



The tide turns

Finisterre's first recycled wetsuits

By Chris Remington

For cold water surf brand Finisterre, small incremental changes have paid off massively for a company that, in just 16 years in industry, has established a new sustainability benchmark within its line of work.

The adoption of a plant-based neoprene, R&D focused on non-chlorine based fabric treatments, the utilisation of 'marine-safe' bags, and charitable donations to the fight against microplastic pollution are all actions that have helped add fuel to the fire of a company continuously navigating best practice.

This focus on the minutiae of manufacturing was typified with B Corp accreditation last

year, as the company celebrated its 15th birthday.

Even then though, founder Tom Kay, spoke frankly of his aspirations for what's next for the firm and, ultimately, the industry. Speaking with *Ecotextile News* 18 months ago, he said "There's a real problem [with wetsuit recycling] and we as a brand have an outlook to try and solve that problem. As much as we

In 2018, Finisterre launched a 'Microplastics' collection, with 10% of profits donated to Surfers Against Sewage.

▼ A neoprene crumb is typically tainted by other fabrics.



can, as a relatively small business, we have put the players in place to deliver a solution and who knows where it will lead?"

Here

Over the past two years, Finisterre, along with partners from the Wetsuits from Wetsuits (WFW) programme at the University of Exeter (UoE) and Innovate UK's Knowledge Transfer Partnership (KTP), have been able to develop a method of creating recyclable wetsuits, having overcome two core challenges.

The first challenge is common to the broader textiles industry, and refers to the utilisation of multiple materials which need to be separated to be recycled. At present, a rubber crumb mixed with remnants of both the inner and outer



layer of a conventional wetsuit is all that the industry has mustered up. This, yielding little value for a firm looking to repurpose old stock.

The second complexity of wetsuit recycling comes with the nature of the material's construction. A thermoset rubber, neoprene is built on a series of cross-links which enable the material to snap back into position when stretched. This linking of polymers, however, means that the material cannot be melted down, as a plastic would, without degradation. With this in mind, Finisterre looked to establish a means to push on and, stating its intention, first appointed full-time wetsuit recycler, Jenny Banks, whose previous studies had focused on sustainable material design.

"Before I joined the WFW team, I knew nothing about wetsuits, but I was able to apply the sustainable design processes I'd developed during my MA (masters' degree) to the challenges we face with wetsuits," she told *Ecotextile News*.

"I actually think that coming in with no prior assumptions about how to design a wetsuit, has been a real advantage," Banks continued. "Finisterre brings commercial know-how and of course, knows our customer inside out. The UoE's role brings credibility to our work by enabling us to back up our design decisions with concrete, scientific evidence. After discussing numerous options, we decided that the Innovate UK KTP scheme was the most appropriate."

Beneath the surface

Finisterre and its partners have come on leaps and bounds in search of a solution. A turning point was that of research which highlighted similarities in performance of a smooth skin neoprene comparative to that of the material coated with both a thermal inner lining and an outer lining.

A graph (right), which depicts the average stress values for different wetsuit surface finishes, when elongated to 200 per cent strain, highlights that a smooth skin neoprene foam exhibits similar characteristics to that of a foam between two layers.

In fact, it was discovered that the inner lining, traditionally a terry-loop knit made from a synthetic

material or merino wool, does little to improve the elasticity of the wetsuit, whilst the outer lining actually detracts from the rubber core's elasticity.

On the contrary, a smooth skin neoprene forms an outer skin of its own during the manufacturing process, forming an effective seal to the foam at no detriment to elasticity. As such, the basis for development work has been based solely on this concept.

Already, the team has created an alternative adhesive to bond the garment where needed. As opposed to a glue and blind-stitched (GBS) seam, recognised for its durability in practice, Finisterre and its partners have created a stitch-less seam – as the isolated use of neoprene inhibits the need for **1**

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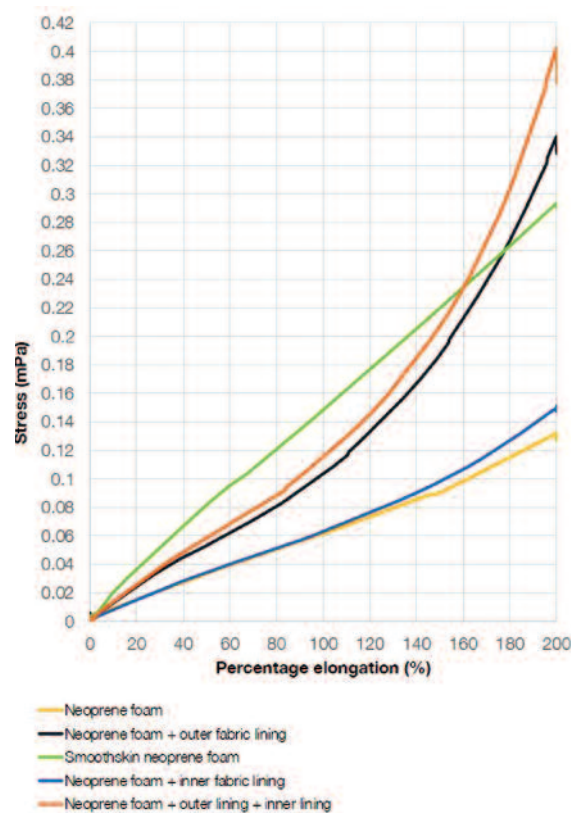
tonnes of old wetsuits are landfilled each year in the UK. (Source: Surfers Against Sewage)

500,000

surfers in the UK. (Source: Cornwall Alive)

£495

annual surfer expenditure. (Source: Cornwall Alive)



stitching – which, notably, is stronger than the standard free-diving seaming process.

Focus must now turn to the efficiency of the recycled wetsuit, having thus far conducted preliminary assessments.

“This may include more thorough ‘live’ testing of the prototype suit and next iterations, with a wider test group as well as further investigations into how to incorporate recycled content into the next generation of products,” Banks suggests. “We’re also supporting the ‘live’ testing we’re doing with a more controlled lab test using a thermal rig that we’ve been building at Exeter University over the last four to five months.”

Founder Tom Kay (pictured) took part in initial trials, wearing a temperature monitor whilst out surfing. The corresponding graphs again indicate similarities between a smooth skin and fully-lined wetsuit in relation to thermal protection. Across body parts like the upper arm, lower leg and abdomen,

▼ Founder Tom Kay tests the new recycled wetsuit



temperature decreases over time mirror one another.

A greater difference can however be seen across the thighs, lower back and chest, highlighting that a thermal inner lining in particular can increase body temperature by as much as 2°C; but as Kay insists: “The recyclable suits are still being tested and we’ll soon move onto the next prototype.”

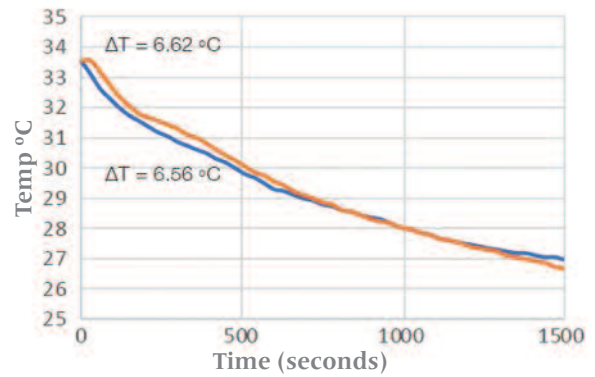
A new wave

With the efficacy of its concept proven, Finisterre has broken new ground in a sector that can be accused of not riding the broader industry’s sustainability wave. Albeit not of the performance the brand would demand, the groundwork is complete, and improvements are there to be made.

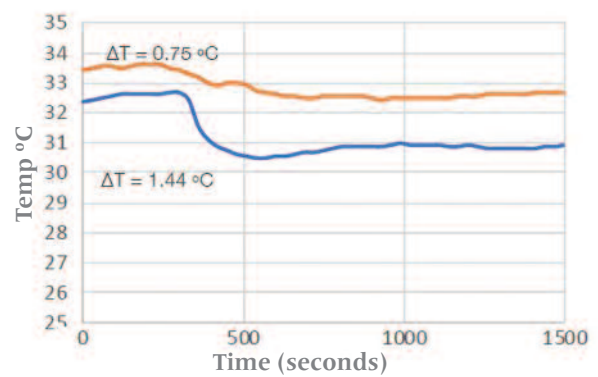
Perhaps more importantly, the company has established an infrastructure through which it can now recycle these products, with Banks telling us of two UK-based recycling partners that it will work with.

“We are currently focusing on our work with our chemical recycling partner, RenewELP, because their process also has the capability of taking existing old wetsuits from any brand, as well as our recyclable one. We’re excited about being able to offer our upstream solution but also want to offer a downstream solution to tackle those wetsuits that are already out there gathering dust.” The company is in calm waters, but this is not reflected in the tenacity with which it’s hopeful of transforming the broader sector. ■

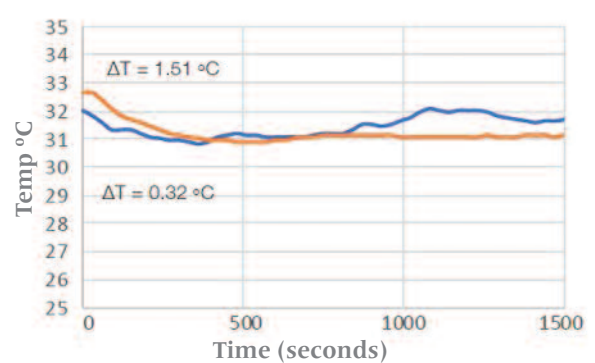
Lower Leg



Chest



Abdomen



Upper Arm

