

## 3D Warp Knits meet functional membrane systems

Penn Textile Solutions and Trans-Textil have combined technologies for high-performance outdoor, sport and leisure products



Three-dimensional constructions integrated by Penn Textile Solutions in its digitally controlled knitting process are the starting point for performance zone and design individualisation in sport, leisure and outdoor. Further functionalisation is achieved with Trans-Textil's Point-in-Point lamination process using the firm's proprietary membrane systems as well as its PFC-free water-repellent Topaz clean4green surface finish. All production steps are "made in Germany" using components certified to the Oeko-Tex Standard 100.

**Penn Textile Solutions is opening up new applications for superstretch textile components by using warp-knit fabrics from its dreamshape® sport collection as the outer shell for sport, leisure and outdoor. In combination with Trans-Textil's PFC-free membrane, lamination and surface finishing technology, Penn's partial 3D constructions enable the targeted placement of functional zones. In attaining this additional functionalisation, the partners have achieved a true textile innovation "made in Germany", one that fulfils the highest requirements in terms of performance, design and ecology.**

### Targeted performance

Penn Textile Solutions' dreamshape® technology combines various materials and warp patterns into a single, stretch, seamless warp-knitted fabric that meets the specific demands of differing areas of the body in sports situations. This makes it possible to position mesh zones with a breathability-fostering mesh size and abrasion-resistant 3D constructions exactly where they are needed for outstanding climatic comfort and enhanced durability. As the functional segmentation is achieved as part of the actual warp-knitting process, this dispense with additional seams, enabling optimised clothing construction and maximum freedom of movement. Reducing the number of seams also lowers the risk of leakage. Thanks to reduced friction, and use of fabrics incorporating elastane, the outfits

accommodate every movement, even in cases of extreme exertion. This function also enables an exceptional, modern and technical design idiom for individualisation and styling in line with customer demands.

### **Functional hybrid systems**

In the multi-layer laminate Trans-Textil's membrane systems ensure reliable impermeability, and in connection with the warp-knit fabric's partial 3D constructions deliver breathability where it is required. The superstretch materials are processed using Trans-Textil's unique Point-in-Point® lamination technology in which a grid of PU hotmelt adhesive dots is applied in an evenly spaced and precisely controlled process adapted to material combination and requirement. This not only ensures robust and durable processing and maximum breathability but also enables a four-way stretch effect for optimal ergonomics and freedom of movement. The result is a functional high-performance hardshell laminate that resembles a midlayer in terms of its high elasticity and soft feel.

Use can be made of Trans-Textil's transparent or colored membrane systems in the 3-layer laminate to provide a design highlight in the form of an additional "see-through" effect. In combination with a coloured lining or one with a design applied in the eco-friendly transfer printing process, this delivers a unique play of colour at sections with an open knit structure following the motto 'Create your own design, create your own performance' of Trans-Textil's Topaz FUSION concept in which the company bridges the gap between individual design and functional high-performance materials.

### **Ecological leadership "made in Germany"**

Penn Textile Solutions and Trans-Textil are not only paving the way in technology terms. Yarns of European origin, warp-knitting technology from Germany and their combination with membrane systems and laminates made in Germany ensure short distances between the production sites while also reducing transport-induced CO2 emissions.

All the materials including the Topaz membrane systems are certified to the Oeko-Tex Standard 100 and are processed in Germany in conformity with REACH and according to the most rigorous environmental considerations. PFC-free formulations from the Topaz Clean4Green line are deployed for the water-repellent surface finish.

**All photos and graphics are available in high resolution upon request for free use with the source proof "Photo / Graphic: Trans-Textil GmbH.**