

Inkjet technology evolving in China

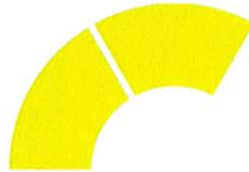
By Jens Kastner 22 September 2023

Understanding the commercial readiness scale

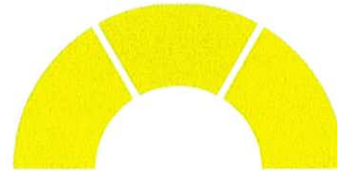
WTiN's Commercial Readiness Scale gives an indication of what stage of commercialisation a product is at. It ranges from Emerging: a research stage development; Scaling: the product is being produced on a small but growing scale, and Commercialised: the product is well-established and ready to purchase.



Emerging



Scaling



Commercially ready

Chinese textile companies are bringing digital textile printing into the realms of denim and yarn to replace unsustainable dyeing processes, industry observers have told WTiN.

'Digital denim' has become increasingly popular within China's textile sector. It involves using a computer and printer, to apply inkjet printing dye to cotton fabric to make a fabric that resembles different styles of jeans. Dyeing with inkjet textile printers addresses the traditional drawback of denim, whose finishing and manufacturing processes are energy and water intensive, causing environmental hazards, particularly at the finishing stage.

Innovators have been demonstrating their wares in Hong Kong, which remains a key international buying hub: "In recent months, Chinese textile companies have come here presenting us with breakthroughs in this disruptive technology," said Kwan Yu Lo, a professor at the Hong Kong Polytechnic University's School of Fashion and Textiles.

Speaking to WTiN, he added that, "The digital printing of denim has the potential to transform highly polluting processes by saving chemicals, water and electricity, as even the most progressive dyeing techniques that are available consume more of these resources than digital printing."

Lo highlighted one Chinese textile company shifting to digital denim printing dyeing as Shaoguan-based Prosperity Textiles, based in the Guangdong Province of southern China. The company, which is fully integrated with in-house weaving, dyeing and finishing solutions, uses the printing-dyeing solution [Cooltrans](#), supplied by Singapore-based NTX, which removes water from the dyeing process.

Marco Stefanelli, director of marketing and business development, at Hong Kong-based Stella Blue Textile, which belongs to Prosperity Textiles and is a joint venture partner of NTX, said that their accumulated experience has enabled the joint venture to consistently produce materials mirroring standard denim.

"However, while to the general mass it is already indistinguishable even when told so, to the ultra-die-hard denim guru, it is still noticeable. Thus, we are working with brand designers to even hash out that final detail," said Stefanelli.

"We only recently adopted it, so we are still at small-run orders, and it is when we will be going to large scales – above 100,000 meters, 500,000 meters, and 1m metres – that those pesky details that are not visible nor noticeable at small runs begin to amplify."

The other pioneering Chinese digital textile printing trend observed by Professor Lo is the digital printing of yarns. This waterless process, which allows textile manufacturers to dye smaller batches of yarn or raw thread to match digital reference specifications, offers significant sustainability benefits. According to Lo, Hong Kong Polytechnic University has one of Asia's few printers capable of printing yarn that can be used for contract research by companies from China and elsewhere.

"If you print the yarn before it goes into the knitting process, you can create a lot of whole new designs," said Lo.

"Our machine is also capable of digital 3D fabric printing, which allows, for example, to create the effect that different colours appear if the wearer or the viewer changes position."

English >

As for the overall situation of China's digital textile printing sector, the 2022 China Textile Digital Inkjet Printing Development Report by the China Dyeing and Printing Association found that the production scale of digital inkjet printing increased by 11.4% in 2021, making it the fastest growing field in the printing market. This has expanded certain ink segment sales in China. From 2015 to 2021, the annual consumption of sublimation ink increased by an average of 24.1%. As of 2022, about 71.4% of all inkjet printing ink was sublimation, which is mainly used for chemical fibre fabric printing. Most is low-temperature for transfer printing, but some is for high-temperature direct injection.

From 2015 to 2021, the annual consumption of activated ink increased by an average of 23.7%. Active ink is mainly used for cotton, wool, silk, hemp and artificial cellulose fabric printing.

The report also found that the quality of China's inkjet printing inks has improved: "Through the enhanced formula, the ink suppliers have significantly improved the stability, colour fastness and adaptability to the nozzle and ink supply system," it said.

"The colour gamut has been further broadened, and the number of colours of large coating inks is increasing. In addition to conventional ink, fluorescent ink has also been developed and applied," it added.

The report observed a continuous expansion of applications in home decoration, building materials, handicrafts, industrial textiles and other fields.

The report did not cover Chinese exports of digital textile printers and ink. But Chinese exhibition fairs focused on digital printing, such as the China (Guangzhou) International Screen Printing and Digital Printing Technology Exhibition 2023, in May, target visitors beyond China's borders.

One of them, Sunny Lau, supply chain and operation manager at the Ho Chi Minh City, Vietnam-based digital textile printer Saigon Printer, said that despite visiting the conference, his company is planning to update one of its plants with Italian-made fully rotary and digital wet printing that can undertake full finishing, which is steaming, washing and stentering.

"Whereas the Chinese are inexpensive but not reliable, the European equipment is reliable but overall costs are high," said Lau, who suggested these prices could be trimmed.

"The Italians need to adopt Asian technicians from China or Vietnam to be able to control their overall pricing," he suggested. If that happened, it would hinder the ability of Chinese digital printer manufacturers, such as Shenzhen-based Homer and Hangzhou-based Yi Sheng, to export significant volumes of machines.

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