

Press Release



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The perfect combination of performance, design and sustainability

Groundbreaking athletic shoes

Joint developments of footwear designer Axis Liu and Covestro

[Covestro](#) will unveil groundbreaking material concepts for running and basketball shoes which it has created together with Chinese designer Axis Liu, at the [K 2019](#) trade fair from October 16–23 in Düsseldorf. Both partners collaborated in the development of the customized concept shoes, in their design and technical features.

The shoes satisfy the wishes of athletically active people for a healthy lifestyle, improved performance and individuality. Various material solutions from Covestro are worked in a seamless design, exemplifying the individual benefits of each material: INSQIN® water-based polyurethane (PU) textile coatings and adhesives, PU foams, textile fibers and films made of thermoplastic polyurethane (TPU) and Maezio™ continuous fiber-reinforced thermoplastic composites (CFRTP).

“For me new materials are one of the most powerful driving forces for creative shoe design and for exploring new possibilities,” says Axis Liu. “Therefore, I appreciate the know-how of the experts at Covestro and I will continue to benefit from this in the future.” The cooperation between Liu and the Covestro team resulted in athletic shoe concepts that set standards in many respects: they are highly sustainable and light, yet extremely durable. They provide increased foot stability and help to compensate for the forces acting on the feet, in order to achieve improved athletic performance.

Running shoe with 3D-printed midsole

For the design of the running shoe, Axis Liu was inspired by a traditional figure from Chinese arts and craft: the “Multilayer Carved Ball” which has a dynamic



structure handmade up of several layers. On the running shoe, the dynamic, extraordinary structure of the midsole was produced by a 3D printer.

Because running shoes are often worn outdoors for several hours at a time, it is particularly important for the upper material to be water resistant and breathable. This functionality is achieved on the concept running shoes by using a special INSQIN[®] coating.

Conventional adhesives based on Dispercoll[®] U dispersions join together the individual athletic shoe components securely, easily and efficiently. This water-based adhesive technology helps conserve energy and resources. It also contributes to making athletic shoe production more sustainable.

Basketball shoe with good shock absorption

During development of the basketball shoe, however, the designer drew inspiration from the world of toys and the modular construction often found there. Of course, his designs also took into consideration that the feet and bodies of basketball players are strained in different ways than those of runners.

In accordance with the different requirements of both sports, there are also differences in the individual components of the materials used. For example, the midsole of the basketball shoe was made using in-mold foaming and contains expanding TPU (ETPU), which provides good shock absorption and at the same time features particularly high restoring forces. This enhances performance for the jumping and quick acceleration that are common in basketball.

Both shoes use the newly developed Maezio[™] carbon fiber-reinforced TPU (CFRTP), which is very light, but also extremely stiff and torsion resistant. This unique material combination offers a high degree of design freedom and a strong aesthetic appeal with unique, unidirectional carbon fiber optics; in addition, it is recyclable.

Other materials and their function

Apart from that there are many similarities between the two concept athletic shoes:

- The uppers of both shoes contain TPU fibers. These are highly resistant to abrasion and tearing, yet they feel extremely comfortable.
- The running shoe upper is applied with screen printing. This is the printing solution using INSQIN[®] technology which is now used by world-leading manufacturers and brand owners. It provides a visual-haptic effect and improves the performance of design and manufacture.
- The Shoe tongue label with Chinese Character “聚”(jù) is applied using a TPU hot-melt film with good printability. 聚” means gather together, it



demonstrates how well films of brand names Dureflex® and Platilon® adhere to textile materials with soft surface feel.

- Insoles made of viscoelastic PU foam effectively absorb mechanical loads.

About Covestro:

With 2018 sales of EUR 14.6 billion, Covestro is among the world's largest polymer companies. Business activities are focused on the manufacture of high-tech polymer materials and the development of innovative solutions for products used in many areas of daily life. The main segments served are the automotive, construction, wood processing and furniture, and electrical and electronics industries. Other sectors include sports and leisure, cosmetics, health and the chemical industry itself. Covestro has 30 production sites worldwide and employs approximately 16,800 people (calculated as full-time equivalents) at the end of 2018.

This press release is available for download from the Covestro press server at www.covestro.com. Photos are available there for download as well. Please acknowledge the source of any pictures used.

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