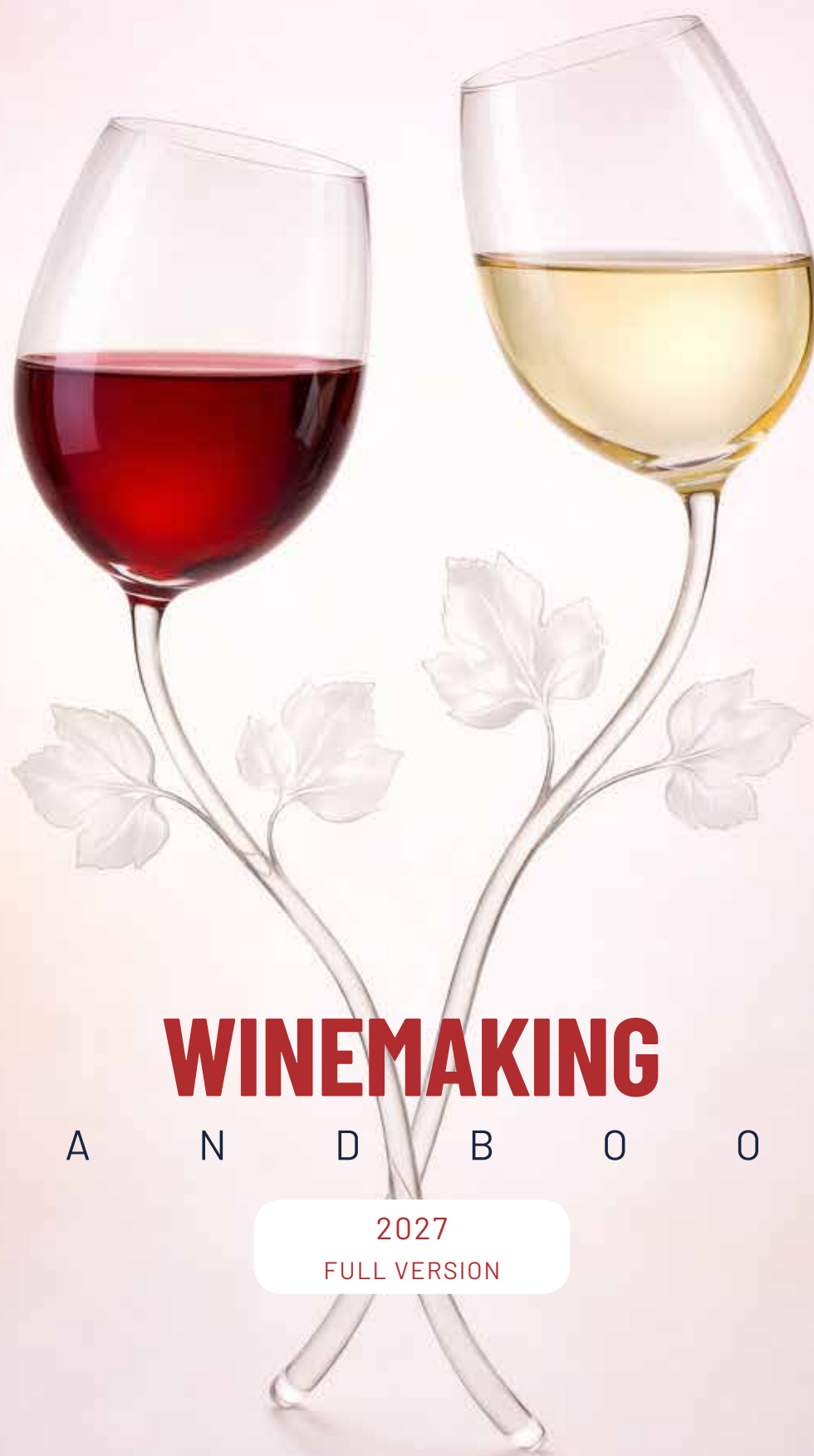




WINEMAKING

H A N D B O O K

2027

FULL VERSION



WINEMAKING

H A N D B O O K

2027

FULL VERSION



Wine today: A Structural Reset

The role of AEB

The 2025 AWITC confirmed what many already feel: **the wine industry is undergoing a structural correction, not a temporary downturn.**

Health, moderation, and intentional consumption are reshaping behavior. The widespread adoption of GLP-1 medications, along with increased use of SSRIs, diabetes medications, and other therapies, is already reducing alcohol consumption both in frequency and volume.

The result is clear: **consumers are drinking less, but they expect wines to be better, lighter, fresher, more stable, and more consistent.**

This shift explains the rise of lower-alcohol, high-acid “bistro” **wines, sparkling and fresh styles, wines designed for immediacy and balance and accessible narratives** that feel relevant, not exclusionary.



Wine is no longer judged only by tradition or critics, but by how well it fits real life.

The “natural wine” movement has played an important historical role and continues to thrive as a niche, but it does not offer scalable answers to today’s challenges.

Modern wine must be clean, expressive, stable, and repeatable.

Consistency is not the enemy of authenticity, it is what allows consumers to **trust a brand.**

Wines today are not crafted the way we think people should like them. They are crafted with the tools that allow consumers to like them.



AEB's 2027 portfolio is built around a pragmatic definition of sustainability: using fewer resources to achieve better, more reliable results.

From formulation to process, our solutions are designed to **reduce inputs, energy consumption, and waste while improving wine quality and consistency**. Products such as tannins, polysaccharides, inactivated and non-*Saccharomyces* yeasts, enzymes, and functional and varietal nutrients play a central role in naturally protecting wines against oxidation and instability. They allow winemakers to **minimize SO₂ additions, extend shelf life without sacrificing freshness, and improve mouthfeel, aromatic precision, and overall balance**. The result is less reprocessing, fewer corrective interventions, and reduced product loss, **wines that last longer and perform better throughout their commercial life**.

Sustainability, however, is not only a matter of formulation. It is also a matter of **process efficiency**. Our equipment line features machines like the **E-FLOT**, which enables **rapid clarification** with significantly lower energy demand compared to extended cold settling, centrifugation, or prolonged refrigeration. Faster clarification means shorter processing times, reduced tank occupation, and lower cooling requirements across the cellar, delivering both qualitative and environmental benefits.

Similarly, the **STABYMATIC** ion exchange provides precise **tartrate and metal stabilization** without the need for long cold stabilization cycles. By dramatically reducing refrigeration time, energy consumption, and wine losses, it offers a targeted, efficient alternative that preserves wine integrity while improving overall process sustainability.

Likewise, the **ISIOX** gas management systems allow for the adjustment of CO₂ and O₂ at packaging (or in the cellar) in addition to lowering the concentrations of mercaptans and H₂S.

Yeast management is another critical control lever. With **REACTIVATEUR** and **PROPAGATOR**, yeast can be rehydrated with complete precision, then recovered, reactivated, and reused, reducing raw material consumption and waste while ensuring healthier, more **controlled fermentations**. This approach lowers the risk of sluggish or stuck fermentations and decreases the need for emergency interventions, saving time, product, and resources.

Taken together, these solutions are not optional accessories. They are core tools for modern, sustainable wineries, where quality, consistency, energy efficiency, and resource optimization must coexist. Sustainability, in this context, is not an abstract concept, it is the practical outcome of **smarter choices at every stage of the winemaking process**.



The future belongs to wineries that embrace science, efficiency, and realism, crafting wines that are stable, enjoyable, and aligned with how people live today.

AEB's mission in 2027 is to support that future, by providing the tools that make wines consistent, resilient, and genuinely sustainable, from fermentation to the glass.

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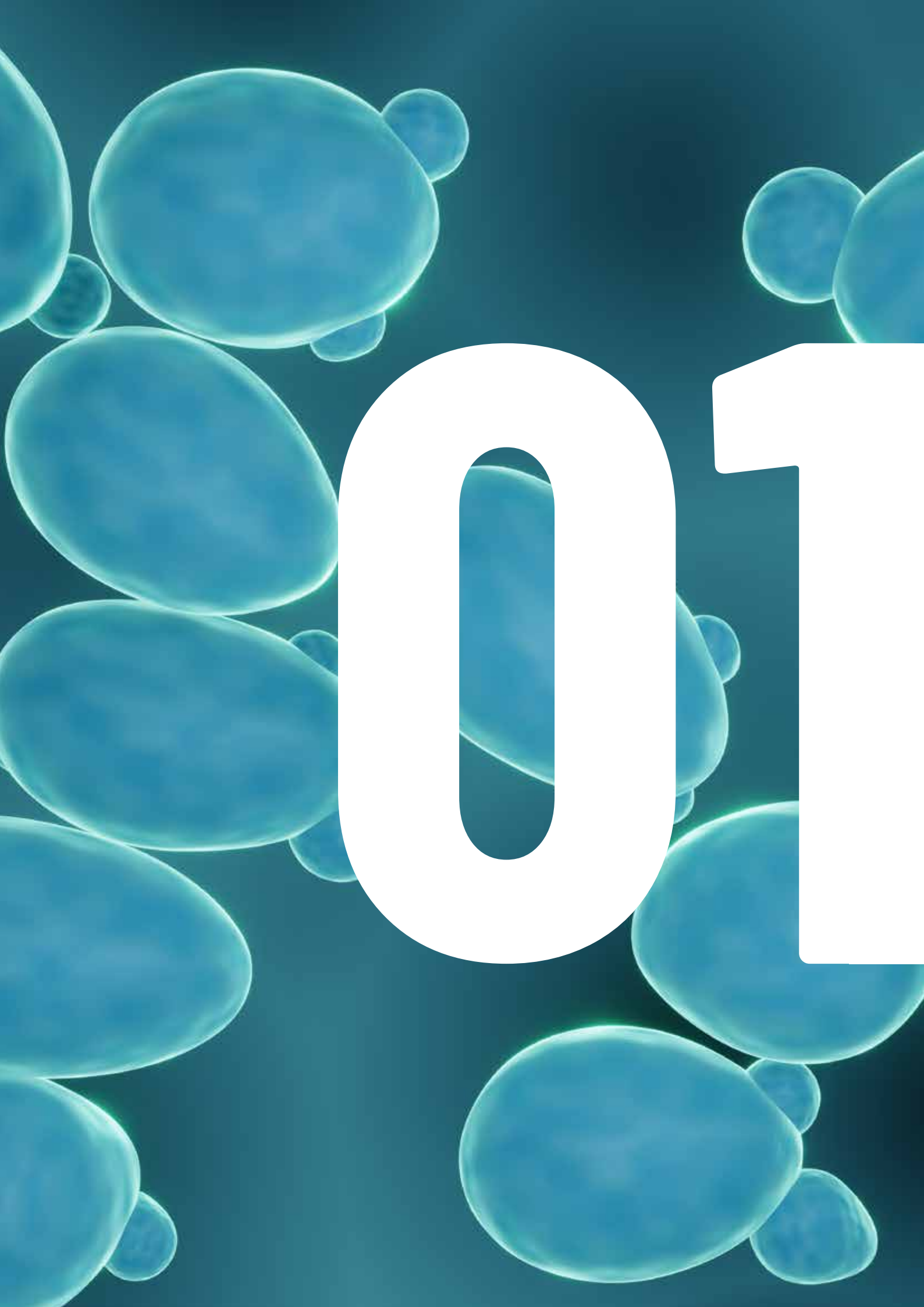


08

Equipment

pg 90



The background is a dark teal color. It is populated with numerous translucent, glowing blue spheres of various sizes. Some spheres are large and prominent, while others are small and appear in the background. The spheres have a soft, ethereal glow. In the center of the image, the number '01' is displayed in a large, white, sans-serif font. The '0' is a simple circle, and the '1' is a vertical bar with a small horizontal tick at the top. The number is positioned slightly to the right of the center.

01

Yeasts



Introduction

AEB's yeast portfolio is designed to give winemakers both **fermentation security and advanced control over wine style**. The range includes a **complete selection of *Saccharomyces cerevisiae* and *bayanus* strains**, covering aromatic whites, thiol expression, cold fermentations, structured reds, sparkling wines, and reliable restart solutions. Alongside this, AEB offers an advanced **non-*Saccharomyces* (NS) line and ready-to-use *Sacch* + non-*Sacch* (SNS) blends**, developed to meet modern stylistic and technical goals. Non-*Saccharomyces* yeasts contribute greater aromatic complexity, improved mouthfeel, and fresher profiles, while typically delivering lower alcohol levels, increased **natural acidity**, and a significant reduction in volatile acidity (often 30–40% lower compared to conventional *Saccharomyces* fermentations). SNS formulations combine non-*Saccharomyces* and *Saccharomyces* in a single inoculum, eliminating the need for sequential additions and simplifying cellar operations while maintaining fermentation reliability. The portfolio is completed by **PRIMAFLORA**, a **bioprotection** culture applied at harvest to control spoilage microflora, limit oxidation, and reduce or replace early SO₂ additions, helping preserve freshness and aromatic potential from the very first stages of processing.

LEGEND



Yeast for sparkling wines and restart



Yeast for white wines



Yeast for rosé and light red wines



Yeast for structured and ageing red wines



Non-*Sacch* and *Sacch*/non-*Sacch* yeast blend or Polivalent yeast

YEAST STRAIN	SUGGESTED VARIETIES / USE	AROMATIC PROFILE	NITROGEN DEMAND (YAN)	ALCOHOL TOLERANCE	FERMENTATION TEMPERATURE
 FERMOL Arôme Plus (<i>S. cerevisiae</i>)	Pinot Grigio, Riesling, Moscato, aromatic whites	Intense floral and terpene lift	High (at least 200 mg/L recommended). Use with FERMOPLUS Floral for best results	High (≈14–15% v/v)	Low temp capable (≈12–18 °C)
 FERMOL Blanc (<i>S. cerevisiae</i> r.f. <i>bayanus</i>)	Neutral & aromatic whites, cider, mead	Floral, citrus, white pulp fruit	Low	High	Cool fermentations
 FERMOL Candy (Hybrid <i>S. cerevisiae</i>)	Whites, rosé, young reds	Confectionary, candy-like esters, yellow fruit	Moderate	Good	≥12 °C
 FERMOL Chardonnay (<i>S. cerevisiae</i>)	Chardonnay, complex textural and lees-aged whites	Ripe & exotic fruit, melon, sur lie roundness	Moderate. Use with BÂTONNAGE products for improved mouthfeel	Good	Low temp & barrel capable
 FERMOL Fleur (<i>S. cerevisiae</i>)	Grüner Veltliner, aromatic whites, rosé	White flowers	Moderate. Use with FERMOPLUS Floral for best results	Good	Cool–moderate

YEAST STRAIN	SUGGESTED VARIETIES / USE	AROMATIC PROFILE	NITROGEN DEMAND (YAN)	ALCOHOL TOLERANCE	FERMENTATION TEMPERATURE
 FERMOL Lime (<i>S. cerevisiae</i>)	Sauvignon Blanc, Riesling, cool-climate whites	Grapefruit, lime, citrus-herbal	Responds to AA nutrition	Good	Cool whites
 FERMOL Sauvignon (IRC7 ⁺)	Sauvignon blanc, Viognier, thiol-rich whites	Thiols: citrus, blackcurrant, exotic	Moderate. Use with FERMOPLUS Sauvignon for best results	Good	Cool–moderate
 FERMOL Tropical (Hybrid)	Sauvignon blanc, Chardonnay, Viognier	Tropical fruit, passionfruit, thiol complexity	Moderate. Use with FERMOPLUS Tropical for best results	Good	Cool–moderate
 FERMOL PB2033 (<i>S. cerevisiae</i>)	Rosé, fresh young reds	Strawberry, red currant, cherry, Provencale	Moderate. Use with FERMOPLUS Rose or Red Berry for best results	Good	12–34 °C
 FERMOL Ro5es (<i>S. cerevisiae</i>)	Rosé, fresh young reds	Strawberry, orange blossom	Moderate. Use with FERMOPLUS Rose or Red Berry for best results	High	Cool–moderate
 FERMOL Red Bouquet (<i>S. cerevisiae</i>)	Fruit-forward reds & rosé	Red currant, red cherry, plum, violet	Low. Use with FERMOPLUS Rose or Red Berry for best results	Good	Moderate
 FERMOL Red Fruit (Hybrid)	Young fruity reds	Raspberry, blueberry, blackcurrant	Low–moderate. Use with FERMOPLUS Rose or Red Berry for best results	Good	Moderate
 FERMOL Grand Rouge (<i>S. cerevisiae</i>)	Structured reds	Varietal typicity, tannic structure	Very low	High	Warm / high temp
 FERMOL Méditerranée (<i>S. cerevisiae</i>)	Warm-climate aging reds	Cherry, figs, polysaccharide roundness	Low	Good	Moderate
 FERMOL Premier Cru (<i>S. cerevisiae</i>)	Premium age-worthy reds	Complex aromatics, full body	Moderate	High	Moderate
 FERMOL Rouge (<i>S. cerevisiae</i>)	Young & mid-term reds	Intense red berries, colour enhancement	Low	High	Warm capable
 FERMOL Super 16 (<i>S. cerevisiae</i>)	High sugar musts	Clean fruit, long finish	Moderate	Very high	High temp
 FERMOL C6+ (<i>S. cerevisiae</i>)	High sugar musts, varietal reds	Reds from warm climates, produces glycerine, mouthfeel	Low-moderate	Very high	Warm capable



YEAST STRAIN	SUGGESTED VARIETIES / USE	AROMATIC PROFILE	NITROGEN DEMAND (YAN)	ALCOHOL TOLERANCE	FERMENTATION TEMPERATURE
 FERMOL T.P.CO (Hybrid)	High typicity reds (all varieties), Shiraz, Bordeaux blends	Varietal fruit	Low	Up to ~16.5%	18–25 °C
 PRIMAFLORA VB (Biocontrol)	Bioprotection (all colours)	Cleaner aromatics, less oxidation	Not applicable	Not applicable	Pre-ferment use
 FERMOL Cristal (<i>S. bayanus</i>)	Traditional & tank sparkling	Neutral, preserves base wine	Low–moderate	High pressure	Cold–moderate
 FERMOL Charmat (<i>S. cerevisiae</i> r.f. <i>bayanus</i>)	Charmat, cider, seltzer, restart	White fruit, citrus, esters	Low	High	Cryophilic
 FERMOL Complet Killer Fru (Fructophilic <i>bayanus</i>)	Restart stuck fermentations	Neutral	Designed for restart	High	Cold & stress
 SNS FERM Le Fleur (<i>Torulaspora</i> + <i>Lachancea</i> + <i>S. cerevisiae</i>)	Floral whites, rosé	Floral & citrus, higher acidity, mouthfeel	Moderate	≈13.5%	22–26 °C
   SNS FERM Thiol (<i>T. delbrueckii</i> + <i>S. cerevisiae</i>)	Aromatic whites, complex rosé	Major thiol expression and texture	Moderate	Good	Direct inoculation
 NS FERM Alcomeno (<i>Lachancea thermotolerans</i>)	Lactic acid production	Fresh style, lower alcohol	Low–moderate	Sequential	48 h before S.c.
  NS FERM Tiotoru (<i>Torulaspora delbrueckii</i>)	Thiol whites & elegant reds	Tropical thiols, soft phenolics	Low–moderate	Sequential	48 h before S.c.
 NS FERM Bellissima (<i>M. pulcherrima</i>)	Co-fermentation programs, bioprotection	Sweet fruit, texture lift	Not applicable	Not applicable	Preferment
   LEVULIA Torula (<i>Torulaspora delbrueckii</i>)	Aromatic whites, rosé	Tropical lift, roundness	Low–moderate	≈9% alone	Cool–moderate
 ZYMASIL Pronto Blanc (Direct inoculation)	Whites, pale rosé	Floral, white fruit esters	Integrated nutrient	≈15.5%	Cool–moderate
 ZYMASIL Pronto Rouge (Direct inoculation)	Reds, large tanks	Ripe red fruit	Integrated nutrient	≈15.5%	Moderate–warm

FERMOL, ZYMASIL, PRIMAFLORA and LEVULIA are registered trademarks of AEB.

White & floral expression yeasts

FERMOL Arôme Plus



STRAIN / SPECIES

Saccharomyces cerevisiae

FERMENTATION PROFILE / KEY TRAITS

Short lag-phase, good ethanol and SO₂ tolerance, capable of fermenting at low temperatures (~12 °C). Requires good (200 ppm) YAN. Killer-neutral, POF-negative.

AROMATIC & SENSORY CONTRIBUTION

Produces wines with very intense aromas where primary varietal notes harmonize with fermentation-derived floral and terpene expression.

RECOMMENDED VARIETIES

Riesling, Pinot Grigio, Moscato; performs particularly well in co-fermentation with FERMOL Chardonnay.

RED WINES

Limited use, only for light, aromatic styles.

WHITE WINES

Recommended for modern, round aromatic whites and cold fermentations.

ROSÉ WINES

Recommended for aromatic rosé at cool temperatures.

ALL-PURPOSE

Best suited where aromatic intensity and terpene enhancement are desired.

FERMOL Blanc



STRAIN / SPECIES

Saccharomyces cerevisiae r.f. *bayanus*

FERMENTATION PROFILE / KEY TRAITS

Low nitrogen demand, excellent performance at low temperatures, very low H₂S production except under extreme deficiency; resistant to cold and high alcohol. Suitable for lees maturation and non-grape fermentations (cider, fruit wine, mead, agave). Killer-neutral.

AROMATIC & SENSORY CONTRIBUTION

Full-bodied wines with complex aromas: flowers, citrus, white-pulp fruit.

RECOMMENDED VARIETIES

General aromatic and neutral whites; also cider and mead.

RED WINES

Occasional use for light reds requiring clean fermentations.

WHITE WINES

Ideal for cool fermentations and lees aging.

ROSÉ WINES

Good for fresh, low-temp rosé fermentations.

ALL-PURPOSE

Robust, low-maintenance fermentation strain.

FERMOL Candy



STRAIN / SPECIES

Hybrid *Saccharomyces cerevisiae*

FERMENTATION PROFILE / KEY TRAITS

Multiplies rapidly and implants strongly, including in musts that have undergone pre-fermentative cold processing. Performs best at fermentation temperatures above 12 °C.

AROMATIC & SENSORY CONTRIBUTION

Enhances amylic & candy-like aromas, yellow fruits, and fermentation esters.

RECOMMENDED VARIETIES

White, rosé, and young red wines.

RED WINES

Recommended for young aromatic reds.

WHITE WINES

Develops expressive fermentative esters.

ROSÉ WINES

Well suited for modern amylic rosé styles.

ALL-PURPOSE

Useful in musts with undesired native microflora.

FERMOL Chardonnay



STRAIN / SPECIES

FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

WHITE WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae

Produces fine lees rich in mannoproteins, rapidly releasing polysaccharides and increasing viscosity and mid-palate roundness. Killer-neutral. Very versatile both for barrel fermentation and low-temperature fermentations. Suitable for wines where texture and mouthfeel are desired.

Ripe and exotic fruits, melon, smooth full mouthfeel, strong sur-lie performance.

Chardonnay and whites matured on lees.

Best suited for barrel or sur-lie aged whites.

Occasional use for round, textured rosé.

Preferred when mouthfeel and polysaccharide release are primary goals.

White & aromatic expression yeasts

FERMOL Fleur



STRAIN / SPECIES

FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

WHITE WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae — IFV Nantes selection

Enhances floral characters, low malic acid consumption, helping preserve freshness in warm-climate musts. Combine with FERMOPLUS Floral for best effect.

White-flower bouquet, persistent both on nose and palate.

Grüner Veltliner, aromatic whites, modern rosé wines.

Occasional use for lighter floral red styles.

Ideal when floral aromatic intensity is desired.

Widely used for intensely perfumed rosé wines.

Suitable when floral esters and freshness retention are priorities.

FERMOL Lime



STRAIN / SPECIES

FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

WHITE WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae — IFV Nantes selection

Low malic acid consumption; helps maintain acidity in hot-region musts. Responds strongly to amino-acid-based nutrients.

Accentuates grapefruit, lemon, and citrus-herbal notes; used to diversify Sauvignon Blanc styles away from heavy tropical thiols.

Sauvignon Blanc, Riesling, Pinot Grigio, Grüner Veltliner, cool-climate whites.

Recommended for thiolic citrus-driven aromatic whites.

Recommended when citrus and freshness expression is desired.

Performs best when paired with FERMOPLUS Floral for thiol expression.



FERMOL Sauvignon



STRAIN / SPECIES	<i>Saccharomyces cerevisiae</i> — strain carrying IRC7 β -lyase gene
FERMENTATION PROFILE / KEY TRAITS	Releases varietal thiols from cysteine- and glutathione-bound precursors.
AROMATIC & SENSORY CONTRIBUTION	High olfactory intensity; blackcurrant, citrus, exotic fruit thiolics, floral notes.
RECOMMENDED VARIETIES	Sauvignon Blanc (including New Zealand style), Viognier, Verdelho, Traminer, other thiol-rich whites.
RED WINES	Not recommended.
WHITE WINES	Primary target: thiol-expressive aromatic whites, Fumé Blanc-style Sauvignon Blanc.
ROSÉ WINES	Recommended thiolic rosé profiles.
ALL-PURPOSE	Best suited where thiol release and varietal lift are desired.



FERMOL Tropical



STRAIN / SPECIES	Hybrid <i>Saccharomyces cerevisiae</i> — IFV Nantes selection
FERMENTATION PROFILE / KEY TRAITS	Designed for broad and complex thiol development; benefits from FERMOPLUS Tropical and FERMOPLUS Sauvignon.
AROMATIC & SENSORY CONTRIBUTION	Tropical and summer fruit with aromatic herb nuances; elegant thiol spectrum.
RECOMMENDED VARIETIES	Fumé Blanc-style Sauvignon Blanc, Chardonnay, Marsanne, Viognier, Müller-Thurgau, Grillo.
RED WINES	Occasional use for light fruity reds.
WHITE WINES	Ideal for ripe-tropical and layered thiolic whites.
ROSÉ WINES	Good for tropical-lift rosé styles.
ALL-PURPOSE	Responds best with FERMOPLUS Tropical nutrient.

Rosé & light red fermentation



FERMOL PB2033



STRAIN / SPECIES	<i>Saccharomyces cerevisiae</i> — selected in Côtes de Provence
FERMENTATION PROFILE / KEY TRAITS	Wide temperature range (12–34 °C), short lag-phase, regular kinetics. Limited anthocyanin adsorption, promoting optimized rosé colour. Killer-neutral.
AROMATIC & SENSORY CONTRIBUTION	Red currant, cherry, raspberry, strawberry, white-flower notes.
RECOMMENDED VARIETIES	French-style rosé and young red wines.
RED WINES	Recommended for fresh young reds.
ROSÉ WINES	Primary application — Provence-style rosé.
ALL-PURPOSE	Strong implantation with controlled colour behavior.



FERMOL Ro5es



STRAIN / SPECIES

FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae

Wide temperature range (12–34 °C), short lag-phase, regular kinetics.

Floral, Red currant, raspberry, strawberry, white-flower notes.

French-style rosé and young red wines.

Recommended for fresh young reds.

Primary application — Provence-style rosé.

Strong implantation with controlled colour behavior.

FERMOL Red Bouquet



STRAIN / SPECIES

FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae — IFV Nantes selection

Highly dominant strain minimizing stuck fermentations; produces thiols from sulfur precursors; high glycerol production; low YAN demand; does not consume malic acid.

Red currant, raspberry, violets, smooth mid-palate from glycerol.

Red and rosé wines requiring fruit intensity and freshness.

Ideal for fruit-forward reds with smooth texture.

Excellent for thiolic-floral rosé expression.

Supports ML timing due to no malic consumption.

FERMOL Red Fruit



STRAIN / SPECIES

FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

ROSÉ WINES

ALL-PURPOSE

Hybrid *S. cerevisiae* — derived from FERMOL Iper R x PB2033

Performs under stressful conditions and high sugar; modest nutritional demand; clean aromatics without reduction when properly nourished.

Raspberry, blueberry, blackcurrant, designed for young fruity wines.

Young reds with pronounced fruit character.

Ideal for fresh, youthful, aromatic reds.

Good for deeply fruity rosé styles.

Performs well in low-YAN musts.

Red wine fermentation (structure & complexity)

FERMOL Grand Rouge



STRAIN / SPECIES

Saccharomyces cerevisiae — Navarra Institute selection

FERMENTATION PROFILE / KEY TRAITS

Short lag-phase, minimal nutritional needs, high ethanol and temperature tolerance, dominant strain suppressing indigenous flora; suitable for refermentation and concentrated musts.

AROMATIC & SENSORY CONTRIBUTION

Clean, varietal expression with good tannic structure.

RECOMMENDED VARIETIES

Reds requiring fermentation security and dominance.

RED WINES

Primary application: structured, clean reds.

ALL-PURPOSE

Useful for musts enriched with concentrate.

FERMOL Méditerranée



STRAIN / SPECIES

Saccharomyces cerevisiae

FERMENTATION PROFILE / KEY TRAITS

Selected to obtain warm, full-bodied red wines suitable for aging but already approachable at the end of fermentation. Produces a high quantity of polysaccharides and mannoproteins, which harmonize palate structure and contribute to rapid stabilization of colour and tannins. Very good fermentation kinetics and technological robustness.

AROMATIC & SENSORY CONTRIBUTION

Emphasizes varietal complexity and enhances sweet notes reminiscent of ripe fig jam and small red berries, especially redcurrant and cherry. Mouthfeel is round, with smooth, well-integrated tannins.

RED WINES

Primary target: structured, warm reds destined for medium to long aging, including organic programs where low YAN demand is an advantage.

ALL-PURPOSE

Well suited to co-inoculation with malolactic bacteria (e.g. MALOLACT) thanks to its polysaccharide release and stable fermentation profile.

FERMOL Premier Cru



STRAIN / SPECIES

Saccharomyces cerevisiae

FERMENTATION PROFILE / KEY TRAITS

Very low H₂S production; produces glycerin, polysaccharides, and polyphenol extraction; minimal SO₂ production; facilitates MLF; killer-neutral.

AROMATIC & SENSORY CONTRIBUTION

Complex, intense aromatics; full-bodied mouthfeel.

RECOMMENDED VARIETIES

Structured reds for aging and high typicity expression.

RED WINES

Highly recommended for premium age-worthy reds.

ALL-PURPOSE

Strong option when MLF integration and low sulfur are required.



FERMOL Rouge



STRAIN / SPECIES FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae

A strain for difficult conditions; high fermentation temperature, low nutrition; strong dominance over indigenous flora; limited colour adsorption for better wine colour.

Intense red berry aromas; medium structure; enhanced colour intensity.

Blush, young reds, medium-term aging wines.

Reliable for tough, high-stress fermentations.

Appropriate for deeper-coloured rosé.

Chosen when tank turnover and robustness are priorities.

FERMOL Super 16



STRAIN / SPECIES FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

WHITE WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae — originally isolated in Samos (Greece)

Adapted to high sugar and high osmotic stress; supports overripe grapes; performs at high alcohol and temperature; strong extractive enzyme activity; excellent flocculation and easy filtration post-fermentation.

Clean, fresh fruit with long, complex finish.

All red varietals, high Baumé musts.

Ideal for high-sugar, high-alcohol premium reds.

Can be used in passito or sweet whites.

Limited use.

Excels in extreme or concentrated fermentations.

FERMOL C6+



STRAIN / SPECIES FERMENTATION PROFILE / KEY TRAITS

AROMATIC & SENSORY CONTRIBUTION

RECOMMENDED VARIETIES

RED WINES

WHITE WINES

ROSÉ WINES

ALL-PURPOSE

Saccharomyces cerevisiae

Adapted to high sugar and high osmotic stress; performs at high alcohol and temperature; strong mouthfeel.

Clean, fresh fruit with long, complex finish.

All red varietals, high Baumé musts.

Ideal for high-sugar, high-alcohol premium reds.

Can be used in whites.

Limited use.

Excels in extreme or concentrated fermentations.

Hybrid & specialty red yeast

FERMOL T.P.CO



STRAIN / SPECIES

Hybrid *S. cerevisiae* — IFV Nantes selection

FERMENTATION PROFILE / KEY TRAITS

Strong implantation capacity, high glycerol, phenolic extraction, killer phenotype, carries IRC7 β -lyase for thiol release; low nutritional needs; resistant to high alcohol (up to ~16.5% v/v) and high SO_2 . Optimal fermentation temperature 18–25 °C.

AROMATIC & SENSORY CONTRIBUTION

Intense floral and fruity profile; black fruits such as blueberry and blackberry.

RECOMMENDED VARIETIES

High typicity reds — all varieties.

RED WINES

Primary application — full, aromatic, fruit-driven reds.

WHITE WINES

Occasional structured whites.

ROSÉ WINES

Occasional structured rosé.

Sparkling & refermentation yeasts

FERMOL Cristal



STRAIN / SPECIES

Saccharomyces cerevisiae r.f. *bayanus* — Champagne region selection

FERMENTATION PROFILE / KEY TRAITS

High alcohol resistance, strong flocculation, reliable “prise de mousse,” low volatile acidity production, low foaming, complete sugar consumption. Suitable for pied-de-cuve preparation and traditional-method aging on lees.

AROMATIC & SENSORY CONTRIBUTION

Clean fermentation profile with neutral aromatic impact, preserving base-wine typicity.

RECOMMENDED VARIETIES

Premium traditional-method sparkling and tank refermentation.

WHITE WINES

Primary application — Champenoise base & secondary fermentation.

ROSÉ WINES

Suitable for rosé sparkling production.

ALL-PURPOSE

Secure fermentations under pressure, alcohol, and CO_2 stress.

FERMOL Charmat



STRAIN / SPECIES

Saccharomyces cerevisiae r.f. *bayanus*

FERMENTATION PROFILE / KEY TRAITS

Exceptionally fast fermentation rate, strong cryophilic phenotype, high alcohol tolerance, low nutritional demand; successful in hard seltzers, ciders, and nutritionally unbalanced media. Excellent for restarting stuck fermentations. Killer-neutral.

AROMATIC & SENSORY CONTRIBUTION

Accentuates white-fruit and citrus notes without masking varietal aromas.

RECOMMENDED VARIETIES

Tank-method sparkling, difficult fermentations, cider & adjunct-sugar musts.

WHITE WINES

Ideal for Charmat-method and cold refermentations.

ROSÉ WINES

Good for fresh sparkling rosé profiles.

ALL-PURPOSE

Preferred when fermentation speed, low maintenance and reliability are required.

FERMOL Complet Killer Fru



STRAIN / SPECIES

Saccharomyces cerevisiae r.f. *bayanus* — fructophilic strain

FERMENTATION PROFILE / KEY TRAITS

Very strong fructose metabolism; killer phenotype ensures dominance in compromised musts; high alcohol tolerance; resistant at low temperatures; ideal for restart of stuck fermentations.

AROMATIC & SENSORY CONTRIBUTION

Clean aromatic profile with minimal by-product formation.

RECOMMENDED VARIETIES

Restarting stuck or sluggish fermentations; partially fermented wines.

RED WINES

Highly effective for restart in high-alcohol or nutrient-limited reds.

WHITE WINES

Secure completion of stuck ferments with residual fructose.

ROSÉ WINES

Same restart benefit in cold or stressed rosé fermentations.

ALL-PURPOSE

Primary reference for fructophilic restart protocols.

Direct-inoculation range (ZYMASIL)

ZYMASIL Pronto Blanc

Direct-inoculation yeast +
nutrient for white wines



STRAIN / SPECIES

Active dry *Saccharomyces cerevisiae* var. *bayanus* blended with a dedicated yeast nutrient based on ammonium salts, thiamine and yeast hulls.

FERMENTATION PROFILE / KEY TRAITS

Formulated for direct inoculation without rehydration, simplifying cellar operations while maintaining high viability and strong kinetics. 250 ppm contribute about 22 ppm of assimilable nitrogen (YAN). Ideal alcohol tolerance up to ~15.5% v/v; killer phenotype neutral; excellent copper resistance; low volatile acidity production.

AROMATIC & SENSORY CONTRIBUTION

Clean fermentations with reliable expression of white-fruit, floral and sweet-fruit notes.

WHITE WINES

Primary use: easy, robust fermentation of white musts with simplified handling and integrated nutrition.

ROSÉ WINES

Can be used for pale rosés where a white-wine style fermentation is desired.

ALL-PURPOSE

Ideal when direct inoculation and integrated nutrition are required under variable cellar conditions.

ZYMASIL Pronto Rouge

Direct-inoculation yeast +
nutrient for red wines



STRAIN / SPECIES

Active dry *Saccharomyces cerevisiae* blended with yeast nutrient based on ammonium salts, thiamine and yeast hulls.

FERMENTATION PROFILE / KEY TRAITS

Direct-inoculation preparation for red wines, able to ferment successfully without prior rehydration. 250 ppm contribute about 22 ppm of assimilable nitrogen (YAN). Ideal alcohol tolerance up to ~15.5% v/v; killer-neutral; excellent copper resistance; low volatile acidity. Designed for fast kinetics and operational simplicity.

AROMATIC & SENSORY CONTRIBUTION

Expresses ripe red-fruit and berry notes, with emphasis on summer fruit, berries and small red fruits.

RED WINES

Main application: straightforward, reliable fermentations of red musts with integrated nutrition, particularly where ease of use and robust kinetics are priorities.

ALL-PURPOSE

Very convenient option for large fermenters or operations preferring no-rehydration protocols.

Non-Saccharomyces yeasts



NS FERM Alcomeno



STRAIN / SPECIES

Lachancea thermotolerans — IUVV Dijon selection (Burgundy)

FERMENTATION PROFILE / KEY TRAITS

Lachancea thermotolerans diverts a portion of grape sugars toward lactic acid production instead of ethanol, resulting in natural acidification and reduced final alcohol. This metabolic pathway explains the strong link between lactic acid formation and alcohol reduction.

NS FERM Alcomeno is used in sequential inoculation ahead of *Saccharomyces cerevisiae*, allowing alcohol reduction and lactic acid production before hand-off to the main fermenting strain. Lactic acid production is highly temperature dependent, with warmer early fermentation temperatures promoting greater acid formation, while cooler conditions limit its activity. The strain can be easily and cleanly arrested by chilling the must to approximately 7–8 °C, giving winemakers precise control over acidity, alcohol impact, and timing.

AROMATIC & SENSORY CONTRIBUTION

Improves freshness, tension, and aromatic precision while preserving varietal character. Wines show brighter fruit definition, enhanced balance, and increased mouthfeel energy due to higher natural acidity and lower ethanol perception.

RECOMMENDED VARIETIES

Alcohol reduction and acidity management programs; particularly effective in warm-climate or high-sugar musts where freshness and balance are at risk.

RED WINES

Enhances drinkability and balance in ripe or high-alcohol reds by moderating ethanol and increasing perceived freshness.

WHITE WINES

Excellent for restoring acid tension and aromatic clarity in warm-region or low-acid whites.

ROSÉ WINES

Ideal for producing crisp, vibrant rosés with higher natural acidity and moderated alcohol.

ALL-PURPOSE

A precision non-*Saccharomyces* tool enabling controlled acidification and alcohol reduction through temperature-managed, sequential fermentation strategies.



NS FERM Tiotoru



STRAIN / SPECIES

Torulaspora delbrueckii — IUVV Dijon selection (Burgundy)

FERMENTATION PROFILE / KEY TRAITS

Used in sequential inoculation (~48 h before *S. cerevisiae*). Rapid implantation suppresses indigenous flora; autolysis during alcoholic fermentation releases nutrients and polysaccharides, reducing astringency and detoxifying the medium. Very low acetic acid formation in high-sugar musts.

AROMATIC & SENSORY CONTRIBUTION

High tropical thiol release; enhanced bouquet complexity and palate roundness.

RECOMMENDED VARIETIES

Sauvignon Blanc, Chardonnay, Gewürztraminer, Chenin, Riesling, Muscat, Sémillon.

RED WINES

Improves softness and mouthfeel via polysaccharide release.

WHITE WINES

Excellent for thiolic and semi-aromatic profiles.

ROSÉ WINES

Useful where texture + aromatic lift are desired.

ALL-PURPOSE

Supports microbial control during early fermentation.



NS FERM Bellissima



STRAIN / SPECIES

Metschnikowia pulcherrima - IUVV Dijon selection (Burgundy)

FERMENTATION PROFILE / KEY TRAITS

Bioprotection. Increases higher alcohols, ethyl esters, acetates, and terpenes; releases polysaccharides for volume and viscosity; contributes to persistence and softness. Produces pulcherriminic acids with bioprotective effect in must.

AROMATIC & SENSORY CONTRIBUTION

Sweet summer-fruit aromas; enhanced bouquet complexity when combined with *S. cerevisiae* strains (e.g., FERMOL Chardonnay, Arôme Plus).

RECOMMENDED VARIETIES

Aromatic enhancement programs and bioprotection strategies.

RED WINES

Adds roundness and aromatic complexity in co-fermentations.

WHITE WINES

Excellent for balanced aromatic enhancement.

ROSÉ WINES

Ideal for fruity, textural rosé styles.

ALL-PURPOSE

Used in combination / co-inoculation for aroma + texture synergy.

SNS BLENDS (non-*Sacch* + *Saccharomyces*)



SNS FERM Le Fleur

Non-*Saccharomyces* /
Saccharomyces blend for
floral aromatic complexity



STRAIN / SPECIES

Blend of *Torulaspora delbrueckii*, *Lachancea thermotolerans* and *Saccharomyces cerevisiae* (IFV Nantes selection)

FERMENTATION PROFILE / KEY TRAITS

Direct-inoculation blend; rapid implantation inhibits undesirable flora and limits volatile acidity. The enzyme pool from *T. delbrueckii* and *L. thermotolerans* promotes varietal thiol release, aromatic compound formation and partial conversion of sugars to lactic acid instead of ethanol, increasing total acidity and lowering pH. Typical alcohol reduction is 0.8–1% v/v at 22–26 °C. Autolysis of the non-*Sacch* strains gradually releases amino acids and detoxifying hulls, softening astringency and increasing roundness via membrane polysaccharides. Alcohol tolerance ~13.5% v/v.

AROMATIC & SENSORY CONTRIBUTION

Marked floral notes (jasmine, linden, hawthorn, yellow flowers) with persistent citrus tones ranging from mandarin to pink grapefruit; greater aromatic balance and complexity with a fresher, more vibrant palate.

RED WINES

For lighter reds where floral top-notes and softer tannins are desirable.

WHITE WINES

Excellent for floral-driven whites requiring higher acidity and lower pH.

ROSÉ WINES

Ideal for rosés with intense floral and citrus aromatic profile and crisp freshness.

ALL-PURPOSE

When the goal is to combine alcohol reduction, higher acidity and strong floral complexity in a single direct inoculation.

SNS FERM Thiol



STRAIN / SPECIES

Blend — 70% non-*Saccharomyces* (*T. delbrueckii*) and 30% *Saccharomyces cerevisiae* (FERMOL Sauvignon) — IUVV Dijon selection (Burgundy)

FERMENTATION PROFILE / KEY TRAITS

Direct-inoculation hybrid (no sequential addition needed). Rapid implantation suppresses indigenous flora and limits VA-producing species. Early *Torulaspora* metabolism releases thiols and aroma compounds and provides texture. Sequential fermentation with *T. delbrueckii* consumes part of the sugars with a lower ethanol yield, typically resulting in a reduction of ~ 0.5% (v/v) alcohol. Subsequent autolysis releases amino acids and polysaccharides, improving roundness, softness, and fermentation stability.

AROMATIC & SENSORY CONTRIBUTION

Major enhancement of aromatic complexity — thiolic, floral, fruity, and textural lift.

RECOMMENDED VARIETIES

Sauvignon Blanc (aromatics and mouthfeel), Chardonnay, Gewürztraminer, Colombard, Riesling, Muscat, Sémillon.

RED WINES

In red wines, early *T. delbrueckii* activity contributes to a lift in fruity esters and thiol-derived precursors, typically perceived as brighter red-berry aromatics and improved freshness.

WHITE WINES

Primary application, multi-layered thiolic aromatics.

ROSÉ WINES

Very effective for complex aromatic rosé.





PRIMAFLORA VB

Bioprotection culture for white, rosé, and red wines



STRAIN / SPECIES

Ready-to-use bioprotective blend of active dry non-*Saccharomyces* yeasts: *Metschnikowia pulcherrima* and *Torulaspora delbrueckii*, supported by detoxifying yeast hulls.

FERMENTATION PROFILE / KEY TRAITS

PRIMAFLORA VB is designed for microbiological protection of grapes and must in the absence of SO₂. The selected non-*Saccharomyces* yeasts rapidly colonize the medium, occupying the ecological niche and inhibiting the development of spoilage microorganisms.

The formulation helps limit oxidative colour shifts, reducing yellow/orange hues, while moderating the extraction of skin polyphenols and tannins, particularly in white and rosé processing. Integrated yeast hulls contribute to must detoxification, improving fermentation conditions and preparing the medium for a clean and reliable alcoholic fermentation with *Saccharomyces*.

AROMATIC & SENSORY CONTRIBUTION

PRIMAFLORA VB supports fresher and brighter colour expression, green/silver tones in whites, pale to powder-pink in rosés, and stable flavylum expression in reds. It helps reduce vegetal notes, enhances the expression of varietal aromatic precursors, and contributes to wines with cleaner, brighter aromatic profiles and improved freshness on the nose.

RED WINES

Can be applied on red grapes from reception through cold soak, limiting spoilage flora prior to *Saccharomyces* inoculation.

WHITE WINES

Ideal for SO₂-free processing from harvest through clarification; promotes pale colour, lower phenolic pickup, and enhanced aromatic potential.

ROSÉ WINES

Particularly suited for producing very pale rosés with low catechin extraction and intense floral and fresh aromatics.

APPLICATION POINTS

PRIMAFLORA VB is a vineyard- and winery-ready bioprotective culture and can be applied:

- On grape harvesters
- In hoppers
- Sprayed on receiving conveyors.

KEY BENEFITS

- Reduces yellow hues, favouring green and silver tones
- Minimizes extraction of skin polyphenols and tannins
- Lowers vegetal aromas
- Enhances expression of aromatic precursors
- Inhibits spoilage microorganisms without SO₂
- Detoxifies must via yeast hulls.

INSTRUCTIONS FOR USE

- Rehydrate in non-chlorinated water at a minimum ratio of 1:10
 - Vineyard application: use water at ambient temperature
 - Winery application: rehydrate at 25–30 °C.
- Apply immediately after rehydration for optimal performance.

STORAGE

Store below 20 °C in a dry environment.

Yeast rehydration and acclimation



1

Using clean, sanitized equipment, prepare rehydration water at a rate of 10 L/kg of yeast.

Water temperature:

- *Saccharomyces cerevisiae*: 39 °C
- *Bayanus* strains: 41 °C

2

Add **FERMOPLUS Energy Glu 4.0** at 25% of the yeast weight, equivalent to 1 part Energy Glu 3.0 per 4 parts yeast.

While gently stirring, slowly add the nutrient first, followed by the yeast. Ensure all clumps are fully dispersed. Avoid aggressive mixing (drills, high shear), which may damage yeast cell membranes. Gentle mixing with adequate oxygen incorporation is recommended. Oxygen, together with the amino acids supplied by Energy Glu 4.0, supports the development of a larger and more resilient yeast biomass.

3

After 20–30 minutes, the yeast is fully rehydrated and requires an immediate sugar source to remain viable.

Begin acclimation by gradually adding must to the yeast suspension:

- slowly add an amount of must equal to the yeast slurry volume over ~5 minutes, stirring gently
- ensure the temperature drop does not exceed 5 °C at any point, as larger drops reduce yeast viability.

4

After 15 minutes, repeat the addition with another equal volume of must, again maintaining a temperature differential ≤ 5 °C.

5

Continue this stepwise acclimation every 15 minutes until the yeast mixture is within 5 °C of the tank temperature. At that point, inoculate the tank, ensuring proper venting to release CO₂ pressure.

FERMOPLUS Energy Glu 4.0 is the new frontier in rehydration nutrients that allows yeast to be rehydrated with water at a temperature of around 20°C.

Restarting a stuck or sluggish fermentation

PRODUCT	PPM (APPROX.)
FERMOL Complet Killer Fru	240–480 ppm
FERMOPLUS Energy Glu 3.0	60–120 ppm
FERMOPLUS Integrateur 20KD 2.0	120 ppm
CELLOFERM	240 ppm

1

Fermenter preparation

Wine temperature: 18–20 °C

Add:

- FERMOPLUS Integrateur 20KD 2.0 at 120 ppm
- CELLOFERM at 120 ppm (cellulose for toxin adsorption).

2

Prepare the wine

- Rack off gross lees or xflow into a sanitized tank
- Add CELLOFERM at 120 ppm to the racked/filtered wine.

3

Prepare the yeast

Water: 10 L/kg, heated to 40 °C

Add:

- FERMOPLUS Energy Glu 3.0: 60 ppm
- FERMOL Complet Killer Fru: 240 ppm.

Rehydrate 20 minutes.

4

Re-inoculation

- Add light grape juice concentrate at 240 ppm
- Add yeast inoculum from Step 3.
- Hold starter 12 hours at ~21 °C
- Confirm active fermentation via RS drop.
- Add stuck wine incrementally (≤ 5 °C temperature change)

5

Once active

- Stepwise build starter with additional detoxed racked/filtered wine (up to 10% of tank volume)
- Maintain 21–24 °C
- Transfer starter back to main tank once fermentation is clearly established.







Nutrients



Fermentation Nutrition

Product Overview

PRODUCT	CATEGORY	APPROX. COMPOSITION	PRIMARY PURPOSE	YAN / FAN CONTRIBUTION (PER 100 PPM)	BEST USE / STYLE	TIMING OF ADDITION
FERMOPLUS Energy Glu 4.0	Rehydration (ambient water temperature)	Yeast amino acids, vitamins, minerals, glutathione	Improves yeast reactivation and implantation	None (not a YAN product)	All fermentations; yeast health	Added to ambient rehydration water
FERMOPLUS Energy Glu 3.0	Rehydration (warm water temperature)	Yeast derivatives, micro-elements, glutathione	Supports restart and early fermentation	None (not a YAN product)	Restart / difficult ferments	Rehydration or restart protocol
ENOVIT P	YAN Correction	DAP + thiamine	Nitrogen correction for sparkling / tirage	≈22 mg/L YAN	Sparkling base wines	Beginning of fermentation
FERMOPLUS Integrateur 20KD 2.0	YAN Correction	DAP + <20 kDa yeast derivatives + thiamine	Stress resistance, sluggish ferment prevention	≈15 mg/L YAN + FAN	Demanding musts	Split additions
FERMOPLUS Dap Free	Organic YAN	Organic yeast nitrogen, vitamins, sterols	Progressive organic nitrogen supply	≈10 mg/L FAN	Organic / low-input programs	Early fermentation
FERMOPLUS Premier Cru	Varietal Reds	Organic & inorganic nutrients + ellagic tannins	Enhances red varietal expression	≈11–12 mg/L YAN	Structured reds	Early–mid fermentation
FERMOPLUS Rosé	Varietal / FAN	Yeast derivatives rich in ester precursors	Berry and floral rosé aromatics	≈8–10 mg/L FAN	Rosé wines	Start of active fermentation
FERMOPLUS Floral	Varietal / FAN	Targeted amino acid spectrum	Floral aromatic lift	≈8–12 mg/L FAN	Floral whites	Early–mid fermentation
FERMOPLUS Tropical	Varietal / FAN	High amino-acid fraction	Tropical and ripe fruit notes	≈8–12 mg/L FAN	Warm-climate whites / reds	Early–mid fermentation
FERMOPLUS Red Berry	Varietal / FAN	Yeast-derived ester precursors	Fresh red berry expression	≈8–10 mg/L FAN	Young reds	Early–mid fermentation
FERMOPLUS Spicy Fruit	Varietal / FAN	Spice-oriented amino acid profile	Spicy / earthy lift	≈8–10 mg/L FAN	Pinot Noir, Syrah, Malbec	Early–mid fermentation
FERMOPLUS Sauvignon	Thiol Support	Cysteine-rich yeast derivatives + skin tannin	Thiol precursor support	≈8–12 mg/L FAN	Sauvignon & thiol whites	Early–mid fermentation

PRODUCT	CATEGORY	APPROX. COMPOSITION	PRIMARY PURPOSE	YAN / FAN CONTRIBUTION (PER 100 PPM)	BEST USE / STYLE	TIMING OF ADDITION
FERMOPLUS Prosecco	Varietal / FAN	Glera-inspired amino acid profile	Clean citrus/floral Charmat profile	≈8–10 mg/L FAN	Charmat sparkling	Early–mid fermentation
FERMOPLUS PyrOff	Corrective	Autolysate + yeast cell walls	Adsorbs methoxypyrazines	Negligible	Under-ripe fruit	Early fermentation
CELLOFERM	Processing Aid	Cellulosic adsorbent	Detox end of ferment and before restart	None	Slow and stuck fermentations	When fermentation slows and before restart

Fermentation nutrients & processing supports

Wine yeast nutrition has improved both the quality of wines and the efficiency of cellar operations. Over the last two decades, winemaking has shifted from relying mainly on mineral nitrogen (DAP) to more sophisticated nutrient strategies based on naturally derived amino acids, vitamins, micro-elements and yeast fractions, which also act as aroma precursors and redox modulators. **AEB** has been among the companies **leading this evolution in yeast nutrition and fermentation management.**

All products in this chapter are designed to help maintain regular fermentation, support yeast performance under demanding conditions, and assist winemakers in achieving specific aromatic and structural objectives.

They are manufactured under **HACCP and ISO 9001 quality systems** and formulated in accordance with **OIV / Codex Oenologique** principles.

These products are intended for use as fermentation nutrients and processing aids within the framework of applicable national wine and food regulations, and in line with good manufacturing practice and winery record-keeping.

Rehydration nutrients

FERMOPLUS Energy Glu 4.0

Rehydrate the yeast at
lower temperature



TECHNOLOGICAL ROLE

FERMOPLUS Energy Glu 4.0 is a next-generation rehydration nutrient that allows yeast to be rehydrated in water at approximately 20 °C, helping wineries save energy and time while maintaining vigorous fermentations. The formulation is enriched with specific amino acids, sterols, natural glutathione and minerals, designed to support optimal cell growth right from reactivation at ambient temperature.

- The high content of naturally derived amino acids and vitamins gives yeast exceptional vigor immediately upon ambient rehydration, significantly increasing multiplication rate.
- By supplying readily assimilable amino acids, the product reduces the need for the yeast to synthesize them, saving energy that can be redirected to biomass production, particularly important during the hydration phase, when energy demand is at its peak.
- Natural sterols and trace minerals improve membrane fluidity compared to previous formulations, supporting membrane activity and yeast vitality under tough conditions.
- A specialized enzymatic lysis of yeast cells increases glutathione content. This natural powerful antioxidant helps set optimal fermentation conditions, reduces cell aging and supports yeast in fully expressing its potential, often compromised by metabolic imbalances.

USAGE & DOSAGE

- Add directly to the ambient rehydration water together with the yeast.
- Dosage: 1:4 relative to yeast inoculum (e.g., 200 ppm of yeast requires 50 ppm of FERMOPLUS Energy Glu 4.0).

FERMOPLUS Energy Glu 3.0



TECHNOLOGICAL ROLE

FERMOPLUS Energy Glu 3.0 is a concentrated rehydration nutrient for use in warm rehydration, rich in micro-elements and glutathione. Its original formula has been further enriched with naturally derived amino acids, sterols and vitamins to enhance yeast activity, multiplication and biomass formation.

- Glutathione helps reduce cell aging linked to free radicals, especially during oxygenation frequently applied at rehydration.
- The balanced composition makes this product particularly useful for restarting stuck fermentations or accelerating sluggish ones, where fast, robust reactivation is needed.

USAGE & DOSAGE

- Dissolve directly in rehydration water along with the yeast.
- Dosage: 1:4 relative to yeast inoculum (e.g., 200 ppm of yeast requires 50 ppm of FERMOPLUS Energy Glu 3.0).

High-YAN fermentation nutrients

(with Mineral Nitrogen, DAP)

ENOVIT P



TECHNOLOGICAL ROLE

ENOVIT P, manufactured using a technology that improves dispersion and solubilization, particularly valuable in refermentation for sparkling wines. It contains DAP and thiamine (0.3%), allowing winemakers to re-establish the desired nitrogen level while providing a balanced thiamine supplement.

- Thiamine partially reduces the formation of higher alcohols (which can add coarseness) and favors the formation of β -phenylethyl alcohol, contributing to a more refined aromatic profile.

USAGE & DOSAGE

- Dissolve in must or wine and add to the tank.
- Typical dosage: about 100 ppm (according to YAN content); 100 ppm provides ~22 ppm of YAN.

FERMOPLUS Premier Cru

Structured reds
& high-potential ferments



TECHNOLOGICAL ROLE

FERMOPLUS Premier Cru is a complex nutrient developed for structured red wines and fermentations characterized by:

- high alcohol potential
- elevated phenolic content
- extended maceration or aggressive extraction
- stressful fermentation dynamics.

RECOMMENDED TIMING

Apply during active fermentation, generally in one or two additions, adapted to fermentation conditions:

- first addition during early-mid fermentation
- second addition only when stress factors justify it.

DOSAGE

250–500 ppm

YAN contribution: typical contribution: $\approx 8\text{--}12$ mg/L YAN per 100 ppm (10 g/hL).

ADJUSTMENT CRITERIA

Increase dose and/or split additions when must analyses show: high °Brix, low YAN, thick skins / high solids → *use higher ppm and consider two additions.*

FERMOPLUS Integrateur 20KD 2.0



TECHNOLOGICAL ROLE

FERMOPLUS Integrateur 20KD 2.0 is a complex nutrient that includes a calibrated portion of thiamine, yeast-derived amino acids, sterols and vitamins, plus DAP. This combination supports yeast cell health and the development of clean aromatics while supplying a significant amount of YAN. FERMOPLUS Integrateur 20KD 2.0 contains low-molecular-weight yeast derivative fractions (< 20 kDa) that are more readily assimilated by wine yeast than larger cell wall fragments. These small peptides, amino acids and glycoprotein colloids can be directly taken up by yeast transport systems during the early and mid-fermentation phases, supporting biomass growth, enhancing metabolic vigor and helping prevent sluggish or stuck fermentations. The accessible nature of these < 20 kDa fractions complements the mineral nitrogen supplied by ammonium phosphate, contributing to a balanced nutrient environment that supports complete and regular alcoholic fermentation in demanding musts.

- The DAP fraction provides rapid mineral nitrogen, while the yeast-derived fraction contributes organic nitrogen and micronutrients.
- The enriched composition helps prevent sluggish and stuck ferments and supports balanced aromatic development.

USAGE & DOSAGE

- Dissolve in must or wine and add at the beginning of fermentation, ideally splitting the total dose into two or three additions.
- Typical dosage: around 200 ppm, bringing approx. 15 ppm YAN per 100 ppm of product, plus an important contribution of easily assimilable amino acids.

► DAP-Free fermentation nutrients

FERMOPLUS Dap Free



TECHNOLOGICAL ROLE

FERMOPLUS Dap Free is a DAP-free complex nutrient based on yeast-derived amino acids, B-vitamins, sterols and natural micro-elements. It is designed to:

- optimize biomass formation when used in the early stages of fermentation
- support the formation of esters and integration of free amino nitrogen for varietal aroma production when added during fermentation.

This makes it particularly suitable for low-input and organic-oriented ferments where mineral nitrogen (DAP) is limited or restricted.

USAGE & DOSAGE

Dosage: 240–600 ppm, depending on must YAN and stylistic goals.

FERMOPLUS varietal line

Concept & timing

The FERMOPLUS varietal line is designed less for bulk YAN contribution and more for:

- **fermentation health**
- **biomass formation**
- and especially for the **natural expression of varietal aromas**.

The specific, yeast-derived, amino acids supplied (e.g. isoleucine, leucine, valine, arginine) are key precursors for more complex, varietal-specific aromatic profiles.

These nutrients also provide:

- **sterols**: to reinforce the membrane and help withstand stress from high temperature and alcohol
- **amino acids**: nitrogen source and aroma precursors
- **glutathione and cysteine**: sulfur-containing compounds that act as natural antioxidants and precursors for aromatic thiols, as well as redox buffers in the must.

Timing of addition

To optimize aroma enhancement, these nutrients are generally recommended:

- between the second and fourth day of alcoholic fermentation.
- in musts particularly low in YAN, the nitrogen level should first be adjusted at the beginning of fermentation using FERMOPLUS Integrateur 20KD 2.0 before adding the varietal nutrient.

FERMOPLUS Floral



TECHNOLOGICAL ROLE

Yeast-derived amino acids prevalent in this nutrient boost a bouquet reminiscent of roses and white flowers. Recommended for varieties such as Pinot Grigio, Riesling, Grüner Veltliner, Marsanne, Trebbiano and wherever a floral bouquet is desired.

USAGE & DOSAGE

- Dissolve in must or wine and add to the tank after YAN adjustment with DAP-based nutrients.
- Dosage: 250–500 ppm.

FERMOPLUS Tropical



TECHNOLOGICAL ROLE

The high content of selected yeast-derived amino acids supports a ripe fruit aromatic profile and round mouthfeel, making it ideal for Chardonnay, Viognier, and also Syrah and Tempranillo.

USAGE & DOSAGE

- Dissolve in must or wine and add after YAN has been adjusted with DAP-based nutrients.
- Dosage: 250–500 ppm.

FERMOPLUS Sauvignon



TECHNOLOGICAL ROLE

Nutrient based on yeast derivatives rich in **cysteine and glutathione**, sulfur-containing compounds that are precursors of aromatic thiols such as: 4MMP (box tree), 3MH (citrus) and 3MHA (tropical). The product works particularly well with IRC7-positive yeasts (e.g., FERMOL Sauvignon, FERMOL Lime, FERMOL Fleur, FERMOL Tropical) and also contains grape skin tannins that supply additional thiol precursors. Suitable for varieties such as Sauvignon blanc, Chenin, Viognier and Vermentino.

USAGE & DOSAGE

- Dissolve in must or wine and add after YAN adjustment with DAP-based nutrients.
- Dosage: 250–500 ppm.

FERMOPLUS Prosecco



TECHNOLOGICAL ROLE

Formulated by taking inspiration from the HPLC amino-acid profile of Glera (Prosecco) must, FERMOPUS Prosecco enhances typical white-flower and citrus aromas desired in base wines for Charmat refermentation.

USAGE & DOSAGE

- Dissolve in must or wine and add after YAN has been adjusted with DAP-based nutrients.
- Dosage: 250–500 ppm.

FERMOPLUS Red Berry



TECHNOLOGICAL ROLE

Nutrient formulated to enhance esters reminiscent of red fruits present in every red wine. Particularly suited for young reds such as Gamay from carbonic maceration, Bordeaux blends, young Pinot Noir, Petite Sirah and other reds to be enjoyed young and fresh.

USAGE & DOSAGE

- Dissolve in must or wine; add after YAN adjustment with DAP-based nutrients.
- Dosage: 250–500 ppm.

FERMOPLUS Rosé



TECHNOLOGICAL ROLE

Nutrient based on yeast derivatives that brings into fermentation precursors of esters reminiscent of roses, red fruits and wild berries. Particularly suited for thiolic and amylic rosés with lighter colour and delicate bouquet.

USAGE & DOSAGE

- Dissolve in must or wine and add at the start of vigorous fermentation, after YAN has been adjusted with DAP-based nutrients during the lag phase.
- Dosage: 250–500 ppm.

FERMOPLUS Spicy Fruit



TECHNOLOGICAL ROLE

Yeast-derived nutrient rich in amino acids that, beyond supporting fermentation, contributes precursors that boost cleaner earthy aromatics typical of varieties like Pinot Noir, Malbec, Syrah, Durif and Nebbiolo.

USAGE & DOSAGE

- Dissolve in must or wine; add after YAN adjustment with DAP-based nutrients.
- Dosage: 250–500 ppm.

Specialty nutrient and remediation

FERMOPLUS PyrOff



TECHNOLOGICAL ROLE

Nutrient based on autolysate and yeast cell walls with high adsorbent power to reduce green characters. Its function is based on the synergistic action of:

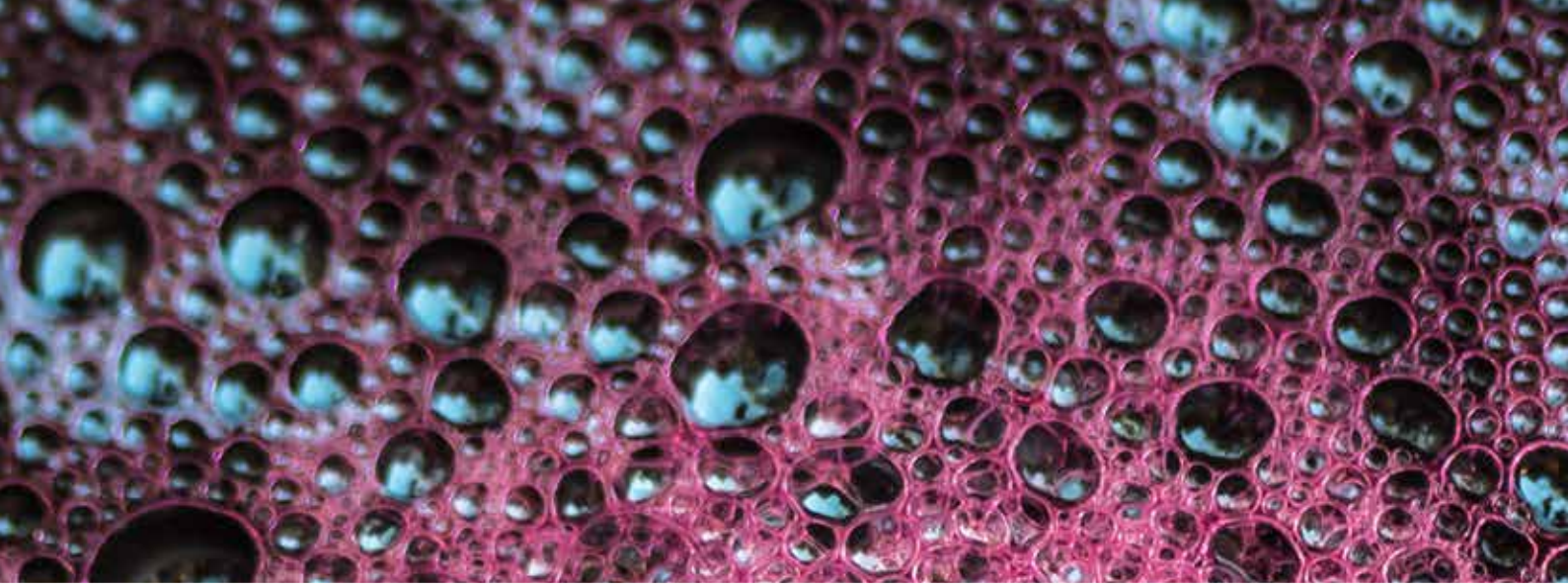
- lysate, which promotes fermentation and aroma production
- cell walls, which adsorb methoxypyrazines, responsible for green/bell-pepper notes in varieties such as Cabernet Franc, Cabernet Sauvignon, Merlot, Pinot Noir, Sauvignon Blanc, Chardonnay and Riesling.

USAGE & DOSAGE

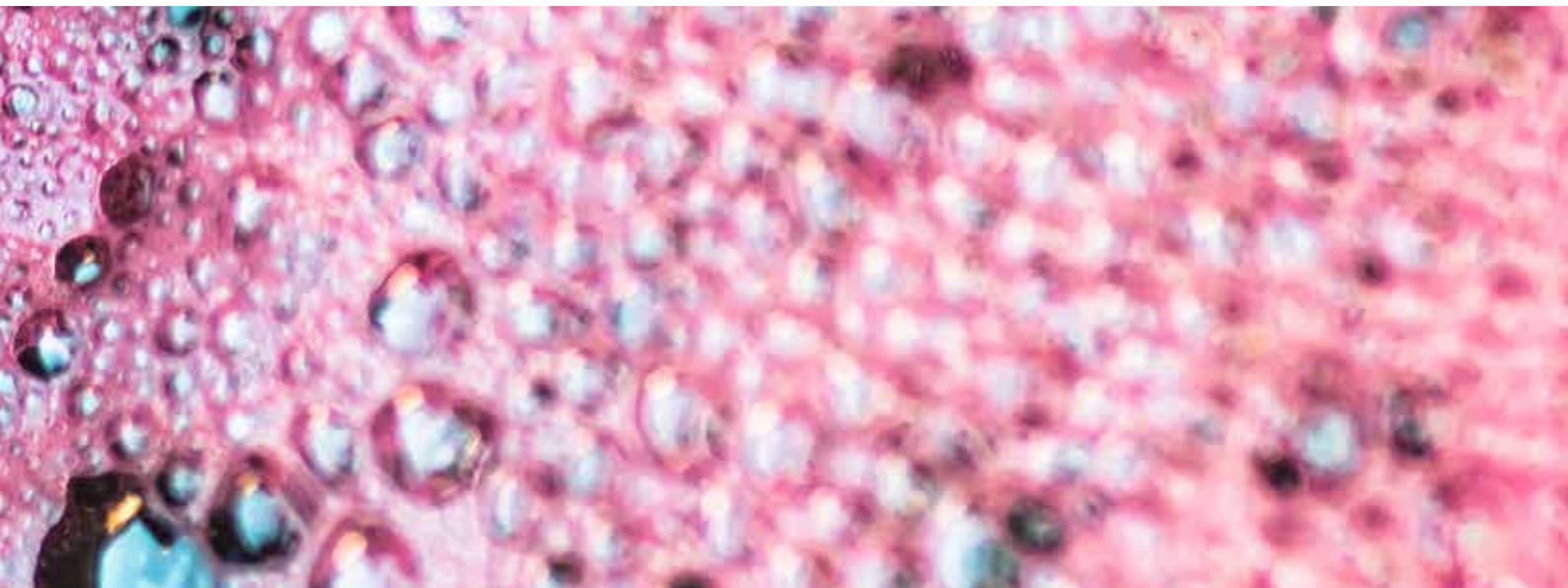
- Works better if added right after pectolytic enzymes have finished their activity and pyrazines have been released.
- Dosage: 250–500 ppm.

The background is a complex, abstract composition. The left side features a deep blue, almost black, liquid-like texture with some lighter blue, wispy patterns. The right side is dominated by a dense field of small, spherical, purple and magenta bubbles or droplets, giving it a foamy or cellular appearance. Overlaid on this background are the large, white, sans-serif numbers '03'. The '0' is positioned on the left, and the '3' is on the right, with its top loop extending towards the top right corner. The numbers are solid white and have a clean, modern look.

03



Malolactic Bacteria



AEB malolactic bacteria

PRODUCT	BACTERIA / TYPE	PRIMARY APPLICATION	KEY DIFFERENTIATION	IDEAL CONDITIONS	ADDITION PROTOCOL	DOSAGE / FORMAT
MALOLACT Rapid	<i>Oenococcus oeni</i>	Fast, reliable MLF (co- or post-AF)	Rapid kinetics, fresh fruit profile, soft tannin integration	pH >3.15 18–24 °C Alc ≤15%	Direct add; co-inoculate ~2 days after AF start; avoid SO ₂ spikes	Pre-dosed: 2.5 / 25 / 250 / 1,000 hL
MALOLACT Acclimatée 4R	<i>Oenococcus oeni</i>	Big reds, harsh ML conditions	High phenolic & alcohol tolerance	pH ≥3.2 ~18 °C SO ₂ ≤60 ppm Alc ≤15%	Direct add; stable temperature, low O ₂	Pre-dosed: 2.5 / 25 / 250 / 1,000 hL
MALOLACT Plantarum Uno	<i>Lactobacillus plantarum</i>	Co-inoculation, high-pH wines	Broad enzyme activity, OTA & Brett reduction	20–26 °C SO ₂ ≤30 ppm high pH suited	Pre-suspend in must/ water; avoid cold shock	25 hL packs
FERMOPLUS Malolactique 2.0	MLB Nutrient	ML support & stress protection	Faster MLF, glutathione aroma protection	—	Add to inoculation or tank at ML start	200 ppm 5 kg bags

Malolactic fermentation

Malolactic fermentation (MLF) is the biological conversion of malic acid into lactic acid by selected lactic acid bacteria. Beyond softening acidity and rounding the mouthfeel, **controlled MLF improves microbial stability, prevents the formation of off-flavors, and reduces the risk of biogenic amines** that may arise from spontaneous indigenous flora.

Inoculated MLF ensures a **clean sensory profile**, greater predictability, and safer fermentation outcomes in modern winemaking.

AEB focuses on *Oenococcus oeni* and *Lactobacillus plantarum*, chosen for performance under real-cellar stress: alcohol, pH, temperature, SO₂ and phenolic load. These strains are supported by dedicated nutrients that improve implantation, shorten lag time, and help guarantee complete malic conversion even under harsh conditions.

MALOLACT Rapid

Fast & reliable
Oenococcus oeni



ACTIVITY & APPLICATION SCOPE

MALOLACT Rapid is a high-performance freeze-dried culture of *Oenococcus oeni* produced using advanced biomass-protection technology. It is suitable for both co-inoculation and post-AF inoculation, delivering rapid, secure MLF with fresh, fruity aromatic expression and softer palate integration. Wines produced via co-inoculation typically show greater fruit expression.

IDEAL OPERATING CONDITIONS

Alcohol tolerance: up to 15% - pH: > 3.15 - Temperature: 18–24 °C.

RECOMMENDED WAY OF ADDITION

- For co-inoculation: add ~2 days after AF start.
- Remove from freezer 30 min before use and add directly to tank.
- Avoid large SO₂ additions and pH decrease around inoculation.

DOSAGE

Pre-dosed formats for:
• 2.5 hL, 25 hL, 250 hL, 1,000 hL.

STORAGE

Store frozen at –4 °C / –17 °C.

MALOLACT Acclimatée 4R

For big reds
& harsh ML conditions



ACTIVITY & APPLICATION SCOPE

MALOLACT Acclimatée 4R is a direct-add *Oenococcus oeni* culture specifically selected for wines with high alcohol, high phenolics and borderline pH. The strain remains active under strong tannin pressure (TPI ~80), providing robust implantation and secure completion of MLF in challenging matrices.

IDEAL OPERATING CONDITIONS

pH: ≥ 3.2 - Temperature: ~18 °C - Alcohol: up to 15% - Total SO₂: up to ~60 ppm.

RECOMMENDED WAY OF ADDITION

- Remove from freezer 30 min before use.
- Direct-add, no rehydration required.
- Prefer stable temperature and low oxygen exposure.

DOSAGE

Pre-dosed formats for:
• 2.5 hL, 25 hL, 250 hL, 1,000 hL.

STORAGE

Store frozen at –4 °C / –17 °C.

MALOLACT Plantarum Uno

Lactobacillus plantarum
(co-inoculation specialist)



ACTIVITY & APPLICATION SCOPE

MALOLACT Plantarum Uno is a selected strain of *Lactobacillus plantarum*, ideal for co-inoculation in high-pH wines. It exhibits minimal acetic acid production from sugars and provides a broad enzymatic contribution (β -glucosidase, esterase, protease), enhancing aromatic release and long-term flavor integration. It also shows bacteriostatic activity, Ochratoxin A reduction (>50%), and strong antagonism toward *Brettanomyces* through rapid population dominance.

IDEAL OPERATING CONDITIONS

Temperature: 20–26 °C - SO₂ tolerance up to ~30 mg/L
- Particularly suited to high-pH musts - Also useful for “raisined” grapes or low-SO₂ vinification.

RECOMMENDED WAY OF ADDITION

- If adding up to 30 ppm SO₂ → wait 24 h before inoculation.
- Prefer gentle 50/50 pre-suspension in must + chlorine-free water.
- Avoid temperatures below 20 °C or above 26 °C.

DOSAGE

Packets for 25 hL.

STORAGE

Store frozen at –4 °C / –17 °C.

Dedicated MLB nutrient

FERMOPLUS Malolactique 2.0



ACTIVITY & FUNCTION

FERMOPLUS Malolactique 2.0 supplies amino acids, vitamins and protective compounds that support: rehydration and implantation; stress tolerance (ethanol, temperature, SO₂); faster onset and completion of MLF; preservation of delicate aroma compounds via glutathione.

It improves survival and multiplication of *O. oeni*, reducing lag time and delivering more consistent MLF outcomes.

DOSAGE

200 ppm.

PACKAGING

5 kg bags.

USE

Add to the inoculation portion or tank prior to/at MLF start.

STORAGE

Store cool and dry.

PROPAGATION OPTION (COST-EFFICIENCY TECHNIQUE)

Direct-add cultures may also be propagated in a starter volume:

- draw ~100 L per 250 hL tank
- add 60 ppm FERMOPLUS Malolactique 2.0
- adjust pH to 3.5–4.0
- inoculate and hold at 24 °C for 24 h
- re-introduce into the full tank.

This increases viable population and accelerates MLF onset in difficult matrices.

Causes of stuck or sluggish malolactic fermentation

How to resolve them

Stuck or sluggish MLF is rarely caused by a single factor; more often it results from the **combined effect of microbial stressors** that limit implantation or **metabolic activity of lactic acid bacteria**. Common inhibitory conditions include low temperature, low NTU / nutrient-poor matrices, excessive SO_2 , high alcohol, and low pH, as well as wines that have been heavily clarified or filtered prior to inoculation.

In many reductive wines there is also a strong electrostatic and colloidal imbalance (highly reduced redox state, unstable colloids, residual copper or sulfur complexes) that binds or adsorbs bacteria to lees or tank surfaces, preventing population growth even when viable cells are present. Under these conditions wines may present as “clean but inactive,” with MLF stalled despite apparently adequate cell counts.

Correction focuses first on removing stress and restoring a biologically favorable matrix. Raise temperature to 18–20 °C, aerate gently if heavy reduction is present, and ensure free SO_2 is $\leq 10\text{--}12$ mg/L at inoculation. If NTU is extremely low or the wine has been stripped of micronutrients, add FERMOPLUS Malolactique nutrient or re-suspend a small lees fraction to provide adsorption surfaces and peptides. CELLOFERM as a detox product is also ideal. In strongly reduced / electrostatically unbalanced wines a brief rack–return with oxygen contact can relieve colloidal binding and release bacteria back into suspension. When restarting, use direct-add strains and prepare a small propagation starter in a warmer, higher-pH fraction of the same wine, then re-introduce to the full tank once active conversion is confirmed.

Malo-Lactic (ML) and Alcoholic (AF) Co-Fermentation (Co-Inoculation)

Rationale

- MLB inoculated after AF often face hostile conditions:
- high ethanol, low pH, low nutrients, reduced redox potential.
- Early inoculation (during AF) allows bacteria to gradually adapt to rising ethanol, implant before SO_2 and reductive stress accumulate, complete MLF faster and more reliably.

Benefits Observed

- Shorter total fermentation timeline (AF + MLF)
- Lower risk of spoilage organisms (*Brett*, heterofermenters)
- Reduced biogenic amine formation
- Better acid, alcohol and phenolic integration
- Fresher aromatic profile and improved mouthfeel.

Critical Control Points

Timing

- Inoculate MLB after yeast lag phase when the must is anaerobic, not at yeast pitch
- If SO_2 was added at crush (≈ 50 mg/L), wait at least 6–8 hours before bacteria inoculation.

Temperature

- Ideal: 22–26 °C
- Avoid >30 °C → MLB inhibition.

Redox / Oxygen

- Slightly oxidative environment early in AF is acceptable
- Avoid reductive conditions that develop late in AF.

How to manage diacetyl during MLF

Biochemical basis

Diacetyl originates from citric acid metabolism by *Oenococcus oeni* in an aerobic environment.

Pathway:

1

Citric acid → acetic acid + pyruvic acid

2

Pyruvic acid →

- Diacetyl (oxidative pathway)
- Acetoin / 2,3-butanediol (reductive pathway).

To minimize diacetyl production ensure the addition of sufficient SO₂ immediately on completion of MLF.

Conditions that increase diacetyl

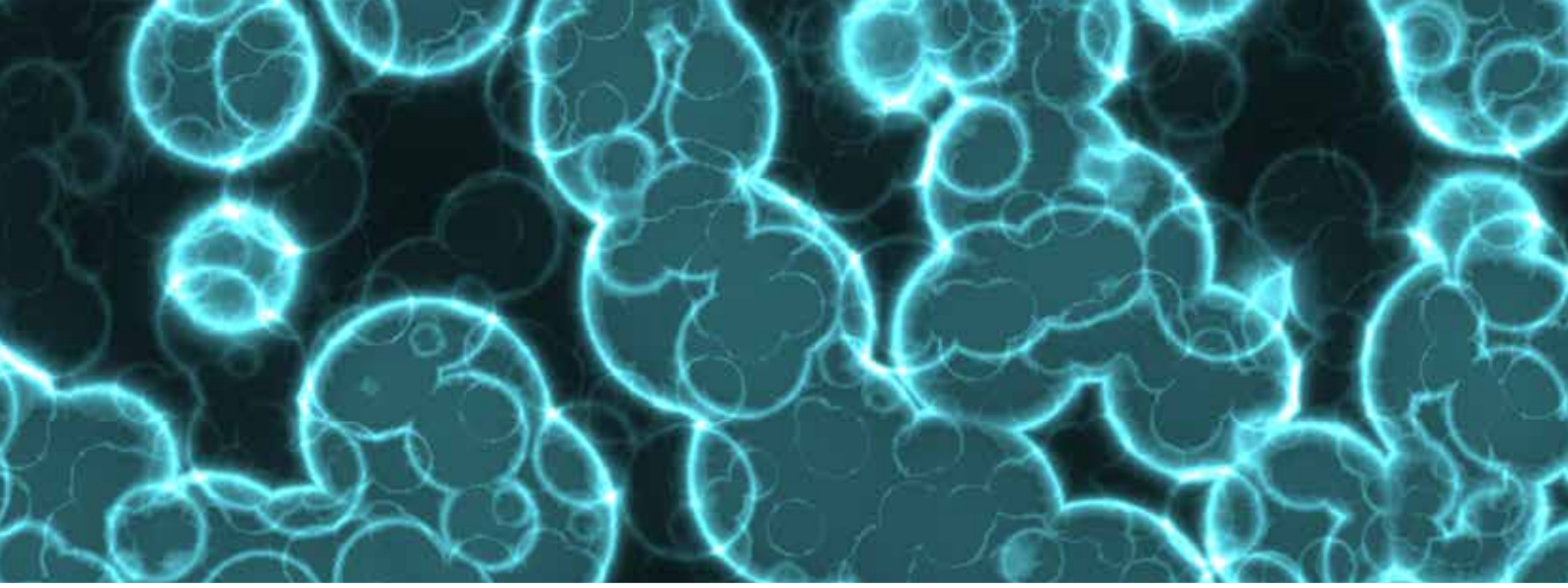
- Presence of citric acid
- Partially aerobic conditions
- Sequential MLF (not co-inoculated)
- Moderate MLF speed (≈2 weeks, not too fast)
- Limited lees contact
- Delayed SO₂ addition.

According to AEB research, adding ~1 g/L citric acid under partially aerobic conditions can double final diacetyl levels.

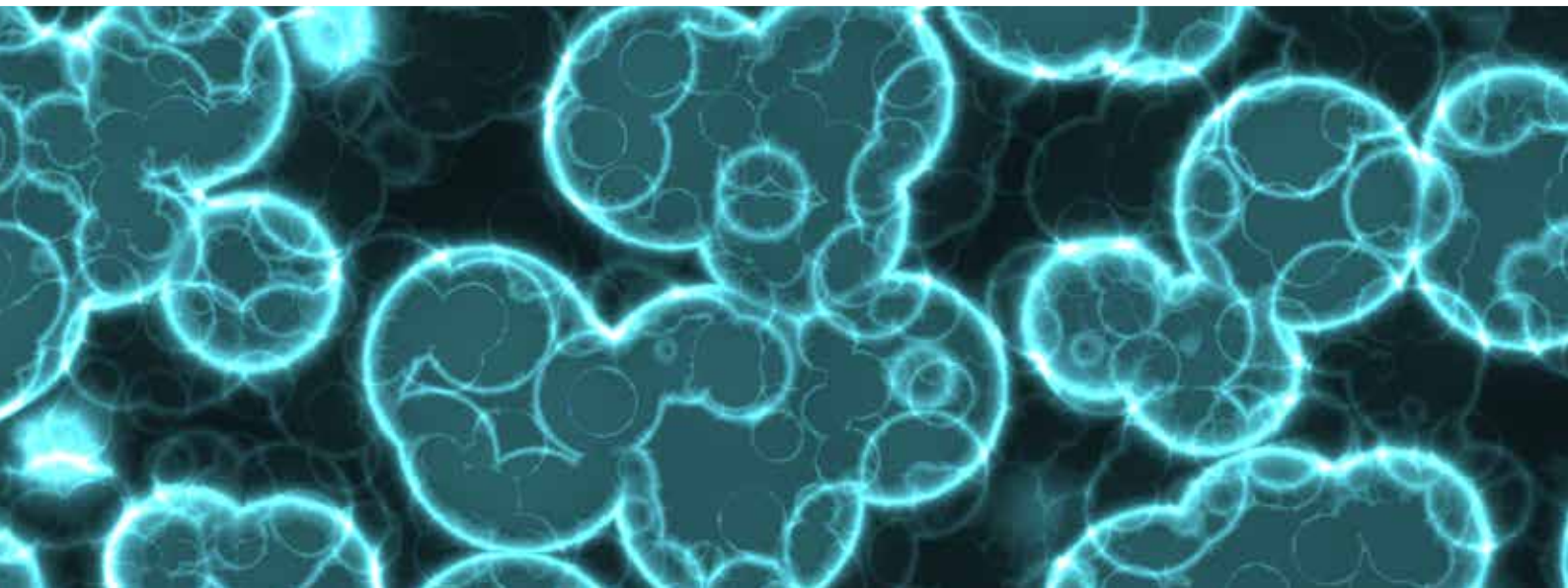


The background of the image is a dense, repeating pattern of glowing blue circles of various sizes. These circles, which resemble bubbles or cells, are set against a solid black background. The circles have a bright blue outline and a slightly darker blue interior, giving them a three-dimensional, luminous appearance. They are scattered across the entire frame, creating a textured, organic effect.

04



Enzymes



AEB ENDOZYM range

Enzymes are **essential process tools in modern winemaking**, allowing winemakers to guide **extraction, clarification, aroma release, and texture development with precision and consistency**. By selectively hydrolyzing grape and yeast cell-wall components—such as pectins, glucans, cellulose, and glycosidic aroma precursors—oenological enzymes improve juice yield, reduce viscosity, accelerate settling and flotation, improve filtration, and unlock varietal aromatic potential that would otherwise remain bound.

The ENDOZYM range is built around targeted enzymatic activity, not generic pectin breakdown. Each formulation is designed for a specific technological objective and operating window, taking into account must composition, temperature, maceration regime, and downstream processing. From cold settling and flotation to red maceration, thermo-treated musts, thiol and terpene release, Botrytis management, sur-lies enhancement, and controlled stabulation, these enzymes allow wineries to achieve cleaner fermentations, better stability, and more expressive wines with greater filterability and fewer corrective interventions.

All ENDOZYM enzymes are produced from *Aspergillus niger* and formulated specifically for oenological use, with controlled secondary activities to ensure efficacy without sensory deviation. Used correctly, they contribute to **greater process efficiency, improved wine quality, and more sustainable cellar operations** by reducing energy demand, minimizing solids handling, and improving clarification and filtration performance across a wide range of vinification styles.

ENZYME NAME	PHYSICAL FORM (LIQUID / GRANULAR)	TYPICAL DOSAGE	IDEAL TEMPERATURE OF ACTIVITY	MAIN APPLICATION	KEY DISTINGUISHING CHARACTERISTIC	PURIFICATION
ENDOZYM Active	Granular	20–40 ppm	15–25 °C	Must clarification / settling / flotation	Strong PL + PG activity; improves lees compactness and free-run yield	CE and A
ENDOZYM Antibotrytis L 2.0	Liquid	10–50 mL/ton	15–25 °C	<i>Botrytis</i> -affected musts / glucan & laccase management	Targets <i>Botrytis</i> effects; supports filtration and colour/aroma preservation	CE and A
ENDOZYM E-Flot	Liquid	5–10 mL/ton	10–25 °C (best ≥12 °C)	Flotation clarification	Fast liquid pectinase for rapid pre-fermentation flotation	CE
ENDOZYM Ice	Liquid	2–6 mL/ton	8–15 °C	Cold-temperature settling of must	Cold-active enzyme effective in 'hairy zones' of pectin	CE and A
ENDOZYM Muscat	Granular	20–40 ppm	12–20 °C	Clarification of highly ramified aromatic varieties	Effective on ramified pectins and 'hairy spots' varieties typically difficult to clarify	CE

ENZYME NAME	PHYSICAL FORM (LIQUID / GRANULAR)	TYPICAL DOSAGE	IDEAL TEMPERATURE OF ACTIVITY	MAIN APPLICATION	KEY DISTINGUISHING CHARACTERISTIC	PURIFICATION
ENDOZYM ICS 10 Rouge	Liquid	2–8 mL/ton	18–30 °C	Red maceration / colour & structure extraction	Super-concentrated PL + cellulase; premium red maceration and aromatics	CE and A
ENDOZYM Rouge	Granular	10–50 ppm	18–30 °C	Red maceration / colour & structure extraction	Concentrated PL + cellulase; premium red maceration and aromatics	CE and A
ENDOZYM β-Split	Granular	20–50 ppm	15–25 °C	Aroma precursor hydrolysis (terpenes & norisoprenoids)	β -glucosidase system; best mid-/post-fermentation	CE
ENDOZYM Thiol	Liquid	20–40 mL/ton	12–18 °C	Thiol precursor release in thiolic varieties	Carbon–sulfur lyase promoting 4-MMP / 3-MH expression	CE and A
ENDOZYM Thiol Rouge	Liquid	40–60 mL/ton	18–30 °C	Thiol pre-cursor release in red grape varieties	Carbon–sulfur lyase promoting red fruit expression	CE and A

*CE = cinnamyl esterase; A = anthocyanase.
ENDOZYM is a registered trademark of AEB.*

Unless otherwise noted:

- **Granular enzymes** should be stored cool and dry, ideally ≤ 15 °C (best stability 4–8 °C).
- **Liquid enzymes** should be stored refrigerated at 4–8 °C and protected from heat; do not freeze.

Most oenological pectinases show optimum reactivity between 15–40 °C, reduced activity below 10 °C, and progressive denaturation above ~45–50 °C.

Must clarification & flotation enzymes

These enzymes act primarily on grape pectins to:

- reduce viscosity
- accelerate settling and flotation
- increase free-run yields
- produce compact, easily separable lees.

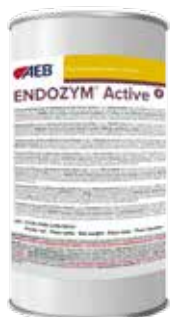
They are used mainly in white and rosé musts and are selected according to:

- clarification method (static settling / flotation)
- must temperature and pectin load
- *Botrytis* / glucan presence.



ENDOZYM Active

Must clarification
(granular)



PURPOSE

General must clarification and rapid pectin breakdown prior to settling or flotation, with a focus on improving free-run juice yield and lees compactness.

CHARACTERISTICS

Granular pectinase with marked pectinlyase and polygalacturonase activities. It hydrolyzes pectic chains, facilitates juice drainage from pomace and significantly speeds up clarification of musts and wines. Cleaner musts show fewer unstable proteins, easier filtration and cleaner aromatic expression.

DOSAGE

20–40 g/ton ($\approx$ 2–4 g/hL), depending on contact time, temperature and SO_2 level. Higher dose for colder musts, high pectin, or higher SO_2 .

ADDITION

Dissolve in 20–30 parts of non-sulfurized must or demineralized water and add to must or directly onto grapes (receiving line or press). Avoid direct contact with high SO_2 or bentonite doses. Activity is strongly reduced under about 12 °C.

IDEAL TEMPERATURE

15–25 °C (effective from $\sim$ 12–35 °C with slower kinetics at the low end).

FORM / STORAGE

Granular. Stable at room temperature for at least 2 years, with <5 % loss of activity per year starting from the third year; best stored cool and dry ($\leq$ 15 °C, ideally 4–8 °C). 500 g vacuum-sealed cans.

ENDOZYM Antibotrytis L 2.0

Laccase / glucan
management (granular)



PURPOSE

Treatment of musts and wines affected by *Botrytis cinerea*, laccase and *Botrytis*-derived glucans, to improve filterability and preserve colour and aroma.

CHARACTERISTICS

Purified enzymatic preparation with activities that help neutralize the effects of *Botrytis*: it indirectly acts on polyphenol oxidases (tyrosinase–laccase), preserving colour and aromatic precursors, and contributes to pectin/glucan hydrolysis so as to prevent filter clogging and viscosity problems. It is particularly decisive in musts heavily attacked by mold, where SO₂ or standard technology is insufficient.

DOSAGE

10-50 mL/ton, with higher dosages recommended for high Botrytis load, low temperatures and/or high sugar.

ADDITION

Dissolve in 20–30 parts of non-sulfurized must or demineralized water and add to must or wine. Often used in combination with a standard clarification or colour-extraction enzyme to complete pectin breakdown.

IDEAL TEMPERATURE

15–25 °C.

REDUCED / INACTIVE

Less effective at low temperatures (<10–12 °C) or very high sugar.

FORM / STORAGE

Liquid. Store at ~5 °C (refrigerated) for up to 24 months in original packaging; do not freeze. 1 kg bottles.

ENDOZYM E-Flot

Flotation clarification
(liquid)



PURPOSE

Liquid pectinase for must clarification through flotation or cold settling, ensuring rapid de-pectinization so the must can be floated before fermentation starts.

Also polygalacturonic fractions are small enough so settling is limited and flotation facilitated.

For flotation, it is important that:

- fermentation has not started
- must temperature stays above ~12 °C
- pectin is thoroughly degraded before entering the flotation unit.

DOSAGE

5–10 mL/ton (≈ 0.5–1 mL/hL), with higher dosages for:

- low temperature
- musts with high pectin / suspended solids
- pH < 3.2.

ADDITION

Dilute in 20–30 parts non-sulfurized must or demineralized water and add to must or directly onto grapes (crushed-grape line or press). Lower temperatures reduce activity. Avoid contact with high SO₂ or bentonite levels.

IDEAL TEMPERATURE

10–25 °C, with best performance ≥12 °C.

REDUCED / INACTIVE

Slow <8–10 °C; reduced efficacy >35–40 °C.

FORM / STORAGE

Liquid. Store at ~5 °C (refrigerated) for up to 24 months in original packaging; do not freeze.

Supplied in 10 and 25 kg pails. 1 kg bottles.

ENDOZYM

Ice

Cold-active pectinase
(liquid)



PURPOSE

Extra-rapid liquid pectinase for must settling at low temperature, maintaining high activity despite cold, low pH or SO₂.

CHARACTERISTICS

Developed on a solid media, enriched in secondary activities able to process the most intricate pectin structures in the “hairy zones.” This gives very fast depectinization even under limiting conditions (cold, low pH, SO₂).

DOSAGE

2–6 mL/ton, use higher end for musts with high pectin and suspended solids or more challenging vinification conditions.

ADDITION

Dilute in 20–30 parts non-sulfurized must or demineralized water and add to must or directly onto grapes. Activity is less hindered than standard pectinases under cold conditions but still increases with temperature and contact time.

IDEAL TEMPERATURE

8–15 °C.

REDUCED / INACTIVE

Limited activity <6–8 °C; denaturation risk above ~35–40 °C.

FORM / STORAGE

Liquid. Store at 5 °C for up to 24 months. Supplied in 1 kg bottles.

ENDOZYM

Muscat

Aromatic must clarification
(granular)



PURPOSE

Clarification and flotation of “hard-to-clarify” aromatic varieties such as Muscat, Gewürztraminer, Malvasia and Müller-Thurgau, which are rich in ramified pectins.

CHARACTERISTICS

Granular pectinase specifically adapted to grapes with high content of ramified pectin and “hairy spots” on the pectin chain, which are harder to degrade. Secondary activities (Arabinase, Rhamnosidase) are key to rapidly removing pectin in these challenging varieties. These activities are encoded in the *Aspergillus niger* DNA and expressed in the solid-phase fermentation used in AEB’s Paris plant.

DOSAGE

20–40 g/ton (≈ 2–4 g/hL), adjusted for temperature, contact time and SO₂ content.

ADDITION

Dissolve in 20–30 parts non-sulfurized must or demineralized water and add to must or directly onto grapes (receiving line). Lower temperatures reduce activity; early addition ensures adequate contact before refrigeration. Avoid high SO₂ and bentonite contact.

IDEAL TEMPERATURE

12–20 °C.

REDUCED / INACTIVE

Strongly slowed <10 °C.

FORM / STORAGE

Granular. Stable at room temperature for at least 2 years, with <5 % annual loss after the third year; store cool and dry. 500 g vacuum-sealed cans.

Enzymes

- 5-

5-

PURPOSE	Premium liquid maceration and colour-extraction enzyme for structured red wines , especially from thick-skinned varieties.
CHARACTERISTICS	Super-concentrated liquid product containing 20,000 Pectinlyase units. Secondary cellulase, polygalacturonase and hemicellulase activities help penetrate cell walls and enable rapid colour and phenolic extraction. Wines made with ICS 10 Rouge show greater structure and complexity. Pomace is more permeable, increasing both the quality and quantity of free-run juice. High PL content also reduces must viscosity and speeds sedimentation.
DOSAGE	2–8 mL/ton. Use higher doses for low pH grapes and vintages with difficult colour extraction.
ADDITION	Because enzymes are inactivated by tannins and alcohol, application is recommended at the first pump-over, just before fermentation starts, when the temperature is above 18 °C. Dilute in 20–30 parts non-sulfurized must or demineralized water, then distribute via a pump-over.
IDEAL TEMPERATURE	18–30 °C.
FORM / STORAGE	Liquid. Store at 5 °C for up to 24 months; do not freeze. Packaging: 250 mL and 1 kg bottles.

PURPOSE	Premium granular maceration and colour-extraction enzyme for structured red wines, especially from thick-skinned varieties.
CHARACTERISTICS	Super-concentrated liquid product containing 7100 Pectinlyase units. Secondary cellulase, polygalacturonase and hemicellulase activities help penetrate cell walls and enable rapid colour and phenolic extraction. Wines made with Endozym Rouge show greater structure and complexity. Pomace is more permeable, increasing both the quality and quantity of free-run juice. High PL content also reduces must viscosity and speeds sedimentation.
DOSAGE	10-50 ppm. Use higher doses for low pH grapes and vintages with difficult colour extraction.
ADDITION	Because enzymes are inactivated by tannins and alcohol, application is recommended at the first pump-over, just before fermentation starts, when the temperature is above 18 °C. Dilute in 20–30 parts non-sulfurized must or demineralized water, then distribute via a pump-over.
IDEAL TEMPERATURE	18–30 °C.
FORM / STORAGE	Granular. Stable at room temperature for at least 2 years, with <5 % annual loss after the third year; store cool and dry. 500 g vacuum-sealed cans.

Special & targeted application enzymes

These preparations are chosen for **specific technological goals**, such as:

- thiol precursor release
- glycosidic aroma hydrolysis
- clarification of thermo-treated musts
- release of polysaccharides from lees.

They are used in particular vinification styles or when specific issues (e.g., glucans, sur lies enhancement) need to be addressed.

ENDOZYM β-Split

Aroma precursor release
(granular)



PURPOSE

Granulated β-glucosidase for the release of terpenic and C13-norisoprenoid aromas from glycosylated precursors in white and red wines.

CHARACTERISTICS

Catalyzes hydrolysis of glycosidic bonds, releasing aromatic molecules. Suppressed by glucose, so it is best used mid-fermentation or on finished wines before bentonite. It can cleave aromatics not only from β-glucosides but also from pentose-linked (non-fermentable) sugars. Its action may be stopped by light fining with BENTOGRAN (3–10 g/hL).

DOSAGE

20–50 ppm (≈ 2–5 g/hL), depending on contact time, temperature and SO₂. Activity is reduced by high sugar and low temperature, and dosages must be increased accordingly.

ADDITION

Dissolve in 20–30 parts non-sulfurized must or demineralized water and add to wine. Often used near the end of fermentation or in finished wines to improve aroma expression. Avoid contact with high SO₂ or bentonite until the desired aromatics are obtained; in white/rosé, BENTOGRAN can be used afterward to neutralize residual activity.

IDEAL TEMPERATURE

15–25 °C.

REDUCED / INACTIVE

Low efficiency at low temperature and/or high sugar; unstable above ~45 °C.

FORM / STORAGE

Granular. Stable at room temperature for at least 2 years, with <5 % annual loss thereafter; store cool and dry. 500 g vacuum-sealed cans.

ENDOZYM Thiol

Thiol precursor release
(liquid)



PURPOSE	Liquid carbon–sulfur lyase to favor hydrolysis of thiol precursors and enhance thiol expression in Sauvignon Blanc, Riesling, Gewürztraminer and other thiol-driven varieties.
CHARACTERISTICS	Promotes conversion of Cys-4-MMP and Cys-3-MH into volatile thiols 4-MMP (box-tree character) and 3-MH (grapefruit), enhancing the varietal bouquet.
DOSAGE	20–40 mL/ton ($\approx$ 20–40 ppm), adjusted for contact time, temperature and SO ₂ .
ADDITION	Add to the fermenting tank midway through fermentation to avoid glucose suppression and allow good integration into the aromatic profile. Use protective tools such as ELEVAGE Glu if oxidation risk is present.
IDEAL TEMPERATURE	12–18 °C.
REDUCED / INACTIVE	Low activity <10 °C; reduced efficiency >30–35 °C.
FORM / STORAGE	Liquid. Store at 5 °C for up to 24 months. Packaging: 1 L bottles.

ENDOZYM Thiol Rouge

Thiol precursor release
(liquid)



PURPOSE	Liquid carbon–sulfur lyase to favor hydrolysis of thiol precursors and enhance thiol expression in red grapes.
CHARACTERISTICS	Promotes the production of red fruit aromatics.
DOSAGE	40–60 mL/ton, adjusted for contact time, temperature and SO ₂ .
ADDITION	Add to the fermenting tank midway through fermentation to avoid glucose suppression and allow good integration into the aromatic profile. Use protective tools such as ELEVAGE Glu if oxidation risk is present.
IDEAL TEMPERATURE	12–18 °C.
REDUCED / INACTIVE	Low activity <10 °C; reduced efficiency >30–35 °C.
FORM / STORAGE	Liquid. Store at 5 °C for up to 24 months. Packaging: 1 L bottles.

A close-up photograph of a person's hand holding a glass of red wine. The person is wearing a light-colored, ribbed sweater. The background is blurred, showing other people in a social setting. A large, white, sans-serif number '05' is overlaid on the center of the image, partially obscuring the wine glass and the person's hand.

05

Polysaccharides & Colloids



Polysaccharides & Colloids

Product Summary

Polysaccharides are one of the “quiet engines” of wine quality. They sit in the background of the matrix, but they have a disproportionate impact on stability, mouthfeel and longevity. Naturally produced during fermentation and ageing, and supplemented through specific cellar products, wine polysaccharides include grape-derived arabinogalactans and rhamnogalacturonans and yeast-derived mannoproteins, typically in the 0–2 g/L range and remaining stable even after many years in bottle.

From a winemaking perspective, two families are particularly useful as tools:

- **gum Arabic (Acacia)**–based products.
- **yeast mannoproteins** and mannoprotein-rich yeast derivatives.

Both act as protective colloids: large, branched molecules that surround and “coat” reactive particles (tartrate crystals, proteins, phenolic micelles), slowing aggregation and precipitation.

PRODUCT NAME	PRODUCT TYPE / COMPOSITION	SCOPE OF APPLICATION	DOSAGE (PPM)
ARABINOL Arôme	Blend of dextrorotatory and levorotatory gum arabic	Aromatic whites and rosé; young reds with fragile aromas and pigments.	200–2000 ppm
ARABINOL Dolce	Dextrorotatory gum arabic designed for smoothness and sweetness perception	High-alcohol reds and full-bodied whites; softness without sugar; suitable also for low-/no-alcohol wines and RTD's.	200–1500 ppm
ARABINOL 30	High-concentration dextrorotatory gum arabic (≈30%)	Export wines and filtration-sensitive wines; strong colloidal shield and long-term stability.	200–1500 ppm
ARABINOL Super Rouge	Levorotatory, high-viscosity gum arabic	Young red wines; pigment stabilization, colour protection and tannin smoothing.	200–1400 ppm
BÂTONNAGE Plus Rondeur	Yeast-derived mannoproteins and peptides with antioxidant fraction	Early fermentation, in musts and during maturation; roundness, mouthfeel and oxidative protection; rebuilding volume and mid-palate. Prevents mercaptan formation.	100–400 ppm
BÂTONNAGE Plus Élevage	Yeast-derived mannoproteins and peptides with antioxidant fraction	Early fermentation, in musts and during maturation; Élevage and oxidative protection; rebuilding volume and mid-palate. Prevents mercaptan formation.	100–400 ppm
BÂTONNAGE Body	Yeast-derived mannoproteins and peptides with antioxidant fraction	Early fermentation, in musts and during maturation; enhances savoury sensations, giving roundness, palate width and length.	100–400 ppm
BÂTONNAGE Plus 150 kD	Yeast-derived mannoproteins and peptides with antioxidant fraction	Early fermentation, in musts and during maturation; increases mouthfeel and body and protects colour in red wines	100–400 ppm
BÂTONNAGE Plus Structure	Mannoproteins, oak tannin fractions and levorotatory gum arabic	Structurally lean red wines; tannin integration and aromatic harmony. Prevents mercaptan formation.	100–400 ppm
BÂTONNAGE Plus Texture	Early-stage mannoprotein and peptide complex	Early fermentation and musts; support mouthfeel development from the start. Prevents mercaptan formation.	100–400 ppm

PRODUCT NAME	PRODUCT TYPE / COMPOSITION	SCOPE OF APPLICATION	DOSAGE (PPM)
BÂTONNAGE Savoury	Early-stage mannoprotein and peptide complex	Weeks to days before bottling; enhance savoury characters and minerality. Prevents mercaptan formation.	100–400 ppm
ELEVAGE Glu	Yeast derivative enriched in glutathione precursors	Oxidation-sensitive white and rosé wines; preservation of freshness and aroma. Thiol protection.	100–400 ppm
SUPER-MANN	Pure mannoprotein extract	Final finishing; tartrate stability support and texture integration.	100–300 ppm

ARABINOL is a registered trademark of AEB.

Colloidal protection and physical stability

Polysaccharides modulate the way charged particles interact in wine. By adsorbing onto tartrate nuclei, metal–protein complexes or phenolic colloids, they create steric and electrostatic barriers that **delay or prevent crystal growth and haze formation**. Recent work on red-wine colloids and protein–polysaccharide interactions confirms that polysaccharides can shift zeta potential, change colloidal particle size and reduce protein haze, **without negatively affecting colour or phenolic composition** (Olivia Burken & Stephan Sommer *J Food Sci* 2024).

For winemakers, this translates into:

- **improved tartrate stability** (especially when gum Arabic is combined with metatartaric acid or cold stabilization)
- fewer surprises from late protein or metal casse
- wines that remain **visually and physically stable** during shipping and shelf life.

Gum Arabic–based products such as the **ARABINOL line** exploit these properties: their long, highly branched chains act as strong protective colloids, slowing tartrate aggregation and helping keep colour and colloids in suspension.

Mouthfeel, mid-palate and aromatic persistence

Beyond stability, polysaccharides make wines feel different. Because they increase viscosity at very low concentration and interact with tannins and proteins on the palate, they can:

- **soften astringency** and smooth rough tannins
- **reduce bitterness** from flavones or oxidized phenolics
- **increase perceived body**, roundness and mid-palate weight
- **extend flavor persistence** in the finish.

Mannoproteins are particularly effective here. Reviews and recent sensory studies show that mannoprotein additions can **increase viscosity, fullness and “creaminess”**, while modulating the perception of acidity and tannin. Products such as SUPER-MANN and the BÂTONNAGE Plus range mimic or intensify what extended sur-lie ageing would naturally provide: a thicker, more integrated mouthfeel, finer bubbles in sparkling wines, and a more cohesive, layered mid-palate.

Antioxidant and protective effects

Yeast-derived polysaccharides and cell-wall fractions are increasingly recognized as true **antioxidant tools**. Several studies on yeast derivatives show:

- measurable radical-scavenging activity in model wine
- lower oxygen consumption rates when SO₂ is reduced or absent
- reduced formation of acetaldehyde
- better preservation of glutathione and other endogenous antioxidants
- less browning and fewer oxidative off-odors over time. These effects are attributed to a combination of mannoproteins, peptides, amino acids (e.g., cysteine, methionine) and small antioxidants trapped within yeast derivatives. In practice, mannoprotein-rich preparations such as BÂTONNAGE Plus Texture / Elevage / Structure and SUPER-MANN can extend the protective envelope normally provided by SO₂, especially in whites and rosés where colour and aroma are highly oxidation-sensitive.

Gum Arabic does not have the same intrinsic redox activity, but by shielding phenolic colloids from aggregation and limiting metal–phenolic interactions, it **indirectly helps reduce oxidative cascades and maintain freshness**, particularly in young reds and aromatic whites.

Colour, foam and integration with other technologies

Polysaccharides also interact with pigments and CO₂ in ways that matter commercially:

- certain mannoproteins and gum Arabic fractions help stabilize red colour, both by protecting anthocyanin-containing colloids and by reducing the loss of pigmented polymers to fining or precipitation.
- in sparkling wines, mannoproteins in particular improve foam properties: smaller, more persistent bubbles and a more stable mousse, through protein–CO₂ interactions.

Because of this **multi-functionality**, polysaccharides integrate well with other cellar operations:

- after cold stabilization or contact with CMC / potassium bitartrate, gum Arabic can “re-smooth” the wine and reinforce colloidal protection.
- after fining or aggressive filtration, mannoprotein products can rebuild mid-palate and buffer the impact of necessary treatments.
- in low-SO₂ or “reductive” white programs, mannoproteins and yeast-cell-wall preparations can be used proactively as oxygen-management tools, complementing glutathione-rich lees management.

Acacia (Gum Arabic) products

ARABINOL Arôme



PRODUCT PROFILE

ARABINOL Arôme combines dextrorotatory and levorotatory gum Arabic fractions selected for their ability to preserve aromatic freshness and support chromatic stability in delicate wines. Its steric protection limits tartrate and protein aggregation, while its affinity for pigment-bearing colloids helps maintain brightness in young reds. On the palate, ARABINOL Arôme delivers a fine smoothing effect: phenolic edges are softened, persistence is extended and aromatic lift feels more precise and expressive.

RECOMMENDED APPLICATION

Particularly suited to aromatic whites and rosé, as well as youthful reds with fragile pigments or wines exposed to transport and temperature variation, helping protect both sensory harmony and visual stability.

APPLICATION

Use after finishing / stabilization, pre-dilute 1:10, mix gently and homogenize.

DOSAGE

200–2000 ppm.

PACKAGING

10 kg drums.

ARABINOL Dolce



PRODUCT PROFILE

ARABINOL Dolce was developed for wines requiring roundness and length without concentrate additions or residual sugar. It adds a sense of perceived sweetness in a non-fermentable manner which also increases the perception of fruitiness. Its dextrorotatory gum Arabic structure increases palate coating and perceived sweetness while preserving dryness, reducing alcohol “heat” and bringing silkiness to otherwise firm textures. Rather than adding weight, it contributes tactile smoothness, continuity and length, making it especially effective in powerful reds and full-bodied whites.

RECOMMENDED APPLICATION

Best suited for high-alcohol reds and structured whites where the goal is to soften edges, enrich the mid-palate and harmonize ethanol perception while maintaining balance and definition. Also used to soften the edges of non-alcoholic wines.

APPLICATION

Apply post-finishing and stabilization, pre-dilute 1:10 in wine, mix and homogenize thoroughly.

DOSAGE

200–1500 ppm.

PACKAGING

20 kg drums.

ARABINOL 30



PRODUCT PROFILE

ARABINOL 30 is a 30% Arabic gum solution that strengthens and extends the action of metatartaric acid, prevents turbidity and tannin-protein precipitations in the bottle for reds, improves wine balance and removes tannic coarseness. ARABINOL 30 highlights aromatic intensity and complexity and improves the perlage of sparkling wines.

RECOMMENDED APPLICATION

Recommended for wines destined for export or extended logistics, and for cuvées requiring enhanced insurance against post-bottling precipitation or filtration stress.

APPLICATION

Apply after stabilization / filtration, dilute 1:10 before dosing, mix and homogenize completely.

DOSAGE

200–1500 ppm.

PACKAGING

25 kg drums.

ARABINOL Super Rouge



PRODUCT PROFILE

ARABINOL Super Rouge is a highly viscous levorotatory gum Arabic designed to support the stability of anthocyanin-derived pigments in young red wines. By enveloping pigment-rich colloids, it helps maintain colour depth and reduce the loss of coloured polymers during ageing and transport.

Its strong colloidal action also softens tannin perception, giving greater roundness and harmony to early drinking reds.

RECOMMENDED APPLICATION

Indicated for young reds, pigment-fragile varieties and wines exposed to oxidative or logistic stress, where colour retention and palate smoothing are strategic quality objectives.

APPLICATION

Apply after fining / finishing, dilute 1:10 prior to addition, homogenize thoroughly.

DOSAGE

200–1400 ppm.

PACKAGING

25 kg drums.

Yeast-derived polysaccharides

Mannoprotein & peptide systems

BÂTONNAGE Plus Rondeur



PRODUCT PROFILE

BÂTONNAGE Plus Rondeur is a mannoprotein-rich yeast derivative developed to replicate the protective and roundness effects of extended sur-lie ageing in a controlled manner. Its peptide and antioxidant fractions help maintain a favorable redox environment, limiting oxidative drift while progressively building creaminess, volume and palate cohesion. Ideal for low SO₂ wines. Increase wine roundness and length.

APPLICATION

Pre-hydrate in 10 parts wine or warm water, allow ~1 hour for full dispersion, add via pump-over or Venturi.

DOSAGE

100–400 ppm.

PACKAGING

5 kg bags.

BÂTONNAGE Plus Élevage



PRODUCT PROFILE

BÂTONNAGE Plus Élevage is a mannoprotein-rich yeast derivative developed to replicate the protective and textural effects of extended sur-lie ageing in a controlled manner. Its peptide and antioxidant fractions help maintain a favorable redox environment, limiting oxidative drift while progressively building creaminess, volume and palate cohesion. Ideal for low SO₂ wines. It is particularly effective in wines that are sensitive to oxidation or that have undergone intensive processing, restoring balance, softness and structural integration.

APPLICATION

Pre-hydrate in 10 parts wine or warm water, allow ~1 hour for full dispersion, add via pump-over or Venturi.

DOSAGE

100–400 ppm.

PACKAGING

5 kg bags.

BÂTONNAGE Body



PRODUCT PROFILE

BÂTONNAGE Body is a mannoprotein-rich yeast derivative that enhances savoury sensations, giving roundness, palate width and persistence. This is a yeast derivative with unique characteristics which, besides improving the taste, increases the volume and palate weight of wines thanks to the presence of yeast-derived polysaccharides.

APPLICATION

Pre-hydrate in 10 parts wine or warm water, allow ~1 hour for full dispersion, add via pump-over or Venturi.

DOSAGE

100–400 ppm.

PACKAGING

5 kg bags.

BÂTONNAGE Plus 150 KD



PRODUCT PROFILE

BÂTONNAGE Plus 150 KD is a mannoprotein-rich yeast derivative that makes the taste of wine more velvety, harmonious and full-bodied. It increases the intensity and aromatic persistence of young wines and maintains them over time. BÂTONNAGE Plus 150 KD performs a protective action against oxidation, preserves color, avoids the risks associated with prolonged contact with lees and reduces, by up to 50 percent, the doses of bentonite needed for protein stabilization in whites.

APPLICATION

Pre-hydrate in 10 parts wine or warm water, allow ~1 hour for full dispersion, add via pump-over or Venturi.

DOSAGE

100–400 ppm.

PACKAGING

5 kg bags.

BÂTONNAGE Plus Structure



PRODUCT PROFILE

BÂTONNAGE Plus Structure combines mannoproteins, oak-derived tannin components and levorotatory gum Arabic to enhance mouthfeel in structurally lean reds. It harmonizes herbaceous or green notes, deepens cocoa-like undertones and moderates angular tannins, producing a more layered and complete mid-palate. It is particularly suited to cool-climate reds, early-harvest programs and wines matured with oak alternatives.

APPLICATION

Hydrate in 10 parts wine / warm water, rest ~1 hour, add gently with pump-over.

DOSAGE

100–400 ppm.

PACKAGING

5 kg bags.

BÂTONNAGE Plus Texture



PRODUCT PROFILE

BÂTONNAGE Plus Texture is designed for early vinification stages, providing fermenting musts and young wines with mannoproteins, peptides and amino compounds that support fermentation behavior and encourage the development of fine, expressive mouthfeel from the beginning.

It enhances varietal clarity in whites and rosé and contributes gentle mid-palate fullness in delicate reds.

APPLICATION

Pre-hydrate 1:10, allow ~1 hour, add to must or young wine via circulation.

DOSAGE

100–400 ppm.

PACKAGING

20 kg bags.

BÂTONNAGE Savoury



PRODUCT PROFILE

BÂTONNAGE Savoury is a new yeast derivative whose distinctive feature is that it is naturally rich in amino acids that enhance savouriness and minerality—qualities sought after in white and rosé wines, but also in young red wines where a certain liveliness and freshness on the palate is always welcome, whilst maintaining the roundness and fullness that make the wine more pleasant and modern.

APPLICATION

Pre-hydrate 1:10, allow ~1 hour, add to must or young wine via circulation.

DOSAGE

100–400 ppm.

PACKAGING

500 g bags.

ELEVAGE Glu



PRODUCT PROFILE

ELEVAGE Glu is a yeast derivative enriched in glutathione precursors, designed to protect oxidation-sensitive wines during the transition from fermentation to ageing. It helps prevent browning and pinking, preserves aromatic freshness and contributes subtle roundness and tension on the palate.

It is especially appropriate for aromatic whites and rosé when the natural CO₂ blanket dissipates.

APPLICATION

Hydrate 1:10 in wine or warm water, rest ~1 hour, add gently to tank.

DOSAGE

100–400 ppm.

PACKAGING

5 kg bags.

SUPER-MANN



PRODUCT PROFILE

SUPER-MANN is a purified mannoprotein extract from *Saccharomyces cerevisiae* hulls, fully soluble and intended for final finishing and bottle-stability reinforcement. Its colloidal action contributes to tartrate stabilization while also enhancing texture, aromatic integration and overall polish.

It is particularly valuable in low-SO₂ programs and in wines requiring a final layer of softness and structural cohesion prior to bottling.

APPLICATION

Pre-hydrate 1:10 in wine / warm water, rest ~1 hour and incorporate with careful circulation.

DOSAGE

100–400 ppm.

PACKAGING

500 g packs.



06



Tannins



AEB range of tannins

Tannins are among the most versatile processing aids in the cellar. They act as sacrificial **antioxidants**, **help stabilize colour**, **support polymerization of phenolics** and **fine-tune structure and mouthfeel** from fermentation through to bottling. According to their botanical origin and degree of polymerization, tannins can:

- stabilize colour by binding anthocyanins into more stable pigments
- protect wines and musts from oxidative damage and enzyme activity
- react with proteins and unstable phenolics
- reinforce or smooth the phenolic backbone
- contribute aromatic nuances (wood, spice, toast, nuts, caramel, etc.).

The **AEB tannin range** is organized into:

- **fermentation tannins** (FERMOTAN, TANETHYL, etc.)
- **tannins for whites and problematic grapes** (FERMOTAN Blanc, GALLOVIN)
- **finishing and ageing tannins** (PROTAN LINE, TANIBLANC)
- **ELLAGITAN Barrique oak tannins** (liquid and granular).

All tannins in this chapter are produced under **ISO 9001** and **HACCP quality systems**, comply with OIV/ Codex Oenologique standards, when used within prescribed limits and according to their technical data sheets.

Fermentation tannins

PRODUCT	MAIN TANNIN TYPE	FORM	MAIN APPLICATION	TYPICAL DOSAGE (PPM)
FERMOTAN	Proanthocyanidin + ellagic	Granular	Red wine fermentation; colour stabilization and early phenolic protection.	120–400
FERMOTAN Liquid	Proanthocyanidin + ellagic	Liquid	Red wine fermentation; rapid dispersion for colour stabilization.	200–500
FERMOTAN AG	Grape skin proanthocyanidins + ellagic	Granular	High-malvidin varieties; color protection and stability	120–400
FERMOTAN CB	Grape skin + seed PA + quebracho	Granular	Structured reds; backbone, tannic density and aging potential.	120–400
FERMOTAN SG	Hydrolysable tannins (ellagic-rich)	Granular	Fragile colour reds (e.g. Pinot Noir, Sangiovese).	120–400
FERMOTAN SH	Seed + skin PA + quebracho	Granular	Syrah-type, high-malvidin red wines; structure and colour depth.	120–400
FERMOTAN Blanc	Hydrolysable tannins (oak + gallnut)	Granular	White and rosé wines; oxidation control and structure.	60–240
GALLOVIN	Gallic tannin	Granular	<i>Botrytis</i> pressure; oxidase inhibition and protein reactivity. Non-bitter.	100–250
TANETHYL Effe	Ellagic + seed PA (aldehydic bridge)	Granular	Cold soak and fermentation; polymerization and colour fixation.	120–400

FERMOTAN line: scientific basis

University of Turin – DISAFA collaboration



The **FERMOTAN range** was developed within a **multi-year research program with the University of Turin (DISAFA)**, focused on how different tannin classes influence colour preservation and pigment behavior during the first 72 hours of maceration.

The study compared varieties with distinct anthocyanin profiles (Nebbiolo, Sangiovese, Aglianico and Merlot) and measured:

- total and free anthocyanins
- colour intensity
- anthocyanin speciation by HPLC

under controlled early-fermentation conditions with sampling at 6, 48 and 72 hours. To isolate technological effect, the absorbance contributed by the tannins themselves was discounted, so only the behavior of grape pigments was evaluated.

The **key conclusions** were:

- fragile, disubstituted anthocyanins are extracted early and need protective support in the first days of maceration
- wines that retain more free anthocyanins at 72 hours have a larger reactive pool available for later polymerization and long-term colour stability
- the most effective tannin family depends on varietal pigment structure:
 - » **quebracho and ellagic–chestnut–quebracho blends** are particularly effective in varieties rich in fragile disubstituted pigments; e.g., Pinot Noir, Nebbiolo, Sangiovese (FERMOTAN SG)
 - » **grape-skin proanthocyanidins** in alcohol are especially suited to Merlot-Cab-type profiles, supporting early extraction while preserving pigment for later stabilization (FERMOTAN CB)
 - » **mixed hydrolysable + condensed tannins** perform best in high-trisubstituted matrices (malvidin-3-glucoside) such as Aglianico Syrah, Petit Verdot and Malbec (FERMOTAN AG).

Based on this work, FERMOTAN products combine different tannin families (skin-derived, seed-derived, ellagic, chestnut, Quebracho) according to the phenolic architecture and pigment vulnerability of specific varietal groups.



FERMOTAN CB



PRODUCT PROFILE

FERMOTAN CB combines grape-skin and grape-seed tannins to capture and stabilize Malvidin pigments and to build a soft but complete structure that will integrate with the varietal tannins over time. A portion of Quebracho tannins provides a sacrificial function, protecting original grape phenolics from oxidative loss.

Formulated specifically for Cabernet Sauvignon, Merlot, Barbera, Montepulciano, Teroldego and other structured reds where backbone and aging potential are key.

USAGE

Mix in 10 parts of wine or must and add during a pump-over.

DOSAGE

120–400 ppm.

PACKAGING

Available in 5 kg bags.

FERMOTAN SG



PRODUCT PROFILE

FERMOTAN SG is designed for varieties like Pinot Noir and Sangiovese, rich in “fragile” disubstituted pigments such as cyanidin and peonidin anthocyanins.

It contains an important fraction of hydrolysable tannins with strong antioxidant power, specifically selected to protect these sensitive pigments in the first days of maceration and to limit oxidative colour loss.

USAGE

Mix in 10 parts of wine or must and add during a pump-over.

DOSAGE

120–400 ppm.

PACKAGING

Available in 5 kg bags.

FERMOTAN SH



PRODUCT PROFILE

FERMOTAN SH is derived from grape seed and wood proanthocyanidinic tannins. It helps to stabilize anthocyanins and consequently fix the colour in varieties with an anthocyanin profile similar to that of shiraz. Recommended in the early stages of fermentation.

USAGE

Mix in 10 parts of wine or must and add during a pump-over.

DOSAGE

20–200 ppm.

PACKAGING

Available in 1 and 5 kg bags.



TANETHYL Effe

PRODUCT PROFILE



USAGE

DOSAGE

PACKAGING

TANETHYL Effe is a complex of ellagic tannins and seed-derived proanthocyanidins with an aldehydic bridge integrated into the structure. This gives it very high reactivity toward anthocyanins and other polyphenols, making the proanthocyanidin fraction immediately available for colour stabilization against the effects of sulfur, pH shifts, oxygen and aging.

Thanks to its ellagic component, TANETHYL Effe is particularly recommended:

- during red fermentation, where it works in synergy with oxygen to promote ethanal bridge formation and polymerization of colour and structure
- in cold soak, when alcohol is not yet present and natural ethanal levels are low, to initiate polymerization earlier.

Mix in 10 parts of wine or must and add during a pump-over or via Venturi.

120–400 ppm.

Available in 1 kg packets.

► Fermentation tannins for whites and problematic grapes

FERMOTAN Blanc

PRODUCT PROFILE



USAGE

DOSAGE

PACKAGING

A blend of hydrolysable tannins from untoasted oak and gallnuts, geared to protect musts and wines from oxidation and to lift the mid-palate in whites and rosés. Particularly useful at the exit of the press, where it can bind oxidized phenols and protect delicate varietal aromas while adding a gentle structural frame.

Make a slurry in 10 parts of wine or must and add at the exit of the press or early in the fermentation.

Depending on the variety, typically 60–240 ppm (often 50–200 ppm).

Available in 1 kg bags.

GALLOVIN



PRODUCT PROFILE

Gallic tannins derived from the core of gallnuts, purified from external catechins that can be present when whole nuts are extracted. They are strong antioxidants with minimal colour contribution and extremely high reactivity toward proteins and polyphenol oxidases (laccase, tyrosinase), making them ideal for musts and wines affected by *Botrytis cinerea* or significant oxidative pressure. GALLOVIN is unique in that unlike most gall tannins it is not bitter, so residual GALLOVIN in the juice will simply lower the bentonite requirement in the final wine.

USAGE

Mix in 10 parts of wine or must and add on the receiving conveyor and at racking.

DOSAGE

- 100–250 ppm on grapes or during pump-over
- 100–150 ppm at racking.

PACKAGING

Available in 5 kg and 15 kg bags.

Finishing tannins

PRODUCT	MAIN TANNIN TYPE	FORM	MAIN APPLICATION	TYPICAL DOSAGE (PPM)
PROTAN Bois	Proanthocyanidin (quebracho)	Granular	Structure building, aging support, micro-oxygenation programs	100–300
PROTAN Fresh	Proanthocyanidin	Granular	Restore freshness and lift in tired or dull wines	60–240
PROTAN LXP	Proanthocyanidin (acacia / lemon wood)	Granular	Body, crispness and freshness in white wines	60–200
PROTAN Malbec	Grape seed proanthocyanidins (ripe seeds)	Granular	Nutty seed notes; filling mid-palate gaps in reds	30–400
PROTAN Pépin	Grape seed proanthocyanidins	Granular	Savoury structure; barrel aging and micro-oxygenation	20–250
PROTAN Plus	Wood proanthocyanidins + mannoproteins	Granular	Volume enhancement and colour stabilization	200–400
PROTAN Raisin	Grape skin tannins	Granular	Skin-like extraction effect; texture and volume	30–400
TANETHYL	Seed proanthocyanidins (aldehydic bridge)	Granular	Early polymerization, colour locking and tannin integration	200–400
TANIBLANC Fresh	Proanthocyanidin + gallic tannins	Granular	White and rosé wines; freshness and antioxidant protection	60–200
ELLAGITAN Barrique Liquid	Ellagic tannins (oak origin)	Liquid	Oak integration and colour stabilization	120–720
EB Berry Mix	Ellagic tannins (oak origin)	Liquid	Fruit lift with berry and spice oak nuances	120–720
EB Fruit Reserve	Ellagic tannins (oak origin)	Liquid	Low-imprint oak support and mid-palate enhancement	120–720
EB Goud Ron	Ellagic tannins (oak origin)	Liquid	Tar, smoke and old-world complexity	120–720

PRODUCT	MAIN TANNIN TYPE	FORM	MAIN APPLICATION	TYPICAL DOSAGE (PPM)
EB XO	Ellagic tannins (oak origin)	Liquid	Strong toast, smoke and chocolate profile	120–720
ELLAGITAN Barrique Rouge	Ellagic tannins (toasted oak)	Granular	Oak barrel mimic; red wine aging support	100–720
ELLAGITAN Barrique Blanc	Ellagic tannins (French oak)	Granular	White and rosé aroma protection and body	60–500

AEB range of finishing tannins

PROTAN Bois



PRODUCT PROFILE

A proanthocyanidin tannin derived from Quebracho, partially polymerized to act as a structure enhancer without adding bitterness. Because of its condensed nature, it is effective in:

- stabilizing colour in reds
- supporting aging during long storage or micro-oxygenation
- tightening structure while preserving roundness.

USAGE

Mix in 10 parts of wine or must and add during a pump-over or via Venturi.

DOSAGE

- 100–300 ppm on grapes or during pump-over
- 100–250 ppm at racking.

PACKAGING

Available in 500 g packets and 5 kg bags.

PROTAN Fresh



PRODUCT PROFILE

A proanthocyanidin designed to bring back freshness to “tired” wines. It can be used in reds, whites and rosés to slow apparent aromatic and structural aging, brighten the palate and re-focus fruit.

USAGE

Mix in 10 parts of wine and add to the tank with a Venturi system.

DOSAGE

- Whites: ~60 ppm.
- Reds: 120–240 ppm.

PACKAGING

Available in 1 kg packets.

PROTAN LXP



PRODUCT PROFILE

A proanthocyanidin extracted from non-traditional woods including lemon tree and acacia. In white wines it:

- adds a layer of body and structure,
- enhances crispness and length,
- brightens the finish and emphasizes varietal definition.

USAGE

Mix in 10 parts of wine or must and add to the tank during a pump-over.

DOSAGE

60–200 ppm.

PACKAGING

Available in 1 kg packets.

PROTAN Malbec



PRODUCT PROFILE

A proanthocyanidin sourced from extra-ripe grape seeds, bringing the typical nutty notes normally extracted from pips, but without bitterness or green characters.

- In reds, it fills the “donut” gap in wines where seeds were removed early because they were under-ripe and structure is hollow in the middle.
- In whites, small additions add a touch of sharpness and crispness to otherwise dull wines.

USAGE

Mix in 10 parts of wine or must and add via Venturi.

DOSAGE

- Whites: 30–60 ppm.
- Reds: 200–400 ppm.

PACKAGING

Available in 500 g packets.

PROTAN Pépin



PRODUCT PROFILE

A grape-seed tannin that brings an “old-world” structural edge without bitterness. It is ideal for reds meant to age and whenever the winemaker wants a more European-style tannic profile.

Thanks to its high affinity for aldehydes, PROTAN Pépin is particularly suited to:

- barrel-aged wines,
- wines undergoing micro-oxygenation,
- programs where long-term polymerization and colour stability are critical.

USAGE

Mix in 10 parts of wine or must and add via Venturi.

DOSAGE

- Whites: 30–60 ppm.
- Reds: 200–400 ppm.

PACKAGING

Available in 500 g packets.

PROTAN Plus



PRODUCT PROFILE

A combination of wood-derived proanthocyanidins and yeast mannoproteins, PROTAN Plus adds volume to red wines and supports colour stabilization. It is intended for the second half of fermentation or the beginning of aging, when structural integration and polymerization paths are being defined.

USAGE

Mix in 10 parts of wine or must and add during a pump-over or via Venturi.

DOSAGE

200–400 ppm.

PACKAGING

Available in 500 g packets and 5 kg bags.

PROTAN Raisin



PRODUCT PROFILE

Adding PROTAN Raisin to a red wine is like adding extra days of maceration on the skins. It is a tannin extracted from grape peels, bringing the typical polymerized structure of tannins naturally extracted from skins.

- In reds, it contributes to body, colour stabilization and overall phenolic polymerization.
- In whites and rosés, low additions improve mid-palate and complexity.

USAGE

Mix in 10 parts of wine or must and add via Venturi.

DOSAGE

- Whites: 30–60 ppm.
- Reds: 200–400 ppm.

PACKAGING

Available in 500 g packets.

TANETHYL



PRODUCT PROFILE

A seed-derived proanthocyanidin with an aldehydic bridge integrated into the structure, giving it high reactivity for polymerization with anthocyanins and other polyphenols. TANETHYL is immediately available to lock colour against sulfur, pH changes, oxygen and natural aging, even in the absence of strong oxygen inputs.

It is recommended for wines that need structure to start polymerizing early, or where oxygenation is limited and aldehyde-mediated bridges need support.

USAGE

Mix in 10 parts of wine or must and add during a pump-over or via Venturi.

DOSAGE

200–400 ppm.

PACKAGING

Available in 500 g packets.

TANIBLANC Fresh



PRODUCT PROFILE

A blend of proanthocyanidins and gallic tannins created to bring a refreshing edge to white wines.

- Maintains fresh, cool aromatic notes reminiscent of eucalyptol, balsamic and spicy nuances.
- Used during fermentation, it protects citrus and floral aromas and limits oxidative browning.
- In finished wines, it sharpens the profile and extends the finish without harshness.

USAGE

Mix in 10 parts of wine or must and add during a pump-over or via Venturi.

DOSAGE

60–200 ppm.

PACKAGING

Available in 1 kg packets.

The ELLAGITAN Barrique Line

American and French oak-derived tannins, in liquid and powder forms, for fermentation, aging and fine-tuning. The ELLAGITAN Barrique line is calibrated so that aromatic impact is always supported by an appropriate level of structuring ellagic tannins.

- Wood origin and toasting level define the aromatic profile.
 - » French oak: more vanilla, structure, and balanced extraction.
 - » American oak: more volatile phenols (eugenol, guaiacol – spice/smoke) and aldehydes (furfural – almond), with careful adjustment of tannin structure.
- All ELLAGITAN Barrique products are adjusted to avoid resins or bitter compounds, to dissolve quickly and to inhibit unwanted microbial growth, reducing the need for SO₂.

ELLAGITAN Barrique Liquid



PRODUCT PROFILE

The most “French” of the liquid line, with a strong vanilla and coconut/whisky-lactone character. It opens the fruit, enhancing red and black berries and adding a subtle peppercorn note to the spice profile. Ideal for:

- red wines requiring both fruit lift and oak integration
- structured whites where a measured oak overlay is desired.

USAGE

Dilute in 10 parts of wine and add during fermentation or at any other stage. Avoid additions in the 2 weeks before microfiltration.

DOSAGE

- Typical range 120–720 ppm.
- Minimum for light nuances in reds: 120 ppm.
- For whites: 30–120 ppm.

PACKAGING

1 kg bottles.

EB Berry Mix



PRODUCT PROFILE

ELLAGITAN Barrique Berry Mix helps stabilize colour while introducing a soft structural note that brings smoothness and roundness. On the nose, it:

- enhances the sweet, ripe fruit notes
 - carries a pleasant bouquet of spices and toasted oak.
- Particularly suited for:
- fruit-driven reds where berry notes and gentle oak are desired
 - blends needing a bit sweeter spice and polished tannin.

USAGE

As for ELLAGITAN Barrique Liquid (see above).

DOSAGE

As for ELLAGITAN Barrique Liquid (see above).

PACKAGING

Available in 1 kg bottles.

EB Fruit Reserve



PRODUCT PROFILE

The ELLAGITAN Barrique product with the least aromatic imprint, ideal where the goal is to support what the wine already has rather than cover defects.

- Helps the wine “take off” with its own fruit, opening the bouquet and enhancing natural varietal intensity.
- Adds almond and caramel nuances while reinforcing mid-palate.

Recommended for:

- delicate reds and whites where subtle oak integration is required
- premium wines where existing aromatics must remain in the foreground.

USAGE

As per ELLAGITAN Barrique Liquid.

DOSAGE

As per ELLAGITAN Barrique Liquid.

PACKAGING

As per ELLAGITAN Barrique Liquid.

EB Goud-Ron



PRODUCT PROFILE

Designed to stabilize colour while adding both structure and smoothness. Aromatically, EB Goud-Ron shows notes of “goudron” (tar) typical of old-world wines, reminiscent of great reds from Rhône and Piedmont. It is ideal for:

- robust reds where earthy, smoky and tarry notes are welcome
- blends needing more “old-world” complexity without oak chips or staves.

USAGE

As per ELLAGITAN Barrique Liquid.

DOSAGE

As per ELLAGITAN Barrique Liquid.

PACKAGING

As per ELLAGITAN Barrique Liquid.

EB XO



PRODUCT PROFILE

The most expressive in the nose among the ELLAGITAN Barrique liquids. It gives:

- pronounced smoky/toasted notes
- enhanced sensations of spice, chocolate, leather and earth.

Not recommended for smoke-tainted or *Brett*-affected wines, but very effective at masking other defects (burnt rubber, slight reduction, mild green notes) and enriching the bouquet of sound wines.

USAGE

As for ELLAGITAN Barrique Liquid.

DOSAGE

As for ELLAGITAN Barrique Liquid.

PACKAGING

As for ELLAGITAN Barrique Liquid.

ELLAGITAN Barrique Rouge



PRODUCT PROFILE

Granulated tannin extracted from highly toasted oak wood. The seasoning process exceeds two years and follows techniques used for top-end barrels. The innovative extraction system hydrolyzes ellagic tannins and precipitates bitter substances; polysaccharidic micromolecules encapsulate toasted aromas and prevent their loss during spray-drying.

DIRECTIONS FOR USE

Rehydrate in warm water (35 °C) or wine for at least ½ hour, then make a slurry 1:10 in wine and add to a circulating tank or barrel. Allow at least one week before filtration.

DOSAGE

- Light nuances in reds: ≥100 ppm.
 - Whites: 30–120 ppm.
- Typical range up to ~720 ppm depending on style.

PACKAGING

500 g packets.

ELLAGITAN Barrique Blanc



PRODUCT PROFILE

Colourless version of ELLAGITAN Barrique Rouge, extracted from French oak staves. It has minimal impact on colour and is used to:

- highlight varietal aromas of white and rosé wines
- protect against browning in wines with prolonged cold skin contact
- improve bouquet complexity by regulating redox potential during and after fermentation
- provide a soft, velvety mouthfeel and body similar to extended barrel agings
- inhibit bacteria or mold, reducing SO₂ needs.

DIRECTIONS FOR USE

Rehydrate in warm water (35 °C) or wine for at least ½ hour, then make a slurry 1:10 in wine and add directly to a circulating tank or barrel. Allow at least one week before filtration.

DOSAGE

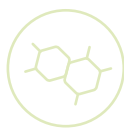
6–50 g/hL, depending on desired impact.

PACKAGING

1 kg packets.



Fining agents & Stabilizers



Processing aids for the final stage

Fining and stabilization begin at the must stage and continue through élevage and pre-bottling. **Positively charged proteins** (gelatin, casein, plant proteins) and polysaccharides are used to remove phenolics, proteins and colloids; **mineral agents** like bentonite, silica and carbon manage proteins and colour; **dedicated products** help control redox, tartrate stability, microbiology and re-fermentation. **Chitosan-based tools** provide modern options for both microbiological control and heavy-metal fining. All products in this chapter are designed as processing aids for professional wine production. Bench trials are strongly recommended before cellar-scale use.

Vegan fining agents

Rationale and regulatory framework



Vegan fining agents have become a global standard in modern winemaking, driven by regulatory, commercial, and consumer demands. Notably, **New Zealand wineries** operate **almost exclusively with vegan fining protocols**, as do many Australian wineries, reflecting strong market expectations for allergen-free and plant-based processing aids. Beyond ethical positioning, vegan fining offers **important technical advantages**: consistent supply, high selectivity, and excellent lees compaction without the allergen-labeling concerns associated with animal-derived proteins.

PRODUCT	COMPOSITION / ORIGIN	MAIN APPLICATION	FORM	TYPICAL DOSAGE (PPM)
VE-Gel  	Pea proteins, yeast hulls, autolysates of yeast	Clarification of white, rosé and red wines	Granular	50–200
VE-Gel Liquid 	Pea proteins, citric acid, Bentonite, KMS, water	Rapid clarification; low lees volume	Liquid	100–400
MICROCEL AF 	Bentonite, cellulose, PVPP	Clarification and oxidation cleanup	Granular	100–500
BENTOGRAN	Sodium-activated bentonite	Protein stabilization	Granular	300–1200
MAJORBENTON UF	Sodium-calcium UF bentonite for use with cross flows	Protein stabilization	Powder	500-2000
CARBOSIL	Silica sol + carbon	Colour fining & clarification	Liquid	50–200
FREE4FENOL	Carbon-based adsorbent	Smoke taint and <i>Brett</i> odors removal	Granular	100–400

MICROCEL is a registered trademark of AEB.

Vegan fining

Fermentation and early-stage phenolic fining



Early phenolic and protein fining during fermentation or immediately after pressing is a highly effective strategy to **manage oxidation, colour evolution, and phenolic harshness while minimizing corrective treatments** later in the winemaking process. By intervening at this stage, these fining agents selectively remove oxidizable phenolics, unstable proteins, and bitterness-contributing compounds when they are most reactive, improving fermentation cleanliness, colour stability, and overall wine balance. Early fining also reduces the need for aggressive post-fermentation clarification, helping preserve aroma, freshness, and volume.

Several of the products in this category are **designed to meet allergen-free or vegan requirements**. Although trace fining proteins may be present at the moment of addition, they function strictly as processing aids and are removed through settling and/or filtration. When used according to recommended protocols, residual allergenic proteins are not detectable in the finished wine, and allergen labeling is therefore not required. **This approach is fully consistent with OIV, and EU regulatory frameworks**, which recognize that fining agents effectively removed from the wine do not constitute allergens in the final product.

Together, these fermentation and early-stage fining tools provide winemakers with precise control over phenolic expression, oxidation risk, and allergen management, supporting both technical performance and market-driven labeling requirements.

Phenolic / protein fining agents

PRODUCT	MAIN APPLICATION / FUNCTION	STAGE OF USE	RECOMMENDED DOSAGE	BEST WAY OF APPLICATION
WINEGLASS	Isinglass	Wine fining (whites, rosés, reds)	10-40 ppm	Hydrate only in water, allow swelling, then add with good mixing
IDROSOL	Liquid porcine gelatin (30 %) clarifier for must clarification and red/rosé fining	Must clarification; reds & rosés	Must clarification: ~10-40 g/hL	Venturi recommended with mixing

Phenolic fining agents

Summary table

Other cellar treatments & stabilization tools

The products listed in this section are primarily stabilization tools rather than classic fining agents. Their main function is to **improve microbiological, oxidative, colloidal, metal, or tartrate stability**, supporting wine cleanliness and shelf life rather than directly clarifying. Most act through protective, inhibitory, or complexing mechanisms and are used at key moments from fermentation through finishing and bottling.

Within this group, **chitosan-based products** are the main exception, as they can also exert a true fining action, particularly on metals and oxidizable compounds, even though chitosan was originally introduced in winemaking for microbiological control. Used correctly, these stabilization tools allow **targeted, preventative interventions that reduce the need for heavier corrective fining later**, while **preserving varietal character and sensory balance**.

PRODUCT	COMPOSITION / ORIGIN	MAIN APPLICATION	STAGE OF USE	TYPICAL DOSAGE	KEY NOTES
ANTIBRETT 2.0	Yeast hulls + chitosan (<i>Aspergillus niger</i>) + β -glucanase	<i>Brettanomyces</i> control; volatile phenol reduction	Wine	5–25 g/hL	Preventive & curative; adsorbs 4-EP / 4-EG; improves filtration
CARBOSIL	Silica sol + activated carbon + bentonite (liquid)	Clarification & color correction	Must / Wine	250–600 ppm	Dust-free liquid carbon; compact lees
CHITOCCEL	Fungal chitosan + yeast hulls	Microbial control; heavy-metal removal	Wine	120–180 ppm	Acts on <i>Brett</i> , LAB, metals, OTA
CHITOCCEL Must	Chitosan + tannins + yeast autolysates (GSH)	Must protection; antioxidant support	Must / Early AF	15–40 g/hL	Controls spoilage flora; supports freshness
DEACID	Potassium bicarbonate + neutral tartrate	Acidity reduction	Wine	~130 g/hL per 1 g/L TA	Bench trials required
DESULFIN	Stabilized copper sulfate (liquid)	H ₂ S & mercaptan removal	Wine	~100 ppm	Precise copper dosing; respect legal Cu limits
MICROCID	Potassium sorbate + antioxidants	Refermentation prevention	Wine	~50 g/hL	Sweet wine protection
MICROCID-F	Potassium sorbate + fumaric acid	Refermentation prevention	Wine	25–60 g/hL	Extra LAB control vs sorbate alone

PRODUCT	COMPOSITION / ORIGIN	MAIN APPLICATION	STAGE OF USE	TYPICAL DOSAGE	KEY NOTES
NEW-CEL +17	Concentrated CMC solution	Tartrate stabilization	Wine (pre-bottling)	12–60 g/hL	Lower dose; strict application conditions
SPINDASOL W	Silica sol (liquid)	Floc compaction	Must / Wine	3–10× fining dose	Improves settling & lees compaction
STERYL Vasche	Allyl isothiocyanate tablets	Flor prevention in tanks	Storage	1 tablet/tank	Volatile antiseptic

Stabilizations products

ANTIBRETT 2.0

PRODUCT PROFILE

Brett management & phenol adsorption



BEST WAY OF APPLICATION

DOSAGE

PACKAGING

ANTIBRETT 2.0 combines yeast hulls, chitosan from *Aspergillus niger* and β -glucanase. It is specifically engineered to target *Brettanomyces*, adsorb 4-ethylphenol and 4-ethylguaiacol, and reduce off-characters from dirty barrels, smoke or mold. It can be used both preventively and curatively, ideally with free $\text{SO}_2 \geq 25$ mg/L. β -glucanase helps break down biofilms and compact lees, improving filtration after treatment.

Pre-suspend the powder in water or wine to obtain a smooth slurry, then add under pump-over or tank turbulence so the chitosan matrix contacts the entire wine volume during the contact period.

5–25 g/hL depending on contamination level.

500 g cans.

CARBOSIL

Silica/carbon liquid clarifier



PRODUCT PROFILE

CARBOSIL is a liquid clarifying blend of silica sol, decolourizing carbon and a small amount of bentonite. It offers fast, efficient colour removal and clarification in musts and wines, especially Pinot Grigio / Pinot Gris and over-ripe white fruit. Being liquid, carbon is already hydrated and dust-free, improving safety and consistency versus powdered carbons. Treated wines show clear, compact lees without residual carbon specks.

BEST WAY OF APPLICATION

Add CARBOSIL as supplied (no pre-swelling required) under tank turbulence or flotation circulation so it disperses rapidly; when used with gelatin, add the gelatin first and dose CARBOSIL afterward to compact and clarify the formed floc.

DOSAGE

As colour remover, 250–600 ppm (25–60 g/hL).

PACKAGING

25 kg pails.

STORAGE

Store at room temperature, dry; do not store below 5 °C.

CHITOCEL

Chitosan-based microbial & heavy-metal fining



PRODUCT PROFILE

CHITOCEL is based on fungal chitosan and yeast hulls. It reduces acetic and lactic bacteria, *Brett*, and other spoilage yeasts while also lowering iron, copper, lead and calcium to prevent metal casse and reduce ochratoxin A. Its positively charged chitosan interacts with negatively charged cell surfaces and may also bind to microbial DNA, damaging membranes and inhibiting growth; yeast hulls add deodorizing and adsorption capacity.

BEST WAY OF APPLICATION

Disperse CHITOCEL in water or wine and add under tank recirculation, ensuring homogeneous distribution throughout the volume to maximize microbial contact and metal binding.

DOSAGE

120–180 ppm (≈12–18 g/hL).

PACKAGING

250 g packs.

STORAGE

Store cool, dry, away from direct light and heat.

CHITOCEL Must

Must protection & antioxidant support



PRODUCT PROFILE

CHITOCEL Must is a chitosan preparation containing gallic and proanthocyanidin tannins, yeast hulls and autolysates rich in naturally occurring glutathione. It controls spoilage flora in musts, contributes antioxidant protection via GSH and tannins, and can aid protein stabilization and clarification through combined chitosan–tannin fining.

BEST WAY OF APPLICATION

Disperse in water or directly in must and add at the press pan or during tank filling so that the product is well mixed from the beginning of processing and remains in uniform suspension during settling or early fermentation.

DOSAGE

15–40 g/hL, mainly pre-fermentation.

PACKAGING

1 kg packets.

STORAGE

Store cool, dry, away from heat and light.

DEACID

Potassium bicarbonate /
tartrate blend



PRODUCT PROFILE

DEACID is a highly soluble blend of potassium bicarbonate and neutral potassium tartrate designed to reduce total acidity and raise pH in a controlled way, without stripping aromatics. It neutralizes excess tartaric acidity and promotes rapid precipitation of potassium salts. Used carefully, it softens aggressive acidity in whites and rounds out reds while preserving freshness. Bench trials are essential: in the lab, add increasing amounts calculated from ≈ 130 g/hL per 1 g/L TA reduction (tartaric), then chill and check pH/TA and sensory profile; when scaling up, watch for CO_2 release and volume expansion.

BEST WAY OF APPLICATION

Dissolve the required dose completely in a small volume of water or wine, then add to the tank under circulation so the reaction and CO_2 release are evenly distributed; chill, allow salts to precipitate and re-check pH, TA and sensory profile before finalizing the treatment.

DOSAGE

≈ 130 g/hL to lower TA by 1 g/L; higher additions require bench trials.

PACKAGING

5 kg and 25 kg bags.

STORAGE

Store cool, dry, non-humid.

DESULFIN

Liquid copper for reductive
faults



PRODUCT PROFILE

DESULFIN is a stabilized liquid copper sulfate solution formulated for precise additions to treat H_2S and light mercaptan reduction. In wines with closed, "reduced" characters, a drop test in the glass can quickly confirm whether copper is appropriate. Copper binds sulfur compounds, forming insoluble Cu-sulfides / Cu-mercaptides that can be removed by racking or filtration. For mercaptans, DESULFIN is used at roughly twice the rate needed for simple H_2S ; for DMDS/DEDS faults, temporary conversion back to mercaptans with ascorbic acid may be needed before copper treatment.

BEST WAY OF APPLICATION

Dilute the calculated dose in a small volume of wine and add under tank recirculation so the copper disperses uniformly; allow time for Cu-sulfide formation, then rack or filter and confirm residual copper is within legal limits. Bench trials: one average drop (≈ 0.05 mL) into 1 L ≈ 50 ppm; taste and smell after gentle mixing. Run several levels around 100 ppm and check sensory and residual copper (target < 1 mg/L).

DOSAGE

Typically around 100 ppm. 10 mL/hL DESULFIN contributes ≈ 0.25 mg/L Cu; practical maximum ≈ 40 mL/hL assuming no pre-existing copper.

PACKAGING

1 kg bottles.

STORAGE

Store at room temperature, dry; protect from frost ($< 5^\circ\text{C}$).

MICROCID

Sorbate-based
antimicrobial & antioxidant



PRODUCT PROFILE

MICROCID is a balanced formulation based on potassium sorbate and antioxidant components (citric acid, potassium metabisulfite, ascorbic acid). The ingredients act synergistically to protect wines and special wines against unwanted refermentation and oxidative spoilage. Potassium sorbate provides broad fungicidal and fungistatic action, inhibiting yeasts responsible for refermentation in sweet wines, while the antioxidant fraction stabilizes free SO_2 and limits the formation of “geranium” off-odors by keeping lactic bacteria in check.

BEST WAY OF APPLICATION

Dissolve the dose in about 10 parts lukewarm water and add evenly to a well-clarified, well-filtered wine (low microbial load) under tank recirculation.

DOSAGE

Around 50 g/hL (providing roughly 200 mg/L sorbic acid and ~45 mg/L SO_2).

PACKAGING

500 g sachets in 15 kg cartons.

STORAGE

Store cool, dry, away from light and heat.

MICROCID-F

Re-fermentation control
with fumaric acid



PRODUCT PROFILE

MICROCID-F combines potassium sorbate with fumaric acid (plus supporting ingredients) to prevent re-fermentation in wines containing residual sugar. Fumaric acid helps inhibit lactic bacteria that could otherwise convert sorbate into off-aroma compounds (e.g., “geranium” character), giving a more secure microbiological outcome and a slight acid “tightening.”

BEST WAY OF APPLICATION

Dissolve MICROCID-F completely in a small volume of lukewarm water, then add to sterile-filtered sweet wines under active recirculation so it mixes quickly and homogeneously before bottling.

DOSAGE

25–60 g/hL.

PACKAGING

1 kg packets.

STORAGE

Store cool, dry, non-humid.

NEW-CEL +17

CMC tartrate stabilizers



PRODUCT PROFILE

NEW-CEL +17 is a sodium carboxymethyl-cellulose (CMC) solution used to prevent potassium bitartrate precipitation without refrigeration. CMC works by forming a thin protective layer on micro-crystals, deforming their structure and inhibiting further crystal growth. It is particularly valuable for wines destined for warm-chain distribution or bottling lines where cold stabilization presents logistical or oxidative risk. Because CMC interacts with unstable colloids, correct application conditions are critical to ensure stability and avoid post-dosing haze or flocculation. CMC selectively blocks KHT crystal growth but does not remove tartrate salts, preventing recrystallization while reducing energy cost relative to cold stabilization. CMC is anionic and can interact with borderline-stable proteins, unstable red pigments and residual polysaccharide colloids, so the wine must be fully stable and filtered before addition.

BEST WAY OF APPLICATION

- Protein-stable (passed heat test), iron/copper stable, no residual fermentation activity, filtered to ≤ 1 NTU (preferably ≤ 0.6 NTU), microbially stable or prepared for sterile filtration.
- Ideal wine temperature: 12–18 °C. Avoid dosing below 10 °C; low temperature increases colloid reactivity and haze risk. Avoid dosing above 22 °C; high temperature may reduce protection efficiency.
- Add after final filtration (or immediately prior to sterile filtration). Stir or circulate gently for complete homogenization. Avoid aggressive pump-shear or high-speed mixing. Allow 24–48 hours rest before bottling when possible.
- Do not combine immediately with gum Arabic, mannoproteins, gelatin / silica fining, PVPP or caseinate; perform these operations before CMC.
- Avoid use on young, anthocyanin-rich reds unless colour is already stable.

Bench Trial Protocol (Strongly Recommended). Perform trials on filtered wine.

Warm samples to ≈ 16 °C

Trial two rates:

- NEW-CEL +17: 12 & 40 g/hL

Mix gently and allow 12–24 hours rest.

Run: mini cold test or freeze test, protein haze check, visual flocculation observation and taste for mouthfeel or bitterness shift.

If borderline results appear → prefer lower addition rate + tighter filtration.

DOSAGE

NEW-CEL +17 12–60 g/hL, using the lowest effective rate confirmed by bench trial.

PACKAGING

1 kg bottles and 25 kg pails.

SPINDASOL W

Liquid silica
for compaction



PRODUCT PROFILE

SPINDASOL W is a liquid silica sol used to compact settling agents and carbon finings. When combined with bentonite or gelatin, it increases floc density, speeds settling and reduces lees volume without impacting aroma or colour, due to its negative charge. It is also used with CARBOSIL to improve flotation or clarification yields.

BEST WAY OF APPLICATION

Add SPINDASOL W after the protein or primary fining agent, into a gently circulating tank, so the silica contacts existing flocs and compacts them without excessive shear that might break them apart.

Bench trials: add SPINDASOL W at 3–10× the protein fining dose in lab tests and evaluate speed and compactness of settling.

DOSAGE

Typically, 3–10× the weight of the primary fining agent.

PACKAGING

Liquid format in pails of 25 kg and drums of 230 kg.

STORAGE

Store cool, frost-free, and mix before use.

STERYL Vasche

Anti flor (pichia) tablets
for tanks



PRODUCT PROFILE

STERYL Vasche tablets are formulated with about 2% allyl isothiocyanate to treat larger tanks. Floating on the surface, they slowly release the volatile antiseptic into the headspace, preventing Pichia yeast growth and other oxidative surface alterations in bulk storage vessels.

BEST WAY OF APPLICATION

Place one STERYL Vasche tablet in each tank to be protected; for very large tanks, partially filled vessels or low-alcohol wines, add additional tablets proportionally. Renew periodically according to headspace volume, closure system and storage temperature.

DOSAGE

One tablet per tank as a base rate.

PACKAGING

50 sachets with one tablet each (≈20 g).

STORAGE

Store cool, dry, away from light and heat.

VE-GEL

Powdered vegetable protein clarifier



PRODUCT PROFILE

VE-GEL is a powdered clarifier based on pea proteins and inactivated yeast, developed as an alternative to animal-origin proteins for the clarification of musts and wines. The synergy between plant proteins and yeast components makes it particularly effective for difficult-to-clarify musts and wines, especially when combined with inorganic fining agents such as SPINDASOL W or BENTOGRAN. It provides rapid clarification with compact lees, high clarity and shorter settling times than standard vegetable proteins.

BEST WAY OF APPLICATION

Dissolve VE-GEL in about 15 parts water and add inline or under tank recirculation, ideally in combination with silica/bentonite for enhanced compaction when required.

DOSAGE

100–500 ppm.

PACKAGING

1 kg sachets (boxes of 15 kg) and 20 kg bags.

STORAGE

Store cool, dry, away from light and direct heat.

VE-GEL Liquid

Liquid vegetable protein for flotation



PRODUCT PROFILE

VE-GEL Liquid is a ready-to-use liquid clarifier based on selected pea proteins and activated bentonite, stabilized with citric acid and potassium bisulfite. The degree of hydrolysis and molecular weight distribution give the protein a hydrophobic character ideal for binding condensed polyphenols and forming flocs that trap bitter, astringent tannins and oxidized quinones. Its rapid flocculation and foam properties make it an excellent flotation aid, especially where non-animal alternatives are required.

BEST WAY OF APPLICATION

Shake well before use, then inject VE-GEL Liquid with a Venturi tube or dosing pump (optionally diluted 1:2) into must undergoing flotation or cold settling, homogenizing the tank. On AEB E-Flot systems the product can be aspirated directly from the container via peristaltic pump.

DOSAGE

300–1500 ppm.

PACKAGING

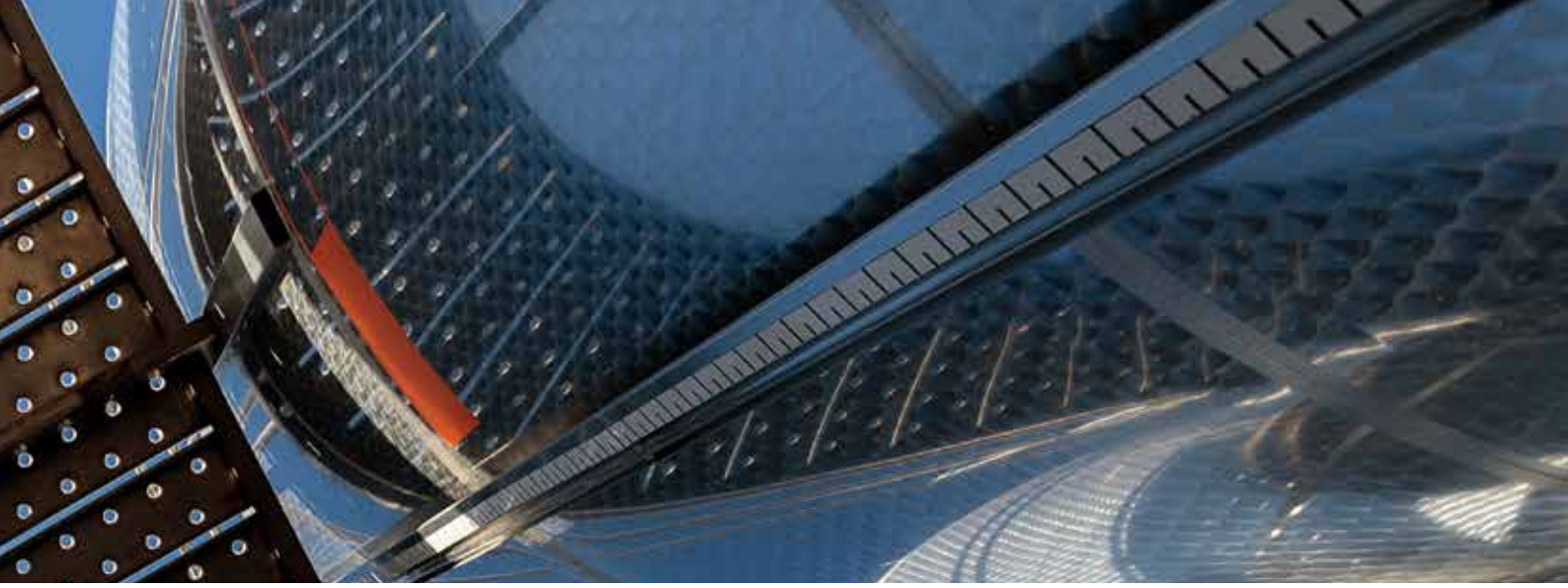
8 kg and 20 kg canisters.

STORAGE

Store cool, dry, away from light and heat.

A low-angle, upward-looking photograph of several modern skyscrapers. The buildings feature glass facades and intricate, textured patterns. The sky is a clear, pale blue. A large, white, stylized number '08' is superimposed over the center of the image. The '0' is a simple oval shape, and the '8' is composed of two stacked ovals. The background image shows the sharp lines and reflective surfaces of the buildings, creating a sense of height and architectural grandeur.

08



Equipment





100% ITALIAN PRODUCTION

ASSISTANCE

OPTIMIZATION

QUALITY • *DESIGN*

CUSTOMIZATION

SUPPORT • SAFETY

PERFORMANCE

GLOBAL PRESENCE • EXPERIENCE



Equipment

Tailor-made technologies and solutions for wineries

AEB ENGINEERING is a leading designer and manufacturer of **technology for production, treatment and hygiene** in the wine sector. It is renowned for its unique approach focused on customisation and highly **qualified support**.

Together with **100% in-house production** and a comprehensive range, AEB ENGINEERING guarantee you the **highest quality and performance**.

Equipment for yeast rehydration & propagation

Correct yeast preparation is one of the most critical yet underestimated steps in alcoholic fermentation. Modern research consistently shows that fermentation reliability, aroma expression, and resistance to stress are strongly influenced not only by yeast strain selection, but by **rehydration quality, oxygen management, nutrient timing**, and the **physiological state of the inoculated biomass**.

Poorly rehydrated or inadequately acclimated yeast may survive inoculation but express reduced metabolic efficiency, longer lag phases, higher production of undesirable metabolites, and lower dominance over indigenous microflora. Conversely, yeast prepared under controlled aerobic conditions with progressive sugar and must acclimation shows higher membrane integrity, better sterol synthesis, faster implantation, and more predictable kinetics, even in difficult musts.

The following systems are designed to standardize and optimize these steps, eliminating operator variability and ensuring consistent yeast prevalence at inoculation.

REACTIVATEUR 60

Automatic yeast rehydration & acclimation for reliable fermentations

Function and technological role

REACTIVATEUR 60 is an automatic system designed to **standardize yeast rehydration and acclimation**, ensuring **rapid fermentation start** and **consistent dominance of selected yeasts**. Fermentation research clearly demonstrates that yeast prevalence is the primary determinant of fermentation success; strain selection alone is insufficient if inoculated cells fail to dominate indigenous flora.

To achieve prevalence, the inoculated yeast population must be at least 20x higher than the native microbial load, and cells must be metabolically active at the time of inoculation. REACTIVATEUR ensures both conditions by controlling temperature, hydration kinetics, aeration, and gradual must addition.

How it works

The system automatically:

- adds the correct volume of water based on yeast quantity
- heats to optimal rehydration temperature
- alternates agitation, rest, and aeration phases improving biomass
- gradually acclimates yeast by adding must avoiding temperature shocks.

Key advantages

- Lower usage of dry yeast (about half).
- Shorter yeast lag phase.
- Highly regular alcoholic fermentations.
- Guaranteed yeast prevalence.
- Improved fermentation kinetics under non-ideal conditions.
- Restart of sluggish or stuck fermentations.
- Production of yeast-rich must for secondary fermentations (Charmat or traditional method).

Available models

Multiple configurations allow rehydration of:

- From 1 kg up to 50+ kg of dry yeast, depending on model.

REACTIVATEUR 60 RIF

Advanced Rehydration, Acclimation
& Refermentation Management



PRODUCT PROFILE

REACTIVATEUR 60 RIF expands the capabilities of the standard REACTIVATEUR by integrating enhanced acclimation control and flexibility for use in must, wine, or partially fermented matrices. It is specifically designed for situations where yeast faces alcohol, low nutrients, or high osmotic stress, such as refermentations or difficult ferment restarts.

By carefully managing oxygen exposure, sugar availability, and temperature gradients, the RIF system preserves yeast vitality while avoiding premature fermentation during preparation.

HOW IT WORKS

In addition to standard rehydration, the RIF system:

- maintains aerobic conditions during reactivation
- adds sugar solutions (5–8%) to prevent metabolic interruption
- controls temperature differentials to ≤ 5 °C
- supports yeast multiplication without triggering ethanol production.

TECHNOLOGICAL BENEFITS

- Ensures yeast and bacterial prevalence in competitive environments.
- Improves success in refermentation with alcohol present.
- Maintains yeast at the highest multiplicative stage before inoculation.
- Produces highly active inocula for secondary fermentation.

OPERATING MODES

- Classic mode: ideal for musts.
- RIF mode: ideal for wine or partially fermented substrates (secondary fermentations or restarts).

IDEAL APPLICATIONS

- Restarting difficult fermentations.
- Sparkling wine refermentation.
- High-alcohol or nutrient-poor environments.
- Situations requiring maximum yeast dominance.
- Equipment for Yeast Rehydration & Propagation.



PROPAGATOR (BIOREACTOR X10 1.5)

Controlled yeast multiplication, physiological optimization & inoculum scaling



FUNCTION AND TECHNOLOGICAL ROLE

BIOREACTOR X10 1.5 (PROPAGATOR) is an advanced system designed not only for yeast rehydration, but for controlled aerobic biomass multiplication under winery conditions. While dry yeast already contains a large number of viable cells, current fermentation research clearly shows that cell number alone does not guarantee fermentation performance. The physiological state of the yeast, membrane composition, sterol content, stress resistance and metabolic readiness are the determining factor for fermentation reliability, especially in high-sugar, high-alcohol or microbiologically competitive musts.

BIOREACTOR X10 1.5 allows wineries to start from a small quantity of selected dry yeast and obtain a large volume of highly active, physiologically optimized biomass, produced under controlled conditions that favor sterol synthesis, membrane reinforcement and balanced growth.

OPERATING PRINCIPLE AND PROCESS LOGIC

The system combines the proven rehydration protocol of the REACTIVATEUR with a feed-batch aerobic propagation phase. Yeast is first rehydrated under optimal temperature and agitation conditions, then progressively multiplied through controlled feeding of carbon and nutrients while maintaining aerobic conditions. This avoids fermentative metabolism and favors biomass growth rather than ethanol production.

TYPICAL OPERATING PARAMETERS

- Initial yeast load: typically, 1–5 kg of dry yeast.
- Propagation cycles: 8 or 24 hours.
- Multiplication factor: approximately 5x to 20x, depending on strain, cycle duration and feeding strategy.

CARBON, NUTRIENT AND TEMPERATURE MANAGEMENT

The winery connects the system to:

- a sugar source (sucrose or acidified concentrated must),
- a dedicated nutrient solution supplied for the system.

The PLC allows the operator to input the dilution ratios of sugar and nutrient solutions so the Bioreactor can automatically calculate and dose the correct volumes during each feeding cycle. Carbon is supplied progressively to avoid osmotic shock and to keep yeast in a respiratory growth phase.

Temperature is precisely controlled via internal heat-exchange flanges, supplied with chilled water or glycol, ensuring stable propagation conditions throughout the cycle.

MICROBIOLOGICAL SECURITY AND HYGIENE

Because the system actively multiplies biomass, microbiological control is critical. To minimize contamination risks:

- processing water is filtered through an ENOWATER system
- if concentrated must is used as a carbon source, acidification is mandatory to prevent growth of spoilage organisms
- the system is fully enclosed and designed for sanitary operation.

BIOREACTOR X10 1.5 includes an automatic CIP system, completing a full cleaning cycle in approximately 10 minutes. This minimizes downtime while ensuring repeatable hygienic conditions between cycles.

SCALING IMPACT AND PRACTICAL BENEFIT

The system allows dramatic scaling of inoculum size. Starting from 5 kg of dry yeast an 8-hour cycle can yield the equivalent of ~40 kg of active yeast.



This represents a major advantage for wineries seeking:

- reduced yeast procurement costs
- guaranteed strain dominance
- high fermentation security across large volumes
- consistent yeast physiology across multiple tanks.

IDEAL APPLICATIONS

- Wineries requiring reliable strain dominance.
- Difficult fermentations (high sugar, high alcohol, low nitrogen).
- Sequential tank inoculations with identical yeast physiology.
- Restarting or reinforcing fermentations under stress.

BIOREACTOR X10 1.5 translates modern yeast physiology and propagation science into a scalable, automated cellar tool, bridging laboratory-level control with real-world winery operation.



Gas management in modern winemaking

Dissolved gases play a **critical but often underestimated role in wine stability, sensory expression and shelf life**. Oxygen and carbon dioxide, in particular, influence redox balance, microbial activity, colloidal behavior and aromatic evolution from fermentation through bottling. Traditionally, chemical tools such as sulfur dioxide and ascorbic acid have been used to manage oxidative risk; however, contemporary winemaking increasingly integrates physical gas-management technologies to control dissolved gases directly, reducing reliance on additives while improving precision and repeatability.

By actively removing or regulating dissolved oxygen and carbon dioxide, gas-management systems help:

- **slow oxidative degradation of aroma and colour**
- **preserve freshness** during processing and bottling
- **stabilize wines** destined for long distribution chains
- **support low-SO₂** or reduced-intervention programs.

From a physical standpoint, gas control relies on the same principles governing gas solubility and diffusion: partial pressure gradients, molecular mobility and equilibrium between phases. The way these principles are applied, however, can differ substantially depending on the technology used. Some systems act through direct gas–liquid contact, promoting rapid exchange but with limited selectivity; others rely on membrane-based diffusion, enabling controlled migration of specific small molecules without disturbing the wine matrix.

The following sections describe two complementary approaches to gas management:

- a selective membrane system designed for precise oxygen and CO₂ regulation with minimal sensory impact,
- and a stripping-based system that achieves rapid bulk gas removal through forced gas exchange.

Understanding the physical mechanisms behind each approach allows winemakers to select the most appropriate technology based on wine style, quality objectives, operational scale and economic considerations.

ISIOX

Selective regulation of dissolved gases
by membrane diffusion



POWERED BY

EXPERTI

FUNCTION AND TECHNOLOGICAL ROLE

ISIOX is an advanced gas-management system developed within the FREEWINE® research program to control dissolved gases in wine through selective molecular diffusion rather than mechanical stripping. The technology is based on the physical behavior of gases in solution and their migration across a semi-permeable membrane according to partial-pressure gradients, as described by Henry's law and Fick's laws of diffusion.

PHYSICAL PRINCIPLE OF OPERATION

In wine, dissolved gases such as oxygen (O_2), carbon dioxide (CO_2), hydrogen sulfide (H_2S) and free acetaldehyde exist in equilibrium between the liquid phase and the surrounding atmosphere. Their solubility and reactivity depend on temperature, pressure and molecular size. ISIOX exploits these principles by circulating wine along one side of a selective membrane while a technical inert gas (typically nitrogen, CO_2 or argon) flows on the opposite side.

Because the partial pressure of the target gas is deliberately kept lower on the gas side of the membrane, small molecules naturally migrate from the wine toward the gas phase until a new equilibrium is reached. This migration occurs without bubbling, turbulence or direct gas-liquid contact, making the process highly controlled and repeatable.

MOLECULAR SELECTIVITY

The effectiveness of ISIOX is rooted in the molecular size and diffusivity of the compounds involved.

Small, low-molecular-weight gases diffuse readily across the membrane:

- Oxygen (O_2) $\approx$ 32 Da
- Carbon dioxide (CO_2) $\approx$ 44 Da
- Hydrogen sulfide (H_2S) $\approx$ 34 Da
- Free acetaldehyde $\approx$ 44 Da

By contrast, aromatic compounds, esters, thiols, higher alcohols and phenolics have much larger molecular sizes and do not migrate across the membrane. As a result, ISIOX can reduce dissolved oxygen by up to 95–97%, adjust CO_2 concentration over a wide range, and eliminate reductive sulfur compounds without stripping aroma or affecting wine structure.

OPERATIONAL FLEXIBILITY IN THE CELLAR

ISIOX is designed as a multi-functional cellar tool, not a single-purpose oxygen remover. Depending on configuration and process gas, it can be used to:

- deoxygenate wine before or after racking, filtration and bottling
- reduce hydrogen sulfide and light reductive notes below sensory threshold
- adjust dissolved CO_2 downward for textural refinement or upward for freshness and protection
- lower free acetaldehyde, indirectly stabilizing colour and aroma
- protect wines during cold stabilization, blending and packaging.

Because the system operates in closed circuit and under gentle hydraulic conditions, it integrates seamlessly into existing cellar lines without increasing oxygen pickup or shear stress.

STRATEGIC ROLE IN MODERN WINEMAKING

ISIOX represents a shift from corrective chemistry to physical prevention. By managing dissolved gases directly, winemakers can significantly reduce dependence on sulfur dioxide, ascorbic acid and other redox-active additives, supporting low-input, low- SO_2 and long-shelf-life wine programs. Its selectivity makes it particularly valuable for aromatic whites, reductive-style wines, premium reds, and wines destined for long transport or extended bottle aging.

In essence, ISIOX applies fundamental gas-law principles to wine, transforming gas management from an uncontrolled side effect into a precise, measurable and sensory-driven enological tool.



STRIPPING CONTROL SYSTEM

Bulk gas removal by forced phase transfer

The STRIPPING CONTROL SYSTEM is a conventional gas-management technology based on forced mass transfer between wine and an injected gas stream. Unlike selective membrane systems, stripping operates by introducing a large volume of technical gas (typically nitrogen or CO₂) directly into the wine, creating intense gas–liquid contact that physically removes dissolved gases according to volatility and vapor–liquid equilibrium.

Physical mechanism of stripping

In stripping, wine is exposed to rising gas bubbles or dispersed gas streams. As the gas phase passes through the liquid, dissolved gases migrate into the bubbles and are evacuated from the system. This mechanism is driven by:

- high interfacial surface area between wine and gas
- turbulence and agitation, which accelerate mass transfer
- partial-pressure gradients.

Typical cellar applications

Stripping systems are generally used for:

- emergency oxygen reduction
- high-CO₂ degassing prior to bottling
- corrective interventions on compromised wines
- large-volume, cost-sensitive operations where fine aroma retention is less critical.

Comparison with selective membrane systems (ISIOX)

The fundamental difference between stripping and ISIOX lies in how molecular movement is induced

STRIPPING	ISIOX
Direct gas–liquid contact	No gas–liquid contact
Bulk, non-selective removal	Selective diffusion by molecular size
High gas consumption	Low gas consumption
Aroma loss possible	Aromas preserved
Lower capital cost	Higher capital cost
Lower precision	High precision & repeatability

This difference explains the significant cost gap between the two technologies. Stripping systems are mechanically simpler and less expensive upfront, but they trade precision for force. ISIOX, by contrast, requires advanced membranes, controlled gas circuits and tighter engineering tolerances, resulting in higher capital investment but far greater control, selectivity and wine quality preservation.

Strategic positioning

In modern cellars, stripping systems remain a useful corrective tool, particularly where speed and cost efficiency outweigh sensory refinement. However, as wine programs increasingly prioritize shelf life, aroma integrity and reduced chemical inputs, stripping is best viewed as a coarse adjustment tool, while membrane-based systems represent a fine-tuning, quality-driven solution.

STABYMATIC

Cation-exchange tartrate stabilization and calcium reduction with controlled pH drop



WHY TARTRATE STABILIZATION MATTERS (AND WHY PH SHIFTS)

Tartrate instability is driven by the natural equilibrium between tartaric acid, potassium (K^+) and calcium (Ca^{2+}) in wine. When a wine is cooled, concentrated, or simply stored over time, it can exceed the solubility limit of potassium bitartrate (KHT) and/or calcium tartrate, leading to crystal precipitation in tank or bottle. Because K^+ and Ca^{2+} are key counter-ions in these equilibria, reducing their concentration shifts the system back toward solubility and increases tartrate stability.

STABYMATIC achieves this through cation exchange: it selectively removes electropositive ions (notably K^+ and Ca^{2+}), which reduces conductivity and results in a pH decrease.

This approach stabilizes wine without cold-holding and without adding “tartrate inhibitors” like CMC or KPA because it changes the ionic balance that causes precipitation in the first place.

HOW ION EXCHANGE WORKS IN STABYMATIC (PHYSICAL/CHEMICAL PRINCIPLE)

STABYMATIC uses pH-Stab 2.0, a strong-acid cation exchange resin (sulfonic functional groups on a styrene/divinylbenzene polymer matrix).

The resin is maintained in the H^+ form. As wine passes through the column, cations in the wine (especially K^+ and Ca^{2+}) are retained by the resin and exchanged for H^+ .

In practical terms:

- cations are removed → conductivity drops (fewer charged species in solution)
- H^+ is released into the wine → pH drops (the “acidifying” effect is intrinsic to the exchange mechanism)
- the system is engineered to avoid altering organoleptic quality, using enological flow management and dedicated pumps/lines.

A useful way to visualize the “driving force” is that the resin is effectively a controlled reservoir of exchangeable H^+ sites. As the wine’s cations load the resin, exchange capacity is progressively consumed. In the automatic system, when a set target is reached (pH/conductivity setpoint), the equipment switches to regeneration.

RESIN REGENERATION (ACID+, ALCA-) AND WHY SULFURIC ACID IS USED

Once exchange sites are saturated, the resin must be returned to its acidic (H^+) form. STABYMATIC performs regeneration using Acid+, an activator based on 17% sulfuric acid, designed to restore the resin to the acid form while preserving polymer characteristics.

OPERATING CONCEPT AND CONTINUOUS WORK (TWO COLUMNS)

STABYMATIC 500, 1000 and 2000 are designed with separate circuits for wine and regenerants and are set up so they can work continuously: one column can be regenerating while the other is exchanging. This is a major practical advantage in harvest and bottling windows, because stabilization can proceed without long downtime between exchange and regeneration cycles.

AUTOMATIC VS SEMI-AUTOMATIC VS MANUAL: WHAT CHANGES FOR THE WINERY

STABYMATIC can operate in three modes:



- **Automatic:** the unit manages both exchange and regeneration, alternating cycles until it reaches the set target (setpoint).
- **Semi-automatic:** the operator selects the desired function; the machine executes that function (useful for wineries that want more control over sequencing).
- **Manual:** the operator can control individual utilities via touchscreen selection (for troubleshooting, special cycles, or very specific operational constraints).

The semi-automatic functional menu includes steps such as filling/recirculating the accumulator, rinsing, draining with nitrogen, and rinsing wine lines, essentially letting the cellar team “call” the required step when it fits their workflow.

IDEAL CONDITIONS

- Stable, clarified wine is generally preferred for predictable exchange kinetics and to keep the system clean, but STABYMATIC is engineered to maintain complete cation exchange even at elevated turbidity, thanks to the column geometry and diffuser design.
- Use the dedicated wash/regeneration programs (including alkaline wash when needed) to maintain performance over time.

AUTOMATIC MODELS

- **STABYMATIC 500:** up to 30 hL/h
- **STABYMATIC 500 Auto Single Column** (*batch / discontinuous*): up to 60 hL/h
- **STABYMATIC 1000:** up to 60 hL/h
- **STABYMATIC 1000 Auto GF:** up to 60 hL/h
- **STABYMATIC 2000:** up to 120 hL/h

ECO SEMI-AUTOMATIC/MANUAL MODELS

- **30 ECO:** up to 3 hL/h
- **50+50 ECO C:** up to 6 hL/h
- **100 ECO E:** up to 13 hL/h
- **200 ECO C:** up to 25 hL/h
- **500 ECO C:** up to 60 hL/h



E-FLOT

Batch flotation system



DESIGN AND FUNCTION

The E-FLOT system is a batch flotation unit designed specifically for the clarification of white and rosé musts prior to fermentation. From a mechanical standpoint, the system consists of a single or double screening unit to remove coarse solids from the must, a dedicated saturation tank equipped with controlled gas and fining-agent injection, and an integrated pump for circulation and transfer. Unlike continuous flotation systems, E-FLOT operates on batches, allowing the winemaker to adapt enzyme dosage, fining strategy and clarification targets to each individual lot of must.

In operation, gas, typically nitrogen, is introduced in a controlled manner to generate microbubbles with a high surface-area-to-volume ratio. These bubbles are optimized to attach to flocs formed by protein fining agents VE-GEL / VE-GEL Liquid (vegetable protein alternatives). Once attached, the buoyancy of the bubble-floc complex causes the solids to rise rapidly and form a compact flotation cap, while clarified must remains below and can be drained or racked.

FLOW CAPACITY AND MODEL RANGE

The E-FLOT system is available in multiple sizes to accommodate different winery scales, from small batch processing to high-throughput harvest operations. Each model is defined by its maximum processing capacity, expressed below in both hectoliters per hour and US gallons per hour.

- **E-FLOT 10:** ~120 hL/h
- **E-FLOT 25:** ~250 hL/h
- **E-FLOT 50:** ~500 hL/h
- **E-FLOT 80:** ~800 hL/h
- **E-FLOT 130:** ~1,300 hL/h

Model selection depends on average press load and cycle time, desired clarification window, winery logistics (tank availability and press rhythm), and peak harvest throughput requirements.



RED FAST

Rapid color extraction and cap management system



PRINCIPLE OF OPERATION

RED FAST is a compact and highly efficient system designed to accelerate colour extraction during red wine vinification while preserving phenolic balance. The system operates by injecting air or CO_2 into the must or wine, generating controlled bubbles that immerse the grape skins beneath the liquid surface. This promotes rapid diffusion of anthocyanins and desirable phenolics without the mechanical stress associated with aggressive pump-overs or délestage.

Unlike mechanical cap management systems, RED FAST relies on gas-driven turbulence, which enhances extraction kinetics while minimizing the release of harsh seed-derived or green tannins. The result is faster colour stabilization, improved chromatic intensity, and cleaner phenolic profiles.

PHYSICAL MECHANISM AND ENOLOGICAL IMPACT

The injected gas forms a single, large bubble at the outlet of a specially designed nozzle positioned approximately 30–50 cm below the cap. This bubble lifts and submerges the pomace uniformly, increasing skin–liquid contact while avoiding shear forces that could damage skins or extract vegetal components.

The system can operate in two distinct modes:

- **inert mode (CO_2):** when the suction pipe is placed inside the tank during active alcoholic fermentation, CO_2 is used, maintaining an oxygen-free environment and preserving reductive conditions
- **air mode:** when fermentation has not yet started or when the suction pipe is positioned outside the tank, air is used to stimulate yeast biomass production and color stabilization.

EQUIPMENT DESIGN AND PRACTICAL USE

RED FAST consists of:

- two stainless steel pipes (one for intake, one for injection)
- a dedicated gas injection nozzle
- and an integrated control unit.

The system is plug-and-play: it requires no permanent installation, no tank modification, and can be moved easily between tanks. Once connected to power and gas, it is immediately operational.

RED FAST is designed for tanks up to 300 hL.

ADVANTAGES

- Accelerates color extraction in hours rather than days.
 - Limits extraction of green or bitter tannins.
 - Preserves skin integrity and aromatic freshness.
 - No installation, minimal labor, high repeatability.
- RED FAST integrates seamlessly into modern red wine fermentation programs focused on precision extraction and phenolic balance.



DOSAPROP

Proportional in-line dosing system



CONCEPT AND ENOLOGICAL RATIONALE

DOSAPROP is an in-line proportional dosing system designed to add liquid oenological products with maximum precision and homogeneity. Unlike manual or batch dosing, DOSAPROP adjusts product addition in real time, proportionally to the flow of must or wine passing through the line.

This approach ensures:

- exact dosage regardless of flow variation
- perfect homogenization
- and repeatable results across different operations (racking, filtration, transfer, bottling).

DOSAPROP is particularly valuable when dosing reactive products such as tannins, gum Arabic, CMC, SO₂, fining aids, and stabilizers, where uneven distribution can lead to instability or sensory deviation.

HOW THE SYSTEM WORKS

At the core of DOSAPROP is a flow sensor installed in the transfer line. As wine, must, or crushed grapes pass through, the sensor continuously measures the actual flow rate and sends a signal to the PLC control unit. The PLC then commands one or more piston dosing pumps to inject the exact proportional quantity of product required.

The physical dosing mechanism is based on:

- AISI 316 stainless steel piston pumps, ensuring continuous (non-pulsed) flow
- inverter-controlled motor speed for micro-adjustment of dosage
- calibrated non-return valves preventing backflow or contamination of the product container.

This architecture guarantees dosing accuracy even under variable pressure or flow conditions.

DOSAPROP RANGE AND CONFIGURATIONS

The DOSAPROP family includes three main configurations:

- **DOSAPROP**

Designed for winery lines with flow rates from 6 to 60 hL/h. Available also in a dual-pump version to dose two different products simultaneously

- **DOSAPROP HI-FLOW**

Engineered for high-capacity operations, managing flows from 100 to 1,200 hL/h, suitable for must, wine, or crushed grapes. Equipped with DN80 or DN100 magnetic flow meters for precise readings at high throughput. Up to three products dosing.







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