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BEHIND THE SEAMS OF THE GLOBAL DENIM INDUSTRY

# insideDenim

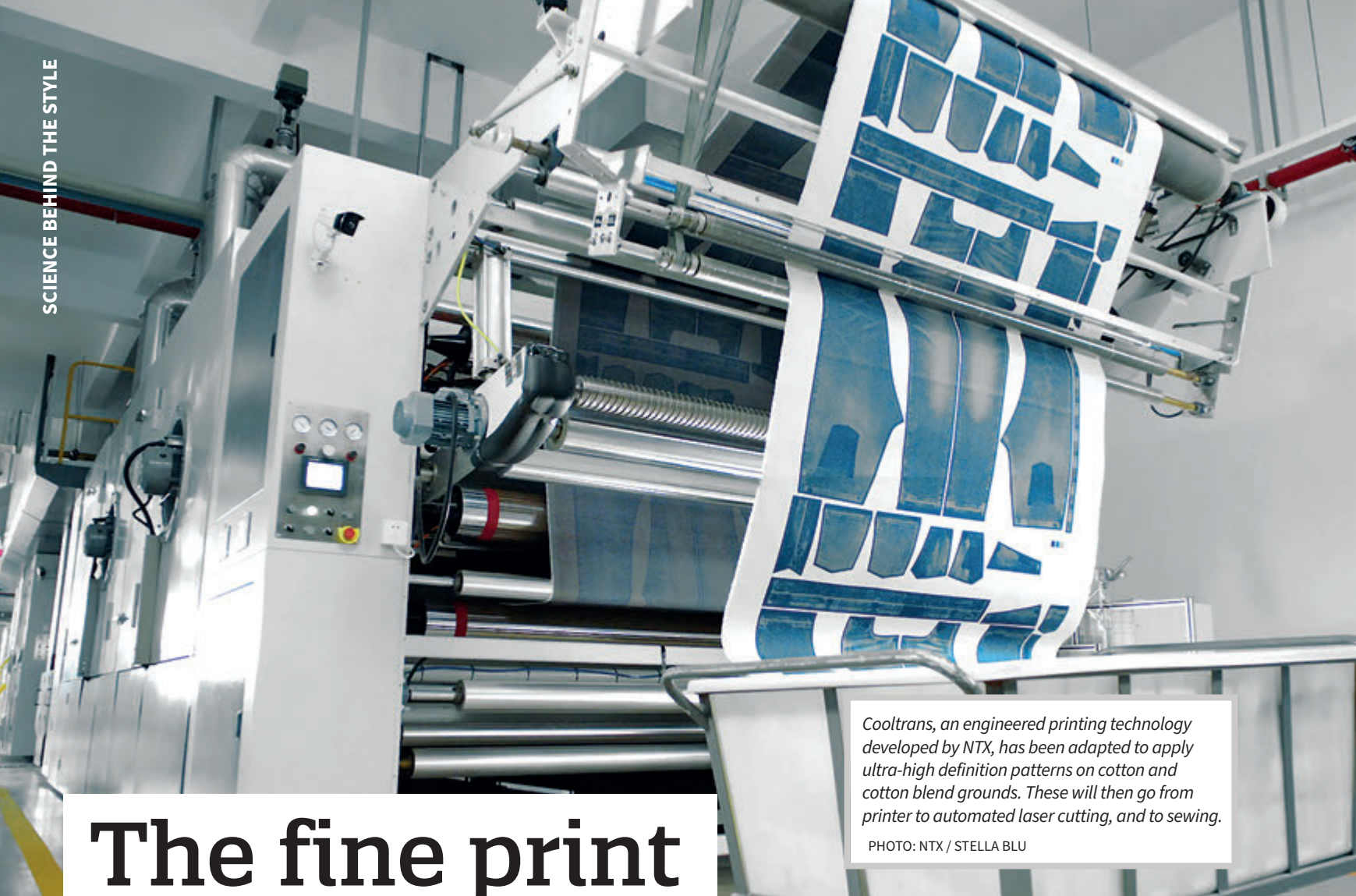


Time for a  
step change

The promise of print / Innovation on show at ITMA / Kontoor's circular mindset

BluConnection / Halit Gümüşer





*Cooltrans, an engineered printing technology developed by NTX, has been adapted to apply ultra-high definition patterns on cotton and cotton blend grounds. These will then go from printer to automated laser cutting, and to sewing.*

PHOTO: NTX / STELLA BLU

# The fine print

The digital printing of textiles has been a break-through technology. Offering on-demand flexibility, a high level of process automation, and releasing no discharge, it is considered efficient, economical and eco-responsible. It is not the only new digital tool the industry now uses widely, 3D fashion design software and laser machines have also profoundly changed how products are conceived and manufactured in today's modern Industry 4.0 factories. It was arguably just a matter of time before the denim industry took a look at the possibility of printing its jeans.

Singapore-based NTX introduced one such solution at ITMA this June in its patented Cooltrans 'textile colouration' technology. It developed the process with Stella Blu, a division of China-based Prosperity Textiles, and the two companies have now formed a joint-venture. They believe they have a solution that reproduces strikingly authentic-looking fading on jeans, front and back, in a single pass. Cooltrans, as Jeffrey Hsu, chief innovation and marketing officer, describes it, "is a ridiculously precise colour-dosing technology." Extreme precision is what he sees as one of the technology's differentiation points. "Our application precision can go up to 3200 dpi," he says of the on-demand, fully digital, AI-driven process that uses standard dyes and is discharge free.

Open up a pair of good-looking vintage jeans. Lay flat. Scan. Transfer the file to the printer. Press go. Laser cut. Sew. Done. This is the promise of digital age jeans fully printed with authentic-looking fading. No laundering, no need for an indigo warp-dyed fabric. It could be a game-changing technology for 'deepfake' jeans.

First developed for manmade cellulosic and synthetic fabrics, Cooltrans can now print on cotton grounds. The technology developed by NTX is said to be neither inkjet, nor sublimation, nor screen printing, but rather a modified transfer print. Mr Hsu tells *Inside Denim* that the face of the fabric is printed using a transfer film and the back is a direct to fabric print. It removes the need for conventional wet processing in denim fabric manufacturing and garment laundering and finishing, making it a waterless and low energy solution.

“We are just starting on the journey to printed denims,” says Marco Stefanelli, head of marketing and business development for Stella Blu. “We are quite positive, but this is not traditional denim, it is an addition to the world of denim. This is a product that an eco-aware consumer will appreciate for its savings in water, chemicals and energy.” He also sees it as a game-changer for product development and lead times. “It usually takes 60 to 120 days to go from idea to finished product. This system brings these down to 60 days. It makes the traditional methods of obtaining aged effects obsolete.” He notes that it does not rule out all rinsing and washing, which may be needed to achieve the right hand feel. Among its many promises, Mr Hsu adds that “it can reduce MOQs to a single piece.”

NTX has also taken an innovative approach to the commercialisation of Cooltrans. “In our business model, we don’t sell the machines, but rather partner with companies by creating a joint venture in which NTX is the majority shareholder,” says Mr Hsu. The company has already formed six such joint ventures, including one with Stella Blu who is now a system partner for the production of denim, piece-dye and pattern prints on cotton and cotton blend fabrics. The jointly owned enterprises then become part of a same network or ecosystem. They all work together, share information on processing, debugging, and can even allocate machine time to each other if needed, he says.

Companies specialising in denim have been investigating the technology for years, as has Gonser Group, based in Tunisia, with headquarters in Germany. Originally a denim laundry, it has evolved to become a vertically integrated denim and jeans manufacturer. The development of its patented Mimikry technology is now up and running at its Gonser Denim Revolution facility, in Tunisia. “Mimikry has been made possible by the evolution of digital printing machines, which no longer create a plastic hand feel, and by the high quality and resolution of our library of effects,” says Alvis Alcaro, the company’s head of communication and development. He insists on the extreme sustainability of the process, which uses GOTS-approved water-based inks, as it eliminates “hours of finishing and laundering stages”.



In development for several years, Mr Alcaro says the company has made significant progress in improving the technology, thanks in part to the creation of a dedicated department covering all processes, from file design and pattern-making to printing. Technical details have also been ironed out. “By tweaking various parameters, such as pre-treatment, colour profiles and ink drops dimension, we are now able to obtain the best rendition on different fabrics,” he says.

Manufacturers of digital printers are also looking to develop solutions for the denim industry. Headquartered in Israel, Kornit Digital specialises in printing systems for the fashion and textile industry. Its technologies can print on any ground, from cotton to silk and to leather, and on fabrics that have raised textures, such as denim, with a wide array of possibilities including three-dimensional embroidery-like motifs. The company makes machines that can print a roll of fabric or a finished garment, and they can also be used to print markings or fadings in resolutions that can go up to 1,200 dpi. For more authentic looks, Dafna Ratzon, marketing manager, says that a white printing technology was recently introduced. “We know we can print a worn-in denim look and achieve a great hand feel that perfectly emulates true jeans,” she tells *Inside Denim*. The company is in talks with brands, she says, and testing various options to reach the best results.



Global digital printing expert Kornit Digital is expanding from the possibility of printing motifs to patterns that emulate actual jeans.

PHOTOS: KORNIT DIGITAL

With Mimikry, its patented digital printing process, vertically integrated denim producer Gonser Group seeks to offer radically more sustainable jeans.

PHOTOS: GONSER GROUP



### Testing, testing, testing

Turkey-based Ereks Blue Matters has in-depth experience with a similar technology based on lasering fadings on a denim fabric before sewing (see *Inside Denim* issue 9). As part of its dedication to sustainable, on-demand, no waste manufacturing, the company is currently curious about the possibility of printing jeans. “Printing can be a very sustainable solution as it saves water, chemicals and energy in fabric production and in industrial laundry processes,” says board member and partner Romain Narcy. But especially, “it opens the door to customised jeans production similar to what we are already doing with our Digital Denim Production process using lasering technology from Seilaser.”

In the samples Mr Narcy has seen, he says that “washing effects look good” but he was less impressed by the hand feel. He also wonders how the jeans will fade after home washing. “We will have to test and assess how they react to domestic laundering,” he says. While he believes that printing may help reduce lead times and be suitable for on-demand manufacturing, “we have yet to see what the capacity of this technology is and if it can replace bulk production or is more adapted to smaller batches.”

### The devil is in the details

Denim consultant Rowan Hunt has been keeping a close eye on the technology for years, and says that he has seen products that, from afar, can look very good. But he notes that emulating indigo using printing cannot be an easy task. “The more dye you apply, the more difficult to achieve varying shades of blue,” he tells *Inside Denim*. “What makes indigo special is that the blue will shimmer with a red or a green cast. I’m not sure you can get that even with the most sophisticated printer.” Fading is another issue where printed denims may fall short of the real thing. “True jeans wear down with wearing and washing, and as they do, they become more comfortable to wear and that’s why we love them. If printed jeans do not wear down well, will people keep them for a long time?” On the plus side, he notes that it is very difficult to control fading in traditional laundry processes. The highly reproducible nature of digital printing could solve this problem. He also conjectures that it could be useful for fabrics made from Tencel, as they will not fade like cotton. “Printing could be a way to make jeans with Tencel look as if they had faded naturally.”



*NTX has partnered with Stella Blu, a division of Prosperity Textiles, to develop its novel high-tech process that can print front and back in a single pass.*

PHOTOS: NTX / STELLA BLU

Achieving the aesthetics of a genuine pair of old and worn-in jeans, and reproducing indigo’s tendency to fade into myriad shades of blue is one of the main challenges that digital printer makers face. **At Gonser, Alvise Alcaro says that darker indigo tones are more difficult to mimic. “Indigo blue is really hard to print, but this is a limit that any printing technique will have. We have been able to obtain impressive results when recreating mid-heavy washes and these are also the most requested as they can be enriched with infinite details that, with a traditional wash, would require a specific fabric structure along with many laundry and manual stages,” he says.**

“Detail, detail, detail. The devil is always in the details,” agrees Jeffrey Hsu, at NTX, when asked about the key challenges the Cooltrans technology faces in denim. “I would argue that what we showed at ITMA was ~95% there. We are now able to create more consistently the exact same [aesthetic] as denim.” He adds that the results are, to the general mass, already indistinguishable from the real thing, even when told so, but the ultra diehard denim guru will notice that the jeans are printed. He says the company is working with brand designers to “hash out those final details”.

While insisting that Kornit Digital’s system can emulate everything, and reproduce blues in an infinite variety of shades, Dafna Ratzon admits that obtaining the effect of traditional bleached or hand scraped fadings that abrade indigo dye, is far from easy. “Our printers apply an ink to a fabric and it is not easy to achieve that same look and feel.” The solution, she says, is to apply just the right amount of ink to get the right shade or colouring.

### Is printing scalable?

The second key challenge that printing technologies must overcome is the critical matter of scale. At the current relatively small volumes NTX is producing, which are under 500 metres, there will be no problem, says Mr Hsu. “When we go to larger scales – above 100k metres, 500k metres, and to 1M metres – that is when those pesky details that are not visible or noticeable at small runs will begin to amplify.” Given the company’s experience in the sports and outdoor industry with full commercial production in excess of 1 million metres, he trusts that NTX’s Cooltrans will in time reach a scale suitable for large denim brands. But, he notes, “it would be wishful thinking to assume we have a plug-and-play solution that generates zero problems.” Even in conventional processes, he points out, “there are many, many problems that require careful attention and dialogue. What we offer is a technical scientific solution, not magic.” This, he insists, requires open, clear and honest communication.

In potential water, chemicals and energy savings, printing is beyond question a more sustainable solution. For Mr Hsu, water savings are in excess of 90%, as it rules out laundering, and brands may also be happy to see their carbon footprint lower by 66% at the very least, he says. Kornit estimates that its processes save up to 95% of water usage and 85% of energy compared to a full range of traditional jeans finishing processes. “Digital printing is a very sustainable solution. Our inks are GOTS, bluesign and Oekotex approved. Surveys show that young consumers give a lot of value to sustainability, which is a big driver of demand for these technologies,” says Dafna Ratzon.

She adds that the Kornit’s systems allow new opportunities for customisation and that they are designed to be easy to use. “This is a good technology to test the market (with 500 ex for instance), or to produce mid-season runs. It gives brands and retailers more flexibility. Our system can connect directly to an e-commerce site, and print only what is needed, thus reducing excess stock.”

### An innovative & creative tool

Digital printing syncs perfectly with the development of computer design software. “This is photographic denim, it is quite cool from a design point of view, and it makes sense to combine this technology with virtual design tools,” says Rowan Hunt. Going from photo to 3D rendition to printing and sewing, a pair of jeans could be made in just a few hours, he speculates.



*While all types of fadings can be reproduced, Gonser says the most convincing are the mid-heavy washes.*

PHOTOS: GONSER GROUP

A nearly one-step process, printing no doubt makes it easier to offer customised designs and limited editions. “Mimikry can contribute to faster sampling but it can also help young designers develop their own products; ultimately it makes jeans making more democratic,” says Mr Arcaro. “I see the adoption of digital printing as not necessarily driven by the aim to replace current washing but mainly as a new creative option. We never get tired of denim but we are always genuinely thrilled to see something new. A printed garment has no comparison in terms of reduced environmental impact, but what is most relevant is the infinite possibilities for unseen products.”

For boutique denim labels, the technology could thus open new design possibilities and simplify the production of small runs. It is probably a long way from offering mass market brands a solution that can replace current practices (and the industry knows how hard it is to change these). It could, however, find its place in the market, with the creation of an entirely new product category. Something like deepfake jeans or jeans-like tops and bottoms with fadings and markings that a traditional laundry might not even be able to reproduce. ■