

Four-denier jackets, new coffee-based fabrics, flashing coats, thermochange textiles and glow-in-the-dark: the 18th Taipei Innovative Textile Application Show (Titas) cemented its standing as the home of innovative offerings

Taiwan's bright sparks offer more inspiration

If the aisles of Titas are anything to go by, this time next year our city streets will be illuminated by joggers and cyclists. Their jackets will be lit using a membrane, or prints that absorb light during the daytime and emit a fluorescent glow after nightfall. Although these developments have been simmering for a while, companies such as Eclat and Formosa Taffeta are hoping brands are ready to move from concept to commercialisation. "It's been going on for a while but hasn't been ready for the mass market, but now we're hoping it will catch on," said Teddy Hu from Formosa Taffeta.

In terms of exhibitors, this year was a record for the Taiwanese show: 367 in 700 booths. The majority were from Taiwan, but a Korean contingent and delegations from China and Japan also took stands. Taiwan is by no means the cheapest location for textile manufacture; the government recognises that to stay competitive it must promote innovation, and part-funds a number of testing and certification alliances to support the industry, one of the country's largest exports revenue earners. Around 40% of the world's performance fabrics for mountaineering, skiwear and sportswear brands come from Taiwan, according to the Taiwan Textile Research Institute (TTRI).

Yarn and fabric makers joined chemical companies, research associations, machinery and digital printing firms showing their latest products at Titas.
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The slight decline in Taiwan's textile exports continued in 2013. Around $11.7 billion was exported, 1% less than in 2012, while the output of the made-made fibre industry was $4.5 billion, a decline of 3.3%. The economic downturn in the West has meant companies have reined in spending: lower-end brands perhaps eyeing cheaper textiles, but for the high-end sports and outdoor companies, Taiwan remains a vital link in the chain.

"The economic situations in the US and European Union are expected to improve this year, which should drive growth in exports of Taiwanese textile products," said Tyzz-jiun Duh, chairman of the TTRI. "In addition, the increased prevalence of affordable fashion and the growth of the leisurewear market will increase the willingness of brands to place orders with Taiwanese firms. With opportunities for regional economic integration in the ascendant, we must use our ability to research, develop and create high-valued-added products to grasp the opportunities of regional economic integration and accelerate the upgrading of our industry."

Environment first

As in recent years, Titas organisers said that the one of the main focuses was on sustainability. Kingwhale promoted its Low Impact Technology (LIT), which reduces water and energy usage, and Hung's Fortune offered a new recycled polyester yarn, 3X Green.

Singtex, the company behind S.Cafe yarn, which uses spent coffee beans collected from Starbucks to add odour control, launched a rayon fabric in collaboration with Formosa. The companies worked for two years developing Formotex, adding to the Singtex stable, which also includes P4Dry, a new, fast-drying print layer. "Coffee grounds are naturally microporous, so they capture the smell," explains J.J Hsu from Singtex's yarn department.

Representatives from The North Face, one of Singtex's biggest customers, took the opportunity to visit its facilities to discuss projects in the pipeline. The US brand has recently stated that by 2016, all the polyester it uses will be from recycled sources. "We are putting that challenge in front of us, and we're relying on suppliers like Singtex to help us make those dreams become a reality," said Jack Dalton from TNF. "It's not easy, as [Singtex founder] Jason Chen knows well, but we are committed to doing things sustainably and doing it through products like the ones Singtex has, which we really appreciate."

Singtex has also begun to supply the coffee oil to a Taiwanese cosmetics company for a range of shampoos and soaps.

FENC's alliances

One of the biggest players in Taiwan's textile industry is Far Eastern New Century (FENC), a long-time supplier of Nike, and a company that stresses innovation as part of its core, spending a quarter of income on R&D. Its recycled polyester lines (TopGreen) were worn by five Nike-sponsored teams at this summer's football World Cup in Brazil.

"In the beginning, the major users were Nike and adidas, but from this year Decathalon, H&M, Puma, Hanes, one by one they are changing to recycled polyester," explained Eric Huang, a senior vice-president at FENC. The polyester flake is depolymerised and repolymerised, the chips are then used to make yarn and fabric. "Nike is pushing us to produce 100% bio-based PET," he added. "We are already successful with the PET bottle but Nike wants to have bio-based PET from corn and rice husks, and agricultural waste."

FENC works closely with Coca-Cola, which named it its top supplier out of 700 in 2013. "Bio-based PET is normally 30%; 70% PTA, 30% MEG. MEG is easy to make from a bio-based source, but PTA is very difficult, so this is the first one that will be 100% bio-based," explained Mr Huang about an ongoing collaboration, PlantBottle.

As well as the recycled lines, FENC is working with Nike on a waterless dyeing system which uses technology from Dutch firm DyeCoo to colour the textiles with nitrogen *(WSA May-June 2014)*. Launched in December 2013, the dyehouse has been testing batches throughout



Nike supplier FENC said an increasing number of brands are switching to recycled polyester.
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this year, with the first Nike ColorDry products on sale last spring. "Nike is a very good partner. It's a collaboration; we share our vision for the next three to five years and we work with each other to design new products."

However, he admits it has not been an easy process. "For the pioneer, it's not easy. It's very new technology so both parties – Nike and our fabric division – are working very closely with each other. Experts from Nike have come to our plant to enhance the existing efficiency and set up best-practices. Technology-wise it's not easy, with high pressure and high temperatures, but Nike has several candidates in Asia that can work together to speed up the process. ColorDry is a very important direction."

Lightest fabric yet

Formosa Taffeta is also working with the DyeCoo waterless dye technology. "We are the only woven company using the machines, and we can now produce a stretch fabric that is ready for mass production," said Ms Hu.

Weight reduction was an important focus for Formosa over the past year. The company, which is part of the Formosa Plastics Group, launched what it claims is the world's lightest fabric – a 4 denier nylon for jackets, weighing 16.5g per square-metre and just 28g for a jacket, including zip. "This kind of windproof and downproof jacket is our key product. Everything is going lighter and lighter in sports and outdoor so we are concentrating on developing the lightest products for our customers."

Formosa also showed a three-layer fabric which weighs 60g per square-metre, consisting of a 7 denier and 10 denier layer, and a new design for fabric construction which creates a 'packet' that can be stuffed, with no need for extra seams. "Making a woven fabric with stretch is a bit difficult, but we have created a stretchy downproof fabric," added Ms Hu. "We also have a new antistatic fabric which starts from the yarn. In the past, antistatic fabric couldn't be made water repellent because you needed a little bit of water in the fabric to make it antistatic. But now, because we start from the yarn, we can add water repellency and still have antistatic."

Alternative uses

Tri Ocean Textile, one of the largest polypropylene manufacturers for apparel, was promoting the benefits of its Dreamfel yarns, which are used by brands such as adidas, Columbia and Helly Hansen.

"Polypropylene is the only yarn in the world that is water repellent, and it is the lightest fibre by weight, 30% lighter than nylon and 40% lighter than cotton," explained merchandise development manager Wilson Huang. It uses lower energy to melt and spin, he adds, and eventually biodegrades, unlike other synthetics. "We are trying to make every athlete feel dry, so we have a polypropylene base with a polyester surface in a double-layer knitted fabric. We have also created a new hollow fibre which is even lighter and keeps you warmer, and have just launched a synthetic filling material made of polypropylene, which is 35% lighter than goose down."



Nike's ColorDry, made with textiles produced at FENC's facility using DyeCoo technology. 'Being a pioneer is difficult,' admits FENC.

Nike

Yu Yuang, a knitting and dyeing facility based in Changhua County, has been working on a lightweight spacer fabric made of polyester and spandex, and is promoting it to clients including Victoria's Secret, TNF and adidas. "We are also using the fabric to make baby pants, to protect their legs when they fall," explained sales manager Holly Li, although adding that it's just a concept for now. The group, which owns cycling brand FMA, produces 2,200 tonnes of fabric per month, 600,000 garments and 250 tonnes of dyed yarn.

Spinning, knitting and weaving company Chia Heir presented its functional wool series NwoolTec+, blending Cordura and Tencel with wool for lightweight spring-summer garments *(WSA September/October 2014)*. "Normally, people think about wool as a winter product, but it's very good for the summer season as it has a wicking function," explained sales manager Hugo Lee. The company, which has a large manufacturing facility in the south of the country, also offers blends with Tencel, Transdry and Sorona, and counts Arcteryx, TNF and Lululemon among customers.

Stand out from the crowd

One of the more striking displays was that of Fabric King, which was promoting its LED-embedded fabrics and apparel. "We have hired someone who used to work in the LED sector to

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New products using S.Cafe coffee oil from Singtex help brands push the sustainability message.

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help us develop this capability. He can find the right factory to customise our LED systems, and the right power bank for customers' specifications," explained Tracey Chu, sales assistant.

It also presented a see-through fabric filled with coloured down, and thermochange shirts. "Our suppliers have been working thermochange for a while, but we weren't sure if it would sell, so this year we've made some garments to show brands how it could work," he adds.

Like other manufacturers, Fabric King had a photoreflector and glow-in-the-dark range – one of the developments many presented as a big trend for the next couple of years. TexRay's printed offering has a durability of 25 washes, and it also offered a membrane technology that glows for two hours after exposure to sunlight. Quiksilver and Marmot supplier Ea Shinn's lightweight, glow-in-the-dark membrane is suitable for bicycle jackets, while yogawear specialist and Lululemon supplier Eclat's version relied on printed designs. "We could previously only produce it in silver, but now we can make it in five colours," said deputy manager Ray Tsang. The fabric is made at its Taiwan-based factory close to its headquarters and R&D centre, with samples for some big brands already in production.

Asia-wide supply chain

According to the TTRI, 80% of the US's yogawear is made in Taiwan, and Eclat has been reaping the benefits of the growth in the pastime: in 2013, it reported sales of $606 million, up from $460 million in 2012 and $360 million in 2011. The group has manufacturing facilities in China, Cambodia, Taiwan, Vietnam and Lesotho and so is well positioned to benefit from the incoming Transpacific Partnership (TPP) trade deal, when passed, as garments made in Vietnam should benefit from 0% tariffs on exports to the US. Yu Yuang is also in the process of setting up a factory in Vietnam, and garment manufacturer Makalot is one of a number entering into joint-ventures in the country.

"The TPP will accelerate supply chain integration among Taiwanese businesses in Vietnam," said TTRI chairman Tyzz-jiun Duh. "Because Vietnam is the number two export market for Taiwanese textile fabrics, R&D, design and other high value-added activities will accelerate overseas distribution and integration following the signing of the TPP."

The continued investment in facilities and innovation bode well for the Taiwan's textile sector. More than 1,000 face-to-face business meetings were conducted between manufacturers and brands over the three-day Titas event, which last year resulted in $66 million of business. At the time of going to press, organisers were yet to give final visitor numbers and business figures for this year's event figures, but if talk on the floor was anything to go by, this year things were looking even more promising.

Dyes, DWR and chemical management

"The future for durable water repellency (DWR) will be complex, it's going to be a long road," attendees were told by Huntsman Textile Effects, which highlighted the benefits and drawbacks of its perfluorinated and non-fluorinated products during a presentation in Taiwan. Lee Howarth, the company's global marketing manager, outlined how the industry has evolved over the past couple of years in response to Greenpeace's Chemistry for Any Weather report.

"We're witnessing a paradigm shift in the use of conventional chemistries. We're seeing a move towards technologies that can deliver water savings and energy savings and greener chemistries," he said. "It's up to brands, retailers and suppliers, as well as chemical companies, to work together to bring about real change."

A large turn-out gathered to hear progress on the Zero Discharge of Hazardous Chemicals roadmap, following on from the group releasing a restricted substances list (RSL) in June. The list establishes concentration limits for substances in chemical formulations and includes ingredients potentially used in solvents, adhesives, stabilisers, inks, dyes and pigments, and Huntsman has been working on alternative solutions.

The group also presented its latest Eriofast range for polyamide and polyamide/elastane blends, made to enhance colour blocking, particularly in swimwear and sportswear. Singapore-based Dystar highlighted a new dyeing technique for polyester while Sweden's Organoclick explained how its finishing process, based on a method that bonds alkyl-functionalised polymers to a substrate, creates fluorocarbon-free water-repellent fabrics. "A strong covalent bond attaches the finish to the fibre in a 3D pattern, which lowers surface tension. It repels water but is not oleophobic," explained business manager Robin Grankvist.

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