Thanks to continued investment in research and development, Taiwanese textile manufacturers are doing their best to stay on top of performance sportswear trends. While environmental concerns remain a key driver of innovation, luminous properties and biometric monitoring were among the highlights of the Titas show in Taipei at the end of last year.

New spin on smart at Titas

The Taiwanese textile industry puts a lot of effort into innovation and market trends, from high-performance materials to the new demands of the growing athleisure category. This is one of the key takeaways from the latest edition of the Taiwanese textile trade fair, Titas, whose nineteenth edition was the largest yet with 790 booths and 370 exhibitors coming from 10 countries. The Taiwan Textile Federation (TTF), which organises the event, also set up meetings for exhibitors with buyers from some 90 brands. First time visitors included representatives from sports brands Merrell, J. Lindberg, Puma, Maloja, Dynafit, Mizuno and Canterbury, while fashion brand buyers from Hugo Boss and Ralph Lauren also made the trip to Taipei last October.

Biometrics and bioluminescence were two of the top areas of innovation on show. Far Eastern New Century (FENC) officially launched its smart textiles platform, FERMI, for Far Eastern R&D Manmade Intelligence. The highlight product, a sensor-equipped band coated with a non-metallic conductive polymer, is a "plug and play" module that can be installed in any garment to provide various monitoring functions, including heart rate. "We've made it as rugged and easy to integrate as a textile ought to be," says Eric Huang, a senior vice president of FENC. Other features include high wash durability (100 washes) and oxidation resistance. Developed in-house, FERMI was made possible by the fusion of two of the company's R&D teams, the textile division's and that of the IT division, Jeff Hsu,



Titas organiser Taiwan Textile Federation says some 34,000 visitors attended the 2015 edition of the show.

TITAS

FENC marketing manager, tells *WSA*. The FERMI 1.0 heart-rate monitoring module does not require a wet surface on the skin to pick up high quality signals and does not need to be worn close to the body for sleep monitoring, says Mr Hsu.

Lights on

Among the many light-emitting concepts on display on the booths of the trade fair, Asiatic Fiber Corporation's (AFC) LED-piping has become the company's best selling product. "Sales are increasing by 50% every year," says Nicky Hou, an AFC managing director. The company also ushered in a new series of heating pads that come in various shapes for applications in jackets or gloves.

Glow-in-the-dark materials were on display on many booths, including what AFC is calling its Night Glowing Yarn. It is said to glow for four-to-five hours continuously after absorbing light for only 10 minutes. Innovation is a key strategy, as Simon Chen, chairman of the company, declared: "Our R&D force is based in Taiwan and more than 10% of our total workforce works in this department." AFC dedicates a budget representing 4% of its revenue to research and development. So far, the company says it has obtained 32 patents for its smart fibres.

FENC's electroluminescent materials platform seeks to offer active, as opposed to passive, protection in low light conditions. It introduced TopLumins, a yarn containing luminescent particles that are added to a polyester polymer during extrusion. The smart fibre "absorbs ambient light to charge, then fluoresces under low light to dark conditions, it is highly durable and rechargeable for repeated use," the company says.

New Wide Group presented a polyurethane membrane that glows in the dark and a print that emits an orange glow. This is the result of a move to "be more creative to inspire brands," says marketing manager Derek Lan. Luminescence was also on Eclat Textile's agenda with a fabric combining a reflective and a phosphorescent print. The knitter also inverts the principle in a UV-sensitive "glow-in-the-light" print that changes colour to alert wearers that they must put on more sunscreen or move to the shade, says Eclat deputy manager Ray Tsang.

Skin-friendly innovation

First seen at Première Vision and Texworld in Paris, Camangi showcased its new Umorfil Beauty Fiber at Titas. This bio-sourced fibre contains collagen peptides that are extracted from fish scales and added to a polymer, which can be either viscose or polyester. The structure of the polyester polymer was modified to make it biodegradable. Hydrolysed collagen, a skin-friendly substance, "keeps skin healthier and makes it look younger," says marketing manager Janis Lee. Among the fibre's multiple properties, she singles out its soft hand, high moisture regain and deodorising functions, saying that it absorbs and eliminates four different types of odours. Two Taiwanese mills are introducing Umorfil fabrics, HerMin Textile in woven fabrics and Eclat in knits.



TopLumins, part of Far Eastern New Century's innovation platform, absorbs ambient light and fluoresces under low light to dark conditions.

Far Eastern New Century

HerMin Textile has chosen to focus on the viscose Umorfil yarns that it blends with cotton or Tencel. "It has the same texture and feel as viscose," says HerMin Textile marketing manager Courtney Cruzan, adding that the company is one of the few in Taiwan to specialise in natural fibre fabrics for fashion markets.

Camangi will be introducing a new yarn, Umorfil Premium, in 2016, containing ingredients extracted from oysters, which are being reintroduced into the Taiwanese coastline to reduce pollution. "Oysters absorb heavy metals such as copper and zinc and these ions will be present in the Umorfil Premium yarn," says Ms Lee. These metallic ions are said to have antibacterial and anti-aging properties, features that she says could be good selling points for multifunctional athleisure clothing.

A lighter footprint

Taiwanese companies face increasingly stringent environmental regulations, leading to renewed investments in water- and energy-saving technologies. Leading textile conglomerate Formosa Taffeta has recently acquired a plasma-finishing machine made by Belgian company Europlasma. "Plasma is a waterless finishing process that has great potential with regards to sustainability," says vice president James M.C. Lee. Formosa Taffeta has also invested in DyeCoo's waterless dyeing machines, which are "close to commercial". The

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Umorfil Beauty Fiber, introduced by Camangi and used by weaver HerMin Textile and knitter Eclat, is the result of a nanotechnology used to integrate ocean collagen peptide sourced in Taiwan into polyester or viscose fibres.

Camangi

company will be the first one to dye woven fabrics with supercritical CO_2. "Dyecoo machines currently represent 5% of our dyeing capacity, and we expect to bring that number to 20%," says Mr Lee. The company's current production capacity in Taiwan is 12 million yards per year.

New Wide Group has been focusing on solution and yarn-dyed polyester fibres that require less energy and water to produce and can be used to create mélange effects, stripes or jacquard motifs. "We have lowered our minimum quantities to boost use," says Elmas Wu, who is both vice-president of global marketing and its CSR managing director. He believes "buyers are motivated by environmental issues and seek to reduce their carbon footprint." He also mentions that the company was unable to reach its target production of recycled polyester in 2015 due to lack of supply. Currently, 40% of the company's polyester yarns are recycled and the aim is to produce 80% recycled polyester by 2018.

At Libolon, improvements have been made in the hand feel of its Ecoyaa branded yarn-dyed polyester and nylon yarns. These are now available in 21 different shades, says vice-president Chung-Ching Chang.

In a programme known as L.I.T., for Low Impact Technology, Kingwhale has developed fabrics made with a modified polyester yarn that can be processed at a lower temperature (below 100°C) thereby requiring less energy and water than conventional polyester. "This process saves water, chemicals, energy and time. The fabrics have the same wicking and antibacterial performances as traditional polyester. Colour fastness is actually better as we can achieve more saturated colours," says James Huang, Kingwhale's president of global operations. The company is also introducing its first fabrics made with recycled wool that it sources in Prato, Italy, a town that has a tradition of recycling wool garments.

By doing away with the paper substrate used for transfer printing, digital printing is another direction Taiwanese companies are taking to reduce their impact on the environment. Double Bond, a producer of inks and auxiliaries for dyeing and finishing and a distributor of digital printers for textiles, says the process reduces water use by 90% compared to traditional printing and that it releases fewer chemicals into wastewater. The company sold three printers in 2015 and expects to sell more in 2016. Digital printing is ideal for fast fashion production and short runs, Everlight deputy general manager Bruce Chen told *WSA*.

Made in Taiwan

Heard on the street markets of Taipei as well as on the Titas show floor, pride in local Taiwanese manufacturing is emerging as a new criterion of quality. "Made in Taiwan has a new meaning. Many companies have kept their R&D centres in Taiwan and though the price of their products may be higher, so is the quality," says Camangi's spokesperson Janis Lee.

Kingwhale and Chia Her take pride in producing their textiles on the island. Chia Her uses several branded fibres from Invista, offering a wide range of Cordura-wool blends, part of the Combat Wool series. The company also works with Lenzing's fibres, blending Tencel with wool and Lycra. Looking to step up its "locally made" offering, Kingwhale is in the midst of creating a joint venture with US mill Hornwood to set up a



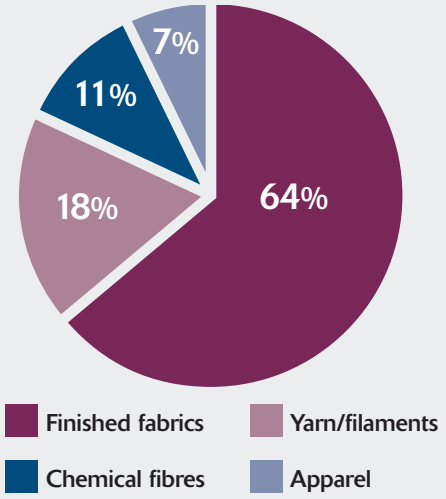
Water-repellent cotton/nylon fabric with a wax finish by natural fibre specialist HerMin Textiles.

HerMin Textile

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Taiwanese textile production and exports

Taiwanese textile exports reached $11.5 billion in 2014, down 4% compared with the previous year. Sales to the US are up, but remain sluggish to Europe. The value of textile products made in Taiwan reached TND470 billion (approx. €13 billion) in 2015.



facility in the United States. "We're bringing in machinery and our R&D," says James Huang. "Local production means shorter lead times, in addition to the marketing story that comes with fabrics that are made in the US." The challenge he sees is whether brands will accept having to pay "the premium that comes with local manufacturing".

The changing international outlook, resulting from the signature of the Trans-Pacific Partnership agreement, was a hot topic and subject of concern at the Titas show. The deal concerns 12 Pacific Rim nations, including Vietnam, but excluding Taiwan and China. While some companies feel it will not have much of an impact on their business, as Tony Yeh, from Evertex, told *WSA*, many others are stepping up their investments in Vietnam to gain access in a duty-free market to North America. Taiwanese knitter Eclat recently announced a $50 million investment to upgrade its garment manufacturing factories in Vietnam, planning to boost production to five million pieces of clothing per month.

"Vietnam is the place to be" says James Lee, at Formosa Taffeta. The company's two plants in that country currently produce 6 million yards per year, a number that will be brought to 9 million yards in 2016 to address rising demand expected from TPP. New Wide Group, another major Taiwanese textile company, acquired land in Vietnam last year in anticipation of the trade deal. "If we hadn't acted fast, the price of the transaction would have been 30% higher," says Elmas Wu at New Wide Group.

This ultimately means that Taiwanese companies will need to keep introducing new and smarter textiles to stay ahead of competition. In matters of innovation and design, the country seems to be to have fully grasped the message, as 2016 is a doubly special year for the island. This year Titas will be celebrating its 20th anniversary and Taipei will be the place to be as World Design Capital.

