

Companies in the performance textiles supply chain are making important inroads into the world of workwear to help people stay safe and comfortable as they go about their business.

Corporate solutions

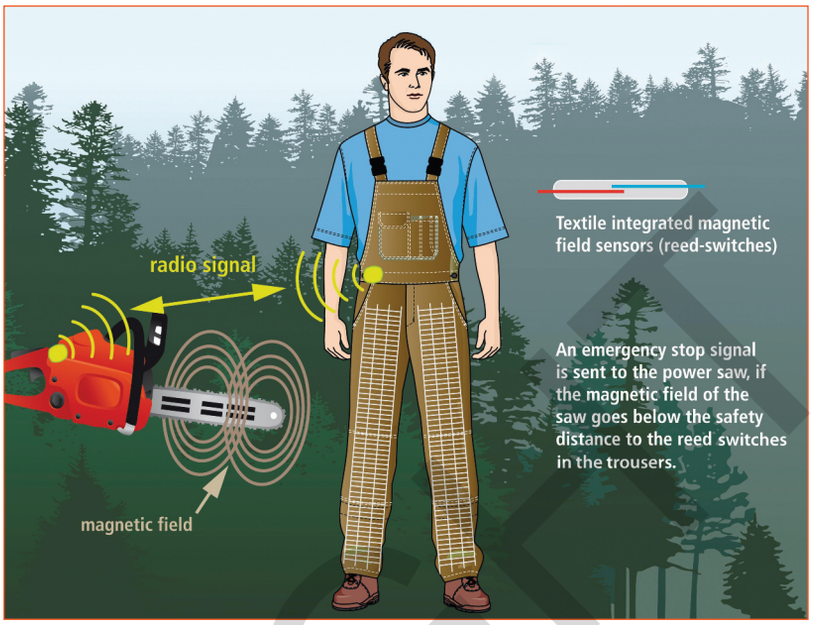
Sports and outdoor represent the best possible market for innovators in performance textiles because passionate participants in those activities pay premiums to have better breathability, weather-protection, lighter weight, temperature regulation, odour management and so on in their clothes. For some time now, workers have been asking for similar levels of performance and comfort in their corporate apparel. Increasingly, employers and manufacturers of textile solutions are listening to them.

Taiwanese textile manufacturer Hyperbola is a good example. It has come up with a "secret recipe" that uses six different minerals in powder form in its nylon mix, with 10% elastane, to produce a cooling fabric, which it has given the working name Hyp-Cool. Although ski, golf and yoga brands are interested, a working name is appropriate because, according to marketing manager Jenny Cho, the product will work particularly well in workwear applications. "Think of traffic police officers out in the sun all day," she says. "You can notice a cool feeling as soon as your skin comes into contact with this product and if someone is cooler in a hot situation they perform better."

She goes on to say that tests Hyperbola has carried out so far have included prototype Hyp-Cool fabrics for clothing worn by warehouse operatives. Immediately after putting the clothes on, the findings suggest that the workers felt between one and two degrees Celsius cooler.

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Increased safety: the Horst system by the Hohenstein Institute provides contact-free protection.

Hohenstein Institute

When they started moving around, the difference was between three and five degrees. Lab tests have shown that the minerals absorb heat, Ms Cho continues. She adds: "If all the staff in your warehouse were wearing this, you would use less air conditioning, saving money and reducing carbon emissions." Adding antimicrobial and ultraviolet (UV) protection functionality are possibilities for the months ahead.

Cut-off point

Researchers at the Hohenstein Institute in Bönnigheim, Germany and the University of Bremen, recently developed an innovative electronic sensor system for cut-protection clothing, to make forestry work safer.

The principle of the system, named "Horst" (from Hose meaning 'trousers' and 'Forst' meaning 'forest'), is simple, yet effective: if a power saw comes too close to the trousers, the machine is switched off before it touches the fabric. The system was awarded an Innovation Prize at Techtextil 2011.

Special cut-protection clothing has been part of the legally-prescribed personal protection equipment (PPE) for foresters for many years now. In Germany, about 25,000 people work professionally in forestry, about half of them in privately-owned woodland. However, conven - tional cut-protection clothing only provides its wearer with passive protection: the trousers and jacket incorporate cut-protection inserts consisting of several layers of special material made of ultra-strong fibres. If the chain of a saw comes in contact with the textile, it becomes caught in the fabric and therefore stops before the wearer is affected. However, the multi-layered material results in greater thermal insulation which can put additional physiological stress on the wearer, especially at warmer times of year.

In contrast, with the electronic protection system Horst, the system kicks in before there is any risk of the outer textile layer being damaged; there is no contact at all, meaning that thinner layers can provide an adequate level of protection. The aim of the development work was to reduce the 'passive' cut-protection layers to an absolute minimum and increase the 'active' protection, so that the clothing feels lighter and has less of an insulating effect.

"What was important for us was to improve protection from injuries while at the same time making the clothes as comfortable as possible to wear," said Angela Mahr-Erhardt, project leader in the Clothing Technology section of the Function and Care department of the Hohenstein Institute. Magnets on the guide bar of the chainsaw and highly sensitive magnetic field sensors (reed switch contacts) incorporated in the trouser fabric create a protective electronic field for the forester. If the saw comes too close, the contacts in the trousers close due to the magnetic field from the chainsaw and a radio signal is sent, which stops the saw immediately.

Following trials, a minimum distance of five to 10 centimetres between the saw and the trousers was judged to be appropriate and practical. As the saw comes closer, it is detected accurately and quickly. This means that, in real life, both the forester and his clothing would remain untouched.

The switch contacts incorporated in the cut-protection trousers operate with zero current. Only the radio transmitter that is built into the trousers uses a battery and if its level of charge falls below a certain level, the power saw is switched off for safety reasons.

Practical tests at the Hohenstein Institute have shown that the innovative protective function is stable and reliable even during heavy physical work. The trousers can be washed many times

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without impairing the protective function.

Another advantage of Horst technology is that it does not restrict the cutting or manufacture of the garments. This means that in the future, manufacturers will be able to use this textile for all types of protective clothing, both trousers and jackets. There are many possible applications for the technology beyond woodlands, in various industries and workshops.

Coldblack now available for workwear

Around the same time, Swiss textile solutions provider Schoeller Technologies announced a development that will allow heavy-duty workwear producers to incorporate its Coldblack sun protection technology into their garments.

Launched in 2009, Coldblack quickly became established in the sports and outdoor markets and attracted the interest of manufacturers of workwear, especially those offering clothing for outdoor workers. The finishing technology reduces heat build-up in clothing and provides protection from UV rays.

Until this year, the textile finish that applied Coldblack was not suitable for industrial laundering. "Time and again we have had enquiries from the workwear area but the finish was not suitable for rental garments," said Hans U. Kohn, chief operating officer of Schoeller Technologies. "This meant that important markets remained closed to us."

The solution, launched in partnership with Swiss textile finishing firm Bezema, was to use vat dyes. Vat-dyed fabrics are suited for industrial and rental garments because they offer high levels of colorfastness; they neither run nor discolour other fabrics during laundering, not even in a 95-degree hot wash. Vat dyes are an area of particular expertise of Bezema's, which is why this company became involved in the launch of Coldblack for workwear. The company's chief executive, Beda Elmiger, said a vat-dye application of Coldblack had created "a product with extremely high performance".

High flyers

Looks count too, of course. At the fourth annual Workwear & Corporate Clothing Show in the UK in April this year, prominent Welsh fashion designer Jeff Banks was one of the exhibitors, with his corporate clothing company Incorporatewear. In August, Incorporatewear posted financial results showing an increase in turnover of nearly 20% to £12.6 million, with an operating profit of £300,000. The company attributed its growth to new accounts with Thomas Cook, easyJet and Virgin Atlantic.

A different kind of flying gear received an important technical enhancement earlier this year when Aberdeen-based Survival One launched a new helicopter passenger survival suit incorporating Outlast technology for passengers being transported to and from oil rigs in the North Sea. It manages a collection of around 30,000 helicopter passenger survival suits for use by the offshore oil and gas industry. Most flights centre on Aberdeen Airport, which has the busiest commercial heliport in Europe, transporting 500,000 passengers a year.

Outlast technology has gone into a new suit called the 1000 Series. Andy Wilson, design and development manager of the safety suit provider explains that one of the main attractions of Outlast was that it allows workers to feel comfortable during the flight. He says Outlast materials help regulate the micro-climate inside the suit "to improve thermal comfort and reduce thermal stress". Workers and helicopter crew have long worn suits with high levels of thermal insulation on these journeys to and from their places of work just in case an accident occurs and they have to survive cold sea temperatures until help arrives. Traditionally, this insulation has made the survival suits uncomfortably warm to wear in normal flight conditions. Flights are short and workers have always accepted the suits' potential to save their lives, Survival One felt that the addition of Outlast could help it add value to the service it offers. Mr Wilson describes it as "a real breakthrough", because the Series 1000 can offer "maximum protection without sacrificing comfort". He adds: "We know what it is like to sit on a helicopter with a survival suit. You have heat, noise, stress and all the rest of it. Our aim is to make the journey as comfortable as possible."

The outer shell of the suit is waterproof, breathable and inherently flame retardant. The thermal lining uses Outlast phase change material technology to control the micro-climate inside the suit, absorbing excess body heat from the wearer in hot conditions and releasing the heat back when the wearer gets cold. There is also a silver-based antimicrobial layer to make sure the material remains fresher for longer, which is important when various people can wear the same suit in the course of a single day's work.



The 1000 Series helicopter suit from Survival One includes Outlast to stop wearers from suffering "thermal stress".
Outlast

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