RISE TO THE CHALLENGE: TANATEX AND TOSI

A new, simpler process, developed by chemical firm Tanatex and one of its customers, offers hope of an easier, more environmentally friendly and more economical way of bleaching yarn without compromising on whiteness.

New bleaching process is greener

Tosi, one of Italy's biggest finishers of yarn and knitted fabrics, and specialist Dutch textile industry chemicals provider Tanatex have jointly developed a new low-temperature bleaching process.

On announcing the development, the companies explained that the traditional process for finishing mercerised yarn uses high quantities of water, energy and chemicals. Environmental concerns led Tosi to look for ways of improving its production process, focusing strongly on the reduction of water, energy, effluent pollution and carbon emissions, without compromising on quality.

One of the improvements it has made has been a newly developed concept that allows bleaching at only 75°C. Normal temperatures for this type of operation are between 95° and 98°C. This has allowed Tosi to reduce its consumption of methane gas and, therefore, its carbon emissions.

Given the name Be Green, the new concept is based on a low-temperature peroxide activator controlling the decomposition of peroxide and rapidly developing the required whiteness. This system is based on specially selected dispersants, surfactants and a bleaching activator. The ready-to-use products were developed during intensive testing carried out by Tosi.

Another conclusion the companies have reached is that process cycles for mercerised yarn can cut by up to 50% the consumption of water and gas. Additionally a reduction of 25% in COD (chemical oxygen demand) levels in the effluent have been measured. The companies have said they will search for further possibilities that will allow them both to become "the greenest companies in their markets".



Textile manufacturers have long known that bleaching is required to keep cotton white, but Be Green is a new, more environmentally friendly way of carrying out that process.

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The description we have seen of Be Green almost makes it sound simple, something any company could do if it could find the right components. Compared to some competitor methods that require five or six chemicals to combine in the correct proportions, this is simpler, but Tanatex product manager, Rob de Wit, makes it clear that finding the right components took time and hard work. "We had been working for a long time on something that would work well in pre-treatment processes," he says. "Companies that do pre-treatment and dyeing, as Tosi does, need consistency and they need a good price. They are concerned about over-use of chemicals because of the environmental pressure they are under now. In pre-treatment processes for bleaching cotton, peroxide decomposes and to make that happen in a relatively short time, companies have traditionally used aggressive processes."

The bleaching activator that helps make Be Green work has been in use in products such as household detergents for about ten years and, more recently, has been added to dishwasher tablets. Adapting it from these applications to be able to put it into cotton bleaching processes has been the challenge. "The technology is interesting," Mr de Wit continues. "If you use a higher concentration of it at lower temperatures, a very negative aspect has been degradation in the fibres. The idea has been there and the technology has been available, but potential users, especially if they work as contract manufacturers, have been wary of harming the fibres."

The partnership between Tosi and Tanatex has focused on finding ways of minimising this effect on the fibres. The companies worked out that one of the specific issues Tosi faced, as a producer that deals with mercerised yarns, was the release of heavy metals, including copper, manganese and iron, during the mercerisation process. "We came up with the idea of using three or four pre-treatment steps to remove these heavy metals first and then apply the bleaching process at a lower temperature," the Tanatex product manager says.

He talks about a "huge process optimisation" that Tosi has been able to achieve, leading to the savings in energy and water and improvement in waste management mentioned above. They achieved this by working together at the Tosi factory in Busto Arsizio, Lombardy, using the company's machines in the conditions in which



Tosi's headquarters in Busto Arsizio, near Milan.

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Three sets of samples showing that Be Green means no compromise on whiteness. The top yarn in each case is greige, the middle one an example of standard production and the bottom one the result of Be Green.

Tosi

they normally work, with results being checked back in the Tanatex laboratory in the Netherlands.

Results so far are encouraging. Tosi was using 108 litres of water per kilo to prepare cotton for dyeing; it's now using 36 litres per kilo. This is a big saving because at full capacity the company produces three tonnes a day. Substantial savings also look possible in the amount of money Tosi will have to pay its service providers at a local pollution unit, who will now be handling less COD from this customer. Another of the effects of Be Green is a lower alkalinity than the previous Tosi process produced, which means a milder effect on the material. This has given the Italian textile manufacturer cotton with a good hand, but without compromising on whiteness, and its customers have begun to notice.

Then there is the attraction of having a greener product. Tosi is preparing to use special Be Green labels to emphasise that its products are now made in a more environmentally friendly way.

Meanwhile, Tanatex believes Be Green has the potential to work well with other mercerised yarns using hypochlorites in the bleaching process. The new concept offers the same whiteness in an easier way, Rob de Wit says. Perhaps the effect on manufacturers using basic bleaching techniques would be less noticeable, but many companies employing pre-treatment and scouring of the fibres they work with can benefit, he feels. Tests have already taken place on viscose, for example.

A full launch event was held this January and Tanatex is now going "full speed ahead" in presenting Be Green to other companies, Rob de Wit concludes. He is optimistic, explaining: "Tosi saw immediately what the possibilities were. That can happen again. Many companies are greener than we might imagine."