

## FOOTWEAR TECHNOLOGY: REEBOK LIQUID FACTORY



Sports brand Reebok is aiming to revolutionise the way athletic footwear is made with the help of a new liquid material developed by chemicals manufacturer BASF.

# Reebok breaks the mould

**U**nder Armour has its Lighthouse manufacturing and design centre in Baltimore, adidas is building a second robot-operated Speedfactory, and Nike has launched the Ease Challenge to find creative new solutions for fastening shoes; the athletic footwear industry is the place to look for cutting-edge innovation. Reebok has now joined the party with the launch of its Liquid Factory project.

Spearheaded by Bill McInnis, head of Reebok Future and a former NASA engineer, the project aims to speed up the development of new footwear products using 3D drawing and a liquid material created by BASF. The formation of the Future team marks the start of a new chapter for Reebok's innovation department as it switches its focus to how and where its products are made.

"We're looking at how we can bring speed, customisation and enhanced product

performance to the process of creating footwear; Liquid Factory is a very exciting development in this area," explains Matt O'Toole, president of Reebok.

### Robotic revolution

The Liquid Factory is a response to what the brand perceives as a lack of evolution in how athletic footwear is manufactured. "We wanted to fundamentally change the way that shoes are made," Mr McInnis tells *WSA*. It uses state-of-the-art software and robotics to draw an outsole using the material developed by BASF; its high rebound capacity makes it ideal for use in athletic shoes. Taking a flat surface as its canvas, a robotic arm precisely draws curved lines using the liquid polymer, building up in 3D layers to create the framework for the sole. Reebok says the result is an outsole with twice the energy return of a conventional rubber one. The framework extends up the sides of the shoe and

*The sole is drawn in 3D layers by a robotic arm.*

 Reebok

integrates with the laces; these 'wings' stretch and mould around the foot as the laces are fastened, resulting in a better fit.

The process eliminates the need for moulds, the use of which Mr McInnis calls "expensive and time-consuming". It makes it much easier to alter or customise designs; instead of creating new moulds, Reebok can program the robots in the Liquid Factory to draw the outline differently. This means design changes can be made in "days or even hours as opposed to months", he says, adding that "customisation is a huge advantage" of the project. Reebok believes the Liquid Factory will allow it to design and create high-performance athletic footwear faster and more efficiently than ever before. "One big difference you'll see is the speed of creating and refining product," predicts Mr McInnis. It will see a massive reduction in the time between the initial product brief and the shoes hitting the shelves; this typically takes up to 18 months. "Our consumer is moving much faster than ever and we need to at least keep pace and preferably stay ahead with what's coming next," he emphasises.

### Going it alone

Transforming how athletic footwear is made is also high up on the agenda of Reebok's parent company adidas. In 2014, it announced plans to build the Speedfactory, a manufacturing plant where customised products are created by automated machines. The dream became a reality in 2016 when production began at the facility in Ansbach, Germany. It is almost entirely operated by robots; a small number of human staff monitor the machines, which assemble shoes with knitted uppers and soles containing adidas' energy-return technology. Large-scale production is expected to get underway this year. Last September, the company unveiled the Futurecraft MFG (Made for Germany) sneaker, the first shoe to be produced at the Ansbach plant. James Carnes, adidas vice president of strategy creation, described its launch as a "defining moment for the industry". It now has plans for a second Speedfactory in Atlanta, US.

Although the companies are connected, Mr McInnis tells WSA that Reebok's Liquid Factory project is an independent venture. While the adidas SpeedFactory focuses on new ways to assemble footwear components, Reebok took the elimination of moulds as its starting point. "The entire industry is spending a great deal of time and effort on how to create shoes in the future as the existing manufacturing model won't last indefinitely," he says.

The Liquid Speed, the first concept shoe produced as part of the project, has already been unwrapped. To take advantage of the improved energy return

offered by the sole it is targeted at the running market. The design and assembly was carried out in the US; final assembly took place at Reebok's headquarters in Massachusetts. It plans to release 300 limited edition pairs. The shoe is subject to the same testing standards as the brand's other footwear products.

### More to come

Reebok is "only just scratching the surface" with the Liquid Factory, according to Mr McInnis. He predicts it will be the start of a "broad new menu" of product development. This phase has focused on developing the outsole but the company thinks the process will eventually be used to create other component parts of performance athletic shoes. The first Liquid Factory manufacturing laboratory will be opened in Rhode Island this year. With an initial capacity limited to the thousands of pairs, the company intends to scale up the procedure so that it has enough machines to satisfy the brand's standard order quantities.

The head of Reebok Future envisages automation impacting footwear in a similar way to how it has affected the automotive industry. The labour-intensive nature of footwear manufacturing has resulted in many companies relocating their operations to Asia in the pursuit of cheap labour; he expects increased automation to allow for more "local for local" manufacturing, that is to say shoes for the US market being produced in the US, and Asian factories producing shoes for the Asian market. "Faster, smaller and more local factories can change the landscape dramatically," he says. It will also bring about a shift in the skills that footwear workers need as they will be required to understand how to programme the machines required for the manufacturing process. This is just one of the challenges that Reebok and its competitors face. If recent developments are anything to go by, the Liquid Factory project will be far from the last creative solution they come up with. 🌐



*The framework extends up the side of the shoe to improve the fit.*

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