

The skin, as the largest organ humans have, has always attracted its fair share of ailments. Some—baldness and dandruff are both skin diseases, you know—we worry about out of vanity. Others are far more serious.

Health and wellbeing: fabrics and fibres fight the good fight

Cases of skin allergies and conditions such as eczema are becoming ever-more prevalent partly because, some experts believe, we are far less tough than our forebears: we require warmer living conditions and put carpets on our floors; we wash much more frequently and use creams and lotions with abandon. It's also true that, with increased awareness, people now expect to receive treatment for rashes, cracked skin, redness, swelling and other symptoms that they may, in the past, just have put up with.

This brings us to the main point of this article: the textile industry has an important role to play in helping people have healthier skin.

Austrian fibre manufacturer Lenzing has a good track-record in this area and deserves a mention here. A year ago, it released details of medical research that showed the benefits to sufferers of a number of skin conditions that come under the broad umbrella-term of dermatitis of using clothing and bedding made from its Tencel fibre. Studies into this, in Asia, North America and Europe, continue, and so do the impressive results.

The company has a clear vision of what it must do to keep bringing to market a product that will benefit public health. Heinrich Firgo, the company's business development and innovation manager, says: "We simply have to continue following the same botanic principles as nature. Our raw, natural material comes from the cool and relaxing environment of forests and woods. We use the pulp of beech trees to make Modal and that of eucalyptus to make the Tencel that has featured in the medical studies. Both trees rejuvenate on their own and don't even need replanting. So it's a closed-loop system; it uses photosynthesis (to absorb carbon-dioxide and release oxygen) and has water-



Lenzing believe Tencel offers natural performance as well as encouraging skin health.

 Lenzing

management and sustainability built into it."

Lenzing's contention is that its natural approach to things will make its fibres naturally healthy. The eucalyptus forests that are at the source of the Tencel fibre use no pesticides and involve no genetic manipulation of the plants; they also take up less land and consume less water than cotton plantations.

Mr Firgo insists that genuine medical applications will be an expanding area for Tencel. He believes hypoallergenic clothing will become commonplace and that Tencel will have a big part to play.

People these days take better care of their skin and will not simply put up with rashes, dryness, cracked skin or other uncomfortable conditions. They expect a solution



Not only natural

More recently, it has become clear that Italian manufacturer Aquafil is walking the same road, but in this case flying the flag for synthetic fibres. Its Dryarn product, a wholly synthetic polypropylene microfibre, recently won the right to call itself 'skin-friendly' after an exhaustive scientific study and Aquafil is claiming that Dryarn the first man-made fibre to achieve this.

Skin specialists at the University of Modena carried out an extensive set of analyses on Dryarn. The tests took place over a period of 12 months and in three phases. In the first, small samples (patches of around two square-centimetres) of 18 individual substances, including dyes and chemicals, that Aquafil uses in the construction of the fibre were placed in direct contact with the skin of 200 men and women with no history of skin problems. The clinicians satisfied themselves that none of these components was likely to cause irritation to healthy skin.

Next, they applied similar-sized samples of Dryarn itself, to see if problems, that failed to materialise when the component parts were in isolation, might appear as a result of putting them into the finished fibre together. Again, the tests showed no damage to subjects' skin.

At this point, the team from Modena turned its attention to people who were suffering from skin complaints and asked them to take part in a trial of finished garments made from Dryarn. All of the people who took part were adults, suffering from complaints such as erythema (redness and irritation that occur in reaction to some medicines, and sometimes to hair-removal treatments) and xerosis (dry skin).

They each received a supply of sleeveless, long-sleeved and short-sleeved tops to wear during the day, and of pyjamas to put on at night—all made from Dryarn—with sufficient changes for them to wear the samples non-stop for one month. It is this third phase of the study that came to an end recently and it's fair to say that Aquafil is excited by the results. All of the patients who took part gave a positive response with regard to comfort and a medical team from the university confirmed that examinations at the end of the trial showed considerable improvement in their skin conditions.

Aquafil's marketing and communications manager, Nathalie de Marco, says plans are in place now for partner organisations to make baby-vests specifically for infants with dermatological problems and that other healthcare applications of Dryarn, based on the findings of the study, are certain to follow. And one advantage she feels users of garments made with her company's fibre will have is that a whole range of colours will be open to them, instead of only the off-white of unbleached cotton and

other natural fibres that many skin-ailment sufferers have had to limit themselves to up till now. Dryarn is coloured at source, as part of the manufacturing process, and all the dyes Aquafil uses at present featured in the Modena study and came through—with flying colours.

Built-in solutions

This last point indicates an advantage that manufacturers of synthetic fibres have, for many years, claimed to have. At Nilit, an Israeli fabric manufacturer, marketing manager, Oded Breier, argues that her company could have a role to play in addressing health issues for the simple reason that it can build any functionality clients want into the polymers it makes.

Health and wellbeing feature already on the Nilit landscape. Important clients such as Jockey US and Victoria's Secret are using its fibres to add antimicrobial capabilities to their underwear ranges—Jockey in men's underpants and Victoria's Secret in bras and in the gusset area of women's briefs. "You can



Fabric manufacturer, Nilit, consider health and wellbeing issues when applying polymer functionality.





Cases of skin allergies and conditions such as eczema are becoming ever-more prevalent.

add antimicrobial treatment to a finished garment," Mr Breier explains, "but after around ten washes it's gone. Add it to the polymer instead and you can offer antimicrobial or any number of other health and wellbeing benefits for the lifetime of the garment."

Those on the natural side of the fibre debate can only counter this argument by finding substances in the wild that provide health benefits naturally and weave them into fabric. Luckily for them, health effects sometimes come to light, if not exactly by accident, then as a side-benefit.

Shell-shock

The inventor of Cocona, a fibre made from the shells of coconuts, Greg Haggquist, had been working on ways of improving printing technology. He found out that coconut shells were being used in water- and air-filtration systems because the wood—hard and porous, so especially suitable for these applications—turns into activated carbon. From here, he developed the notion to put activated carbon into fibre and the result is Cocona.

He, and developers, TrapTek, were immediately delighted with the way fabric made from the fibre dried quickly and controlled odour (molecules of substances such as butyric acid and trimethyl amine that cause body odour are just the right size to fit into the coconut shell's pores at ambient temperature and to wash away from there during laundry and drying cycles). However, it turns out that Cocona's carbon content can also protect wearers against ultraviolet radiation, to a sun protection factor (SPF) as high as 50.

This quality, which addresses a prominent and growing health concern in many parts of the world, has already proved attractive to sports and outdoor apparel brands. In golf especially, several big names—including Cutter & Buck, Oakley and Ping—have looked at coconut as a way of helping them protect

golfers from suffering health problems as a result of prolonged exposure to the sun.

In the outdoor arena, Marmot, Patagonia and Vaudé have all signed up as Cocona users, and cycling brands, including Specialized, have also geared themselves up for including Cocona in the materials they use in their apparel collections.

Picture of health

Some of these companies, most notably Marmot, have embraced the unusual origin of the fibre very enthusiastically. According to TrapTek's marketing manager, Jon Erb, they like the fact that what was once the only part of the coconut that humankind seemed to have no use for can now be made into clothes that protect people from skin problems. Marmot has shown this graphically by using images of coconuts in its advertising for base-layer clothing, including bottoms that feel as soft as silk pyjamas.

Natural and manmade fibres are both making a contribution to the textile industry's involvement in healthcare. In some cases, technical textiles are involved in projects that address some of the most serious health issues of our times. In the past decade or so, instances of the MRSA bacterium have become frighteningly frequent. The number of cases US hospitals treated in 1999 was 127,000; by 2005, this figure had more than doubled to 278,000. Over the same period, the number of deaths the health authorities there attributed directly to MRSA rose from 11,000 to 17,000.

Without going into too much detail, textile manufacturers are at the forefront of fighting this phenomenon and we intend to publish more on this specific subject later in 2008. The main point is that when it comes to combating diseases that affect or can be borne by the skin—just as we have seen here with attempts to make easier the lives of people suffering from erythema and other ailments—the right fabric can be a great friend in the fight. 