



Invisible technology, visible results

P2i's chief technology officer Dr Stephen Coulson tells *SGB Outdoor* about the company's ion-mask liquid-repellent nano-coating technology, and how it's taking the world's leading footwear brands by storm.



Ion-mask is P2i's liquid-repellent nano-coating for footwear and other lifestyle products. It works by applying a nanoscopic protective polymer layer

one thousand times thinner than a human hair to the whole surface of a fully constructed shoe using patented plasma treatment technology.

The ion-mask process dramatically reduces the surface energy of a product, so that when liquids come into contact with it, they form beads and simply run off without being absorbed, revolutionising footwear performance.

Not only does ion-mask keep wearers' feet comfortable and dry, but unlike membranes it does not present a physical barrier and delivers the full natural airflow of the chosen material, resulting in optimum breathability. And, being only nanometres thin, ion-mask adds no additional weight or bulk to shoes, while in wet environments the hydrophobic properties ensure that less water is retained. For example, in typical laboratory immersion tests, shoes treated with ion-mask will absorb up to 50 times less water than those that are untreated, depending on the shoe construction and materials.

Combined, these attributes have led a number of

the world's leading footwear brands, including adidas Golf, Nike, Timberland, Scott, Mizuno, Hi-Tec, K-Swiss, Pearl Isumi and Ecco, to adopt ion-mask.

According to Marco Grott, director of footwear development for adidas Golf, ion-mask provides extraordinary benefits both for the company and its customers. He says: "As a performance transforming technology it's the natural complement for our existing state-of-the-art product features, plus P2i has done its homework to ensure that deployment into manufacturing is smooth and efficient."

By resisting the absorption of water and dirt, ion-mask also helps guard against stains, allowing footwear brands to push traditional design boundaries even further. Lighter colour fabrics or more difficult to clean materials can now be used successfully in shoes designed for active or outdoor lifestyles – opening up a new market for multi-purpose lifestyle footwear that looks good and performs well.



John Healy, general manager of Timberland's invention factory, comments: "As a leader in waterproof and water-resistant footwear, Timberland is constantly searching for new technologies to improve our

products and the way they perform in the outdoors. Ion-mask hit our radar as we were looking to expand our canvas offerings for spring 2011. With ion-mask, we are able to offer truly breathable, summer-weight canvas shoes that are super water- and stain-repellent. It's an exciting development for anyone looking to spend time outdoors."



For the growing number of environmentally-aware manufacturers, ion-mask is also a responsible choice. Traditionally the processes used to create water resistance have involved significant inputs of energy and chemicals. By contrast, the low-energy, solvent-free ion-mask process uses only tiny quantities of protective monomer, resulting in minimal waste and no adverse impact on the environment.

Another key issue for any footwear manufacturer is durability, not only in terms of a product's physical construction, but also the way it stands up to everyday use. In the case of water repellence, the performance of traditional approaches is limited. For instance, the name Durable Water Repellents (DWRs) can be misleading, as abrasion and flexing limits the durability of DWRs in real-wear conditions. This is not the case for ion-mask, which is molecularly bonded to the whole product surface, meaning it cannot wear or rub off. In dynamic test conditions, ion-mask has been shown to be ten times more durable than a market-leading DWR.

