

## **Enzymatic optimization of textile production**

### **About Novozymes**

With over 700 products used in more than 130 countries, Novozymes' bioinnovations improve industrial performance and reduce raw material consumption by offering sustainable solutions to several industries. Novozymes' business is industrial enzymes, microorganisms and biopharmaceutical ingredients.

In industrial applications, enzymes can replace chemicals and optimize production processes. Enzymes can assist companies in improving their raw material efficiency, save energy and/or generate less waste. One example is the textile industry where enzymes can optimize the production process through raw material efficiency and by combining production processes.

### **Save energy and water with combined processing**

Enzymes can enhance a number of processes and save large amounts of water, energy and chemicals in the production of textiles. The textile industry has for some time used enzymes applications such as desizing, biopolishing and bioscouring. A new application combines the mentioned textile production processes and thereby strengthens the benefits from the enzymes applications.

As, an example, processes can be combined in the production of denim products such as jeans. When the desizing and abrasion (stone washing) processes are combined, the savings for 1 ton of denim products amount to 3000 MJ process heat and 20 m<sup>3</sup> water. Additionally, in towels and t-shirts production, combining bleach clean up, dyeing and biopolishing in one bath with enzyme product catalase added, entails savings up to 4000 MJ heat and 30 m<sup>3</sup> water, as well as a reduction of costs related to wastewater treatment.

### **Relieving wastewater treatment**

Enzyme assisted processing in general creates less problematic wastewater compared to conventional processing. One reason for this is that enzyme assisted processing is much more gentle on the fabric than conventional methods, and less cotton is worn off during processing. This means thicker cotton on the final product (2.5 % higher weight) and less biological material in the wastewater. When using enzymes for scouring, more than 50 % of the biological material in the wastewater can be avoided, equal to 50 kg COD per ton garment.

### **Documenting impact with Life cycle assessments**

Novozymes uses Life Cycle Assessments (LCA) to document the environmental impact of enzymatic solutions compared to conventional methods. LCA studies shows that enzyme applications save between 1 and 1.3 tons of CO<sub>2</sub> emissions for each ton of knitwear produced. Furthermore, enzymes have been proven to save 70,000 liters of water per ton of knitted fabric produced in a textile mill.

### **Learn more about enzymes in the textiles industry**

Learn more about the optimization possibilities of enzymes and find the LCA studies here:

- [Novozymes' enzymatic solutions](#)
- [Published LCA studies by Novozymes for several industries](#)
- [Novozymes' enzymatic solutions for the textile industry](#)