

## FOOTWEAR TECHNOLOGY: SYMPATEX

Functional material developer Sympatex believes its new footwear technology can open up “a completely new chapter” in the development of waterproof outdoor shoes.

# Progress of the utmost importance

**W**hen Sympatex announced the launch of a new technology called Utmospheric ahead of September’s Lineapelle exhibition in Milan, it predicted that as a result of this innovation, the traditional method for producing liners for waterproof outdoor shoes could be “made redundant”. The process allows for the creation of three-dimensional laminates that adapt “perfectly” to the shape of the wearer’s foot. This is achieved by means of a thermal moulding technique. The resulting liner is free of seams and creases. More importantly, it can be done without compromising the quality or functionality of the laminate, something which is not guaranteed when employing current methods of production.

Dr Rüdiger Fox, who took over as chief executive in July 2016, tells *WSA* he hesitates to call Utmospheric a new technology as “the thermoplastic deformation of polyester material is something that has been in use in many industries for decades”. He prefers to refer to it as a new application of an existing technology. Regardless of how it is labelled, Sympatex hopes it will represent a real step forward in how outdoor footwear is made.

### The sin of wasted time

The starting point for Sympatex in the development of Utmospheric was to closely examine how the footwear industry makes outdoor shoes and then question whether there were ways it could be improved. Although an obvious statement, the most important thing about a waterproof shoe is that it prevents water from getting in. It must also be breathable, allowing sweat in the form of water vapour to escape so the feet stay cool. This is made possible by a shoe liner, featuring a textile material and a waterproof membrane. Many materials can be used to achieve this, including those that Sympatex makes.



Dr Fox says his own professional background is in industries that adhere to a ‘lean’ production model, that is to say one in which minimising waste and maximising productivity are the main priorities. He explains that when working under this model, the focus more often than not is on ensuring that the time spent working on a product is limited to operations that add value to it. The “real sin” of lean production, according to Dr Fox, is to spend time destroying something, only to rebuild it again.

The reality is that this is what manufacturers of outdoor shoes do. The current process for making a liner is to take a flat textile material and then cut and sew it into a three-dimensional shape. The laminate is created, but then has to be cut up in order to obtain the right shape. The cuts and seams inevitably damage the membrane, so its water impermeability properties have to be re-created by means of tape. Using Utmospheric, this would no longer be the case as the liner is already the correct shape.

*The three-dimensional liner is created via a thermal moulding process. This means it has no seams.*

 Sympatex

*Sympatex believes its  
Utmospheric  
technology is a more  
efficient way of making  
liners for waterproof  
outdoor shoes.*

 Sympatex

“We opened up a degree of freedom of design in the inner shoe,” Dr Fox says. He describes the current process for manufacturing liners as “like trying to square the circle”; Utmospheric is the equivalent of going straight to the circle.

Dr Fox believes the footwear industry is one of many that has a tendency to focus purely on low cost. While doing this, it has lost sight of the importance of overall efficiency in the process, he warns. Put simply, low labour costs have rendered efficiency less important. After all, what are a few wasted seconds when they cost a company so little?

### Advantages for all

Sympatex’s core membrane is polyester based. Dr Fox says it was fortunate that it had the right materials on hand to develop this technology; thermal moulding can be done with polyester, but not with other materials, such as PTFE. With the material itself not a concern, the company was able to focus on optimising the process.

“We replace an existing manual process with an almost completely machine-based process,” he explains. This immediately lends itself to thoughts of automation, the importance of which is clearly growing in the footwear industry. Sympatex has never claimed to be leading the way in terms of final shoe design, according to Dr Fox, but it wants to inspire others within the sector to question how shoes are made.

“Some of our behaviours seem to date from times when automation hasn’t been so easy,” he says. With Utmospheric opening the door to greater possibilities of automation, Dr Fox feels some of the offshoring of production that currently takes place could become “unnecessary”. He adds that it casts doubt over his company’s present global logistics and could lead to discussions about whether production could or should be brought closer to its main markets.

The use of this technology to make shoe liners offers a number of advantages. For example, Dr Fox says he would expect material usage to be more efficient than with current methods. There will also be cost savings and efficiency gains for manufacturers, but it is too early to quantify these.

For the customer, the chief benefit will be greater comfort levels due to the absence of seams on the liner. In addition, the process lends itself to customisation, which is less easy using contemporary methods. Dr Fox says the “ultimate goal” is to be able to create the ideal inner shoe for a specific foot. Even if Utmospheric only gets Sympatex 95% of the way there, it is confident the final 5% will come from the natural elasticity of its membrane and textiles.



### Positive feedback

Sympatex has said its Utmospheric technology can be easily integrated into existing shoe manufacturing operations, with Dr Fox telling WSA this was one of the main goals when the company began the project.

Work has been underway with pilot partners for a number of months. This involves existing customers; it wanted to give its current partners the first insight into the process and to offer them the chance to provide their feedback. It has also reached out to potential new customers, through which it hopes to “at least open up the dialogue”. As well as outdoor shoe manufacturers, its partners are also children’s footwear companies, already an area of strength for Sympatex.

The initial idea was to install the equipment required to make Utmospheric liners at a central location, from which it could serve all its global customers. However, the feedback it received from customers was that they would prefer to have their own machine in order to produce the components they need near to where they manufacture their products. As a result, Sympatex went straight to the creation of a modular system that can be installed wherever the customer wants them. Production machine development is underway, and the company expects Utmospheric to be launched during the course of next year, with a view to going into full series production by the end of 2019 at the latest. 🌐

*Trials with pilot customers have already taken place, with manufacturers of outdoor footwear and children’s shoes involved.*

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