

ISSUE 6: 2022

BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

insideDenim

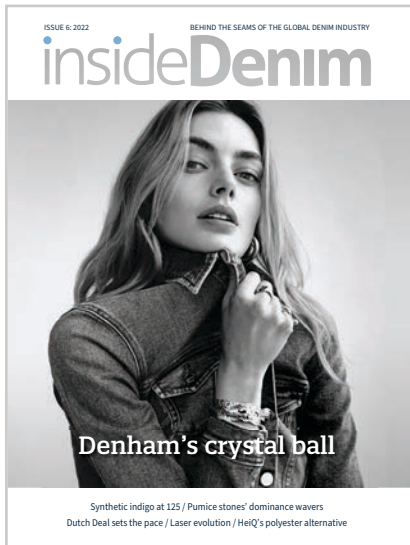


Denham's crystal ball

Synthetic indigo at 125 / Pumice stones' dominance wavers

Dutch Deal sets the pace / Laser evolution / HeiQ's polyester alternative

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Cover The latest collection from Denham the Jeanmaker, a Netherlands-based brand whose founder, Jason Denham, is this issue's Guest Comment.

PHOTO: DENHAM

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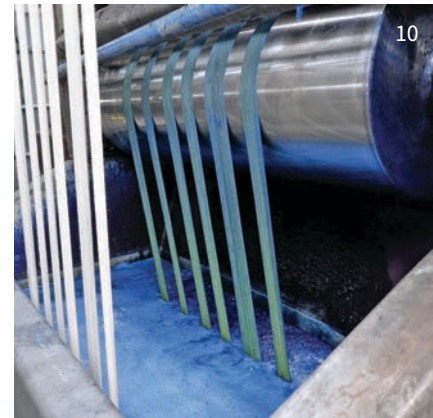
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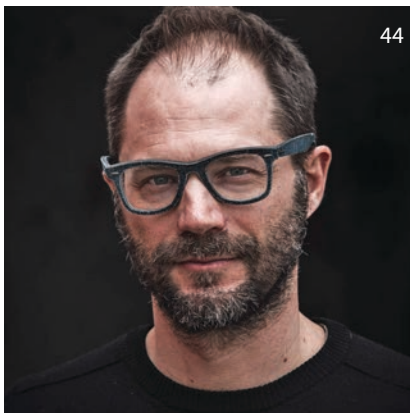
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Past, present and future: where denim heads, others follow

It's always fun to ask industry leaders and experts how they see the future unfolding. While no one can predict anything with certainty – even more so in these rollercoaster times – those that have been in the industry for a while, or who are at the forefront of new programmes and ideas, can often see things shaping in a way we wouldn't be able to. Jason Denham, founder of Netherlands-based Denham the Jeanmaker, digs out his crystal ball for us in Guest Comment and sees a rosy future: one in which denim makes a fashion resurgence and becomes the star of everyone's wardrobe.

Other predictions in this issue come from Bossa's Besim Ozek and PVH's Nicolas Prophte, who envisage a decent percentage of post-consumer recycled denim as an industry standard in three to four years. They are integral players in the Dutch Denim Deal, which launched in late 2020, aiming to establish a textiles collection and sorting network that would make it easier for brands to incorporate the waste into their products. Just over a year into the three-year programme, we find out what progress has been made and what they are concentrating on next.

Atlantic Mills' managing director, Amrin Sachathap, also tells us where he sees things heading: a move towards aesthetics in fabrics and designs, which he feels has been lost recently as the 'storytelling' takes over. The balance between beauty and sustainability is key for the Thailand-based denim producer. So too for Nino Castro, founder of TheLaserLab, a new service which aims to slash time and duplication when it comes to laser design by creating a library that can be easily customised by brands and replicated at manufacturers around the world. Laser use is growing substantially, he says, and he can only see it continuing on that trajectory.

“How many companies will come forward as development partners for HeiQ's AeoniQ, which it claims is a real cellulose-based alternative to polyester?”

From the future to the past: Science Behind the Style leads with a look at synthetic indigo, and its challengers, on its 125th anniversary. The only synthetically developed colourant that can replicate the identical molecular structure of the natural form, and which does not require a chemical oxidising agent, denim's favourite dyestuff and its auxiliaries have made great leaps, most notably BASF's introduction of the pre-reduced form in 1993.

We also take a look at pumice stones, and what alternatives there are on the market that can reduce sludge and increase durability. But can they match performance?

Speaking of alternatives, how many companies will come forward as development partners for HeiQ's AeoniQ, which it claims is a real cellulose-based alternative to polyester? Many denim players have been searching for a solution: this could be the opportunity they have been waiting for.

Now to the present. The *Inside Denim* team had been really looking forward to visiting Bluezone this month, after our great trips to Milan for Denim PV in October and Bluezone last September – alas, the pandemic had other ideas. It must be so frustrating for the show organisers and their colleagues, the exhibitors and visitors to keep having their plans rewritten (as well as the uncertainty it puts into the market). Jason Denham comments that the technical and social development of denim over the past five years has been unbelievable, and we have seen throughout the pandemic so much strength and adaptability, and positivity in adversity. Behind the scenes, innovation is ongoing, despite the hurdles. We will soon be able to see the results in person at the shows planned for summer. Until then, *Inside Denim* will keep you up to date. As Mr Denham says: watch this space. ■

Clare Grainger

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 GUEST COMMENT

Denham founder **Jason Denham** says the technical and social development of denim over recent years has been incredible and fabrics are better than ever. The innovation and changes within the industry means jeans are now the most sustainable garments.

“There are 10-year peaks and denim is making a huge comeback”

Thanks for inviting me to share my voice on where the denim industry is heading. 2022 – 2025, bring it on. It’s exciting times in the denim world... as I’ve only got 800 words I’ll cut to the chase and tick all the boxes that you would expect me to address... and then I’ll get on to the exciting part that we should all be focusing on.

I’ve been a denim lover all my life. I have worked for big denim companies, I have run a denim consultancy, I have made niche start-up denim brands and today my namesake brand Denham is a global premium mid-sized brand. I’ve experienced a lot in 20 years and I have also sourced and produced a lot of denim made in Japan, made in Italy, made in Europe and made in China.

The technical and social development of denim over the last 20 years is incredible and in the last five years, unbelievable. I am very proud of how sustainable our industry is. I have long campaigned that jeans are the most sustainable garments – period. Good jeans that are well made have a long life; we live in them, we wear them in and then we pass them on. We don’t waste water washing them every day. I give huge credit to the mills and vendors and every subsidiary supplier for taking action to do everything possible to support brands like mine in taking sustainable action.

Today, transparency and certification is the norm, and so it should be. I’ve always said that “sustainability is our responsibility, period”. Ever since I started the Denham brand in 2008, we have worked with the most sustainable denim partners like Candiani and pioneered projects like Coreva, denim innovation in compostable technology. Recycling, upcycling and recutting has also been part of the Denham collection since our early years and last month we launched a new project two years in the making called PCRS (Post-Consumer Recycled Selvedge). This is special because we collected and recycled our own jeans from the consumers in our stores and together with Candiani we recycled old Denham jeans and took the product full cycle – “this jean used to be a Denham jean”.

Moving on... here’s my glass ball

Denim moves in cycles, it’s been a constant since 1850 and jeans will outlive all of us. The thing is, there are 10-year peaks and denim is making a huge comeback. More than a decade ago, your jean was the first pick in your outfit and your wardrobe was built around your jeans. Now, we build our outfits around our sneakers first, then the handbags or accessories or the outerwear. Sneaker culture never stopped loving, innovating, reinventing and hyping their products, whereas in the denim world, price and sustainability have taken over style and content.

The positive learning in this is that denim textiles are now better than ever. The technology and sustainable quality of denim is exceptional today. Denim is no longer a price commodity product, every mill, vendor and step of the supply chain have had no choice but to increase quality and prices, which in turn is upgrading our jeans. On top of this, denim is relevant again, the pandemic created a global sweatpant frenzy... which, thank God, is a regretful trend.

Today, clothing is meaningful and not disposable; recycling, upcycling, swapping and trading is everyday language and jeans have been at the forefront of this for decades. Thrift shops and vintage stores wouldn’t exist without jeans. So, here’s my closing statement: in the next few years, denim will re-emerge as the star of your outfit. Denim is back on the catwalks and designers are once again creating fresh silhouettes and exciting concepts with blue jeans. Watch this space. The truth is in the details! ■

Jason Denham is the founder and chief creative officer of Denham the Jeanmaker, an Amsterdam-based denim brand. Born and raised in Newcastle, England, Denham’s passion for design began as a teenager. Following a degree in fashion design and business, he worked with numerous brands to learn all the elements of jean making. In 1996 he was hired by Pepe Jeans in London and was relocated to Amsterdam. In 1998 he established a denim agency, Clinic+, through which he consulted for brands including LVMH, Kenzo, Levi’s and Ben Sherman. Four years later, he founded the Blue Blood brand, and in 2008, Denham the Jeanmaker.

PHOTO: JASON DENHAM

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Industry News

Officina+39 celebrates multiple partnerships



Chemicals group Officina+39 has unveiled its latest products, including Novascraper Indigo, which gives a vintage look to denim garments through laser finishing.

The company said it requires less manpower and lowers the rejection rate compared with manual scraping.

Officina+39 and Spanish mill Tejidos Royo joined forces to create a denim line called the Sixth Sense that drastically reduces water consumption, using Officina+39's Aqualess Mission. This uses Remover BC, Aqualess Aged and Oz-One Powder. Tejidos Royo combined this with low-impact yarns and its foam-dyeing technology Dry Indigo.

Officina+39 has also launched CircularKromia, a tie-up with Italian company Atelier Riforma (pictured). The start-up collects discarded clothing and

gives them a new life. Garments that were not able to be used again were ground down to create Officina+39's Recycrom dyes.

The chemicals group celebrated the Circle Book 2, a partnership between 10 companies including Lenzing and Meidea, at an industry dinner at its headquarters in Biella. As well as touring the R&D labs, guests were able to see the capsule collection created as a result of the Circle Book 2, called Culture.In.

Lucia Rosin, founder of Italy-based textiles consultancy Meidea, told *Inside Denim* there had been a very positive reaction to the collection, with some companies asking how they could be involved in any subsequent projects. ■

Institutes launch 'ambitious' global study to scale textiles decomposition projects

The not-for-profit organisation Biomimicry Institute has been awarded €2.5 million to lead a multi-year initiative called Design for Decomposition.

Together with Laudes Foundation, Hong Kong Research Institute of Textiles and Apparel (HKRITA), Yale Center for Green Chemistry and Green Engineering, Metabolic Institute, The OR Foundation and Celery Design, the Biomimicry Institute will pilot technologies that convert old clothes and textiles into biocompatible raw materials.

The multi-year initiative will host pilots in Western Europe and Ghana, testing the most viable decomposition technologies that are commercially viable but have yet to scale. The initiative is a follow-up to the Institute's *The Nature of Fashion* report in 2020, which identified decomposition as the missing link for the sector.

The initiative begins with biological research about the various types and circumstances of natural decomposition and then matches those approaches to decomposition technologies to determine which best model nature.

In the pilot phase these approaches will be tested in Accra, Ghana, which receives about 15 million used garments each week, and also in Amsterdam or Berlin with more established waste management infrastructure. Simultaneously, research will take place at Yale.

Reflecting on the scale of the problem and the goals of the initiative, Edwin Keh, CEO of HKRITA, said: "It doesn't get much more ambitious than this." ■

Retraced creates new platform

Supply chain management platform Retraced has launched a traceability partnership with Décor Global, a design and manufacturing firm. The blockchain-based platform will be live in April and will enable companies to collect information from their supply chain with regards to suppliers, working conditions, materials, certifications and environmental impacts, and to share this with stakeholders.

PG proves denim's versatility

A collaboration between PG Denim founder Paolo Gnutti, designer Barbara Anna Corradini and students from the Teatro Regio di Parma Opera House has demonstrated denim can be relevant to 'untraditional' fashion sectors including haute couture. The two dresses were the result of months of collaboration.

"There's no place my fabrics can't work – it's just down to the mind of the stylist to interpret them," Mr Gnutti tells us.

Blue Snow offers water savings

Turkish denim mill Kassim's latest technology, Blue Snow, has enabled it to reduce water in the wash cycle by as much as 80% by dispersing the chemicals with foam. Using Garmon's Smart Foam system, the chemicals are added to the machines via dispensers. As well as reducing water, this also means they can wash up to 100 garments, rather than the previous 30, per batch.

O-Zone leap for Tonello

Italian technology provider Tonello has launched O-Zone in partnership with Milan's Candiani Denim. Garments are treated inside a touchscreen-operated, cabinet-like space that allows for customisation such as localised discolouration and lightening. It has been designed to work in small batches and is ideal for experimentation on the garment. The Vicenza-based technology provider described it as "a leap in quality".

Kontoor expands certification

Kontoor Brands is expanding its Indigood Facility Certification to encompass mills that adopt "radically different" water-saving technologies. In 2019, it launched foam dyed denim, Indigood, and then expanded it to include additional freshwater-conservation technologies. Textile manufacturing facilities using 90% less freshwater than conventional fabric production could qualify for full certification. The certification launched with Arvind's Naroda facility in India. ■

UK denim education goes from strength to strength

Denim designer, consultant and educator Mohsin Sajid (pictured) has outlined a packed line-up of denim education projects running at UK universities and colleges in 2022, supported by denim suppliers and established UK designers.

He said: "The UK has always had an important relationship with denim and indigo, from Queen Boudicca, woad and the British engineers who designed the draper looms that supplied

many of great American mills in the late 1800s, to the countless British designers who have ended up in some of the best denim companies."

He said it is no coincidence British graduates get snapped up early in their careers, having an ability to design commercial collections but remaining very creative. "Many UK graduates also have a self-belief and confidence they can design anything," he added.

Mohsin worked as a designer before teaching his first short course at his alma mater, Westminster University, in 2005. This expanded to 15 other colleges as word spread.

For the past seven years, he has run or co-led longer denim projects with Royal College of Art and Ravensbourne University London. Teaming up with Andrew Olah and the Kingpins team, Ravensbourne has collaborated with Transformers ED to bring denim education to a wider audience around the world. "For the last three years we have designed the 12-week course to include Kingpins Show and Transformers Foundation members, so that the students can learn from the denim supply chain," said Mr Sajid. "The wonderful thing is we have also brought in many established designers to teach alongside us: Sue Barrett, Miles Johnson, Malin Ekengren, Rowan Hunt, Jessica Gebhart, Amy Robertson, Salli Deighton, the list is endless!"

For 2022, there are several courses in the pipeline: Kingston MA denim project (January to March); LCF BA denim project (March to June); Central Saint Martins menswear BA denim project, with Miles Johnson (May and June); Ravensbourne BA denim project (September to December); and an RCA MA denim project. ■



Textiles experts gather in Istanbul

High-profile speakers from the textiles and chemicals industries took part in Sustainability Talks Istanbul, a hybrid one-day conference sponsored by Turkish denim producer Kipas.

Speakers included Nicolas Prophte, vice-president of sourcing, production and innovation in denim for Tommy Hilfiger; Andrew Olah, founder of Kingpins; Burak Karaarslan from Turkish mill Taypa; Romain Narcy from the Ereks - Blue Matters mill and laundry; and Eda Togan from Superdry.

Liesl Truscott from the Textile Exchange explained how the non-profit is in the second year of a benchmarking pilot which will be rolled out across the industry. "Benchmarking plays important role of tracking process," she said. "We need to measure everything, so can we learn and improve together."

Johannes Stefan, head of Lenzing's textiles business in Europe, discussed the gap between what consumers intend to do and what they actually do: they wish to choose sustainable apparel, but sometimes they go with the cheapest option. He said Lenzing considers how it can build awareness, increase accessibility to sustainable products and foster attachment to products and brands.

A session centred on the machinery side of denim production included participants from Karl Mayer; Sântis, Iteima, Laroche, John Deere and Tonello. ■

Rudolf creates 'complete toolbox'

Chemicals maker Rudolf has created Offuel, its first range of chemical auxiliaries for denim finishing that is at least 90% made up of alternatives to crude oil or components based on recycled materials (or both). Rucogen Upcycle RNB is based on chemically recycled polyethylene terephthalate (PET) from waste plastic bottles. All 11 Offuel finishing auxiliaries offer designers a "complete toolbox" for wet denim processing, Alberto De Conti, Rudolf's fashion division head, said.

AFM's recycled indigo

Pakistan-based Artistic Fabric Mills (AFM) has launched IndiLoop, a fully recycled chemical indigo warp dye process which the producer described as a breakthrough. Available in both light and medium shades, IndiLoop is generated from AFM's own production waste. It requires no extra chemicals, as it is assimilable with indigo during production. AFM said the process would not be scaled to a mass industrial level, but nevertheless stated it remained "a great feat".

Isko launches R-Two50+

Turkish denim manufacturer Isko's latest product, R-Two50+, contains a minimum of 50% recycled content and is produced using a patented yarn spinning technology. The fabrics have passed Global Recycled Standard (GRS) certification. The company has also launched a Creative Room in West London, with Welsh brand Hiut the first to launch designs washed at the site.

Lenzing offers matte Tencel

Fibre group Lenzing has launched a matte version of its Tencel branded lyocell fibres, designed to diminish sheen in denim. Tricia Carey, director of business development for denim, said: "We work closely with our partners to address their needs. Our partners wanted the option to choose denim fabrics that are less shiny, and we listened."

FibreTrace now GOTS certified

Textiles traceability technology provider FibreTrace has achieved Global Organic Textile Standard (GOTS) certification across its pigments. Manufactured exclusively by Germany's Leuchtstoffwerk Breitung, the company's inert, inorganic and ceramic luminescent pigments are made of rare earth minerals typically encountered in renewables and solar energy. ■

The first commercial batch of synthetic indigo came to market in 1897. Its discovery would be crowned by a Nobel Prize for its contribution to the advancement of modern chemistry. Now, 125 years later, it owes its high level of recognition to its ties to the denim industry. In less than a decade, the modern synthetic dyestuff had replaced its natural equivalent, and its dominance continues, despite the specific processes needed to make the pigment bond to cotton fibres.

Landmark year for synthetic indigo

The history of synthetic indigo is closely linked to that of modern chemistry, its high point being the Nobel Prize for chemistry bestowed to Adolf von Baeyer in 1905. The German

scientist had begun investigating the chemical structure of indigo in 1865, and would successfully synthesise it in 1883. Throughout the 19th century intense research would lead to several key breakthroughs in chemistry and dyestuffs. A British scientist, Andrew Perkins, “invented” mauveine in 1856. He would go on to identify aniline as a precursor to intense colouring agents.

Synthetic indigo remains special in that it replicates the identical molecular structure of natural indigo. “This is worth acknowledging, because it is in contrast to all other synthetically developed colourants since then,” says BluConnection co-founder Peter Zinser.

Badische Anilin & Soda Fabrik (BASF), the first company to commercialise synthetic indigo, had been founded in Ludwigshafen in 1865 by Friedrich Engelhorn. He was looking to develop a new business in textile dyes made from tar, a by-product of his gasworks. The company’s historical records indicate that the introduction of Indigo Pure was the result of 17 years of intense research and a sizable investment of 18 million Gold Marks.

Like many early chemicals companies, BASF’s various divisions would come to be reorganised and rearranged. The conglomerate’s historical textile dyestuff activities became a part of DyStar in 2000. A leading supplier of synthetic indigo, DyStar was formed in 1995, merging the textile dyestuff businesses of Bayer, Hoechst and Mitsubishi. It went through a period of varied ownership and fortune, and its main shareholders are now China-based Longshen and India-based Kiri Industries.

Archroma’s Pure Indigo Icon2 combines its aniline-free indigo with CleanKore technology to allow the production of aniline-free and potassium permanganate-free denim.

PHOTO: ARCHROMA

The origins of Swiss chemicals company Archroma, another leading supplier of indigo, also go back to the early years of synthetic dyes. Its roots trace back to Sandoz, founded in Basel in 1886 to produce textile dyes. Sandoz and Hoechst merged their specialty chemicals activities to form Clariant in 1995. In 2013, US-based SK Capital Partners acquired what was then Clariant's textile chemicals, paper specialties and emulsions businesses to create a new entity it named Archroma.

BluConnection, founded in 2010, specialises exclusively in indigo and denim. It launched its business with a 30% pre-reduced indigo, DenimBlu30, manufactured in its zero-discharge production site in Singapore. Its founders include Peter Zinser, Alexander Bock, Andreas Mendel and Georg Schnitzer, considered one of the developers of pre-reduced indigo.

A challenging dyeing process

The challenge with indigo, be it natural or synthetic, is that it is insoluble in water, which is a specific property of pigments, and, once reduced, and ready for dyeing, it is highly sensitive to oxygen. The most common reducing agent today is sodium hydrosulfite, which converts indigo into its "leuco" form. This operation, conducted before and during the dyeing process, is what generates high levels of salt in wastewater. Pre-reduced indigo, such as BluConnection's, is hydrogenated, and considered a greener solution.

The other specific characteristic of indigo dyeing is the near magical process that makes yarns progressively go from yellow to green to blue. Chemistry is important to stabilise and optimise the process, but it is basically oxygen in the air that brings out the coveted and unique indigo blue. Here again, indigo is special, says Mr Zinser, in that it does not require a chemical oxidising agent that other types of dyes need to express their colour. It can therefore be considered a better, lower impact process. Successive dyebaths, and dips, will lead to darker hues. The dyebaths are most often reused, sometimes for years, and topped up with more indigo as required.

Reducing the reducing agent

A key area where the impact of indigo dyeing could be improved upon is thus in the chemistry needed to reduce the pigment, which would contribute to decreasing the global use of hydrosulfite. It is the chemical that generates salt in effluent. Here, as in all chemicals, the dose makes the 'poison'.

Hydrosulfite is used to reduce indigo and to remove oxygen from the dye vat, but it will continue its action in wastewater treatment plants, interfering with their ability to break down pollutants. "Excess hydrosulfite can only be treated with large amounts of insufflated air, with great expenditure of energy and corresponding CO₂ emissions. Even if it were possible to oxidise all the hydrosulfite, it would turn into salt, making it impossible to use for agricultural purposes and making river water uninhabitable for freshwater species," says Luigi Caccia, general manager of Italian mill Pure Denim. In water-stressed denim producing areas, it is, he says, "the most damaging effect of denim dyeing".

This is why pre-reduced indigo is considered one of the most important breakthroughs in indigo dyeing. That was in 1993, when it was first introduced by BASF. It basically shifted the job of reducing indigo to the dye suppliers instead of the dyehouses. "This allowed a substantial reduction in salts and bases, making it a more sustainable product," Paolo Gnutti, head of PG Denim, tells *Inside Denim*.



DyStar introduced a biodegradable organic reducing agent that enables salt-free dyeing. PHOTO: DYSTAR

Pre-reduced indigo decreases the amounts of hydrosulfite required by between 50% and 70%, says Mr Zinser. It also contributes to "substantial water savings and better safety and hygiene for workers in dyehouses".

The global market share of pre-reduced indigo is estimated to be roughly 30%. Mr Zinser points out that it is useful to break down its adoption into two markets, China and the rest of the world. He says that outside of China the share of pre-reduced indigo is higher, in the order of 60%. He believes that it can even exceed 80% in some denim producing countries. "Many of our customers, often leading denim mills, use 100% pre-reduced indigo," he says.

Italian denim mill Berto says that 98% of its fabrics are dyed with pre-reduced indigo, and that it is transitioning the remaining 2% of powder indigo to liquid. It is currently making new investments in its dyeing process, which will lead to further improvements, the company says.

With or without salt

Indigo pigment can be reduced using an electrochemical process that does away with all hydrosulfite at this stage of the process. This technique, initially developed by Swiss scientist David Crettenand, is licensed by Swiss company Sedo Engineering with its Smart Indigo machine. A unit is installed at Italian factory Pure Denim, which helped develop the first prototype and has been using the machine since 2015, transforming indigo powder into a pre-reduced liquid (30% concentration), explains Luigi Caccia. Indigo powder and caustic soda are fed into the device and pass through an electric field to form a liquid leuco indigo solution. Sixteen Smart Indigo units are in operation, many in Asia, with new machines booked by mills in Mexico and Egypt.

DyStar says its Indigo Vat 40% Solution can lead to a 60% to 70% reduction of sodium hydrosulfite usage. It has been on the market for some 15 years. The company also introduced a few years back a biodegradable organic reducing agent which “does the job without the negative effects of the salt”, says Günther Widler, DyStar’s head of technology for denim. The company is now working on filtering out excess indigo to release cleaner wastewater, which he says could be reused, ultimately leading to a closed loop use of water and dyestuffs in factories.

Addressing aniline

The latest development in synthetic indigo processing is from Archroma. It launched a near aniline-free pre-reduced liquid indigo in 2018. Aniline is present, but remains below limits of detection according to industry standards, the company takes care to mention. It has calculated that in the first three years of commercialisation of its Denisol Pure Indigo, its partners have been able to remove some 18 tonnes of aniline from their processes. Market demand has led the company to start to increase capacity, says Umberto Devita, Archroma’s global manager for indigo.

Pure Denim uses an activated charcoal filter to remove aniline from wastewater. “But it is impossible to remove all aniline; aniline is a fact,” says Mr Caccia. Here again, pre-reduced indigo is considered a better solution. Indigo powder will have a higher level of aniline impurity, which can reach 6,000 ppm, says Mr Zinser. The lower concentrations in pre-reduced indigo will make it easier to produce jeans that do not exceed permitted levels. BluConnection has developed a purification process which filters out aniline from its pre-reduced indigo, allowing a finished denim product to stay within the accepted 20 to 50 ppm limits. “Aniline does not however disappear. We, as do other chemicals companies, reduce its presence so that our customers do not have to,” he says.

Rethinking dyeing

Innovation in the dyeing process itself is another way the industry is reducing water usage and pollution levels in effluent. Foam dyeing is one such near waterless process. Introduced by Spanish mill Royo as Dry Indigo in 2018, it uses 65% less energy and 90% fewer chemicals than standard methods. As no water is necessary, there is no wastewater to dispose of, the company says. Spray dyeing is another water-saving dyeing technique.

Using Archroma’s One Way Impact Calculator, CleanKore says its patented technology leads to substantial overall savings and a reduced carbon footprint.

PHOTO: CLEANKORE

CleanKore, a company based in Ohio, has developed a patented process that tweaks existing dyeing techniques to make indigo bond only to the outer surface of a yarn, leaving an undyed white core which can make some operations unnecessary, such as potassium permanganate, and can optimise processing in laundries. Achieving this requires neither new equipment nor new chemicals, Ryan Ripley, business development manager, tells *Inside Denim*. “We alter various elements of a dye range to achieve the white core.” CleanKore says this white core makes it possible to achieve brighter fading of indigo blue as well as of sulphur black. Mr Ripley says the initial result is “as close as possible to conventional dyeing”.

The company has partnered with Archroma and can thus rely on the Swiss company’s global network of mill and wash technicians to assist dyehouses in implementing the system. Arvind, in India, and Kipas, in Turkey, are early adopters, along with Tak Sang, in China, and Atlantic Mills, in Thailand. Industrial production runs of CleanKore dyed fabrics have begun, which means the first products could be in stores during 2022.

Natural and biotech indigo

Denim dyehouses are often wary of natural indigo. In pigment form, it is indistinguishable from synthetic indigo, which opens the door to fraud. Its use in the industry has remained niche, despite its aura among consumers. Many point out that it is not possible to grow sufficient quantities of indigo plants to meet global demand for synthetic dyes, which is said to represent some 70,000 tonnes a year. “Natural indigo is produced in low quantities, with high costs and technical limitations, and is only suitable for very high-quality products,” says Mr Gnutti.

Stony Creek Colors is striving to change the industry’s outlook on natural indigo. It has recently expanded production to tropical regions to secure year-round supplies. The company has completed two years of validation of IndiGold, a pre-reduced plant-based indigo with a concentration of 20%. “It will be available in a soluble, liquid form for commercial use by denim mills during 2022,” says Sarah Bellos, company founder and CEO. “Modern genetic and genomic tools are rapidly improving our yield per tonne of crop biomass,” she states, noting that Stony Creek’s natural indigo will have a climate positive impact as it can play a role in regenerative agriculture.

Mills seem to place more faith in the promises of biotech dyes. “My personal opinion is that biotech indigo would be better than natural indigo,” says Luigi Caccia, in reference to best use of farmland and the risk of deforestation. Pure Denim is currently working closely with a European company to bring a biotech indigo to market.

BluConnection is also closely monitoring progress in biotech indigo. “Despite our interest and openness to new tech and to cooperation in this field, we have been unable to obtain a sample of bio indigo worth mentioning so far,” says Mr Zinser. He questions the ability of this new process to reach industrial scale in the near future.





Stony Creek Colors has just released IndiGold, a plant-based pre-reduced indigo with support from Levi Strauss and Fashion For Good. It uses hydrogen as the reduction agent.

PHOTO: STONY CREEK COLORS

Sarah Bellos also questions the efficiency of biotechnology. “From a cost perspective, I find it hard to believe that fermentation will ever beat the productivity of agriculture. Stony Creek Colors’ indigo precursors are grown directly inside plants using solar energy and extracted with water. It is a renewable and scalable solution and our costs will come down as crop and market adoption expand,” she says.

Huee founders Tammy Hsu and Michelle Zhu believe otherwise. The biotech start-up (formerly known as Tinctorium) is making progress on its drop-in biobased indigo. “Our process uses microbes to create a bio-identical indigo that will perform like any other indigo,” says Michelle Zhu, Huee CEO and co-founder.

The company is progressively increasing the size of its fermentation vats. The next step would be to find an industrial partner with expertise in fermentation to further scale up. The price of the future bio-manufactured dyestuff is as yet unknown. “Like any innovative product, our biotech indigo will start as a premium solution and we know we can bring costs down over time,” says Ms Zhu. But, in the current context and with growing pressure from consumers, “we cannot wait for a solution to check all the boxes, we need to begin progress now.” A bio-manufactured indigo, without toxic chemicals, and without the inconsistency of natural indigo, could provide a real solution to a major apparel industry hot spot, she says.

In the course of its 125 years of existence, much has been done to make synthetic indigo dyeing as sustainable as possible. One could just as well say that not much was needed to achieve this. The high-performance pigment has seen improvements in reducing agents, which have had a clear impact on water usage and effluent.

New indigos in development, be they biotech or natural, are modelled on current industry standards, and will need to align with acceptable market prices, even if they do have the bonus of being aniline-free. Producers of synthetic dyes do not view them as competitors, having developed what they consider to be the most efficient, industry- and market-proven solution. They do however suffer from pervasive chemicals-bashing and from the tainted image of denim as part of the global fashion industry. Lack of transparency and reliable data on denim dyeing impacts does not help to put a positive twist on synthetic indigo, which many in the industry believe to be one of the more sustainable dyes. ■



PHOTO: BASF

The history of synthetic indigo

- 1883** Adolf von Baeyer first synthesises indigo.
- 1897** German chemicals company Badische Anilin & Soda Fabrik (BASF) begins production of synthetic indigo on an industrial scale.
- 1905** The Nobel Prize in Chemistry is awarded to Johann Friedrich Wilhelm Adolf von Baeyer.
- 1906** BASF introduces hydrosulfite in powder form, simplifying vat dye and indigo processing.
- 1932** Japanese chemicals company Mitsui launches commercial production of synthetic indigo, the result of research begun in 1913.
- 1993** BASF introduces 20% pre-reduced indigo, obtained via catalytic hydrogenation, leading to a substantial reduction in salts and bases.
- 1995** Dystar, a company combining the textile dye businesses of Bayer, Hoechst and Mitsubishi, is founded.
- 2000** DyStar integrates BASF’s textile dye unit, and introduces 40% pre-reduced indigo.
- 2004** Smart Indigo is first commercialised using an electrochemical reduction method patented by Swiss chemical engineer David Crettenand.
- 2010** BluConnection is founded by Alexander Bock, Andreas Mendel, Peter Zinser and Georg Schnitzer. It launches DenimBlu30, the first 30% pre-reduced indigo from its zero discharge production site in Singapore.
- 2013** Archroma is formed by SK Capital from the Textile Chemicals, Paper Specialties and Emulsions businesses of Clariant.
- 2017** “River blue”, a documentary by Mark Angelo, draws attention to the impacts of indigo dyeing on freshwater resources.
- 2018** Archroma introduces Denisol Pure Indigo, an aniline-free indigo (in which the presence of aniline is below measurable levels).
Spanish mill Tejidos Royo introduces Dry Indigo, a foam dyeing method derived from a process developed with Texas Tech University and machinery maker Gaston.
Tinctorium is founded, later renamed Huee, to develop a biotech plant-based indigo.
- 2021** Stony Creek Colors launches IndiGold, a plant-based pre-reduced indigo.



Launched in 2020, Kaiser Tekstil's synthetic F-Stones are said to have very high durability, in addition to being recyclable. This, the company says, means that no stones go to waste.

PHOTO: KAISER TEKSTIL

No-stone future

It is the look that everyone is said to want. The so-called salt and pepper effect that denotes authenticity and that pumice stonewashing delivers. But for anyone sensitive to environmental issues, the impact of the continued use of volcanic rocks may come as a surprise. On the grounds of the impact of the mining, transportation, handling and disposing of pumice stones, many might have expected them to have gone the way of the dinosaurs by now.

A natural, though not renewable, resource, pumice handling and use generates considerable pollution in denim finishing processes, from the front to the back end. The transportation of these heavy loads contributes to greenhouse gas emissions. Their handling is time- and space-consuming. Their abrasive properties not only degrade jeans but also washing machines. As they break down into finer particles and dust, they require numerous rinse cycles to clean garments, and they generate difficult-to-manage sludge and effluent.

From semi-synthetic or synthetic stones to various abrasive materials, numerous alternatives to pumice have been developed. They all claim to release cleaner wastewater, have a longer life span than volcanic rocks, can be recycled, and reduce maintenance and handling. But none claim to achieve the exact, like-for-like effect of pumice. This is where new research and development is called for, and where enzymes, commonly used to enhance efficiency, are seen as instrumental.

Most consumers have only a vague notion of the repercussions of the use of pumice in denim stonewashing. For the industry, these volcanic stones remain a gold standard, and are unmatched in their ability to achieve what is considered authentic wear and tear. The long-established practice is nonetheless increasingly being called into question, as alternative solutions come closer to reproducing the coveted look and feel of real stones.

Among the many alternatives to real stones, some contain actual pumice dust. This is the solution that Turkish technology provider Baytech chose for its patented Hand Made Stones (HMS) that are made from 60% pumice dust, sourced from mining companies, and sealed in biodegradable polymers. Invented by Yavuz Baykan, who founded Baytech in 2016, they are said to offer similar abrasion to traditional stones but break down substantially less, meaning the sludge in waste streams is largely eliminated and the stones last longer. They are said to reduce water usage by between 20% and 30% per load, and further savings are achieved by reducing rinsing after processing.

“Our Jecostone solution does not alter colour and is safer for the fabric”

FLORIANO ARCORO, JECOSTONE

In a collaborative effort with fellow Turkish partners Baytech and Kaiser Tekstil, Ereks-Blue Matters has developed two “eco stone” wash recipes that combine HMS stones with enzymes. The new process is now used in 25% of its production, and it intends to increase this proportion to 50% of production during 2022, with all new products to be developed without the use of pumice. “We have to say that replacing an iconic and well-known product such as pumice is not easy,” the production and wash platform tells *Inside Denim*.

EcoDenimStone, an alternative to pumice developed and patented by Turkey-based Nesrin Koçak and her son Berkay Koçak, is said to combine “geological engineering, chemical engineering and occupational health and safety expertise”. The company is careful to protect its IP and does not give any further indication of its composition. But pumice, says Mr Koçak, “is a natural rock that contains many minerals. It is not just the rubbing of the pumice stone on the denims that gives the worn-down look. The minerals in the pumice stone are released by friction and help wear and age denim.” In other words, he says, “no alternative product can replace pumice.” The company says that EcoDenimStone lasts 100 times longer than pumice and can be used in conjunction with enzymes, ideally the water-free sort, for a more sustainable result.

Synthetic stones

Turkey-based Kaiser Tekstil introduced a set of brightly coloured synthetic F-Stones in early 2020. “In our lab, we have been using the same stones for a year now. They have been in operation for more than 7,000 washes, and may last even longer,” Kaiser Tekstil marketing manager Ezgi Nur Öndaş tells *Inside Denim*. To achieve the best results, she says it is recommended to combine them with enzymes, such as the company’s water-free Lava Cell NSY. When they are no longer effective, Kaiser will take the F-Stones back to recycle them.

Westex, based in Istanbul, claims that its Westex Stones have better abrasive characteristics than natural pumice and can withstand up to 2,000 washes. They are said to reduce water, energy and labour costs by eliminating the need to remove sand residues. As synthetic stones do not absorb chemicals, wastewater treatment is less of a problem, the company says.



Jecostone comes in two versions, a drum liner, which is said to last 100 hours, and abrasive pads, which are said to last 60 hours. Their use, instead of real pumice, can lead to savings in machine maintenance.

PHOTO: JECOSTONE

At PV Denim in Milan, Blue Jeans Lavanderie Industriali presented a series of synthetic abrasive materials. “We have been trialling all sorts of different configurations, including cubes, spheres and hexagons, and we have found that a 16-sided shape gives the best results,” says company general manager Alberto Rossi. Once exhausted, the stones can be regenerated by the company’s partner in the development process. Using these alternatives in the first six months of 2021, the company says sludge ratio decreased by 30% compared with 2020.

Jecostone, a concept developed by denim industry veteran Floriano Arcaro in collaboration with Mario Cocci and Itexa, a maker of abrasive non-woven materials based in Luzzara, Italy, has taken another route to create an alternative to pumice. The company spent several years creating the two plastic-coated abrasive resin solutions it launched two years ago. Jecostone is a liner designed to be installed in the drum of industrial washing machines, and is said to withstand 100 cycles. Jecorocks are abrasive pads measuring 8 cm in diameter, lasting 60 cycles.

“It is only a matter of time before pumice stones are banned,” Floriano Arcaro tells *Inside Denim*. He insists that Jecostone products are not only an alternative, but are truly a new product in that they don’t generate the grey effect that pumice dust leaves in treated clothing. “We believe we have a better solution as there is no modification of colour and our process is much safer for the fabric,” he says. Mr Arcaro points out that in the past, denim fabrics were very resistant, and that this is no longer the case. “Pumice can be a problem on delicate or elastic fabrics,” he says.

To boost their effect, Jecostones can also be combined with enzymes, as Mr Arcaro, like many in the industry, concedes that no synthetic abrasive material will achieve the exact same look as pumice. But he says: “Our abrasives reproduce the signs of normal use of a pair of jeans; it is as close as you can get to the real thing.” Less damaging to washing machines and to garments, its solutions are said to be a good option for knitwear.



Tonello's NoStone concept is a reusable stainless-steel abrasive drum and liner which won the ITMA Sustainable Innovation Award in 2015, the year it was introduced.

PHOTOS: TONELLO

Launched in 2015, Tonello's NoStone system is also based on an abrasive drum liner, developed in three versions. The Vicenza-headquartered company says it is operator-friendly in that it is lightweight, easy to handle and removes the need to load and unload stones from washing machines. “With NoStone, our customers can finally say goodbye forever to trolleys and bags full of stones, always in the way and needing to be stored in large spaces in the laundry. The NoStone is thin and stackable when not in use,” says marketing and R&D manager Alice Tonello. She believes it gives the same look as traditional stonewashing while requiring less water because it eliminates the need to rinse garments to remove sand and dust.

Tonello recently introduced a new easy-lock feature that further speeds up time spent installing and removing the NoStone liners. “This allows our customers to switch from one process to another, depending on their needs, making their lives easier,” she tells *Inside Denim*.

Reinventing washing

British company Xeros Technology is the inventor of XOrbs, patented polymer beads with various cleaning and decontaminating properties. It has recently turned its attention to denim and has developed a drum- and bead-based stonewashing process known as XTend. The company has developed a special drum, XDrum, equipped with a built-in storage compartment, which automates the distribution and retrieval of the polymer beads. The drum can be integrated into new machines or retrofitted into old ones. A valve in back of the drum releases XOrbs and a herringbone-shaped device inside the lifter guides them back into the storage compartment after washing, says Mike Ferrand, Xeros Technology managing director for commercial products. This, he says, makes it possible to control the deployment and harvesting of the XOrbs, so no handling is required in production.

The company has developed special XOrbs that are larger and denser to increase their abrasive properties. “XOrbs hang onto chemicals or enzymes and distribute them evenly across the load. This makes it possible to achieve an even, consistent and reproducible finish. XOrbs also adsorb excess dye, and will capture remaining indigo to avoid back staining,” says Jamie Harrison, Xeros Technology licensing director. The beads, which can be used in combination with enzymes to enhance their effect, need only be changed twice a year, the company has found. They are never handled and can also be recycled.

Xeros Technology has partnered with Ramsons, a washing machine manufacturer based in India, which makes the drum and equips denim finishing machines with them. ABA Group, in Bangladesh, has recently set up nine Xeros-enabled Ramsons denim finishing machines in a new facility, including eight 5,000 litre capacity machines that can process up to 200 pairs of jeans at a time.

Mechanical and chemical abrasion

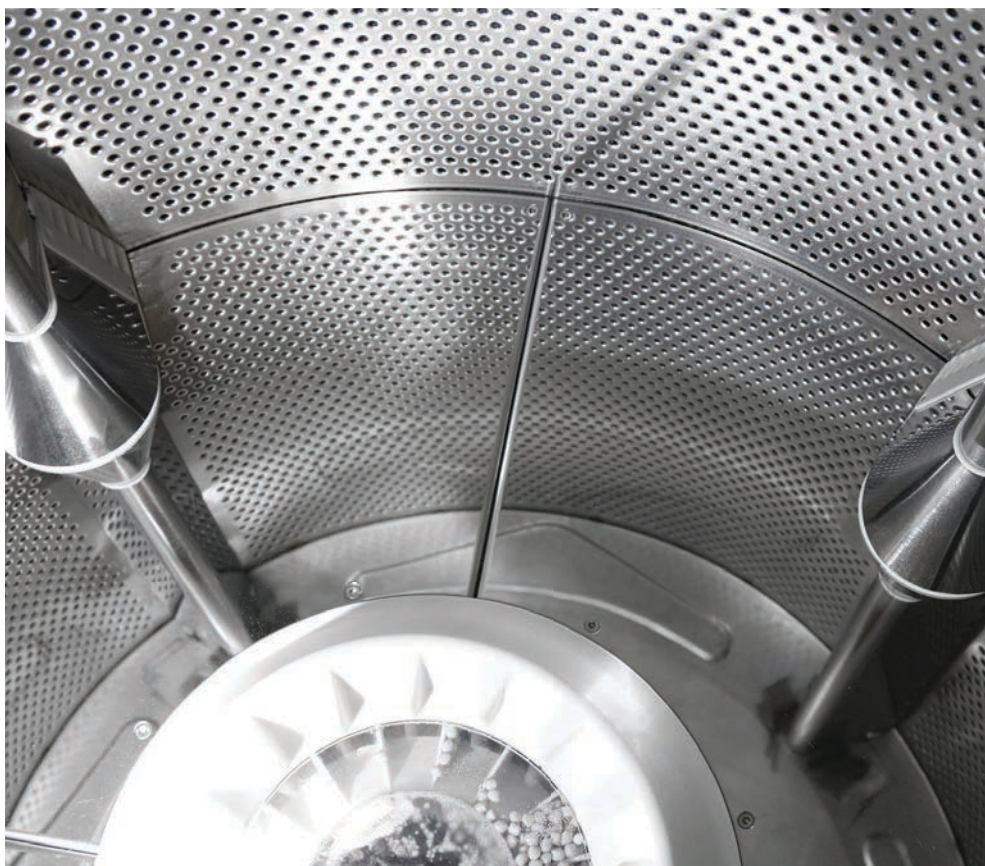
Obtaining the authentic stonewashed effect, without pumice, is possible, or nearly possible, but requires a combination of processes, as denim industry consultant Luca Braschi tells *Inside Denim*. Many different parameters are involved, he says, depending on the look you want to achieve. “Synthetic stones alone will not get you the right look, but need to be enhanced with enzymes,” he says. Soko Chimica’s newest product, Lumia, is designed specifically for that. A dry ozone-based pre-treatment process, it enhances, or as company CEO Matteo Urbini puts it, “highlights” abrasion and reduces the need for potassium permanganate (PP) and bleach. “It is now time to stop using real stones, and it is time for enzymes to play the main, not the secondary, role,” he says.

The combination of mechanical abrasion, provided by synthetic stones, and chemical abrasion, delivered by enzymes, is the best solution, confirms Luigi Lovato, founder and CEO of Elleti Group. At Pakistan-based Soorty, the new Zero Stone concept also makes enzymes and chemicals play the principal role in denim finishing as part of its Smart Blue Technology.

Crescent Bahūmān (CBL), in Pakistan, has tested a number of synthetic stones. None give the “ditto effect” of real stones, says Zaki Saleemi, CBL’s group vice-president, who adds: “I am for eliminating pumice and switching to other solutions, including enzymes or nebulisation processes, if we can get a result that is 80% to 90% close to the real stones.”

“XOrbs distribute enzymes and chemicals evenly to achieve a consistent and reproducible finish”

JAMIE HARRISON, XEROS TECHNOLOGY



Looking to diversify into denim, British company Xeros Technology has developed a stonewashing process that combines a special drum designed to be used with its patented polymer XOrbs beads.

PHOTO: XEROS TECHNOLOGY

He agrees that there is no single-tiered solution to replace pumice and obtaining the desired result often requires tweaking different parameters. “It fundamentally starts with the fabric, which needs to be adjusted to improve output whatever method is used,” he tells *Inside Denim*. “Some fabrics are laser-friendly, or better for wet or dry ozone. It’s always a combination of both the process and the fabric.”

Then there is the issue of time, and its impact on cost. Real stones are said to achieve the desired look the fastest. Though synthetic stones last longer, can be recycled and lessen the cost of wastewater treatment, they require more time to achieve the desired result, and will need a booster. The consensus is that alternatives to pumice can reach 80% or 90% of the “real thing”. As always in fashion, looks count. What some might have thought to be just a stone’s throw away, the elimination of pumice, is turning out to be an uphill task. ■



EVERY
DROP
COUNTS

Jeanologia's H2 Zero technology recycles 100% of water used and guarantees zero discharge. It is said to allow savings of more than 10m³ of water per hour. PHOTO: JEANOLOGIA

Every drop counts

It is easy to accuse the denim sector of reckless use of a precious resource. From cotton farming to denim fabric processing and to garment finishing, it does not have a great track record for water management. But though this may have been true a decade or so ago, much has changed in recent years. This is one of the key takeaways of the Transformers Foundation report, 'Cotton: a case study in misinformation', released last October (see box).

In addition to progress in the cotton fields, the industry has been busy working on many innovative, and at times truly disruptive, technologies that have contributed to reducing energy, chemicals and, possibly more importantly for society at large, water consumption.

Jeanologia is, in this field, one of the first names to come to mind as an inventor and purveyor of disruptive technologies. The Valencia-based company's first laser machines date back to 1999 and it introduced ozone as early as 2005, nebulisation in 2010 with e-Flow, and H2 Zero in 2016.

Many of Jeanologia's technologies have become industry standards. Staying true to its philosophy, it is now calling on the industry to further reduce its use of water with its Mission Zero pledge. In the words of company founder, Enrique Silla, "after covid, the next global crisis will be the water crisis" and this is why it is necessary to "dehydrate and detoxify the industry by 2025".

From cotton farming to fabric and garment processing, the denim industry is often charged with consuming inordinate amounts of water. In reality, much progress has been made to counter these accusations. The latest developments focus on recycling water to achieve zero-liquid discharge.

According to Jeanologia, its H2 Zero concept can "rewrite the future of the industry of jean finishing by its ability to recycle 100% of water used and guarantee zero discharge". When Mission Zero was officially announced on World Water Day in 2021, there were 19 H2 Zero machines installed in plants across the globe. The company estimates that these saved some 15.5 million cubic-metres of water in 2020. These numbers are based on the company's integrated Environmental Impact Measuring (EIM) software program that monitors impacts in real time.

“After covid, the next global crisis will be the water crisis”

ENRIQUE SILLA, JEANOLOGIA

Reducing water usage in denim finishing is also the goal of Wiser Wash, which introduced its waterless denim processing technology in 2017, after six years of research. A combination of electrified ozone gas and laser, it claims to be able to achieve specialty bleached effects and bright contrasts using only one cup of water. Wiser Globe, a holding company based in Amsterdam, oversees two divisions, Wiser Wash and Wiser Tech.

“Wiser Wash has developed a solution that continually monitors and verifies the process to achieve the right look and reduce the risk of variations from run to run,” says Musa Çakici, business development director for Wiser Wash. “The sensor-equipped machines measure ozone concentration and distribution inside the tumbler, which makes it possible to achieve consistent results.”

Wiser Tech, the software side of the business, uses artificial intelligence and machine learning to continually optimise the technology. It also stores and monitors the parameters a company usually uses to obtain a given effect. An augmented reality system, presented at PV Denim, allows technicians to control the machines remotely to assist mills equipped with the technology.

Wiser Wash machines are currently running in Turkey, Vietnam, India and Italy. Musa Çakici operates two laundries in Turkey, a conventional one and a Wiser Wash equipped one, which enables him to compare time, energy and results between the two systems. Wiser Wash technology is slower than conventional processing, and the machines are costly, but he believes that scaling up will bring costs down, and insists that it is essential to shift to more sustainable processes that use less water. “Our sales are going up by 40% every year; this is a sign that brands are ready to do good,” he says. His Wiser Wash facility can produce 200,000 pieces per month.

Italian denim manufacturer Elleti Group believes in the system and is the company’s exclusive partner in Europe and the Mediterranean region. A pilot line has been set up in its facility in Verona, and if it proves to be popular, Luigi Lovato, company CEO, says he will have units installed in the group’s other factories in Tunisia and Romania.



Elleti Group has partnered with Wiser Wash, which it says is a fitting continuation of its investments in cutting-edge solutions and its commitment to environmental sustainability.

PHOTO: ELLETI GROUP

The first samples made in early 2021, amounting to 200,000 garments, were a “huge success”, he says, adding: “Wiser Wash gives beautiful results that are very close to conventional washing but a lot more sustainable.” He explains that enzymes are first applied to prepare the load, but there are virtually no other chemicals and very little water used. “It is a very innovative and very sustainable system, but requires a big investment,” he says.

The switch to ozone

Innovation in ozone can also be seen at technology provider Tonello, based in Vicenza, with its O-Zone machine developed in tandem with Candiani Denim. This new process makes it possible to obtain unique and customisable aesthetics, such as localised fading and lightening, Alice Tonello, marketing and R&D manager, tells *Inside Denim*. The ultimate innovation in terms of reduced water consumption, she says, is the company’s All-in-One System. “This is a washing machine that integrates within the same machine our latest sustainable finishing technologies,” which she says include ECOfree 2, NoStone, Core and UP.

Tonello’s ECOfree 2 uses ozone in both water and air, leading to significant savings in water and chemical consumption. Core, designed to create effects and apply chemicals on garments, can lead, in some cases, to reduced water consumption of up to 96%. Finally, UP optimises garment washing, reducing the liquor ratio to unprecedented levels (LR 2:1), she claims, and also dramatically reduces energy use, processing time and costs.

Italian mill Berto has recently made important investments in its finishing department. “More precisely we are now finishing many of the fabrics in our collection with Jeanologia’s G2 Dynamic technology. It has made a special edition of the machine specifically for Berto,” says marketing manager Francesca Polato. The ozone-based technology uses only about 0.8 litres of water instead of the standard 5.2 litres, leading to 80% savings in water consumption, she says. Moreover, this type of finishing is said to give the fabric better performance in terms of crocking and laser treatment.



O-Zone, a new machine developed by Tonello with Candiani, creates aesthetics similar to PP, dégradé or sun-faded looks, the company says.

PHOTO: TONELLO

Smarter finishing solutions

As part of its recently launched “Aqualess Mission”, Italian chemicals company Officina +39 combines three products that it says reduce by three-quarters the amount of water typically used in denim and garment laundry processes. These products are Remover BC, a laser booster, Aqualess Aged, which creates abrasion effects, and Oz-One Powder. It suggests traditional systems use about 52 litres of water for a pair of jeans, while its system requires only 12.5 litres. Company CEO Andrea Venier tells *Inside Denim* that this concept has been applied in a capsule collection created by Spanish mill Royo using its Dry Indigo, another waterless process.

Chemicals supplier Garmon singles out Smart Foam as a way to minimise water usage by up to 80%. “This patent-pending system has allowed our industry to save an estimated 22 million litres of water since its introduction in 2020,” says marketing manager Francesco Romiti.

In the process of increasing the capacity of its plant in Egypt, denim mill Sharabati has invested in a new water treatment facility that will both treat and recycle water. “We will be able to reuse up to 50% of the water we use and that will lead to big water savings,” says Dr Dilek Erik, Sharabati marketing manager. The expanded facility brings total capacity from 10 to 12 million metres of fabric per month, she says.

Transformers Foundation speaks up about misinformation

Many articles on the impacts of the denim industry start out by stating that 20,000 litres of water are necessary to grow one kilogramme of cotton fibre. This is one of the five “myths” that a report by the Transformers Foundation, a non-profit, seeks to debunk in ‘Cotton: a case study in misinformation’, which it released with the International Cotton Advisory Committee (ICAC) in October.

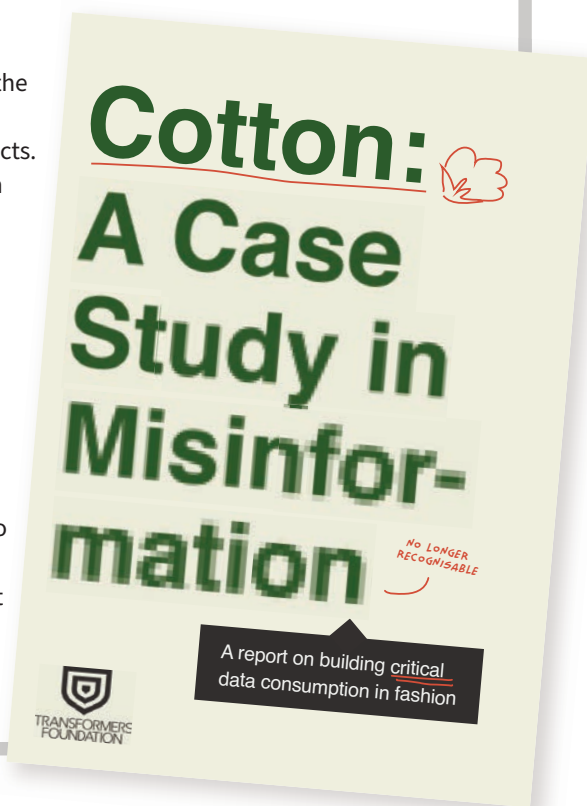
Besides having no known primary source, the report explains that this claim is problematic as it is based on global averages that fail to capture the complexity of cotton and water. “Average rarely means typical, especially when it comes to farming. There are staggering global differences in the way cotton is grown and how much water farmers use, as well as how and if they use these inputs efficiently. Climate, rainfall, and irrigation technology vary greatly from one country to another, and often from region to region, and even field to field,” the report states. In addition, those infamous 20,000 litres do not include water used to make a cotton garment.

The in-depth investigation focuses on cotton farming practices and draws on ICAC data from 2020. It explains the difference between water use and water consumption, and the different forms of water: green, blue and grey, whose impacts and importance vary.

For each type of cotton cultivation, rainfed, irrigated, or a combination of both, the report strives to highlight the relevant information that could help the industry better measure and communicate about its impacts.

The oft-touted myths often stem from data that is inaccurate, outdated, or, the report says, “silenced”.

The industry, says Transformers Foundation, should make data transparency the norm to convey a clearer and cleaner image of its efforts and impacts if it wants to begin to seriously debunk widely shared but false factoids that taint its track record.



DNM, a denim mill based in Damietta, Egypt, was established in 2011. Its modern facility is designed and engineered with the latest equipment and processes to minimise its environmental impact. Particularly sensitive to water use, it has chosen to install a closed-circuit treatment system instead of a traditional biological wastewater treatment. The Zero Liquid Discharge (ZLD) water treatment plant has seven separate filter processes to achieve zero liquid waste and leading to an 85% reduction in the factory’s total water consumption, says Zuhal Karaçayir, marketing manager.

Understandably, companies operating in Egypt are especially concerned about water usage. But all companies, from manufacturers to brands and retailers, have a responsibility towards local communities and biodiversity by ensuring that the precious resource is neither polluted nor wasted. In this matter, every drop counts. ■



We believe through
focused innovation,

**DENIM CAN BE
THE MOST
SUSTAINABLE
FABRIC
IN THE WORLD.**





From a 'strategically good' location close to Bangkok in Thailand, Atlantic Mills specialises in selvedge and Japanese-style denims but with a European slant on colour, creating high-quality, long-lasting fabrics that look even better over time. Its managing director, **Amrin Sachathep**, shares the vision of his family's mill.

Covid has shown trust is vital

Q Can you tell us a bit about Atlantic's offering. What advantages or challenges does your location in Thailand offer?

A I think the history helps tell the story. My grandparents came from India in the 1930s and started trading in textiles, buying from the north east of Thailand and reselling in Bangkok. In 1960, my uncle moved to Japan and shipped denim fabrics from the very best Japanese mills back to Thailand. The business grew significantly, but there was a diminishing product availability from Japan over time, so we started to develop our own product. Twenty years ago, we took over the last denim mill in Ireland, and moved hundreds of containers back to Thailand. The origin of Atlantic Mills is derived from the actual starting origin which was on the coast of the Atlantic Ocean.

We gradually bought new machines and grew organically. Fifteen years ago, we designed a rope dye machine from Japan; we're probably one of the only companies outside Japan to own one, simply because of my family's history. My family spent more than three decades in Japan and we continue to have an office there. We redesigned the machine so it has the ability to innovate and feature European-inspired colours while maintaining the consistency of the Japanese rope dyeing techniques. We also brought Japanese technicians from Okayama and they have been working for us ever since.

In 2014, we took over our spinning supplier. The textile business was collapsing very quickly in Thailand simply because it was not competitive compared to the full-package systems being offered in Bangladesh, Pakistan and India, which had GSP privilege [Generalised Scheme of Preferences, which removes import duties into the European Union]. Thailand had moved away from GSP so we set up a garment factory in Laos as it has free duty access into Europe. We created that factory with green credentials, and now we can offer the full package. Customers also wanted to have different options to China. Thailand is strategically a very good location. Unfortunately, we don't have our own raw material but that's one thing we continue to pursue with partners globally.

What are your specialities?

Atlantic has been in the premium game from the beginning. People used to tell us we were expensive but we were not expensive – we were offering a product that was made without sacrifices just as a Michelin chef would do with the food he cooks. We always created a product which is very dense and could withstand durability, essentially the reasons denim was created in the first place. Our denim is real denim: dark indigo colours and very good penetration so you can wear it raw.

“Covid has actually helped us significantly, as it has with a lot of the Thai factories”

We are one of the biggest selvedge producers out there, selvedge is our niche, it defines the mill. We've always focused on cotton and great recyclability – we don't really use much polyester, we try to steer away from it, although we do add it for some customers. It's generally a price game and it reduces the impact of the product look; real denim has to be made from cotton and we continue to focus on it. We really want to keep the denim enthusiasm.

For many industry friends, the pair they wear every day is ours; they want to see how it looks over time. The most sustainable product in that sense is the product that's long-lasting and you don't have to wash it, you're saving water and you know the mill is taking care of the fabric.

You have a big focus on the environment, especially in terms of recycling. Why is this important and how easy is it to access post-consumer waste in Thailand?

Thailand is one of the biggest collection points for second-hand clothing, so we buy post-consumer waste from the market and cut the jeans ourselves. But it's a very tedious task, it isn't that easy to work with and make economical. Therefore, we do more post-industrial waste. Depending on what product category you're using, you might have 100% virgin cotton and then use the waste from the virgin and spinning for open-end spinning; it's high-twisted cotton. But by doing recycled, you're reducing certain elements of the fabric, so you have to be careful.

Recycling has always been very important from the beginning. We want to close the loop so if you blend fibres you're creating a bigger disaster for the environment. It's funny, people talk about recyclability on different levels, but we had to do it to survive. We recycle about 70% of water as water costs money. Sustainability is also a cost-saving exercise – your investment today might give you a return only 10 years later, but it's a driving force to stay in business. We use palm shells from Thailand for our boiler and solar electricity, so we also use as much renewable as we can.



ALL PHOTOS: ATLANTIC MILLS

In terms of the technical side of fabrics and dyes, what elements do you enjoy focusing on the most?

We have two dyeing sides. One is the Japanese deep, dark indigos that are meant to be worn raw. This takes a lot of effort to take the colour down, it takes a lot of time to get that product to look washed out, as we want to create that authentic look. It's durable and long-lasting.

On the other side, we create low-penetration indigo, that means you can wash the colour down quicker, it's extremely laser friendly, you don't have to use potassium permanganate and you're also creating a product which can also be a water-saving exercise for the garment factories. We like to highlight these two sides as most other mills are in the middle.

We do have other products. We have a rope-dye twelve-dip, a six dip and a two-dip indigo created with indigo from a small farm in Japan. The last thing we want to do is create something super dark then have to wash it down a lot and waste more water, so it's a very flexible way of working.

On the fibres side, we work with sustainable fibres like traceable cotton, Tencel and CiCLO [a synthetic stretch fibre that biodegrades]. We've also created a product to replace spandex that's biodegradable, which we will launch with a partner in US and a couple of brands. The idea is moving fibres towards biodegradability and recyclability.

On the technology side, we're working on the back-end to create a blockchain technology to tell the user where everything comes from. A lot is still manual, so it's not properly traceable. We're pushing each of our suppliers to get there and when it's ready, we will put it all together. It's hard to get down to the individual cotton farms as cotton gets blended from different fields to even out the colour. Brazil's doing a phenomenal job where they're trying to label every bale with the actual farmer.

Many of your customers are based in Europe and the US. How have you had to adapt around lockdowns and the supply chain disruptions we've seen over the past two years?

We've been very lucky to have customers who haven't really reduced their order size through covid so we've been able to be able to maintain the factory at a good level. Thailand never went into lockdown on a manufacturing level. Customers noticed that, especially when they saw Vietnam close for three to four months recently and Cambodia and China close for a couple of months. They saw Thailand was the place to be. People have asked us to make us their main partner in the region again. Covid has taught us that trustability is the one thing that you cannot do through an office. Trustworthiness in business has become even more important when you cannot travel to see the products. So, covid has actually helped us significantly, as it has with a lot of the Thai factories, even though we haven't had any help from the government.

Over the last eight or nine years, we wanted to move away from being dependent on the US and Europe so we set up offices in smaller countries like South Korea, Peru, Philippines, Indonesia, Vietnam, India and Turkey. Our vision was to create products to sell to these countries' domestic business and it's been a big success. US and Europe represents 60% of our business, all these other countries make up the other 40%. Indonesians love the 20oz selvages and it's a very hot country!



How have you found the reduced travelling?

Nobody is inviting you to see them at their office, but it's actually very important to travel at this point as if you're meeting outside the office you're creating a friendship, and that's how we've always done our business. Our customers are our friends. I have travelled to a couple places already because as of October, it is only one day quarantine in Thailand on return.

Looking at the industry a bit more widely, what will you be focusing on over the next few years?

It sounds bad but 20 years ago, there were all these calibres of product created from rich ideas. The market has changed, people are focusing so much on the storytelling that they're forgetting to make the product look good. So, we want to blend the two together.

It's always been very important for us that we don't sacrifice a product but we also keep it as sustainable as possible. We want to create something durable that you want to wear every day. A product that looks even better as you wear it down. We want to be one step ahead, we don't want to focus on only volume businesses, we want to be niche but to create something forward-thinking and at the same time adaptable and visionary. Denim needs to evolve. ■



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Turning momentum into a standard

Recycling denim is the future of the industry, according to Besim Ozek, business development director at Bossa. The Turkish mill is one of the early protagonists, having invested in recycled content and technology for more than 15 years. “Organic is wonderful, I love it, but it’s not scalable; you can’t increase it as the organic cotton plantations are limited,” he says, “but there are plenty of fabrics in the garbage and that is the future of the textiles industry.”

In October 2020, 30 companies from the Dutch denim industry and suppliers, as well as public partnerships and entities, signed the Dutch Denim Deal – a commitment to set up a “reverse supply chain” for recycling fabrics and to increase the amount of recycled content in collections. The initial target was for the brands, jointly, to produce 3 million pairs of jeans with at least 20% recycled content by the end of the three-year period, and to work towards having a minimum of 5% recycled content as standard as well as designing for circularity.

Although it was officially signed in October 2020, the workings go back as far as 2017, when a group led by The House of Denim Foundation’s James Veenhoff sought to set up a circular working group to encourage wider use of recycled content in fabrics. At the time, the adding of post-consumer waste to fabrics was a fairly new concept for brands, although some mills had been working on it for years. It was felt a new circular way of working could be achieved if players from different disciplines worked together to create a network.

Main challenges

Bossa has been joined by fellow Turkish mills Orta, Calik and Ereks, and since the signing, Kipas has joined, plus AGI Denim and Soorty in Pakistan. These mills have all been working with recycled fabrics for a few years, and are constantly improving and updating techniques. At Bossa, one third of its fabrics are now Global Recycled Standard (GRS) certified, meaning they contain at least 20% recycled content, and there are more than 50 fabrics to choose from. Sticking to the optimum 20% is key. “I can produce 50% but it’s too risky, because the fibre length of cotton is 30mm and the recycled fibre is 15mm,” explains Mr Ozek. “If you increase that ratio it affects the quality.”

The Dutch Denim Deal is a cross-industry partnership between public and private companies that could offer a blueprint for a circular system. What progress has been made in the year since it was signed and what are the implications for the rest of the world?

He cites three challenges. The first is educating brands. “When we started a few years ago, brands wanted recycled but they wanted everything to have a uniform look; they have to compromise slightly. It’s almost impossible to have very heavy washing, too. Now they know what’s possible.” He admitted it has been a learning curve for the mills, too. “It used to be almost impossible to develop lighter weights, but today I can produce 8oz fabric.”

The second is polyester, “a big headache” for mills. “If there’s polyester in the post-consumer denim, we can’t do anything with it. It can be used in other industries, such as the knitting industry. We have to do an overdye on the fabric, but the indigo dye only dyes the cellulosic fibres.”

The third hurdle is cost. The Deal includes a clause that says mills must enhance the efficiency of machines and processes so that a realistic retail price can be achieved – but “cutting all the parts we can’t use is costly and labour intensive and it’s not easy to tell the brands about the cost difference,” he adds.

Government muscle

One of the key differences from other circularity-focused collaborations is that this time, the government is involved, with public entities working alongside the private sector to set up and optimise a collection system that will help feed the demand. “Civic initiatives are at the heart of these efforts. Where such initiatives encounter obstacles that the organisers believe can be tackled at central government level, the government will seek to remove them,” says the official text.



Kuyichi was launched in 2000 by NGO Solidaridad, originally sourcing only organic cotton from Peru. Organic is still its most-used fibre, but it also blends Lenzing's Refibra, Tencel and Modal, as well as linen, recycled cotton and recycled polyester.

PHOTO: KUYICHI

“Waste collection, sorting, transport and transparency. These will be the priorities for the coming year”

NICOLAS PROPTE, PVH

Traditionally, the securing of recycled content has been down to the mills, which have their own relationships with textile waste companies, but the Deal adds scope for the brands to build their own networks and take more responsibility for waste. It states, “brands need to work with local authorities to develop new revenue models to optimise the collection system”. This part is one of the main challenges, Nicolas Prophte, vice-president of sourcing, production and innovation in denim for Tommy Hilfiger, tells us. “We need the public sector to act as a facilitator, set the right public policies and steer the stakeholders to set up efficient waste collection and sorting processes.”

PVH Corp, owner of Tommy Hilfiger and Calvin Klein, joined at the six-month mark. PVH has already neared some of the initial targets alone – producing a 100% recycled jean in 2019 as well as 2.3 million pieces with 20% post-consumer recycled (PCR) by last autumn – but wanted to join to pass on its experience. “We can’t drive industry change alone and have found that the Denim Deal is a unique opportunity to work collectively with public authorities and key stakeholders across the entire denim value chain to close the denim loop,” adds Mr Prophte.

Wheat from chaff

Downstream, textile waste processing companies will “strive to find an adequate market for non-usable PCR materials, to limit the cost of PCR cotton” and will “scale up and improve the quality of textile collection”. The Deal includes a plan to set up a new collection and sorting hub in the Netherlands.

Sorting company Wieland Textiles uses a near infrared technology to categorise textiles into 90 parts in a split second, based on the fibre composition, structure and colour. However, the Fibersort machine cannot remove buttons, zips and labels, so this is done in Turkey. “We intend to invest in trim-clean technology that will enable us to remove those buttons, zips and labels ourselves, which will make transport movements unnecessary,” says Hans Bon, director of Wieland. “The labels are the most important: polyester labels in cotton or wool garments should be abolished, or at least to be made of the same material as the garment. If this happened, it would be revolutionary.” He suggests if the Deal leads to more circular jeans, there is no reason not to do the same with other post-consumer textiles.



One year mark

The signatories met at the one-year point at PVH Europe’s Amsterdam office in October 2021 to learn more about the practical natural of recycled fibres, discuss what progress had been made and set out the next steps. “The session felt like a big step forward, even though we are tackling complex challenges... new alliances, new insights, relationships with even bigger ecosystems, the role of governments and consumers,” explains James Veenhoff. “Our coalition members are finding out that working together is fun, inspiring and is leading to progress.” He adds that governments need to understand and support initiatives by designing fiscal structures that create a level playing field, as well as providing incentives. “Let’s turn this momentum into a new standard: post-consumer recycling should become the new norm.”

Under the terms of the agreement, Utrecht-based brand Kuyichi has increased the number of its fabrics with PCR cotton fibres from a quarter of styles (with 60% PCR cotton) in 2020 to 38% (with 72% PCR) in 2021. “As we are a small brand, we value collaborating with others,” Zoé Daemen, corporate responsibility manager at Kuyichi, says. “We hope the Denim Deal will push the denim industry towards a place where incorporating recycled fibres has become a no-brainer.”

She also points out it’s significant that the Netherlands is the central point for the initiative – speaking the same language and being active in the same markets makes it easier to communicate. “The Netherlands has been an example in denim for a long time,” she says. “It is so nice that we can now show another kind of example – not trend-wise, but in terms of innovation and industry change.”

Wieland Textiles’ machines can sort and detect fibres’ unique spectrum of colours and make a high-speed analysis based on the composition, colour and structure of the used fibres. The garments are transported by the conveyor belt and an air blower blows the analysed clothes into bags.

PHOTO: WIELAND TEXTILES

All participating brands are stepping up their actions on recycled cotton, says Mr Prophte, “but we’re still facing challenges in terms of waste collection, sorting, transport and transparency. To set up the reverse supply chain we envision, these will be the priorities for the coming year.”

Global implications

The concept has global implications. It could act as a blueprint for similar systems in the US, Pakistan, Mexico and elsewhere. A Europe-wide system could be implemented, if the major players could be identified and an efficient reverse supply chain set up. There are many questions to answer: how can consumers learn where to take old jeans? How do we clean up the waste streams, so clothes don’t get mixed with household rubbish? Which collection and sorting companies have the correct capabilities? How can other governments be encouraged to invest?

There are several other circularity pilots running concurrently. Accelerating Circularity is now moving into the trial phase in the US and is supported by Lenzing, Kontoor, Gap and Cone Denim. Fashion for Good has launched a 15-month project, Sorting for Circularity India, alongside adidas, PVH, Arvind, Birla Cellulose and Levi Strauss & Co; and The Circular Fashion Partnership’s Bangladesh-based pilot includes Cyclo, Recover, Renewcell, Lenzing, and Infinited Fibre Company.

In the Dutch Deal, the possibility to scale up and transfer the learnings is an integral consideration. The chain should continue beyond the three-year period and be replicated or expanded for other countries, other products categories, other stakeholders or even other fibres, suggests Mr Prophte. “We really hope to encourage other countries to adopt this model for scaled post-consumer recycled cotton uptake,” he says.

On the mill side, all systems are go. The fabrics, quantities and qualities are proven, says Mr Ozek – brands now must be brave enough to place the big orders. “Everyone loves to hear about recycled denim, but the quantities and commitments are a bit slow at the moment. They are sometimes afraid, they don’t know how to manage it. This year, I produced more than 6 million metres for just one company, but some people are still nervous.”

By the conclusion of the project in 2023, answers will have been found and loops closed, with cotton looping around Europe and into the mills. For Mr Prophte and Mr Ozek, this should be an industry standard within the next three or four years. “Just like recycled paper, 30 years ago it was yellow-ish and the quality was poor and nobody wanted it,” says Mr Ozek. “Today, everyone is using it, and recycled textiles will be the same. The Denim Deal is a wonderful project, I totally believe it’s the future of the world.” ■

“Everyone loves to hear about recycled denim, but the quantities and commitments are a bit slow”

BESIM OZEK, BOSSA



Mud Jeans is targeting ‘carbon positivity’ by planting a tree per pair of jeans that gets sent back for recycling.

PHOTO: MUD JEANS

Denim Deal coalition partners

- **The government**
Ministerie van Infrastructuur en Waterstaat, Ministerie van Economische Zaken en Klimaat
- **Local authorities**
Gemeente Amsterdam, Gemeente Zaanstad, Metropoolregio Amsterdam
- **Textile waste processing companies**
Circulus-Berkel, Midwaste, Rd4, Leger des Heils ReShare, Sympany, Smart Fibersort, Wieland Textiles, Wolkat Products
- **Fibre producers, spinners, weavers and manufacturers**
Boss, Çalık Denim Tekstil, Ereks Konf, Gama Recycled, Orta Anadolu
- **Brands and retailers**
Brightloops, Kings Of Indigo, Kuyichi, MUD Jeans, Scotch & Soda
- **Other parties**
Amsterdam Economic Board, House of Denim, Modint, Nederlands Normalisatie Instituut
- **Companies that have joined since October 2020**
247 Jeans, Garcia, AGI Denim, PVH, The Movement, Remokey, Lamme Groep, Kipas Textiles, Soorty, Transformers Foundation.

Denim Dynasty founder Nino Castro believes too much time is wasted starting laser designs from scratch and has come up with an idea that he believes will simplify the process for designers, brands and manufacturers.

Burning ambition

Laser design and execution has advanced considerably over recent years, according to specialist Nino Castro, owner of the Denim Dynasty consultancy. Introduced in the denim industry in the late 1990s, laser offered a less labour intensive, more consistent and scalable way to create vintage or worn-in looks than achieving them by hand, stone or other finishing methods. It was touted as worker friendly – eliminating the need for potassium permanganate – and could also potentially offer savings in time, water and chemicals. But the brands initially weren't so sure. When Mr Castro joined technology company Jeanologia in 2005, his first years were spent trying to change people's opinions. "They labelled laser a fake look, something that they didn't want to have in their catalogue," he says. "It was our task to make those finishes more appealing and more natural looking."

The team spent years perfecting designs, taking into consideration the dye, how many baths the fabric had, the weight, the composition and the final wash, all of which affect how sensitive the fabric is to laser treatment. Indigo dyes tend to be more laser friendly than sulphur dyes, with heavier fabrics and lighter washes appearing the most natural-looking. "In general, the better a capability a fabric has to avoid back-staining, the more laser friendly it is," says Nino. "I helped brands such as Levi's, Kontoor, Guess and Target to become more familiar with laser. Levi's embraced laser, using it to their advantage."

At Gap Inc's Denim Kitchen in LA, where from 2017 he worked on chemistry, sustainability and laser innovation, he learnt one of the most important parts was delivering the laser innovation to the brands in a form that they could digest. Brands often do not have laser specialists in-house, instead relying on factory partners, designers and third parties to interpret their ideas.

However, developing in LA was challenging for some overseas vendors, he says. Enterprise resource planning (ERP) was introduced to help automate and share documentation. "My whole career has been dedicated to finding the next thing with laser," he says. "Laser was a big challenge until we came up with an easy way to make a digital mock-up. Previously, to change a whisker, we had to mark the garment, wash it again, it took a full day."



Tonello's THE Laser Table & Mannequin allow jeans to be marked at 360 degrees. The four-component system was launched after a long period of research and development.

PHOTO: TONELLO

Advances in design technology have also affected speed. Laser generators have become more powerful, mirror systems more efficient, harnessing the power and increasing speed, and the software now allows more freedom of adjustment. There have been many attempts at total automation but they never succeeded completely. Chinese group Wacom launched a pen and tablet that made the task both more artistic and accurate, “changing the game” over the past few years, according to Mr Castro. “We increased our efficiency about tenfold: before it could take me 50 hours to finish a design, now I can finish it in five hours.”

Battling inefficiencies

However, inefficiencies still exist in the present system, he says. For the manufacturers, training and keeping talented laser designers can be difficult, particularly those who know about washes, fabrics and chemistry. Their working environment might not be conducive to creativity and they could have other duties and time pressures. The manufacturers are also limited to a certain capacity, which some brands are able to book ahead “at reasonable costs” but later decisions might lead to higher costs for the same service, which could be off-putting. The factories also then own the design, so if a brand wants to replicate it at a different factory, the designs might have to be redone from scratch, sometimes leading to varying results.

From a designer’s perspective, Mr Castro also found he was spending too much time duplicating designs, and so began to build a library. “The library could be a way for us to give the design control back to the brands, so if they want to make a modification on a design, they can share it with 10 manufacturers.”

TheLaserLab, which officially launches at the start of 2022, will act like a shopping site for designs, which brands can browse through, then request modifications by Nino’s in-house team. “For each design, we generate several previews that allow the user to estimate the look in different fits and washes,” he says. He comments that years ago, people would take time burning CDs to listen to music, but now they have Spotify. “It’s such a convenient service, everything’s at your fingertips, and this is what brought me to exactly that point: this is something we can do with laser design.”

Fabric sensitivity

Embracing laser also means embracing its limitations. The initial investments in laser technology are high, meaning it becomes more profitable at larger volumes, which could be a barrier for smaller manufacturers. Brands also need to consider laser-sensitive fabrics. “There is a habit of not thinking about laser when purchasing fabric, buyers concentrate on its character and softness etc. Later on, when the team wants to do laser, they might find the fabric is very resistant,” says Mr Castro.



New tools such as pen displays – digital drawing tablets with a screen – require retraining for the designers but increase precision and efficiency. PHOTO: DENIM DYNASTY

However, pre-treatments that counter this are growing in sophistication, with multiple laser boosters and cleaners on the market from the chemical companies. In the past, some chemical boosters improved the contrast but reduced the fade, making fabrics look overdone, but Mr Castro is impressed with a new family of cleaners that address the back-staining. “They enhance the laser pattern beautifully, it really works,” he suggests, “but the appetite might not be there from the brands to increase the cost, unless it’s unavoidable.”

It is very difficult to find any concrete figures on how much denim globally is produced using laser, or what percentage of manufacturers and laundries have the technology, but Mr Castro suggests “almost every vendor has access to it”. Jeanologia suggests 35% of jeans globally are made with its technology, but this includes all its machinery and software.

“I really believe laser is the future of the denim industry,” concludes Mr Castro. “Despite the pandemic, laser capability is growing all over the world. People who weren’t convinced by it when I visited them 12 years ago are now big believers. The last frontier is digitalising the process once and for all.” ■

Laser technology systems upgraded

Technology companies such as Italy’s Tonello and Spain’s Jeanologia offer several ranges and models of laser machinery. Tonello’s latest system, THE Laser, includes four laser systems and software called CREA. THE Laser Lab is designed for stores and laboratories, THE Laser Table and Table + Mannequin models are for horizontal processing on a fixed table and/or vertical 360°, and THE Laser Conveyor is specifically designed for knitwear and working on a conveyor belt. The machines can also be connected to the group’s Metro software, which measures consumption. Other advantages include a system whereby the laser can understand where the garment is placed and laser correctly.

Jeanologia has developed a variety of lasers (Handman, Twin Super, Compact, Flexi Lab, Nano industrial and Nano Retail) aimed at development centres, small producers (1,000 garments per day) and large manufacturers, with lasers able to produce 4,000 garments per day. Its eMark X software improves the laser marking speed, simplifying processes and increasing productivity. The latest development, the Handman, is equipped with two Twin Super lasers and a robot in each cabinet, meaning two people working with two robots can produce 10,000 jeans in 24 hours. Handman is in use in three plants around the world, producing five million pairs of jeans a year.

Swiss textile technology developer HeiQ has launched AeoniQ, a cellulose-based yarn that it says offers the ease of use, the performance levels, the versatility, the affordability and the scalability to allow the textile industry to consign polyester and nylon to the past.

A yarn for the climate

It is 16 years since co-founders Carlo Centonze and Murray Height set HeiQ up as a spin-off from the Swiss Federal Institute of Technology Zurich, where they had met. Dr Height, who is now running HeiQ's subsidiary in his native Australia, was researching silver-based materials as a solution to odour in clothing. On a hike in the Alps with Mr Centonze, they reached the conclusion together that he was onto something and HeiQ is the fruit of that realisation.

In the years that followed, they brought their odour-free technology to market, followed by cooling technology, a fluorine-free water repellent, an oil repellent and, in 2019, the Swiss environmental award-winning HeiQ Clean Tech for sustainable polyester dyeing. More recent innovations have included an antiviral and antimicrobial technology called Viroblock, which won the company the Swiss Technology Award in 2020.

All the while, HeiQ was wrestling with a bigger question: how can we clothe 8 billion people while stopping textiles from contributing any further to the destruction of the environment? It now has what it thinks could be the answer: a new, cellulose-based yarn that it believes really does have the potential to take the place of polyester and nylon.

The new yarn, HeiQ AeoniQ, can come from a wide range of renewable resources, including wood pulp and algae. The yarn is recyclable, biodegradable and will add nothing to the microplastics problem in the rivers, lakes and oceans of the world. At a pilot plant it will begin operating in Austria in March 2022 to produce AeoniQ, HeiQ will run a 99% closed-loop manufacturing operation, using energy that is 100% from renewable sources. Mr Centonze describes its environmental impact as "outstandingly low" compared with that of all other fibres.



The yarn that has the potential to provide a green alternative to polyester and nylon, AeoniQ from HeiQ.

PHOTO: HEIQ

A first for the industry

“It’s the first cellulosic yarn capable of replacing polyester and nylon,” he explains. “The problem is that every person on this planet consumes an average of 14 kilos of textiles per year. This means 111 million tonnes of textile fibres are produced each year, a gigantic quantity, a mountain.” Of this total, he describes 80 million tonnes as being particularly problematic because this is the volume that polyester and nylon contribute. Their inherent problem, Mr Centonze explains, is that these fibres are not biodegradable. Polyester, he points out, takes up to 1,000 years to break down in the environment and, therefore, we don’t even know exactly how the degradation of polyester will work; it is too soon to tell, about 900 years too soon.

“However,” the HeiQ co-founder continues, “polyester and nylon are the only fibres today that are capable of serving the demands of the market. More people means more clothing and it looks as though that is likely to mean more polyester and nylon. We cannot produce more cotton or wool because we need arable land to grow food, so there will be less land available for those natural fibres.”

Why circularity is difficult

End-of-life issues are another part of the challenge. Carlo Centonze’s calculation is that only 1% of textiles are part of a closed-loop recycling programme today. The rest fails to come back into the textile value stream. Most of this, 73%, goes into landfill or incineration. First among the factors that make garment circularity so difficult, according to HeiQ, is that they are not designed or made to be recycled. The high cost of recycling can also make recycled materials more expensive than virgin ones.

“It’s time to change,” he says. “Consumers are demanding change and are holding brands to account. It is essential for brands to be authentic and to inspire consumers. The good news is that if brands stick to these principles, people are now willing to pay more for their products, rewarding them, for the first time, for sustainable behaviour.”

He argues that consuming 80 million tonnes of petroleum-derived fibres per year is incompatible with this and that the solution has been staring everyone in the face. Cellulose is the most abundant biopolymer on earth and HeiQ claims to have been successful in using it, through a method it is keeping secret, to create a sustainable, high-performance, cellulosic yarn and explains that it will be possible, in time, to manufacture this product at the scale required. AeonIQ, Mr Centonze insists, is “designed for eternal circularity, from nature, for nature”. It is a continuous, cellulosic, filament yarn that can be “recycled eternally” without loss of performance and is “sustainable and scalable by design”. Carlo Centonze says: “We can take back textiles made out of cellulose and fully recycle them in our process. This is one of the big advantages of our platform.”



HeiQ CEO Carlo Centonze claims AeonIQ has the potential to replace polyester.



Martin Gebert-Germ joined HeiQ last November to lead its Austrian subsidiary.

Carbon capture

Sources of the cellulose that goes into making AeonIQ will vary greatly but they must be in keeping with three principles that the yarn’s developer has set out. The Swiss company wants all of the raw materials to provide a decarbonising balance by capturing carbon dioxide from the atmosphere as they grow, to have no impact on the availability of agricultural land for food crops and to have been produced without pesticide or fertiliser. This will enable a circular material flow. “The spinning technology we have developed will work with any source of cellulose. Among the sources we can use is sustainable pulp from the forestry industry or, even better, algae sustainably farmed offshore. Algae represent an important sink for carbon dioxide as well as a source of cellulose that we can use in our processes.” Onshore bacteria and micro-algae are further possible sources, as are recycled materials from pre-consumer production waste and from post-consumer, end-of-life garments. He emphasises the role these sources can play in providing AeonIQ with good potential for decarbonisation.

He contends that these factors will combine to have the following effect on the carbon footprint of textile manufacturers who opt to use AeonIQ instead of polyester. For every tonne of polyester that they take out of their production process, substituting it with AeonIQ instead, they will make a carbon footprint saving of up to five tonnes of CO₂-equivalent. Using the new yarn, HeiQ argues, will break the link between clothes and fossil fuel-based fibres and side-step the carbon cost of disposing of these at the end of a garment’s life. Instead, AeonIQ will promote renewable raw materials, growing them to absorb greenhouse gas emissions, harvesting them and growing them again. Production methods for AeonIQ will also have a lower impact and the yarn can be recycled and reused time after time. The compound result of all this, according to HeiQ’s calculation, is a five-tonne carbon footprint improvement per tonne of textiles.

Technical profile

Its pilot plant will be located in the town of Herzogenburg, 60 kilometres west of Vienna. In parallel with building the plant there, HeiQ has also set up a new Austrian subsidiary, with Martin Gebert-Germ as its chief executive. Mr Gebert-Germ officially joined HeiQ at the start of November from technical yarn manufacturer Glanzstoff, now part of the Indorama Group.

Of AeonIQ, he says: “The most important point is that it can be texturised while keeping its high tenacity and, up till now, this has not been possible with any other cellulosic fibre. Spin-dyeing is possible and we will also be able to shape the functionality at cross-sectional level. HeiQ’s secret here is the method it has developed for spinning AeonIQ, but once spun, the yarn will work with nearly all textile processes. This means business-as-usual for manufacturers because they will be able to use all existing equipment for weaving, knitting and dyeing. They can use standard dyes and existing functional finishing such as antimicrobial functionality.”

He adds that the fabric that knitters and weavers will be able to make from the yarn will be ideal for people to wear next to the skin. It can match the quick-dry and stretchability properties of polyester and nylon, Mr Gebert-Germ adds, the smoothness and coolness of viscose and the touch and cosiness of cotton. Combinations with other fibres will also be possible, he explains. On this point, Carlo Centonze says specifically that AeoniQ will combine well with cotton to produce denim fabrics. “We can definitely do denim combinations too,” he makes clear, “combining AeoniQ with cotton in whatever proportion the denim mills and brands require.”

No oil means stable prices

He goes on to say that the cost structure of AeoniQ will be stable (factories will use the nearest, most abundant and affordable source of cellulose, provided it is in keeping with their three principles). Preliminary autumn 2021 calculations put the price of AeoniQ at €4.50 for a 100gsm fabric. In the same calculations, HeiQ’s figures for other materials (of the same length and weight) put viscose and polyamide 6.6 at €5.10, polyamide 6 at €4.80, polyester at €4.15 and cotton at €3.70. “We’re in the middle,” the new chief executive of HeiQ Austria says, “so our customers will be able to use AeoniQ to make apparel at a reasonable price, not related to the fluctuations of the oil price and without any agricultural land demand.”

He also makes the point that, while the yarn itself appears similar to some filament viscose yarns that are already on the market, the process to make it is “totally different” and much more sustainable. For example, the process in place for filament viscose today cannot accommodate recycled material, but the process for AeoniQ can.

Call for partners

Work is already under way in Herzogenburg and HeiQ’s pilot plant will come into operation during the second quarter of 2022, with the first delivery of yarn expected in April. This plant will have the capacity to produce only 100 tonnes of AeoniQ per year, but Carlo Centonze is adamant this will be enough for the brand partners that come forward to be early adopters of the yarn. There will be enough for these brands, who will be limited in number to 20, to make sales samples, prototypes and capsule collections. And there is scope for brand partners to join forces with HeiQ in the “creative space” that he says AeoniQ offers, for example in work to integrate durable functionality and performance benefits into the yarn.



Efforts are under way already to raise further financing of \$300 million to build a mass-manufacturing plant by the last quarter of 2024. HeiQ is still working out the best location for this first large factory (gigafactory is the term it uses), but it has estimated that it will have a production capacity of 300,000 tonnes per year, meaning that, by early 2025, the company will be able to offer what he calls “recurring mass deliveries” of AeoniQ.

It is looking to secure, initially, five operational partners (in addition to the 20 brand partners), Mr Centonze says, manufacturers who will build and run these additional mass-manufacturing plants, similar to the HeiQ one, around the globe and, thus, contribute to the scaling up of AeoniQ.

“This is a climate-positive technology,” he says, “and we want to make sure it is adopted as quickly as possible by as many as possible.” Yes, it would take a network of around 2,500 of these mass-manufacturing plants to be able to substitute all of the polyester and nylon in production at the moment, but HeiQ has designed the new yarn to be scalable and insists that the potential exists to make 80 million tonnes of it per year, if entrepreneurs, inside and outside the textile and apparel sector, help take the technology adoption forward forcefully.

Its search for partners does not end there because it also wants to bring two strategic partners on board to work with it “at a very deep level” to keep innovating with AeoniQ and bring the new ideas to market. The first of these is on board – The Lycra Company, with its \$1 billion in sales and 3,000 employees. “We are proud to partner with HeiQ in the technical development and commercialisation of this fibre,” Lycra CEO Julien Born says. “The industry is ready for innovations such as AeoniQ. We are well positioned to learn quickly and maximise the huge potential of this new technology.”

Brands have had no option

Asked how willing apparel brands really are to move away from polyester and nylon, Carlo Centonze says: “It’s very simple. All brands, without exception, are aware of the problems associated with using fossil fuels to produce fibres, yarns and fabrics for clothing, but what alternative have they had until now? Cotton is a wonderful fibre and it’s biodegradable, but it’s using up tremendous water and land resources and is not scalable any more.

“Here, we have new technology that is sustainable and can meet the scale required. I believe brands will be very willing to substitute polyester and nylon for this. And consumers will very quickly push the brands to do so, once they realise the option they have here: textiles with a higher sustainability content that they will not have to overpay for. Very quickly they will switch to brands that embrace stewardship for the planet and people.” ■

insideDenim

BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

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6,000+



3,500+

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It's been 18 months since we published our first issue and despite the pandemic we are growing and growing fast! We are so pleased so many of you are subscribing to and liking our content. Amongst the challenges there's further positives as we connect with industry professionals quite literally all over the world. In less than a year we have over 3,500 registered website users and an organic 6,000 following across our social media channels, we're hearing loud and

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Sandya Lang, Nudie Jeans' sustainability manager, is passionate about improving conditions for workers in the supply chain, as well as reducing the brand's environmental impact.

Knowledge is power

Swedish brand Nudie Jeans was launched in 2001 with a vision of being “the most sustainable denim brand”. Social improvements, traceability and sustainable materials are central to its ethos and, over the past year, its warehouse and head office became GOTS certified, enabling it to sell GOTS-certified products. For the second year, it mapped its entire supply chain's water data and CO₂ emissions, and invested in carbon offsetting to cover the business's full emissions. Around 94% of its fibre usage is organic cotton, with 326,991 kg used in 2020. Nudie Jeans is available in 50 markets, and is sold in Nudie Jeans Repair Shops, online and at third-party retailers.

Q: Can you tell us briefly about your role?

A: My role is the sustainability manager, where I have the overall responsibility for our sustainability work and sustainable strategies for the future. In addition, I work practically with social compliance in the supply chain, in particular with living wage and supply chain transparency.

Nudie belongs to initiatives such as Fair Wear, Fairtrade, Chetna Organic Coalition and Sag Salim, which empowers Turkish cotton growers. Which strategies have the most impact, why is the social aspect a big focus for you?

All of the initiatives are equally important, it is all about taking our responsibility throughout the supply chain and we collaborate with initiatives that can make a difference and impact for the workers along the chain. The environmental part is often easier to quantify, like the amount of hazardous chemicals, pesticides, CO₂ emissions and water amounts, for example, and maybe that's why we have seen brands focused on that over the years, as it has been more difficult to get quantified data on the social aspects. But we believe it is as important to work to improve the social conditions along the supply chain.

One has to remember that garments are made by humans, often in countries far from Sweden, and it should be the responsibility of all brands to work with improving the social conditions for the employees in the factories we produce the garments in, as well as the environmental improvements needed.



Around 46,000 pairs of Nudie Jeans were repaired for free last year.

Some of the initiatives you mention are also integrated in our purchasing practices, for example, forecasting for cotton volumes, paying our share of living wages at selected suppliers and a fair price for the cotton. This is something that ideally all brands should take more responsibility for.

What do you look for in these type of partners?

The initiatives we team up with fill a function and a purpose. They are selected to help us work with complex and difficult issues in the supply chain. The organisations should ideally have a very local approach, seeking to empower and build capacity at the different tiers of the supply chain.

Nudie values organic cotton as the 'gold standard' and it is the most used fibre. Why is this, and how do you deal with any supply issues such as the market saw last year?

Yes, we have used only certified organic cotton for all our denim since 2012 and for all our other cotton products since 2017. Over the years, we have built partnerships with our fabric manufacturers and they know that we are having a stable need for organic cotton. In cases where we work directly with the fabric manufacturers who have direct contact to the organic farms, we have been less impacted. It may also help that we give forecasts on the organic cotton volumes we will be using for the Indian production of organic cotton, for example.

Nudie says it is looking to expand the fibre portfolio with new sustainable materials and pre- or post-consumer recycled fibres. Which new fibres do you find interesting?

During this year, we have focused a lot on post-industrial/pre-consumer but also post-consumer recycling and we have some interesting processes in the pipeline. Regarding the post-industrial/pre-consumer recycling, we have been part of a pilot with UNIDO where we take responsibility for the second choice garments and have given them a new chance as input in a new denim fabric.

The majority (73%) of Nudie Jeans contain 1-3% elastane and 4-8% recycled polyester. What challenges does this create in terms of recycling, and how do you balance sustainability issues with customer preferences (ie for stretch)?

Yes, it is a challenge to balance, but in the recycling process we can use a mix with up to 3% polyester or elastane, however most of our garments include 1-2% elastane. For garments with other compositions including polyester, for example, we are looking into other solutions or products that can be made with leftover garments.

Transparency is a big issue for Nudie, and you produce detailed reports to show how you work and where you source. You have mentioned you are trying to track the source of some of your polyester, elastane and polyamide. Why are these fibres difficult to trace?

We have come quite far in terms of product transparency, but not for all materials. Polyester, elastane and polyamide are some of those materials. The reason is that we buy very low amounts and there isn't traceability or transparency in the same way as with the cotton supply chain. We need to prioritise our efforts and considering the small amount we use of these materials, we haven't come to have full traceability yet.

How do you communicate your message to your customers and keep a loyal following, given the prices are a little higher than perhaps the High Street?

We work with long-term relations, even at consumer level. We offer a membership to our community and the customers can benefit from a lot of services. Free repairs, for example. We put a lot of effort into informing and educating the store staff, and we add value to the products by having a transparent supply chain, letting them know that the products are made with sustainable materials and under fair working conditions.

Looking at the industry more widely, what changes do you see on the horizon?

I see that the industry is moving towards more circular business models, where activities we have been doing for many years are now gaining new ground, such as repairs, second hand and recycling. I also see the need for a transparent supply chain – that is key to due diligence in the supply chain and taking responsibility for human rights and environmental issues at the lower tiers. ■

Sandya Lang has led Nudie's sustainability team since 2011.

ALL PHOTOS: NUDIE JEANS



Jonas Astrup, the Tashkent-based chief of the International Labour Organisation's (ILO) third-party monitoring project, updates *Inside Denim* on the state of cotton-picking in Uzbekistan. Particularly, how the ILO now detects a positive – and significant – link between the Uzbek cotton harvest and female empowerment.

Cottoning on: Uzbekistan, now



A global boycott of Uzbek cotton remains in place, the seeds of which first took root around 2006, following the publication of reports by non-profits such as the International Crisis Group and the Environmental Justice Foundation a year prior. These documents identified the presence of child and forced labour during the country's annual cotton harvest. Widely acknowledged to have been spearheaded by the Washington-based Cotton Campaign, a human rights coalition which dates its own involvement to 2007, this sourcing boycott has since grown to encompass more than 330 international firms, largely hailing from the Western Hemisphere, including Inditex, H&M, PVH's Calvin Klein and Tommy Hilfiger, and J Crew. Signatories of the pledge against use of Uzbek cotton are listed on Cotton Campaign affiliate the Responsible Sourcing Network's website.

During recent denim trade show Kingpins24 Global, founder Andrew Olah assembled a noteworthy panel dedicated to the subject of cotton from Uzbekistan which included both ILO's Jonas Astrup and Responsible Sourcing Network founder and chief executive (plus Cotton Campaign co-founder) Patricia Jurewicz, among others. Mr Olah said the idea for the discussion was initially seeded by BCT Denim owner and director Muzaffar Rakhmatov, also present on the panel, whose company has offices in Tashkent, Bukhara and Istanbul. The intention behind the talk was to draw the denim community's attention to the "enormous" amount that has changed in the Uzbek cotton fields since the implementation of the boycott more than a decade ago, as per the most recent ILO data for 2020. (The ILO will publish the data it gathered during the 2021 harvest in early 2022.)

Local women pick cotton during harvest season on the outskirts of the Uzbek city of Samarkand.

PHOTO: MEHMETO / SHUTTERSTOCK.COM



Sustainable development goals

Uzbekistan president Shavkat Mirziyoyev's government formally acknowledged the earlier allegations of child and forced labour during the cotton-picking season – presented as a hangover from the early Stalinist period – as true in 2017. President Mirziyoyev subsequently issued a series of cotton-related reforms, which have resulted in today's rapidly privatising, liberalising and mechanising sector. Indeed, so much has changed that the ILO concluded in 2021 that 96% of Uzbek cotton pickers were not in any way coerced into working during the cotton harvest in 2020. It stated that it continued to find that systematic child labour is no longer used during the cotton harvest in Uzbekistan and systematic forced labour did not occur in 2020.

During Kingpins, Mr Astrup acknowledged that 4% of cotton pickers still experienced “some degree of

coercion in the recruitment process”, but also pointed out that forced labour exists “in all countries and in all sectors” and maintained that all those involved in picking Uzbek cotton in 2020 were paid at least minimum wage. Talking to *Inside Denim* towards the end of the 2021 cotton harvest, Mr Astrup concedes that there are still isolated cases of child labour at the local level, but “it is important to understand that those cases are caused by pockets of poverty in rural areas”. The best way to address this, he says, is to develop the country's textile and apparel industry to create much-needed employment opportunities. Decent full-time jobs with good wages that can sustain the livelihoods of thousands of families are the “best weapon” against child labour, he states.

Later, in an early December post to LinkedIn, Mr Astrup would underscore his organisation's view that responsible sourcing of Uzbek cotton, textiles and garments should not only be facilitated, but also encouraged. In the post, he said that many (unspecified) European enterprises have already begun sourcing from Uzbekistan and that the ILO's third-party monitoring project is presently providing them with guidance and support. Asked if he considers the fact that 64.6% of pickers were women (the vast majority of whom were also from rural areas) during the 2020 season – a not insignificant figure, particularly in the context of the United Nations' sustainable development goal number five, which encompasses gender equality and female empowerment – was worthy of particular attention, Astrup tells us that he agrees that ensuring Uzbek women have access to the freedom to work “is an important end in itself”.

Entrepreneurial spirit

On the subject of global brands and retailers, Mr Astrup suggests one angle to how businesses might help is to write a cotton and textile “success story” alongside the nation's female entrepreneurs. The concept is closely tied to the notion of textile clusters, “unique” to Uzbekistan's cotton reforms, wherein private companies are allocated a cotton-growing area from among communities up and down the country, complete with a business model to progress along the value chain through processing and manufacturing. For local women, who typically have more familial care responsibilities, there are opportunities to provide services to the clusters, such as childcare facilities for textile workers or catering, cleaning, security or landscaping services, as just some examples.

Mr Astrup sees significant potential here for further female economic empowerment and, during our interview, calls on international industry players to contribute their own ideas and experience to help boost Uzbek women workers in the cotton sector and beyond. Touching upon the social conscience of brands and retailers, he additionally offers that Uzbekistan would do well to maintain and expand another aspect to its cotton and textile industry: the fact that its producers are not located in the capital, but rather across the country's provinces and districts. The fact that factories do not typically have integrated dormitories, for instance, but instead tend to employ locals, which he suggests enhances working conditions, community relations and other positive social aspects by extension, could make Uzbekistan an attractive destination for buyers. The country should strategically position itself in such a light before international textile and apparel companies, Mr Astrup tells *Inside Denim*.

Will this be enough to raise the nation's responsible profile and encourage industry stakeholders to lift the boycott on Uzbek cotton, however? In another LinkedIn post, the Uzbek ambassador to the US and Canada, Javlon Vakhobov, painted this action as long overdue. Yet, earlier government-level calls to end the boycott have not been heeded, despite drawing attention to the economic pressures placed on local agriculture and industry in the wake of covid-19. As industry-wide mechanisation continues to gather pace within the country, perhaps it is time to edit the story of Uzbek cotton and take a more nuanced, updated look at the complex human costs behind the fibre. ■

Ms Deighton dates her passion for more eco-conscious denim to around 2006, when she visited a third-party laundry in China.

PHOTO: TONELLO/RUDOLF HUB 1922

Properly British

After getting her start as a denim designer at Wrangler in Nottingham in 1989, which included time spent making garments at the brand's since-closed Falkirk factory in Scotland, Salli Deighton's rather indigo-hued career has championed British retailers such as Asos, Marks & Spencer, Debenhams and Tesco (specifically, its F&F brand) in more recent years. When multiple major UK-based retailers picked up the phone to ask for her advice on how to reprocess their piles of unsold denim domestically around the time covid-19 first hit, the self-styled sustainability geek's faith in the unique selling points of LaundRe, an idea which first began to sprout during her time at Asos, only intensified.

"We want to be a real factory workhorse," Ms Deighton says of her plans for LaundRe. "I've worked for all these big retailers and I know what they need; they need a workhorse and we're going to have to be really savvy to make it work for them." The ebb and flow of covid tides around the world over the past couple of years unquestionably brought home the need for such an agile, localised approach to processing and holding denim stocks in the UK, she explains.

Piecing things together

Though without an official address as yet, LaundRe is intended as a smart nearshoring hub for the UK ("because we don't have one," as the designer-developer puts it succinctly). Making a digitally enabled base for some of the overseas "starships", as she describes the technologically advanced machinery she is used to working with in Bangladesh and Turkey, for example, to land and work their washing, finishing and/or reprocessing alchemy on home shores is key. So too is providing space to hold blank stock produced in countries further afield to better enable UK retailers to phase their buys in response to sales and, by extension, mitigate potential risks such as the need to cancel orders further down the line. More still, LaundRe will act as a nexus for research and development, plus facilitate educational workshops between buyers and mills, especially, several of whom have already expressed an interest in taking part.



FACTORY TALK: LAUNDRE

A next-generation laundry concept is poised to make quite a splash in the UK, ready to bring denim washing, finishing and reprocessing back to the nation's shores for the first time since 2002. *Inside Denim* chats to **Salli Deighton**, the English denim design and development specialist making it all happen.

On the subject of UK buyers, Ms Deighton raises the important point that many assistant-level denim buyers, technicians and new trainees are no longer given the opportunity to step foot in a factory or laundry before they begin placing their first orders. "There are some that are really trying hard to learn," she grants, "but until you've physically been and worked with this equipment and seen it, it's really hard to fully understand it." LaundRe workshops can help bridge this gap, she states. In a similar vein, the facility can also support an overall raising of buyers' (genuine) sustainability consciousness. She explains: "I think everyone [in the industry] feels the UK is not really committed to sustainability. But I think that if we had a facility here, the buyers would want it, they would use it, they would learn."

Her target audience mainly consists of the teams behind the larger British fast fashion retailers. Any steps towards improved understanding and practice on the part of these firms could really make a sizeable impact, she tells us.

In terms of scale, LaundRe will skew more towards microfactory size. Some machines will have capacity for 300-unit lots, whereas others will be able to efficiently accommodate 50 pieces. Ms Deighton envisions that much of the enterprise's business will be "little bits and pieces" for brands of all sizes, so being able to work to these volumes is necessary. The team, which also includes fellow English denim developer Rowan Hunt, is in the process of considering around three to four brands of washing machines at present, so this aspect remains undecided, but "all" will ultimately incorporate ozone and nebulising technologies to optimise water efficiency. LaundRe's chosen water tech "is not perfect for this kind of hub yet", its founder allows, but she also notes that the Zero Discharge of Hazardous Chemicals (ZDHC) programme has offered to consult on its treatment of wastewater. They are also in discussions with what Ms Deighton describes as two new recycling technology providers "who would very much like to be LaundRe's guinea pigs".

Signing off

"LaundRe is a service to the UK and UK retail," the designer insists, while talking with *Inside Denim* as 2021 drew to a close. She is emphatic, too, that fashion is due what she spins as a denim rebirth. "I believe very much that people are going to start to shy away from buying jeans that are the same price as two cups of coffee," she states, suggesting that between £40 (around \$55) and £50 may be the sweet spot the UK industry is currently missing.



As the trend for nearshoring evolves, Ms Deighton hopes LaundRe will help facilitate this at home in the UK.

PHOTO: LAUNDRE

Ms Deighton is so convinced of the laundry's eco credentials that her plans include the addition of live camera footage from the facility, as far as her brand and retailer partners will allow, of course. "Until the customers start to know how we do things, I don't think we are ever going to really create an understanding of what sustainability is and how things are done and, most importantly, what people are paying for," she maintains. Similarly, the team hopes to link up with Singapore-headquartered traceability technology provider FibreTrace to offer source-to-market visibility.

Covid and its repercussions may have put something of a spanner in the works for LaundRe in terms of fully reaching its funding target thus far, but Ms Deighton emphasises that discussions are ongoing. She adds that anyone interesting in journeying along with the smart hub can email her (salli@laundre.co.uk) to find out more. ■

Not only is LaundRe's founder an eager learner herself, but she also equally enjoys sharing her knowledge with other denim enthusiasts and industry colleagues.

PHOTO: TONELLO/HARMONY FITZGERALD-GENOVESE



Kojima Jeans Street in Kurashiki, Japan.

PHOTO: IAMSHUTTER / SHUTTERSTOCK.COM

A family affair

Japan, arguably the empire of the most beautiful denims. It's where you can find its beating denim-heart, Kojima, in the Kurashiki area. Let's go back to 1992, when young Hisao Manabe started his own agency for Japanese fabrics. An agency he called Collect; collecting the best fabrics he found across Japan. With these, Hisao collaborated with Japanese and international brands.

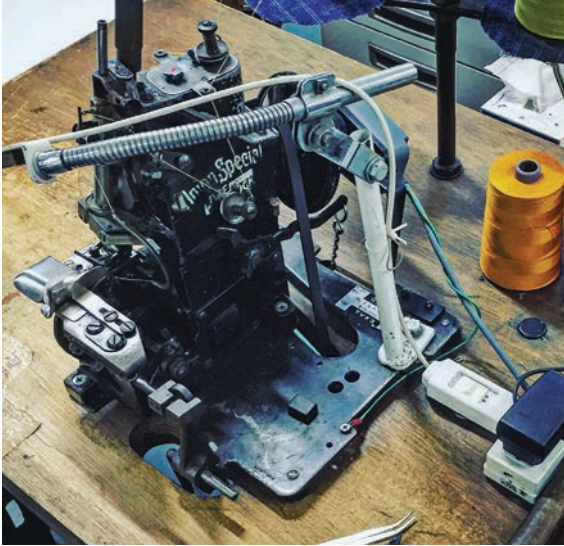
He soon turned his focus to denim. And when focusing on denim, you start acquiring the right machinery, and start weaving your own denim. Especially when it comes to selvedge denim, woven on vintage shuttle looms. Sounds easy, but it isn't. You have to be the kind of passionate person like Hisao Manabe, who loves real indigo, who revived the ancient Japanese indigo dyeing tradition, who performs indigo hand-dyeing on ancient Japanese pottery. Then you can somehow hope to reach the standards of beautiful Japanese denim.

Today, Collect offers a large range of exceptional denim fabrics, known and respected internationally for their genuine assets. The incredible, very positive and professional team from Collect can be seen around the world at the best fairs. You might have seen Ray around with his long hair and big smile!

FACTORY TALK: COLLECT

Have you ever heard about the Manabe family from Japan? True denimheads, father and son. **Tilmann Wrobel** tells their fantastic story: how the family company began as a fabric agency but became the world-famous Japan Blue Co.

Well, it's not the fabric part I would like to highlight here. Because the story goes on. Once Collect had established itself as a benchmark for the industry, Hisao then started building brands. In 2006, he launched what is now one of the most famous denim brands, Momotaro. It was the answer to the growing Japanese demand for American lifestyle denims, but with a stronger and more enduring fabric than those imported from the US. A proper rugged denim range. Momotaro's tagline is 'Made by hand without compromise' and I can tell you, they mean what they say.



Old Union Special machine cleverly adapted.

PHOTO: TILMANN WROBEL

Today, there are three levels of Momotaro ranges. The regular range, which you can find pretty much all over the world in fine denim stores. Then comes the Copper Label, which is directly manufactured in the headquarters of the group. A whole floor is dedicated to the Copper Label manufacturing. A smart section of true vintage sewing machines and skilful workers do what is needed for this premium part of Momotaro. The most exciting thing for me was to see how these vintage sewing machines are maintained in the best condition. You might see a really old Union Special chainstitching machine and, attached to it, a brand new electrical part, perfectly adapted to this particular machine. These kinds of custom machinery updates are rare.

Well, you might think that's pretty cool for a premium level range of Momotaro, but there is more. The brand has a Golden Label level. When you enter one of the brand's stores on Jeans Street, you will find a room with a wooden hand-weave loom. A neatly dressed gentleman hand-weaves here, yarn by yarn, what will become the hand-woven fabric for the Golden Label. The machine allows only a few metres to be woven per week, and a pair of Golden Label jeans comes at a friendly price of about \$2,000. Get your pre-orders ready!

The Momotaro name comes from the peaches and the famous peach boy [a character in an Okayama folk tale] the area is known for. The first time I went there, I remember Hisao and his son Katsu gifted me kindly with peach sweets from the area.

You can find this, and more, on Kojima's Jeans Street, a street with a special story. Once well-known for its textile companies, the street got totally forgotten and was abandoned due to globalisation and changes in the textile industry. Here again, Hisao and Katsu played a leading role in transforming this street into a modern-day denim heaven, filled with denim stores. By the way, the huge image at the entry of Jeans Street is Hisao in a pair of old jeans (well, it's more his behind and legs)!



Brand building father and son team - Hisao and Katsu Manabe.

PHOTO: TILMANN WROBEL

Let me tell you a little more about Katsu. Katsuhito Manabe, raised in as pure a denim culture as you can imagine. When he travelled to Paris in 2008, he decided to stay a few years and establish a company expansion in the district of Paris Marais. Katsu is a really friendly and handsome guy who knows his business and the industry like the back of his hand. Together with his father, he has built new brands for the group, such as Japan Blue Jeans, Soulife, Shin Denim, and more. You might see him in Paris, in the best denim stores across the world, or in the Kojima headquarters of Japan Blue, because he got promoted, slowly taking over the indigo flame his father handed to him.

What a cool family affair! ■



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

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Flavio Berto has worked in every department of the company to broaden his understanding, rising to become CEO.

PHOTOS: FLAVIO BERTO

CLOCKING ON...

For more than 130 years, Berto has been synonymous with high-quality fabrics. Its CEO, **Flavio Berto**, opens the door to the family-run mill.

Blending tradition and innovation

6.00am

The alarm clock goes off early in the morning. The first thing I do is jump into a hot shower for a good awakening.

6.30am

Once I have showered, I prepare breakfast: a good tea, some scrambled eggs, bread and jam. I read the news and check the day's appointments.

7.15am

I leave from my home in Padova to go to the company, located in Bovolenta, with some good music at high volume. The company is still where it was founded in 1887 by my great-grandfather Giuseppe Berto and his brother Egidio. Bovolenta is a small city, 30 minutes away from Padova, in the countryside, in the north east of Italy.

8.00am

My working day starts by answering a few emails and organising the day's meetings.

9.00am

My colleagues start to arrive and we have several meetings, mainly sales and marketing. This is followed by some meetings with the research and development department, where the creative director and the product manager update me on the new developments and on new and innovative materials they want to introduce. They update me on the clients' requests; we try to always satisfy the customisations asked by customers.

1.00pm

Now it's time for a good Italian lunch with my sister and father, the joy of being able to see and compare notes with family members makes the days more interesting. My father ran the company for years, so he is always able to give good advice. My sister is in the garment manufacturing business so it's always important to talk to her about what's going on in the industry. But, of course, the most pleasant thing is to eat good Italian food with the family.

2.00pm

The afternoon is usually dedicated to meetings with the operation manager to organise the production departments and schedule clients' orders. In Berto, we have a warping department, indigo dyeing, weaving,



finishing and quality control. From the yarn to the finished fabric, the whole process takes place here in Bovolenta. So, it's important to check and trace everything for the maximum transparency and quality of our products.

6.30pm

The working day is almost finished. I deal with the most urgent emails and organise appointments for those topics where there are more particular situations. Personally, I prefer face-to-face meetings to emails, so I tend to make as many meetings as possible.

8.00pm

I take an hour to refresh my body in the gym or by walking around Padua. I like to keep fit, I have always been a sportsman and I still am. In the winter season I go skiing on weekends, I also race during Christmas holidays. During the rest of the year I love cycling in our beautiful countryside, from Padua to Venice for example, and in the mountains, more specifically in our beautiful Dolomiti, where I also love trekking and hiking.

9.00pm

I prepare dinner, almost always accompanied by a glass of good wine, and then I watch some television or surf on social networks.



11.00pm

My day is finished, it's time to go to bed. I read a book for a while and then I fall asleep, ready for another challenging day. ■



Italian accessories brand Stripes of-f Road uses denim from Berto.

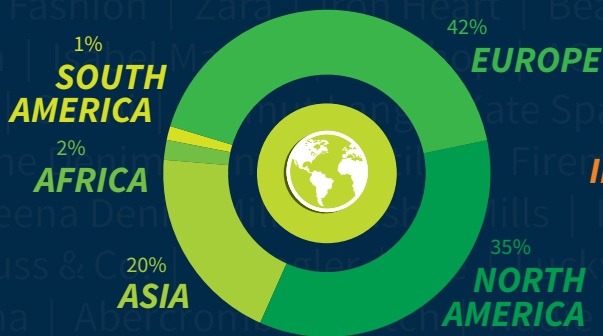
PHOTO: STRIPES OF-F ROAD

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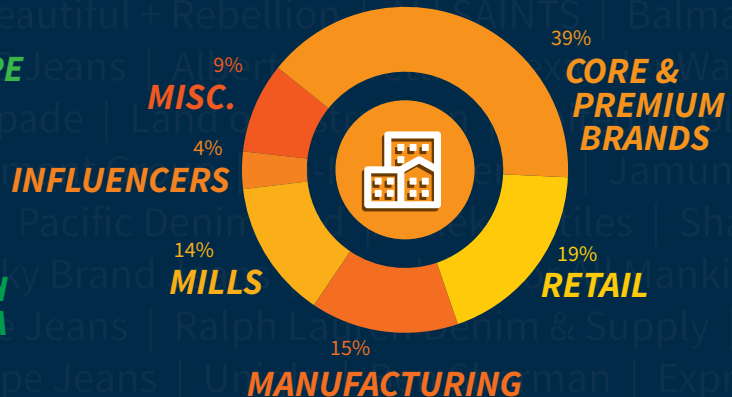
BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

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

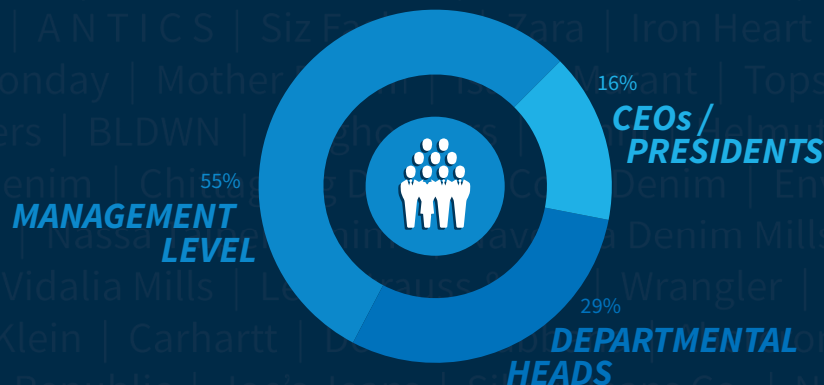
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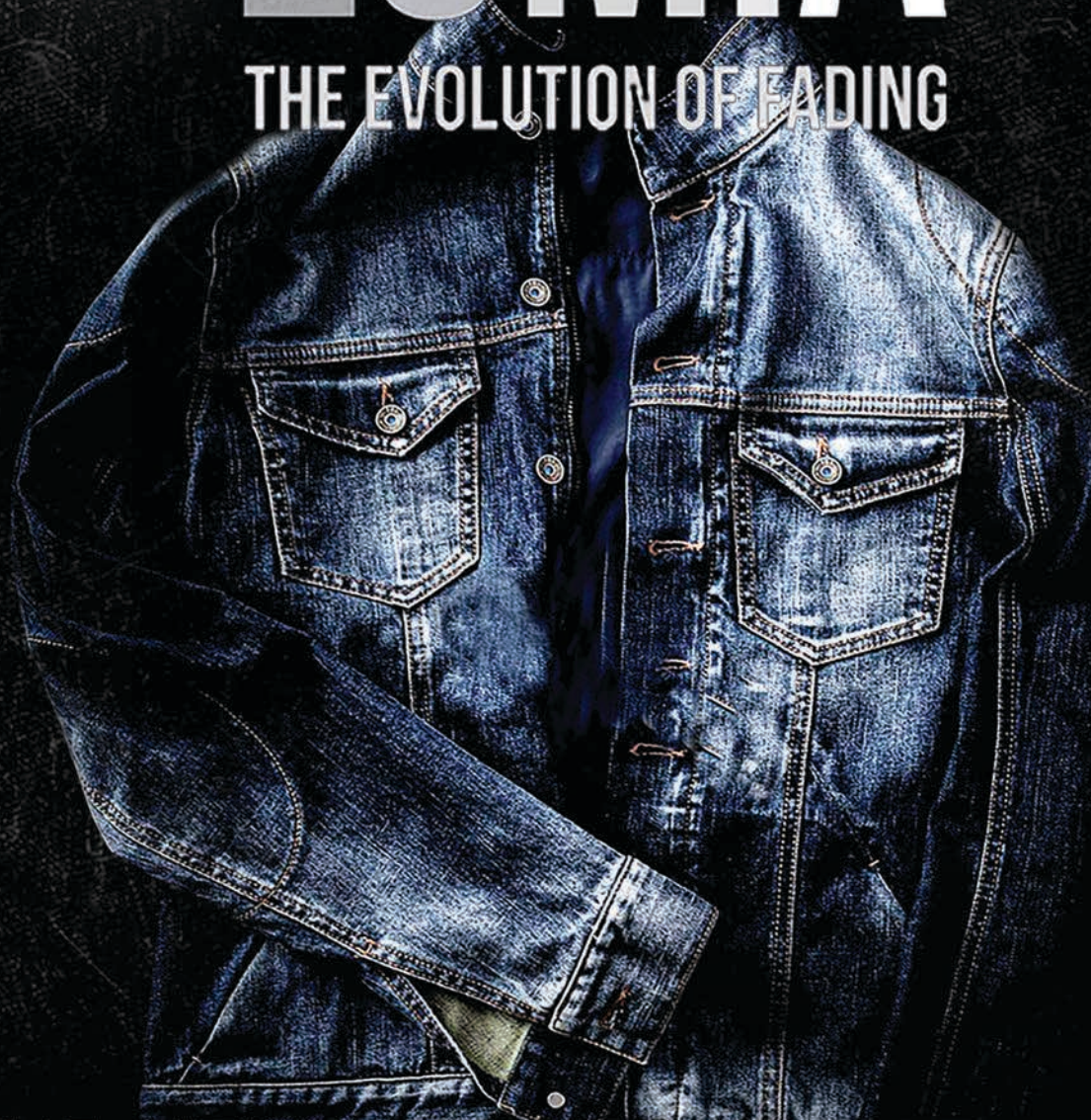


insideDenim will be landing on the desks of those individuals we have hand-picked to receive our magazine: **Global Sourcing** Managers, **Product Development** Managers, **Senior Denim** Designers, **Product Development** Directors, International **Sourcing** Directors, **Wash Technicians**, Senior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



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