INNOVATORS: ANKE DOMASKE

The search for a skin-friendly fabric led QMilk's German founder to casein, a product whose uses are multiplying the more she researches.

Milking the benefits

On the night German company QMilk won the GreenTec environmental award for 'production', founder Anke Domaske was presented with an unusual proposition. Ukrainian boxer Wladimir Klitschko was seemingly so inspired by the milk-based textile that he suggested a collaboration. "It was a great night," she says, of the Berlin-based event. "The BossHoss told me they are dreaming of shirts made of milk and Klitschko had a vision: boxing gloves made of QMilk fibre."

While the fabric might not be yet suitable for the boxing gloves, it could be used for a bag to put them in. The material exhibits a soft handle and antibacterial properties that lend themselves to soft-flowing fabrics.

The antimicrobial properties are what first attracted Ms Domaske. When her step-father developed a reaction to some clothing while he was undergoing treatment for cancer, she began to search for textiles that wouldn't irritate his skin. "I was looking for untreated clothing and couldn't find any," she tells us. With a Masters' degree in microbiology, she was sure there would be a solution in nature. "I have always been inspired when people tell me something doesn't work. It makes me want to try it out for myself, and if it doesn't work, at least I tried."

She began to research a way to create a spinnable fibre from casein, a major component of cheese, without adding too many chemicals. *(WSA March/April 2012.)* The casein proteins appear once milk turns sour, and it has been used as a material since the late 1800s. Milk-based products ranged from buttons made of Galalith, a material formed by the interaction of casein and formaldehyde, at the turn of the 20th century and marketed as a plastic substitute, and clothing popular in Europe before the Second World War. However, the subsequent rationing of milk led to dwindling supplies and developments were sidelined. They have since been resurrected by Chinese manufacturers and Italian spinners, but Ms Domaske was interested in a new way of production that requires very little water and fewer chemicals than standard production.

She started from scratch, buying blenders and thermometers from a local supermarket. She enlisted the help of the Bremen Fibre Institute for small-scale trials until the fibre was suitable to upscale. The raw material is delivered in powder form from around Germany, made from milk deemed unfit for consumption – around 200 million tonnes of which are disposed of annually in Germany alone. Water and other natural ingredients are added to form a pulp, which is processed at around 80°C and pushed through a spinneret to form the fibre.

Initial trials produced a fibre with a yellowish tint, but by the end of 2013, the fabric was such that she began to secure investment and interest from brands and retailers. They moved into a factory at the start of last year and started larger-scale trails in April 2014.

"We can now adjust the installation to meet the requirements of our partner companies," she explains. "Qmilk combines the advantages of silk and wool, and combines well with wool. It's antibacterial, flame retardant, temperature regulating and chemical resistant."

Other users

The trials resulted in some unexpected benefits. When technicians handling the fibre commented on the smoothness of their hands, they realised it could also be beneficial in cosmetics, and QMilk launched a line of face creams last August. It is also being trialled in sectors such as packaging, technical components and bioplastics, using a granular form of the recipe. The team is working with the electronics industry to produce biopolymers, harnessing the product's natural flame retardant and electrically isolating properties, and the automotive industry has expressed an interest in using the products for upholstery.

Judges of the The GreenTec Awards were impressed with the company's zero-waste process, and the fact it can produce a kilo of biopolymer in five minutes by consuming only two litres of water. QMilk also collected the prize for Bio-based Material of the Year at the recent International Conference on Bio-based Materials in Cologne, and it has taken home a raft of other prizes from various German and international bodies.



Fashion designer and former microbiologist Anke Domaske has created a formula for using spoilt milk.
QMilk

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There are now more than 700 companies interested in using the fabric. "We are about to run the first trials for sports brands as well as underwear companies, work wear, bedding and technical textiles," she says. She has showcased the possibilities for apparel in her own label, Mademoiselle Chi Chi, which has been worn by celebrities including American actresses Mischa Barton and Ashlee Simpson.

The focus now is on improving the stability and standardising the quality, so as to make it viable on a larger scale. The company is operating a two-shift system with a team of 20 and is running at a capacity of 1,000 tonnes per year. "We want to stablise production; this will be the focus of the next two years. And then to get our products out to the consumer."

She feels the increasing demand for textiles in general, and skin-friendly ones in particular, means the company has a role to play in the market. "There is already a gap of six million tonnes per year. Even when textile production capacities increase, the gap cannot be filled due to the rising population and the increasing use of textiles in the technical field," she says. "I haven't experienced any of my material's limits, and that's what makes it so much fun, because we've created something totally new."



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