RISE TO THE CHALLENGE: SPEEDO AND AQUAFIL



Speedo USA has become the first brand to use a technique developed by two universities and pioneered by Aquafil that can recycle swimwear scraps into usable fabric.

In at the deep end

Each year, manufacturers produce 70 million tonnes of fibres and this is forecast to reach 90 million tonnes within a few years, Aquafil's CEO tells us. "At the end of their lifecycles, they finish up in landfill, burnt or, at best, incinerated to make energy," says Giulio Bonazzi. The Italy-based yarn maker believes a better approach is to take little as little as possible from the earth and recycle as much as possible. "This is the principle that inspires us and the entire Econyl system."

Aquafil's Econyl nylon regeneration process has recycled thousands of tonnes of nylon 6 since its specialised plant was inaugurated in Slovenia in 2011, turning old fishing nets and carpets back into reusable fabric used for brands including adidas, La Perla and Koru. But until recently, it had not been possible to recycle swimwear, because of the difficulty in separating nylon from spandex. Aquafil enlisted the Georgia Institute of Technology in the US and the National Institute of Chemistry in Ljubljana to help with the research. "After intense research over several years we arrived at the conclusion that in our plant, under certain conditions, it is possible to separate the two materials and recycle the nylon 6 component," Mr Bonazzi explains.

For Speedo USA, the development coincided with a search for more environmentally friendly materials. "We explained to our fabric vendor that we really wanted to be able to recycle the fabric but we knew it wasn't possible, and they told us that Aquafil had just discovered how to do the process and were interested in partnering with a brand," says Kristine Lebow, Speedo USA's director of merchandising and design.

Speedo's PowerFlex collection uses nylon 6 that has the same properties each time it is regenerated.

Speedo USA



The companies met to discuss the partnership and to arrange with Speedo's supplier factory in China to bag the offcuts from the cut-and-sew process. These are sent to a warehouse and readied for the journey to the processing plant in Slovenia. However, as the scraps are classed as waste, they face onerous red tape under the same classification processes as hazardous chemical waste. "I respect the fact that you wouldn't want to bring one landfill in China to another landfill in Europe, but if you want to recover the nylon 6, we have to bring back the scraps," says Mr Bonazzi. "The same rules apply to all waste, so this bureaucracy in Europe is very difficult to deal with." A separate classification would be a more sensible solution, he suggests.

The shipping and processing invariably incur costs, which Aquafil mainly absorbs. Speedo's director of product development, Masami Shigematsu, says there is a balance to be achieved between environmental considerations and cost considerations. "The benefit is that instead of buying the chemical derivatives from petroleum to make nylon, Aquafil is taking the scraps, so it's a different kind of cost," she explains. "Normally they were taking huge fishing nets or carpet remnants, so those costs are already factored in."



Giulio Bonazzi, Aquafil's CEO. The Italian company celebrated its 50th anniversary in mid-October.

Coser

Depolymerisation

The scraps arrive in Ljubljana and enter the reactors to begin the depolymerisation and purification processes. The separated spandex and dyestuffs remain at the bottom of the reactor and are extracted, but Aquafil has two research projects under way, hoping to make use of the leftovers. The first is looking at using the waste to generate energy, while the second concerns separating the dyes and possibly regenerating them for future use. "We have made some very preliminary work on this with a university in Trento, Italy," explains Mr Bonazzi," but it's very ambitious and we are just at the beginning of this."

The separated nylon is extruded and made into new yarns. The resulting product is a polymer with the same technical and quality characteristics as the original and which can be regenerated an infinite number of times, which is good news for Speedo. "Generally when you recycle fabrics such as polyester it degrades a little bit so it's not exactly the same product, but this is a regeneration process so it leaves the same fibre that they started with," explains Ms Lebow.

Consumer demand

The system is tapping into a growing consumer awareness about recycling and pollution, and recent publicity surrounding ocean waste has struck a chord. Adidas gained mainstream media attention over the summer with its tie-up with campaign group Parley for the Oceans, raising awareness about ocean pollution, and surf brand O'Neill signed up in mid-October. A big source of nylon 6 for Aquafil comes from 'ghost' fishing nets that kill millions of fish and tens of thousands of seals, dolphins and sea birds per year, and the company is part of the Healthy Seas initiative (*WSA* September/October 2015 and November/December 2013). Aquafil's sorting factory uses near-infrared rays to detect the polyamide and determine which nets are usable – only nylon 6 has the ability to be broken down and rebuilt – the rest is sent elsewhere for processing. These nets are added to the carpets and swimwear and broken down to create the new yarn, which is ready to be blended into new fabric.

"Some of our consumers swim in the ocean and there's a lot of news about just how many plastic microparticles are in the ocean, and nets are one of the primary sources for Aquafil to get their nylon," says Ms Lebow. "A lot of our consumers are young as well as very active, and there is a whole new ethos coming out of that generation. They're looking for products and to support companies that take environmental factors into consideration. It's an interesting time."



PowerFLEX Eco Women One-Piece and PowerFLEX Eco Men Jammer will be available to consumers in January.

Speedo USA

PowerFLEX Eco

Speedo's PowerFLEX Eco swimwear fabric collection is comprised of 78% Econyl nylon and 22% Extra Life Lycra. The highly durable fabric retains its shape up to 10 times longer than traditional swimwear fabrics and is resistant to chlorine and sagging, says Speedo. The range was launched at Salt Lake City's Outdoor Retailer in July and is offered in styles for both performance and fitness swimmers..

Ms Shigematsu hopes the initiative can be expanded to cover more of Speedo's products. "This is our test and it was a test for Aquafil so as it progresses, we'd like to expand it wherever we can. It would be interesting to see what we can do in the future with polyester as well. We're always looking at a lot of different things."

She said the aim will be to encourage other brands to join in. "Aquafil was impressed that we were on board since the conversation started and we have a great factory, so it's a multi-company global initiative and that's exciting because I think the future of manufacturing is to appreciate your supply chain, to work together."

Mr Bonazzi adds that the waste transportation procedures are becoming more standardised as the project progresses.

"Once you respect the procedures, the process gets simpler," he says. "Communication and knowledge are making life easier. Speedo came on board with a lot of enthusiasm and to have companies like them is essential to increase the growth of these kind of ideas, which can be quite challenging, especially at the beginning."

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