



The Brooks Genesys running shoe produced using FitStation/MSI technology is scheduled to be available in January 2019.

IMAGE: BROOKS

An advance in customisation

Brooks Running Company, established in Seattle in 1914, supplies performance footwear to athletes in over 50 countries worldwide. It has a history of producing personalised footwear to enhance the athletic performance of its customers' by creating running shoes aimed at complementing their natural motion path rather than by attempting to correct any existing physical flaws. CEO Jim Weber says that, "As part of our focus on reinventing performance running, we will continue to push the envelope to bring runners innovations that help them uniquely tailor their run." The company has now taken this to a new level in terms of customisation.

The latest development involves an in-depth analysis that includes 3D foot scanning, dynamic gait analysis and foot pressure measurements using FitStation powered by HP technology. FitStation is pioneering hardware and software that combines 3D foot scanning with dynamic gait analysis and foot pressure measurements. It

offers the customer an in-depth analysis which includes key motion zones to identify the unique motion path of their body and information about their desired running experience. It is thus able to create a one-of-a-kind holistic digital profile of an individual that combines personalised fit, biomechanics and experience which, in turn, can be translated into specific requirements for each shoe.

It is in fact a follow-on from a form of biomechanical assessment that has long been part of Brooks's Run Signature service designed to find a shoe from its range that best fits a particular customer. This involves sensors being attached to the customer's ankles, shins and knees, after which they are asked to perform a series of knee bends and run a few steps on a treadmill equipped with a camera. Their motion is captured with the aim of recording the biomechanics of the way in which they run. For instance, it can analyse how far their

knees point away from each other and how they are affected by way their hips swing while running. FitStation technology takes this to a whole new level.

MSI TECHNOLOGY

The shoes themselves are being produced in the USA by Superfeet using a Desma rotary polyurethane injection-moulding machine, which uses a 3D foot scan to ensure each shoe is tailored to its owner. Ed Ponomarev, general manager of FitStation and business development HP Inc. says that, "FitStation powered by HP is changing what personalisation means, from the in-store experience to the final product. Digitalisation of biometric data opens an opportunity to ultimate individualisation with the speed and cost efficiency of mass production."

The system uses the 3D foot scans to determine the proper lasts on which to produce the shoes, ensuring each is tailored to the specific shape of the runner's foot. Then, using a combination of variable PU injection



The FitStation scanner performs an essential part in collecting foot and gait data. IMAGE: BROOKS

with direct moulding capabilities, the foot pressure measurements, movement analysis of the runner's joints and their personal experience preferences are combined to create personalised midsoles with multiple tuned zones to ensure the runner stays in their preferred motion path and enjoys the running experience they desire.

While the FitStation platform is undoubtedly ingenious, Desma's Multi-Section-Injection (MSI) technology is no less so. This state-of-the-art direct moulding technology allows PU midsoles to be produced with individual characteristics. Not only can these different characteristics be present in individual midsoles, but can also be achieved in different sections of that single midsole. Production nevertheless takes place on a conventional rotary machine using standard moulds; the clever part is the variable mixing head.

Desma has a great deal of experience in this field, particularly as far as colour change per shot has been concerned and MSI is a logical progression on from this. The production parameters produced by the FitStation scan of the customer are used to customise the mixing of PU's major components polyol, isocyanate and distinguished additives. This is made possible by a specific configuration of material combinations at a mixing head which is adaptable so that different value mixtures can be injected shot-by-shot. It results in an individual customised midsole being produced at the same speed and cycle

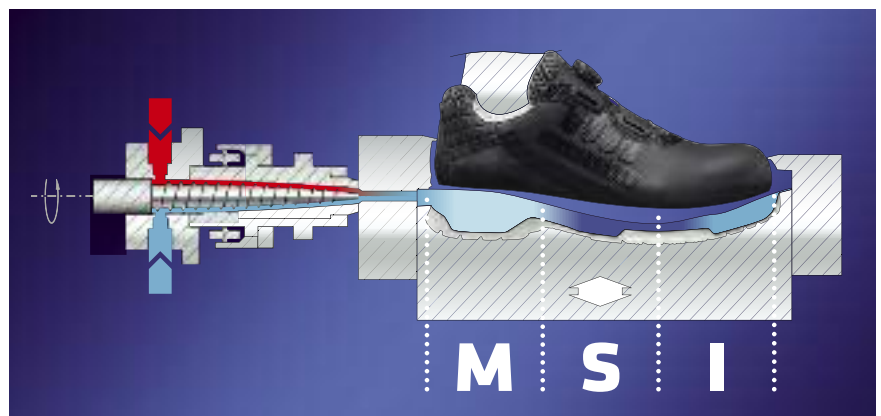
time as in a normal mass production scenario. The combination of these two new technologies is a breakthrough as far as the customisation of footwear production is concerned.

A FUTURE PORTENT?

Customers can order their individually customised shoes in either specific retail outlets or on the internet, which ever is the most convenient. What does this combination of technologies portend for the future and what might its implications be? One can see that it is likely to be more affordable than that of many other customisation concepts and therefore far more likely to appeal to manufacturers. Other sectors of the footwear industry are in fact already said to be showing considerable interest in the idea including

manufacturers of work, trekking and military boots, casual and children's shoes, and sports shoes as well as special performance footwear.

The whole programme is very much one of partnership as FitStation relies on Desma's MSI technology for its fulfilment and Desma relies equally on FitStation's input. The FitStation platform offers a closed loop and full integration between consumer and the manufacturing process, which has only been made possible by Desma's MSI technology. Christian Decker, Desma managing director says, "It is one of the current best showcases for IoT or Industrial Revolution 4.0 scenarios: a closed loop and full integration between consumer and manufacturing process. The year 2018 has been underlined with multiple milestones in the footwear business and this will be one of the most advanced." 📌



MULTI SECTION INJECTION

MSI technology enables different densities of PU to be used in the heel, tread and toe of the midsole. IMAGE: DESMA