



AUSTRIA: Enzyme process offers Eco-friendly jeans boost

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Scientists in Austria have developed what they claim is a cheaper, more efficient and eco-friendly method for giving a distressed look to denim jeans, and one that offers an alternative to the controversial sandblasting technique.

A central step in processing indigo dyed textiles such as blue jeans is the wash and bleach process which creates a final wash down effect. To remove the ring-dyed indigo dyestuff, manufacturers use a combination of drum washing machines and chemical treatments.

Oxidising agents are an essential part of this bleach process, with low-cost chemicals such as sodium hypochlorite (NaOCl) used to reduce the amount of dyestuff in 80% of jeans production.

Cellulose hydrolysing enzymes are another option, but traditionally require a long treatment time and high enzyme dosage, both of which can lead to irreversible fibre damage.

However, by applying a swelling agent to the fabric surface - such as a concentrated paste containing sodium hydroxide - scientists at the Research Institute for Textile Chemistry and Textile Physics at the University of Innsbruck were able to boost the potency of cellulose enzymes, as well as achieving localised effects.

This 'surface activation' technique also requires a shorter wash down treatment and uses fewer chemicals to achieve the same effect, according to a study published in *Biotechnology Journal* and followed up by just-style.

Annual global production of denim is estimated at 3bn linear metres and more than 4bn garments, according to Thomas Bechtold, from the Research Institute for Textile Chemistry and Textile Physics at the University of Innsbruck. And this, he adds, uses over 30,000 tons of indigo dye.

"The surface activation method also allows for more eco-friendly processing of jeans in the garment industry, which is approximately 10% of the total cotton market worldwide," he explains.

The controversial process of sandblasting is also used for some jeans which are styled with a worn or torn look. The technique is banned in many countries as it can lead to lung disease, but it is still used in denim workshops in Bangladesh, Egypt, China, Turkey, Brazil and Mexico. Many of the jeans sold in Europe are produced in these countries.

"This method also offers a replacement of the sandblasting of denim, which is an extremely unhealthy process for which, until now, there have been few alternatives available," Bechtold adds.

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