This autumn, outdoor brand The North Face will launch Futurelight, its new, proprietary breathable-waterproof outerwear technology. The company says Futurelight will "redefine the future of technical outerwear". A closer look suggests they might not be exaggerating.

Fine-tuned breathability

by Shari Shallard



When The North Face (TNF) unveiled Futurelight at the CES 2019 exhibition in Las Vegas, even consumers who had spent little time thinking about breathable-waterproof technology for textiles could probably tell that the company believed it had achieved something special. A jacket, warm and protective enough to be worn by a professional Alpine skier to scale and ski on Mount Everest, was actually soft, light, and pliable to the touch. Not only was it not bulky, it wasn't even thick; though the material was waterproof, it wasn't remotely stiff either. It was hard to believe the jacket could be adequate for the Mount Everest trek, and yet test results and athlete feedback say it is.

The problem

Futurelight takes on an issue that has long vexed lovers of the outdoors: clothing that can simultaneously deal with what's going on outside and what's going on beneath the clothing. Men and women have become used to having to take their outerwear on and off as they bounce back and forth between being too cold and too warm.

Snow sports in particular are known for this. Skiing and snowboarding take place in low temps with snowy surroundings or even frosty precipitation. Protection is vital. And yet, underneath, all the activity is raising one's heart rate, raising one's body temperature. The very technology stopping the elements from permeating the protective layer also inhibits any relief from the heat and sweat building up underneath.

There are products on the market that have already made great strides in providing both adequate protection and breathability. But the trade-off remains: the more protective, the less breathable, the more breathable, the less protective.

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A couple years ago, TNF committed to overcoming the trade-off. "True to our roots," a spokesperson for Futurelight tells *WSA*, "The fabric was born in the mountains out of specific requests from our athletes looking for increased performance and breathability in their waterproof gear."

The solution

Researchers from TNF decided to look beyond the outdoor apparel industry to find a solution. Ultimately, they found their answer in medical and technology fields: nanospinning. Nanospinning is key to achieving high levels of air permeability within the membrane of the fabric. In nanospinning, also called electro-spinning, a polymer is mixed with a solvent to make it liquid. The polymer is then pushed through a nozzle or syringe into an electrical field where yarns are whipped or spun. They fall onto a moving carrier in a tangled array of nano-filaments, and the yarns form a non-woven fabric.

This process creates nano-level holes, which allows for high porosity — and therefore high levels of venting — without compromising the waterproofing and protection of the garment. TNF says the wearer will stay dry from the external elements without becoming hot, sweaty, or uncomfortable inside the garment, because air can move with greater ease through the material.

"Nanospinning has allowed our brand to add unprecedented air permeability into the membrane of a garment for the first time," the spokesperson says. "This process creates nano-level holes like that of a mesh, allowing for incredible porosity while still maintaining waterproofness, letting air move through the garment and provide more venting in the fabric than ever before. The nanospinning process also allows us to fine-tune and optimise the breathability, stretch and hand-feel of any garment depending on the activity or environment."

The degree to which the material is air permeable is customisable, as nanospinning allows designers to modify the weight, stretch,



Hilaree Nelson, captain of TNF athlete team, and her partner Jim Morrison wore Futurelight to complete the first known descent of Lhotse Couloir.

The North Face



TNF sent a team of athletes to the highest peaks in the Himalayas to test Futurelight.

The North Face

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breathability, durability, construction, and texture, meeting the needs of different environments. The launch brings different weights of membrane and a variety of fabrics for use in all levels of activity. A tent made using Futurelight, for example, does not have the same breathability needs as a glove, which does not have the same needs as a jacket. In fabrics designed for more aerobic activities, breathability goes up; a jacket designed to protect its wearer in wet, rough conditions will have a higher level of protection.

Tested in the labs

The company conducted internal tests on assessing Futurelight's breathability, using the moisture vapour transmission test. According to it the results showed the Futurelight jacket to be "more breathable than any jacket currently on the market".

For third-party independent testing, TNF turned to Underwriters Laboratories, a safety certification testing organisation whose customers include the US's National Fire Protection Association (which certifies gear for first responders, including firefighters, EMS personnel, and hazmat or hazardous material teams). Underwriters Laboratories' waterproofing tests are intense.

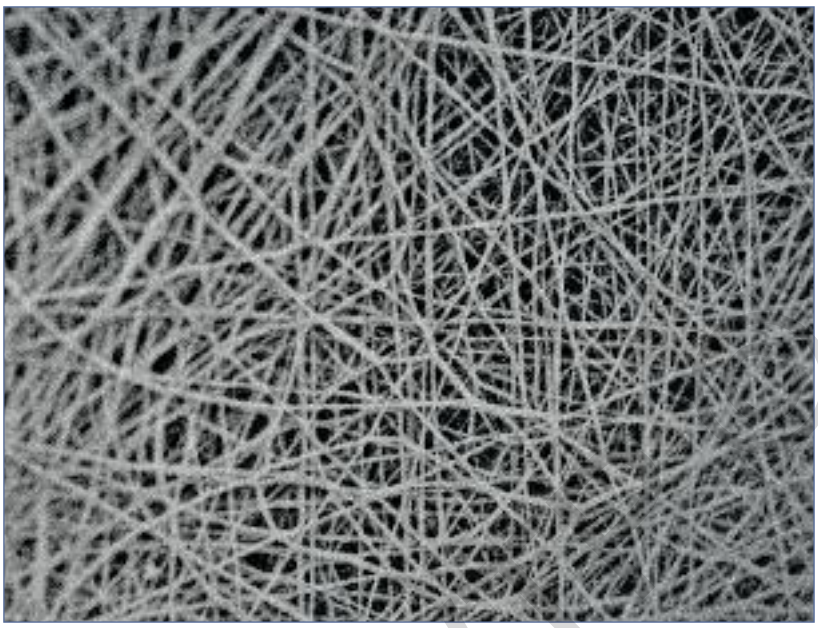
The liquid integrity test for assessing Futurelight were said to be 50% more stringent than the current standard for the outdoor industry, demonstrating, as Michael Seward of Underwriters Laboratories has said in a press release, that "Futurelight is not only totally waterproof, but fit for the harshest expeditions the outdoors has to offer."

Tested on the slopes

Assessments continued outside the laboratories as well. According to the company, The North Face validated their testing with more than 100 continuous days of in-field wear. Futurelight, the company tells *WSA*, "has since been tested extensively by our global athlete team and expedition-proven in the highest peaks of the Himalayas."

Famously, in addition to summiting and skiing Mount Everest, this testing included alpinist Jim Morrison and his partner Hilaree Nelson completing history's first known descent of Lhotse Couloir. (Descending Lhotse Couloir comes with the low oxygen of 8,000m altitude, the dangers of avalanche season, and the unimaginable complexity of a 50-degree slope.)

Nelson, who was captain of the brand's athlete team, described the experience in these terms: "During the past two years, our world-class team of climbers, skiers, alpinists, snowboarders and trail runners has been rigorously testing Futurelight across every discipline to prove this technology in varying weather conditions and climates all over the world." She was pleased with its performance. She said: "In all my years in the mountains I've never experienced a product that moved and performed as well as Futurelight. It is creating a new paradigm for what I expect out of a waterproof material."



Nanospinning results in a non-woven fabric.
The North Face

Sustainability

Long engaged in sustainable practices, the company has said that Futurelight has allowed it to make its most sustainable three-layer garments. The material is created with 100% recycled nylon and polyester, with a DWR finish that uses no fluorine or PFCs and is said to have four-times higher wash durability than standard DWR finishes.

The manufacturing process also entails a plasma gas treatment for finishing the fabric, which uses 40% less energy and chemicals during the dyeing and DWR finishing process. Even the factory adheres to high sustainability practices, using solar power to handle electricity needs.

"We have a responsibility to push progress on all fronts, from engineering pinnacle products with a lower footprint," the Futurelight spokesperson states, "enabling athletes and explorers and inspiring communities to define what exploration means to them, to revolutionising the outdoor industry with unparallelled technology."

Displacing Gore-Tex?

Some industry observers say they are surprised that TNF has developed this new technology, because it has long partnered with breathable-waterproof membrane technology provider Gore-Tex (the partnership dates back to 1977) for its most sophisticated jackets, gloves

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and more. The TNF website describes the Gore-Tex technology as delivering "the industry's most innovative and highest-performance waterproof and breathable weather protection". Gore-Tex fabrics, the TNF website reads, "lead the industry in providing durable, waterproof, breathable protection. [Its] membrane is completely impervious to rain, sleet and snow ... Tiny pores in the [membrane] allow perspiration to escape while preventing water from entering".

That's why, when the company announced Futurelight at CES earlier this year, interested publications ran headlines comparing the two. A few examples: Will the North Face's New Material Make Gore-Tex Obsolete? North Face's New Waterproof Fabric Makes Gore-Tex Look Downright Primitive. Fabric Fight: Gore-Tex Challenged by Futurelight. What were the articles' overall conclusions? Essentially, they all said, "wait and see".

TNF has not issued a statement on how the development of Futurelight will affect its relationship with Gore-Tex, so *WSA* is going with 'wait and see' as well.

Autumn and beyond

Futurelight fabric, "is paving the way for the future of technical fabrics and provides endless possibilities across our product categories". In addition to jackets, Futurelight will appear in new products across the brand's pinnacle product lines, including the Steep, Summit, and Flight Series. Futurelight apparel will be customised to suit various activities; trail running, for example, needs to be more breathable than downhill skiing. The company has discussed the use of Futurelight in gloves, footwear, and single wall tents (no more being rudely awaken by drops of condensation hitting your forehead!), and expects its applications will only continue to grow.

In talking about the pioneering nature of Futurelight, TNF is quick to say "disruption" is core to who the company is. Disruption, "is one of the key elements of the DNA of The North Face brand. It is what our company was founded on and we still believe to this day, disruption is the key to future growth."

In the same way the nanospinning technology and sustainable practices of Futurelight have set a new standard in breathable-waterproof technology, she says: "The North Face is constantly thinking about the future of apparel and how we can push the limits to create the next best innovation for our athletes and consumers, helping them pursue and achieve the highest peaks in their athletic and personal pursuits."



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