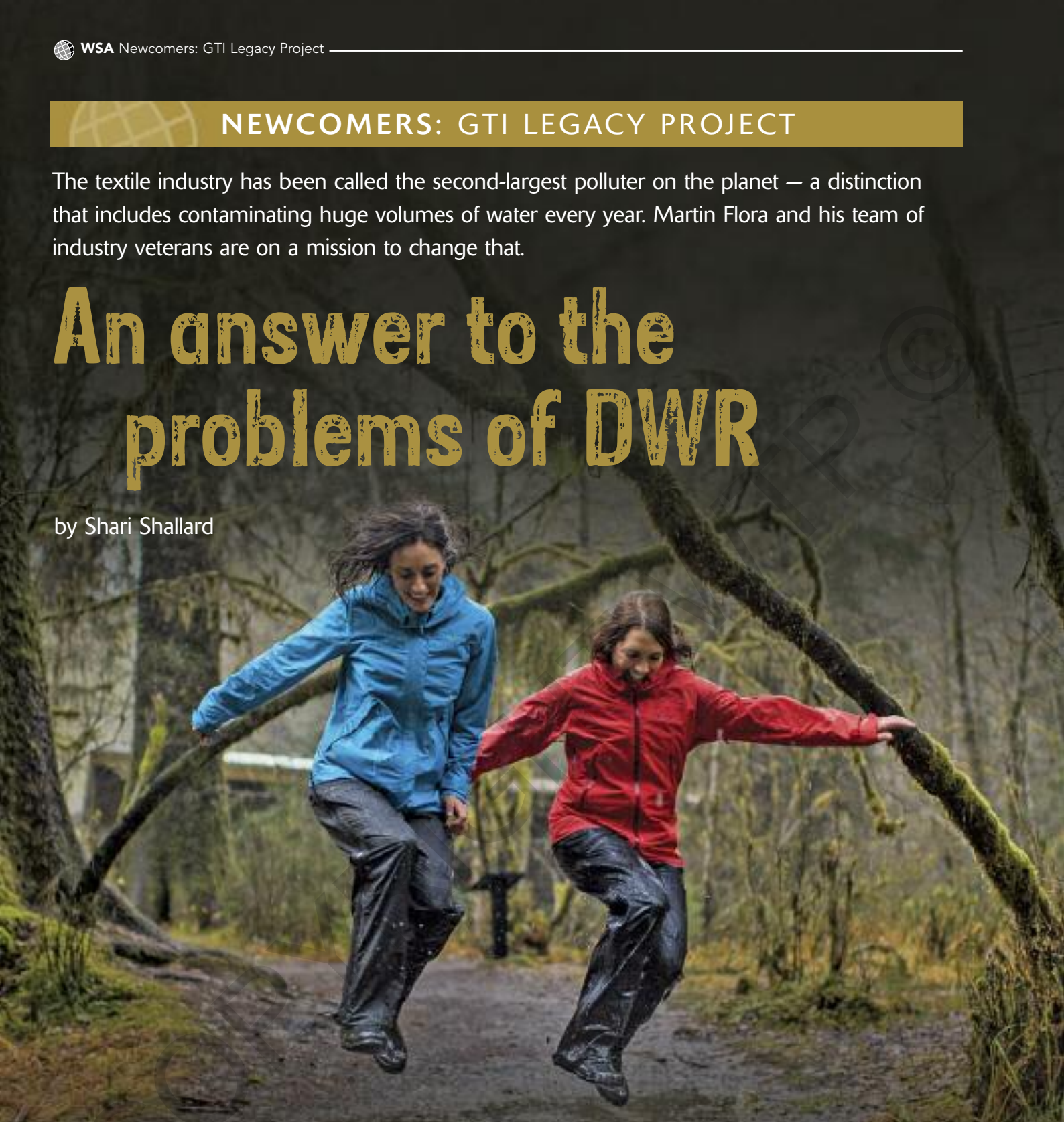
## NEWCOMERS: GTI LEGACY PROJECT

The textile industry has been called the second-largest polluter on the planet — a distinction that includes contaminating huge volumes of water every year. Martin Flora and his team of industry veterans are on a mission to change that.

# An answer to the problems of DWR

by Shari Shallard



Our conversation with Martin Flora, CEO of Green Theme International (GTI), could not have been better timed. The previous day, US President Donald Trump slashed the size of two nationally-protected lands in Utah. Just a fortnight earlier, 800,000 litres of oil had leaked from the controversial Keystone Pipeline in South Dakota. As we spoke, fires were raging in drought-stricken California — blazes that would continue to erupt with frightening speed as the days continued. Mother Nature was having a particularly bad week, and her chances of recovery were seeming rather hopeless.

So it was reassuring to speak with somebody who is working on her behalf.

Headed by Mr Flora, GTI comprises a team of textile industry veterans — most of whom have at least 30 years under their respective belts — who have developed fluorine-free breathable water protection that uses absolutely no water and has no hazardous discharge. This omission of water and contamination is a major change of direction.

There is a fear that traditional finishes cause pollution as they're applied — environmentally-

*Start-up company Green Theme International believes its Aquavent durable water repellent technology can revolutionise the textile industry.*

Marmot





*Martin Flora, CEO of Green Theme International (left) and Aquavent inventor Dr Gary Selwyn (right).*

*Green Theme International*

damaging effluent is washed off during the application process — and again in the consumers' hands, when wet weather and laundering wash more finish into the water stream.

GTI's new technology, Aquavent—it is worth repeating—does neither.

But what is perhaps most exciting about this new technology — as Mr Flora is proud to point out — is that the environmental benefit isn't necessarily GTI's most compelling selling point. According to GTI, Aquavent has 100-wash durability (based on AATCC 22 spray test) and, as proven on the more severe Bundesmann water repellency test, outperforms C8, C6 and PFC-Free durable water repellent (DWR) in both performance and durability. All this while remaining breathable.

Mr Flora believes GTI is positioned to revolutionise the textile industry with its unparalleled efficacy and, in the process, eliminate one of the planet's greatest environmental threats. The product, he says, speaks for itself. The challenge is disrupting an industry entrenched in its ways and establishing infrastructure for everyone to more easily commercialise new and innovative ideas.

## Why a water-free finish is superior

GTI's technology was developed by Dr Gary Selwyn, a veteran innovator in the field of materials processing and process chemistry. His process uses a combination of heat and pressure to crosslink finishes with each individual fibre. Where traditional finishes wash chemicals onto the surface of a fabric, Dr Selwyn's finish actually becomes part of the fabric.

Pressure enables the chemistry to penetrate yarns and individually coat the fibres. "It gets a real good molecular bite onto that fibre," says Mr Flora, which allows it to achieve both uniformity and durability.

Mr Flora likens the durability of GTI's finishing technology to using a non-water-based paint on a car. "A water-based paint washes off," he says, "but a non-water base is durable for the life of the car."

When Dr Selwyn first brought his invention to Mr Flora, Dr Selwyn claimed that his finish would outlast 100 washes. Mr Flora was impressed. "The typical industry standard is twenty washes," says Mr Flora. "If you make it to twenty washes with any efficacy still available, it's amazing."

So Mr Flora agreed to test it. "Well, my PhD came back after more than 100 washes and said, 'Okay, we're burning up the machinery. Can we turn it off now? It works.'"

Mr Flora went to Dr Selwyn's lab to learn more. "As I became familiar with what he had invented, I recognised that what he had was a platform — a platform to change the industry."

## Making an impression

What's perhaps most striking about GTI's technology is how it upends the traditional choice between environmental sensitivity and effective performance. It's possible, according to GTI, to have both.

Mr Flora describes a recent demo for which his team treated a pair of running pants with their fluorine-free finish, then emulated rain by

COPYRIGHT WTP ©



*GTI's fluorine-free breathable water protection uses no water and has no hazardous discharge.*

*Green Theme International*

pouring water on the pants. "It was a knit, with lots of open space in it, " he says. "And the water just beads up. The customers' faces kind of contorted like, 'Wow, that's different'."

The demo continued, next on a stretch woven garment with engineered holes and finally on a mesh waistband. "The water still beaded up, even on these giant holes."

Other demos have included marketing director Brian LaPlante folding a fleece like a bowl and pouring water in it; water went right through an untreated fleece, while a treated fleece completely contained the water. Mr Flora has even worn a treated fleece in the shower to

COPYRIGHT WTP ©



prove no water would seep through.

Mr Flora's enjoyment of such moments is clear: "I don't have to say anything more about the performance of the fabric. The products are completely different from what's out there in the industry."

Importantly, breathability — a vexing issue with DWR fabrics — isn't compromised either. While traditional finishes clog the spaces between fibres with excess chemistry and limit evaporative air flow, GTI permanently hyper-fuses water protection directly to the individual fibres of the fabric.

GTI regularly uses the CFM (cubic feet per minute) test to assess the breathability of fabric before and after treatment and has found a change of 2% or less. "Essentially," says Mr Flora, "the impact is almost zero."

He is in serious conversations with some of the biggest names around the globe and in a range of industries. "For outdoor brands, we can be lighter and more cost efficient because we're not using membranes in every solution," he says. "For the fashion industry, we can protect a wool suit. You can wear a sports jacket in the rain for half an hour and it won't let any water through the fabric."

The technology, he says, is changing the way existing fabrics can work.

## Disrupting the industry

Seeing GTI's finishes in person tends to convince onlookers of its capabilities. The next step is getting the textile industry to take up the chemistry, machinery and processes involved in GTI's waterless finishing — which is not so simple.

The textile industry is slow to change, says Mr Flora, because it is entrenched in this set up:

- Brands have to change lines frequently; their focus is turning over that product mix. "To be truly innovative takes two to five years of just pure research. Apparel companies don't have the bandwidth to do that. They have to turn and burn."
- Mills are consumed with filling production. "They have high-cost overhead with machines and people; they're chasing volume orders. To implement a new technology is expensive and may not be fruitful. There isn't a lot of incentive to change how they do business or their infrastructure."
- Chemical companies are too insulated. "The chemists don't really have connection to the marketplace, so they don't understand what consumers want. Their aim is 'how do I make a better iteration of what's already in the market?'"






COPYRIGHT WTP ©

Mr Flora calls this a vicious cycle in which "there's almost no way to break out and truly do something different."

So how is GTI going to disrupt that cycle? The industry is not yet set up to use their technology, the machinery is proprietary, and the company has patented the process itself.

"This is where our business model has to match our social goals," says Mr Flora. "We are on a mission to change the way things are done — to change the paradigm of how people use these products in the future and to remove water pollution from the textile industry."

Eventually, this may mean releasing the technology to the market. For the next year or two, though, GTI plans to establish joint ventures or facilities in key markets around the world and work as subcontractors for the marketplace. The company has started engaging with brands and mills to bring the technology into existing supply chains.

Mr Flora sees this as the time to show everyone how the technology works. "We want to make sure it gets off the ground effectively," says Mr Flora. "Once it's into the marketplace, then we can start training companies how to use our technology to make new products."

GTI opened its first facility last summer in Taiwan, a place they chose because "Taiwan is a hub of textile innovation in the world; there's a convergence of volume and price and innovation." This facility will be not just a production centre, but a commercialisation center. Mr Flora expects multiple iterations to come out of their technology — including medical and military applications.

"We wanted to create a space in the heart of the industry," he says, "where we could bring these new ideas to market. A technology by itself is of relatively low value to brands. Somebody has to commercialise it. Not just invent it and not just apply it, but to do it in mass quantity and with uniformity. The Taiwan facility is our first commercial launch point."

Among the innovations currently in development: water-free dyeing and flame retardant, anti-bacterial, and insect-repellent treatments. In addition, GTI has a joint venture in Italy underway and is starting work on joint ventures in Korea and Japan — with plans to have facilities operational in all three countries' major textile production regions by early 2019.

## Too important to fail

The textile industry's reliance on water is unsustainable, whether you want to call it an environmental crisis or a doomed business model.

According to the 2015 GLASA State of the Apparel Sector Water Report, just the dyeing and finishing stage alone requires over five trillion litres of water a year — equivalent to two million Olympic-sized swimming pools. The report points out that textile supply chain countries, such as China, India, US, experience high water stress already; with at least 3% annual market growth anticipated for apparel to 2025, demand is expected to outstrip supply.



*Outdoor brand Marmot will be the first to bring Aquavent-enabled products to market, starting in February 2018.*

Marmot

"Clothing is a status symbol," says Mr Flora. "As more middle class people in developing countries are becoming affluent, consumption of clothing is going up at a much faster rate than the population."

For its own survival, the textile industry must accommodate these new normals — no easy feat for an industry that has relied on water for its entire existence. But early signs are very promising.

GTI is launching a product in February with outdoor brand Marmot, which will be available in the US at REI stores exclusively and globally through other retailers. Marmot will launch additional styles using the technology in autumn, while a number of other brands plan to launch the technology in 2019.

Mr Flora believes this is the beginning of a change that will revolutionise the whole industry. "It has to," he says. "The water resources cannot sustain the growth of textiles in the future. It's impossible."

He feels — and embraces — a personal pressure that, in his 30+ years in the textile industry, he's never felt before. "This is the first time in my career that the stakes are so high, I can't put it down. If we fail, it slows down everyone's idea of what's possible."

The success or failure of GTI, Mr Flora feels, goes far beyond him and his team — it impacts the industry and it impacts the planet. "We understand this is a legacy project for us," he says. "We're taking a risk by doing a startup. But the value to the environment is so emotionally important to us as a community that the reward to the environment is well worth the risk."

COPYRIGHT WSA