develops for IRO Denim, Kaporal Jeans and Sézane, but also washes and manufactures for famous brands from other countries including Spain and Germany.

### Guiding lights

Almost three years ago, my team and I were in charge of the entire Kaporal denim range. We spent months in Morocco and had the opportunity to test and develop hundreds of washes with the New Wash team.

And why do I talk about the team? Well, because we had such a warm welcome, met so many nice, smiling people, who love what they do, that I feel I must highlight at least a few of them. Fatima and Lamine were our guiding lights in the big buildings of New Wash. Know-how and an open mind to fresh ideas were naturally in place.

We had a goal in the laundry not only to freshen up our client's denim range, but also to achieve a maximum of sustainable washes. For this we had a wide variety of choices within the latest sustainable laundry equipment: Jeanologia lasers, Tonello infrared tumblers, Jeanologia E-Flow washing machines, ozone machines, sustainable chemicals, you name it – anything we needed to reduce the amount of chemicals and water involved. The laser bay became our headquarters, we had prepared templates and the Jeanologia lasers allowed us to create natural usage, as well as logos and graphics on urban jog-jeans.



*Hand-drawn whisker templates.*

PHOTO: TILMANN WRÖBEL

### Hand finishing

Even though the massive amount of new sustainable equipment was impressive, the huge bays with handmade finishes were just as impressive. When it comes to scrapings and usage or destroy parts, everything is handmade, none of the standard neoprene whisker stencils. Individuality and personality for each client are key. I didn't count the – what seemed to me – hundreds of skilful workers, folding the 'worn-in' folds, preparing the jeans, the ladies grinding fabric, following the hand-drawn examples.

And then, when you are deep in your work, sweating and laughing, CEO Mohamed Anwar and general manager Hafid Anwar arrive, enjoy a great tea and Moroccan sweets, and check all the wash developments. Because these gentlemen are so down to earth and involved with the daily business of their factory. Lovely! ■



*Tilmann Wröbel is the founder of Monsieur-T, the 'denim lifestyle' studio. He started his career as a haute couture designer before moving into streetwear and denim. He has worked as a designer and consultant for some of the world's top brands, and is based in Paris, France.*

© MONSIEUR\_T\_OFFICIAL/PHOTO: CHRISTIAN GEYR


**FACTORY TALK: KINGPINS24**

With physical shows still not possible in most parts of the world, online shows, virtual presentations, webinars and seminars have been vital to keep the supply chain connected. Inside Denim rounds up some of the developments that mills presented at Kingpins24.

# No slowdown for innovation

**A** growing desire to use waste as raw material is a focus for many mills' research and development work. Circularity was discussed by many mills, unveiling their latest waste-using progress and recycled materials.

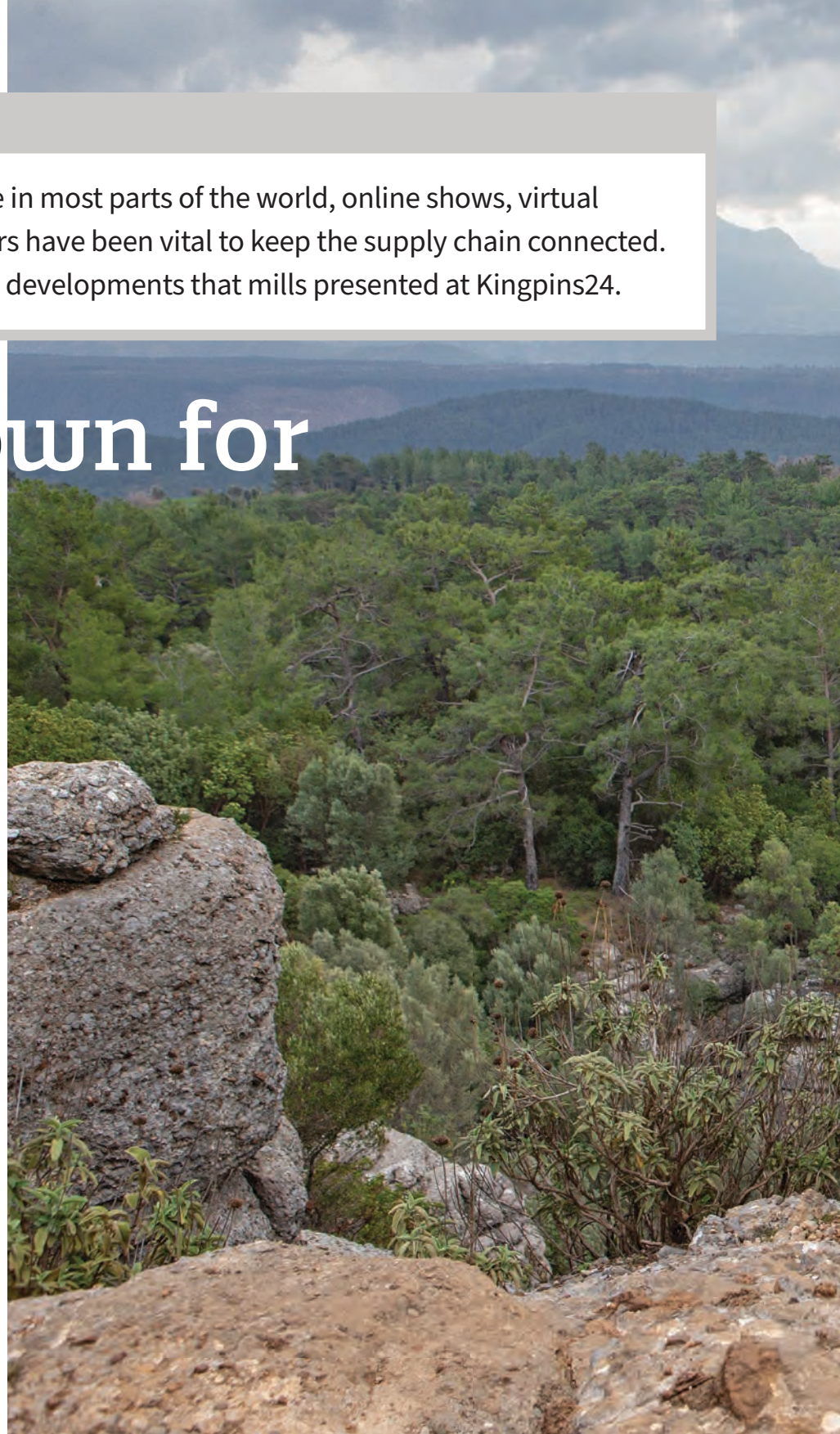
The team at Pakistani mill and manufacturer **AFM** showed how they are using their skills and experience to replicate effects and designs from conventional methods with recycled fibres, kinder chemicals and less water. A shredding and sorting facility, combined with the latest spinning machines, means they can achieve 100% post-industrial waste cotton fabrics, and blends with 40% post-consumer waste. AFM creative director Ampelio Dal Lago made a range by matching shades of recycled cotton without adding any indigo. "Recycling cotton is the major mission because it can save the environment," he said.

During a panel chaired by Roian Atwood, Faiza Jamil from **Artistic Milliners** discussed the Pakistani mill's Cradle to Cradle fabrics and Circular Park – a new sorting and shredding facility. "Circular is a design concept, not just recycling," she said. "The way we have been designing things creates a lot of waste. Nature operates in a circular way and we must learn lessons from there."

Marcel Imaizumi, chief operating officer at **Vicunha**, said the Brazilian company had been recycling content for two decades, but didn't initially promote it as it was undervalued – "but now it adds value". Its Tiger fabric is made with 100% recycled fabric including Tencel's Ecomade, Refibra and recycled cotton.

Turkish denim producer **Calik** unveiled RE/J, a recycled denim fabric made from 100% pre- and post-consumer waste, which will be made available to buyers in time for the autumn-winter 2022 season. It uses Lycra's EcoMade fibre (created with 68% recycled plastics and renewable plant-based resources), in addition to Repreve's recycled polyester, derived from waste plastic bottles.

Nicholas Prophte, vice-president of sourcing, production and innovation at **PVH Europe**, said its circular strategy focuses on lower-impact materials, recyclability-minded design, traceability and new business models. A collaboration with Turkish denim mill **Kipas** has resulted in 80% pre-consumer and 20% post-consumer cotton fabric, with the intention to increase the latter to 30% in the short- to medium-term; 50:50 trials are also under way. Around 70-80% of all Tommy Hilfiger denim contains at least 20% post-consumer recycled content.





Calik Denim introduced RE/J for autumn-winter 22/23, a 100% recycled concept.

PHOTOS: CALIK DENIM

### Hemp's potential

Turning to hemp, Mr Prophte acknowledged the fibre's potential as an alternative to cotton, but he also stressed the need to "dive deep" for full visibility in terms of production at farm level. He described European hemp as "mandatory" for the Tommy Hilfiger business and confirmed the company's use of "real" (not cottonised) hemp. More will be revealed during PVH's denim presentations this summer, he said.

Pakistan-based mill and manufacturer **AGI Denim** launched a fabric called HempX, a blend of organic cotton, hemp and elastane made with recycled components. The material is processed using the company's Double Zero technology, which AGI claims saves 85% water compared with conventional indigo dyeing and finishing processes. It is also made using 50% renewable energy. The company will install solar panels at the factory by the end of this year, with a view of phasing out fossil fuel-based energy in the future.

AGI's Henry Wong spoke about hemp as an "emerging champion" as he also announced a partnership with hemp processor Panda Biotech to develop US grown hemp. Wrangler and Lee-owner Kontoor has also newly partnered with the agricultural company.

Following the Pakistani government's lifting of its ban on hemp growing in September last year, Lahore-based denim manufacturer **Crescent Bahuman** has partnered with green-minded designer Miles Johnson on *Now or Never*, an "all-natural and recyclable" hemp-centred denim collection. The collection is inspired by protests against climate change, both during the 1960s and today.

The collection includes blends of core-spun hemp yarn, Tencel lyocell and both organic and Better Cotton Initiative (BCI)-certified cotton, and uses "sustainable, waterless dyeing methods" – something that Mr Johnson pushed for. Zaki Saleemi, vice-president at Crescent Bahuman, elaborated: "Overall, there is a water saving of 98% in dyeing and 80% in finishing, thanks to the use of our latest Naya indigo dyeing process."

Jordan Nodarse, a designer at Turkish mill **Bossa**, introduced fabrics in the new collection as part of a conversation with Simply Suzette's Ani Wells. As well as the environmental benefits of hemp, it enables a focus on slow fashion by adding durability and the possibility of creating more of a circular mentality, he said of the new collection *Hempy*. Bossa's Xupple Stretch addresses the issue of inclusivity with extra stretch, and which could also help to minimise store returns. "It gives less concern about size and replaces that with comfort and positivity," he said. Eco 3 "applies the full cycle of garment washing sustainability": laser, eco stone, eflow, ozone technology and ecological chemicals.

### Water

Bossa is also working with the Turkish government on a project to create a less thirsty cotton variety. The seed will be non-GMO (genetically modified) and the aim is that it will be finalised within three years. Business development director Besim Ozek said: "Hopefully, we will have a cotton seed called Bossa to show you."

The mill has reduced its water usage by more than 40% in two years, from an average of 70 litres per metre to 38 litres per metre. It is also creating laser- and ozone-friendly fabrics, which will help the laundries use less water, and making fabrics that will need to be washed less frequently by the consumer.



*Crescent Bahuman partnered Miles Johnson for hemp-based collection Now or Never.*

PHOTO: CRESCENT BAHUMAN

### Orta builds on Gama partnership

Turkish denim mill **Orta** has explained how its relationship with recycling specialist Gama has helped drive its ambitions towards a circular way of working. Its waste management system sorts and separates waste, then sends it to Gama (also based in Turkey), which converts it into fibres that can be woven into new material. The companies have been working together for four years, with their R&D teams jointly working on new products.

Orta director Dr Sedef Uncu Aki said: "We need materials to fulfil our needs and wants, but we need to be mindful. Our sector will only be free of our bad reputation when we start looking at our waste as a resource."

Orta applies its Golden Ratio philosophy to designing with recycled content, so the recycled fibres do not weaken the fabrics. In two years, Orta increased its recycled cotton content to 650,000kg and is aiming for 1 million kgs this year. In 2020, 20% of product contained recycled fibre blends.

Orta also created a 'virtual reality denim journey' with five virtual 'balloons', looking at lifecycle assessment; eco raw materials such as Gen H (hemp), organic and recycled; BioAwake natural dyes – henna, Earth Colors and Halys (clay); biodiversity; and the Golden Ratio standard.

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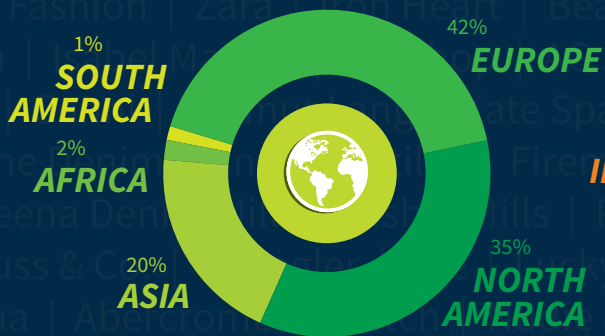
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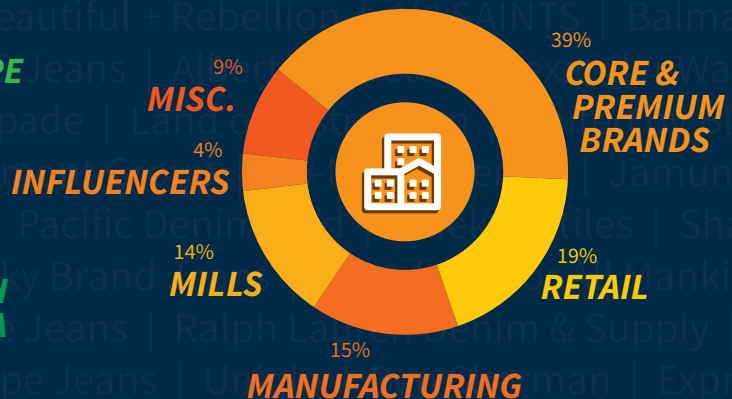
BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

We want our readership to be as valuable and as valued as our journalism. It's why we have left no stone unturned in identifying key global contacts in the global denim industry.

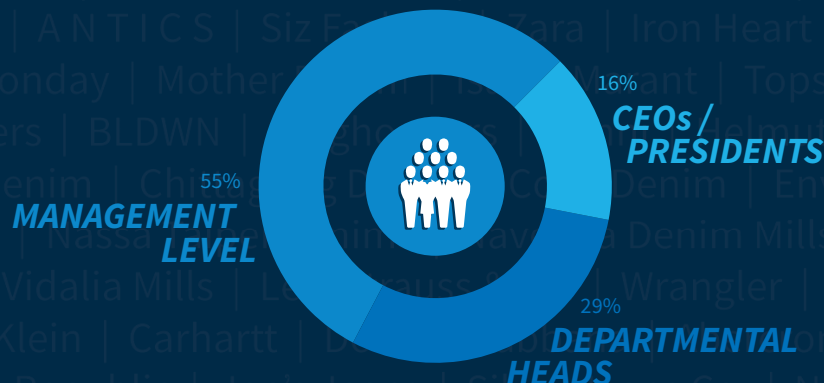
## GEOGRAPHICAL



## TYPE OF BUSINESS



## JOB TITLES



insideDenim will be landing on the desks of those individuals we have hand-picked to receive our magazine: **Global Sourcing** Managers, Product **Development** Managers, **Senior Denim** Designers, **Product Development** Directors, International **Sourcing** Directors, Wash **Technicians**, Senior **Sustainability** Managers, Denim **Laundry** Managers.





Cone Denim and Jeanologia teamed up on the Road to Mission Zero.

PHOTO: CONE DENIM

Water was also a focus at US-based **Cone Denim**, which unveiled its Road to Mission Zero initiative in collaboration with Spanish technology provider Jeanologia. Mission Zero denim will involve reducing water usage to “near zero” levels, and the goal is to return clean water back to nature. “People and the planet come first and that is why we decided to embark on a very important mission: to eliminate 100% of jeans water waste from fabric to final garment by 2025,” said Jeanologia CEO Enrique Silla. Cone’s initial denim offering draws from its Flash Finish fabrics (which, on average, save around 83% of water, 39% of chemicals and 14% of energy usage, it claims), made with Jeanologia’s G2 Dynamic ozone technology.

Berke Aydemir, head of R&D at **Naveena**, presented an antimicrobial range made with technology from Swedish company Polygiene. Mr Aydemir said this can extend the life of the garment, saves energy and water and reduces the carbon footprint. Niklas Brosnan, marketing director at Polygiene, said the collaboration is part of a wider education and marketing push to convince consumers to wash clothes less frequently. He claimed there is a groundswell building: “We want to change the mindset from consumables to durables,” he said.

The owner of Chinese mill **Foison Textile**, Sam Li, discussed the hardships of operating during the pandemic with Kingpins’ Vivian Wang. He said the company had invested heavily in sustainability over recent years, including adding a photovoltaic panel system that supplies most of the factory’s energy, and that he is confident that 2021 will be a better year for textiles. ■



PHOTO: LENZING

#### **Bast Recast: ‘relevant and responsible’**

The Bast Recast collection is the result of a collaboration between **Naveena Denim, Lenzing, Kingdom, Endrime, Craftil, Jeanologia, Warp-Face** and **Officina+39** and was described by Endrime’s founder Mohsin Sajid as “ground-breaking”.

The fabric is a mix of Tencel lyocell, modal and Refibra (a Lenzing technology which upcycles cotton scraps into lyocell fibre), plus organic cotton and wet-spun cottonised hemp sourced from Kingdom, in China’s Heilongjiang province. All thread used – “100% biodegradable” – is supplied by Craftil.

After the covid-19 pandemic delayed the project by around six months, Mr Sajid involved Jeanologia to ensure that the denim was washed “sustainably”, he said. Warp-Face’s studio transformed the denim scraps and off-cuts generated by the production process from waste into pulp, which was then remade into a type of paper for the collection’s hangtags and labels. Officina+39’s Recycrom dye (made from recycled used clothing) was used for the tags and labels.

Mr Sajid said that he was proud of the project. “Hand on heart”, he added, “it’s probably the best denim collection I’ve ever designed.” Lenzing described the line as “relevant and responsible, a product for our times – a product for the great denim reset”.



Ian Berry's latest exhibition, *Splendid Isolation*, will reopen at Museum Rijswijk, The Netherlands until August 15, and at Textilmuseet (Textile Museum of Sweden) October 2021 to April 2022.

ALL PHOTOS: IAN BERRY

## CLOCKING ON...

Artist **Ian Berry** immerses himself in the creative process to produce world-renowned artworks using denim as his medium.

# Art imitating life

## 7.30am

I get woken up with a thud by my little boy, Elliott, who has already been up over an hour. I'm not a morning person and take a while waking up. I'll do circles between Instagram, Facebook, WhatsApp and the rest, reading messages and then think I'll reply when I'm awake. I'm still getting around to it.

## 8.00am

Make a coffee. After living in Sweden, I like my coffee strong. I rarely let an English person make me coffee now. I'm a breakfast person but now more Swedish style, with open sandwiches and yogurt. Not together, mind.

## 8.30am

The school run. It's like a mini-Olympics just getting him dressed in his uniform, then trying to get him there. Sometimes it's my only trip outside, in the shadow of Canary Wharf, East London. I normally run back, and then intend to go in the home gym or to the gym... tomorrow.

## 9.20am

My inbox is normally full of emails (one of the most common is a denim mill thinking they are the first to ask, "Could you show at our booth at X, Y, Z trade fair?" even though I have never shown at one). There are many asking for commissions and collabs. I've done probably less than 1% of requests but it still takes time talking through. In the early years, I didn't know many in denim, past the main brands. Many have now become friends.

## 12.30pm

I crash after lunch and need a little sleep, no more than 20 minutes. If I don't, I become quite ill, it's been like this for 15 to 20 years. So yes, if you meet me out and about on a day I've not been able to have the sleep, I'm a wreck.



From Ian Berry's *Hotel California* creation.



## 1.00pm

I wake a new man. I go into the studio and start cutting denim, surrounded by all my jeans, cross-legged on the floor. I really need to work out a better way to work. I often stream a film or series, which is a little odd giving how much focus the work needs. When I see my work, even years later, I can remember what I was watching at the time.

## 6.00pm

After working non-stop (avoiding answering the phone, finding an excuse not to do a Zoom, putting off 'interaction'), I get called for dinner. I'm very lucky with this. Good home-cooked food.

## 7.00pm

This is when I get the most work done. I wanted to move to the US years ago and wonder if I thought the hours I worked would fit in the best.

## 8.00pm

I will post to social media. I'm not the best on there but have a very nice, loyal community. I often can't post what I'm working on and when I'm deep into work I can go months without posting. I'm trying to be better. My work doesn't come across all that well on social media and still after all these years people think I paint on top of denim or something.

## 1.00am

Bed. When pieces take months it can be hard to be motivated. But near the end, when you see it come together, it goes faster. Also, I find it hard after an exhibition to get back into work, as every show I've had for the last dozen years has been a sell-out. It sounds good but it means you come back to an empty studio and I do find I am better when I'm surrounded by my work. When my head hits the pillow, I'm out within seconds. ■

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