ENHANCE THE AROMA OF YOUR WINE WITH OUR ENZYMES

CHOOSE **ENDOZYM®**, THE COMPLETE AEB ENZYME LINE

AEB®

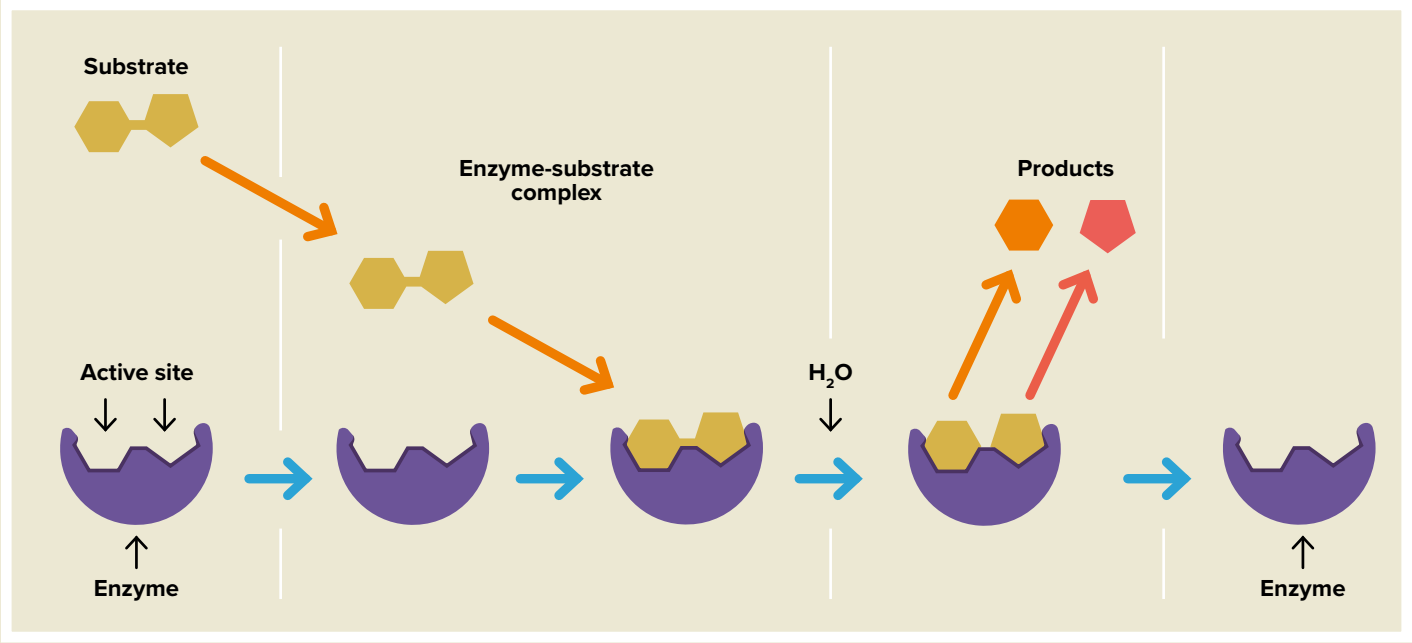
WHAT ARE ENZYMES AND WHAT FUNCTIONS DO THEY HAVE?

Enzymes are **biotechnological products that play a fundamental role in the production of high-quality wines.**
They are true **biological catalysts capable of accelerating chemical reactions** and thus become valuable tools to be used in winemaking, as they **increase production efficiency and improve the sensory properties of wine.**

Due to their specificity, enzymes allow **very high reaction yields, often over 95%.**

HOW ENZYMES WORK

Enzymes work by binding to a specific substrate and catalyzing the chemical reaction that converts the substrate into a product, but without being consumed in the reaction.
Once the product of the reaction is released into the medium, they receive a new substrate.



PRODUCTION PROCESS

1. **Selection of** micro-organism **strain** or other biological source
2. **Pre-inoculation**
3. **Fermentation**
4. **Solid/liquid separation**
5. **Enzyme extraction and concentration**
6. **Formulation and packaging**

AEB RESEARCH AND DEVELOPMENT

CONTROLLING ENZYME ACTIVITY

To assess the functionality of the enzyme and determine its suitability for use in winemaking, our Group's team of experts - thanks to its laboratories - performs a thorough quality control on the selected raw material.
The **three key steps of AEB's qualitative enzyme analysis** consist of:

1

Obtain the desired reaction and define the optimal dosage under different conditions according to grape truths.

2

Assess the specificity of the enzyme and its exact composition, linked to the enzyme substrate and its secondary activities to select the most suitable raw material for the desired vinification process.

3

Assess the stability of the enzyme over time to keep the product enzymatically and microbiologically stable.

ENZYME SELECTION

Our research into the blending of enzyme activities starts from the idea that the **selection of raw materials must be adapted to the specific grape variety and the characteristics one wishes to obtain in the finished wine.**
Only in this way is it possible to best express each stage of the process and to bring out the wine's true potential.

THE AEB PROCESS FOR ENZYME SELECTION

Identification of technological need and selection of grape variety(s) →

Identification of biochemical reactions and selection of potential enzymes. Biochemical reactions are identified at the specific process and screening stage; enzymes are selected based on their ability to catalyze the desired reactions and their compatibility with the winemaking process. →

Testing of selected enzymes on a small scale, often carried out in collaboration with university experimental laboratories, to determine their effectiveness and optimize enzyme treatment conditions. →

Large-scale experimentation to validate the effectiveness of enzyme treatment on wine quality in terms of varietal aromatic expression, color extraction and stability.




THE ADVANTAGES OF USING ENZYMES IN WINE PRODUCTION

1 INCREASED EXTRACTION YIELD DURING PRESSING AND MACERATION

- \+ Greater extraction of **COLOR**, **AROMAS** and **VARIETAL TANNINS**
- \+ Greater **STRUCTURE** and **CHARACTERIZATION** of wines

2 EASE OF CLARIFICATION

- \+ **FASTER** clarification process
- \+ Greater **CLARITY** and pleasantness of the wine on visual inspection
- \+ Greater **STABILITY** of the wine over time (less likelihood of deposits)

THE BENEFITS
OF OUR ENZYMES
WATCH THE VIDEO

3 GREATER FILTERABILITY

- Increased **SPEED** and **EFFICIENCY** of filtration (reduction of polysaccharides and long-chain carbohydrates that can clog filters)
- Increased wine **CLARITY** and **STABILITY**

4 IMPROVED AGEING

- Greater preservation of **AROMATIC NOTES**
- Greater protein and color **STABILITY**

THE MOST WIDELY USED ENZYME ACTIVITIES IN OENOLOGY AND THEIR MECHANISMS OF ACTION

THE ROLE OF PECTIN

Pectin is an extremely complex macromolecule **found in nature**, and grapes contain varying amounts of it depending on the degree of ripeness. Basically, it is a structural polysaccharide, which is degraded during grape ripening by endogenous enzymes present in the berry and **released into the must during crushing operations**, causing **an increase in its viscosity and making racking and clarification operations difficult.**

The concentration and composition of pectin **varies depending on the grape variety**, and, for the same grape variety, depending on the stage of ripening, health status, and climatic pattern. For this reason, pectolytic enzymes for the wine industry are often a mixture of the three main **pectolytic activities**:

Pectinlyase (PL): randomly breaks the pectin chain to form smaller polymers. This activity allows a rapid reduction in must viscosity.

Polygalacturonase (PG): hydrolyzes the bond between unesterified galacturonic acid monomers.

Pectin methyl esterase (PME): cleaves the ester bond between galacturonic acid and the COOH group and allows the action of PG.

OTHER ENZYMATIC ACTIVITIES

CELLULASE AND HEMICELLULASE

Enzymes that catalyze the hydrolysis of cellulose glycosidic bonds and help degrade the cell walls of the skin.

Properties:

- Increases pressing yields.
- Improves color and aroma extraction during maceration.
- Improves the release of varietal tannins, which can affect the final structure of wine and its aging potential.

β-GLUCANASE

Enzyme capable of breaking down the glucan molecule.

Properties:

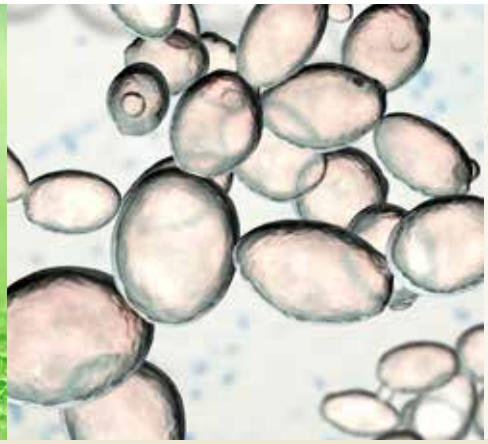
- Improves the effectiveness of clarification and acts positively on the filterability of wines.
- It accelerates the autolysis processes of yeast cells, releasing nucleic acids and mannoproteins useful for the protein and tartaric stability of wines and for the enhancement of their aromatic component.

β-GLUCOSIDASES

Enzymatic activity that plays a key role in extracting the aromatic precursors present in grapes by cleaving the glucose bond and thereby releasing it. Aromatic precursors are not volatile molecules but become so through enzymatic hydrolysis.

Properties:

- Increased release of the aromatic component.



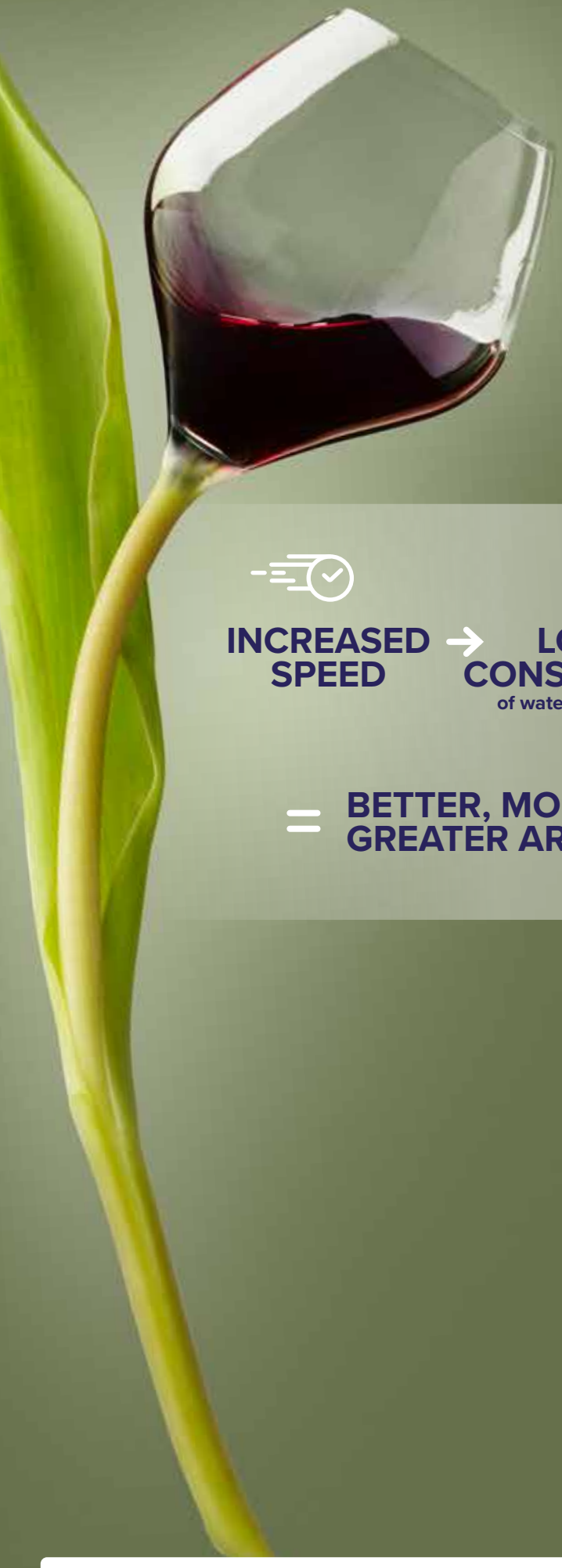
CHOOSE THE ENZYME FOR YOUR WINE

Product	Recommende dosage	APPLICATION APPLICATION												
		Maceration	Color extraction	Static clarification/ blanching	Flotation	Filterability enhancement	Refinement	Varietal aromatic characterization	Thermovinification	Climate change response	Processing of ripe grapes	Anti *Botrytis* treatment	Anti *Brettanomyces* treatment	Reduction of oxidizable polyphenols
ENDOZYM Contact Pelliculaire	1-5 g/hl	●	●											
ENDOZYM Rouge Deep Skin	1-4 ml/hl	●	●							●				
ENDOZYM Rouge Light Skin	1-3 ml/hl	●	●							●				
ENDOZYM Rouge HR	1-5 ml/hl	●								●	●			
ENDOZYM Rouge Liquid	1-5 ml/hl	●	●											
ENDOZYM Rouge	1 a 5 g/hL	●	●											
ENDOZYM ICS 10 Rouge	0,2-0,8 mL/hl	●	●											
NEW ENDOZYM Velluto	1-4 ml/hl	●						●						●
ENDOZYM Rouge Super	1-5 ml/hl	●	●											
ENDOZYM Thiol Rouge	4-6 ml/hl							●						
ENDOZYM TMO	2-4 mL/hL			●		●			●					
ENDOZYM Thermostep (1 & 2)	2-4 mL/hL		●						●					
ENDOZYM Aromatic	1-5 g/hl	●						●						
ENDOZYM Cat-0	1-4 ml/hl	●						●						●
ENZYLIA Opera	2-5 ml/hl			●		●	●	●						
ENDOZYM Thiol	2-4 mL/hL							●						
ENDOZYM E-Flot	2-4 mL/hL				●									
ENDOZYM Muscat	1-3 g/hl			●				●						
ENDOZYM ICS 10 Arôme	0,2-0,8 mL/hl	●		●		●		●						
ENDOZYM Cultivar	1-4 g/hl	●		●		●		●						
ENDOZYM Antibotrytis	2-4 g/hl											●		
ENDOZYM ß-Split	2-5 g/hl							●						
ENDOZYM Active Super	1-4 ml/hl			●		●								
ENDOZYM Active Liquid	1-4 ml/hl			●		●								
ENDOZYM Active	1-4 g/hl													
ENDOZYM ICS 10 Éclair	0,2-0,8 mL/hl			●		●								
ENDOZYM Éclair Liquid	0,5-2 ml/hl			●		●								
ENDOZYM Éclair	0,5-2 g/hl			●		●								
ENDOZYM Ice	2-5 ml/hl			●		●		●						
ENDOZYM Glucapec	2-4g/hl					●	●					●		
ENDOZYM Élevage	8-10 g/hl			●		●	●							
ENDOZYM Hi-Flow	2-6 g/hl			●		●								

Enzymes exclusively for red wines
Enzymes exclusively for white wines
Enzymes potentially usable for all types

DISCOVER THE FULL RANGE OF AEB ENZYMES

AEB®



ENZYMES: A SUSTAINABLE CHOICE

At AEB, we are constantly working to promote sustainable practices in the wine industry.
Enzymes play a crucial **role in reducing the environmental impact of production, minimizing waste and energy consumption, while maximizing yield, quality and efficiency.**

Enzymes are **natural, biodegradable substances** that do not accumulate in the environment and pose **no health or safety risks to workers or consumers. Additionally, they do not require large amounts of water**, energy, or chemicals to function. **They optimize desired results in less time and with less effort.**

INCREASED SPEED → **LOWER CONSUMPTION** of water and electricity → **LOWER COSTS** → **LESS** pollutant **EMISSIONS**

= **BETTER, MORE STABLE WINE WITH GREATER AROMATIC POTENTIAL**

Our enzyme products are designed to be as sustainable and safe as possible, without compromising quality or performance. We use rigorous quality control procedures, **provide technical assistance and customized solutions to optimize the winemaking process.**

Choosing AEB enzymes means unlocking the potential of grapes, while promoting a positive impact on the environment, economy and society, one glass at a time.

CERTIFIED QUALITY

CERTIFIED MANAGEMENT SYSTEMS
CQY CERTIQUALITY
UNI EN ISO **9001:2015**
UNI EN ISO **14001:2015**
UNI ISO **45001:2018**
UNI EN ISO **22000:2018**

GMO FREE
ALLERGEN FREE

AEB enzymes are naturally free of genetically modified organisms and allergens.

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