RISE TO THE CHALLENGE: PROVIRON AND REVERDIA



A project to use renewable resources to develop a building block for polymers, resins and many other products is making strong progress.

Partners promise "genuine green product"

A collaboration between Belgian chemical company Proviron and Dutch material sciences firm Reverdia has resulted in Provichem 2511 Eco, a di-methyl-succinate (DMS) that can be used as a raw material for a range of chemicals that can, in turn, be used in textile and footwear applications. What's more, the two companies (Reverdia is itself a partnership set up by Dutch life and material science company Royal DSM and Roquette Frères, a global starch and starch derivatives company) have said that manufacturers choosing to use Provichem 2511 in their raw material mix will be making their supply chains more sustainable.

Minimise carbon footprint

Bio-based succinic acid is derived from non-fossil feedstock and produced with sustainable production technologies that minimise carbon footprint. It is a building block that can be used in the manufacture of polymers, resins and many other products. Key applications include footwear. But Reverdia has said a new production set-up it is developing in Italy will allow it to serve application areas including polyester polyols for polyurethanes and, further down the line, elastane production for use in apparel. It has called its product Biosuccinium, saying it will "provide the impetus for an entire range of more renewable, and more sustainable products".

Further down the line, Reverdia believes its Biosuccinium product will be able to help partner manufacturers make greener versions of elastane and plasticisers for athletic shoes.

adidas

Provichem 2511 Eco, the new product that Proviron is bringing to market, is based on Biosuccinium. It is being produced in Belgium and "commercial volumes" became available in the autumn of 2012. Biosuccinium is to be produced in Reverdia's new production facility, which it has called the world's first large-scale commercial plant for renewable succinic acid. This factory, announced at the start of 2012, is in Cassano Spinola, in Piedmont in northern Italy, and is on an existing site that one of the Reverdia parent companies, Roquette, runs there. The plant is scheduled to be operational by the end of 2012, but "representative samples" and larger volumes of Biosuccinium have become available early, making partnerships such as the one with Proviron to make 2511 Eco possible now. Samples and larger quantities have been made at Roquette's demonstration plant in Lestrem in northern France. The development at Cassano is the result of the decision to scale this up.

Sugar into acid

Wim Michiels, chief executive of Proviron, has complimented Reverdia for having developed "a unique proprietary yeast technology" to convert sugars into succinic acid. His belief is that the technology will be able to provide partner companies such as his with bio-based succinic acid "with best-in-class quality, sustainability profile and economics". Various customers have already approved samples of 2511 Eco, and are now scaling-up, Mr Michiels has said. He sees many more opportunities in the pipeline and says, in terms of commercialising "this genuine green product", 2511 Eco is a good start. For his part, Will van den Tweel, general manager of Reverdia, says the collaboration is "based on great chemistry" between the people of Proviron and Reverdia as well as chemistry for a more sustainable world.

Stefaan Depecker, Proviron's commercial director, explains that his company has been looking for bio-based raw materials to be able to offer more sustainable alternatives to oil-based products for some time and says it's a policy that ties in with the philosophy of the company from the outset. When chemical engineer Leo Michiels (the current chief executive's father) founded the Belgian company in 1977, he picked the 'Pro' part of the name to signify 'process' and the 'viron' part for the environment. "He was ahead of his time," Mr Depecker says. "Ecology and chemistry are both part of our DNA."

For Reverdia's new business development manager, Richard Janssen, his company's ability to provide the right bio-based raw material at the right time for 2511 Eco is a result of "dynamics coinciding". He explains: "The depletion of oil resources, the rising price of chemicals and the increasing awareness of sustainability are all part of a macro-trend. Our work involves adapting microorganisms, and in this instance we now believe we can do it well enough and quickly enough to help with this project."

Like buying a new car

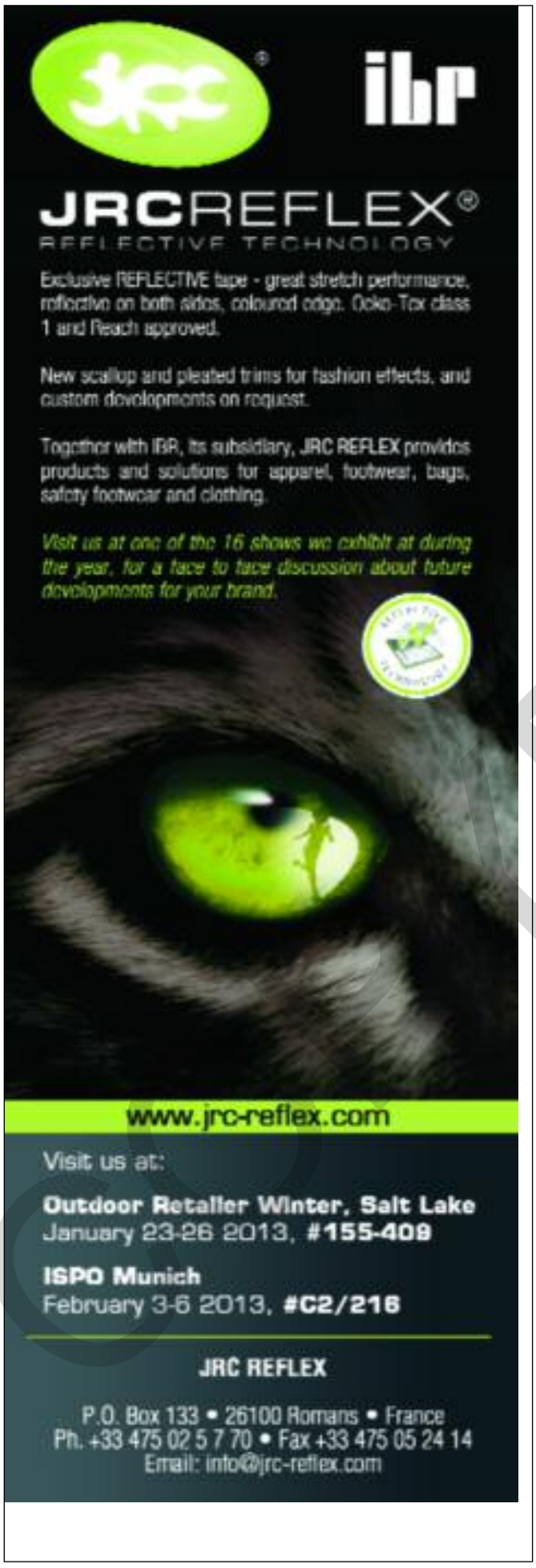
Biosuccinium, the result of this particular exercise in adapting microorganisms, makes a major contribution to Provichem 2511 Eco. Proviron sources the acid from Reverdia and uses it to make its bio-based DMS product, which can be a building block for greener versions of many of the existing products that form part of the sports and outdoor clothing and footwear supply chains. "A petrol-based variant of 2511 Eco is already on the market," Stefaan Depecker says, "and this new bio-based product has the same specification. It's already been accepted by industry and our customers can easily replace the old version for the new one. It's



Chief executives and partners. Wim Michiels of Proviron on the left and Will van den Tweel of Reverdia.

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A new production plant for Biosuccinium that Reverdia has set up at Cassano Spinola, in Piedmont in northern Italy.

Reverdia

like changing from an old model of a car to a new one. The customer is completely familiar with how the product works and can use it as before, just with a reduced carbon footprint. And a reduced carbon footprint is something many big consumer product brands are pushing for."

Textile and footwear applications

As mentioned, Proviron's new product, 2511 Eco, can help clothing and footwear manufacturers with that push. It can be used as a solvent to replace toxic and non-biodegradable chemicals in textile production in applications such as protecting polymers from discolouring, an area in which chemicals with higher levels of toxicity than 2511 Eco are still used frequently. Elsewhere in the textile supply chain, the manufacturer has confidence the product can replace less sustainable ones that play a role in regulating pH during the dyeing process. And a relatively new application Proviron has been examining with clients is the potential 2511 Eco has in ink-stain and paint removal.

For his part, Richard Janssen says Biosuccinium also has a bright future. He calculates the reduction in carbon footprint for Biosuccinium compared to succinic acid from non-renewable resources at about 50%. "That's a big difference," he says, "but there is clearly still room to improve." As well as Proviron, though, it's already a big enough improvement to be attractive to suppliers in various parts of the clothing and footwear sectors. It can go into polybutylene succinate, a biodegradable plastic that is catching the attention of zipper manufacturers and of footwear manufacturers for packaging. Bio-based polyurethane is a large application area, he says, not least for plasticisers in footwear and for membrane technology for weather-proofing in clothing.

"We have mentioned elastane," he repeats, "but it is for the longer term, maybe for the next three-to-five years. It's made today from butanediol, but we can convert succinic acid into butanediol. It's quite a challenge but we can do it in time."