

To find out how far cooling functionality in athletic clothing has come, **Shari Shallard** takes a closer look at some of the latest innovations and talks to two seasoned athletes and trainers about the extent to which cooling technology helps them.

Cooling technology harnesses the power of sweat

There may be no performance-related goal more universal than that of moderating body temperature during times of intense activity. Just ask participants of the 1976 Boston Marathon; a scorching sun compelled onlookers to spray hoses at sweaty runners as they went past.

Hoses aside, cooling technology isn't new, but new and improved versions keep coming along. Last quarter alone saw the release of innovative advances, including HeiQ's latest version of Smart Temp and Coolcore's thermoregulating yarn. Even among those brands offering less dramatic (or even no) new developments in this niche, most offer a cooling version of their apparel, ranging from basic lightweight and wicking designs to more sophisticated formulations that actively cool the skin.

The range of options, as well as continuous progress in this arena, beg the question: how far have we really come from the old-fashioned act of dumping water over one's head?

HeiQ's latest take

The latest version of HeiQ's cooling technology builds on its Smart Temp technology, which was launched in 2011. This

Worn by Olympians in the early nineties, Nike Dri-FIT is still used regularly for its wicking and cooling capabilities.



‘intelligent’ thermoregulation technology is currently used by more than 50 major brands globally on more than 500 million items (not only in sportswear, but in standard apparel and home textiles too) — including Hanes’ X-Temp programme and Dick’s Sporting Goods’ Second Skin range in the US.

The technology works like this. A garment treated by HeiQ Smart Temp ‘senses’ an increase in body temperature and perspiration and responds dynamically, thanks to a hydro-functional polymer that changes shape at higher temperatures. The garment evaporates moisture faster when the wearer is hot and more slowly when the wearer is cool — essentially mimicking the body’s ability to sweat. This is important because typical clothing can block off our bodies’ ability to self regulate temperature through sweating. The newest version, called HeiQ Adaptive AC-06, takes these capabilities to the next level with an activated cooling functionality. Adaptive AC-06 features a patent-pending instant cooling hydro-functional polymer that is activated when the skin temperature exceeds the range of 28° to 32°C; it is then deactivated once cooling is complete.

This is different from previous versions, according to chief executive, Carlo Centonze, because two actions are used to keep the body at the optimum performance temperature. The most exciting part, he says, is that “the technology is activated even before the first sign of sweat on the fabric, to help lower the wearer’s skin temperature when needed most”. Before the wearer actually begins to sweat, a melting action is activated, sending an instant-cooling impulse directly to the skin. As the body continues to warm, a vaporising action transports sweat away from the body. The effect? A reduction in skin temperature of 1.5° to 2.5°C compared to an untreated fabric sample.

“Cooling textile technology helps to prevent overheating and keeps the body at the optimum performance temperature,” Mr Centonze says. “Overall, the wearer feels cool, comfortable and focused to perform better.”

Mr Centonze says the Smart Temp product family is one of HeiQ’s most popular and will continue to grow because consumer interest in thermal regulation technology is very high, while retail availability of clothing with such a technology is quite low. He says HeiQ’s pipeline is “very, very healthy”.

Coolcore power in a single yarn

Coolcore, a company that started by making a towel with a cooling fabric and wicking abilities, today makes chemical-free thermoregulation fabrics that use wicking, moisture circulation and regulated evaporation to keep users cool and



dry. It most recently released Fibr-X, an extruded single yarn that is said to have the same thermoregulating performance as its original multi-fibre technology. The single-yarn innovation should give manufacturing partners increased flexibility in creating fabrics, garments and accessories with the same benefits as Coolcore and, because it is based on a single extruded fibre, is expected to reduce manufacturing time and materials.

“We are most excited about the efficiencies created by the single yarn,” vice-president for global marketing, David Ludd, says, “while having the same benefits of wicking, moisture transportation, enhanced cooling and drying as our multi-fibre technology.” Fibr-X features proprietary cross-section designs that use an evaporative process to wick moisture. Requiring no chemical additives or treatments, it can be used alone or woven with other natural or synthetic fibres to create fabrics with additional performance capabilities.

The degree of temperature change enabled by Fibr-X depends on several things. “The temperature change that one can feel is conditional on a number of factors including ambient temperature, humidity, and body temperature,” according to Mr Ludd. “That said, Coolcore can achieve up to 30% cooler surface temperature when wet.”

He says Fibr-X should make its way into stores via consumer products in spring 2019, and that

Experienced athletes and trainers Helen Cain (right) and Domenick Risola wearing their TriPossibilities Coaching Asics singlet.

 TriPossibilities



innovations such as these are not coming a moment too soon. “Thermoregulation is essential to comfort and our world isn’t getting cooler,” he says. “We are seeing more extremes in weather, and, as this continues, cooling technology is going to become ever more important.”

Stay cool while training

What about out on the battlefield? Beyond the labs and the factories, how do the athletes — the hikers, the runners, the weekend warriors — perceive today’s offering of cooling technology? Helen Cain and Domenick Risola are coaches and co-founders of TriPossibilities Coaching LLC based in Florida, and provides one-on-one training programmes for a range of goals, including triathlons, Ironmans, long distance swims, running races and more. With their clientele, Mr Risola primarily handles biking, strength training and extreme sports, while Ms Cain focuses on swimming, and they share the running programmes. Different seasons bring emphasis on different sports, so temperature-moderating sportswear is vital year round. This means a demanding and ever-changing schedule for both, depending on what races are coming up and what season they are in.

“During the peak of tri season, we do approximately 12 hours per week of swim, bike, run and strength training,” says Ms Cain. “In the off season, we do five and seven hours of the

same — there is usually more emphasis on a single sport during off season.” She generally trains six days a week, at least twice a day. Currently, that means “weight lifting three times a week, biking six days a week — it’s a heavy bike block focus — and two to three runs a week.”

For training in warmer months, Mr Risola typically wears Nike Dri-FIT, one of the most long-standing options in cooling technology (Olympic athletes wore it as early as 1996). The simplicity serves him well. “I need something to keep me dry and cool,” he says. “It works pretty well. It does pull the moisture from my skin; it’s definitely way better than a cotton shirt.” Dri-FIT was designed to help wick sweat from skin, while the lightweight, porous fabric allows moisture and air to pass easily through the material. As a result, sweat evaporates more swiftly, leaving the wearer cooler and drier.

As temperatures fall, Mr Risola turns to Under Armour’s ColdGear line, the counterpoint to its HeatGear line, employing some similar technology (and, obviously, some dissimilar) to help moderate temperatures. While Mr Risola is pleased with his Nike Dri-FIT and Under Armour’s HeatGear and finds them to be comparable in their effectiveness, he believes not all cooling technology is created equal. “You really do get what you pay for,” he says. “Some of the cheap polyester just holds the moisture and weighs a ton, not cooling you at all.”

Despite his reliance on specialty apparel, Mr

Coolcore thermo-regulation fabrics are designed for wicking, moisture circulation and regulated evaporation.

 Coolcore

Risola has observed a couple of drawbacks. “They’re not super soft like the tri-blends,” he says, and “these garments generally hold on to a smell after workouts despite washing them.”

Interestingly, the issue of lingering odour is one that Coolcore is currently taking on. When asked what was next for Coolcore, Mr Ludd says the company is working on integrating new anti-bacterial and anti-odour technology into their fabrics. “Fuze is a permanent technology that never washes out and is chemical-free,” he says. It is designed to enhance Coolcore’s drying and cooling properties, colour fastness, and ultraviolet protection while providing “the added benefit of eliminating odour”.

Even cooler while competing

When Ms Cain started participating in triathlons in the early nineties, she wore bike shorts to start (which she says filled with water during the swim portion) then she changed into running gear for the final stretch. Now, with TriPossibilities, she has come to appreciate the value of specialised triathlon apparel, which TriPossibilities Coaching gets through Jakroo, a company that develops and personalises competitive sports apparel.

Options include a top made with soft and breathable AirStream Italian fabric; nylon/lycra (with polyester pad) bottoms for biking; and a one-piece suit that includes quick-dry, moisture-wicking fabrics and a DWR treatment to reduce drying time. “They are super lightweight,” Ms Cain says, “and the top is always cool — well, compared to the 95 degree [Fahrenheit] weather we train and race in.”

The bottom, she says, is more focused on holding everything in and less about cooling. In all cases, she says, the cooling aspect is there but subtle — until it gets wet. “If I pour cool water on the top, it stays cool longer — much longer than if I were to do that to traditional fabric.”

For straightforward running, TriPossibilities uses an Asics singlet, carefully selected to accommodate Florida’s summer heat. “If you’re a runner, you have to have a good singlet for the 100-degree days,” she says. “We chose this one for our team running singlet this year, and it’s great.”

The Asics top, according to Ms Cain, is lightweight, soft, and wicks sweat away from the body without becoming heavy. She marvels at how polyester has evolved over the years to become her fabric of choice for staying cool while competing.

“One-hundred percent polyester — do you remember what that meant in the seventies?” she laughs. “It used to be horribly uncomfortable, so in the past I would have avoided polyester at all costs. Now manufacturers incorporate polyester into other blends and it is fantastic. Even my 100% polyester shirts are soft, wick sweat away from the body, and look great.”

Two degrees matter (to some people)

For Ms Cain, the prospect of apparel that can lower the body temperature by several degrees isn’t her most pressing factor (“I expect to be hot,” she says. “When you exercise, you’re hot.”), but she recognises developments such as Coolcore’s and HeiQ’s are important.

“Triathletes really care about all of those details,” she says. “Overheating can be a major issue.” And as co-owner of TriPossibilities, what matters to her triathletes, matters to her. “I can’t even imagine what the manufacturers will come up with next,” she says, “but I’m always excited to see what they can do.” 

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