EUROPABIO
The European Association for Bioindustries

"White Biotechnology is an emerging field within modern biotechnology that serves sustainability in industry. It uses micro-organisms like yeasts, moulds or bacteria as "cell factories" and enzymes to produce goods and services. White Biotechnology can play a vital role in encouraging cleaner industrial processes. The story below is one example."

Stonewashing without stones

Stonewashing jeans no longer requires stones. A new biotech-process using enzymes creates the same look while doing less damage to jeans, washing machines and the environment.

Naturally "bio-stonewashed" jeans

Probably the world's most worn clothing gear at 1.8 billion pairs sold per year, jeans are increasingly being "stonewashed" using enzymes instead of stones.

At such volumes, important savings can be made. Because "bio-stonewashing" with enzymes is gentler on the garment, the jeans still have the same worn look but last longer.

Small doses of enzymes can replace several kilograms of stones, making room for more jeans to be treated at once.

The enzymatic method saves water and energy, because there is no longer a need for several rinsing processes.

Costs and treatment times are reduced, while there is less damage to washing machines and less solid waste produced.

The “stone-washed” jeans-look is obtained by washing the indigo-dyed jeans with abrasive pumice (volcanic) stones.

However, these stones wear out the fabric, damage the washing machines and break apart. Several rinsing processes are needed to get rid of the stones afterwards.

Thanks to biotechnology, a new biological method has emerged. A type of enzyme called a cellulase has been developed to replace the pumice stones.

Jeans are made from cotton, a cellulosic material. The cellulase enzymes are capable of breaking down the surface cellulose fibres of the jeans in a controlled manner without seriously damaging the fabric.

The same worn look is achieved, while considerable savings are made in terms of time, volume, waste, water and wear on machines.

What is an enzyme?

An enzyme is a type of protein present in all living things. Wherever a substance needs to be transformed into another, nature uses enzymes to speed up the process. For instance when breaking down food in the stomach.

Enzymes are produced by micro-organisms that are grown in closed fermentors and are bio-degradable after use.

Novel processes...

Micro-organisms such as yeasts, moulds or bacteria can be improved to work as “cell factories” to efficiently produce industrial enzymes targeted at specific tasks.

Enzymes developed for the textile industry can improve production methods and fabric finishing. For example, cotton fibre cleaning with enzymes also increases the efficiency when indigo-dyeing.

...without limits

Imaginative applications for this clean technology are virtually limitless: enzyme solutions can be applied to a number of industrial areas such as the food, feed and technical sectors.

EuropaBio member companies producing this product: Genencor International, Novozymes A/S

Further reading

- “Industrial sustainability through biotechnology” OECD brochure 1998
- www.genencor.com
- www.novozymes.com
- www.amfep.org

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EuropaBio - the voice of the European Bioindustries ...

If you want to become a EuropaBio member or receive more information on White Biotechnology please contact:

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EuropaBio, the **European Association for Bioindustries**, has nearly 40 corporate members operating worldwide and 18 national biotechnology associations, representing almost 1000 small and medium sized enterprises.

Member activities include:
- human & animal health care
- diagnostics & bio-informatics
- state-of-the-art chemicals
- agriculture & crop protection
- food processing
- environmental products & services.

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