

insideDenim



Genderless jeans

What's next in hemp / Elasticity vs circularity
A new spin on dyeing / Mud Jeans / Sarah Bellos

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Cover Genderless and modern. Jeans from newly launched denim brand Handz.

PHOTO: PATRICK JAMES MICHEL / HANDZ

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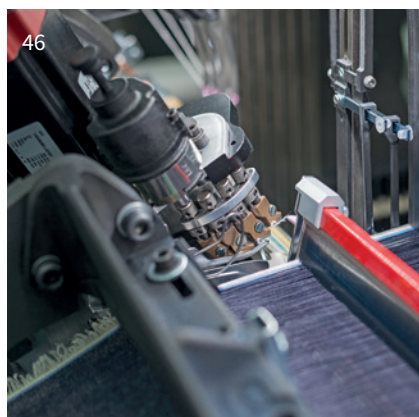
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Meet the team



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 Acting editor / 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.



A new denim cycle

The new denim cycle is the topic of many discussions within the industry and at shows and events that have returned in full swing. If business as usual is making any kind of a comeback, the denim sector is clearly heading towards a new normal as the pendulum swings away from skinny and closer to wider leg widths.

Market data indicates that skinny jeans are not going away, just moving down a notch on the desirability scale. The trend has nonetheless taken on a life of its own on TikTok and consorts. Influencers need to feed their audiences with anything new, making #skinnyisout a popular hashtag for however long a trend survives on social media platforms. A closer look at videos tagged #skinnyisout shows that not everyone, women or men, is planning to ditch their slim fit jeans. But a new and more diverse offering in stores will no doubt inspire fashionistas and beyond that it is time to update their wardrobe with the new looser styles.

In addition to style, sustainability is also a topic of many discussions and here, too, a new cycle may be underway. Authorities in Norway, the UK and France are taking measures to curb greenwashing and protect consumers from unsubstantiated environmental claims. Small and large brands alike are being targeted, and face fines. With this comes much media exposure – of the negative kind – driving home the very real reputational risks brands are taking. This must be good, as it sheds light on the lazy sustainability claims brands put forward in general and on the shortcomings of the Higg Index's scoring system for materials in particular. It is unfortunate that one of the most widely regarded sources of information on the impact of textiles has such glaring flaws. Shouldn't they be easy to fix?

The new more critical context for sustainability clearly confirms that false claims will be called out and brands held to higher standards. The bar needs to be raised and more accountability and genuine transparency demanded. This is what we strive to do in the pages of *Inside Denim* and on our website. We seek to cover areas that the industry at large, and at times even buyers, have little or no access to.

In this issue, our eighth, we take a closer look at the measures that mills are taking to reduce the impacts of dyeing and generate cleaner effluent. Not very sexy, but very useful. Some of the industry's pain spots, preserving freshwater resources for instance, are certainly complex but relatively clear-cut. This is not always the case in matters of sustainability, where trade-offs need to be negotiated. Take hemp: is it worth the trouble to replace a small portion of cotton with a fibre that lacks an industrial infrastructure? Or take elasticity: is there a way to provide consumers with the high comfort (= stretch) jeans they want while at the same time reducing blended materials that hinder a garment's ability to be recycled? There is no simple solution here and plenty of room for debate and discussion.

There is also the possibility that new market opportunities, as we investigate with genderless jeans – could this be another new cycle? – provide unforeseen solutions. The burgeoning gender-free space, we find, not only addresses the need for more inclusively but may also help reduce overproduction.

These are just some of the topics covered in this issue, which we hope you will enjoy reading as much as we enjoyed producing it. And for those of you who have read all the way here, wow 🍷🍷🍷! I do ask for your benevolence, this is my first Ed's letter, and I am just stepping in for Clare Grainger, who is busy taking care of a growing family. ■

Sophie Bramel

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 GUEST COMMENT

Sarah Bellos, founder and CEO of Stony Creek Colors, says the industry has yet to meet the ultimate challenge, shifting to regenerative processes and materials instead of endlessly depleting finite resources.

“We have just this one planet, and we know externalities are ultimately paid for”

Despite the crises of recent years, I see true resolve and continued efforts to bring regenerative solutions to scale in our industry. Yet with energy costs and inflation rising globally, we know challenging times are far from over. We also know sustainability is a three-legged stool. How do we support the social and environmental legs when the economic leg is wobbling? I believe we must nourish the necessary evolution toward transparent and multi-stakeholder collaboration and interdisciplinary learning, even in a highly competitive environment.

This naturally carries shifting connotations depending on where you sit. Regions aiming to increase exports may prioritise access to connections, technology and funding. Areas with more advanced infrastructure might instead focus on fair enforcement of marketing claims and competitor accountability to labour and environmental standards. No matter which group we belong to, we have just this one planet, and we know externalities are ultimately “paid for” - whether we accurately value them from the outset or not.

Much of what clothing is made from today is not only derived from non-regenerative materials, but they never really go away. Example: ocean microplastic contamination from polyester. Yet some resources can be infinite. If we couple renewable practices with human ingenuity, we can produce what we need to grow our industries, without depleting endlessly.

Unfortunately, our industry has not yet met this challenge with consistency or confidence. The increased demand for organic cotton brought the resultant uncovering of severe adulteration of “certified” organic fibres. In the US this is something farmers struggle with across many industries, not just textiles. Even agricultural chemicals that have been banned in US farming make their way into our homes through food or clothing wrongly marketed as “organic” due to unenforced global standards or outright fraud.

I’ve experienced this first-hand in my 15+ years working with natural dyes. Some natural indigo continues to be sold as ‘GOTS certified’, as ‘certified organic’ or ‘natural’ when it is actually fully adulterated with synthetic, petroleum-based pigment. Far from plant-derived, this synthetic indigo is derived from aniline (a known carcinogen), sodium cyanide and formaldehyde, among other chemical inputs. Tools like certifications, Life Cycle Assessments (LCAs), and public disclosures can help to level the playing field, but only when true transparency and accountability are present.

At my company, Stony Creek Colors, we are currently using all of these tools to try to understand and communicate our impact today and where we will head as our plant-based indigo advancements reach commercial scale. Yet even in our fully vertical process, this self-study is far from perfect. Though we own the entire value chain, (from in-house agronomy and seed genetics to the farmer-grown plants and proprietary extraction processes) there is currently no way to compare our existing or future impact to that of synthetic indigo. This is mainly due to a lack of an industry standard LCA and general secrecy about the synthetic indigo used in nearly all denim today.



“I see true resolve and continued efforts to bring regenerative solutions to scale in our industry.”



Our indigo crop uses the process of photosynthesis and growth to capture carbon in the plant tissue and trap aerial nitrogen in the soil, enriching it for other crops in rotation. From these crops we produce the plant-based indigo dye we sell to denim mills. What makes this an exciting opportunity for our farmers - and by extension our customers - is that our indigo process creates a climate positive chemical, one that stores more carbon than it uses while also replacing a petroleum-based chemical.

Rather than seeing our process as static, Stony Creek continues to innovate. We use data from LCAs and other third-party tools to guide our process innovations; our drive to provide truly regenerative products even led us to change our indigo plant varieties and extraction methods. The indigo seeds we now provide to our farmers were selected for their soil health properties and the benefits they provide such as rebuilding soil organic matter (a key need in fighting climate change), requiring low fertiliser levels as a legume crop, and their natural pest resistance.

After moving from a semi-traditional fresh-leaf process to our proprietary dry-leaf stabilisation and extraction, a recent advancement in R&D has further refined our manufacturing to reduce water consumption - and the associated wastewater treatment - by 80% in typical factory operations.

Given one could count the number of synthetic indigo producers globally on one hand, the hidden and shadowy process should be a glaring concern to anyone focused on risk mitigation, worker health and safety, or climate. Knowing the true cost for this low priced but essential denim material should be a collaborative industry priority.

Without the knowledge of the impact of critical components to our denim supply chains, and on a shaky three-legged stool, we may pay dearly later when the bills come due. But collaboration and transparency now could allow us to properly prioritise the renewable solutions that cannot just help our industry to grow, but offer solutions for the leading economic, social and environmental issues of our time. ■

Sarah Bellos visits an indigo field in Tennessee.

PHOTO: STONY CREEK COLORS

Global News

France Denim brand Armalith recently invited brand executives and members of the media to run its jeans through a special test. With the help of stuntman David Julienne and his team, it invited guests to pull on a pair of Armalith jeans and submit themselves to the abrasion tests for motorcycle clothing following the Darmstadt or Cambridge protocols. An official was present to oversee that the tests were conducted according to standard protocols.

UK Welsh denim brand Hiut, based in Cardigan, has launched Déjà Blue, an initiative designed to prolong the lifecycle of pre-owned jeans and thus contribute towards “closing the loop”. In exchange for a £50 Hiut voucher, the company is inviting customers to return their used denims to be washed, photographed and ultimately resold on its website as “rare finds”.

Germany Cologne based eco-denim brand Armedangels has said jeans are like relationships and that a perfect pair of jeans will “click” with the wearer, just like our interactions with other people in real life. The brand has sought to prove this point in its latest campaign. It features couples of all shapes and sizes, including 19-year-old twins, a mother-daughter duo, and lovers of all ages, as well as a couple who have been “the perfect fit” for each other for 60 years.

Sweden A limited-edition collection from H&M-owned denim brand Monki follows the principles of the Ellen MacArthur Foundation’s Jeans Redesign project. The collection reworks three of the brand’s favourite fits, the wide-leg Yoko, straight leg Monokimi and tapered and cropped leg Taiki, along with a denim jacket. The fabric is made from a blend of 80% in-conversion cotton and 20% recycled post-consumer cotton and dyed using natural indigo.

Latvia Latvian polyethylene terephthalate (PET) recycling firm PET Baltija has announced plans to purchase Silon spin-off Tesil Fibres, a Czech fibre producer that specialises in manufacturing recycled PET (rPET) products from post-consumer plastic bottles. PET Baltija’s revenues are expected to more than double following the merger. The deal will also take the Latvian company international. Last year, Tesil Fibres registered sales of €27 million (\$27 million).



El Salvador Inquisalva-Inquistar, a supplier of chemicals for the textile industry based in El Salvador, is the new distributor of Archroma products for Central America and the Caribbean. Founded in 1987, the company will be adding Archroma’s textile dyes to its portfolio of products for the preparation, dyeing and finishing of textiles, along with products for water treatment, the company said. Inquisalva is a bluesign partner.

Argentina Machinery manufacturer Karl Mayer has revealed that textile producer Enod is the first Argentinian company to install a Prodye-S indigo dyeing system on its premises, alongside a Prosize sizing machine. Described as an advanced slasher dyeing system, the technology allows for savings of up to 20% of hypochlorite and caustic soda as a result of its high flow-rate and low speed, combined with closed-design dyeing vats. It enables the achievement of a darker indigo hue with its shorter dye section.

Romania High-end Romanian jeanswear label No44, which works exclusively with Turkish denim mill Isko, has revealed its “unique” participation in the producer’s R-Two project, involving taking back used denims from any brand to be regenerated into new fabrics. R-Two fabrics are blended from reused cotton and recycled polyester. The reused cotton is certified to Content Claim Standard.

Japan Japanese denim label Edwin has released an updated version of its signature 503 jeans model, manufactured with recycled materials this time around, to mark 25 years since the style debuted. Produced at the brand's Tohoku facility, each pair of 503 Is Blue jeans, as they are called, comes with a 10-year warranty which includes complimentary repairs under the company's Re:dwin scheme. The line is available in tapered, straight and looser fits.

US Walmart Foundation, the charitable arm of US-based retailer Walmart, has granted North Carolinian agricultural association the Soil Health Institute an award of \$2 million over three years to support scaling and expansion of its directly operated US Regenerative Cotton Fund. The intention is to use the money to roll out a farmer-facing initiative across South Carolina and Alabama.

Canada Canadian brand Jag Jeans has launched a new range, Forever Stretch, that is based on a new yarn technology. Its added flexibility allows jeans to "size up or down with the wearer, shaping and moulding to her curves with every wear," the company said in a statement. Its jeans are available in a range of washes from dark to black, and use simple XS to 3X sizing that the company said covers dress sizes going from 0 to 30.



Pakistan Weeks of torrential rain and flooding in Pakistan in the 2022 monsoon season caused more than 1,600 fatalities. At the end of August, the government in Islamabad said that, in addition, it estimated at least \$10 billion worth of damage to major crops, including the cotton crop in Sindh, Balochistan and Punjab. Local media estimated that 745,000 bales, around 7% of the country's cotton crop, will be ruined. Textile industry leaders have said the price of the cotton that survives is likely to be high, with some imports of cotton likely to be necessary.

China Customs data from China has revealed that the volume of raw cotton imported into the country in the 2021-2022 season (August 2021 to July 2022) was slightly more than 1.7 million tonnes. In season 2019-2020, when covid-19 restrictions were at their peak, the figure was around 1.6 million tonnes, but in season 2020-2021, Chinese mills imported more than 2.8 million tonnes of raw cotton. Cotton market information resource Cotlook has said low cotton prices in China and high levels of unsold cotton stock there made it less attractive for buyers to import cotton in the season recently ended.

- The city of Bengbu in China's Anhui province played host to a conference on biobased fibres in late September, organised by China Chemical Fibers Association (CCFA) with support from local manufacturer Anhui Fengyuan Biochemical. Speakers included CCFA president, Chen Xinwei, Donghua University professors Wang Huaping and Zhang Yumei, Beijing Institute of Fashion Technology associate professor Bin Wang and secretary general of CCFA's polypropylene branch, Li Zengjun, all presented ideas and insights into how best to develop the industry and work with biobased raw materials.

Bangladesh Industry body the Bangladesh Textile Mills Association (BTMA) has said that export-oriented mills across the country are cutting or even halting production owing to fuel shortages. A knock-on effect of this, BTMA said, is that spinning, weaving, dyeing, printing, finishing, and knitting operations that have reduced production are now no longer earning enough to pay workers' and other costs. The organisation said another consequence could be that the industry will miss its export target of \$60 billion for the current financial year.

Australia New South Wales cotton farmer Nick Gillingham was named as grower of the year at the 2022 Australian Cotton Conference. The announcement came at an awards dinner at the event in Gold Coast. Nick Gillingham heads a team of 20 that grows cotton at a farm called Keytah, near Moree. The farm consists of 25,000 hectares with 10,000 under irrigation and half utilised for cotton each year in a 100% rotation. In addition, 10,000 hectares are assigned to dryland cropping with another 5,000 retained as native vegetation.

Industry News

Naveena is an early adopter of circular projects

The Lycra Company has begun rolling out its Dual Comfort fibre technology for the denim industry. This technology draws its properties from the T400 A EcoMade fibre, which contains both recycled and renewable content, and Coolmax.

Dual Comfort is the technology at the core of one of a series of innovations that Karachi-based denim mill Naveena has launched this year as part of a wider drive to introduce more circular solutions.

Naveena has applied its own name, Dualistic Denim, to the range of fabrics it has developed, describing these as offering comfort, durability, easy stretch, moisture management and a natural hand feel.

Another of this year's circular-focused innovations is new the Biotech denim fabric, the result of a collaboration with Circular Systems, a Los Angeles-based group that works to transform waste into textiles. Its Agraloop technology takes CBD hemp crop residue and refines it into textile-grade Agraloop BioFibre. Naveena has chosen to use this fibre in its Biotech fabrics.

Made using a near-waterless process, Agraloop BioFibre upcycles agricultural residue into natural staple fibre that can be blended with other natural fibres and spun into yarn. The end result is durable, low-impact fabrics with natural-fibre aesthetics, according to Naveena. "We believe that the future of the denim is circular," its global sales and marketing manager, Aydan Tuzun, has said. ■



PHOTO: NAVEENA

Rainbow finish

Kilim Denim has developed a special finishing technique, Kilim Rainbow, which creates the effect of an overdye or coating, without adding the additional step in the dyeing process and thus keeping costs down. It is available in an array of casts and gives the fabric a hand feel similar to a coating.

"The denim item appears to be overdyed, but it is not; it is our proprietary technology," sales chief, Isil Sena Candan, told *Inside Denim*, describing it as a relatively simple solution that provides "novelty and authenticity". ■

Denim workwear

Lahore-based Naveena Denim (NDL) is branching out into technical textiles with the official launch of a new division, N-Tech, dedicated to denim workwear. The work-ready denims made by NDL feature Dyneema, a high modulus polyethylene yarn known for its high strength and light weight, made by Dutch conglomerate DSM.

To highlight the possibilities of N-Tech fabrics, UK-based design studio Endrime created a 'Strength n' Style' denim workwear collection that went on display recently at Bluezone. The design pieces draw on 1920s heritage workwear along with Endrime's signature future thinking, modern ergonomics and dart manipulation. ■

Longer wearing

Levi Strauss & Co has published its sustainability report for 2021. The company released the first such document last autumn. President and chief executive, Chip Bergh, remarked that the new report coincides with the launch of the brand's second global 'Buy Better, Wear Longer' campaign. The promotion looks to link the business to the circular economy, spotlighting that its denims can stand the test of time if worn with care.

Double capacity

Pakistani apparel manufacturer Interloop has announced plans to double the capacity of its denim clothing making facility, located in the capital of Punjab, from 500,000 pieces monthly to 1 million by 2023, as it declared in its annual report for 2022. The company diversified its activities to make denims in late 2019 in a LEED Platinum-certified facility.

At a stretch

Market research carried out recently by denim mill Isko investigated evolving consumer attitudes in North America and Europe. It found that stretch jeans have lost none of their high ranking in consumer wardrobes. Comfort and elasticity remain key, by a large margin, Mirela Slowik, category leader for stretch and performance technologies at Isko, has told *Inside Denim*.

Collector's items

Archive-inspired denim line Lee 101, produced under the aegis of Kontoor-owned brand Lee, has tapped denim consultant and collector Wouter Munnichs to front the campaign for its autumn-winter 2022 collection. Core styles including the 101 Z, 101 S, 101 T and 101 Rider jeans, Loco and Storm Rider jackets all feature, as do classic sweatshirts, t-shirts, Henley tops, shirts and Bib overalls. A looser-fit jean, the 101 L, is a new model.

Put to the test

A service facility that textile machinery developer Rieter runs in Kahramanmaraş in south-central Turkey has moved to a new site, covering 2,000 square-metres. The new set-up includes an R70 fully automatic rotor spinning machine and an Autoconer X6 winding machine. Rieter has said customers would be able to run yarn comparison tests at the facility and analyse the impact of different technologies to optimise their operations. ■

New series of Grivec Bros-made Denham jeans



Left to right: Marcel Grivec, Jason Denham and Roger Grivec.

PHOTO: DENHAM

A new chapter in the collaboration between the Grivec brothers and Dutch denim brand Denham has gone live. The brothers, Marcel and Roger, have made a new series of limited-edition Razor jeans for Denham in their Chevremont atelier in the Netherlands. The connection between the two brothers and Jason Denham goes back to 2009 when they learned to sew in Denham's sewing academy.

"This season we wanted to focus our attention on authenticity, and what is more authentic to the original blue jeans than Americana? We wanted to return to original selvedge denim weaving, so we sought out the most authentic, exclusive American shuttle looms from the Cone Denim White Oak manufacturer," Mr Denham said.

In this new series of Razor jeans, each is numbered and no two are exactly alike. The jeans are made in 14-ounce virgin selvedge denim. Jason Denham has explained that he fell in love with the fabric "because it's a beautiful, authentic American selvedge fabric that is an incredible indigo shade".

He also said he had chosen to bring the fabric back to Europe to make the jeans because, for this project, he wanted to have the local, handmade construction that the Grivec brothers offer. "We always say truth is in the details, in the craftsmanship, in the workmanship," he concluded. ■

Back to black

Sulphur black is one of the new products to be rolled out by US-based CleanKore, the developer of a dyeing method that retains the authentic white core of yarns, and by chemicals manufacturer Archroma. "We are combining our CleanKore technology with Archroma's Diresul black pre-reduced liquid dyestuff to provide the denim market with beautiful, sustainable fabric," Ryan Ripley, CleanKore's business development manager, has told *Inside Denim*.

In addition to savings in water, chemicals, energy and production time, according to Archroma's in-house impact calculator One Way, this new solution eliminates the need for potassium permanganate spray, thus avoiding the yellow cast that the chemicals can give on black denims. Products can also be laser-finished, and thus achieve low EIM scores, using Jeanologia's rating system.

Umberto De Vita, Archroma's global indigo manager, commented: "The sulphur black project allows us to add one more solution for denim manufacturers and brands looking to create safer and enhanced black denims and save precious resources." ■

Dual-branded

Koontoor Brands has opened the doors of the first in a series of dual-branded retail store footprints planned for Europe along Berlin's Tauentzienstrasse shopping artery. Dedicated to the Greensboro, North Carolina-based group's flagship denim labels, Lee and Wrangler, the approximately 150-square-metre space operates under a joint fascia, with separate window displays and frontages reserved for each brand.

Metal in mind

Tokyo-based designer Yoon Ahn has revealed details of a collaboration between her Ambush brand and denim company Levi's, which appears to feature co-branded metallic silver jacrons and black Levi's tabs on lightly washed denim. Silver-coloured jacket buttons appear almost bottle cap-like. Ms Ahn highlighted "the attitude" these design ideas revealed.

Low-impact

Turkey-based denim mill Bossa has teamed up with Marmara Hemp, based in France, and design studio Endrime, located in the UK, to develop a low-impact capsule. "Marmara Hemp is very sustainable, the hemp retting process is mechanical, not chemical, and we believe there is great potential for this fibre," Özge Özsoy, Bossa's head of marketing, told *Inside Denim* at Bluezone in early autumn.

Fibre to fibre

Japanese fashion label Anrealage has released a limited line of recycled polyester denim apparel and accessories. The range is the latest creative outcome to result from the brand's ongoing collaboration with domestic polyester recycler Jeplan and department store chain Takashimaya. Jeplan specialises in chemically recycling polyethylene terephthalate (PET) polyester garments "any number of times" through using its proprietary textile-to-textile Bring technology.

Farmer conversion

Clothing brand SuperDry has said that a programme to switch all of its jeans to organic cotton has led it to work with farmers to help them make the transition to organic. It has said that, by 2025, it will have supported 20,000 farmers to convert to certified organic practices. "We are converting enough farmers to fulfil our own organic cotton requirement," it explained. ■

Turkey-based denim mill Bossa has teamed up with Marmara Hemp and design studio Endrime to develop a low-impact hemp-based capsule collection.

PHOTO: Bossa

Hemp high and low

The favourite fibre in denim is by far cotton. But cotton-bashing is also a favourite pursuit for brands and retailers that promote hemp as a more sustainable choice. From an agricultural point of view, this claim has real footing. But the impacts of a fibre's farming are a small sliver of a bigger picture. Zoom out from the field, and the perspective changes. Raw materials that are grown undergo countless transformations and processes throughout the supply chain that may level the playing field between the two 'original' denim fibres.

These considerations are often passed over by marketing teams at brands, retailers and mills. When they hype up their hemp-laced jeans, they tend to focus on the plant itself and its positive impact as a robust, regenerative, and resourceful crop. While it is entirely possible that the first denims "de Nîmes" were made from hemp, the fabrics that are being developed use so-called cottonised hemp, a staple fibre. These are integrated into denim fabrics in proportions that go rarely above 30% and are more often in the 10% range which minimises, not to say belies, the impact the presence of hemp in a product can have on its sustainability profile.

For some, hemp and denim have a strong connection. For others, it is and will forever remain a minor fibre. Both camps have a point. Its place and role in the industry may however evolve as an infrastructure builds up to process this alternative fibre.

Hemp believers

"There is a strong correlation between hemp and denim," says Alberto Candiani, president of Candiani. "Integrating just a little bit of hemp in the weft gives a denim fabric a special look and feel." Adding a measure of hemp in basic, he says "boring", open end yarns makes them "magical". The Milanese mill sources its hemp fibres in Europe, and incorporates them in proportions that can go up to 50%. This staunch believer in hemp in denims points out that the company has had a "very successful" run with Levi's.

“Levi’s very much believes in the importance of hemp as a more sustainable option to conventional cotton,” confirms Paul Dillinger, vp of Design Innovation at Levi Strauss & Co. The company continues to champion hemp “for all the reasons that drew us to it when we first launched cottonised hemp back in 2019.” He says the company has expanded its use of hemp fibres across the brand and continued its R&D initiatives to increase the hemp-to-cotton blend ratio. The group’s 2020 Sustainability Report indicates that its use of hemp increased from roughly 12,000 units at the start, to more than 1 million units in two years.

Orta has seen demand for its hemp-blend denims remain strong, especially from northern European brands. The Turkey-based mill integrates about 20% cottonised hemp into a fabric in both the warp and the weft. It sources its fibre in France, at La Chanvrière. “Its hemp fibres are as natural as can be, the retting process is done on the field, without any chemicals and the fibres have the properties we need for spinning,” Sebla Onder, Orta’s head of sustainability, tells *Inside Denim*. Hemp aligns well with the company’s focus on regenerative materials. It adds a nice hand feel to denims, but it won’t replace cotton, she says. “The supply of hemp for textiles is limited and it doesn’t make sense to source it from China,” where she says the retting process uses chemicals.

Naveena Denim (NDL) chose Marmara Hemp, grown in France and supplied by The Flax Company, for four different fabrics, having an average of 25% hemp, it developed for German eco-brand Tom Tailor, in a tie-in with Lenzing and Jeanologia. “The entire collection was designed with a mind for circularity from the sustainable fibres to the waterless finishes,” says NDL executive director Rashid Iqbal Nasir.

Marmara Hemp was also the highlight of Bossa’s hemp-focused capsule collection Hempy. “Marmara Hemp is extremely sustainable, and we see great potential for it,” says Özge Özsoy, the Turkish mill’s head of marketing. “The fabrics are made in a blend of hemp, organic cotton and Tencel lyocell, and UK-based design studio Endrime made the styles.”

Mohsin Sajid, owner and creative director of Endrime, is a great promoter of hemp in denims, but he is not alone. Denim designer and consultant Rowan Hunt is also a big fan of the fibre. “One of the advantages of hemp,” says Mr Hunt, “is that it can be grown in Europe.”

Growing resources

Europe is a leading producer of hemp, and France dedicates the most land to the crop, but the main markets for industrial hemp are not textiles. This situation is changing in France, due in part to the efforts of Denis Druon, president of The Flax Company, and developer of the Marmara Original Hemp label. He has set up a novel seed-to-fibre network to reintroduce the natural fibre in apparel. The network



“There is a strong correlation between hemp and denim”

ALBERTO CANDIANI, CANDIANI

includes three major hemp cooperatives, located in three different regions, a manufacturer and a distributor (The Flax Company). They work in close collaboration to provide the qualities and quantities the apparel industry needs month after month, and in a fully traceable manner, he says. “Two years ago, 98% of the hemp harvested by French growers went to non-textile applications such as construction materials, seeds, and so on. Now 15% of their harvest is directed towards textile applications.”

The organisation supports farmers during the retting process to obtain the required characteristics for textile hemp without using any chemicals. “Our qualities are suitable for blends of up to 30% hemp and there is no difference in processing for spinners,” says Mr Druon. The company is scaling up its operations and says it can deliver 100 tonnes per month. Many mills, as shown, and to which Rajby can be added, are using the fibre. Brands that have introduced Marmara Hemp in their ranges include Levi’s, PVH, Inditex, H&M, Uniqlo, Wrangler and Bestseller.

(Top:) Candiani sources its hemp fibres in France and Belgium and uses it in proportions that can reach 50%.

PHOTO: CANDIANI

(Bottom:) A network of five French companies, growers Eurochanvre, Planète Chanvre and Cavac, fibre processor Van Robaey Frères and distributor The Flax Company, are behind Marmara Hemp.

PHOTO: MARMARA HEMP



The Flax Company has also backed its sustainability claims by third party organisations. Marmara Original Hemp is certified Cradle-to-Cradle (Platinum level) and a life cycle assessment has been conducted, confirming its low impact. "Marmara Hemp is now registered in the Higg Index," says Mr Druon.

In the US, Panda Biotech is also setting up a processing facility for textile-grade hemp. It is building and equipping a plant in Wichita Falls, Texas, that is expected to begin operations in early 2023. "Panda Biotech has developed a two-stage, automated and entirely mechanical process. The first stage is decortication and the second is opening and separation which is commonly known as cottonisation," Mark D'Sa, Panda Biotech business development manager tells *Inside Denim*. When fully functional, he says the company will have a processing capacity of ten tonnes per hour which will yield 34 million pounds of hemp fibre annually. These fibres, made from US-grown hemp, will also be traceable, he says.

In 2021, AGI Denim signed up to become Panda Biotech's first exclusive partner in Pakistan. Mr D'Sa says the company is now also working with other denim and woven fabric manufacturers in Mexico, Bangladesh, India, Indonesia, Portugal and Japan.

BastCore, based in Nebraska and with operations in Alabama, is also betting on US-grown textile-grade hemp. The company holds two patents, for a decortication and a degumming process, that mechanically transform hemp stalks into material suitable for staple fibre spinning. The company says its methods are less harsh and thus preserve the fibres' qualities.

Cone Denim began working with BastCore earlier this year. "BastCore's innovation opens great opportunities to create sustainable denims made from American-grown hemp located close to Cone's manufacturing operations in Mexico," commented Cone president Steve Maggard at launch. The two parties have since extended their partnership.

Hemp waste useful too

Some companies seek to put hemp waste to better textile use. After having experimented with orange cellulose pulp with Orange Fiber last year, Lenzing introduced a Tencel lyocell yarn incorporating 20% cellulose pulp from hemp this year, which Candiani wove into denim fabrics. "Our interest in hemp pulp is strong," says Michael Kininmonth, business development manager for the Austrian cellulosic fibre producer.



As part of its focus on innovative low-impact fibres, Naveena Denim Mills created a range of denims made from Circular System's Agraloop Biofibre.

PHOTO: NAVEENA

Circular Systems extracts raw fibre material from flax and CBD hemp crop waste to make its Agraloop BioFibres. The Los Angeles-based company is scouting out various types of crop residues, which are usually burned, left to rot, or used in low-value industrial applications, for possible textile applications. It says its Agraloop technology upgrades these residues into natural staple fibre ready to be blended and spun into yarns with other natural fibres.

Naveena Denim Mills (NDM) has used the fibre in its Biotech range of denims, which can contain up to 20% Agraloop fibre made from CBD hemp waste. "It is an innovative low-impact material and it gives denim fabrics a unique natural fibre aesthetic," says Aydan Tuzun, head of global sales and marketing for the Pakistani mill.

Hemp doubters

The future of hemp thus looks positive, as new suppliers and forms of hemp are developed. Its growing use in textiles does admittedly contribute to lessening a product's environmental impacts. But some mills are not entirely convinced of its market potential. The higher cost of the raw material and the added efforts it requires during manufacturing are the main barriers this camp puts forward. "Hemp gives jeans a true denim look, and it is a very sustainable and long-lasting fibre, but not all buyers can feel its presence in a fabric," says the sustainability manager of a leading Turkish mill. "There was a bullish trend for hemp at the start, yet buyers were not convinced by the feel," agrees Faisal Mahmood, Diamond Denim's head of sales and marketing. "The trend is there, the story sells, but not the product." The added value of integrating this alternative fibre may thus be lost on those that ultimately decide what sells: the buyers and the consumers. ■



Texas-based Panda Biotech is building a facility to mechanically process industrial hemp into textile-grade fibres.

PHOTO: PANDA BIOTECH

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In their quest to reduce the impacts of their products, brands and retailers are quick to promote a switch to more sustainable fibres. But indigo dyeing is a major industry hotspot that makes headlines when rivers turn blue. Behind the scenes, and beyond the scope of an average consumer's line of vision, mills are rethinking their approach to dyeing to save resources at all stages of denim manufacturing.

New thinking about dyeing

The spectacular sight of rope or slasher dyeing is one of the many wonders in the world of indigo. But much is not often seen, nor often shown. At the front end, the measures taken to ensure safe working conditions and the handling of chemicals. At the back end, the infrastructure and complex array of processes needed to decontaminate dyehouse effluent.

The shift to pre-reduced indigo, instead of powder, is underway and a first key step that significantly contributes to reducing the use of hydrosulfite in dyeing. This reducing agent is said to generate some 90,000 tonnes of salt formation every year. By any measure, this mass, if it were to be released into natural water supplies, would degrade ecosystems. To address the issue of difficult-to-treat effluent, dyestuff makers such as DyStar, Archroma and BluConnection naturally recommend switching to their pre-reduced indigo formulations.

Salt-free solutions

DyStar, which is celebrating the 125th anniversary of the invention of synthetic indigo this year, continues to operate the original plant in Ludwigshafen, Germany, where the molecule was first synthesised. Its modern-day successor, Cadira Denim, replaces hydrosulfite with Sera Con C-RDA. "It is an organic reducing agent that is biologically degradable and easier to treat in an effluent treatment plant (ETP)," says Günther Widler, DyStar's head of technology for denim. Progress is also being made by the company to filter dyebaths to retrieve the indigo and obtain clean, salt-free water. "This will make a denim dyeing range work in a closed loop, no indigo will go to an ETP and freshwater consumption can be reduced by up to 80%," he says.

BluConnection's new, plant-based reducing agent BluWit also eliminates the need for hydrosulfite in dyeing processes with pre-reduced indigo. "It is a natural, more sustainable and safer alternative to hydrosulfite. It is odourless, biodegradable, and easy to handle," says BluConnection's CEO and founder Peter Zinser. In production trials conducted at denim mills, the use of BluWit as a reducing agent has been found to lead to 95% sulfite-free effluent, having 60% less salt, and reducing chemical oxygen demand (COD) by 5%. In wastewater, total dissolved solids (TDS) can be brought down by up to 61%, the company has found.



BluConnection has introduced a new plant-based reducing agent, BluWit, which eliminates hydrosulfite usage when dyeing with pre-reduced indigo.

PHOTO: WTP

In addition to contributing to safer dyeing conditions, BluWit is also said to provide the authentic denim look that the industry expects. Tests at denim mills have shown that combining the company's DenimBlu30 with BluWit is a no compromise solution. "After processing, jeans present a bright shade and fresh tone," says Mr Zinser.

Emulating indigo

A bright blue hue is what Pakistani denim supplier Crescent Bahūmán (CBL) feels it has achieved with Blue Infinity. This new, low-impact denim warp dyeing process does not use indigo, making hydrosulfite unnecessary. "Using indigo as a dyestuff has been under pressure because of high water consumption, the use of hydrosulfite as a reducing agent and aniline content," says Zaki Saleemi, CBL's vice president of strategy. "CBL worked not only to address these underlying processing issues but has also sought to reach a wider scope of shades and effects from brilliant blues to greener and greyer shades," he says. Blue Infinity "gives a flexibility in design that product developers will appreciate," he adds, and a product will age like any indigo denim.



Soorty's Cascara dyeing process is said to reduce the amount of water used as well as the load on effluent, without compromising aesthetics.

PHOTO: SOORTY

Applied in a compact dyeing range, Blue Infinity makes it possible to decrease the number of dye boxes, which, along with being aniline-free, helps reduce total volumes of water, dyestuff and auxiliaries, he says. They are said to lead to savings in the order of 50% for water and chemicals and 45% for energy. The GOTS 6.0-approved chemistry creates safer working conditions, he adds, as “more than 99% of the chemicals used in the dyeing process have no hazardous character and have a biodegradable profile.”

Pakistan-based mill Azgard 9 has also introduced a salt-free dyeing method that is said to save chemicals and water without compromising performance. “Ambiclear generates effluent that is neutral in chemicals and colour and is 50% less polluted than that of conventional processes,” says Mian Farrukh Mehmood, head of product development. “Conventional dyeing requires 20 to 25 litres of water per metre of fabric; we have brought this down to 7 litres/metre, reducing water usage by 75%.”

Anticipating fading

If handled correctly, indigo dyeing can be safe and clean, and purists uphold that a pair of raw denim jeans worn for years is a very sustainable product. This may well be true but may well be immaterial. Washed and faded is the norm. This market reality has pushed mills to rethinking their dyeing processes to minimise downstream impacts at laundries. The new thinking starts with a simple assumption: what if one were to apply less indigo, and its accompanying auxiliaries, to create less intense hues that would wash down faster and may be more laser-friendly?

This is precisely how Evlox devised its ICE dyeing concept. “It seems quite logical and simple, but sometimes logic and technology do not go hand in hand, and developing this process has been a challenge,” Paco Ortega, R&D manager at Spain-based Evlox tells *Inside Denim*. He says the company combined different characteristics, “both physical and chemical, which results in a low penetration and hues reminiscent of 1980s denims”. It also eliminates or reduces the quantities of hydrosulfite and caustic soda, he states.

Using Jeanologia’s Environmental Impact Measuring (EIM) scoring system, Evlox’s ICE dyed denims were found to save up to 80% in chemicals, up to 65% in water and up to 25% in energy when aiming for lighter washes, when compared with a dark indigo fabric having the same structure.

Several mills offer solutions that lessen dye penetration to speed up fading, make denims laser-friendly, and save water, chemicals and energy. Many are based on a pretreatment applied to the yarn to limit absorption, such as Indigo Textile’s Orbit Dyeing Technology. “In traditional dyeing, 40% of the indigo penetrates yarn so more processing is needed to whiten a product. This is a fundamental rethink of dyeing methods,” says Nauman Ahmad, product development manager for the Pakistani mill. With Orbit, a fabric’s EIM score is improved by approximately 25%, he adds.

With Cascara, “dye penetrates just two-thirds of a yarn,” says Noman Nadir Khan, VP research & product development for Soorty. This Pakistan mill has also invested in a Smart Indigo machine, an electrochemical reduction process, which reportedly saves up to 71% water and 22% steam.

At Arvind, in India, indigo is oxidised in near waterless conditions using its Quantum foam dyeing process which takes place in a nitrogen chamber. “Arvind is one of the few companies in the world to have this type of machine,” says senior marketing manager Ashutosh Bhargava. Denims dyed using this method are



Crescent Bahümán believes its new Blue Infinity concept can be a game-changing low-impact solution for all products, from mainstream to premium. PHOTO: CRESCENT BAHÜMÁN

highly compatible with laser finishing, he adds, and thus avoid the hazardous chemicals (PP, bleach, etc.) used in conventional laundering processes.

Two years ago, the company began using CleanKore’s patented technology that makes indigo bond only to the outer surface of a yarn. “It saves significant amounts of water, chemicals, energy and speeds up process times, at both fabric and garment manufacturing stages,” says Mr Bhargava. “It is a good solution for brands looking to move towards waterless laser finishing.”

The newest company to adopt CleanKore technology is the Hong Kong-based vertical denim manufacturer Epic Group. “Using verified, third-party data, Epic has calculated up to 44% water savings in garment finishing and up to 60% energy savings in the fabric dyeing stage,” Ryan Ripley, CleanKore business development manager tells *Inside Denim*. He adds that Epic has committed to converting 15-20 million garments to its technology in the next three years.



ICE, Evlox’s new low-impact dyeing concept, saves resources during the dyeing and finishing stages, making it possible to diminish the use of oxidising agents to fade jeans.

PHOTO: EVLOX

Going waterless

Cleaner dyeing processes initially developed for knitwear, where the use of indigo can be problematical, could be viable solutions for woven denim fabrics as well. Colourizd, with offices in Hong Kong and North Carolina, has devised what it calls a ‘direct colour application method’ for cellulosic fibres. The new twist of this technology is that it generates a washed down effect at yarn stage, and thus potentially eliminates the need for washing and fading down the line. Company founders Antony Lau, Jennifer and Alan Thompson were looking to give cotton fabrics a linen-like look when they began working on this process 12 years ago, and which they commercialise under the name GiDélavé. Now they say that technical progress makes it possible to emulate denim.

The process that Colourizd has created transfers a colourant to a pretreated yarn, which can be grey and does not need to be bleached, removing one manufacturing step. “Unlike conventional dyeing that leads to loss of strength, our method adds strength to yarns,” says Ms Thompson. “A 20 singles comes out as a 19 singles.” This is not only “a savings point” it can also be useful to reinforce yarns made from recycled cotton, she claims.

Tests using indigo as a colourant are underway at Colourizd. “There are two ways we could oxidise the indigo,” explains Mr Thompson. “We could either oxidise the indigo prior to using it or treat the yarn as it comes through the machine and then chemically oxidise the indigo.” With regards to common washing and fading techniques, he says that “enzyme washes, pumice and whiskers give good results”. But laser treatments will not work the same way, he notes, as “our machine forces colour into the yarn” whereas conventional dyeing keeps the core white. Another element to take into account, says Ms Thompson, is that “the indigo will not fade. This requires designers to think ahead on what shade and fade they want as they won’t be able to adjust the colour in finishing.”

Confident that their invention can help make garment manufacturing more sustainable, and can be particularly advantageous for dyehouses located in water-stressed regions, they founded a new company, Colourizd Machinery Company, to commercialise the equipment. “Our current machine is industrial scale and can produce 450,000 yards a month,” they say. Two machines are currently running in China.

Thesara Industrial Technology, based in India, is finalising another near-waterless dyeing process it calls Wisik that applies indigo in a “reduced atmosphere” on a fabric, not a yarn. “It is a surface dyeing,” V. Prabhakaran Chetti tells *Inside Denim*. He adds that “it is safe and does not emit any harmful gases.”



Thesara’s Sustainable Functional Coating and Indigo Dyeing on Fabric machine applies dyestuff in a reduced atmosphere. This technology allows dyes to be absorbed more rapidly, using less water and less chemicals and with zero effluent generation, the company states. PHOTO: CRESCENT BAHUMÁN

By eliminating yarn dyeing, Mr Chetti says no sizing is needed which, among other benefits of this solution, leads to decreased water and chemicals usage, shorter processing times, and thus overall energy savings and lower production costs. Initially developed for knits, the technique is said to also apply to woven fabrics. As it is a surface dyeing process (+ surface), it colours a single side of the fabric at a time, with up to 80% penetration. “But it is possible to achieve the authentic white core of traditional indigo yarn-dyed fabrics,” he says.

Thesara now has a working model of the equipment and is close to finalising a commercial version. “We are looking to partner with a machine manufacturing company to make it available globally for the denim community,” he says.

As pressure mounts to save precious water and energy supplies, indigo dyeing is, as can be seen, the focus of great experimentation and innovation. They are a sign of the efforts suppliers and mills are making to ensure safer working conditions, make the best use of resources, and accelerate the shift towards more sustainable manufacturing. They do, however, require new thinking in the design and product development processes. This is the missing link that will fundamentally make the most difference and would lead to real change. ■



Colourizd’s innovative process strengthens yarns, which can be particularly useful in the creation of knitwear with a worn-in look.

PHOTO: COLOURIZD

Skinny jeans remain top sellers, but looser styles are chipping away at their long-standing market dominance. Comfort, which relies on a measure of stretch, remains a top priority for consumers, but goes against sustainable design guidelines that discourage fibre blends. These are the complex market dynamics that denim mills and manufacturers face with regards to elasticity.

The skinny & elasticity

It may become a common dilemma going forward, when market trends come head-to-head with calls for more sustainable product. Coming out of the pandemic, slim fitting jeans may have lost some ground, but demand for comfort is way up. This signals that the cursor in elasticity may be moving away from super stretch towards comfort stretch.

Sales trends confirm that a tipping point has been reached. Straight-cut jeans surpassed skinny as the best-selling style for women in the United States in 2021, and represented one-third, or \$3.3 billion, of the women's jeans market segment for that year, says NPD Group, a market tracking firm. The entire segment grew 9% in 2021, compared to 2019, with skinny jeans the only style to experience a decline in sales.

Views on how this new denim cycle will evolve vary. "It is driven by Gen Z, TikTok, and the like," says Ebru Ozaydin, head of marketing for denim at The Lycra Company. "But when you ask retailers what is selling, they say skinny is still dominant in North America and in Europe. Market data indicates that one third of sales are slim fits."

Isko keeps a close eye on the evolution of consumer demand for stretch denims, the Turkey-based mill's speciality. "Macro trends show that consumers want the authenticity and look of rigid denims, but not the feel of a true rigid denim," says Mirela Slowik, category leader for stretch and performance at Isko. A recent survey across North America and Europe found that stretch jeans have not lost their high ranking in consumers' wardrobes, and comfort and elasticity remain key, by a large margin, she tells *Inside Denim*.

There is a shift to looser fitting jeans, says Mike Simco, global marketing director for Hyosung, "however skinny jeans remain a top-selling product. Even looser fitting styles have spandex in them. Most brands we've spoken to say that stretch denim is a mainstay."



Isko's new range of Reform denims covers three levels of elasticity: Reform HP fabrics have an elongation of 40-60%, Reform XP goes from 80-100%, and Reform 100 can stretch by 100%.

PHOTO: ISKO

Pivot to comfort stretch

Spandex, or elastane, may be the dominant elastic yarn, but it requires special care when used in denims. Mills have widely adopted stretch polyesters that are said to better withstand fabric and garment processing. Lycra T400 A EcoMade, which contains both recycled and renewable content, is one of these and it is a key feature of Lycra Dual Comfort, The Lycra Company's newest fibre technology for denims. Combining comfort stretch with a cooling effect, it also has higher resistance, as Silvia Toledo, senior marketing manager for the company points out: "A fabric made with Lycra Dual Comfort will have double the strength of a 100% cotton denim."

Korean fibre producer Hyosung's stretch polyester technology is called Xanadu. "These are conjugate yarns where the hemi-sphere of each filament has two different polyester polymers," says Mr Simco. "Upon heating in dyeing and finishing, the differential shrinkage of each polymer causes the filaments to form mini springs, which give excellent stretch and recovery."

Sorona, which is 37% biobased, is another stretch polyester yarn. It was originally developed by DuPont Biomaterials, now renamed CovationBio by its new owner Huaafon Group, a Chinese polymer producer. "The denim market will not do without a measure of stretch. But there are only a few ways to achieve elasticity without elastane and Sorona does it well," says Matthew Cole, CovationBio's marketing manager for The Americas.

The rule of dual core

These polyester stretch yarns are usually co-spun, meaning they are covered with cotton fibres during spinning. Also known as dual core yarns, in reference to the bicomponent polyester, they help avoid the high shrinkage values of denims woven with elastane. This parameter is important at pattern making, cutting and garment finishing stages. "Each type of wash generates a different level of shrinkage, which means we have to test every fabric for every wash," says Romain Narcy, partner, strategy and innovation manager for Ereks Blue Matters. In some cases, he says, shrinkage values may vary from roll to roll. The Turkey-based sustainability-focused garment manufacturer has experience with many of the dual core yarns and found Calik's E-Last fabrics to be less prone to variations.

The secret to the Turkish mill's E-Last denims is a special finishing that improves their dimensional stability. "Usually, shrinkage values are in the range of 12-13%. With E-Last we have brought this down to 6-8% across our entire range, including power-stretch and super-stretch references," says Selen Ergül, senior marketing executive for Calik.



Korean fibre producer Hyosung has developed a new bio-based creora spandex drawn from corn instead of coal. A Life Cycle Assessment has shown that it can reduce water use by 39% and carbon dioxide emissions by 23%, compared to conventional spandex products.

PHOTO: HYOSUNG

Dualistic, a concept Naveena Denim Mill (NDM) developed with The Lycra Company, is another dual core technology combining Lycra T400 A fibre with a special finishing process to achieve high mechanical stretch and recovery, the company states. "Dualistic fabrics do not contain any spandex, and can stretch up to 35%," says Aydan Tuzun, head of global sales and marketing for the Pakistan-based mill.

Countless other mills have embraced these dual core technologies. Turkish mill Kipas calls its version Dual Max. Brazil-based Vicunha says it is continuously working on new technologies to meet evolving market needs. "In terms of stretch technologies, for example, improvements have been made recently in their level of recovery," says Ralf Dislich, the company's managing director for Europe.



Pakistan-based Naveena Denim Mills developed its Dualistic fabrics in collaboration with The Lycra Company. They are said to combine high stretch and cooling with an authentic denim look and touch.

PHOTO: NAVEENA

Alternative elastomers

Italian mill Candiani started from scratch when it sought to create an elastic yarn made from natural rubber, which would ultimately lead to the launch of Coreva. “During the entire development process, I was systematically told that it was not physically possible. But Italians are good engineers, and they are creative engineers,” Alberto Candiani, company president, tells *Inside Denim*. The challenge was to create a thread that was fine enough for textile applications. This involved modifying the vulcanisation process and reintroducing spinning machines from the 1990s. Used in proportions of 1-4% in a fabric, Coreva will allow a fabric to stretch from 15% up to 75%, but performs best in the 20-50% range, he says.

As a result of its plant-based make, Coreva presents a better end of life profile compared to synthetic stretch yarns. “The yarns are so fine that they are not only degradable but also biodegradable and compostable,” says Mr Candiani. “And if a garment containing Coreva were to be shredded for mechanical recycling, it would be easier to separate out physically from the fabric.”

Despite its properties and eco-profile, its progress has been slow, due in part to the pandemic. Its higher cost makes it a niche product, he says, adding that Coreva is currently present in 5% of the mill’s production. He would like to bring it to 20% in the next five years. To support its development, the company is planning to launch a fully circular and sustainable consumer-facing brand built on Coreva technology.

Xlance is another alternative stretch yarn with unique characteristics. First developed by Dow in the 1990s, the polyolefin-based elastomer is under new ownership, in which Italian warp-knitter Carvico is a minority shareholder. Xlance sales manager Melissa D’Innella says that the company’s teams have been approaching the denim market for a year now. “In the past, Xlance was present in jeans, so we know it works,” she says. Trials are underway with an Italian mill to see how it stands up to the main processes used to make jeans, specifically its resistance to hypochlorite, ozone processing and laser finishing. Xlance delivers what the company calls “dosed” elasticity and makes up 2-3% of a fabric. “It can achieve up to 35% elongation, it may go higher, but we plan to position it as a comfort stretch solution,” she says.

Presented as more sustainable than other synthetic elastomers, Xlance is reported to be produced in a solvent-free process and to present a high resistance to chemicals. It can be heat-set at relatively low temperatures (120°C), says Ms D’Innella, which makes it suitable for blends with other thermosensitive polymers such as PLA.



Coreva, a natural stretch yarn created by Candiani, is said to have a level of resistance akin to that of synthetic elastomers.

PHOTO: CANDIANI

Mechanical stretch options

The Ellen MacArthur Foundation’s (EMF) Jeans Redesign Guidelines has set the bar for non-cellulose content low, at just 1-2% by weight in a finished product, to make garments easier to recycle. This does not rule out the use of an elastic yarn, whatever it be, but it does discourage blends. And it has inspired mills to develop pure cotton mechanical stretch denims.

Naveena Denim Limited’s (NDL) Natural Stretch fabrics were designed specifically to address a request for circularity from Levi’s. These 100% natural comfort stretch denims have an elongation of 10-13% and low shrinkage, around 2%, says NDL’s executive director Rashid Iqbal. A “challenge” to engineer, he says the concept involves special spinning, weaving and finishing processes.

Orta has also created a comfort stretch denim (with an elongation of 15%) using a technology it calls Torque. This, says Sebla Onder, the company’s sustainability lead, is a “magical stretch technology” that makes “100% natural cellulosic fabrics mechanically recyclable and potentially biodegradable while causing no microplastic pollution.”



NDL’s Natural Stretch range offers comfort stretch without any elastic fibre, a product designed to be both comfortable to wear and easy to recycle.

PHOTO: NAVEENA



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Lucia Rosin, founder of design and sustainability agency Meidea, says designers can integrate special features to make these fabrics move with the body, during a panel talk on the evolution of elasticity hosted by Inside Denim at Bluezone. She also mentioned that mills could choose very soft cotton yarns and weave them in a left-hand twill texture to offer high comfort and circularity.

When longevity equals sustainability

Providing lasting comfort and aesthetics without a stretch yarn is a challenge both for mills and for consumers who have come to take a measure of give for granted. “A denim fabric with just 2% elastane will offer higher performance and longevity, and remain within the bounds of the Jeans Redesign recommendations,” says Ms Onder at Orta. “A stretch fibre will reduce sagging and bagging, so the jeans will be washed less often.”

At The Lycra Company, Ebru Ozaydin points out that “our different yarn platforms observe EMF guidelines. With just 1% of Lycra, a jean can even have power stretch.” Fibre producers are developing ranges that address these new eco-demands, as seen at Hyosung. “Creora 3D Max offers the required stretch with excellent recovery, but with only 2% synthetic content that recyclers can handle,” says Mike Simco.



Stretch specialists also emphasise the importance of extending a product’s lifespan. “We can tap emotional durability, the relationship between a wearer and their wardrobe,” says Ms Ozaydin. The company’s newest polymer, Lycra Adaptiv, increases the probability that a pair of jeans will fit well over time. “People will buy a new product for fashion or fit. Lycra Adaptiv offers fit forgiveness, which allows consumers to keep their garments for longer.”

Isko’s new patented Reform denims also seek to make the most of elasticity to provide enhanced comfort and fit. “These fabrics will not put any pressure on the body, they offer long-lasting performance. They are also perfectly suitable for looser styles and straight leg jeans,” notes Ms Slowik.

While the denim trend cycle may be shifting to looser fits, mills and stretch fibre producers alike defend the properties of comfort and longevity that a measure of elasticity gives. From an aesthetic point of view, Alberto Candiani tends to agree. “Slim fits may have lost ground, particularly during the pandemic, but they have not lost their appeal. For both men and women, skinny can be edgy and it can be trendy, in a rock n’ roll vein.” The denim culture has a special connection to the rock n’ roll culture. And like rock n’ roll, he posits, skinny won’t disappear any time soon. ■

The Lycra Company’s Dual Comfort concept for denims is based on a bicomponent polyester fibre, which can carry a measure of recycled polyester. Its structure also provides moisture-wicking properties.

PHOTO: THE LYCRA COMPANY

Isko, the company that invented jeggings, is reintroducing the concept in washes reminiscent of ‘90s marble effects.

PHOTO: ISKO



With support from India-based Delight Group, the principles of Good Earth Cotton, born in Australia and promoted as a climate positive, traceable cotton, will be applied by 1,977 Indian cotton farms, spanning 3,689 hectares of land. This programme represents a first of its kind, according to Good Earth Cotton, which intends to capture primary and site specific scientific data at scale and verified across participating growers.

PHOTO: DAVID HUTTON

The quest for common metrics

In looking to assure their stakeholders, employees, customers and shareholders that they are applying the best possible practices, companies have many options to choose from, but no universal, institutional, fully independent or globally recognised standard. The business of certification is the field of private, diversely funded organisations.

In the course of what is commonly called a “sustainability journey”, brands typically begin by taking steps to certify the origin of their raw materials, be it organic, recycled or regeneratively grown cotton. Alternatively, they may want to promote social or specific community issues. For other fibres, the notion of animal welfare or biodiversity and deforestation may count. Whatever it is, there are countless causes that a company may wish to show support for through its approach to certification.

Continuing down this path, what happens when a brand decides to blend different types of cotton or add in a measure of recycled polyester (rPET) to strengthen a recycled cotton denim fabric? No single label adequately certifies the environmental impacts of farming and of plastic recycling practices. It is possible of course to put two authentication marks

The need to back sustainable practices with bona fide third-party certification has led to the development of countless labels and standards serving the varied environmental, social and governance (ESG) policies of brands and retailers. After some twenty years, the business of certification has reached a state of maturity, verging on saturation, that signals it is time for an overhaul.

on a product’s tag or label. But what about the brand that also promises to ensure fair pay for factory workers? Or the company that believes biodiversity is of critical concern? How many labels and seals can consumers, if they are the intended audience, absorb before reaching a point when the message gets lost, and certifications fail to do their job of providing confidence?

This, in a nutshell, is the quandary that certification organisations and their customers face. Calls to cover an ever-wider range of social, ecological and economic codes also fuel the modern ailment of audit fatigue, and its escalating costs. Two organisations are tackling the problem, each from its own specific standpoint. The Delta Project was created to clear some of the unnecessary clutter within sustainable cotton standards and Textile Exchange is in the process of reviewing its many siloed standards.

The life cycle of a standard

The Textile Exchange, based in the US, has addressed the evolving needs of brands by developing new standards, now offering an array spanning its Organic Content Standard and Global Recycled Standard to a series of Responsible Down, Wool, Mohair and Alpaca Standards. To its current portfolio of eight labels, it added a new, overarching Climate+ platform that aspires to monitor another series of impact areas now deemed essential, which include greenhouse gas emissions, soil health or biodiversity, to name but a few.

In a move to merge these two levels of certification, Textile Exchange is working on overhauling its hierarchy of labels to create a 'unified standards system', the working title for this plan, signalling a new phase in the lifecycle of standards.

"We recognise that our eight different standards each have different interests and challenges. It would be beneficial for us and for our stakeholders to bring them under a single unified umbrella and to tie them in with the Climate+ impact areas," says Laura Kohler, Textile Exchange's standards manager, speaking at a webinar on the development of the new unified system.

"The unified standards system is an opportunity to start afresh."

STEFANIE POKORSKI, TEXTILE EXCHANGE

The first stage of the harmonisation project was launched in 2021 to identify the unified standard's scope and indicators. It is expected that a first draft of the unified standard will be published in early 2023 and open to stakeholder consultation at that time, followed by a second draft and consultation in the summer of 2023, says Ms Kohler.

Alongside the revised and harmonised labels, Textile Exchange plans to roll-out a brand-new unified logo system. "The labels we have today lack harmony, we are working on developing a new graphic system that we hope will be simpler and easier to use. The unified standard presents an opportunity to start fresh," says Stefanie Pokorski, standards claims manager, speaking at the same Textile Exchange webinar. The organisation is aware of its current labels' restrictions: that they are difficult to apply when a product is certified to multiple standards and that they lack wide market recognition.

In addition to these ambitious plans, Textile Exchange is also considering adding new product categories to its roster such as manmade cellulosic fibres, biosynthetics and 'in conversion' cotton. But Ms Kohler points out that the organisation does not intend "to duplicate existing standards or add another level of audit."



Unifi, US-based maker of Repreve-branded recycled polyester, introduced a new generation of its in-house certification system known as U Trust.

PHOTO: UNIFI

Units and datasets

A similar type of overhaul is at work among cotton certification systems with the Delta Framework, a project funded by the Swiss State Secretariat for Economic Affairs through the ISEAL Innovation Fund, which is led by Better Cotton, partnering with seven other sustainable cotton standards, programmes and codes. Together, they have taken the name Cotton 2040 Group. “The goal is not to create a new standard, but to align the way we measure and report our sustainability progress on our common impact areas,” says Eliane Augareils, senior monitoring and evaluating manager for Better Cotton.

While the organisations committing to use the Delta Framework do not have the same scope or type of interventions, they do share some common impact goals and they all need to monitor progress toward these goals. For instance, reducing the water footprint is a key priority of the cotton sector, but monitoring irrigation water use is done very differently by each organisation.

“Some programmes report volumes, others use reduction percentages over time, still others compare water use between their certified farmers and a comparison group,” says Ms Augareils. “These diverse approaches are usually not comparable and the results cannot be aggregated into common reporting to promote the progress made by sustainable cotton initiatives overall.”

Going one step further, the Delta Framework includes a digitisation guidance to allow the creation of a compatible data management system across several platforms. This titanic task involves deciding on which unit of land surface is retained, whether time frames are based on calendar or seasonal years, and even the number of decimal points for a given data point. “This will make it technically possible to consolidate and analyse data across all standards involved,” says Ms Augareils.

“The Delta Project is finished, but the framework will need to be revised regularly in order to remain relevant, adapting the indicators to future sustainability priorities, and to integrate new tools and technologies, such as satellite imagery, when they become available,” she says.



Keeping up to date

The evolution of technology in the past twenty years is shaping how standards work and driving demand for interoperable datasets. This point was raised by Fashion Revolution in its Fashion Transparency report for 2021. “Once again, we are explicitly looking for machine readable lists in alignment with the Open Data Standard for the Apparel Sector to drive convergence on how data is shared. This is critical in helping remediate issues more quickly. In 2020, just 10% out of 250 brands disclosed their supplier lists in a machine-readable format and now 31% of 250 do so, showing increased convergence and alignment with best practice disclosure,” it states.

As mentioned, standards themselves have a life cycle. “Standards change all the time,” Vincent Duret, textile business unit manager for France-based Ecocert tells *Inside Denim*. “We are currently at Textile Exchange’s v4, GOTS is at v7.” They need to adjust not only to an evolution in the hierarchy of criteria but also to an evolution in technology. He mentions the current update applied to the Global Recycling Standard (GRS) which will require brands that wish to use the label themselves to be certified. In the past, they could simply buy a “certified” product and sell it as such. “These new conditions help level the playing field,” he says.

For products of agriculture, the development of generic globalised standards is a subject of intense debate. The goal of the Delta Project was not to create an overarching cotton standard applicable to all types of farming and business practices, but to clean up the back office of certification. Admittedly, a handful of major organisations participated in this mission, but it does not cover, by any measure, all types of sustainably grown and certified cotton fibres. So while both initiatives profess to close some of the gaps in the business of certification, many others may still be left gaping. ■

The new unified labelling protocol currently under revision by Textile Exchange may expand to include manmade cellulosic fibres, such as those made by Lenzing and biosynthetics.

PHOTO: LENZING

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Water Consumption

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Water Recycling

Around **440,000** tons per year in the whole Group.



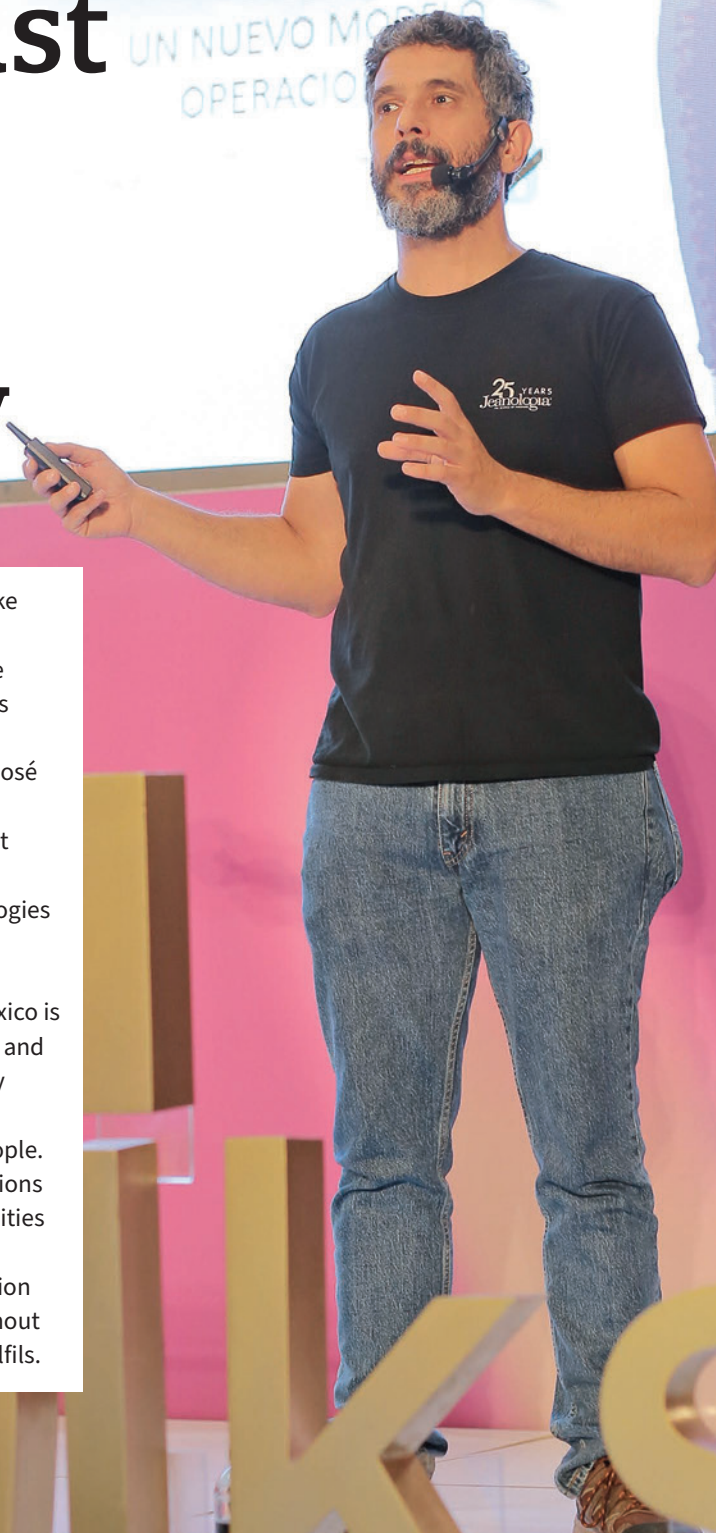


Jeanologia's **José Luis García** says the denim industry in Mexico has good prospects for growth as western brands scale down sourcing in Asia. To make the most of the opportunity, he argues that manufacturers must embrace new technology and make garments in the most efficient and most sustainable way possible.

Mexico must invest in advanced technology

It is in the interest of the whole denim industry to take notice when textile finishing technology provider Jeanologia explains the vision for the future and the mission it has set itself. In describing its aims, it talks about helping to make denim and the entire textile sector more ethical, more efficient and more sustainable. José Luis García, who works in the Jeanologia Brainbox team in Mexico, calls it “detoxing garment finishing” and insists that these efforts are certain to make an impression on denim manufacturers. By his calculations, the company’s technologies play a part in finishing the fabric for 35% of all the denim garments being produced in the world today.

He argues that the technology provider’s presence in Mexico is important; denim output is poised to grow there as brands and manufacturers move a proportion of their production away from Asia. The Spanish company has a team in Mexico comprising technicians, design professionals and sales people. It runs a showroom there to show off its own denim collections and provides locally based denim designers with opportunities to try out new ideas, as well as offering formal training to customer organisations. This work of training new-generation technicians and spreading Jeanologia’s know-how throughout the denim value chain is the role that the Brainbox team fulfils.



Jeanologia's José Luis García speaking at the Intermoda event in Guadalajara, Mexico, this July 2022.

PHOTO: INTERMODA

Closer to consumers

“Everybody knows that we are in a period of great global change,” Mr García explains. “We’ve come through the covid-19 pandemic, which has left a clear mark on this industry because it has made the globalisation that we had all grown used to much more complex now. Asia seemed to be growing stronger and stronger all the time in terms of its share of denim production. Well, now we see things going the other way.”

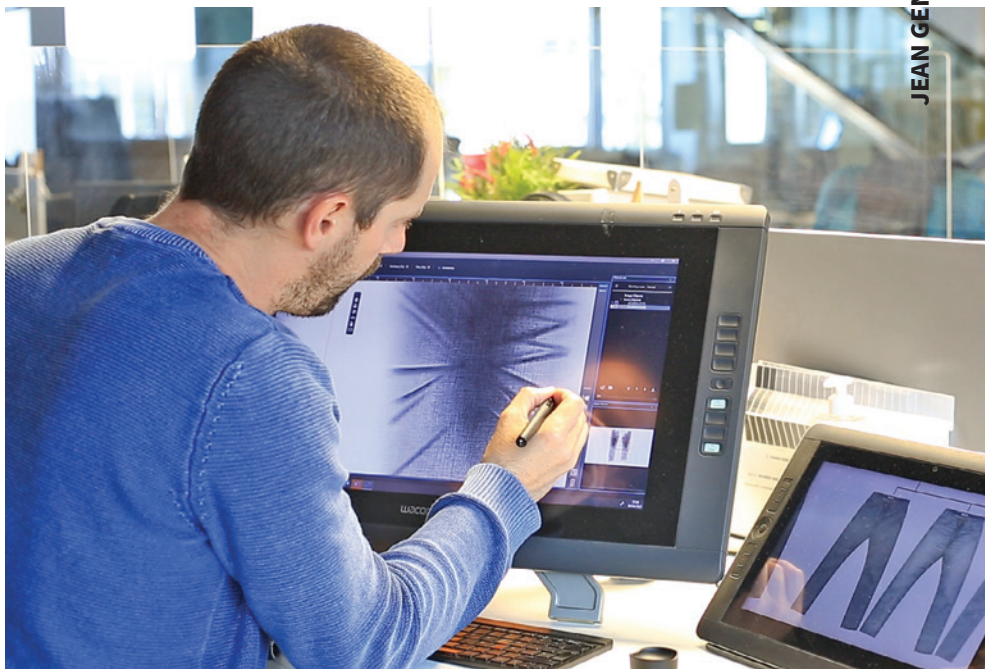
He says there is evidence already of production moving closer to consumer markets. For producers everywhere, the biggest and most attractive consumer market is the US, making Mexico what he calls “a natural market” for producing denim and finished garments in large volumes for shipment across the border. He calculates that between 5% and 15% of denim production in Asia has now moved to the Americas and, according to information that Jeanologia has amassed, this could increase to between 40% and 50% of Asia’s total production.

This has coincided, according to the company’s assessment, with an increase in sales of denim in the US and companies there have realised that supply chain complexity and delays on delivery times mean they can no longer depend as much on the Asian market. “This means diversifying production,” Mr García says, “and that includes bringing more production to Mexico.”

Demand for sustainable products

At the same time, he says brands selling to consumers in the US want products that they can present as being more sustainable. “These brands believe they can find this in Mexico,” he continues. “Made in Mexico is synonymous with better-quality products. There is also the know-how here of how to create the finishes brands are looking for and manufacturers can produce large or small quantities of the products brands want and ship them quickly.” Bringing all this together, he argues that Mexican denim manufacturers can best capitalise on their delivery-time advantage by investing in technology such as Jeanologia’s; the clear suggestion is that new technology will mean greater speed and agility, as well as greater environmental responsibility.

“Mexico is attractive,” he says. “Discussions are under way to bring, in the course of the next two or three years, production programmes to manufacturers in Mexico that have put these sustainable technologies in place.”



Rush for fabric

He confirms that an increase in denim production in Mexico (he thinks it could go up by 3.5% compared to pre-pandemic levels and for exports to increase by 17%) will be good news. But it will have an important consequence: there will be more demand for denim fabric than suppliers can keep up with. “It’s already becoming difficult to source fabric,” José Luis Garcia insists, “and this is linked to the crisis we are living through at the moment, with the war in Ukraine and the whole international situation. Costs have gone up, including the cost of cotton, of chemicals and of energy.”

Advanced technology’s potential for generating cost savings is all the more important in this context, he claims. Cost savings and environmental improvements go hand in hand. He cites a figure of 18.2 million cubic-metres of water per year as the volume that existing installations of Jeanologia’s technology are helping to “save from contamination”, pointing not just to environmental progress, but to an important reduction in water treatment costs, too. Labour-saving benefits are also important, he points out, explaining that there is a labour shortage in the denim industry in Mexico. “Finding people who want to work in textiles is becoming complicated,” he says. “Everyone knows textiles work is hard.” Technology will allow producers to cope with this, to save costs and become more competitive.

Digital path

The technology that is on offer from Jeanologia represents a set of tools that can help manufacturers embrace change and move forward along what he calls “the digital path”, create better products and become more efficient. These tools include the company’s Light Sensitive Fabric Test technology for helping jeans manufacturers choose fabric well, its eDesigner digital design package and its production technology.

Concentrate on what you are really going to produce, Jeanologia says, insisting that denim brands and manufacturers can save time, money and materials by using its eDesigner technology.

PHOTO: JEANOLOGIA

On the first of these, Mr García emphasises the importance of fabric quality and fabric choice. The fabric that a brand or manufacturer chooses to use will help determine the characteristics that the finished jeans will have, he explains. Choose the fabric well and it is possible to apply thousands of different finishes well, but without good fabric knowledge, this is much more difficult to execute.

Light Sensitive Fabric Test is a system for analysing denim; it works by applying different laser treatments, different types of tears and different washes to a single piece of fabric to see which ones look best. Carrying this task out effectively will allow manufacturers to see right away what the best finishing options are for each piece of material. This also works in the other direction: if there is a need for a specific finish, the technology will allow knowledgeable producers to pinpoint quickly and easily the best fabric to use.

Next, they can then use eDesigner to check that a particular finish will look right before putting it into production. This software application can create digital samples and entire digital collections for manufacturers to share with customers at the earliest possible stage, saving time and the materials that are required to make sample products. “It’s still very common these days to start a new collection by making physical samples,” he continues. “Designers think up the styles they want and production teams create examples of them for their design colleagues to examine, give feedback on and, eventually, make their selections. All of this can take two or three months and, of all the samples that arrive during that time, maybe only 10% will go into production. Creating digital samples saves a lot of time and allows you to concentrate on the items that you really are going to produce.”

And when it comes to production, bearing in mind the need and desire to prioritise sustainable processes, Jeanologia suggests using the range of technologies it has grouped together in a set-up it calls ‘Engineering Centre’. This includes the laser technologies that will provide the motifs and marks that the design team wants to see, plus ozone-based eco-wash solutions under its G2 label. Another component part of the Engineering Centre operational model is the company’s SmartBox washing technology, with which it offers manufacturers important savings in water, chemicals and energy. “The water saving can be as much 70%,” Mr García says, “and there is no pumice stone and no permanganate involved. All of this means that you are working cleanly from the outset.”



Some of the most prominent brands in the denim domain are already using EIM to measure their sustainability improvements and share the good news with consumers.

PHOTO: JEANOLOGIA

“The covid-19 pandemic has made the globalisation that we had all grown used to much more complex now, ”

The final piece of technology he talks about is EIM (Environmental Impact Measurement), a software tool that measures the environmental footprint of an individual garment, taking into account its consumption of water, energy and chemicals and its impact on workers’ health. “You can use it to measure each step,” he explains, “and see the difference any change in your process would make.” He can list the names of dozens of brands that are already using EIM to measure sustainability improvements in their supply chains and to communicate them to consumers.

Mexican companies are already investing in technology solutions like these to prepare themselves for growth and to put themselves in a position to meet demands from denim brands for a more sustainable product. Across the Americas, there are more than 400 Jeanologia machines already in operation, out of a total of 4,000 globally, helping manufacturers produce millions of pairs of jeans a month. “We are not asking companies in this part of the world to help us start something new,” he explains. “We are asking them to join us as we continue what we have already begun. ■



XDD TEXTILE COMPANY LIMITED

Vietnam based true vertical mill factory
SPINNING MILL | DENIM MILL

SUSTAINABILITY



U.S. COTTON

TRACEABILITY & TRANSPARENCY



XDD TEXTILE is a true vertical spinning and denim mill factory based in Vietnam. The company has also made it a point to purchase 100 percent BCI-certified cotton from different countries. XDD has been spinning a high yarn count since 2013, notably spinning for brands such as Supima. All cotton bought from the U.S., has received certifications from the U.S. Cotton Trust Protocol and Higg Index, making the fabric traceable and transparent. The company has collaborate with Textile Genesis, which is a platform for customers to trace the sources.



ORGANIC COTTON

XDD is purchasing organic cotton from Turkey and India which is also certified from GOTS, OCS 50/100. XDD can ensure that it preserves a stock keep of over 20,000 tons, and be ready for any orders to meet buyer demands, as a stable cotton supply and never out of stock promise.



20000 TONS STOCK PRESERVE



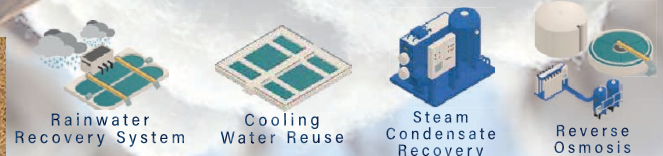
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Aiming at the ecosystem

The town of Laren in the Netherlands, located 30 kilometres or so east of Amsterdam, is known to have served as an artists' colony at least twice in its history. As the pace of industrialisation picked up across the country, painters living and working during the nineteenth and twentieth centuries increasingly found themselves drawn to depicting the area's then relatively unspoiled bucolic landscape and its inhabitants. Today, Laren finds itself once more a locus of nature-inspired creativity as the home of Dutch denim label Mud Jeans, a brand so moved to close the fashion loop that it embarked on a three-year journey to pioneer the "first" jeans made from 100% post-consumer recycled (PCR) denim back in 2019. On June 21, 2022, the company announced that it had achieved its goal via a livestreamed watch party hosted by actress and sustainability advocate Jennifer Hoffman.

Navigating the environment

Known as 'Road to 100', the project sought to spur the development of denim made entirely from PCR fibres by building upon earlier efforts by the label, beginning in 2015. It was at this stage in its history, three years after Bert van Son acquired the brand in 2012, that Mud Jeans began incorporating PCR denim in its blends, Ms Landsberg tells us. By the time it started down the 'Road to 100' a few years later, the

Mud Jeans has long found favour with its commitment to bettering the denim ecosystem. When it unveiled 100% post-consumer recycled denim this past summer, though, it showed itself to be once more ahead of the pack. *Inside Denim* chats to the brand's CSR officer, Lea Landsberg, to find out more.

jeanmaker was already selling rigid fabrics containing 40% PCR alongside 60% Global Organic Textile Standard (GOTS)-approved organic cotton, created in partnership with Valencian collaborators Recover, Ferre and Tejidos Royo.

As described in *Inside Denim* previously, Recover's role was – and still is, with the brand's main lines – to process used denim and mix the recycled fibres with GOTS cotton, before Ferre spins the blended fibres back into yarns, which are then woven into denim by Tejidos Royo. Finally, the fabrics are cut, sewn and finished on a single site by Tunisia's Yousstex International. Another, stretchier version is made up of 75% GOTS cotton, 23% PCR denim and 2% elastane.

Although the need to incorporate chemically recycled fibres in the 100% PCR yarn was identified early on, mechanically recycling cotton-rich discarded denims was still a major part of the process. The first fabric samples contained 67% mechanically recycled cotton and 33% chemically recycled cotton.

ALL PHOTOS: MUD JEANS

Mud Jeans also abides by the Jeans Redesign guidelines, an initiative spearheaded by UK circular economy think tank The Ellen MacArthur Foundation, since July 2019. To this end, it deliberately designs out elements that may hinder recycling at end of life, from eliminating leather back patches to reducing rivets and buttons (now made of stainless steel in line with Nordic Swan Ecolabel specifications). While its own take-back model and Lease A Jeans scheme, first launched in 2013, does allow the brand to generate some PCR cotton of its own, it does not collect enough used denim to satisfy in-house demand for the fibre at present.

Pushing forward

The 100% PCR men's denim shorts that Mud Jeans presented to the world in June were realised through close collaboration with researchers at the Saxion University of Applied Sciences in the east of the Netherlands, in addition to existing partners Recover and Ferre, plus fibre manufacturer Lenzing. Saxion's reputation for textile innovation, especially when it comes to experimenting with recycled fibres, made it an ideal partner, Ms Landsberg says. Its specialists helped crystallise the label's goals significantly and worked to ensure that sustainable, efficient production remained a priority from start to finish, she adds.

First steps included identifying the need to add chemically recycled fibres to the yarn, followed by experimenting with the ratio of chemically versus mechanically recycled cotton present in the blend. A further challenge involved reaching agreement on the "most sustainable" chemical recycling process. Ultimately, the team opted to use N-Methylmorpholine-N-oxide (NMMO), a solvent used by Lenzing in lyocell production that is capable of dissolving and regenerating cellulose fibres such as cotton. According to Mud Jeans co-owner Dion Vijgeboom, speaking during the June watch party, the sample shorts were a mix of 33% chemically recycled and 67% mechanically recycled post-consumer cotton. This had resulted in a prototype fabric with a slightly softer hand feel than traditional denim, Mr Vijgeboom told viewers, but he also acknowledged that changes would be made over time as the collaborators tweaked the proportion of chemically recycled fibres, for example. Ms Landsberg similarly suggests that the brand will increase the yarn count of the fabric to give it a different look and slightly heavier feel.



Mud Jeans' partner facility in rural Tunisia, Yousstex International, is where its fabrics become branded apparel, ready for retail. The factory recycles 95% of the water it uses to make jeans and includes an on-site laundry, partly powered by Jeanologia's e-Flow technology.

“Having hope for better times should not be a feeling, but a doing in the present.”

VINCENT VAN GOGH

Another important aspect, and perhaps the most challenging, was choosing between ring and rotor (open-end) spinning. Numerous testing rounds proved that rotor technology performed better for 100% PCR material than the ring-spun samples, although both spinning techniques were found to “have their own benefits”, Ms Landsberg states. The brand considered the rotor-spun samples to be “very promising”, not only in terms of the quality of the fabrics made, but also their durability. Researching and experimenting with various potential denim washes is next on the horizon. During a question-and-answer session following the ‘Road to 100’ watch party, Mr Vijgeboom remarked that PCR cellulosic fibres other than cotton, such as hemp, may form part of Mud Jeans’ 100% recycled denim line-up in the future, but this is not in the company’s immediate plans.

Rather, scaling up production of its fully recycled cotton denim is of primary importance, with the label hoping to launch jeans of this kind in around a year’s time, Ms Landsberg tells us. “With this being an unprecedented effort, we expect to encounter several challenges along the way,” she says, but discussions between the label and its partners to firm up the timeline are already under way. As for price, the team will also work to increase the affordability of apparel made from 100% PCR fabrics ahead of its retail debut.

New terrain

In late August, Mud Jeans released a capsule collection with Amsterdam’s Van Gogh Museum, dedicated to the work of nineteenth-century Dutch painter Vincent van Gogh and his contemporaries. Created from a blend of 50% GOTS cotton, 30% hemp and 20% PCR cotton, the fabrics were this time produced by Turkish manufacturer Calik Denim using Cradle to Cradle-certified indigo dye, with Yousstex cutting, sewing and finishing the final denim jeans, jackets, aprons and bags. The brand only started using this denim this year. Each piece features details which hark back to the life of the artist, such as lasered sentences from his personal correspondence and embroidery inspired by paintings including *Almond Blossom* and *Self-Portrait with Grey Felt Hat*. According to marketing material, the capsule was inspired by the label’s passion for the beauty of the natural world and optimism about the future, values it says it shares with the institution.

Somewhat fittingly, then, in light of its own sustainability journey, Mud Jeans also picks out a line from a letter Van Gogh wrote to his brother Theo on July 22, 1883: “Having hope for better times should not be a feeling, but a doing in the present”. The jeanmaker shows no sign of straying from its eco-mission any time soon. ■

Learners receive training in practical sewing skills from their very first classes at Jean School, empowering them to realise their own design concepts from the start. Past student projects have received support from mills such as Bossa, Soorty, DNM Denim, Orta Anadolu, Advance Denim, Naveena and Calik Denim, as well as The Lycra Company.

ALL PHOTOS: SIR CONRADS

A head start for denimheads

As denim trade show Kingpins prepares to touch down in SugarCity, a former sugar factory situated in-between Amsterdam and Haarlem, once again from October 19 to 20, a similarly blue-blooded institution is gearing up to mark a decade of denim education in the Dutch capital. Established in September 2012, Jean School is the brainchild of Amsterdam-based non-profit House of Denim. It is run by vocational training centre ROC van Amsterdam (ROCvA), in close collaboration with the foundation and its network. Purportedly, the “school” was the first in the world to offer students a denim-centric education at the time of its launch.

In celebration of Jean School’s tenth anniversary this year, several local happenings are planned to coincide with both Kingpins and the House of Denim-affiliated festival Denim Days, which will itself take place between October 21 and 22. These include the exhibition ‘Brightest Blue’, set to travel to either event, along with a cocktail party at Amsterdam’s Denim City, also initiated by House of Denim, on October 20. Jean School alumni will DJ during the bash, Ms Hoitink tells us.

This autumn, House of Denim’s Jean School celebrates a decade of instructing the next generation of denim design and development talent in all things innovative and of-the-moment. As it looks to expand its impact across borders, *Inside Denim* dives into a world of indigo-hued education with co-founder and fashion consultant Mariette Hoitnik.

Fashioning futures

Not long after the idea for a multi-disciplinary platform for sustainable denim innovation and advocacy first took hold in the minds of House of Denim’s founders, circa 2009, the pair identified a knowledge gap. To make a real difference in the world of denim and jeans-making, artisans and designers would first need a solid foundation in industry-specific skills and processes, with which they could then go on to disrupt and break new ground. However, this kind of incubator-like education did not appear to be available anywhere, leading to consultations with ROCvA and experts from across the denim industry, including brands, who helped shape a pilot programme of practical, hands-on study to be delivered by the training centre.

Today, Jean School offers a full-time, three-year course for those who aspire to specialise in denim design or production, whether that be at a mill, laundry, manufacturer, brand or retailer. The typical curriculum covers everything from the history of denim through to how it is made, finished and sold, with up to two terms allocated for internships. Every year, the fourth term is dedicated to the realisation of practical projects and the goal is for graduates to complete their studies with, at a minimum, proficiency in cutting, sewing and washing their own denims, using both present-day industrial methods and more artisanal, traditional techniques. Regular guest lectures and masterclasses “from the best” also ensure that students keep pace and maintain a connection with the wider industry, while at the same time deepening their knowledge of key topics such as circularity “from plant to pant”, as Ms Hoitink phrases it. This empowers Jean School alumni to “ask more questions” and emboldens them to “set a new standard” upon entering the workplace, she adds.

Since April 2015, Jean School has additionally offered an intensive one-year course for English-speaking international students, based at Denim City Amsterdam in the trendy De Hallen retail and cultural complex. The programme is also open to applications from Dutch students in possession of either a preparatory or propaedeutic certificate, issued to those who complete one year of tertiary-level education, or a HAVO diploma, awarded to secondary school graduates who followed a more vocational pathway in preparation for university study. Students based at this Denim City location (House of Denim opened a second site in São Paulo in 2020) have access to a workshop, a classroom, a laundry lab for experimenting with laser and ozone technologies, plus House of Denim’s own archive and library. Whether studying with Jean School for one year or three years, alumni should leave with concepts like circularity and sustainability more or less in their DNA, Ms Hoitink says.

Industry connections

Jean School receives applications year-round and recruits from a wide range of backgrounds, so long as prospective students can demonstrate a passion for denim at interview. To reach this stage, they must have submitted a letter of motivation, as well as a relevant portfolio of denim design and development work. Well-regarded by the industry, previous corporate sponsors include PVH-owned Tommy Hilfiger, Levi Strauss & Co, denim mill Candiani, yarn developer Manifattura Italiana Cucirini, the City of Amsterdam, C&A Foundation (now under the Laudes Foundation aegis) and the European Regional Development Fund, plus House of Denim itself. There are also academy-style programmes in both Amsterdam and São Paulo, which provide working professionals with the opportunity to undertake in-depth training and educational modules.



House of Denim co-founder Mariette Hoitnik (centre) originally trained as a fashion designer at ArteZ University of the Arts in Arnhem, but today harnesses her extensive network to help nurture the next generation of talent, both at home in Amsterdam and further afield.

“...alumni should leave with concepts like circularity and sustainability more or less in their DNA.”

MARIETTE HOITNIK, HOUSE OF DENIM

The ultimate goal, according to Ms Hoitnik, is to establish an international Jean School network, whose footprint will extend across “all the key denim capitals”. Discussions are already underway with potential Brazil-based collaborators, with a view to establishing a full-scale Jean School there.

In May, fashion group PVH’s philanthropic arm, PVH Foundation, revealed House of Denim to be one of three European charities set to benefit from a planned investment of \$10 million in the activities of global non-profits over the next four years. Speaking at the time, group chief executive Stefan Larsson commented that the funds were especially intended to open the door to increased opportunities in fashion for those from underserved or underrepresented communities. “We look forward to elevating the next generation of innovators around the world,” he said. Ms Hoitnik tells us that at least some of these monies will flow into Jean School and its activities, to help it better reach “talents who don’t fit into the system” and aid them on their individual journeys towards personal and professional development within the denim industry. Progress is also being made with local partners to enlarge the pool of opportunity for those already enrolled, but the fruits of these negotiations have not yet been made public.

Towards a brighter blue

The path to success for today’s denim aficionados may not be paved with gold, but industry-led education can help “to make this denim world a brighter blue”, in Ms Hoitnik’s words, by embedding a sense of respect for every human hand involved in the value chain. More than a decade ago, House of Denim’s founders set out to learn, teach and inspire with Jean School. Alumni of the programme are now dotted all around the world, from factories to laundries and brands to retailers. As an ever-evolving industry continues to navigate and negotiate its challenges, this certainly gives cause for optimism. ■

The growing popularity of gender-free denim design highlights limitations in the traditional men's-or-women's approach to retail.

Leaving 'his or hers' behind

After several years of tentatively stepping into the gender-free zone, denim is claiming its place as a definitive genderless apparel category. It could even be said that it is reclaiming this position, if you go back to pre-1930s Levi's, but women having to borrow their husband's or brother's jeans doesn't quite feel the same.

In 2016, Zara's launch of its Ungendered line put the Spanish brand among the first big-name high-street retailers to officially offer unisex jeans. Yes, the line was met with criticism for being too masculine, too plain, and too limited, but it was hard to deny that the move did break new ground.

Soon after, Guess, AG Jeans, Closed, and others, also announced unisex collections, and in 2019, H&M teamed up with Eytys for a gender-neutral line. Even Levi's (that arguably started the his-and-hers split when it debuted Lady Levi's in 1934), released its Unlabeled line in 2020. Last year, PacSun CEO Alfred Chang said gender-neutral was a growing category for the brand, reaching more than 20% of its offerings. This year has seen big unisex denim releases such as Everlane's 'Everyone — All Gender Collection'.

Some of these lines have since disappeared, while new unisex lines have appeared; collectively they show brands' growing understanding that today's shoppers want denims that reflect real-world diversity in lifestyle, tastes, sexual identity, gender fluidity, and an endless spectrum of body types.

We talked to two brands, Handz and Unspun, for which the gender-free approach to design is fundamental to their offerings, and to Denim Dudes founder Amy Leverton, whose writings on gender and denim remind us that jeans are and always have been about more than just style. What's clear is while the details still need to be worked out, unisex design becomes an inevitable and necessary component — also more sustainable — component of addressing some of the unmet needs of denim customers.



New label Handz is "genderless and modern".

PHOTO: PATRICK JAMES MICHEL

Jeans to embrace all bodies

"We are thinking about future retail spaces, in which a gender-free area should be for all people in love with great denim, with pure and beautiful indigo," Handz co-founder and designer Tilmann Wröbel tells *Inside Denim*. Mr Wröbel and his partner and manufacturer Themis Goudroubis just launched the new brand as a "genderless and modern" label. "On these racks, one should be able to find a pair of jeans that fits women and men, a single style and reference that [can] fit all."

The pair were inspired to create Handz after experiences with clients revealed a void in the denim market. These voids, Mr Wröbel says, create frustration. "There are women in love with proper authentic Japanese denim, and who cannot find well-fitting heritage jeans. Then there are men who wish to wear a slim and stretch denim, right from the women's closet. It was really barking at us, that traditional retail is most of the time divided into women's and men's sections. This had to evolve."

“Gender-free is a step towards inclusivity.”

AMY LEVERTON, DENIM DUDES



Hardeman is a non-gendered brand based in Amsterdam.

PHOTO: HARDEMAN

Historically, he says, most unisex jeans have been “more or less fitted for men” with minor modifications so that women can wear them, too. To offer a genuinely gender-free jean, Mr Wröbel explains it is necessary to analyse the bodies of men and women, “to understand how one sole denim product can gently ‘melt’ from men’s to women’s sizes, in the same grading chart, in the same style,” by taking into account factors such as waist, hip, legs, and appearance. “We have been working, fitting, calculating specs. The result is a non-gendered pair of jeans that embraces all kinds of bodies.”

Gender-free design is not only about gender, he points out. He and his partner want to “create garments for humans of all kinds, neutral so that they might be worn by men, women, any gender in between” but also for “the young and the old, the skinny and the curvy”.

“It’s important to me to be respectful to all the people who look for freedom to choose to wear — and fit into — a great pair of valuable denims,” says Mr Wröbel. “This is not just a new trend we are facing. We believe this is the next step into the near- and long-term future of our society.”

Why customised equals genderless

Custom-jeans maker Unspun presents its customers with a choice of ‘masculine’ or ‘feminine’ rather than men’s or women’s. Masculine fits are slightly loose, with more room in the thigh and crotch area, whereas a feminine fit is closer to the body. “Our software will make the jeans fit your body, regardless of your gender or age,” Annika Visser, brand lead at Unspun, tells *Inside Denim*. “It’s all about what you will feel most comfortable in.”

Once consumers of any sex have selected their preferred type of fit (along with waist rise and hem length), they use the brand’s app to complete a body scan which provides measurements for a fully customised pair of jeans, thus avoiding the traditional body-type conventions that have long made it difficult for consumers to shop across the aisle.

“When we started Unspun, we wanted to change the way that clothing is produced to solve the over-production issues of the fashion industry and make production more intentional,” says Ms Visser. Most people, she adds, struggle to find properly-fitting clothes. “We blame this on pigeonholing in the fashion industry, making us want to fit into cookie-cutter sizes.”

Educating customers that customised jeans are a form of gender-free design has proven to be a challenge. “Until recently we displayed all masculine and feminine cuts side-by-side on our website [but] we received feedback that shoppers were not understanding the value proposition, that the jeans will be made to fit anybody, no matter your size or gender,” says Ms Visser.

As a result, the collections have been split into masculine and feminine fits as the team reconsiders how best to present the collections going forward. But the company’s ethos is clear: Discrimination and bias are inherently baked into the fashion industry, Unspun states on its website, we need to get rid of sizes altogether and instead custom-fit products around actual people in real time.

Societal shifts

For Amy Leverton, denim expert, founder of Denim Dudes, and author of the book by the same name, an increasing presence of gender-free jeans is great news for the industry, but there is still progress to be made both in terms of perception and design.



Unspun makes its jeans based on measurements, not set sizes.

PHOTO: UNSPUN

It is “a step towards inclusivity, and of course this is the movement that's driving this expanding market,” she says. While women have been wearing men’s jeans since the 1920s, she points out, “the most positive shift that’s happened in recent years is towards a true genderless approach where men are more comfortable with the concept of ‘femme.’” A shift in societal stigma associated with feminine traits will “break down traditional gendered design norms,” she says, pointing to labels like Hardeman, Y Project and Telfar — brands whose denim designs consistently subvert those norms — as already exemplifying such a shift.

The logistics are tricky, though. “The hardest challenge for brands is in the engineering of gender-free jeans.” Of the unisex jeans she has tried, the “intricacies of pocket shape and positioning, silhouette, fastening” are difficult to “get right for everyone”.

She expects this to improve as designers and manufacturers gain deeper understanding of their target consumers. “I believe we’re in a pivotal moment in time when it comes to gender politics,” she says. “If a brand wants to invest in genderless clothing and everything that that term stands for, they need to consult with designers who have a first-hand understanding of gender fluidity.”

Another weapon in the sustainability fight

As Unspun’s Ms Visser mentioned, designing non-gender-specific apparel can also offer a more sustainable approach to manufacturing. By eliminating the male/female divide, brands double the number of potential buyers (and the number of those next in line to give a piece a second life).

Adrien Roberts, international director of education at Accademia Costume & Moda in Rome and Milan, recently spoke on this topic at a fashion industry conference in Milan. “Why are we splitting objects into genders? What is a female shoe, what is a female bag? It’s a container for goodness sake,” he said to the audience. “Isn’t it a question of size and shape? A question of what do you want? It would be more sustainable if we were living in a more gender-fluid world where we promoted [products] by size and fit rather than gender.”

The topic of sustainability is vast and there is no single solution, he said, but “at least approaching it from a fluid point of view suddenly opens your markets to 100% of the world, rather than defining something as typically male or typically female.” Simply offering a wider size range, he said, would be “more sustainable all the way through”.

De-gendered retail spaces

Currently, most mainstream brands’ websites and stores still divide their offerings into men’s and women’s sections, but a growing number are recognising the limitations of this traditional approach and Mr Wröbel’s vision of Handz’s gender-free retail spaces as the norm is likely not too far in the future.

For, as Ms Visser says, “We are all unique and different. Why should our clothing be made according to templates and conform to a set of standardised sizes and shapes?” ■

THE PERFECT JEANS

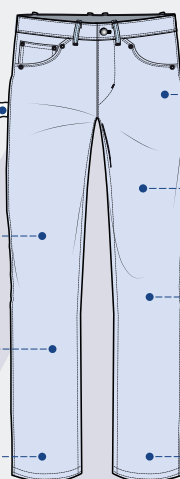
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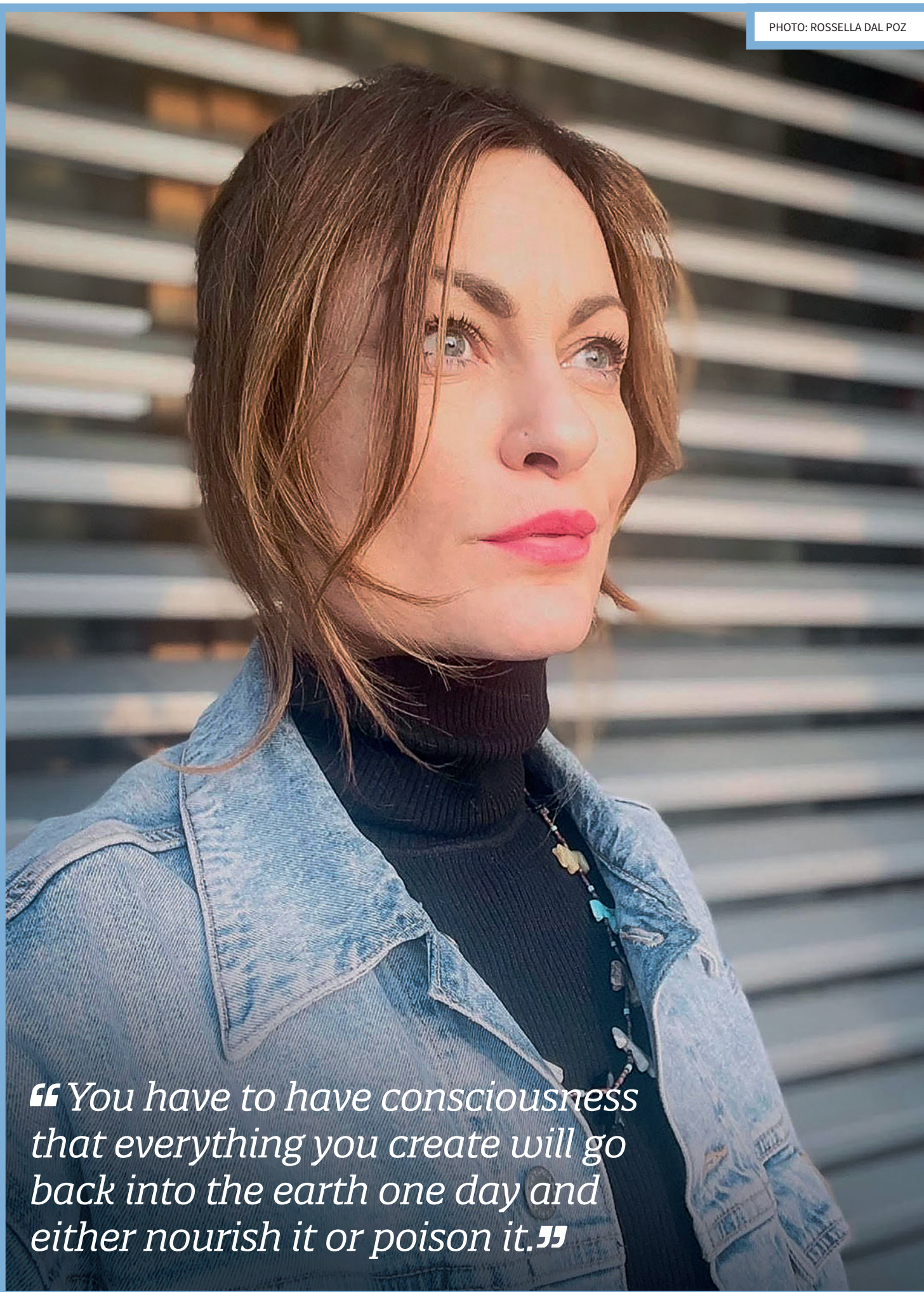
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“ You have to have consciousness that everything you create will go back into the earth one day and either nourish it or poison it.”



Milan-based denim designer **Rossella Dal Poz**, who has worked on successful projects for brands including 7 for All Mankind, Jacob Cohen and Gas Jeans, talks to *Inside Denim*.

Rethink the whole system

We spoke to Rossella Dal Poz at the start of Milan Fashion Week in September 2022. In this conversation she reflects on the problems caused by the over-production of clothes, and on the best way to manage waste. She also talks about changes in the attitudes of designers, brands and consumers.

Q: Is it possible the current cost of living crisis and its effects on families everywhere will help to raise awareness of the importance of not wasting anything? Could this be a small compensation for how difficult things are at the moment?

A: That's the thing, yes. I think people will become more careful and try not to waste things, even if real change takes time. Right now, maybe it's possible that things will continue to go to waste, but in a few years I believe we will get there. I think it's the only solution, honestly. Putting waste to good use is something I have been fighting for. This will need a collective effort.

Why does the textile industry still create so much waste?

Real consumer demand doesn't match the offer, and that's a problem. There is a lot of production that doesn't really need to take place; there is over-production in the fashion industry. When you create a collection and you start to receive orders, you make a forecast to work out how many pieces you will need. But, in the end, I think there is always a surplus added in. Sometimes this may be because the minimum order quantity at the manufacturer is too high, or at least the cost is much cheaper if you ask the manufacturer to produce more. That cost incentive means you are able to achieve what looks like a better price and it can seem too attractive to ignore. The problem with fashion is that you cannot throw garments away as though they were organic waste.

If everyone knows waste is such a serious environmental problem, why are minimum order quantities still so high?

Well, for me the main problem comes from fast fashion, for sure. There is often a minimum quantity because that's what the mills insist on. Now, it's true some mills are reducing their minimum quantities, but if you produce in China or elsewhere in Asia, the minimum is still really high. We have to rethink the whole system, really. If you produce in Italy there are garment manufacturers here that can produce small quantities and have low minimum requests. These companies need to be supported to push artisanal traditions forward and to support local workers as well. Some of them are in danger of extinction. I'm not saying that tailor-made is the answer but demand for custom-made garments is increasing and maybe local and artisanal production is something to think about once again. The price may be higher, but look at the quality of the garment. We should not underpay for fashion and a well-crafted garment will be made to last.

What do you mean when you talk about going beyond upcycling?

It means to go beyond the reuse of garments and think also about transforming them at the end of life into material that you can use for something else. One obvious example is to use textile waste as compost to make the soil better and grow more trees. But there are other interesting possibilities, such as putting the material into insulating panels for cars or houses. Thermal insulation is an important topic these days.

What are the most important changes you have seen with regard to designers' attitudes to waste and excess?

I can see changes; designers in general are more conscious now, for sure. There is more awareness and you can see a change of attitude in the way many of them go about creating projects. But this still isn't mainstream. Also, I don't like the idea of designers turning waste into something valuable and useful just because it is a trend. By definition, a trend will come to an end quite quickly. Designing with a sustainable mindset is a duty. It should be part of our way of living, not just a trend. I believe in designing things that will last and evolve and return to life in a new form.

And in the attitude of clothing brands?

Brands should reduce the number of pieces in their collections. If you think about the situation a few years ago, collections were huge. Did anyone really need all those styles? Sure, if you are a brand you want to show and sell more options, but I think you have to focus and this will lead to smaller offers for the end consumer. Of course, not all consumers are the same. Some are fashion addicts, others are more conservative. They want to choose, but they probably don't need ten options. We should educate consumers and lead them more. It's all about communication.

What are the particular considerations here for denim brands and designers?

There are very good things happening in the denim industry, especially among emerging brands. This is a historical moment and smart design is the key. Brands and designers are working to save water by, for example, designing more responsible products that require less washing during the production phase. Focusing on the biodegradability or compostability of garments is another possible answer. I would rather focus on this than on choosing and using organic cotton because, in fact, the volume of real organic cotton produced across the world is very small. Also, it's important to see brands producing fewer products but with higher quality because this means making products that have durability and this will create less waste. You have to have consciousness that everything you create will go back into the earth one day and either nourish it or poison it. ■

The European Confederation of Flax and Hemp (CELC) has published the initial results of a strategic study on linen's environmental footprint. It wants its members and the apparel industry in general to be aware of important changes that are coming.

A head-start on LCA for linen

The European Green Deal aims to forge a path for all industries, including textiles and apparel, to move towards a cleaner, greener and more circular economy. It underlines the importance of making it easy for consumers to make sustainable choices. This ought to spell the end of greenwashing, the practice of dressing products up to appear more sustainable than they really are. However, to remove the risk of the public being taken in by greenwashing, it is imperative to have reliable, comparable and verifiable information.

With this in mind, the European Commission has already spent almost a decade trying to create rules for calculating the product environmental footprint (PEF) of a wide range of consumer goods. It launched a pilot phase for participating industries as long ago as 2013 and announced in 2019 that, with the pilot phase over, it would press ahead and prepare a formal recommendation on PEF category rules for the legislative bodies of the EU to consider and, it hopes, bring into law. The Commission completed its recommendation document last December and it is now a question of waiting to see when the legislative bodies can fit this into their agenda.

No time like the present

The European Confederation of Flax and Hemp (CELC) has decided not to wait and has already begun to carry out lifecycle assessment (LCA) studies of European flax and linen, using the product environmental footprint method that the European Commission has approved. It published the results of an initial study on scutched flax, the long fibre in its raw state after extraction, in early 2022 and the work will continue with further LCA studies on hackling (making the fibres straight before spinning) and wet spinning. Only certified European flax features in these studies; 80% of global fibre production for linen is in France, Belgium and the Netherlands.



CELC says it is the first agro-industrial textile sector to measure its environmental impact according to the European Commission's criteria. These look at 13 impact categories (rising to 16 in later versions of the PEF), including climate change and water use, to arrive at a single score. It will create a robust, reproducible, systematic and recognised framework for environmental assessment and product comparison, CELC claims, and help brands meet consumer expectations and prepare for regulatory changes that could alter forever the way companies communicate the sustainability credentials of their products.

Common language

This initial study is already giving businesses and brands a strategic tool to help them calculate the PEF score of products that use certified European flax fibre, including jeans, denim dresses and jackets.


Textile and sustainability manager of CELC, Marie Demaegdt, says she believes the advantage of using the work of the European Commission as a basis for linen's LCA studies is that it standardises the methodology and provides a common language for telling producers, brands and consumers what the environmental footprint of the material is. Previous standards have tried to make the playing field level, but Ms Demaegdt's view is that they leave too many aspects open to interpretation. This means it is difficult for brands to make a reliable calculation of the impact of their products, to use these calculations to test different scenarios for eco-design, and to share the information with their consumers.

(Top:) CELC says there is a keen need to have studies that are specific to flax and linen. Even the machinery that flax growers use is particular to their work.

PHOTO: CELC

(Right:) Fashion brand Brora calls these cross-weave linen trousers a great alternative to wide-leg jeans. It argues that the European linen it uses is a more sustainable alternative to traditional denim.

PHOTO: BRORA



“To make it specific to flax cultivation and fibre production, we had to dig deeper,” she explains, “but that was something we wanted to do anyway. We wanted stronger data. Everything about flax cultivation is very specific. Even the machinery that our growers use is specific to flax and different from the machinery farmers use to produce other crops.”

The importance of being durable

She is confident the PEF category rules, although still awaiting approval, can work across a broad range of products. As for other products, a technical secretariat has helped to guide progress through the pilot phase and into the drawing up of the apparel-specific rules that will come into force. CELC joined the technical secretariat this January to “co-construct the rules” and make sure the linen sector’s voice could be heard. It is among those who have made proposals on the modelling of durability, one of the factors that the rules are taking into account. “Durability is one of the key topics,” Marie Demaegdts insists. “It’s important to assess how many times each garment is likely to be worn because more uses mean better impact per use.” On this specific subject, another exercise that CELC is involved in with other members of the technical secretariat is a durability study, co-ordinated by a French standards body, that will seek to correlate laboratory tests, the typical ones textile companies carry out, and analysis of consumer behaviour.

“It’s important to assess how many times each garment is likely to be worn; more uses mean better impact per use.”

MARIE DEMAEGDT, CELC



Certified European flax scutched fibre is the focus of the initial lifecycle assessment that CELC has carried out.

PHOTO: CELC

CELC says another reason why it wanted to make a head-start on carrying out LCAs based on the European Commission methodology is that it wanted its members to be prepared for the changes that are coming. For the method also to be robust and uncomplicated enough to be available to small -and medium-enterprises (SMEs) was of great importance, too, because the flax sector is full of SMEs. Engaging them “in the LCA dynamic” and helping them “to set their own environmental trajectory” will bring benefits. The first of these is that they will be able to answer their clients’ questions and meet their traceability and carbon footprint requests. They will also be able to monitor their own performance against key environmental criteria, set out plans for their own continuous improvement and measure progress.

Start at the very beginning

The confederation says it noticed that there was little awareness in the flax and linen sector of PEF, but also that the same is true of many apparel brands. “Companies are not fully aware of PEF methodology or of the PEF agenda,” Ms Demaegdts says. That there was expected to be little specific data about flax and linen in the upcoming European database was no surprise to her because linen only makes up 0.4% of the global textile fibres market. But now CELC is intent on producing datasets for each step of the linen-making process and calculating from these an average for linen produced in the European Union. Brands and retailers who choose to use linen from European supply chains in their collections are going to need this data to carry out their own product environmental footprint analyses, she insists.

Open doors

The European Commission’s recommendation on PEF category rules should be good news for natural fibres such as cotton, linen and wool. It should help bring the work begun in 2013 to a successful conclusion and oblige companies (not just ask them nicely) to measure accurately and communicate truthfully their environmental performance. As a result, competing in the market using sound, science-based environmental information will become part of the price companies from all over the world must pay if they want to sell to customers in the EU.

It ought to open doors for a material that offers the recyclability, reparability, longevity, sustainability, ocean-protecting and small business-supporting characteristics of linen. Some, however, in the natural fibres world have raised concerns.

In the build-up to the publication of the recommendation document, a new international coalition of organisations representing natural materials emerged, calling itself Make the Label Count (MTLC). At its launch last autumn, it said that the PEF methodology the European Commission is recommending is lacking in a number of key areas.

Much has happened since 2013 to increase knowledge of the environmental impact of materials, MTLC has said. It adds that the EU’s proposals are likely to set global standards for making clothes greener, and it insists that, to get this right, amendments to the methodology are needed. “The EU’s proposals could deliver positive outcomes if the method behind them is amended,” the campaign group said at its launch. “We must act now and get it right, to ensure the claims that companies will use on their labels are credible and that consumers are not misled.”

One clear example of this, MTLC says, is that the environmental impacts of microplastic pollution should be included in the PEF methodology. But the Commission’s recommendation document makes no reference to this.

The company that made the product

There is a story by Jorge Luis Borges, written in 1975, whose title translates as ‘Utopia of a Tired Man’, in which the narrator stumbles upon a gentleman who lives several centuries into the future. They reflect together on the differences between life in the narrator’s time and the world to come. One observation is that in the second half of the twentieth century “people were naive; they believed that a product was good because the company that made the product asserted that it was good and kept repeating the message”. Half a century on, it is clear that this tactic still works for many marketing teams, and that consumers need help in shaking off the naivety to which Borges refers.

“We know raw material is one of the key impacts in the total product lifecycle,” CELC’s textile and sustainability manager continues. “And as European flax accounts for 80% of world production of flax long fibre, we knew that brands would need that information from us. We have begun work on it early because it makes sense to start with the raw material.” ■

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With an advanced and automated system, the factory's dyeing house operates in safe working conditions.

PHOTO: ISKO DENIM

Science, skill and scope

Isko Denim holds many patents, specifically in stretch weaving, its dyeing operations are fully automated, and its new garment-making division is equipped with Industry 4.0 machinery and solar panels line its rooftops.

These all proceed from its scientific approach to manufacturing and to minimising its impacts. In what is possibly one of the largest denim manufacturing sites under one roof, it has the daunting task of continually optimising its operations.

Isko's roots go back more than a century. It is part of Sanko Tekstil, the textile division of Sanko Group, which was founded in 1904 and remains a family-run business. The denim division, headed by Fatih Konukoğlu, son of Sanko Group founder Sani Konukoğlu, was created in 1983.

The company's focus on sustainability also goes far back. As one of the first denim mills to receive Nordic Swan and EU Ecolabel certifications, the often-overused term is more than a catchword for Isko, it is ingrained in its everyday activities and vision. "It is not something I learned in school," says Fatih Konukoğlu, a textile engineer by training. "No one taught us about saving water, or energy," he said as he welcomed a group of journalists, including *Inside Denim*, to the factory last June. Sustainability, he says, is a journey from which we learn every day.

FACTORY TALK: ISKO

In a 300,000m² facility located in Inegol, near Bursa, Turkey's industrial hub, Isko produces some 300 million meters of fabric every year. This state-of-the-art facility is where a future-forward vision of denim is in the making.

"All of our investments are geared towards sustainability. It is easy enough to buy sustainable fibres, but if the chemicals used to turn them into fabric are dumped in the environment, that is not good," says product development manager Baris Ozden who has been with the company for 26 years. "There is only way to do good and that is to take an all-encompassing holistic approach to manufacturing," he says.

The factory tour was an opportunity to see the efforts the company makes to ensure it abides by its high standards. Its indigo dyeing operations take place under controlled humidity and temperature conditions and the management of chemicals is fully automated. "No human hand ever touches the chemicals," says Mr Ozden. Sensors weigh the tanks continuously, and cameras take 100 photos a minute to gauge colour via spectrometry. These automated operations are nonetheless backed by manual inspection. A technician is tasked with checking the colour every 1,000 or 5,000 metres. The entire indigo dyeing line extends over 1,800 metres, says the product development manager. "If a problem were to arise, we might have 1,800m of ropes that are unfit for use." The dyeing machines are rarely ever brought to a stop, it can happen maybe once a year, he adds.

The company's weaving operations are spread across two levels to allow real-time quality control. On the upper floor, the 2,000 or so weaving machines release lengths of newly minted denim fabrics that drop directly down to the lower level where they are inspected. This allows a technician to stop a machine if an issue is spotted that the loom itself did not identify. Isko has partnered with Italian manufacturer Iteima to supply its fully-automated sensor-equipped looms that generate data used to continually optimise production. Many of these are Iteima iSaver rapier looms that are designed to minimise selvage on the left side of the fabric, reducing weft yarn waste edging by 50%.

Industry 4.0

Isko's new garment making facility, Martelli Production, also features advanced manufacturing equipment. These include automated folding and sewing machines that stitch zippers and flies or pockets and belt loops in a single go. Among these Industry 4.0 machines, several come from SIP Italy, which Ertugrul Konukoğlu, Creative Room manager says have been further customised by the two partners. "We created this division to better understand the impact a specific fabric can have on garment manufacturing and the final garment itself. We see this as an additional service to other companies in the supply chain as it can help them overcome obstacles in their own processes," he tells *Inside Denim*.



Inside Denim had the opportunity of visiting Isko's factory at its Inegöl headquarters last June.

PHOTO: ISKO DENIM

In the laundry facility, Jeanologia laser and Tonello ozone machines are installed next to equipment used for various finishing processes such as enzyme treatments. "Day by day we strive to eliminate pumice stones," says Ercan Gedik, who is part of Isko's Martelli Division. He adds that Tonello's Nanobubble technology reduces water usage and makes garments last longer as the fabric is less degraded.

One of the more impressive installations seen in June was the stock and distribution centre. The colossal, fully automated space measures 100 metres long and 40 metres high. It operates in the dark and in low oxygen conditions to prevent fabrics from oxidising as well as any fire from spreading. Topping the Inegöl site, the factory's roof is covered with solar panels that provide 20-25% of its energy needs.

But Isko is particularly proud of its R&D centre, where 30 people work under the management of Gökhan Kaplan. "Since 2009, the company has employed 100 researchers, and this where many of our patents were first developed," he says. It is yet another example of the company's science-led thinking and commitment to making denims greener. ■



Baris Ozden, head of product development, led the press group around the site.

PHOTO: WTP

The factory's distribution centre measures 100 metres long and 40 metres high.

PHOTO: ISKO DENIM



Cone Denim's state-of-the-art wastewater treatment unit progressively rids effluent of fibres, chemicals and unwanted elements to recycle 90% of the water it uses in a closed loop.

PHOTO: CONE DENIM

Forever filtered

Every 90 minutes, every day of the year, a technician samples a full beaker of liquid from one of the tiered pipes of the new water treatment facility at the Cone Denim Parras plant. It is weighed and its content analysed, feeding a database that continuously monitors the process.

Depending on what type of denim fabrics are in production, the factory's effluent is ever changing, César Albarran, general manager of the plant, tells *Inside Denim*. This explains in part the constant surveillance. For the process to work smoothly and generate the required level of water purity, the presence of solids and their make up requires non-stop monitoring and fine-tuning. Throughout the years that it took to set up the zero liquid discharge (ZLD) system, this is one of the key parameters that define zero liquid discharge.

The ultrafiltration and reverse osmosis machinery is housed in a brand-new building and has been in operation for a year. Victor Rodriguez, plant engineer and project manager, is the person who oversaw the development of this ground-breaking effluent treatment system that complies with Mexican norms and ZDHC guidelines.

FACTORY TALK: CONE DENIM PARRAS

An innovative water treatment system at Cone Denim's facility in Parras, Mexico, takes reverse osmosis to new heights. The technology is not only used to soften water for processing but also to purify the factory's effluent and continuously recycle water for reuse in the zero liquid discharge mill.

One of two plants that Cone Denim operates in Mexico, it is located in the picturesque town of Parras in the state of Coahuila. The northern region of the country is arid, but Parras was established in an oasis, and its landscape is dotted with palm trees, pecan tree groves and vineyards.

The state-of-the-art ultrafiltration and reverse osmosis system is part of Elevate Textile's commitment to reduce its water usage by 25% per unit of production by 2025. The \$5 million investment in the Parras plant allows it to reuse what is estimated to be 100 million gallons per year. It thus plays a key role in reducing the group's water footprint. Cone Denim owner Elevate Textiles has reduced water consumption by 22.1%, compared to 2016 levels, as it states in its 2022 sustainability report.

“The main challenge was to scale the process. It took several years before achieving the desired speed and efficiency.”

CÉSAR ALBARRAN, CONE DENIM PARRAS



The ultrafiltration and reverse osmosis processes are housed in a new building and have now been running for a year. Water goes back to the factory in the specifications required for denim wet processing. PHOTO: WTP

FACTORY TALK

At scale

The multiple stage process treats 11,000 gallons of water per hour, or close to 42,000 litres. Effluent from the plant’s wet processing operations is first sent to a biological treatment basin. This is where denim fibres are filtered out, among other organic substances. After this first phase, effluent is then sent to the ultrafiltration unit, where it passes through five membranes, further separating any solids from the liquid. In a third and final phase, effluent goes through the reverse osmosis system. Here seven different membranes filter out the last remaining unwanted chemicals at a rate of up to 1,400 litres (308 gallons) per minute to deliver clean, soft water. Mr Albarran says the main challenge here was to scale the process. This took several years, multiple iterations and pilot tests before achieving the desired speed and efficiency. “The most complex part of the process is managing the solids to optimise the system. If there is too much, the system would clog, but too little can also be an issue,” he says. Continuous monitoring is necessary to adapt to changing manufacturing parameters, as different production runs will use a different set of dyes, chemicals and finishes. “Our team is very much committed to making this system work at its best, and this involves a constant finetuning of the units,” says Mr Albarran.

When operating at scale, the infrastructure could enable the Cone Denim Parras plant to recycle up to 90% of its wastewater for reuse in its manufacturing processes. The remaining 10% is sent to a vast pool roughly the size of a football pitch and 45 feet or 14 metres deep. Sprinklers in rows spray water into the air to accelerate evaporation and return what is left to the natural cycle. This, says Mr Albarran, is the best solution for the small proportion of wastewater that cannot be recycled.

Optimising energy

Cone’s Parras plant includes a co-generation system that has been in operation since 2015. The natural gas-powered facility generates 80-90% of the factory’s electricity, steam and hot water needs. Additionally, water used to cool the co-generation machinery is channelled directly to the factory’s wet processing operations as is the steam. This unit generates 7 megawatts (MW), Mr Albarran tells *Inside Denim*, and covers close to all of the factory’s needs that he says are in the order of 8.1 MW. Energy consumption is another closely monitored concern for the company. “We are always keeping an eye on signs of corrosion and steam leaks that need to be fixed. It is a never-ending job,” he says.

The denim making facility in Parras began operations in 1995, and Mr Albarran heads it since 2021. Cone Denim has a second Mexican plant, located in Yecapixtla, since 1998. The group’s third mill, in Jiaying, China, was added in 2007.

The Parras plant produces 600,000 yards a week. Its spinning operations include both open end and ring spinning equipment, and it has 158 looms. It stocks on average 2.5 million yards of fabric, corresponding roughly to one month of production, says Mr Albarran. The newest machine to be installed in the facility, a Trützschler blender, was in the process of combining cotton, Tencel, Coolmax and CiClo fibres into an intimate blend when *Inside Denim* visited the site.

Optimising operations for efficiency and to make the best use of waste – recycling cotton fibres from spinning - is all part of the mill’s staff everyday tasks. For those working in the new water treatment facility, their routine is even more rigorous. “The system can never stop, it functions 24/7, 365 days a year,” says Mr Albarran. “We cannot send a drop of blue water anywhere.” ■



The factory’s effluent goes from a dark to a lighter shade of blue, then becomes yellowish before reverting back into clean water. PHOTO: CONE DENIM



Denim Authority samples in various fades.

ALL PHOTOS: DENIM AUTHORITY

The new Denim Authority

Today it is my pleasure to introduce you to a great team and a fabulous facility, located in the north of Tunisia, a region known as “the horn”. But, before going any further, allow me to fill you in on its background with a brief overview of its place in the history of denim. .

You might know, or remember, the famous British denim brand Lee Cooper, founded in 1908. It is Europe’s first actual denim brand. Throughout my own career I have been in contact with the brand for many years and my consultancy designed for Lee Cooper for over a decade. So I have first-hand knowledge through my own experience. In 1974, though British, Lee Cooper had a very French leaning. This was due to its strong subsidiary and warehouses located in the country, which extended even to the use of French to communicate, and inspired the company to build a denim factory in Tunisia. Its goal at the time was to make this facility a benchmark of denim manufacturing in the area.

This is why Lee Cooper came to name this factory Denim Authority. It was an active player in the heyday of European denim brands and rose to become a flourishing manufacturer of jeans and slacks for the brand.

FACTORY TALK: DENIM AUTHORITY

When in Tunisia, a visit to Denim Authority is not to be missed as it is one of the best ready-made garment manufacturers in the area, says **Tilmann Wröbel** who gives *Inside Denim* a near insider’s take on its story. Beyond the factory itself, its stellar team, he says, has ‘crazy perfect’ denim know-how.

Years later, when Lee Cooper underwent radical structural changes, its owners took drastic decisions, and would pivot the brand to a purely licensing business. This left Denim Authority and its management team in a state of limbo in Tunisia. When I was working for the brand during these times of change, the work environment was very difficult for all involved.

Who would have thought at that time that Denim Authority would become the first rate RMG or ready-made garment manufacturer it is today? In fact, Hatem Daoud, Ghassen Azouz and Patrice Chesi, did. They are the three associates that masterminded the Denim Authority’s rebirth in 2011. They are, respectively, general manager, factory manager and styling manager.



From left to right, styling manager Patrice Chesi, general manager Hatem Daoud and factory manager Ghassen Azouz.

Those early days under new ownership were far from easy for the management team. The company was in a shaky financial condition, had stocks of unused and random raw materials on hand, and a new reputation to build. It was in a critical state in 2011.

Determined and dedicated, the new owners kept the faith and with the help of Christian Rollandin, who came on board as sales manager, the factory was able to go from 900,000 pieces manufactured in 2011 to 1.5 million in 2022. Their target is now to reach 2.5 million pieces by 2027.

Looking forward

Now let's move on to the current context to see what the company is now doing to reach its 2027 goal. Denim Authority cuts, sews, washes and finishes, in its own laundry. The laundry is where "style-master" Patrice Chesi applies his artistry. These are on show at the trade fairs, including Bluezone and Kingpins, where the company exhibits its goods twice yearly.

Among its many certificates, Denim Authority is GOTS approved and referenced by the Business Social Compliance Initiative (BSCI). These are not that common for RMG factories. They confirm and validate the team's commitment to sustainability in denim manufacturing. These span a strong focus on laser treatments, avoiding the use of pumice stones and permanganate, to the progressive switch to using only sustainable products and liquids. In the laundry, its specialists are working on wash developments that reduce water consumption by 75%. They have high goals.

Topping these green wet processing methods, are Denim Authority's green energy projects. The company has launched a study to draw its energy from photovoltaic panels. It also has an energy cogeneration project in which thermal and mechanical energy is generated in a single operation.



Below: The company's design centre, part of new extensions for the fabric laboratory and an additional 2,700m² for the finishing zone.

These sustainable developments and targets, as much as great product and fast follow-up, have enabled the team to attract new clients such as Scotch & Soda, Nudie, Armed Angels, Baldessarini, Kaporal, The Kooples, MAC, G-Star, Paul Smith, to name just a few.

To continue to build a sustainable business in the long term, and to grow along with its many denim brand partners, Denim Authority has a precise action plan. It recently acquired a third laser machine from Jeanologia, a second automatic cutting table from Lectra, and an ozone machine from Tonello. A new extension of the fabric laboratory has been built, and a 2,700m² extension of the finishing zone will be up and running this month.

I see this evolution as an overall great achievement when reflecting on what the company has gone through. It is a true success story and definitely worth the trip to Tunisia or to a Denim Authority booth at any of the upcoming denim trade fairs in Europe. You will not regret it. ■



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. He is based in Dusseldorf, Germany, and Biarritz, France.

© MONSIEUR_T_OFFICIAL/PHOTO: CHRISTIAN GEYR



Denimhead and indigo enthusiast Christina Agtzidou has been making jeans for 23 years, starting as a designer, pattern maker and merchandiser in Greece before taking on roles in Germany, Hong Kong and New York. She is now design manager for denim at the Tom Tailor brand, where she's focused on design and development for the young female division plus special projects such as organising a denim library for the House.

PHOTOS: CHRISTINA AGTZIDOU



CLOCKING ON...

From choosing each day's jeans to reading indigo philosophy, **Christina Agtzidou's** deep love for denim is woven into all aspects of her day.

Emotion-led designing

6.00am

Coffee is the first thing I do – otherwise there's no performance! – as I go through Instagram and the news. On my balcony in the centre of Hamburg, I look at the beautiful view – the shapes of clouds are unbelievable! Finding jeans is an issue as I have many; today is a pair of raw selvedge jeans and a simple tank top.

8.00am

I'm on my way to Tom Tailor via the underground, excited for the coming meeting. Fixed accessory on me: headphones to listen to my music. I observe people on the train, look at posters on the walls, and enjoy the views of Hamburg.

8.30am

At the office, I clean my desk and check emails, answering as many as I can. Then I bring my materials into a big room for the concept meeting. The floor is full of jeans, fabrics, denim blankets. I'm a visual person; I need to see everything. I like to create emotions when I present my ideas. I'll share innovations on sustainability, new technologies, all pre-discussed with relevant mills and partners. It's important to come with a plan and answers to every question.

9.00am

Our meeting begins. I'm lucky to have a great team – we're cheerful people and reach outcomes by having fun together. With flat hierarchies we sit on the floor, speaking about styles we wish to have, strategies, and allocation countries, and we plan our next collection. Making jeans is great and cool, so this doesn't feel like work. We consider our customers' needs, how Tom Tailor wants to present goods, and finalise qualities and treatments.

12.00pm

Back at my desk, I brief sourcing offices around the world and update the mills – eating a quick lunch in-between calls. My priority is giving mills and factories maximum time to prepare and develop. We have a new project coming that I'm excited about – a denim that will be sustainable while bringing great efficiency to Tom Tailor.

2.00pm

A break with colleagues for a coffee. I finalise details of my upcoming trip to visit the great Pakistani mills – spinning, weaving, and finishing. We'll meet our factories and look at the production runs. I worked for many years in denim manufacturing, so I am happy to be in such an environment again.



PHOTO: SHUTTERSTOCK.COM

4.00pm

Sustainability meeting with a special team of people from different fields (development, design, buying, and sourcing); we crosscheck the latest statuses of sustainability projects. We discuss fibres, pricing of cotton, goals and needs, and I give updates from my recent visit to Bluezone in Munich.

5.30pm

I head home, listening to music – evenings it's ambient or piano pieces. At home, I talk to my mom in Greece and calm down with a small filter coffee.

6.30pm

Time for cooking. I like fresh meals and variety in vegetables, salads and meat, along with Greek feta cheese, olives and extra virgin olive oil. I enjoy my meal listening to the news and music.

10.00pm

I check Instagram and chat with friends, then grab a book. My books are oriented in indigo philosophy, inspirations from Japan or the early years of the last century, and I like the classic jeans and workwear of the 40s and 50s. To bring novelty for the future, we should learn from the past.

11.00pm

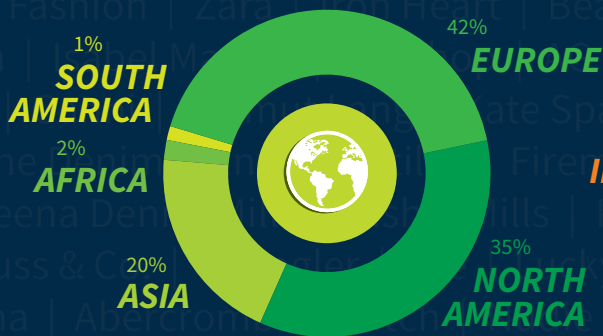
Time for bed. I prepare tomorrow's outfit. Raw selvedge jeans from Japan, a white shirt. I'll read poetry or quotes about life and human behaviour, to create emotions or put me into deeper thinking. I check tomorrow's meetings, look at the view from my window, and fall asleep listening to Craig Armstrong. ■

insideDenim

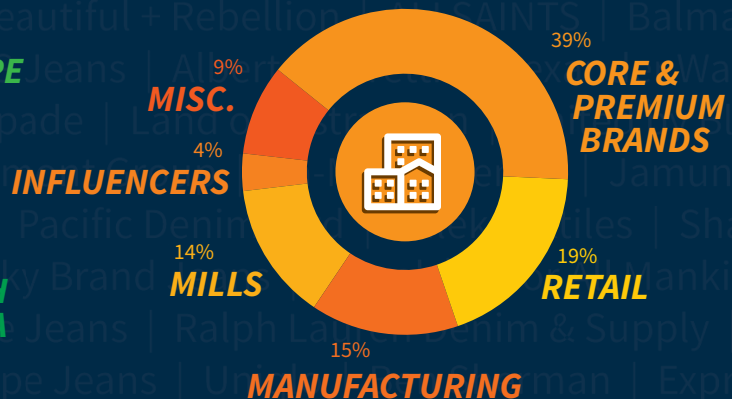
BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

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.

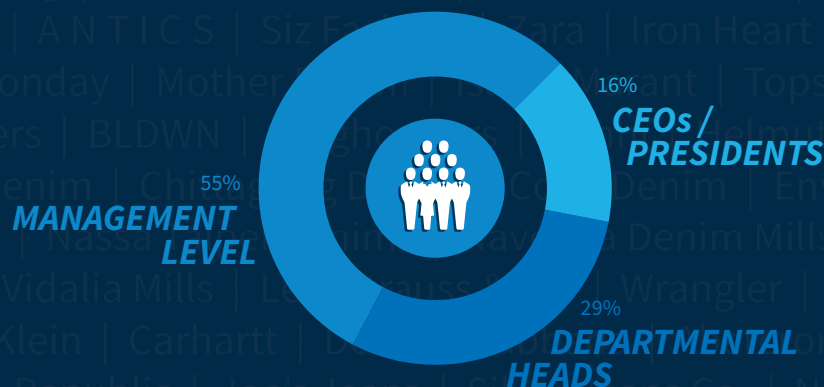
GEOGRAPHICAL



TYPE OF BUSINESS



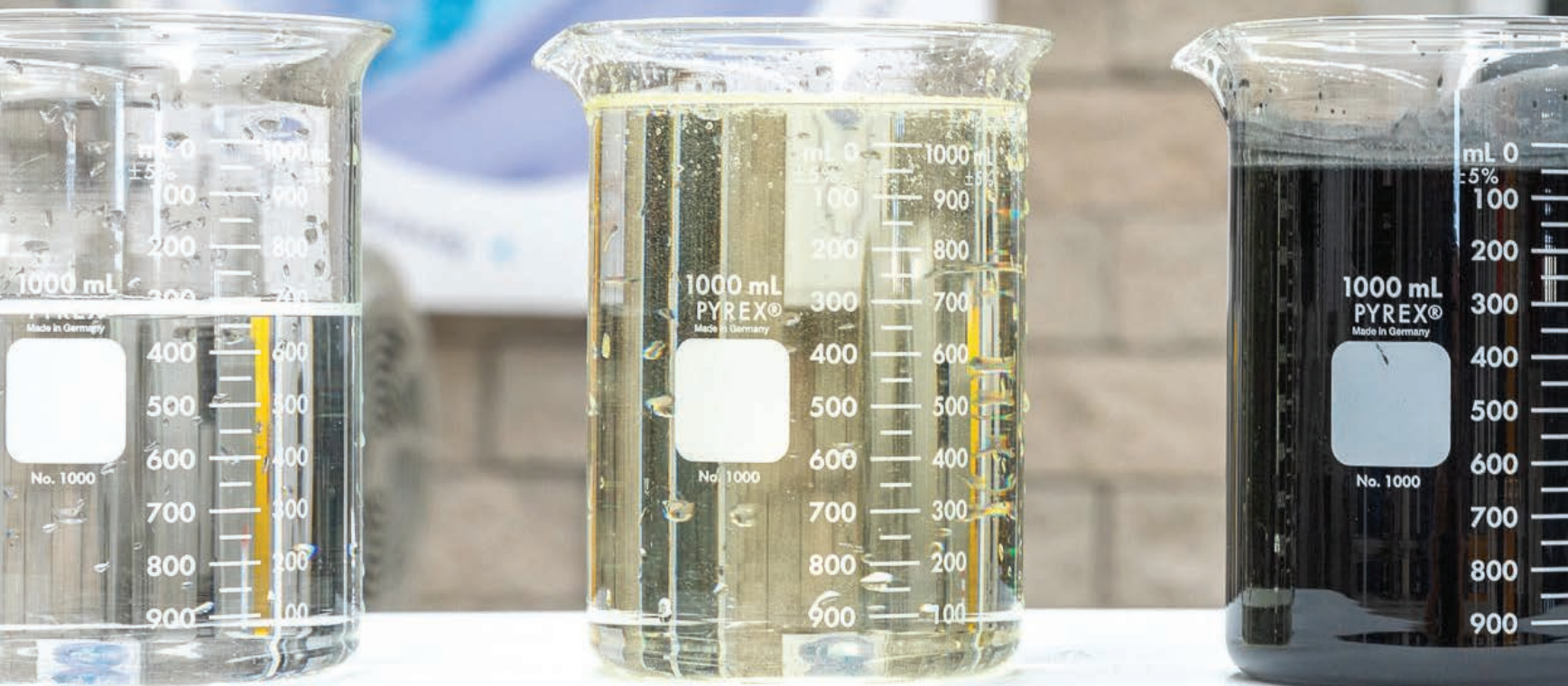
JOB TITLES



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®



100M
GALLONS OF
WATER SAVED PER
YEAR

At Cone Denim, we are committed to 25% water savings by 2025.

Our ZLD system incorporates biological treatment, ultrafiltration and reverse osmosis processes to provide water to be recycled back into the denim production process.

This is the New Wave in Denim Sustainability.