NEWCOMERS: PRIMALOFT BIO



High-performance materials developer PrimaLoft says it is "setting sustainability forward" with the creation of a biodegradable fibre suitable for use in performance fabrics and insulation.

Biodegradable fibre 'redefines' sustainability

The question posed was "what happens to our materials at the end of their usable life". Put simply, they degrade with the help of microorganisms, but it takes a long time — could they be made more appetising with the addition of a 'food source'? After four years of development work, it appears that the team of scientists and material engineers at PrimaLoft has found a way of getting microorganisms to look upon its fibres as a better food source than other man-made fibres

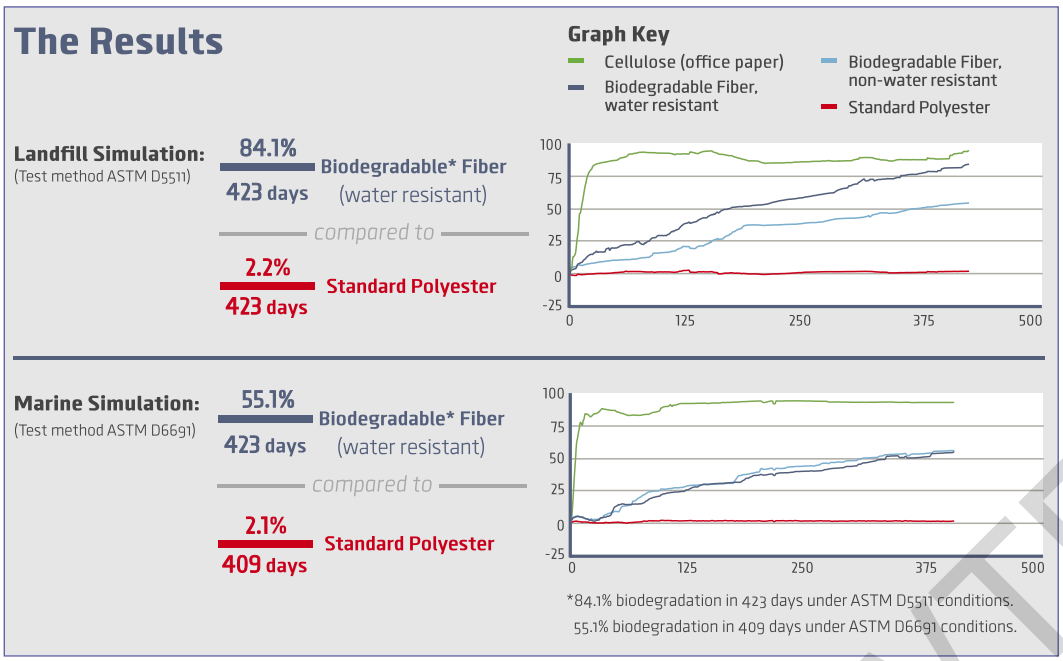
In pursuit of its policy of enhanced sustainability — the company's slogan is 'relentlessly responsible' — at the OutDoor show last June the US insulation, yarn and performance fabric manufacturer unveiled its first insulation products made entirely from post-consumer recycled content or PCR. It is aiming for 90% of its products to have at least 50% PCR content by 2020. But the company has decided this doesn't go far enough.

Its new 100% recycled biodegradable fibre is called PrimaLoft Bio and is set to make a positive impact on the outdoor sector with insulation and fabrics made from it. The timing of its introduction could not have been more appropriate, as the issue of microfibre pollution of the oceans is getting increasing attention from mainstream media and consumers. President and CEO Mike Joyce tells *WSA* that it does not really matter how or why microfibres end up in water streams, but what matters is that they do and a solution is urgently needed. This was the starting point for the development of the new fibre, which has

PrimaLoft Bio goes beyond the use of post-consumer recycled material.

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An independent testing laboratory has helped PrimaLoft verify and quantify the biodegradability of its new fibre.

PrimaLoft

been primarily designed to deal with the microfibre shedding that occurs when a garment is washed during its normal lifecycle.

"With PrimaLoft Bio, PrimaLoft is leading the charge by redefining what sustainability really means," Mr Joyce said. "Recycling is a good start but we are intent on providing an even better answer to the environmental issues facing our industry."

New horizons

After an initial announcement at the end of October to launch PrimaLoft Bio fibres for insulation, it followed this up a few weeks later with the presentation of a performance fabric made from the same biodegradable fibres. Mr Joyce explained that the company had always considered fabrics to be "a particularly important part" of its biodegradable materials development. His justification is that by creating a biodegradable fabric to go with a biodegradable insulation, it has opened the door to the possibility of a fully biodegradable garment. He believes its Bio represents "a new horizon" for a textile industry that seems intent on becoming more sustainable.

What makes the fibre more biodegradable than standard polyester

The OECD definition of biodegradation is: "the process by which organic substances are decomposed by microorganisms into simpler substances such as carbon dioxide, water and ammonia." PrimaLoft has used a proprietary technology to "enhance" recycled polyester fibres so they are more attractive to the naturally-occurring microorganisms found in anaerobic environments (where there is no free oxygen), such as those that can be found in landfill, and in ocean water, where oxygen is present.

"It's really about what type of microorganisms you are attracting," Mr Joyce says. Although the microorganisms present in landfill are different to those found in ocean water, the company has managed to find a substance that is attractive to all of them, or "a common food source" as the





PrimaLoft Bio is suitable for use in insulation products and in performance fabric.

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company's CEO describes it. The addition of this substance to the recycled polyester polymer encourages the microbes to eat away at the resulting fibres at a faster rate, reducing their potential impact on the environment. The biodegradation process leaves behind water, methane, carbon dioxide and biomass in the form of expired microorganisms and organic waste.

The Bio fibres will only biodegrade when they come into contact with the microorganisms found in landfill or in ocean water, so they remain durable through the lifecycle of a fabric or insulation. Furthermore, the process does not affect the performance characteristics of the insulation or the look and feel of the fabric. Mr Joyce says one of the biggest challenges it faced was to ensure that the fibres could stand up to "the rigorous process of manufacturing fabrics".

Testing transparency

PrimaLoft has been extremely transparent when discussing its latest innovation, releasing test data that clearly indicates the methods used and the rate at which the fibres biodegrade. As Mr Joyce explains: "It is very important for us that we are very transparent in terms of the testing. We are the first ones into this space, so we want to make sure we are highly responsible. This is why we have shown which test methods we use, how many days testing [have been carried out] and the percentage of biodegradation."

All testing was carried out at a certified laboratory using American Standard Testing Methods (ASTM), as it was important to use an independent lab.

In test conditions simulating an accelerated landfill environment (test method ASTM D5511),



PrimaLoft hopes to have 90% of its products having at least a 50% PCR content by 2020.

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the fibres showed 84.1% biodegradation in 423 days. This compares to 2.2% for standard polyester fibres. In simulated marine conditions (test method ASTM 6691), the Bio fibres showed 55.1% degradation in 409 days. In comparison, the figure for standard polyester fibres was 2.1%.

'Unheard of' recognition

Mr Joyce tells *WSA* there has already been "tremendous" demand for PrimaLoft Bio, and stresses his belief that sustainability is now a requirement, rather than an additional value for manufacturers and brands to consider. The company is working with a number of brands that share its "vision of sustainability".

The primary use for the fibres is expected to be in outdoor products, but there has also been interest from lifestyle and fashion brands. The outdoor sector has tended to lead the way in terms of sustainability, Mr Joyce says, and this is likely to be the case again when it comes to the early adoption of PrimaLoft Bio.

A real coup for the company came in November when its Bio invention was named product of the year at the inaugural Outdoor Retailer Innovation Awards, handed out on the first day of the Winter Market in Denver. Mr Joyce says the company is "thrilled" with this recognition, adding that it is rare for an ingredient brand like PrimaLoft to be a finalist for this type of award and that winning is "unheard of".

He believes the award "reflects how this technology is being accepted". It has given the company even more motivation to move it forward. Several companies have expressed an interest, including those it already works with as well as some potential new customers. Beyond the outdoor, lifestyle and fashion brands, there have been enquiries from fibre manufacturers and from the home furnishing sector.

He admits he "underestimated" how much demand there would be. He suggests that with microfibre pollution and sustainability currently high on the agenda of those within the outdoor and clothing industries (consumers as well as brands) it is simply a case of the right solution being brought to market at the right time.

The company expects PrimaLoft Bio insulation and performance fabric to be commercially available from autumn 2020. It is working with what Mr Joyce calls "co-contributors", including shell manufacturers, liner manufacturers and other component suppliers, out of a desire to create garments that are completely biodegradable. He says: "We want to be able to supply our brand partners with a complete solution so that they can adopt it more readily. If we do that, we will be able to make an impact."

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