Bacterial Enzymes Can Replace Stonewashing Demin Jeans

Jeans are made out of denim fabric. The latest fashion is to wear jeans which appear faded. The method used for making jeans appear faded was by using the process of pumice stone. In this method the freshly dyed denim fabric was tumbled with pumice stones to give a faded appearance. This had the disadvantage of waste production and environmental issues.

Stone washing is a process that is used to give denim a worn out look. It also increases the denim's softness and flexibility. Stone washed jeans have been popular for quite some time. The late 1960's popularized the worn out look for jeans.

For giving a faded appearance to the denim jeans they are washed with pumice stones. In order to stone wash jeans, the original way, they are washed with pumice stones. This process scraps the surface layer of the jeans and threads from the fabric are emerged and become visible. The jeans therefore look worn out.

Cellulase enzyme treatment has been promoted to avoid the machine induced severe wear and loss of tensile strength during denim processing. The minimization of water contamination, clean-up effort and substantial reduction in use of toxic chemicals are areas where enzymes have potential to play a significant role in decreasing the pollution.

Enzymatic treatment of fabric is an ecofriendly process and allows up to 50% higher jeans load and yields the desired look and a softer finish. Cellulases are also used to improve the appearance of cellulosic fabric by removing fuzz fiber and pills from the surface, reducing pilling propensity, or delivering softening benefits. The damage caused to the machine wear is negligible and there is no clogging of outlet of washing machine by sand due to eroding of pumice stone in the traditional process.

The enzyme will develop an eco-friendly technology due to its compatibility with other chemical processes. It is found that there is an increase in production since seven litres of cellulase can wash 3 - 4 kg of denim.

Scientists from NCL discovered the enzyme used for giving denim a stone wash effect from bacteria called ‘alkalothermophilic thermomonospora’, this is found to grow in extreme conditions. The enzyme was produced by this bacteria and it was applied instead of pumice stone.

The enzyme from bacteria promises to develop an eco-friendly technology and is also found to be compatible with other chemical processes. This has resulted in an increase in production namely seven litres of cellulase can wash 3-4 kg of denim. The CSIR-NCL scientists demonstrated the application of these cellulases for biofinishing of denims in collaboration with Ahmedabad Textile Industry's Research Association (ATIRA). These cellulases were effective in biofinishing of denim with respect to the removal of hairiness with marginal total weight loss, increasing softness of the fabric and abrasive activity with low backstaining.

References:

1. http://cotton.missouri.edu/Classroom-StoneWash.html
2. Ramakrishnan Anish, et. al.,'Application of Cellulases From an Alkalothermophilic Thermomonospora sp. In Biopolishing of Denims', (2007), Biotechnology and Bioengineering, Vol. 96, No. 1, January 1, pp. 48-56.
3. Indian patent no. 245202, A Process For Biofinishing of Denims In Textile Industry.
4. Report published in Wiley InterScience Journal on September 1, 2006
5. http://www. jeansinfo.org