RISE TO THE CHALLENGE: OUTLAST-KELHEIM FIBRES

Thick viscose fibres cut short may not be the ideal vehicle for phase change material (PCM) in many garment applications, but partners Outlast Europe and Kelheim Fibres have found that these fibres work well in combination with down in a new fill product, Universe. The key is being able to pack in higher quantities of PCM.

Partners show that PCM is fill-friendly

Temperature regulating phase change material (PCM) manufacturer Outlast Technologies has launched a new performance filling material, Universe. The new product is made from 30% heat- and moisture-regulating PCM viscose fibres and 70% down, and is suitable for use in apparel as well as in applications such as bedding.

Viscose fibres in Universe are short cut, 10 millimetres in length, with a density of 7 decitex; Outlast said at the time of the launch in late 2014 that it chose thick fibres with a high diameter deliberately to guarantee a high loading of PCMs. Martin Bentz, managing director of Outlast Europe, says the performance compared to a standard PCM viscose fibre is four times higher. He also states that combining the fibres with down proved to be a difficult technical challenge, but was overcome when Outlast worked with an existing partner, German viscose producer Kelheim Fibres.



German fashion brand Bugatti will be the first to offer down jackets with Universe fill. For summer 2015 it will offer three different styles in four colours; these jackets are already reaching retail stores. For next winter, there will be five different styles in two different fabrics and nine colours in total.

Bugatti

Need for partners

"We began working with Kelheim a couple of years ago," Mr Bentz explains, "on a project to integrate microcapsules of PCM into fibres. We developed those fibres together and, under the agreement we reached, Kelheim only produced the fibres for Outlast for us to sell to spinners." He explains that Outlast depends on partners because, although it owns more than 100 patents, it focuses on being a technology and marketing company and needs partners to help it bring its products to market.

In the case of Universe, the idea was all about developing a thicker fibre, into which it was possible to pack more PCM for the fill market. "When we first looked at this, we began with an acrylic fibre," says Mr Bentz. "Acrylic is good for blending with wool and other fibres, but it has some limitations and we widened the search, with viscose as one of the targets. Kelheim is only two-and-a-half hours away from our European headquarters [in Heidenheim an der Brenz], so it was easy for us to meet and talk about this. Our technology groups got together to continue the discussion and it only took nine months in the end for us to develop this." Part of the development involved early tests carried out by a knitter and a spinner.

Completely new field

Universe is "a completely new field" for Outlast's PCM fibres in terms of its end use. Outlast has been used in jackets before; finished garment brands and manufacturers have long been attracted to the high levels of heat and moisture management that the product can offer. It is not a wicking technology, which manages moisture by reacting to sweat and pulling it away from the skin. Instead, Outlast, as an adaptive technology, "proactively manages your skin temperature", the company claims. The phase change materials absorb and store heat as the body warms up and releases the heat back to the body when it cools down. It is like ice in a drink in that it absorbs heat and keeps the drink at the desired temperature for a longer period of time. In the same way, PCM absorbs excess body heat, manages moisture, and reduces overheating, chill and perspiration. But a difficulty with earlier attempts to put PCM into jackets is that the coating used to help protect the fibres from rain and snow added weight. In these days of warmth not weight, this has made some outdoor clothing brands think twice about incorporating the technology into their jackets.

Price advantage

With Universe, Outlast believes these brands will now have a good alternative. Research and development director, Volker Schuster, explains that what is different about using PCM in a fill product is that all the fibres inside together form "a huge surface", and the fibres allow air to flow around them. "Therefore every fibre can react very quickly to temperature changes," he says. "Since the airflow is increased, it allows the PCMs to be more active."

Demand for Universe should be strong, Kelheim and Outlast believe, because demand for down remains high in outdoor apparel (prominent brands that were shouting loudly and proudly about down jackets at the start of 2015 included Colmar, Columbia, Montane and Bergans of Norway). "It is still very trendy," Martin Bentz confirms, "and prices are going through the roof. We are certain that blending down with PCM will give brands the stability they need but also a price advantage." He points out that 30% is the minimum proportion of PCM for the technology to take effect. During the development stage the partners tried various blends. One issue that emerged was that, after washing, there was a separation of down and the other fibres in the fill. These were the factors that made the task of identifying the right staple length, the right proportion of PCM, the right finish and so on such a technically challenging one.

A science in itself

Mr Bentz insists that Outlast has no intention whatsoever of going into the down business itself. "We don't want to," he says. "We're no specialist in down, which is a science in itself. What we do is offer our product, either directly to brands or to supply chain partners of theirs who carry out the work of blending the PCM with down."

The first clothing brand to have taken part in this project as a development partner was German fashion brand Bugatti, which has jackets containing Universe fill going into retail in the first months of 2015. Beyond that, there has been what Martin Bentz describes as "plenty of interest" from outdoor companies, especially ski brands and he thinks that sleeping-bags and fashion jackets are other likely application areas. "There has been huge interest from customers that I have seen directly," he states, "because if you look across brands, all the down jackets look very similar and it's hard for brands to differentiate themselves. Universe is going to give them an opportunity to differentiate, on cost and on performance. They can have all the performance benefits of the adaptive technology, all of the back-story, including the detail of the early developments for astronauts, which is still seen as interesting and forward-thinking and has a positive image globally, as well as the cost benefit. The story is always the same: it's better for the body to cool down before sweating starts. Universe is simply a new way of doing this."



Viscose fibre produced at Kelheim Fibres.

Kelheim Fibres