ASK THE EXPERT: MOISTURE MANAGEMENT

The textile industry has been addressing moisture management issues for some time, but the flow of new ideas and applications still threw up an interesting series of questions for our expert this time, Mark Hartmann.

No sweat

Mark Hartmann joined Outlast in 2000 from Cargill, where he worked as a resin research and development chemist. As director of research and development for Outlast, he oversees bringing new heat management products to the textile market. He is also involved in the analytical testing of heat management in textile products.

Question: What is your earliest recollection of the term 'moisture management' in the apparel and textile industry, and do you believe it still resonates with clothing brands today?

Answer: I believe moisture management was coined back in the late 70s or early 80s when textile companies needed to improve the breathability of fabrics, to produce products that allowed for faster sweat evaporation, either through wicking or other technologies. This sparked the movement away from cotton to faster drying, wicking fabrics. Today, moisture management is an industry term that brands are expected to incorporate into their products.

Q: What are the most important technical points to emphasise in trying to put across to consumers the benefits of performance textiles with moisture management capabilities?

A: Moisture management has evolved into an all-encompassing term that includes breathability, water-resistance or -repellency, wicking, quick drying, sweat reduction and so on. Important technical points that should be emphasised are the different properties of moisture management technologies. For example, the majority of moisture management technologies, such as wicking, xylitol and carbon-based products react to the moisture



Moisture management is an important aspect of Falke's Spring/Summer 2012 running apparel range.

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once it is produced. Although they provide a benefit to the consumer, it isn't until the individual has already become uncomfortable that it begins its work. Conversely, other moisture management technologies are proactive, such as phase change materials (PCMs). These active technologies work to reduce moisture by managing it before it begins, and they continually provide benefits such as breathability and sweat reduction. This differentiates from passive technologies that provide benefits only after the body is already sweating, such as wicking or quick drying.

Q: Without necessarily naming brand names, can you describe the moisture management innovation, in the last three years, that has impressed you the most?

A: I'm impressed with the innovations in sweat reduction. Each person has his or her own sensitivity to temperature changes, meaning that he or she sweats or becomes chilled quickly or slowly. These innovations actually affect the micro-climate temperature, which in turn affects many other comfort variables such as sweat production, relative humidity, micro-climate heat index, vapour pressure and evaporation rate, as opposed to only moving moisture. These innovations help reduce temperature swings and influence the comfort zone efficiently, thus creating a well-balanced micro-climate that reduces sweating or chilling.

Q: Is it possible to have cheap moisture management? This is a question that must come up in the boardrooms of a lot of apparel brands. They are facing rising raw material costs and lower levels of consumer spending, so it's hard not to have some sympathy with them.

A: Yes, it is possible to have a product with inexpensive moisture management but you get what you pay for. A product's quality becomes inferior and less durable, making it easily contaminated by body oils, dirt, perspiration salts, and so on.

Q: There are various fabrics on the market that are combinations of special moisture management fibres and other materials, natural or synthetic. Can you say which combinations you think work best in applications for heavy-sweat activities, and which less so? For example, is it really possible to enhance the natural moisture management capability of merino wool?

A: Any fibre can be treated to enhance its hydrophilicity or hydrophobicity, therefore enhancing its moisture management properties. Fibre or technology combinations that work best are those that reduce sweating by keeping the micro-climate or body cooler, coupled with efficient hydrophilic treatments. Examples of this are phase change materials (PCMs) containing fibres with a hydrophilic or push-pull moisture movement treatment.



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Q: How can garment manufacturers best go about incorporating moisture management panels into, say, a soccer shirt? How do they make the panels effective and stop perspiration from spreading to all parts of the surface?

A: Nowadays there are excellent digital and computer-controlled printing or spraying processes that allow for the precise patterning of treatments onto various fabrics. For instance, mesh panels with increased hydrophilicity and breathability can be incorporated next to fabric that has been hydrophobically treated, to prevent moisture spread. Additionally, new knitting technologies allow for the development of fabrics that incorporate specific fibres with specifically treated fabric areas. This helps to direct the flow of moisture around the garment.

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