The next natural fibre in line for a technical upgrade may well be cotton. From traditional suppliers to textile start-ups, many fibre and fabric manufacturers are picking up the challenge.

The performance cotton challenge

by Sophie Bramel

The comfort characteristics of cotton are well established and largely recognised, much more so than wool when it made its comeback in performance clothing. Some will remember that wool was long the preferred fibre for many sports clothes, from mountaineering to cycling and to bathing suits. Its success at re-entering the active sports clothing market may inspire promoters of cotton. The trend for natural fibres in activewear has been further boosted by a widely shared notion that they are less harmful to nature. Though the science is still out on this issue, the end of life and fibre shedding throughout their use of clothes made of cotton, or wool, may put less strain on land and in waterways.

The emergence of athleisure, now powering through menswear, has also attracted attention to natural fibres in general and cotton in particular. All these encouraging signals may have been picked up by National Cotton Council of America (NCC), which is building partnerships with performance materials and finishes. The non-profit trade organisation promotes the use of US-grown cotton (in fibre or finished product form) through the Cotton USA trademark and has taken booths at Première Vision and Intertextile Shanghai to display a new, functional face for cotton. "Our goal is to draw attention and inspire brands to innovate with US-grown cotton by suggesting these possible external technologies that can be added to cotton fabrics," CCI executive director Bruce Atherley told *WSA*.

The possible partnerships Cotton USA has promoted at these shows include Hologenix, Solucell and Proneem, to name just a few. US-based Hologenix developed a new cotton-based fabric for the occasion made in 42% Celliant, 42% cotton and 16% elastane. It is said to contain enough Celliant to deliver its performance-boosting properties while retaining the comfort of cotton and elasticity of elastane.



Pyrates places organic or Pima cotton on the outside and its patented infrared-reflecting and negative ion-emitting "vegetal protein fibre" on the inside of its fabrics. These are a part of its Pyratex Health range.

Pyrates

Chinese company Solucell has developed a technology that creates pure cotton hollow-channel yarns using a dissolving process that is not based on the traditional (and more toxic) polyvinyl alcohol (PVA). The air trapped in Solucell Air fibres is said to provide thermoregulation and moisture management properties. The company claims this is the "first functional cotton with no chemicals added".

Natural chemistry

French innovation lab Proneem is another Cotton USA partner looking to develop natural-fibre performance fabrics. The Marseille-based company has a long experience in bedding. Its main product is a neem oil-based anti-dust-mite finish, which it says is applied on 1.5 million bedding items per year. Building on this success, the company now seeks to expand into the sports and outdoor markets.

Specialising in natural additives, Proneem has identified minerals that, when in contact with moisture, generate coolness or warmth



Launched on Kickstarter in 2015 by Vancouver-based climbers Brad Spence and Taz Barrett, Boulder Denims are designed to transition smoothly from rock wall to town. The Lycra dual-FX stretch denim fabric is given a Schoeller Nanosphere finish to repel stains, liquid and dirt.

Neil Skilton

depending on the substance. "The difference felt is barely a few degrees, but that is enough to have a huge effect on wearer comfort," says company founder and general manager Nathalie Hagege. The minerals, which may or may not be encapsulated, are affixed to textiles by a proprietary process. Fabrics can be either natural or synthetic, but Ms Hagege tends to favour natural fibres such as cotton, cellulosics or down.

For more active uses, the company has developed wicking and antibacterial finishes that can be combined with its fresh-effect or thermoregulating formulae. All are based on natural ingredients, which Ms Hagege sees as essential for products worn next to the skin. "Consumer safety is my top priority," she says. At Première Vision this February, Proneem will be introducing a new talcum-based product that will address perspiration odours. "It is engineered to block a specific set of odours," she says.

Pyrates, a textile innovation start-up founded in Switzerland and now based in Madrid, also focuses specifically on natural fibres and additives. Its skin-friendly fabrics come in a variety of compositions including cotton and cashmere, as well as SeaCell, Tencel, Modal or bamboo viscose cellulosic fibres. It has even developed a patent-pending protein fibre that it claims has muscle-relaxing properties. "It is a vegetal fibre that emits infrared rays and negative ions. These produce a sensation similar to being immersed in nature," says sales and communication manager Marie Liétard-Montigny. "It activates blood flow, which brings added oxygen to the muscles and helps them relax. The negative ions are key," she adds, "as they enable the body to absorb more oxygen." Clothing made in this plant-based fibre will carry a label stating "protein fibre". But good old cotton plays an important role in the company's fabrics. "We use both pima and organic cotton that we blend with our active fibres. Cotton functions as a facilitator," says Ms Liétard-Montigny. After a successful show in Berlin, the company will be exhibiting at Munich Fabric Start this year.



Isko gives denim a new sporty twist in its Arquas sportswear platform that targets athleisure and is based on woven cotton-based fabrics.

Isko Arquas

Active properties

Turkish denim specialist Isko has expanded its sports fabric platform Arquas, which was on display at Performance Days this past November. Organised in four ranges – active, outdoor, hybrid and lifestyle – its innovative cotton-based functional fabrics offer a wide array of features from classic elasticity and shaping/compression to anti-odour, wind- and waterproofness and water repellency. Isko believes that woven fabrics can elevate athleisure. "Used for leggings, woven fabrics tend to pleat less than knits, they create a smoother and more elegant line which also masks body defects," marketing manager Sultan Baykal told *WSA*.

Some Arquas references, such as a mélange soft shell fabric with fleece back, can be stonewashed. "It looks like a knit but is actually a denim, and will withstand washes better than a knit," she says. A highlight of the collection, the Scuba soft shell, has anti-odour and antibacterial functions along with water and stain repellency.

Cotton rates high on the list of preferred fibres at Portuguese knitter Tintex. The company focuses on natural fibres and natural dyes, and also makes room for innovative uses of cork in its collections. Its brushed cotton fleece fabric with a very discreet sparkling coating has a strong athleisure aesthetic. The company also uses Marchi & Fildi's pre-consumer recycled cotton Ecotec yarns. Starting in 2018, Tintex says all of its cotton-based fabrics will be either organic, recycled or Better Cotton Initiative (BCI) cotton.

Blends with cotton are also a key target market for Invista's high-tech Cordura nylon. The company has partnered with Cotton Incorporated to offer quick drying and moisture management functions based on Cotton Inc's TransDRY finish, or water-repellency with the Storm Cotton finish. These add to the tear strength and abrasion resistance that Cordura brings to the (mostly denim) fabrics.

Breathable waterproofness

While cotton's appeal in garments worn next to the skin is natural and understandable, the fibre also possesses serious qualifications for outerwear. It is not even necessary to apply a wax or coating to make a cotton fabric weatherproof, if certain conditions are met. Developed by scientists at the Shirley Institute in Manchester, England, in the early 20th century, Ventile is a 100% cotton fabric that breathes and blocks water thanks to special spinning and weaving processes. Extra-long-staple cotton fibres are spun to form a low-twist yarn, which is then woven into a tight high-density textile. In wet weather the softly spun yarns in the tight weave texture expand and block out rain and wind. When British production of Ventile ended in the 1990s, Swiss weaver Stotz became the sole supplier of the fabric. In May 2017, Stotz was able to acquire the Ventile trademark from UK company Talbot Weaving (Chorley) Limited, and will be replacing its own brand, EtaProof, with the original English label.

"Demand is as high as it has ever been," says Daniel Odermatt, market manager for Ventile at Stotz. The fabric is available in five weights ranging from 170 to 300 gsm, all having the same level of waterproofness and breathability. The only finish applied is a "light impregnation to

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Portuguese knitter Tintex upgrades its cotton-based fabrics with UV sensitive inks or discreetly sparkling coatings with high athleisure appeal. From January this year the company will be exclusively using organic, recycled or BCI cotton.

Tintex



Denim developments are a key part of Invista's strategy for Cordura. The abrasion-resistant polyamide brings added durability to jean fabrics and can be paired with other technologies such as Schoeller's PCM or Ceraspace finishes.

Cordura

reinforce water repellency," he says. To address growing demand, weave textures have been developed, including a rip stop and organic cotton references, whose sales are up 20%, says Mr Odermatt. "When I started working for the company, the army was our main market, representing 30% to 40% of sales, this has dropped to 2% thanks to growing sales to newer brands looking for performance fabrics made in natural fibres," he adds, citing Stone Island, Klattermusen and Amundsen among its clients.

Zurich-based company Fabricated is developing a similar concept with CottonShell. The fabric has natural (PFC-free) weatherproof qualities thanks to long staple yarns woven in a tight and dense manner. The Swiss start-up is currently working with weavers in Japan, Austria and Taiwan, but says that only the Japanese fabric is commercially available. "The Austrian version is basically ready but we have not yet commercialised it. As for Taiwan, we are still in development," Marcel Geser, a



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partner in CottonShell and designer of Development Never Stops, told *WSA*. "We started working with natural fibres about 15 years ago," he says. "New technologies, blends and processes have been developed since then that help respond to increasing interest in natural fabrics."

CottonShell fabrics are made with a long staple cotton fibre woven at an unusually high thread density. "When exposed to water, the fibre swells and makes the fabric waterproof up to 800mm while remaining permeable to water vapour. These characteristics provide protection against wind and weather and make the material ideal on rainy days in the city, at sea or in the mountains," the company states.

To perfect the performance concept, seam-sealing tapes have also been developed for CottonShell clothing. "Unable to find a visually suitable tape, we developed our own made from CottonShell fabric. The adhesive we use works better with natural fibres, and this makes it possible to apply regular seam-sealing processes," says Mr Geser.

It is striking that both traditional fabric manufacturers and younger ones are focusing their efforts on what Cotton Inc has long called "the fabric of our lives". Up until now, this has been true enough for our everyday wardrobes. But the natural fibre seems to have new tricks up its sleeve that may also make it suitable for performance clothing.



Klattermusen has been a long-time user of organic Ventile fabrics. The Midgard jacket is considered a "three-season jacket" which the brand says will age well.

Klattermusen

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