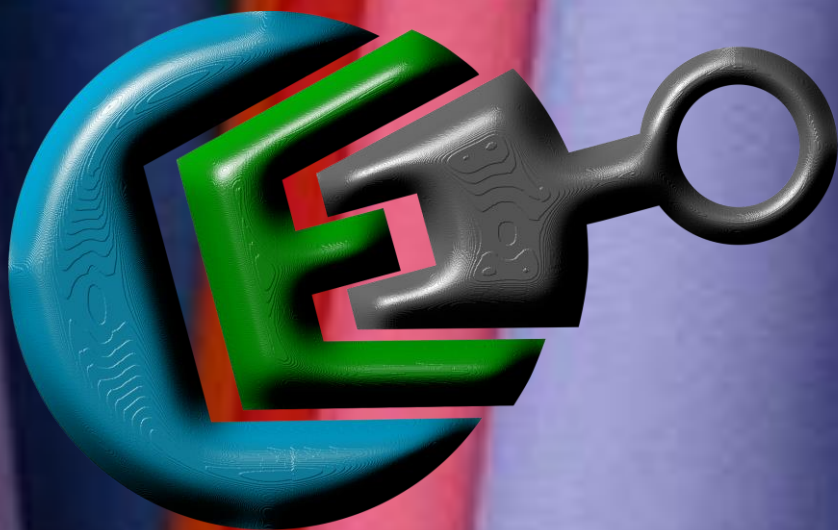


THE USE OF CUSTOM ENZYMES IN
TEXTILES PROCESSING AND
MANUFACTURE



custom enzymes

Custom Enzyme Formulations

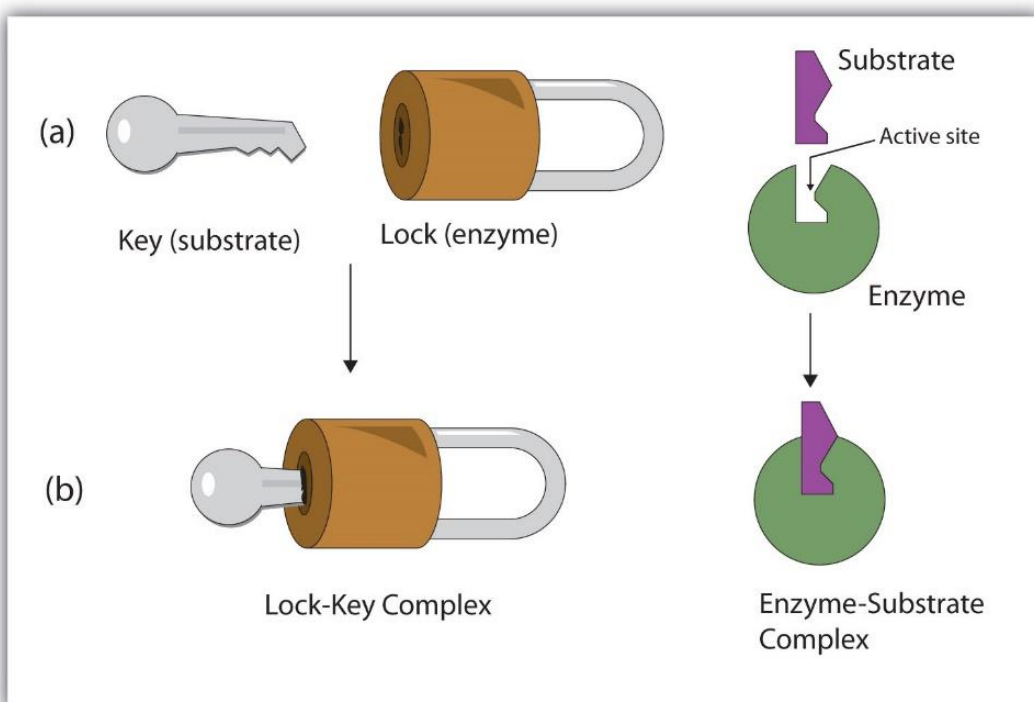
Biotechnology continues to gain popularity particularly in the field of process and improvement in various industries utilising enzymatic formulations by removing the chemical component. This allows a business to reduce its environmental impact and achieve greater sustainable goals.

The continued focus on environmental issues and impact from traditional chemical methods has led to an increased shift towards alternatives that can integrate biotechnology as a major contributor in sustainable production across many applications.

Our *Custom Enzymatic Formulations* are developed to serve an array of industries that currently rely on chemicals to produce the end - product. By integrating these formulations into the process, major benefits can be achieved. This leads to positive outcomes such as greater yield, higher quality products and a clean and safe environment.

An enzyme is a biological catalyst. This means that (like all catalysts) it increases the rate of the reactions it takes part in without being used up.

Each enzyme has an active site which is specific for a certain substrate. The idea of the substrate fitting 'just right' to the active site of the right enzyme is called the 'Lock and Key'. The enzymes will not interact with anything other than that it is designed to treat.



e.g. A substrate can be determined as Hydrogen Peroxide in the bleaching process

The utilization of enzymes in the textile industry is a case of an industrial revolution. As a result of their non-lethal and eco-friendly attributes, enzyme applications in the manufacturer of textiles are gaining attention as a significant prerequisite to chemicals in the industry.

Each custom enzyme formulation is specific, effective, and work under mild conditions yet, in addition, but they also help reduce process times, energy and water consumption, improve nature of the item and decrease contamination by reducing the need for chemicals.

Enzyme Properties Used in Textile Industries

Enzymes accelerate rates of reactions by lowering the activation energy.

They remain intact at the end of the reaction which means that they can be reused.

Enzymes operate under milder conditions and are easy to control as they have specific optimum temperatures and pH.

Enzymes can be utilised as alternatives to toxic hazardous and polluting substances.

They only catalyse specific reactions e.g., the enzymes used in desizing do not react with cellulose which does not lead to the loss of the strength of the cotton.

They are biodegradable and when reactions are complete, they can simply be drained as they will not produce any toxic materials.

A marked improvement to product quality and a significant positive impact to the environment are just two attributes of utilizing enzymes in the textile industry. The group of Hydrolases are major additions into the process. *Amylases* are used to remove starch-based sizes after weaving. *Cellulases* remove fibrils and fuzz fibers, *Esterases* in partial hydrolysis on synthetic surfaces improves hydrophilicity whilst following bleaching, *Catalases* remove hydrogen peroxide resulting in huge savings in water consumption.

FEATURES AND BENEFITS OF CUSTOM ENZYMES IN TEXTILES

BIOPOLISHING – ECOENZYME AC/NC

- Improvement in pill resistance
- Cooler feel
- Brighter luminosity of colours and softness
- Minimum back staining

DESIZING – ECOENZYME MT/HT

- To facilitate the removal of sizing at room or high temperatures

BIODLEACHING – ECOENZYME CATALASE

- Breaks down hydrogen peroxide bleaching liquor into water molecules and less reactive gaseous oxygen

BIOSCOURING – ECOENZYME BIOSCOUR

- A specially designed Pectate lyase enzyme for effective removal of Pectin, Lipase and Protease from fabric



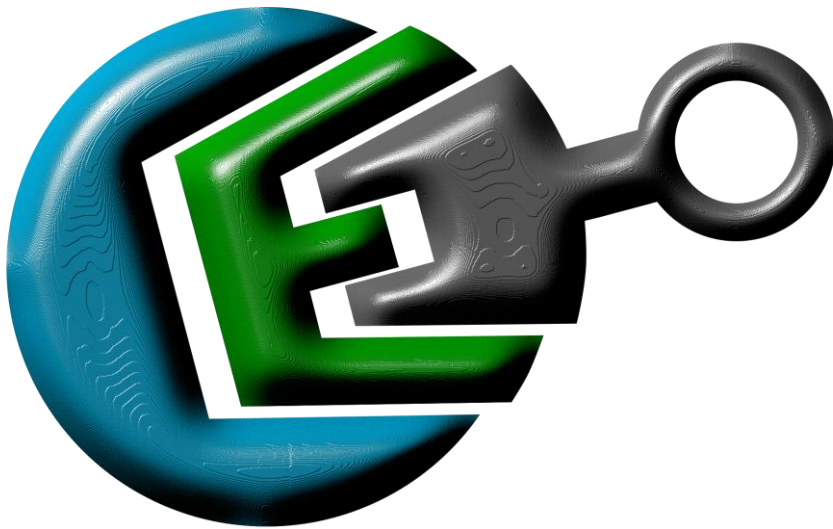
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SUMMARY

Custom Enzyme formulations can be safely used in textile wet processing like desizing, scouring, bleaching, dyeing, and finishing, while traditional chemicals can cause many problems including pollution of effluents when disposed into the environment.

Advances in enzyme biotechnology use in the textile industry have made it possible to explore the potential of single enzymes or enzyme mixtures for specific applications.

The use of enzymes in textile chemical processing is rapidly gaining global recognition as they are non-toxic and eco-friendly.



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THANK YOU

Steve Booton

+61 499 798626

steve@customenzymes.com