

Thirsty work

Marks & Spencer's decision to sell more clothing made from recycled plastic bottles will signal renewed efforts to develop new fully recyclable polyester yarns.

When it announced a new £200 million strategy to reduce its carbon footprint last month, Stuart Rose, the chief executive of M&S said it will 'change beyond recognition' the way it operates over the next five years: "We will become carbon neutral, only using offsetting as a last resort; we will ensure that none of our clothing or packaging needs to be thrown away; much of our polyester clothing will be made from recycled plastic bottles."

Recycled polyester textile fibres are not new. Patagonia's 'Ecospun' recycled fleece was developed in the early 1990's in partnership with Wellman fibres and Dyersburg fabrics. These companies used clear (and green) plastic bottles as raw material feedstock for the new recycled polyester apparel, but impurities, the high price of the recycled fibre at the time compared to falling polyester prices, and its availability as only a short-staple spun yarn meant that after early success, orders fell flat.

The truth was that consumers didn't understand the concept of the recycled product back then and were unwilling to continue paying higher prices. Wellman could not provide the economies of scale necessary to allow Patagonia's fleece to be price-competitive, and other brands were slow on the uptake of the recycled concept.

Today, all that is changing. There are now a number of fibre producers offering recycled polyester yarns, with apparel brands becoming increasingly interested as consumer awareness continues to grow. Not only that, higher petroleum prices have pushed up the price of polyester which makes recycled polyester relatively more affordable and more attractive to retailers and apparel brands.

Available yarns

Fibre companies such as Unifi, Teijin, Wellman,



Marks and Spencer CEO Stuart Rose has said the UK high street chain will use more recycled polyester yarns in its clothing.

Toray, Mitsubishi and Taiwanese firm Chung Shing have all developed recycled polyester yarns along with some other less well-known yarn producers. These recycled polyester yarns can come from a number of sources. The chipped partially oriented yarn (POY) usually comes from aged or wasted POY that has not made it to the final product stage, or fully recycled polyester from garments or even old plastic bottles.

Retailers and brands prefer their recycled

polyester yarn to come from products such as apparel and bottles, which is a much easier story for consumers to grasp. However, even recycled polyester which has not made it past the manufacturing shop-floor does have some ecological advantages over virgin polyester. This includes the elimination of several energy intensive production steps, from the crude oil well head, to the production of polyester intermediates.

The raw materials for Unifi's 'Repreve' recycled polyester yarns are mechanically recovered from a mixture of post industrial fibre waste and post consumer plastics. These materials are chopped, ground and melted to reform polyester chip, which is extruded, textured and processed just like virgin polyester.

This has been welcomed by companies such as Valdese Weavers which has made a commitment to use 45% recycled content across entire fabric product lines and thus includes the use of 'Repreve'.

On the other hand Teijin's 'Ecopet' process, for example, involves the chemical breakdown of the polyester polymer back into monomers (the building blocks of polyester). This depolymerisation of polyester is a much more energy intensive process, but is said to eliminate purity issues, and allows for very even shades in solid face fabrics. But is this process more environmentally friendly than the mechanical recovery of polyester given its higher energy use?

The answer must be that both methods of producing recycled polyester are a step in the right direction for the sustainable textiles and apparel industry. Retailers and brands may well have to accept some sort of trade off with today's recycled polyesters, because at the end of the day they want 'right first time' garments, and their customers expect products that look and feel good irrespective of price.

The good news for pioneers like Patagonia is that because some of the larger and more mainstream apparel retailers are now seeing the benefits of using recycled yarns, the technology will also improve. Marks & Spencer's recent announcement is a great example of this, and it will leave Britain's high street giant in a position to highlight the use of recycled yarns to the mass consumer market, and convince the supply chain to drive up standards in the process.

In the March issue of *Ecotextile News* we will take a closer look at recycled textile yarns including both polyester and nylon.