

FOOTWEAR TECHNOLOGY: BAYER MATERIALSCIENCE

New technology from Bayer MaterialScience offers the makers of PU-coated materials and the brands that buy from them the chance to make their processes and supply chains solvent-free.

A 'new generation' of PU-coated fabrics

Polymer producer Bayer MaterialScience has launched a new polyurethane-coated fabric production process called Insqin, saying it will help companies produce a "new generation" of fabrics coated with polyurethane (PU) and mark "a new chapter in the footwear and apparel sector". The new range offers brands "an integrated package of pure waterborne PU technology, material co-development and certified manufacturer partner programmes for PU-coated fabrics" it explained. Bayer MaterialScience has figures that suggest seven billion pairs of shoes, two billion bags and one billion garments containing PU-coated fabric are made each year. It calculates that at least one billion of the seven billion pairs of shoes are in the sports footwear segment.

Battle for sustainability

"Today is an exciting and pivotal day for all textile-consuming industries, as we look ahead to an innovative and sustainable way of producing coated fabrics with Insqin," said Nicholas Smith, global head of textile coating at the company, at the time of the launch. "Not only are we now able to join efforts with brand owners to shape a more productive innovation process, we are also contributing to a practical solution that addresses the ongoing battle between sustainability and scalability."

Bayer stated that Insqin would enable the manufacture of "all kinds of coated fabric" to be carried out without solvents. "Worker exposure to solvents needs to be addressed," it continued, "and pollution risks need to be minimised."

Nicholas Smith has since explained to WSA that Insqin can make a difference because the water-based technology removes the need for solvent in the PU resin used as raw material and, more importantly, he says, in the production process, in which additional "process solvent" is often necessary. In other words, Insqin enables the production of PU-coated materials without the use of solvent,

Bayer MaterialScience says its new waterborne technology can help manufacturers of PU-coated material make their production more sustainable by eliminating solvents.

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thereby eliminating the risk to workers and of environmental contamination.

Production costs will come down

He says it is difficult for Bayer to say how much Insqin might add to production costs for fabric manufacturers who choose to make this change.

"There is an enormous range in production costs for PU-coated fabrics made with solvent-based processes," Mr Smith explains, "depending on the application and requirements for effect, feel and performance. However, what can be said is that there are a number of factors that will play together to bring production costs down over time."

Economies of scale are important in determining production costs, and as the demand for these materials increases, production costs will come down, he insists. The demand is there: Nicholas Smith refers to PU-coated materials as "indispensable in the apparel and footwear industry". A second factor to consider is what he refers to as "the economy of experience"; as producers become more experienced in making the new materials, their costs will reduce. "Finally, we expect the resource costs to play an ever increasing role in overall material production costs," he claims. "As the cost of energy and water rise sharply in China, the lower energy and water consumption of the new processes will start to bring their own economic contribution."

Collective commitments

Bayer MaterialScience has in place arguments it will use to convince companies to invest in Insqin, which is important, bearing in mind that PU coating is often carried out by companies that compete mainly on price. "Leading companies in the global apparel and footwear industry have made collective commitments to improve the sustainability of their industry," says Nicholas Smith. "Insqin, by addressing not one, but multiple sustainability impacts, is a response to a clear need from the market." He acknowledges that since the industry is big and fragmented it is important for large numbers of industry players to make a commitment to sustainability and to back that commitment up with investment. Only if they invest in the necessary innovation will economies of scale and experience be reached. "Then prices will come down," he says. "One or two companies alone will not bring about real improvement, but if the industry acts together, a major step-change will have been realised."

User organisations can sign up for the whole "integrated package" from Bayer MaterialScience, or they can buy the technology and use it themselves; they will be free to avail themselves of as much or as little support as they need from Bayer. "PU-coated fabric



manufacturers and their customers, the brand owners, tell us they benefit a lot from working with us," Mr Smith insists. "We are talking about the development of completely new kinds of material, and traditional supply chains that are ideal for mature products are not optimal for innovation. We have long experience of developing waterborne polyurethanes and their formulation and application in making PU-coated material, and this is of great value to our business partners. It helps the development of better materials, more suited to product needs, more quickly." His company runs pilot coating lines at its own facilities, which he says allow it to show manufacturers how to scale the production of the materials to meet commercial demands.

Better off without solvents

Returning to the sustainability question, he says the standard process for making PU-coated materials for shoes, clothes and accessories has, throughout its history, carried a risk of solvent emission, sometimes leading to worker exposure. In theory, at least, he believes manufacturers ought to have been able to contain the risk, but concedes that in practice "it seems to have been difficult to achieve". Things are changing. He says current thinking in this industry favours ceasing use of "substances of concern", but adds that the use of any solvents, even if the process is carefully controlled, requires high volumes of water and energy for rinsing. "We believe Insqin will represent a game-changer for the manufacture of this type of material," he concludes. 

Demand for PU-coated fabrics is high. Bayer MaterialScience has figures that suggest 7 billion pairs of shoes, 2 billion bags and 1 billion garments containing PU-coated fabric are made each year.

 Bayer MaterialScience