

## RISE TO THE CHALLENGE: UNDER ARMOUR & CELLIANT

Sports brand Under Armour has harnessed the power of infrared energy to help athletes improve their performance and kickstart their recovery after exercise. The secret is a mineral-infused fabric developed with the help of textile innovator Celliant.

# Under Armour goes in for infrared

**T**here is no doubting the commitment of textile technology developer Celliant to get the credentials of its infrared products verified. The company, headquartered in Santa Monica, California, has been involved in a number of clinical studies with the aim of demonstrating the effectiveness of its technology; it works by converting the body's natural heat into infrared energy and reflecting it back towards the muscles in order to stimulate blood flow.

The key to this is a unique blend of naturally-occurring thermo-reactive minerals, including titanium dioxide, silicon dioxide and aluminium oxide. The minerals are ground into an extremely fine powder and added to PET to make Celliant's master batch. This is then added to liquid polyester before being extruded into staple fibre.

The minerals, now embedded within the fibre, are capable of absorbing the energy the body gives off, altering its wavelength, and re-emitting it back in the direction of the body in the form of infrared. Infrared is recognised as a vasodilator; in other words, it stimulates the dilation of the blood vessels, increasing blood flow and making more oxygen available to the body's cells. The company describes this effect as providing "more fuel for your body".

Increased blood circulation implies enhanced muscle performance, while higher levels of oxygen in the blood help to eliminate lactate more quickly, reducing soreness

*The garments are designed to increase blood flow to the muscles, allowing the wearer to perform better for longer.*

 Under Armour

after exercise. Infrared is capable of penetrating deeper into the muscle tissue. This means garments featuring this technology do not need to be in contact with the body to be effective.

### Persistence pays off

Celliant-infused fibres have found their way into items such as technical outerwear, athletic clothing and wetsuits, as well as bedding, veterinary products and furniture. This indicates that a good number of brands have been willing to accept that they have beneficial effects. What Celliant needed was more concrete acknowledgement of this fact, and its hard work to get it has paid off.

In July last year, the US Food and Drug Administration (FDA) designated Celliant-engineered products as medical devices and general wellness products as they temporarily increase localised blood flow at the site of application in healthy individuals. Seth Casden, president of parent company Hologenix, tells *WSA* that the company is glad it took the decision to work with the FDA, but says it never envisioned it would take 10 years to get this clarity. The main benefit of following this path has been that undertaking all the necessary studies has helped its understanding of the technology and its physiological effects.

The company places a great deal of importance on transparency. One of the ways it has been transparent is by making available on its website summaries of the clinical studies it has been involved in. It shows where the study was carried out, who was in charge of it, how many subjects were involved, brief results and where it was published. The most recent one involved 153 subjects, its most extensive to date. Its reasoning is that the more scientific proof it obtains to back up its claims, the more widespread adoption of



*Garments in the UA Rush collection have a distinctive hexagonal logo that differentiates them from other Under Armour products.*

 Under Armour

the technology is likely to be.

Its brand partners are able to advertise that their products can improve performance and boost recovery, leaning on the research and studies Celliant has carried out to support these claims. Earlier this year it secured its most important brand partner to date, with Under Armour releasing a range of performance apparel that features its technology.

### Big brand on board

Under Armour unveiled its Rush collection in April, calling it "the fabric version of an infrared sauna". Mr Casden tells *WSA* that the first meeting with the US brand took place back in 2009, meaning this collaboration was a decade



*Three Under Armour athletes - Stephen Curry, Kelley O'Hara and Anthony Joshua (l-r) - have worn Rush garments in training over recent months.*

 Under Armour

in the making. He says Celliant was working hard during that time to “get the science validated” in order to convince Under Armour to come on board.

Celliant is responsible for the sourcing and grinding down of the minerals to create the unique powder. It sells this directly to its brand partners, who then send it to their fibre suppliers. This is where Celliant’s role in the supply chain ends. Each brand has a licensing agreement that permits it to make products out of fibres and fabrics containing the mineral powder.

The company has not always operated like this, but it adopted the licensing model when it realised that this was the best way to make its technology cost-effective as a product, and so more attractive to potential partners. Mr Casden says this transition was not without its challenges, but insists any difficulties were outweighed by how it impacted the raw material cost. This removed a key barrier to its success on a larger scale.

All the garments in Under Armour’s Rush collection are Celliant-laced. The technology developer dictates that 42% of the fibres within a fabric have to feature its mineral mix for them to be labelled as such. Products on offer include men’s and women’s fitted T-shirts, long-sleeved shirts, leggings and tights, as well as a sports bra. They are essentially baselayers, although this is not the only application of the technology. Rush garments are differentiated from other Under Armour items by a hexagonal logo.

Several of its athletes, including basketball star Stephen Curry, heavyweight boxer Anthony Joshua and US international soccer player Kelley O’Hara have trained in UA Rush clothing in

recent months. The brand released a documentary that charted these athletes’ experiences of the range during training.

#### **Ambitious plans**

While the polyester value chain has long been concerned with how to improve the performance characteristics of its material, Mr Casden says there has never really been any thought as to how it could be enhanced to improve the health and well-being of those wearing garments made from polyester. This is where Celliant’s technology could be of use. It can also be embedded within recycled polyester fibres, which are very much in vogue, as well as within nylon fibres. He “absolutely believes” that Celliant can become a mass-market product, making reference to an ambitious goal of replacing all polyester with infrared polyester.

Currently in the pipeline is the development of infrared cellulosic fibres. The company is working with a number of partners on this project, which may come to fruition within the next year. It expects performance clothing and sleepwear to continue to be its most important markets.

From a testing point of view, the next challenge is to secure recognition of the technology’s benefits for non-healthy people. The FDA’s previous determination only classified Celliant products as a medical device and general wellness product for healthy people. It now hopes to make progress in the “wider healthcare space”. An example Mr Casden gave was those suffering from diabetes, who might benefit from the increased blood flow that its products have been shown to stimulate. It is engaged in FDA-focused clinical trials to this end. 