New market conditions are encouraging European polyester manufacturers to invest in mechanical recycling, solution dyeing and local sourcing.

Casting a new line in polyester

Under pressure from leading sportswear brands, polyester fibre manufacturers in western Europe are scaling up recycled polyester output as a way to maintain their standing in the global market. Leading sportswear brands widely publicise their intentions of reducing the environmental impact of their businesses, and some have put down specific timelines and guidelines for their suppliers. For many, the year 2015 is the next major milestone. This is not a distant deadline in the sportswear industry. Most design teams are already preparing their autumn-winter 2014-2015 collections and some have probably begun work on spring-summer 2015 products already.

At all available opportunity, Nike underlines its commitment to sustainable development and corporate social responsibility. The company specifically keeps a tab on its use of recycled polyester in apparel, which it claims doubled in 2011 compared with 2010. Nike says the number of its branded garments containing at least a portion of recycled polyester fibre grew from 3,000 in 2004 to 31.5 million in 2011, estimating it has removed the equivalent of 280 million plastic bottles from the waste stream.



The Sympatex polyester-polyether copolymer membrane now contains 15% recycled post-industrial polyester.

Sympatex

Puma and adidas have also widely broadcast their own sustainability programmes. In apparel, Puma has announced its intention of stepping up consumption of organic cotton and recycled polyester by 2015. Within the framework of a programme called Environmental Strategy 2015, adidas aims to reduce its environmental footprint by 15% relative to sales. Adidas was one of three companies to sponsor a study assessing the environmental impact of recycled polyester. The lifecycle analysis (LCA) indicates "mechanically recycled polyester has a better environmental profile than chemically recycled, but chemically recycled fibres have a wider range of applications for the industry". Regarding non-renewable energy use (NREU), recycled polyester can achieve savings of between 40% and 85% and global warming potential (GWP) savings of between 25% and 75%, as stated in company documents.

This backdrop explains much of the investment that has impacted the polyester fibre business in Europe over the past two years. According to the European Man-made Fibres association (CIRFS), polyester is by far the dominant fibre today. "It continues to gain market share," says Frederic van Houte, CIRFS general manager. He further believes that European producers are a leading force in matters of sustainable development.

A changing landscape

The contours of the polyester market in western Europe have undergone many changes recently as Advansa, Trevira and Miroglio's polyester divisions have all come under new ownership in the past two years. The most recent change is at Miroglio. The Italian fashion conglomerate spun off its polyester business this year, with a view to focusing on its ready-to-wear and retail operations, says Stefano Cochis, who remains the polyester business unit director of what is now called Filatura di Saluzzo (instead of Filature Miroglio) and which is controlled by the Sinterama group starting since the start of this November. Sinterama produces polyester for the automotive industry and technical applications. The Italian group declared sales of 30,000 tonnes of yarn and a turnover of €130 million in 2011.

Sinterama is also a part of the consortium, with Indorama Ventures, that took control of Trevira in 2011. Indorama has a 75% stake in the former Hoechst polyester manufacturing unit. The Trevira factories in Germany and Poland have a capacity of 90,000 tonnes per year and sales are said to have reached €255 million in 2011. Advansa BV also came under new ownership in 2011. The Turkish group Sabanci sold the company, including the polyester staple production plant in Germany, to a consortium of financial investors, senior management and Reiling, a German company specialising in recycling. Advansa's sales in 2010 are said to have been €150 million.



Sportswear brands are progressively shifting to recycled polyester.
Nike

In the transformation of polyethylene beverage bottles into polyester textile yarns, the major difficulty seems not to reside in the technology itself but in securing a supply of post-consumer bottles that are clean and adequately separated by colour. The Reiling investment in Advansa can, in this case, be considered a positive asset for the fibre producer.

In 2008, when development began at Miroglio to produce mechanically recycled polyester yarns, and ultimately shift all polyester production to the recycled Newlife range by 2015, the company sought out partnerships with local waste management companies (see *WSA* May-June 2012). "We have unlimited access to bottle supply, with a capacity of over 40,000 tonnes per year. This means supply is not an issue for us as we have secured our supply chain," says Dr Cochis. He adds that as a key supplier of yarn for fleece makers around the world, Filatura di Saluzzo (ex Filatura Miroglio) will continue to specialise in apparel and will remain an independent company within the Sinterama Group. Current production capacity for Newlife is 3,000 tonnes per year and he would like it to reach 10,000 tonnes per year by 2015. Research and development for Newlife focuses on finer counts and easy-care properties, in addition to the already available thermal, UV protective and odour-control functions. "We need to provide functions that are not easy to come by," says Dr Cochis.

Now that Advansa is partly owned by recycling specialist Reiling, it comes as no surprise that the company is promoting its recycled polyester fibres. "The quality of the recycled PET flakes is quite high because the bottles are collected in collaboration with major

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Korteks has developed a wide array of solution-dyed polyester yarns.

Korteks

supermarkets. This means there is no loss of quality between virgin and recycled references, and we can spin all kinds of cross-sections," says Silvia Toledo, marketing manager for Advansa ThermoCool. In addition to its recycled spun yarns produced in Germany, Advansa has plans to propose recycled polyester filaments made in Turkey in the course of 2013.

Among its wide product portfolio, which includes polyamide and PLA, Radici Group also produces recycled polyester, a product range first launched in 2011, and now labelled r-Starlight. To add to the yarn's eco credentials, Noyfil, a Radici Group company, has developed a broad palette of solution-dyed yarns. "Solution-dyeing is a way to achieve maximum sustainability as less water is used," says Daniele Dossi, product manager for Starlight and r-Starlight. He sees no limitations in counts, cross-sections, colours or additives within the company's recycled product offering.

Coloured in the mass

Dope-dyed yarns tend to boast higher resistance to light, increased colour-fastness and abrasion resistance. Solution or spun-dyed fibres are important in the automotive industry and in technical markets such as flame-retardant textiles. For fashion and sportswear, it is not easy for fibre producers to develop ranges that will suit all markets and styles. However, Stefano Cochis at Saluzzo believes it makes sense to solution-dye Newlife to further reduce water consumption. "Dyeing one kilo of polyester requires 10 litres of water," he says, adding that Miroglio developed few references, beyond black. The situation may evolve with Sinterama, a company specialising in dyed polyester yarns.

Over the past five years Turkish polyester producer Korteks has expanded its range of solution-dyed yarns. "This is a good way to reduce one's ecological footprint and water consumption. It is better to treat the fibre than the fabric," points out Orhan Atunbas, Korteks export manager. The company's palette now includes over 500 colours, which are available in quantities as low as 250 kilos. Though the company does recycle polyester within its own production process, most of its production (a total of 40,000 tonnes per year) is virgin polyester. "For many reasons, we strive as a company to reduce and reuse energy and materials during production. We have found uses for the waste we cannot recycle within our manufacturing process," says Necat Altin, Korteks general manager. For active sportswear apparel Korteks has developed a five-channel cross-section polyester yarn offering enhanced moisture management and labelled Dry Touch, which has been on the market for a number of years.

Reducing energy consumption along with innovation are the two main strategies Trevira is implementing to reinforce its market position. In a move to reduce overall energy consumption, the company has recently introduced a new energy management system that includes solar panels and improved logistics to reduce distances. This is part of a global plan to reduce energy input by 10% by 2020, Robert Gregan, CEO, has declared in a company document.

Trevira has recently launched a new reference called Trevira Moisture Control based on a dual-channel fibre profile engineered to accelerate the transfer of water vapour from inner to outer layer. Tests conducted by the Hohenstein Institute indicate that a suit made in 100% Trevira Moisture Control matches the comfort of a classic 100% wool business suit. Increasing the share of spun-dyed references is also in the company's research and development pipeline for 2013.



Zegna Sport has introduced Thermore TMK in its autumn 2012 - winter 2013 collection. Thermore TMK is made up of 50% recycled post-consumer polyester.

Thermore

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Local sourcing

The Sympatex membrane is in part polyester (the film is a polyester and polyether copolymer) and also in part recycled. "Recycled content makes up nearly 15% of the membrane. The raw material comes from our own manufacturing process; it is therefore pre-consumer waste," says Hervé Clerbout, Sympatex sales manager and director of business development. The company has recently optimised the copolymer production process, working with DSM, its polymer supplier, to reduce greenhouse gas emissions. A recently conducted lifecycle analysis (LCA) shows that the copolymer membrane emits 50% less CO_2 than a PTFE membrane.

Sympatex has not only invested in its production process but also worked on local sourcing and 'closing the loop' since 2008 when it came under the full ownership of Morgan Stanley and Annex Capital. Over the past few years, the company has developed a range of eco-laminates that are sourced in Europe, within an 800-kilometre radius, and which includes fabrics made from Newlife. "This is a way to promote a fully traceable and transparent supply chain, and it is also a way to support the European textile industry," says Hervé Clerbout, who believes it is the job of suppliers to find innovative solutions, citing increased cooperation between Sympatex and companies such as Halti in Finland, Armor Lux-Bermudes in France, and recently, a BMW "art car". The company works with textile partners to develop eco-laminates but also with brands to develop products that are easier to recycle at their end of lives.

While the pressure on cost seems to fade — Hervé Clerbout believes it is no longer an issue — polyester seems well suited to address growing demand for sustainability in addition to innovation.



The new Trevira Moisture Control polyester is said to offer the same level of comfort as a wool suit.

Trevira

Lenzing's plan for 2015

For European cellulose fibre producer Lenzing, 2015 is also an important date in which the company will have expanded its production capacity from 750,000 to 1.2 million tonnes. A new Tencel production line will be in operation by early 2013 at the company's headquarters in Lenzing, Austria, and a new viscose plant will be finished in India in 2014. The company has also recently acquired a spruce pulp mill in the Czech Republic (Biocel Paskov) to further secure a local supply of raw materials. The reasoning behind these investments is an issue that the Austrian company calls the Cellulose Gap. As the human population grows, Lenzing believes demand will focus on hydrophilic materials more than hydrophobic (or synthetic) fibres. Due to limitations in cotton farming, dependent on many variables including weather and land availability to name some of the many aspects that affect agriculture, Lenzing believes the fashion industry will turn increasingly to man-made cellulose fibres in the future.



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