

Textile engineering has taken a new turn. Innovators are paying more attention to the invisible and some visible parts of the spectrum to generate some surprising results. Ancient traditions and Mother Nature could have assisted their research.

When black becomes cool fashion

Every season the fashion writers of the world seem to be fixated on what colour will take the place of black. There seems to be a reluctance to accept the fact that black just happens to be a most useful colour in the designer palette for apparel and textiles. There is a lemming-like urge to find another colour to write about.

Fact is, black just won't go away. After all, Henry Ford is claimed to have said that you could have his groundbreaking automobile in any colour as long as it was black. Every season, the leather industry is besieged by fresh colour forecasts, yet tanners know that over half their production will be for black leather. And possibly a good percentage of dark brown — but what odds would you place on an exciting shade of yellow taking over production schedules?

For that matter, ask any self-respecting Bedouin in the blazing midday heat of the desert about the right colour for wrapping oneself in. Not much of a brainteaser there. Look around

you as you try to get some shade from your umbrella: black, swirling capes and black turbans and black tents abound. Even black goats. Maybe the desert nomads know a thing or two about colour. Maybe they have found that black equals white when it comes to keeping cool, too. Cool in this instance is not the word for fashion chic. It means cool in terms of temperature and comfort.

Going against accepted wisdom

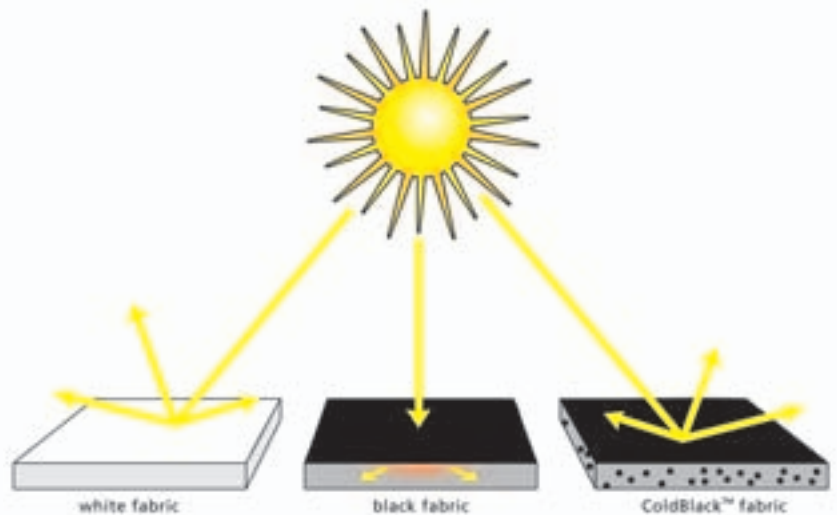
The question of why the Bedouin would wear black, which absorbs heat, and not light pastel colours has vexed many over the years. Back in the 1980s, however, it became a matter of research for Amiram Shkolnik and Arie Borut, and C. Richard Taylor and Virginia Finch, respectively from the universities of Tel Aviv, Israel, and Harvard, USA. There had been an earlier study by Walsberg, Campbell and King, in 1978, which investigated how birds coped with heat, whether black plumage was more effective, whether fluffed plumage made a



difference when compared with flattened plumage. Before that, in 1969, researchers had found that light and heat penetrate deeper into white cattle than into black.

These studies make interesting reading but essentially what it proved was that black clothing does absorb sunlight and the heat radiating from your body but, if the garment is loose-fitting and there is a slight breeze or air movement of about 3m/s or say 7mph, the wind takes away the heat faster than it is absorbed. White clothing, for that matter, reflects internal heat too while it reflects external heat. It could be that overall you will feel warmer wearing white than black. So perhaps the Tuaregs didn't need sophisticated laboratory tests to get them into black.

For those who want to know a bit more about the black goats and the birds — it seems that Mother Nature knew something too. Fluffed black plumage is the best bet when it comes to reducing the amount of heat transmitted to the skin when there is a breeze blowing through. As birds fly, it means they always have a breeze flowing through their feathers. (But a wet or flattened blackbird is the worst for heat gain—no matter what the wind speed. Perhaps that is why birds are always fluffing up their feathers.) And how about the black goats and white cattle? Same thing. The black haired animals win. The question of fluffiness is also important, which perhaps explains why polar bears have white coats because once the arctic wind picks up, the results change dramatically: fluffy white fur exhibits the lowest heat loss.



ColdBlack for cool cats

In the world of performance textiles and innovation, it was only a matter of time before Schoeller Textiles took a look at black's behaviour. This summer it has caused a stir in activewear circles with the introduction of its ColdBlack finish. Like so many others, the Swiss company realised that black was still a major colour for those out hiking and cycling and generally enjoying longer periods outdoors. The dark colour shows less dirt, stains and soiling, unlike the brighter lighter shades we are meant to be attracted towards.

The company also had to produce a textile that didn't rely on a breeze and it also had to be a textile that could be worn as a fitted garment. (Riding a bicycle in a swirl of fabric could be a

ColdBlack has the effect of making dark colours behave almost the same as light colours so that they reflect up to 80% of the sunlight.

 Schoeller



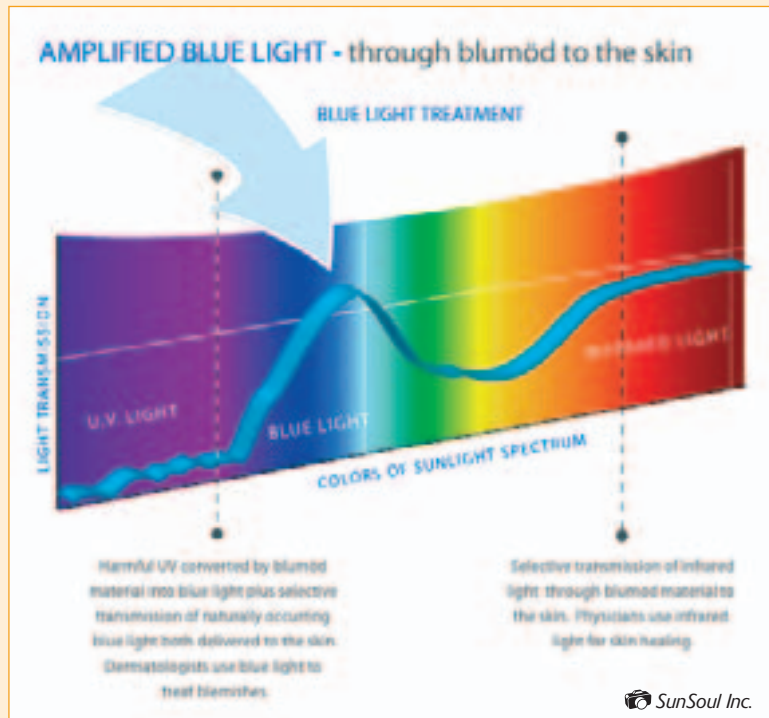
Playing the spectrum

Other developers have been looking at the light spectrum, too. One of these is SunSoul Inc., based in Toronto, Canada. In the last issue of *WSA*, the subject of UV protection in fibres and fabrics was considered in depth. But SunSoul has taken a different line on improving skin welfare. It calls its fabric blumöd, which it claims is the world's first proven therapeutic fabric as it harnesses the sun's natural light to safely clear and heal blemishes of the skin, specifically acne. The fabric is designed to convert UV into healthy blue rays and deliver the light to treat acne. It is claimed that two hours a week spent wearing blumöd shirts or hats will be sufficient.

The principle of light to treat skin disorders is common practice among dermatologists. SunSoul's current invention converts broad-spectrum sunlight to a narrow spectral range using fluorescent material providing light amplification at pre-selected wavelengths. The patent-pending product uses proprietary fluorescent pigments to maximise selective light wavelength delivery to the skin surface. The first FTM or fluorescent therapeutic material is designed to deliver blue light to kill the acne-causing bacteria. The optimal wavelength range for this is 400-500nm.

The invention overcomes the drawback of having messy sunscreen lotions or treatment creams on the body. It can be used in conjunction with other conventional skin treatments or as a 'break' or alternative to them.

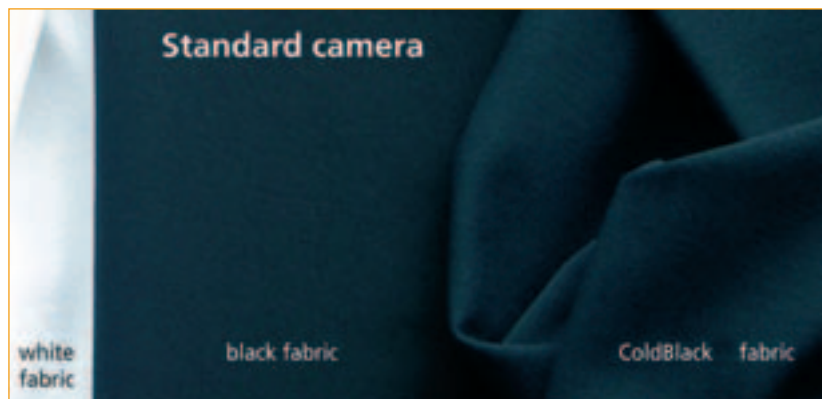
It also means that people will find it easier, more comfortable and positively beneficial to enjoy the great outdoors. 🌍



disaster.) It began by examining the infrared or IR spectrum. Assuming that white reflects up to 100% and black as little as 0%, it had to create a finishing technology that influences IR reflection, so that dark colours would reflect sunlight in a way similar to the lighter shades. With ColdBlack, dark colours achieve a reflection up to 80%. The finish alters the reflective power in the non-visible near infrared range of the spectrum and part of the UV radiation, too, which accounts for 49% of solar energy. While the finish affects the reflective in the non-visible part of the spectrum, it only marginally influences the depth of colour in the visible range.

According to Schoeller, this permits better heat management so that black clothing with the new finish stays 'cool' for longer than a comparable material without the finish. This even holds true when the heat exposure is reduced as, for example, when the wearer moves out of the sunlight. Normally, black clothes stay warm for quite a while. ColdBlack textiles stay cool for longer and store heat for a significantly shorter period than conventional black fabrics.

The outdoor industry appears to be intrigued by this latest development, so much so that ColdBlack was among the winners of the Outdoor Industry Awards presented during the Outdoor show in Friedrichshafen. Perhaps it will find even greater appeal with the Bedouin. 🌍



The human eye can only perceive part of the sunlight range so ColdBlack is designed to alter the reflective power in the non-visible spectrum without perceptibly influencing the colour in the visible area.

🌍 Schoeller