

RISE TO THE CHALLENGE: PUMA, COVESTRO & TRANS-TEXTIL

Three companies have collaborated to produce what Puma describes as its most technical boot yet.

Joining the dots

As French footballer Olivier Giroud stepped on to the pitch for Arsenal's clash against Tottenham Hotspur at the end of April, national press in the UK reported he had a "secret weapon". The two famous London sides were squaring up for the anticipated derby with thousands of fans watching on intently. But studying the form for different reasons would have been the Puma's team responsible for boot design, as Giroud debuted the latest version of the evoPower design, the Vigor 1.

To create what Puma describes as its most technical football boot to date, the German company teamed up with a local textile-maker as well as chemicals group Covestro to launch its first design constructed around a textile sock. This construction, which is said to be easier and cheaper to make than standard methods, has been tested by Italy's Mario Ballotelli and Czech goalkeeper Petr Čech, as well as Giroud, who says Puma has "raised the bar" with the design.

The R&D teams at sports brands are always on the hunt for adaptations that will make the boots lighter and stronger or look better. Puma's team studied footage of its sponsored players to see how they use their boots and to work out which parts could be improved. "We examined what the body naturally brings to the ball and how we can give it more impact and even better aim, and took each boot material to the next level," says Matthias Mecking, Puma's general manager for team sports.

This led to the idea of a knitted sock and the partnership with Trans-Textil, which is based close to Puma's headquarters in Bavaria and specialises in laminating, coating and printing functional fabrics, mainly for the safety wear sector. The football boot is a move away from its usual products, but its research teams were confident the material they produced could help fit Puma's brief of creating a strong and supportive

yet flexible, breathable material. It also enables the 'barefoot' kicking experience.

Trans-Textil also introduced long-time chemicals partner Covestro (formerly known as Bayer Material Science) to the collaboration. Between them, they added the Topaz-dots to the sock material to create a 3D effect.

"The dots are what transforms this spandex," Nick Smith, head of textile coatings at Covestro, tells WSA. "They are printed on the outside and offer grip, and they are printed on the inside to create a spongy effect. When the player kicks the ball, the dots offer comfort because there is some cushioning between the foot and the ball."

As well as providing cushioning, the Topaz-dots are integral to added precision, as they regulate the uneven surface when the foot comes into contact with the ball. The dots are made with Covestro's Insqin, a water-based technology whose manufacture consumes fewer resources than standard PU-coated materials. Covestro states that almost all other PU-coated materials are made using dimethylformamide (DMF) as the process solvent, a substance of very high concern in the European Union. Insqin therefore addresses the need for more sustainable solutions, and was developed for garments, bags, footwear and furniture.

"As a company, we have often spoken about replacing hydrocarbon-based synthetics with water based. Here there's a different approach: they've replaced the synthetic entirely and used it to make a different material," adds Mr Smith. "As the provider of the polyurethane and the design of the polymer - the polymer is providing the mechanical properties - we had to get the right modulus, the right elasticity, the right formulation."

He adds that Insqin also enables the core design: "Because

Olivier Giroud has been testing evoPower Vigor 1 boots. The Insqin dots allow Puma to meet design and sustainability goals simultaneously.



if you don't like the way it looks, you're never going to put it on your foot and realise how good it feels. Being a chemicals supplier, the greatest satisfaction is when we see our work in products you can buy; products that look beautiful, are highly technical and are sustainable."

The boots will be available in orange over the summer, to add to the green colourway released in January.

Unfortunately for Mr Giroud, the derby didn't go Arsenal's way, with limited opportunity for the striker to demonstrate the boots' capabilities. Around 1.6% of players in the English Premier League now wear the EvoPower series, making it the 10th most popular design, according to the Football Boots Database 2017. Puma has two designs in the top 10, and Nike has the most with six, but two adidas boots are the most popular (the adidas X 16.1 and the adidas ACE 17.1 Leather, both with a 10% share). Puma will be hoping, with increased exposure, that its "secret weapons" can help it to rise up the table to challenge its rivals for a shot at the title. 

Process sustainability

Covestro is looking at sustainability from the manufacturing side. One project is a water-based adhesive that can be digitally printed on to shoes and could enable the automation of the manufacturing process. "Currently, midsole adhesives are applied by workers in China or Vietnam with a brush," states Covestro's Nick Smith. "Everything else in the world is automated except for textiles because it is so difficult." The new way would enable glue to be applied to specific areas of the sole, in a set pattern, which could also have benefits for design.

The chemicals company is also working on a way to print designs in one pass using a thermoplastic polyurethane, rather than screen printing, which normally requires someone to walk up and down a long table, operating the machine in layers. In the future, it should be able to digitally print materials on to other materials.

