HANDBOOK

enartis

Inspiring innovation.

ABOUT US

Founded in 2003, today Enartis is an international network of people who have made relationships with the winemaking community the key to its success. Strategic thinking and seizing new business opportunities have allowed the company to enter the diverse fermented beverage market as a whole.

Enartis has introduced more than 300 specialized products, including yeasts, tannins, enzymes, fermentation nutrients, bacteria, as well as stabilizing, clarification, and fining aids. Additionally, the company offers state-of-the-art technologies which can be integrated into the production process, technical support, and attentive and consistent customer service.

With more than 230 employees, three specialized departments (ENARTIS ENGINEERING, Enartis Technical Team, Enartis Labs), six enological laboratories in Italy, Spain, USA, Argentina, Australia and South Africa, 12 branches strategically located throughout the world, and due to close collaboration with universities and international wineries, Enartis guarantees full global support while adapting offerings to specific markets.

The international presence broadens the view of what is happening in the industry and enables the transfer of information and knowledge to clients in real-time.

Each year, the company invests in research and development, believing that innovation is an opportunity for growth and a means of responding to the evolving needs of the market. Openness to new technologies and artificial intelligence has led the company to offer innovative solutions for the digitization of winemaking and automation of state-of-the-art wineries.

Attention to sustainability and environmental protection, in line with the company's values, drive Enartis toward continuous improvement at both the production and process management levels.

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NEW PRODUCTS

BACK

ENZYMES

Enartis developed the EnartisZym Range through the combination of knowledge about individual enzymatic activities and practical experience in the winery.
The EnartisZym Range includes a series of enzymatic preparations formulated to obtain maximum effectiveness when used in classic and newer applications.

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Clarification

EnartisZym **RS**

FASTEST CLARIFICATION

- Liquid pectolytic enzyme preparation, rich in cellulasic and hemicellulasic side activities.
- Break down "hairy zone" of pectins and hemicelluloses.
- Intense clarification and fast depectinization.

APPLICATION	DOSAGE	PACKAGING
Settling of difficult-to-clarify musts; varieties rich in pectins; improve wine clarification and filterability; flotation	In must: 1-3 mL/hL (38-113 mL/1,000 gal) In wine: 2-5 mL/hL (75-190 mL/1,000 gal)	1 kg 10 kg

Flotation trial with EnartisZym RS

Flotation Trial - Mendocino County (California) 2022			
	% Solids	Yield	NTU
Control	9%	-	61.1
EnartisZym RS, 3 mL/hL	2%	93%	11.6

Maceration of White Grapes

EnartisZym **AROM MP**

- Micro-granulated pectolytic enzyme preparation developed to increase aromatic compound extraction, press yield, and improve juice clarification.
- Rich in cellulasic, hemicellulasic, and proteasic side activities.
- Contributes to protein stability thus reducing bentonite additions.

APPLICATION	DOSAGE	PACKAGING
Maceration of white grapes; production of fruity white wines; improved protein stability	20-40 g/ton	0.25 kg 1 kg

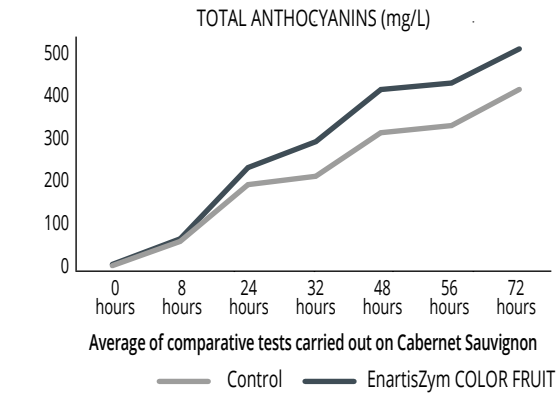
This is the reason why I chose to use EnartisZym AROM MP for my Sauvignon Blanc or for any of my thiol varieties. With this enzyme, I get excellent results not only from an aromatic point of view but also in terms of regarding extraction yield. By letting it act even for only the minimum contact time necessary, the enzyme allows complete depectinization of the must. I don't even have to do lengthy pressing. Product wonderful. **Philip Viljoen, Winemaker at Bon Courage Cellar - Robertson, South Africa**

NEW EnartisZym **COLOR FRUIT**

- Liquid pectolytic enzyme for red grape maceration and rapid extraction of color and aromatic precursors.
- Ideal for unevenly ripe grapes to maximize extraction of color and fruity aromas during short maceration.
- Improve clarification and filterability due to cellulase activity.

APPLICATION	DOSAGE	PACKAGING
Specific for the vinification of red grapes with intense color and aromas; for red grapes characterized by uneven ripening; accelerate and increase the extraction of phenolic compounds and aroma precursors	2-5 mL/hL (75-190 mL/1,000 gal)	1 kg

After 3 days of maceration, EnartisZym COLOR FRUIT extracts an anthocyanin concentration of more than 15%.



EnartisZym **COLOR PLUS**

ENHANCE COLOR

- Micro-granulated enzyme preparation developed to accelerate and increase the extraction of phenolic compounds, polysaccharides, and aromas from grape skins.
- Improves color stability and intensity.
- Hydrolyzes proteins and reduces precipitation of tannins and pigments.
- Rich in cellulasic and hemicellulasic side activities.

APPLICATION	DOSAGE	PACKAGING
Extraction and stabilization of color from red grapes; production of expressive and structured wine	20-40 g/ton	0.25 kg 1 kg

I use EnartisZym COLOR PLUS for better color extraction during maceration of red wines on the skins. We add it during crushing. I found that wines treated with this product had better color stability over time during ageing. Color intensity in red wines are also better when using EnartisZym COLOR PLUS vs a control.

Louwritz Louw, South Africa

EnartisZym **EZFILTER**

FAST FILTERABILITY

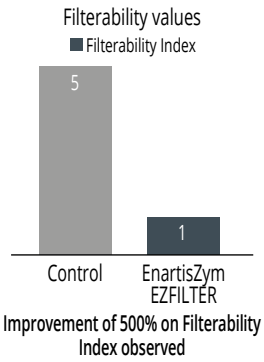
- Liquid enzymatic preparation with primary pectolytic and betaglucanase activities, and secondary rhamnosidase and hemicellulase activities.
- Improves clarification and filterability of must and wine due to its ability to hydrolyze polysaccharides, such as pectins and glucans, derived either from grapes or unwanted microorganisms.
- Can also be used to accelerate the release of mannoproteins both in fermentation and during maturation on lees.

APPLICATION
Improve filterability and clarification of wines from *botrytis* infected grapes; accelerate mannoprotein extraction; improve wine stability

DOSAGE
2-4 mL/hL
(75-150 mL/1,000 gal)

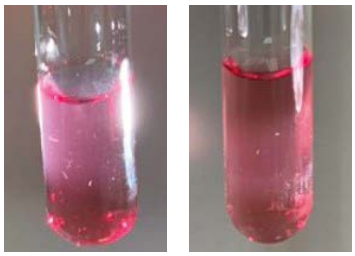
PACKAGING
1 kg
10 kg

EnartisZym EZFILTER improves filterability index up to 5 times.



Improvement of 500% on Filterability Index observed

Glucan Test



Control

EnartisZym EZFILTER after 3 week treatment

	Sample	Pectins	Glucans	Clogging Index
Red wine	Control	+	+	> 50
	3mL/hL EnartisZym EZFILTER	-	-	16
White wine	Control	+	-	> 50
	3mL/hL EnartisZym EZFILTER	-	-	36

Analysis on white and red wine filtered at 0.45 µm showed that in both cases that control wine was not filterable. However, the addition of EnartisZym EZFILTER significantly improved the filterability, rendering the wines free of pectins and glucans

Unfiltered wine: clogging index >50

EnartisZym Characteristics

	Clarification/ Flotation	Clarification by Flotation	Maceration of White Grapes	Maceration of Red Grapes	Color Stability	Flash Détente/ Thermovinification	Aromatic Enhancement	Yeast Lysis	Improve Filtration	*Botrytis*
EnartisZym **RS**	♦♦♦	♦♦♦							♦	♦
EnartisZym **AROM MP**	♦♦		♦♦♦				♦♦♦			
EnartisZym **COLOR FRUIT**				♦♦♦	♦♦	♦♦	♦♦		♦♦	
EnartisZym **COLOR PLUS**				♦♦♦	♦♦♦	♦♦				
EnartisZym **EZFILTER**								♦♦♦	♦♦♦	♦♦♦

About Enological Enzymes

WHY USE ENOLOGICAL ENZYMES?

Enzymes are essential for improving press yield, clarification, flotation, wine filterability, aroma and polyphenol extraction, as well as enhancing aromatic expression, improving mouthfeel, contributing to protein stability and helping to stabilize color.

WHAT ARE ENZYMES EXTRACTED FROM?

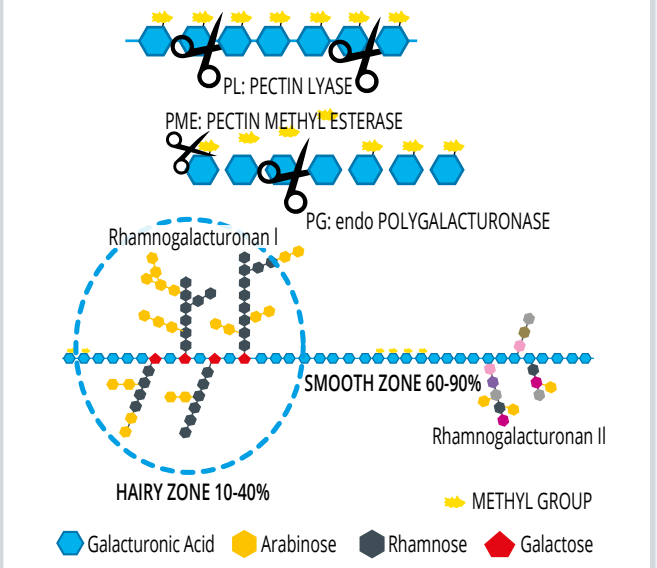
Enological enzymes are produced by diverse species of fungi such as *Aspergillus*, *Rhizopus* and *Trichoderma*, except for lysozyme which is extracted from egg whites.

WHY SO MANY PECTOLYTIC ENZYMES?

Pectolytic enzymes include enzymes (Figure 1) that break down homogalacturonan chains and enzymes that break down other pectin components such as rhamnogalacturonans I, II and their side chains. The balance between these pectolytic activities impacts the performance of the enzyme preparation.

- Pectin lyase (PL) randomly separates the pectin chain and releases midsize polymers. This activity promotes a fast depectinization and fast reduction of viscosity.
- Polygalacturonase (PG) separates galacturonic acids only when they are not esterified.
- Pectin methyl esterase (PME) de-esterifies galacturonic acid, allowing PG to perform.
- Rhamnogalacturonase, arabinanase and galactanase break down "branched pectins," commonly referred to as the "hairy zone." These activities are especially important to improve settling or filtration of difficult juices.

Figure 1: Representation of main pectolytic activities on pectin chains.



WHAT ARE THE DIFFERENCES BETWEEN POWDERED AND LIQUID FORMS OF ENZYMES?

Powdered enzymes are easy to store, have a long shelf life with limited risk of contamination and do not require preservatives. Liquid enzymes are convenient to use and dose, but require cold storage and have a shorter shelf life due to possible microbiological contamination after opening.

HOW LONG WILL POWDERED/GRANULAR ENZYMES REMAIN ACTIVE AFTER REHYDRATION?

Rehydrated powdered/granular enzymes should not be kept in liquid form for more than a few hours at room temperature.

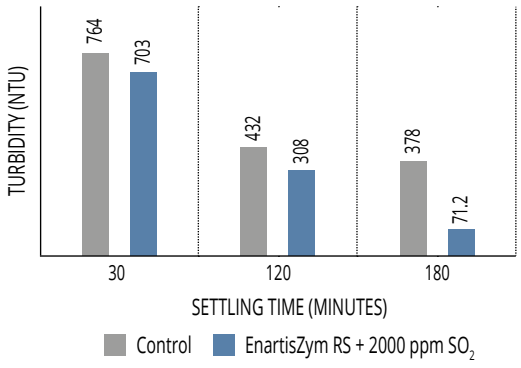
HOW DOES TEMPERATURE AFFECT ENZYMATIC ACTIVITIES?

Most enzymes are denatured at temperatures above 60°C and inactivated at temperatures below 5°C. Optimum temperature for enological enzymes is around 40°C.

DOES SO_2 AFFECT ENZYME ACTIVITY?

Even with an addition of 2000 ppm of SO_2, the enzymatic activity of EnartisZym RS, for example, is not affected (Figure 2). Using SO_2 and enzymes is fine, however timing is important. Add enzymes after SO_2 has adequately dispersed or vice versa. Do not add SO_2 and enzymes at the same time.

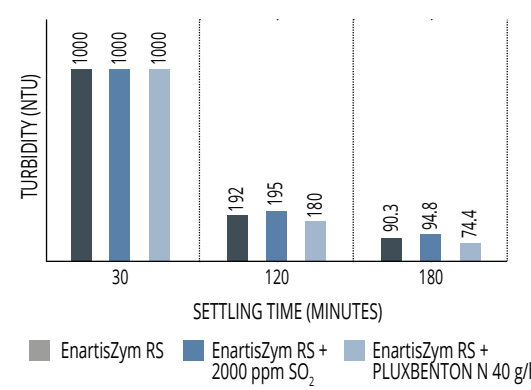
Figure 2: Impact of SO_2 addition on EnartisZym RS effect.



HOW DO TANNIN OR BENTONITE ADDITIONS INTERFERE WITH ENZYME ACTIVITY?

As shown, the addition of bentonite or tannin does not have a significant effect on the clarification capacity of EnartisZym RS (Figure 3). We recommend waiting 30 minutes after the complete homogenization of the enzyme before adding tannin or bentonite.

Figure 3: Impact of tannin and bentonite addition on EnartisZym RS effect.



HOW DO I DECIDE WHAT DOSAGE OF ENZYME TO USE?

Dosage is related to the desired effect, contact time, temperature and inhibiting factors. Cold temperatures, short contact times and alcohol presence can be compensated by applying a higher dosage rate.

BACK

YEASTS

One of the most important requirements a yeast must possess is the ability to ensure a healthy and complete fermentation, as this is the first step to create quality wine.
The knowledge and understanding of microbial characteristics, in addition to the practical experience gained over many years, has allowed Enartis to understand the needs of the market and suggest the application of each yeast to achieve the best quality wine, meeting winemakers' expectations.

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Centre of Excellence for Research in Microbiology (CERM)

The **Centre of Excellence for Research in Microbiology (CERM)** was established in 2024 with the aim of enhancing research, development, and innovation standards in the field of enological biotechnology. This initiative is the result of a long-standing collaboration between Enartis and Italiana Biotecnologie Srl, a company also within the Esseco Group and a leading name in biotechnology research in Italy.
Enartis has always been synonymous with innovation and quality in the alcoholic beverage sector, particularly in wine. With a history of continuous commitment to research, Enartis invests in and promotes numerous R&D activities, developing solutions that meet the evolving needs of the global wine market.

Excellence and Quality CERM Solutions

CERM represents qualitative and operational excellence and in-depth knowledge in the field of biotechnology. Many Enartis' yeasts and nutrients that are known for their efficiency and reliability proudly have the CERM mark of excellence. These products, developed with the support of advanced research by Italiana Biotecnologie, are widely recognized for their significant contribution to the improvement of winemaking processes and the quality of the final wine.

MISSION

CERM is dedicated to excellence in innovation, research, and the development of biotechnology products primarily used in enology.

The collaboration will focus mainly on the study of yeast (*S. cerevisiae* and *non-Saccharomyces*), yeast derivatives, activators, and nutrients, using cutting-edge methodology and technology to explore new aspects in depth. The goal is to thoroughly understand the behavior of these products under various operational conditions to enhance their effectiveness and efficiency in winemaking processes.
CERM represents qualitative and operational excellence and in-depth knowledge in the field of biotechnology. Many yeast and activators that Enartis, known for their efficiency and reliability, proudly bear the CERM mark of excellence. These products, developed with the support of advanced research by Italiana Biotecnologie, are widely recognized for their significant contribution to the improvement of winemaking processes and the quality of the final wine.

Collaboration with

ITALIANA BIOTECNOLOGIE

Italiana Biotecnologie**, a research and innovation center in the field of biotechnology and part of the multinational Esseco Group, **has always been a strategic partner of Enartis in the selection, characterization, production, and quality control of yeast.
Renowned for its scientific rigor and expertise, Italiana Biotecnologie brings its extensive experience in applied biotechnology to enology to the "Centre of Excellence for Research in Microbiology."
The combination of these skills allows CERM to study, validate, and create biotechnology solutions that meet industry expectations and lead to the optimization of the entire process.

****Discover our CERM products! You will find them next to the CERM logo in this catalog.**

Yeast Inoculum: different strategies

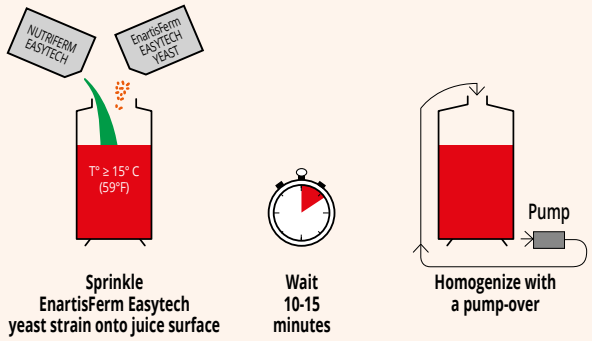
EASYTECH: DIRECT INOCULATION

Easy tech CERTIFIED BY ENARTIS

NO REHYDRATION REQUIRED!

Easytech is a certified range of Enartis yeasts and nutrients that can be added directly to juice rather than requiring typical rehydration and acclimatization steps. This innovative range simplifies cellar operations and reduces the risk of making mistakes at inoculation, saving wineries time and money. The Enartis Easytech range was developed to make winery operations **more sustainable** by reducing resources needed to adequately prepare inoculations, including equipment, energy, water, and staff. The use of Easytech nutrients in the application of these yeasts maximizes their adaptation under stress conditions. Easytech yeasts ensure optimal fermentation performance in juices with temperatures above 15°C.

Simply sprinkle the product in before a pump-over or punch down:



Sprinkle EnartisFerm Easytech yeast strain onto juice surface

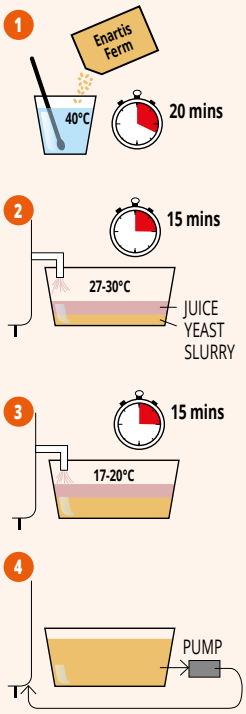
Wait 10-15 minutes

Homogenize with a pump-over

Enartis Easytech range is also suitable for traditional yeast rehydration.

****Discover our Easytech yeasts! You will find them next to the Easytech logo in this catalog.**

TRADITIONAL INOCULATION



Rehydrate 20-40 g/hL of active dry yeast in 10 times its weight of chlorine-free water at 35-40°C (95-104°F).

Stir gently to break up any clumps. Wait 20-30 minutes.

Slowly add some juice/must to yeast suspension to drop temperature: temperature drop should not be more than 10°C (18°F).

This helps yeast acclimate to cool temperature of the juice and avoid cold shock. Let stand for 15 minutes.

Repeat (2) until the temperature difference between the tank and yeast slurry is below 10°C (18°F).

Add yeast slurry to the bottom of the fermentation vessel and mix the tank.

This protocol applies to all EnartisFerm yeast strains in Active Dry Yeast (ADY) form, with the exception of non-*Saccharomyces* yeasts.

WHITE AND ROSÈ VINIFICATION

EnartisFerm **AROMA WHITE**

Easy tech CERTIFIED BY ENARTIS

- Expresses varietal aromas. Due to its ß-lyase activity, it is ideal for thiolic varieties such as Sauvignon Blanc, Pinot, Riesling, and Gewurztraminer.
- Fermentation at 14-16°C (57-61°F) favors fresh citrus and mineral notes; 17-20°C (62-68°F) favors tropical and sweet white fruit aromas.
- Low producer of riboflavin: reduced risk of light-struck defect.
- Moderate speed fermenter.
- Medium/high nutrient requirements.

APPLICATION	DOSAGE	PACKAGING
Thiol production; ester and acetate production; direct inoculation	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg 10 kg

EnartisFerm **VINTAGE WHITE**

- Enhances varietal aromas, produces delicate wines with round and complex mouthfeel.
- Releases large quantities of polysaccharides.
- Forms lightly-compacted lees reducing the number of *bâtonnage* and pump-overs needed for *sur lie* effect.
- Moderate speed fermenter.
- Low nutrient requirements.

APPLICATION	DOSAGE	PACKAGING
Varietal expression; barrel fermentation; lees ageing; increased volume on the palate	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg 10 kg

EnartisFerm **ES123**

- Blend of two *S. cerevisiae* yeasts selected for varietal aroma expression in white wines.
- Produces fresh and long-lasting aromas of white fruit, flowers, and citrus fruit.
- Excellent for neutral and aromatic varietals and ideal for second fermentations with *Charmat* method.
- Medium speed fermenter.
- Medium/high nutrient requirements.

APPLICATION	DOSAGE	PACKAGING
Fresh and easy-to-drink wines; fruity white wines obtained from neutral grapes; ester and acetate production; fresh sparkling wines; sweet wines	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg 10 kg

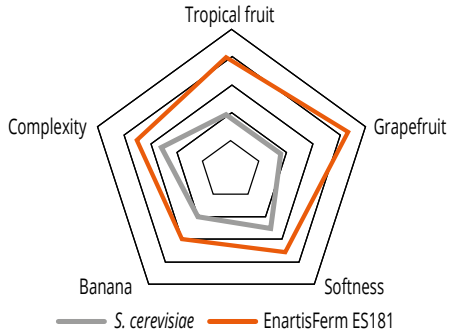
I have been using EnartisFerm ES181 for more than 10 years. Without fail it has been a reliable companion helping me produce quality white wines my clients have become accustomed to. **Henri Swiegers, Production Manager & Winemaker at Badsberg Wine Cellar - South Africa**

EnartisFerm **ES181**

- Produce white and tropical fruit aromas, increasing the aromatic complexity without overshadowing the primary aromas.
- Excellent for fermentations at low temperatures and in hyper-reductive conditions.
- Ideal for thiol expression, thanks to its ß-lyase activity.
- Fast fermenter.
- Low nutrient requirements.
- Low VA, H_2S and SO_2 production.

APPLICATION	DOSAGE	PACKAGING
Intense aromas; thiol production; varietal expression; ester and acetate production	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg 10 kg

EnartisFerm ES181 aromatic expression comparison to other *Saccharomyces cerevisiae*.



EnartisFerm **Q9**

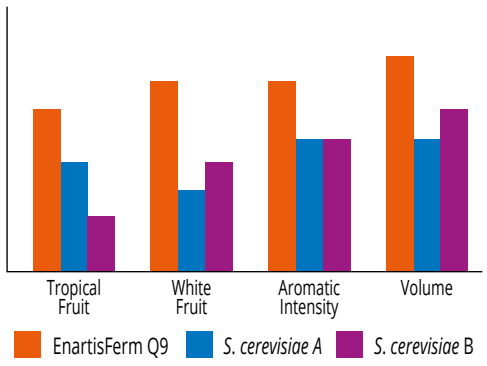
- Produces fruity white and rosé wines, respecting the variety profile.
- Fermentation at low temperature favors mineral notes (flint, gunpowder, smoke, roasted coffee).
- Fermentation at high temperature produces high amounts of esters and acetates.
- Fast fermenter.
- Medium/high nutrient requirements.
- Low VA, H2S and SO2 production.

APPLICATION
Thiol production (minerality); varietal expression; ester and acetate production; intense aromas

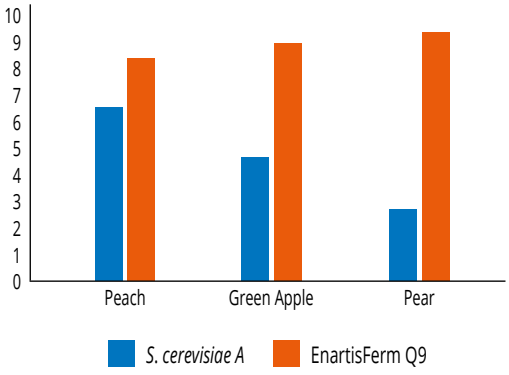
DOSAGE
20-40 g/hL
(1.7-3.4 lb/1,000 gal)

PACKAGING
0.5 kg

EnartisFerm Q9 aromatic expression comparison to other *Saccharomyces cerevisiae*.



Comparative tasting on Trebbiano



Aromatic production trials on Muscat

EnartisFerm **Q4**

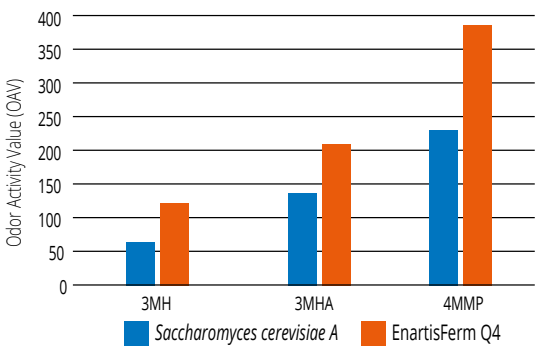
- Enhances aromatic characteristics of thiolic varieties.
- This strain carries a complete, long version of the IRC7 gene, which produces a unique β-lyase enzyme responsible for releasing thiols, particularly 4-MMP, by breaking bonds with cysteine.
- Expresses varietal aromas and enhances notes of box tree, gooseberries, tomato leaf, citrus, and blackcurrant associated with 4-MMP.
- Moderate speed fermenter.
- High nutrient requirements.

APPLICATION
production of complex white wines; thiolic varieties

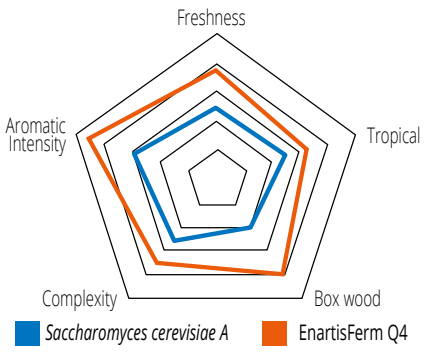
DOSAGE
20-40 g/hL
(1.7-3.4 lb/1,000 gal)

PACKAGING
0.5 kg
10 kg

EnartisFerm Q4 aromatic expression comparison to other *Saccharomyces cerevisiae*.



Average of comparative tests carried out on thiol varieties



Comparative tasting on Sauvignon blanc

EnartisFerm Q CITRUS gave my wines incredible aromatics and massive sensory expression. We frequently perceive distinct notes of pineapple, orange and guava. EnartisFerm Q CITRUS reminds me of landing in Hawaii! **Lucas Meeker, Winemaker at The Meeker Vineyards - California, USA**

EnartisFerm **Q CITRUS**

- Expresses terpenes, norisoprenoids, and thiols (ß-glucosidase activity).
- Produces complex wines with intense zesty, citrus notes (grapefruit), tropical fruit (guava, passion fruit, pineapple) and flowers (jasmine, lime blossom).
- Fast fermenter.
- Medium nutrient requirements.
- Low VA and H_2S production.

APPLICATION	DOSAGE	PACKAGING
Varietal expression; fresh and citrus aromas; thiol production; ester and acetate production	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg 10 kg

RED VINIFICATION

EnartisFerm **RED FRUIT**

- Expresses terpenes and norisoprenoids (ß-glucosidase activity).
- Produces intense aromas of red berry and violet, and high quantity of glycerol. Wines exhibit freshness and smoothness on the palate.
- Fast fermenter.
- High nutrient requirements.

APPLICATION	DOSAGE	PACKAGING
Rosé wines; fruity, young or moderately aged red wines; esters production	200-400 g/ton	0.5 kg 10 kg

EnartisFerm **VINTAGE RED**

- Ideal for wines meant for ageing. Produces elegant, complex wines with rich red fruit and spice notes, and round, full-bodied mouthfeel.
- High production of glycerol and mannoproteins.
- Medium nutrient requirements.
- Wide fermentation temperature range (18-35°C).

APPLICATION	DOSAGE	PACKAGING
Varietal expression; medium to long ageing; premium red wines; oak ageing; structure and roundness	200-400 g/ton	0.5 kg 10 kg

EnartisFerm **ES454**

- Produces elegant, complex, varietal wines with spicy and red fruit aromas and balanced structure.
- Excellent for terroir expression, high quality grapes, and medium to long ageing.
- Moderate speed fermenter.
- Medium nutrient requirements.
- Low VA, SO_2 and H_2S production.

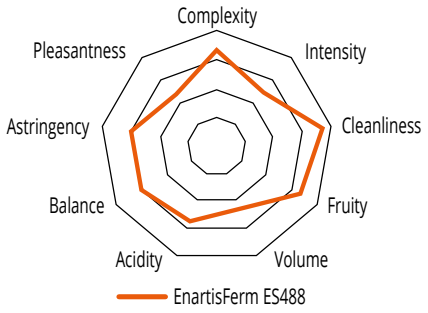
APPLICATION	DOSAGE	PACKAGING
Varietal expression; esters production; premium red wines; intense and stable color; structure and roundness	200-400 g/ton	0.5 kg 10 kg

EnartisFerm **ES488**

- Reduces herbaceous notes in unripe grapes.
- Enhances thiol aromas in red wines, adding freshness with notes of violet, black berries, and licorice.
- Moderate speed fermenter.
- High nutrient requirements.
- Low VA, SO_2 and H_2S production.

APPLICATION	DOSAGE	PACKAGING
Thiol production; reduce herbaceous notes; unripe grapes; medium to long ageing	200-400 g/ton	0.5 kg 10 kg

Average of tasting on italian red wines fermented with EnartisFerm ES488.



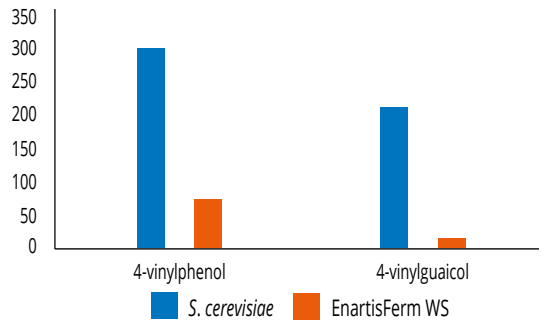
EnartisFerm **WS**

ZINFANDEL ISOLATE FROM WILLIAMS SELYEM WINERY, CALIFORNIA

- A very robust yeast, enhances structure and tannins while preserving varietal character.
- Produces elegant, clean, fresh, fruity and spicy wines with round and smooth mouthfeel.
- Fast fermenter.
- High alcohol tolerance (up to 18%).
- Suitable for riboflavin reduction.
- Low production of vinylphenol and vinylguaiacol.

APPLICATION	DOSAGE	PACKAGING
Wide spectrum of red varietals; high °Brix grapes; restart stuck fermentations	200-400 g/ton	0.5 kg 10 kg

EnartisFerm WS comparison to *S. cereviasie*: Average production of phenols in white wine.



EnartisFerm **D20**

HEAT TOLERANT

CABERNET SAUVIGNON ISOLATE FROM DAOU VINEYARDS & WINERY, CALIFORNIA

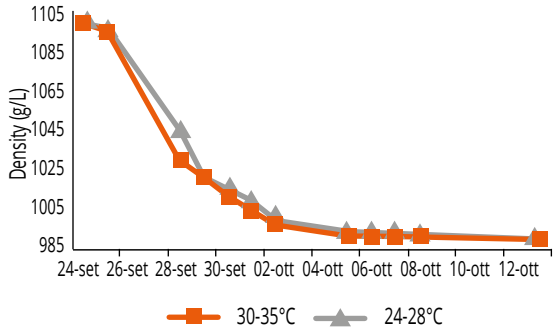
- Ideal for Bordeaux varieties, emphasizes black fruit, floral, and spice aromas, minimizing herbaceous notes.
- Produces powerful, complex and structured wines with long ageing potential.
- High alcohol tolerance (up to 17%) and resistant to high temperatures (up to 38°C).
- Moderate speed fermenter.
- Medium nutrient requirements.

APPLICATION
High °Brix grapes; varietal expression; high temperature fermentation; white, rosé and red wines; fruity aromas; ester and acetate production

DOSAGE
200-400 g/ton

PACKAGING
0.5 kg
10 kg

EnartisFerm D20 fermentation with and without temperature control.



ENARTIS
California Premium Vineyards Collection

Continuing the tradition of isolating, characterizing and preserving indigenous microflora from selected vineyards, Enartis USA provides the industry with selected microbiological cultures either as exclusive, proprietary cultures or as commercial strains, available in active dry form.

EnartisFerm WS: MORE THAN 30 YEARS OF EXCELLENCE
With more than 30 years of history, EnartisFerm WS is a cult yeast, highly appreciated around the world for many varieties and wine styles.

EnartisFerm D20: FAST SUCCESS FOR OBVIOUS QUALITY STRAIN
In 2013, Daniel Daou approached Enartis to isolate a yeast resistant to high fermentation temperatures and leading to stable color and balanced tannins. The isolation started with Cabernet Sauvignon grapes coming from the top block on DAOU Mountain in Paso Robles, in the Adelaida Appellation. In 2015, after many trials and selections of isolates, EnartisFerm D20 in active dry form was produced and its success is already recognized around the world.

EnartisFerm **Q5**

- Ideal for barrel-aged wines.
- Expresses terpenes and norisoprenoids (ß-glycosydase activity).
- Produces structured red wines with intense fruit and floral notes (strawberry, raspberry, black cherry), and rich in color.
- Moderate speed fermenter.
- Medium nutrient requirements.
- High production of glycerol.

APPLICATION	DOSAGE	PACKAGING
Varietal expression; esters production; extended barrel ageing	200-400 g/ton	0.5 kg

EnartisFerm **Q7**

- Ideal for warm regions and high-alcohol wines (alcohol tolerant up to 16.5-17%). Used for both young and aged wines.
- High production of fresh fruit, plum, dark cherry, ripe berry, and spicy aromas.
- Excellent for freshening overripe and jammy fruit notes.
- Medium nutrient requirements.

APPLICATION	DOSAGE	PACKAGING
Hot climates freshen overripe grapes; high °Brix grapes; medium-long ageing	200-400 g/ton	0.5 kg

MULTIPURPOSE YEASTS

EnartisFerm **EZFERM 44**

- Fructophilic yeast, ideal to prevent or restart sluggish/stuck fermentations.
- *Saccharomyces cerevisiae* and *bayanus*.
- Alcohol tolerant (up to 17.5%).
- Low nutrient requirements.
- Fast fermenter.
- Wide fermentation temperature range (12-34°C).
- Low VA, H_2S and SO_2 production.

APPLICATION	DOSAGE	PACKAGING
Restart stuck fermentations; hot climate grapes and drought areas	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg 10 kg

EnartisFerm **ES PERLAGE**

- Ideal for sparkling wines, produces clean, elegant, delicate, and complex wines with round and balanced mouthfeel.
- Fast fermenter.
- Alcohol tolerant (up to 17%), resistant to SO_2 and low pH.
- Wide range of fermentation temperatures (10-30°C).
- Low nutrient requirements.
- Low VA, H_2S and SO_2 production.

APPLICATION	DOSAGE	PACKAGING
High quality sparkling base wines; traditional method; *Charmat* method; white and rosé wines	20-40 g/hL (1.7-3.4 lb/1,000 gal)	0.5 kg

NEW

EnartisFerm **Q MCK**

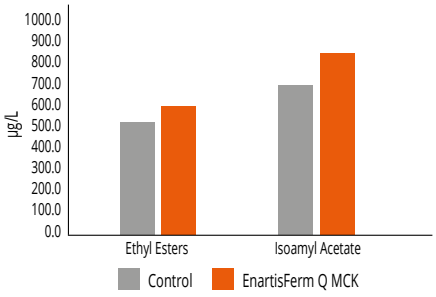
- *Metschnikowia pulcherrima* strain.
- Bioprotection during grape harvest and pre-fermentation stages in white, red, and rosé must.
- Natural alternative to the use of sulfur dioxide.
- Requires inoculation with a *Saccharomyces cerevisiae* yeast to ensure alcoholic fermentation.

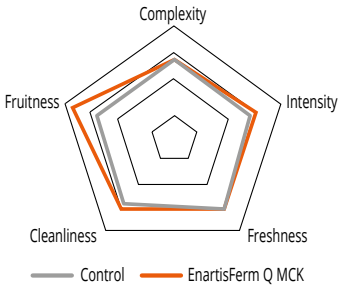
APPLICATION
During mechanical or hand harvest; white, red, and rosé must; bioprotection during pre-fermentation stages; cold stabulation

DOSAGE
5-15 g/hL
(0.4-1.3 lb/1,000 gal)

PACKAGING
0.5 kg

Gas Chromatograph analysis shows that ethyl esters and isoamyl acetate are higher with EnartisFerm Q MCK during stabulation and, as shown in the graph below, have a positive impact on sensory characteristics.





EnartisFerm **Q RHO**

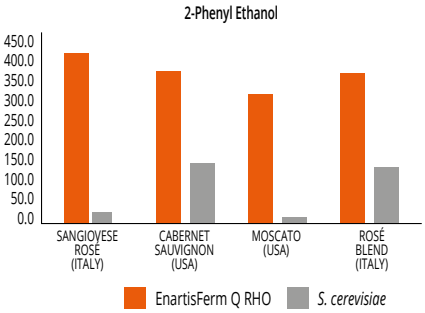
- *Saccharomyces uvarum* strain.
- Produces high amounts of glycerol, acetates, and phenylethanol (rose aroma).
- Low temperature tolerance.
- Preserves and increases total acidity enhancing wine freshness.
- Low alcohol yield.
- Low production of volatile acidity.

APPLICATION
White, red and rosé wines for blending or wine adjustments; increase acidity; reduce sugar/alcohol yield; increase aroma complexity and softness

DOSAGE
20-40 g/hL
(1.7-3.4 lb/1,000 gal)

PACKAGING
0.5 kg

An increase in glycerol with a consequent reduction in alcohol yield is observed in fermentations with EnartisFerm Q RHO.



	S. cerevisiae	EnartisFerm Q RHO
pH	3.71	3.38
Glycerol (g/L)	9.15	11.45
% Alc. (V/V)	13.19	12.76

EnartisFerm **Q TAU FD**

- Freeze-dried strain of *Torulaspora delbrueckii*.
- Produces wines with high levels of esters and terpenes, for increased aromatic intensity, fruitiness, complexity, and mouthfeel.
- Suitable for sequential inoculation with *Saccharomyces* strains, or solo use up to 12% potential alcohol.
- Slow fermenter.
- Low nutrient requirements.
- Very low VA, H_2S and SO_2 production.

APPLICATION
Fruity wines; wine produced from dried grapes; sparkling base wines; reduce volatile acidity

DOSAGE
20-30 g/hL
(1.7-2.5 lb/1,000 gal)

PACKAGING
0.5 kg

ALSO **AVAILABLE**

EnartisFerm **ES U42**

A blend of *Saccharomyces uvarum* and *Saccharomyces cerevisiae* for low-temperature fermentations. Produces high glycerol, low volatile acidity, and enhances rose and spicy aromas.

EnartisFerm **Q ET**

A versatile yeast for direct inoculation without rehydration, simplifying the process and reducing inoculation errors.

EnartisFerm **SB**

A fast-fermenting yeast with short lag phase and suitable across a broad temperature range. Produces clean wines with low volatile acidity and H_2S.

Yeast/Wine Style Recommendations

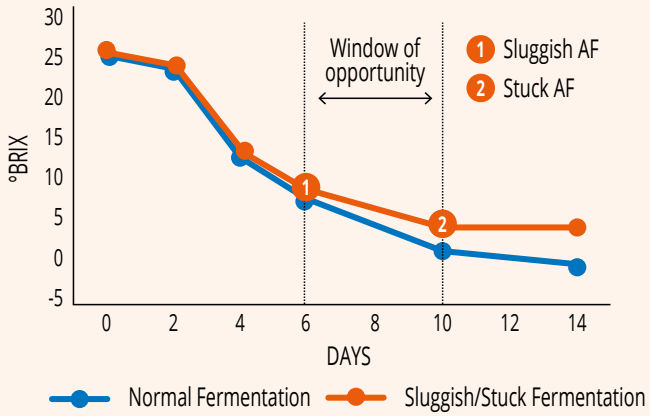
	Varietal Expression	Thiol Expression	Ester And Acetate Production	High Aromatic Impact	Young Whites	Aged Whites	Rosés	Young Reds	Reserve Reds	Late Harvest	Sparkling Base Wines	Stuck Fermentations
EnartisFerm **AROMA WHITE**	●	●	●	●	●	●	●					
EnartisFerm **VINTAGE WHITE**	●				●	●	●					
EnartisFerm **ES123**	●		●		●	●	●					
EnartisFerm **ES181**	●	●	●		●	●	●				●	
EnartisFerm **Q9**	●	●	●	●	●	●	●					
EnartisFerm **Q CITRUS**	●				●		●					
EnartisFerm **RED FRUIT**	●		●	●			●	●				
EnartisFerm **VINTAGE RED**	●								●			
EnartisFerm **ES454**	●								●			
EnartisFerm **ES488**	●	●					●	●	●			
EnartisFerm **WS**	●						●	●	●		●	●
EnartisFerm **D20**	●		●	●		●		●	●			
EnartisFerm **Q5**	●		●						●			
EnartisFerm **Q7**	●							●	●			
EnartisFerm **EZFERM 44**	●									●		●
EnartisFerm **ES PERLAGE**	●										●	
EnartisFerm **Q RHO**			●	●	●		●	●		●		
EnartisFerm **Q TAU FD**			●	●	●	●	●	●	●			
EnartisFerm **Q MCK**	●	●	●	●	●	●	●	●	●	●	●	

Enartis Yeast Characteristics

	Temperature	Lag Phase	Fermentation Speed	Alcohol Tolerance	Killer Factor	Compatibility with MLF	Nitrogen Needs
EnartisFerm **AROMA WHITE** *S. cerevisae*	14-24°C (57-75°F)	Short	High	15%	Killer	Neutral	Medium-High
EnartisFerm **VINTAGE WHITE** *S. bayanus*	14-24°C (57-75°F)	Short	Medium-Slow	15,5%	Killer	Good	Low
EnartisFerm **ES123** *S. cerevisae + S. bayanus*	15-25°C (59-77°F)	Medium	Medium-Slow	15%	Killer	Low	High
EnartisFerm **ES181** *S. cerevisae*	10-20°C (50-68°F)	Medium	High	16,5%	Killer	Low	Low
EnartisFerm **Q9** *S. cerevisae*	14-20°C (57-68°F)	Medium	Medium-Slow	14,5%	Neutral	Neutral	Medium
EnartisFerm **Q CITRUS** *S. cerevisae*	10-20°C (50-68°F)	Medium	Medium-Slow	15%	Neutral	Low	Medium
EnartisFerm **RED FRUIT** *S. cerevisae*	15-20°C (59-68°F)	Medium	Medium-Slow	15%	Neutral	High	Medium
EnartisFerm **VINTAGE RED** *S. cerevisae*	15-32°C (59-90°F)	Short	High	16%	Killer	High	Low
EnartisFerm **ES454** *S. cerevisae*	15-30°C (59-86°F)	Short	High	16%	Killer	High	Medium
EnartisFerm **ES488** *S. cerevisae*	15-28°C (59-82°F)	Medium	Medium-Slow	16%	Killer	High	High
EnartisFerm **WS** *S. cerevisae*	16-30°C (61-86°F)	Short	Medium-Slow	18%	Neutral	Neutral	Medium
EnartisFerm **D20** *S. cerevisae*	18-38°C (64-100°F)	Short	Medium-Slow	17%	Neutral	Neutral	Low
EnartisFerm **Q5** *S. cerevisae*	15-32°C (59-90°F)	Short	High	16%	Neutral	High	Medium
EnartisFerm **Q7** *S. cerevisae*	16-30°C (61-86°F)	Short	Medium-Slow	16,5%	Neutral	Neutral	Low
EnartisFerm **EZFERM 44** *S. bayanus*	15-30°C (59-86°F)	Short	Medium-Slow	17,5%	Neutral	Neutral	Low
EnartisFerm **ES PERLAGE** *S. cerevisae*	10-30°C (50-86°F)	Short	Medium-Slow	17%	Killer	Neutral	Low
EnartisFerm **Q MCK** *S. cerevisae*	4-20°C (40-68°F)	-	-	15%	-	Neutral	Medium
EnartisFerm **Q RHO** *S. uvarum*	8-25°C (46-77°F)	Medium	Slow	-	Neutral	Low	Medium
EnartisFerm **Q TAU FD** *Torulaspora delbrueckii*	17-25°C (63-77°F)	Medium-High	Slow	11,5%	-	-	Medium-High

Protocols to Restart and Complete Sluggish or Stuck Fermentations

The successful restart of a sluggish or stuck fermentation depends on an accurate diagnosis and fast intervention with the correct treatment.



PROTOCOL 1 : Sluggish Fermentation

The moment a fermentation becomes sluggish, seize the 'window of opportunity'. Quick intervention may help restore yeast vitality and avoid a full restart later.

1. Maintain temperature >20°C (68°F).
2. Press off skins or rack off lees (recommended).
3. Treat must or juice with 10-15 g/hL of EnartisStab MICRO M. Keep EnartisStab MICRO M in suspension for 30-60 minutes by mixing the must.
4. Rack off lees 24 hours after treatment (recommended).
5. Treat with 30 g/hL of NUTRIFERM NO STOP.
6. Track fermentation rate (Δ°Brix/day) and volatile acidity for the next few days.
7. If fermentation rate increases, monitor until desired dryness is achieved.

In some circumstances, low viability and difficult conditions can prevent a sluggish fermentation from completing. In this scenario, proceed to *Protocol 2*.

PROTOCOL 2 : Stuck Fermentation

The yeast population is no longer viable. It is necessary to acclimatize and add a new population of yeast to the wine.

STEP 1: Preparing the starter

In a sanitized tank capable of holding the full volume of stuck wine, prepare a solution consisting of the following.

- 250 L of stuck wine (2.5 percent of the total volume of wine to be treated).
- 250 L of water (equal to the volume of wine to be diluted). 1 kg (10 g/hL) of NUTRIFERM ULTRA.
- Add concentrated must or sugar to bring the sugar content of the solution to 50 g/L or 5° Brix
- Adjust the sugar level to 50 g/L (5°Brix).
- Keep the temperature at 20-23°C (68-73°F).

STEP 2: Yeast rehydration

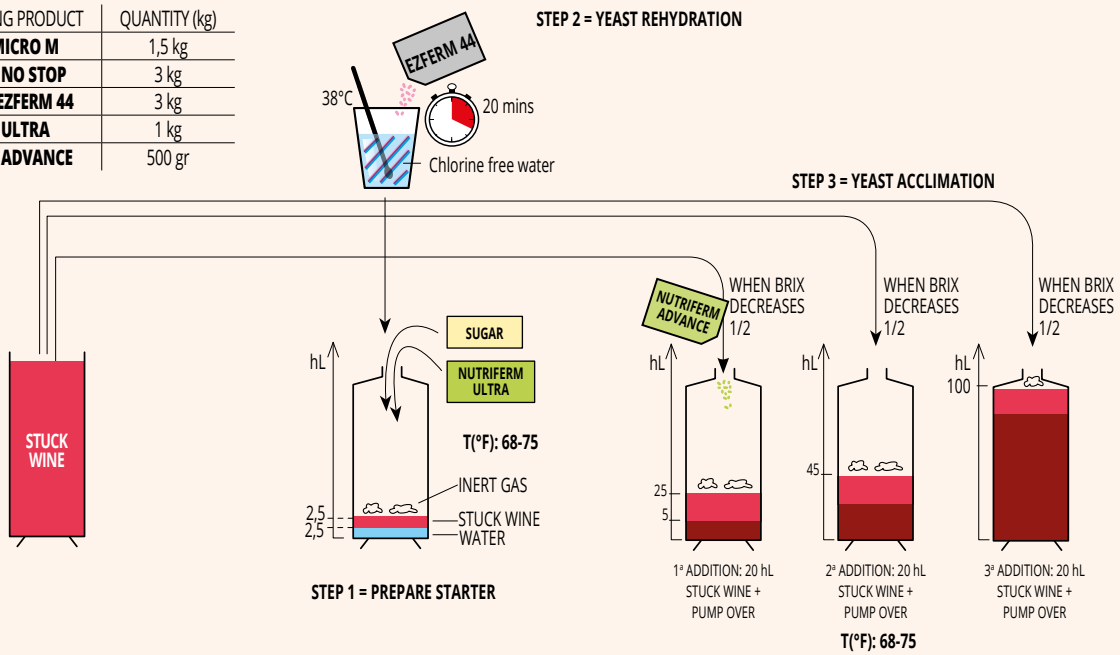
In 40 L of water at 35-38°C (95-100°F), being careful not to exceed 40°C (104°F), add 3 kg (30 g/hL) of EnartisFerm EZFERM 44 yeast while stirring gently.
Wait 20 minutes.

PRODUCT NEEDS FOR 100 hL:

WINEMAKING PRODUCT	QUANTITY (kg)
EnartisStab **MICRO M**	1,5 kg
NUTRIFERM NO STOP	3 kg
EnartisFerm **EZFERM 44**	3 kg
NUTRIFERM ULTRA	1 kg
NUTRIFERM ADVANCE	500 gr

STEP 3: Acclimate yeast and start fermentation

- Add the rehydrated yeast to the water/wine solution prepared in STEP 1 and stir. Keep the temperature at 20-23°C and monitor the sugar content. Caution: before proceeding with inoculation, make sure the temperature difference between the yeast suspension and the solution is less than 10°C (18°F).
- Monitor the sugar content of the starter. Do not let it go dry!
- When the sugar content is reduced by half (<2.5°Brix), add 20 hL of stuck wine (equal to 20% of the total volume of arrested wine) + 500 g of NUTRIFERM ADVANCE (equal to 25 g per 20 hL of stuck wine) to the starter.
- When the sugar content of this fraction is also halved, add another 20 hL of stuck wine (equal to 20% of the total volume).
- Repeat the operation described in the previous step (addition of the remaining 60 hL of stuck wine in fractions of 20 hL each) until the mass is exhausted.



BACK

YEAST NUTRIENTS

Understanding the nutritional requirements of yeast is fundamental in order to accomplish a successful fermentation and prevent stuck fermentations. Managing nutrient requirements not only allows for regular and complete fermentations but enhances sensory quality. Enartis has a wide range of nutrients which provide solutions for many different conditions and purposes.

enartis

Inspiring innovation.

EASYTECH NUTRIENTS

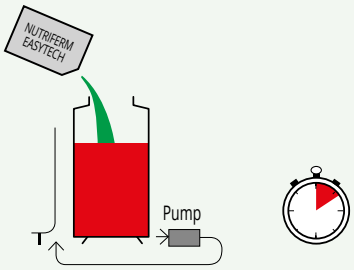
Easytech
CERTIFIED BY ENARTIS

No prior dissolution required!

Easytech is a certified range of Enartis yeasts and nutrients that can be added directly to juice rather than requiring typical rehydration steps. This innovative range simplifies and minimize cellar operations, saving wineries time, labor, and money. Enartis offers two fermentation activators:

- **NUTRIFERM ULTRA**
- **NUTRIFERM AROM PLUS**

Easytech **nutrients** are micro-granulated, meaning they are less powdery and safer to use. They are also easier to dissolve directly in must without creating clumps and provide immediately available nutrients for yeasts due to the high solubility rate.



Just one step!

Easytech
CERTIFIED BY ENARTIS

NUTRIFERM AROM PLUS

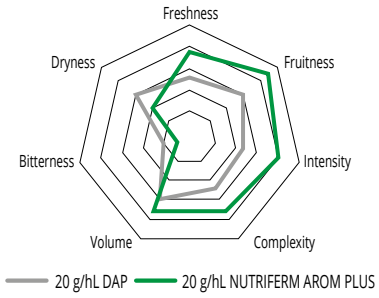
IMPROVE AROMATICS

- Autolyzed yeast with an elevated content of free amino acids, survival factors, and thiamine (vitamin B1). Survival factors improve yeast viability and ensure successful fermentations.
- Elevated content of selected amino acids used by yeast as precursors of aromatic compounds to strongly increase intensity and complexity.
- Granulated nutrient formulated to be added directly to juice without prior dissolving (**Easytech**).

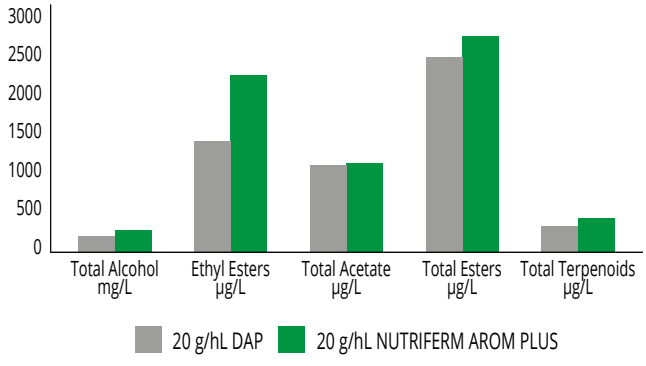
APPLICATION	DOSAGE	PACKAGING
Ensure optimal yeast growth; enhance secondary aroma production	15-30 g/hL (1.3-2.4 lb/1,000 gal)	1 kg 10 kg

NUTRIFERM AROM PLUS is far and away the best performing complex yeast nutrition on the market! When added during rehydration of the yeast, it ensures a complete and steady fermentation, assisting yeast in fermentation to produce a complex flavor profile in any wine style. **Rianco van Rooyen, Winemaker at Robertson Winery - South Africa**

Tasting comparison of white wine with inorganic nutrition (DAP) vs pure organic nutrition (NUTRIFERM AROM PLUS).



Gas chromatograph analysis at the end of fermentation. The wine fermented with NUTRIFERM AROM PLUS has higher levels of aromatic compounds.

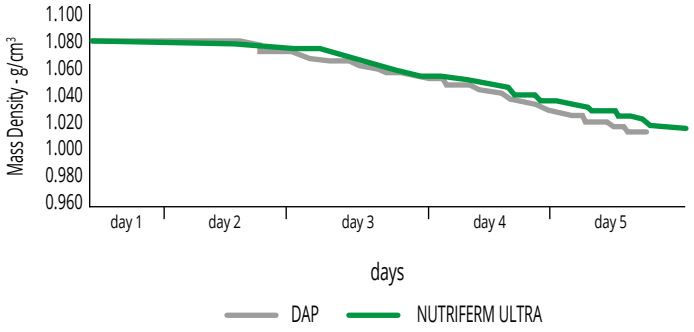


NUTRIFERM ULTRA

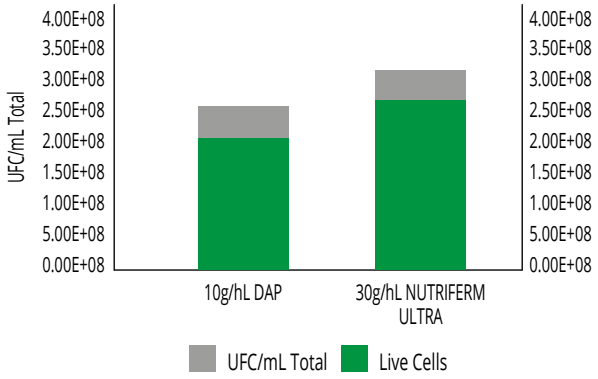
- Granular organic nutrient providing all nutritional factors necessary to improve yeast viability: easily assimilable amino acids, thiamine (vitamin B1), long-chain fatty acids, sterols, and vitamins.
- Promotes regular, complete fermentation, leading to wines free of defects with clean aromas and flavors.
- **Easytech** formulation: to be added directly to juice, without prior dissolving.

APPLICATION	DOSAGE	PACKAGING
Promotes a regular and complete fermentation; enhance the varietal expressions	10-30 g/hL (0.8-2.4 lb/1,000 gal)	1 kg 10 kg

Fermentation kinetics analyzed by Winegrid. Mass density comparison of inorganic nutrition (DAP) and organic nutrition (NUTRIFERM ULTRA).



Total cells and live cells are higher with organic nutrition (NUTRIFERM ULTRA).



NUTRIFERM ADVANCE

- Complex nutrient containing ammonium phosphate (DAP), inactivated yeast, and cellulose.
- Formulated to prevent irregular kinetics and fermentation issues, keeping the yeast functional until complete sugar depletion.
- Improves yeast alcohol tolerance, prevents H_2S formation, and detoxifies must.

APPLICATION	DOSAGE	PACKAGING
Nutrient correction at 1/3 sugar depletion; prevention of off-flavors and stuck or sluggish fermentations	20-40 g/hL (1.7-3.4 lb/1,000 gal)	1 kg 10 kg

NUTRIFERM TIRAGE

- Complex nutrient containing DAP and autolyzed yeast.
- Specific yeast nutrient for second fermentation.
- Supplies essential organic and inorganic nitrogen as well as survival factors.
- Ensures a complete and regular fermentation in both traditional and Charmat methods.

APPLICATION	DOSAGE	PACKAGING
Supplies yeast with essential nitrogen elements and survival factors needed for second fermentation	5-20 g/hL (0.4-1.7 lb/1,000gal) in base wine	1 kg

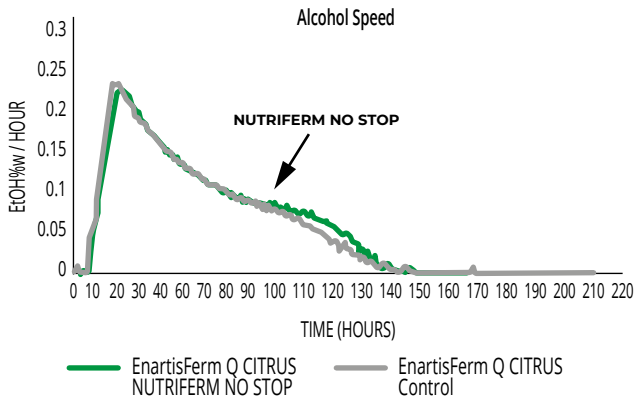
NUTRIFERM NO STOP

DON'T GET STUCK!

- Inactivated yeast, autolyzed yeast and thiamine hydrochloride (vitamin B1).
- Helps maintain yeast membrane integrity. Prevents and corrects fermentation anomalies; effective without requiring new yeast inoculation in case of a stuck fermentation.

APPLICATION	DOSAGE	PACKAGING
Nutrient correction at 1/2 sugar depletion; prevent and treat stuck fermentations	20-40 g/hL (1.7-3.4 lb/1,000 gal)	1 kg 10 kg

Effect on the speed of alcohol production during the fermentation of a white wine (Trebbiano, Italy) after the addition of NUTRIFERM NO STOP.



ALSO **AVAILABLE**

CELFERM

Pure cellulose that removes toxins, promoting clean, healthy fermentations. Provides solids to support yeast growth in very clean juice and reduces H_2S formation.

NUTRIFERM SPECIAL

Complex nutrient containing DAP, thiamine, and inactivated yeast. Supports yeast vitality and prevents stuck fermentations.

NUTRIFERM CONTROL

Promotes clean and complete fermentations. Provides essential nutrients to prevent sluggish or stuck fermentations and ensure aromatic cleanliness.

NUTRIFERM ENERGY

Autolyzed yeast with a high content of free amino acids and thiamine. Shortens lag phase and prevents H_2S and acetic acid formation.

DIAMMONIUM PHOSPHATE (DAP)

Enartis nutrients and fermentation aids main features

	Application	Organic Nitrogen	Inorganic Nitrogen	Aromatic Precursors	Sterols & Fatty Acids	Minerals	Vitamins	Adsorptive Effect	Timing of Addition
NUTRIFERM AROM PLUS	Supply of precursors for the synthesis of fermentation aromas	♦♦♦♦♦♦		♦♦♦♦♦♦	♦♦♦	♦♦♦	♦♦♦		Yeast inoculation
NUTRIFERM ULTRA	Reinforce fermentation capacity of yeast	♦♦♦♦♦♦		♦♦♦♦	♦♦♦♦	♦♦♦	♦♦♦♦		Yeast inoculation
NUTRIFERM ADVANCE	Helps for a complete and clean fermentation		♦♦♦			♦♦♦	♦♦♦		1/3 sugar depletion
NUTRIFERM TIRAGE	Helps for a complete and clean fermentation in both traditional and Charmat methods	♦♦♦	♦♦♦	♦♦	♦♦	♦♦♦	♦♦♦		Secondary fermentation
NUTRIFERM NO STOP	Prevention and treatment of stuck fermentations				♦♦♦♦♦♦	♦♦	♦♦♦	♦♦♦♦♦♦	Second half of fermentation and in case of sluggish or stuck fermentations

The Importance of Balanced Nutrition for Yeast Health

Balanced nutrition is essential for optimal status and biomass production. Nitrogen availability, regardless of the origin (amino acids or ammonia), will affect fermentation performance as well as the production of secondary metabolites and aromatic compounds during fermentation.

- **Amino acids** are assimilated by the yeast without consuming a large amount of energy. Yeast can store them for later or use to synthesize proteins, enzymes and other amino acids.
- **Ammonia** requires a large amount of time and energy (long transformation process) to synthetize proteins and enzymes.

Enartis Nutrient Recommendations for Balanced Nutrition

NUTRIFERM AROM PLUS	Rich in aromatic amino acids precursors to promote the synthesis of esters.
NUTRIFERM ULTRA	Rich in essential amino acids to ensure optimal yeast growth.
NUTRIFERM ADVANCE	Maintains the vital activity of yeast until complete sugar depletion and detoxifies the juice.
NUTRIFERM NO STOP	Rich in survival factors that regenerate the cell membrane. Detoxifies the juice. Prevent or treat sluggish and/or stuck fermentations.

1

To provide **quality**, **essential** elements for yeast growth

2

Sensory profile improvement (increased synthesis of secondary aromas)

3

Maintain good **Fermentation metabolism**

4

Avoid stuck or **sluggish fermentations** (greater fermentative cleanliness)

5 Easytech CERTIFIED BY ENARTIS

Easy-to-use Microgranulated formulation for direct addition to must

6

Adaptable to any winemaking protocol, technology or style

BACK

YEAST DERIVATIVES

Every day, more is known about the contribution made by polysaccharides to the stability and quality of wine. Many winemakers have adopted techniques such as pre-fermentation cold maceration, the use of macerating enzymes and *sur lie* ageing, to enhance the content of polysaccharides and help make wines with better sensory characteristics and stability. Unfortunately, factors such as time constraints, lack of tank space or off-aromas in the lees can make these practices impossible. For those who cannot make use of the polysaccharides naturally contained in their lees and grapes, Enartis offers EnartisPro and SURLÌ, polysaccharides preparations for fermentation and wine maturation.

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Inspiring innovation.

EnartisPro **AROM**

- Inactivated yeast rich in mannoproteins, with antioxidant properties.
- When added before or during fermentation, it helps prevent the oxidation of aroma compounds, enhancing freshness, balance, and intense aroma profile in the finished wine.
- Increases clean aromatic notes due to the adsorption of off-aroma compounds.
- Increases volume, softness, and fullness.

APPLICATION	DOSAGE	PACKAGING
White and rosé juice; antioxidant; enhanced roundness and volume; improves wine stability; reduce herbaceous aromas	20-40 g/hL (1.7-3.4 lb/1,000 gal)	1 kg

EnartisPro **PERLAGE**

- Yeast cell walls rich in antioxidant sulfur peptides. Releases a large quantity of readily soluble mannoproteins.
- Ensures antioxidant protection and protects aroma and color.
- Promotes colloidal, protein, and tartrate stability. Improves foaming properties.
- Increases shelf life of base wines and protects wine during storage before second fermentation.
- Produces fresh, round, and balanced sparkling base wines.

APPLICATION	DOSAGE	PACKAGING
Antioxidant; aroma protection; improve mouthfeel; improve foaming properties; protect base wine during storage	20-50 g/hL (1.7-4.2 lb/1,000 gal)	1 kg

EnartisPro **BLANCO**

- Inactivated yeast with high content of immediately soluble mannoproteins and sulfur amino acids with antioxidant activity.
- When added at inoculation, the released mannoproteins bind with anthocyanins and aromas, protecting them from oxidation and precipitation.
- The sulfur amino acids with antioxidant activity preserve thiolic aromas, producing fresher wines with exotic fruit notes and a more intense and lasting bouquet.
- Softens astringency and balances bitterness.
- Improves color, protein, and tartrate stability.

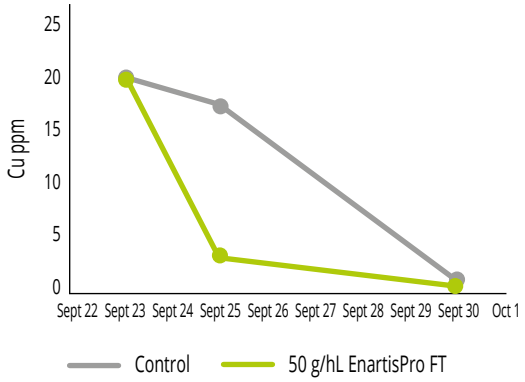
APPLICATION	DOSAGE	PACKAGING
Enhance volume; increase aromatic freshness and complexity; reduce herbaceous aromas; improve wine overall stability	10-30 g/hL (0.8-2.4 lb/1,000 gal)	1 kg

EnartisPro **FT**

- Composed of PVI-PVP (polyvinylimidazole and polyvinylpyrrolidone) and inactivated yeast rich in soluble mannoproteins and thiolic group-containing peptides with antioxidant properties.
- Improves resistance to oxidation by removing metals and limiting oxidizing enzyme activity (tyrosinase and laccase). This allows for fresh aromas and vibrant color.
- Ideal for ageable wines and thiolic aroma expression.
- Softens astringency and balances bitterness.

APPLICATION	**DOSAGE**	**PACKAGING**
Enhance thiols; antioxidant protection; extension of wine shelf life; increase aromatic intensity and stability	30-50 g/hL (2.4-4.2 lb/1,000 gal)	1 kg

Copper monitoring during alcoholic fermentation.



Where there was a high copper value during the first few days of alcoholic fermentation, an increase in volatile acidity and total sulfur dioxide is observed.

	Acetic Acid g/L	So_2 Total ppm
Control	0.4	61.8
EnartisPro FT 50 g/hL	0.33	47.6

Fermentation wine with EnartisPro FT results in lower sensitivity to pinking and browning.

End of Alcoholic Fermentation	Control	EnartisPro FT 50 g/hL
D.O. 420 nm	0.267	0.256
D.O. 520 nm	0.107	0.109
Pinking sensivity	20	11
Browning sensivity	33	18

EnartisPro **UNO**

- Inactivated yeast rich in immediately soluble mannoproteins.
- When added at inoculation, the released mannoproteins bind with anthocyanins and aromas, protecting them from oxidation and precipitation.
- Improves aroma persistence, color stability, and wine shelf life.
- Softens astringency, balances bitterness, and increases roundness.

APPLICATION	**DOSAGE**	**PACKAGING**
Red, white, and rosé juice; improve wine overall quality and stability	10-40 g/hL (0.8-3.4 lb/1,000 gal)	1 kg

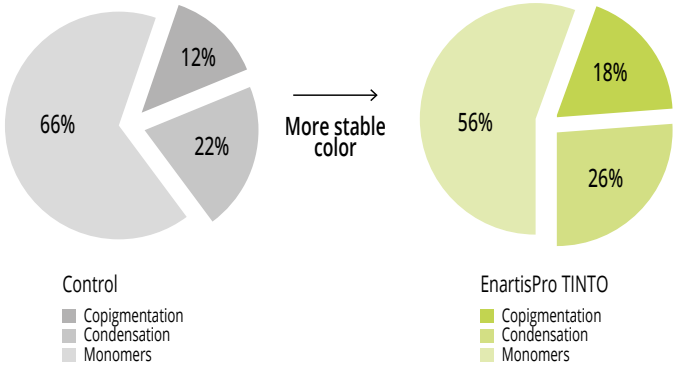
EnartisPro **TINTO**

SENSORY OPTIMIZATION

- Inactivated yeast rich in immediately soluble mannoproteins and ellagic and grape seed tannins.
- Specifically designed to favor anthocyanin/tannin condensation during fermentation, it increases color intensity and stability.
- Promotes bright and clean aromas, builds mid-palate, softens astringency, and balances mouthfeel.
- The best choice for color stabilization and sensory optimization of wine.

APPLICATION	DOSAGE	PACKAGING
Color stability; fruit aromas; softness; improved balance and complexity	15-40 g/hL (1.25-3.4 lb/1000 gal)	1 kg 10 kg

The addition of EnartisPro TINTO increases the stable color form by reducing the presence of free anthocyanin.



SURLÌ VITIS

- White grape skin tannins and plant-derived polysaccharides.
- Enhances softness, volume, structure, and perceived sweetness along with the reduction of bitterness and acidity.
- When used at the recommended dosage, it is filterable and can be added to wine just before microfiltration for improving sensory quality and stability.
- Increases the antioxidant properties of wine.

APPLICATION	DOSAGE	PACKAGING
Improve overall wine quality and stability prior to bottling	2-20 g/hL (0.2-1.6 lb/1,000 gal)	1 kg

SURLÌ ONE

- Inactivated yeast enzymatically treated.
- Contributes to protein, tartrate, and polyphenol stabilization. Improves wine longevity.
- Enhances aromatic complexity, volume, and roundness, softens astringency, builds up mid-palate, and improves wine length.
- Mimics lees ageing (*sur lies*) with the security of microbial stability.

APPLICATION	DOSAGE	PACKAGING
Volume and roundness; improve mouthfeel and complexity; lees ageing; white, rosé, and red wines	20-50 g/hL (1.7-4.2 lb/1,000 gal)	2.5 kg

SURLÌ ELEVAGE

- Inactivated yeast rich in free and immediately available mannoproteins.
- Improves aromatic cleanliness while preserving original fruit characteristics.
- Improves wine balance, roundness, volume sensation, and length. Balances and softens astringency.
- It has an instant effect and can be successfully used with only 24-48 hours contact time.

APPLICATION	DOSAGE	PACKAGING
Improve mouthfeel; volume and roundness; softness; increase wine length; lees ageing; white, rosé, and red wines; pre-bottling	5-30 g/hL (0.4-2.5 lb/1,000 gal)	1 kg 20 kg

SURLÌ KPA

- Inactivated yeast adjuvant rich in mannoproteins and potassium polyaspartate (KPA).
- Preserves acidity and organoleptic quality.
- KPA prevents the precipitation of tartaric acid in the potassium salt form, and thus helps to maintain natural acidity and improve the sensations of freshness and minerality.
- Inactivated yeast quickly release the mannoproteins contained in cell walls.

APPLICATION	DOSAGE	PACKAGING
Helps to preserve the natural acidity of the wine; increases the perception of volume and softness; increases aromatic persistence; increases the shelf life of wine	10-40 g/hL (0.8-3.4 lb/1,000 gal)	2.5 kg

SURLÌ VELVET

- Completely soluble yeast mannoproteins.
- Enhances aromatic complexity and intensity, increases volume and roundness, and reduces the sensation of astringency.
- Improves colloidal structure and stability of wine.

APPLICATION	DOSAGE	PACKAGING
Improve overall wine quality and stability prior to bottling	0.5-10 g/hL (0.04-0.8 lb/1,000 gal)	0.5 kg

ALSO **AVAILABLE**

EnartisPro **R**

Inactivated yeast with a high content of soluble mannoproteins that soften astringency and improve color stability and mouthfeel.

SURLÌ VELVET PLUS

A mannoprotein-rich product with antioxidant properties. Designed to enhance mouthfeel, improve colloidal stability, and add smoothness to wine.

How to Choose Polysaccharides SURLÌ Range

In order to determine which SURLÌ to use and the appropriate dosage, use the following rapid taste test. Rehydrate 1 gram of SURLÌ in 50 mL of water at 38°C for 2 hours. Meanwhile, prepare 50 mL of solution with 13 mL 95% alcohol and 37 mL water. After the 2 hours, add the 50 mL of solution to the suspension and let it cool at room temperature with periodic mixing. The final solution must be kept at a temperature of at least 20°C and mixed two or three times daily for at least three days. The solution is now ready to add directly to wine being treated knowing that 1 mL in 100 mL of wine corresponds to a dose of 10 grams of SURLÌ per 100 L.

Note: SURLÌ VITIS and SURLÌ VELVET can simply be dissolved in a water solution containing 13% alcohol (1 g of SURLÌ in 100 mL of water solution) and can be used immediately.

EnartisPro and SURLÌ Ranges

		Antioxidant Protection	Aroma Enhancement	Mouthfeel Improvement
Fermentation	EnartisPro **AROM**	♦♦♦	♦♦	♦♦
	EnartisPro **PERLAGE**	♦♦♦	♦♦	♦♦♦
	EnartisPro **BLANCO**	♦♦♦	♦♦♦	♦♦♦
	EnartisPro **FT**	♦♦♦♦	♦♦♦	♦♦
	EnartisPro **UNO**	♦	♦	♦♦♦
	EnartisPro **TINTO**	♦♦	♦♦	♦♦♦♦
Pre-Bottling	**SURLÌ VITIS**	♦♦	♦♦♦	♦♦♦
	SURLÌ ONE	♦♦	♦	♦♦♦♦
	SURLÌ ELEVAGE	♦♦	♦	♦♦♦♦
	SURLÌ VELVET	♦	♦	♦♦♦♦

BACK

FINING AGENTS

Fining agents can be used for many purposes in winemaking including clarification, filterability improvement, prevention of haze and sediment formation, sensory profile and color improvement, and removal of undesirable elements from wine.

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Inspiring innovation.

PLANT-BASED FINING AGENTS

Range of plant-based fining agents for producing high-quality wines which meet the demands of the most discerning consumers.
PLANTIS plant-based fining agents ensure fast clarification, reduced color oxidation, decreased presence of metals, and improved balance of the wine.

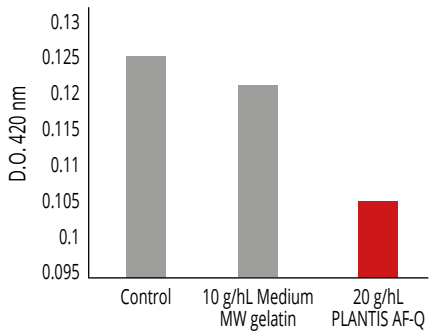
PLANTIS Range

PLANTIS AF-Q

- Allergen-free preparation made of hydrolyzed pea protein and activated chitosan.
- Increases flocculant efficacy and clarification, while forming small, compact lees.
- Improves juice and wine resistance to oxidation by removing pro-oxidant metals and low molecular weight polyphenols.
- Helps preserve young color, increases aromatic cleanliness and freshness, reduces bitterness and astringency, and increases wine longevity.

APPLICATION	DOSAGE	PACKAGING
Flotation; prevent and treat oxidation and pinking; reduce bitterness and astringency	5-30 g/hL (0.4-2.5 lb/1,000 gal)	1 kg 10 kg

Reduction of 420nm absorbance comparing PLANTIS AF-Q with traditional fining treatment.



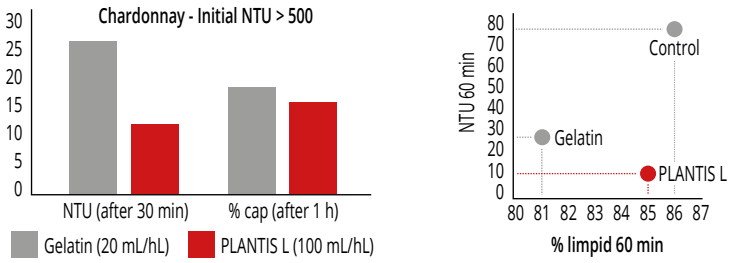
NEW PLANTIS L

BACK

- Liquid, plant-based fining agent made of pea protein (*Pisum sativum*).
- Designed to optimize floatation.
- Special production process that increases rehydration and surface charge of the protein.
- Improved clarification performance for clean must and compact lees.
- Removal of oxidized and easily oxidizable phenolic substances.
- Decreases metals content involved in oxidation.

APPLICATION	DOSAGE	PACKAGING
Juice clarification and flotation	30-120 mL/hL (1.1-4.5 L/1,000 gal)	20 kg 300 kg

NTU reduction during flotation with PLANTIS L.

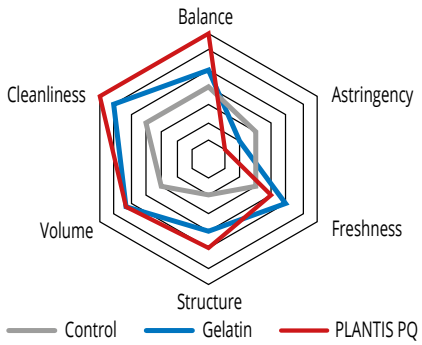


PLANTIS PQ

- Plant-based fining agent made of potato protein and activated chitosan.
- Improves wine clarification, filterability, and aromatic cleanliness.
- Ideal in red wines, it reduces the perception of astringency and dryness.

APPLICATION	DOSAGE	PACKAGING
Wine clarification; reduce astringency and dryness; elimination of unstable color	4-10 g/hL (0.3-0.8 lb/1,000 gal)	1 kg

Tasting comparison between tradition fining vs plant-based fining (PLANTIS PQ).



PLANTIS AF-Q	*+ chitosan*	**Must** Static clarification Flotation **Wine**		• Fast and efficient clarification • Metal removal and increased shelf-life • Increased aromatic cleanliness and freshness
PLANTIS L	*liquid form*	**Must** Flotation		• Easy-to-use • Improves yield, aids in rapid clarification
PLANTIS PQ	*+ chitosan*	**Wine**		• Decreases astringency and bitterness

SELECTIVE FINING AGENTS

Selective fining agents designed to achieve specific enological goals, such as reduce potentially oxidizable polyphenols and metals, prevent and treat undesirable sensory compounds, and protein and color stabilization. The specificity of these fining agents achieve the desired result in a simple and targeted way, respecting and enhancing the sensory authenticity of the final wine.

CLARIL Range

CLARIL AF

- Bentonite, PVPP, and pea protein.
- Ideal in must and wine to eliminate the phenolic compounds responsible for oxidation, pinking, and bitterness.
- Improves protein stability and clarification.
- Alternative to potassium caseinate.

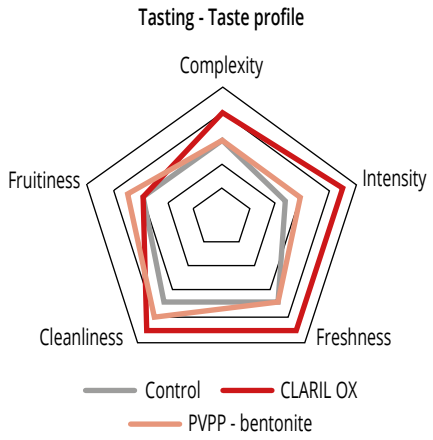
APPLICATION	DOSAGE	PACKAGING
Prevent and treat oxidation and pinking; remove bitterness; improves protein stability	30-150 g/hL (2.4-12.6 lb/1,000 gal)	1 kg 10 kg

NEW CLARIL OX

- Plant-based and allergen-free fining agent made of plant-proteins, chitosan, and bentonite.
- Selective removal of potentially oxidizable compounds.
- Treats oxidized must and prevents browning.

APPLICATION	DOSAGE	PACKAGING
White and rosé must during settling and/or fermentation	30-80 g/hL (1.7-6.7 lb/1,000 gal)	2.5 kg 10 kg

Sensory evaluation of CLARIL OX vs. traditional fining agents.



Significant reduction in pinking and browning sensitivity is observed when fermenting with CLARIL OX, compared to the commercially available reference PVPP.

End of Alcoholic Fermentation	Control	CLARIL OX	PVPP and Bentonite
D.O. 420 nm	0.267	0.192	0.203
D.O. 520 nm	0.108	0.062	0.067
Pinking sensivity	20	8	10

We wanted to say thanks for the great service and friendly staff. We are very happy with all your products from yeast to stabilization. You have a great team indeed! Looking forward to many years of business to come! **Nicholas Husselman, Winemaker at Koelenhof - South Africa**

CLARIL SMK

- Activated carbon, pea protein, and chitosan.
- Removes aroma defects in must and wine: volatile phenols, smoke taint, geosmin, molds, and other defects.
- Restores aromatic cleanliness, fruity character, and freshness.
- Negligible impact on color and phenolic content, even at high addition rates.

APPLICATION	DOSAGE	PACKAGING
Aromatic cleanliness in must and wine	25-110 g/hL (2.1-9.2 lb/1,000 gal)	1 kg 10 kg

CLARIL HM

- Co-polymer of PVI-PVP (polyvinylimidazole polyvinylpyrrolidone) and pre-activated chitosan.
- Adsorbs heavy metals (Cu, Fe, Al) and removes hydroxycinnamic acids and low molecular weight catechins.
- Prevents oxidation, browning, and oxidized aromas.

APPLICATION	DOSAGE	PACKAGING
Prolong wine shelf life; prevent oxidation	30-50 g/hL (2.5-4.2 lb/1,000 gal)	2.5 kg

CLARIL ZR

- Plant-based and allergen-free fining agent made from plant protein, chitosan, and bentonite.
- Designed for the clarification of red wine intended for tartrate stabilization with colloid addition of ZENITH.
- Removes unstable color compounds, improves wine clarification and filterability, and reduces sulfur off-flavors.

APPLICATION	DOSAGE	PACKAGING
Clarification of red wine intended to be tartrate stabilized with ZENITH; elimination of unstable color	20-40 g/hL (1.7-3.4 lb/1,000 gal)	2.5 kg 10 kg

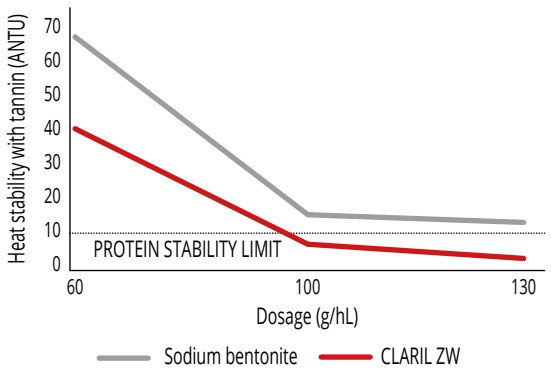
CLARIL ZW

PROTEIN STABILITY

- Plant-based and allergen-free fining agent made from plant protein, chitosan, and sodium activated bentonite.
- Designed for the clarification of white and rosé wines intended for tartrate stabilization with colloid addition (ZENITH and CMC).
- Improves protein stability and eliminates unstable colloids that can affect wine clarification and filterability.

APPLICATION	DOSAGE	PACKAGING
Clarification of white and rosé wine intended to be tartrate stabilized with ZENITH; protein and colloid stability	20-80 g/hL (1.7-6.7 lb/1,000 gal)	2.5 kg 10 kg

Protein stability using CLARIL ZW vs standard sodium bentonite.



Carbon

Applied to must or wine, these wine fining agents serve to remove unwanted substances, and positively influence the organoleptic characteristics of the finished product. Enartis has developed a range of carbon-based fining agents capable of meeting specific needs, including the treatment of wines contaminated by *Brettanomyces*, the decolorization of musts and base wines with excessive pigments, and the treatment of oxidized white wines.

ENOBLACK PERLAGE

- Active carbon in pellet form.
- Strong decolorizing ability.
- Easy to use and rehydrate due to dust-free format.
- Removes ochratoxin A (OTA).

APPLICATION	DOSAGE	PACKAGING
Discoloration of juice and wine; treat oxidation; color adjustment in rosé wine	5-100 g/hL (0.4-8.3 lb/1,000 gal)	1 kg 15 kg

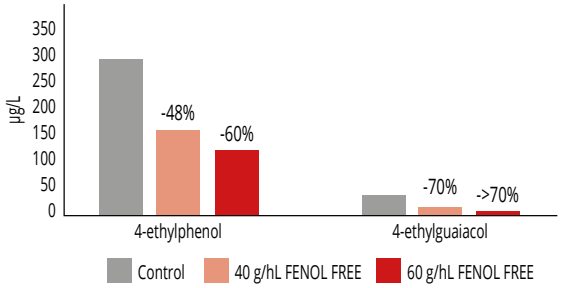
ENOBLACK PERLAGE

FENOL FREE

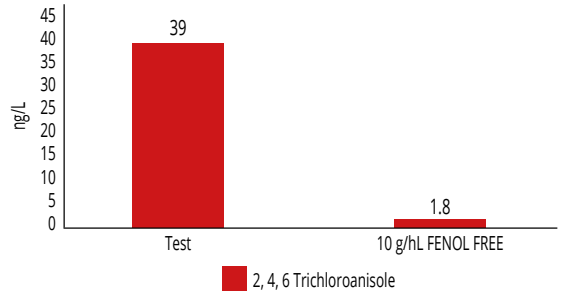
- Activated carbon in powder form.
- Good deodorizing ability. Removes volatile phenols related to *Brettanomyces* and smoke taint.
- Negligible impact on wine color.

APPLICATION	DOSAGE	PACKAGING
Treatment for wines contaminated with *Brettanomyces* or smoke taint; deodorizing	20-40 g/hL (1.7-3.4 lb/1,000 gal)	1 kg 10 kg

Reduction of volatile phenols produced by *Brettanomyces* after treatment with FENOL FREE.



Reduction of 2,4,6-Trichloroanisole molecule responsible for "cork taint" defect after addition of FENOL FREE.



2.0 ng/L threshold of perception of 2,4,6-Trichloroanisole
4.2 ng/L recognition threshold of 2,4,6-Trichloroanisole

ALSO **AVAILABLE**

CLARIL SP
Bentonite, PVPP, and potassium caseinate. Prevents and treats oxidation, browning, and pinking. Improves aromatic cleanliness.

ENOBLACK SUPER
Activated carbon with high decolorizing capacity. Removes ochratoxin A (OTA).

Bentonite

Bentonite is a natural mineral traditionally used as a fining agent for all types of wines, including red, white, and rosé. Due to its negative charge, bentonite attracts and binds positively charged compounds, such as unstable proteins in wine, which can cause turbidity or unwanted precipitations.

PLUXCOMPACT

- Granulated calcium bentonite sodium activated.
- Generates compact lees.

APPLICATION	DOSAGE	PACKAGING
Protein stabilization; removal of unstable color; clarification; prevent "light-struck" defect	10-200 g/hL (0.8-16.7 lb/1,000 gal)	1 kg 20 kg

TRADITIONAL FINING AGENTS

Gelatin

Enartis offers a range of traditional fining agents to perform various functions, including the removal of polyphenols and astringent tannins.

HYDROCLAR 45

- 45% liquid solution of food grade gelatin. Extremely hydrolyzed gelatin and low charge density.
- Designed to remove undesirable polyphenols and harsh tannins.

APPLICATION	DOSAGE	PACKAGING
Reduce excessive astringency; reduce dryness; pressed wines	7-40 mL/hL (0.27-1.5 L/1,000 gal)	5 kg 20 kg

ALSO **AVAILABLE**

PULVICLAR
Granulated food-grade gelatin. Highly effective for clarification by flotation. Improves balance and decreases astringency without impacting wine structure.

STABYL MET
PVI-PVP and silica. Effectively removes metals, hydroxycinnamic acids, and low molecular weight catechins to prevent turbidity and limit oxidation.

PHARMABENT
Powdered, activated calcium bentonite sodium selected from the purest natural bentonites. Removes proteins and unstable color.

HYDROCLAR 30
Liquid solution of food grade gelatin ideal for clarification. Reduces dryness and astringency.

PLUXBENTON N
Granular sodium bentonite for efficient protein removal and improved clarification.

BENTOLIT SUPER
Powdered, activated calcium bentonite sodium. Excellent clarification with good protein removal.

SIL FLOC
Pure silicon dioxide in solution. When used in combination with protein fining agents, it enhances their clarification properties.

PROTOCLAR
Potassium caseinate. Prevents and treats oxidation, browning, and pinking, while reducing bitterness and off-flavors.

PVPP
Pure polyvinylpolypyrrolidone. Highly effective in removing oxidized and oxidizable polyphenols, browning compounds and off-flavors. Prevents and treats oxidation, prevents pinking and reduces bitterness.

Know More about Fining

WHY FINING?

Fining agents can be used for many purposes in winemaking including clarification, filterability improvement, prevention of haze and sediment formation, sensory and color improvement, and removal of undesirable elements from wine.

HOW DOES FINING WORK?

Each fining agent has specific properties and reacts with various wine molecules depending on their origin, density of charge, molecular weight and chemical properties.
Fining is based on two main principles:

- Flocculation: molecular interactions based on charge, chemical bonds, absorption or adsorption of compounds and formation of flocculates.
- Sedimentation: since the flocculates formed are not soluble and heavier than wine/juice, they settle.

WHAT ARE THE MAIN FACTORS THAT INFLUENCE FINING EFFECTIVENESS?

Product preparation and addition, temperature, pH, wine redox potential, and previous fining treatments are factors that can influence the effectiveness of fining.

CAN PLANT-BASED FINING AGENTS BE EFFECTIVE AS THOSE FROM ANIMAL PROTEIN?

Enartis has developed adjuvants of plant origin, made of pea and potato proteins, which replace animal proteins such as gelatin, casein, and egg albumin. They achieve comparable results while better respecting quality and sensory characteristics of the wine. At the same time, they adhere to labeling standards and the needs of consumers who are becoming increasingly demanding throughout the world.

Benefits:

- Faster clarification, reduction of suspended solids and elimination of undesirable compounds that can alter wine quality.
- Decrease in oxidized or easily oxidizable polyphenols that give brown color, dull appearance, and bitter taste.
- Efficacy in reducing oxidized color (DO 420nm), mainly with pea protein products.
- Decreased concentration of heavy metals involved in oxidation reactions.
- Improved sensory quality through cleanliness and aromatic freshness, as well as increased preservation of young and bright colors with less oxidized tones.

How to Choose the Correct Plant-Based Fining Agent

EFFECT	TRADITIONAL FINING AGENT	PLANT-BASED FINING AGENT
Treat Oxidized Color	CASEINATE – PVPP – CARBON	CLARIL OX - CLARIL AF
Clarification	GELATIN – EGG ALBUMEN	CLARIL ZR – CLARIL ZW – PLANTIS L – PLANTIS AF-Q
Reduce Astringency	GELATIN – EGG ALBUMEN	PLANTIS PQ – CLARIL QY
Reduce Bitterness	ISINGLASS – PVPP – CASEINATE	CLARIL AF – CLARIL QY
Treat Off-Flavors	CASEINATE – CARBON	CLARIL ZR – CLARIL SMK

HOW CAN UNSTABLE COLOR BE REMOVED WITHOUT AFFECTING COLOR INTENSITY?

To ensure color stability in red and rosé wines with high color intensity, the unstable color can be removed with fining. CLARIL ZR and PLANTIS PQ are the best plant-based fining agents for removing unstable colloids and color compounds, preserving color intensity.

HIGHER PERFORMANCE DURING FLOTATION:

After standard enzymatic treatment with pectinase (EnartisZym RS), use PLANTIS L to achieve greater efficiency in the formation of floccules that retain gas bubbles, ensure fast clarification, and achieve excellent lees compaction. Due to the nature of pea protein, it helps decrease the metal content and in the removal of oxidized and easily oxidizable phenolic substances, resulting in extended wine shelf-life.

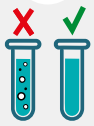
BEST PRACTICES AND TIPS TO IMPROVE JUICE FLOTATION

Flotation is a fast and effective clarification method utilized prior to fermentation. Flotation has many benefits such as improving clarification efficiency while respecting quality and sustainability, but it requires more extensive technical know-how to implement it correctly and efficiently, as well specialized equipment.

How Does Flotation Work?

Flotation relies on specialized equipment which disperses micronized gas bubbles into juice or must via a flotation pump. These micronized bubbles will slowly rise to the top of the tank and bring grape solids and particulates up with them, forming a floating lees cake or "flees" at the top. The clarified juice is then racked from the floating lees cake, leaving the flees in the tank.

1



How to prepare the juice

Add enzymes **EnartisZym RS** or **EnartisZym EZFILTER**, when juice is transferred to tank. Check for the presence of pectins, and proceed with flotation as soon as the results are negative.

Do not wait overnight!

2

Connect the flotation pump

Connect the flotation pump to the tank. Make sure that the delivery hose is short (3 m/10 ft) and connected to the bottom valve, while the suction hose is connected to the racking valve.

Start mixing the tank, keeping the gas off for now.

3

Add flotation aids

Slowly add flotation aids through the flotation pump while tank is mixing. Make sure the whole volume of juice is well homogenized with the appropriate **fining agents**.

4

Start floating

It's time to inject gas and start floating.

Open the gas injection valve and adjust the inlet pressure according to the flotation pump manufacturer instructions.

5

End of flotation and waiting time

Make sure that at least 1/3 of the volume of the tank goes through the flotation pump.

Afterwards, disconnect the pump and wait 30 min per every meter of tank height containing juice.

Then, **rack off immediately**.

Lab Parameters to Check

- ✓ After adding the enzyme, perform a pectin test every 2 hours until results are negative.
- ✓ Check turbidity before and after flotation. The target NTU depends on the winemaker's preference for conducting alcoholic fermentation.
- ✓ Measure % solids before performing flotation. If the solid % is >8, flotation would be very difficult and static settling in recommended.
- ✓ Keep temperature between 15-20 °C (59-68 °F) throughout the process.

	Enartis recommendation	Purpose	Dosage
ENZYMES	**EnartisZym RS** Liquid pectolytic enzyme	Fast depectinization and difficult-to-clarify varieties	2-4 mL/hL
PLANT-BASED FINING AGENTS	**PLANTIS L** Liquid preparation of pea protein	Highly reactive protein to ensure optimum speed and compaction of lees	40-100 mL/hL
	PLANTIS AF-Q Allergen-free preparation made of pea protein and activated chitosan	Fast and clean clarification, preserving young color and extending wine shelf life	5-30 g/hL
SELECTIVE FINING AGENTS	**CLARIL OX** Bentonite, pea and potato proteins, activated chitosan	Reduce the risk of must oxidation and preserve the fresh character	30-50 g/hL
	CLARIL SMK Activated carbon, pea protein and chitosan	Great in removing off-flavors such as smoke taint, volatile phenols, molds, etc.	20-40 g/hL

Additional Considerations

- ✓ Flotation pump and tank must have appropriate size and shape. For optimal flotation do not use conical or egg-shaped tanks, but rather use tall and small diameter tank
- ✓ Fill the tank 70-80% of total volume to ensure space for cap formation
- ✓ Ensure the juice has not started fermenting
- ✓ Juice must be free of glucans

BACK

MALOLACTIC FERMENTATION

Malolactic fermentation is the simple process of converting malic acid into lactic acid by *Oenococcus oeni* bacteria. In fact, using the right strain, malolactic fermentation represents the last opportunity to reduce herbaceous notes, enhance fruit aroma, increase aromatic complexity, and improve the balance and structure of wine. Enartis offers a range of bacteria and nutrients suitable for ensuring successful fermentation, even in the most difficult conditions.

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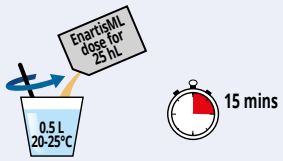
Protocol for ML bacteria preparation and inoculation

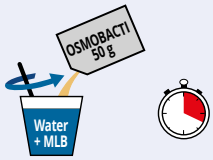
Direct Addition, 25 hL

1



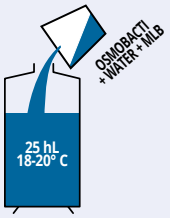
Rehydrate 25 hL package of EnartisML bacteria in 500 mL of chlorine-free water at 20-25°C (68-77°F).
Stir gently and wait 15 minutes.

2



Add NUTRIFERM OSMOBACTI to the EnartisML bacteria slurry in order to improve survival rate and activate EnartisML bacteria.
Stir gently and let stand for 4 hours at 18-20°C (64.5-68°F).

3



Stir the suspension gently and add to wine during pump-over or mixing.

Malolactic Bacteria

How to Choose ML Bacteria Strain

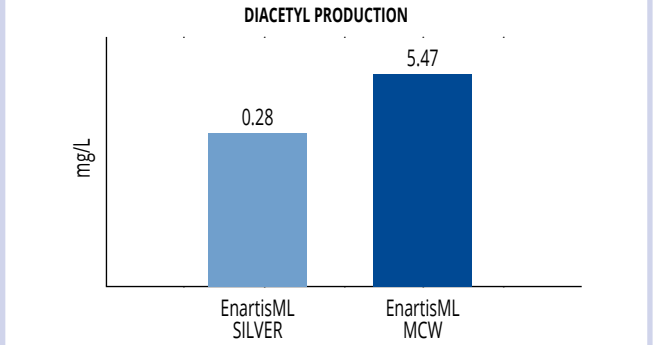
Each strain of bacteria performs best within specific environmental parameters. When selecting the appropriate ML bacteria strain, it is important to consider the relative stress conditions of the wine such as pH, SO_2, and alcohol content. ML bacteria can be selected for their effects on wine aroma and mouthfeel. The Enartis bacteria range does not produce biogenic amines.

EnartisML **MCW**

- Selected strain of *Oenococcus oeni*, in freeze dried form for direct addition after rehydration.
- Isolated from Sonoma County, California.
- Resistant to extreme conditions such as high alcohol and low pH.
- Produces high diacetyl and contributes to creamy, "buttery" characters in wine.

APPLICATION	DOSAGE	PACKAGING
Sequential inoculation; co-inoculation; very difficult conditions; increase creamy notes		2.5 hL (66 gal) 25 hL (660 gal) 250 hL (6,600 gal)

EnartisML MCW produces high amounts of diacetyl which contributes to buttery, creamy notes in wine.



EnartisML **SILVER**

- Selected strain of *Oenococcus oeni* in freeze dried form for direct addition after rehydration.
- Fast and complete malolactic fermentation even under difficult conditions, such as high alcohol, low pH, and high polyphenol content.
- Contributes to aromatic cleanliness and fruitiness. Decreases fruitiness and decreases herbaceous notes.
- Recommended for difficult wines with alcohol >15% and pH as low as 3.1.

APPLICATION	DOSAGE	PACKAGING
Sequential inoculation; co-inoculation; difficult conditions; increase fruitiness		2.5 hL (66 gal) 25 hL (660 gal) 250 hL (6,600 gal) 1,000 hL (26,400 gal)

EnartisML **UNO**

- Selected strain of *Oenococcus oeni*, in freeze dried form for direct addition after rehydration.
- Guarantees a fast and complete malolactic fermentation.
- Respects color intensity and organoleptic quality.
- Alcohol tollerance <15%; pH tollerance >3.3.

APPLICATION
Sequential inoculation; co-inoculation; respect wine aroma

DOSAGE

PACKAGING
2.5 hL (66 gal)
25 hL (660 gal)
250 hL (6,600 gal)

ENARTIS STRAINS	EnartisML MCW	EnartisML SILVER	EnartisML UNO
SPECIES	*Oenococcus oeni*		
pH TOLERANCE	>3.1	>3.2	>3.3
Total SO_2 RESISTANCE (mg/L)	<40	<50	<40
FREE SO_2 RESISTANCE (mg/L)	<10	<10	<10
ALCOHOL TOLERANCE (%v/v)	>15	>15	<15
CONVERSION SPEED	Moderate	High	High
Aromatic Characteristics	Buttery, "Sweet"	Fruity, Floral	Fruity, Varietal

Malolatic Bacteria Nutrients

NUTRIFERM ML

- Nutrient specific for ML bacteria rich in polysaccharides, amino acids, micronutrients, vitamins, and cellulose.
- Stimulates bacterial growth, ensures domination of inoculated strain over natural flora, improves cell division, and shortens malolactic fermentation time.
- Promotes complete fermentation in difficult conditions or in case of stuck fermentation.

APPLICATION
Nutrition for malolactic bacteria; prevent stuck/sluggish MLF; difficult conditions; increase MLF speed

DOSAGE
20-40 g/hL
(1.7-3.4 lb/1,000 gal)

PACKAGING
1 kg

NUTRIFERM OSMOBACTI

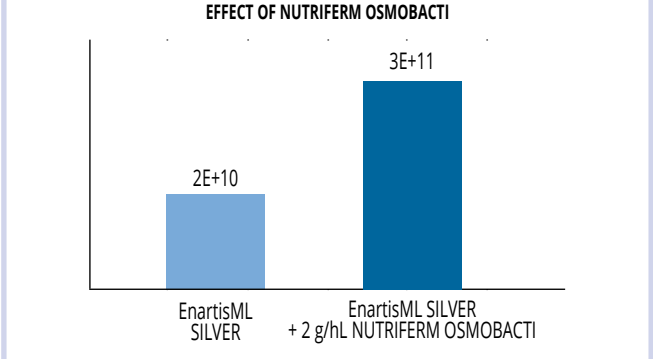
- Activator and regulator of osmotic pressure specific for ML bacteria: autolyzed yeast, cellulose, L-malic acid, and bi-ammonium phosphate.
- Improves survival rate of ML bacteria during rehydration and resistance in difficult wine conditions.
- Activates ML bacteria, allowing a faster start and completion of malolactic fermentation.

APPLICATION
Nutrient during rehydration; difficult conditions; increase the survival rate; accelerates the start of MLF

DOSAGE
50 g per 25 hL (660 gal) dose of bacteria

PACKAGING
100 g

NUTRIFERM OSMOBACTI used during rehydration of ML bacteria increases the cell division and survival rate of the ML bacteria.



Know More about ML Bacteria

MALOLACTIC FERMENTATION BENEFITS

The main role of lactic acid bacteria (LAB) in wine is to conduct malolactic fermentation (MLF): the conversion of malic acid to lactic acid. Additionally, LAB improve wine microbial stability, aroma complexity, mouthfeel, and color stabilization. They also reduce total acidity and bentonite and SO_2 additions due to their ability to break down proteins and degrade acetaldehyde.

WHAT ARE THE PRINCIPAL FACTORS INFLUENCING THE DEVELOPMENT OF LACTIC ACID BACTERIA (LAB)?

At certain levels, factors such as pH, temperature, alcohol, and SO_2 (free and total) can have a negative synergistic effect when combined, making the completion of MLF difficult. Additionally, vineyard sprays, initial malic acid content, yeast strain used for alcoholic fermentation, and wine polyphenol content can be stress factors. Problems can arise when 3.8> pH <3.2, alcohol >14.5%, malic acid <1 g/L, wine temperature <18°C or >27°C, total SO_2 >30 mg/L and/or free SO_2 > 10 mg/L.

WHAT HAPPENS IF WINE HAS A LOW CONCENTRATION OF MALIC ACID?

Wines with a malic acid content below 1.0 g/L face greater difficulties starting MLF because there is not enough "food" for the ML bacteria to grow and produce the necessary enzymes to degrade malic acid. The addition of **NUTRIFERM OSMOBACTI** helps start MLF by activating bacteria's enzymes and improving conditions (higher pH and malic acid concentration) to increase the survival rate.

WHAT ARE THE RISKS OF SPONTANEOUS MLF?

Uncontrolled, spontaneous MLF may increase the risk of spoilage organisms such *Brettanomyces* sp., as well as the production of undesirable compounds. Volatile acidity, excess of diacetyl, acrolein (bitter), and ropiness are the most common negative sensory characters expected in spontaneous MLF by wild LAB. Spoilage LAB also produce metabolites which are toxic to human health such as ethyl carbamate and biogenic amines (BA). Inoculation with selected *Oenococcus oeni* ensures a rapid onset of MLF and better control over the production of aromas and wine mouthfeel. Enartis bacteria are safe in avoiding BA production.

WHAT ARE BIOGENIC AMINES?

BA are a group of compounds primarily formed by LAB via decarboxylation of amino acids, mostly during ageing. The most common found in wine are putrescine, cadaverine, tyramine, and histamine. Known as a human health threat, BA causes headaches and allergy issues which are enhanced by the alcohol content in wine. Also, they produce irreversible damage to the wine due to the negative sensory impact. Their formation can be prevented by inhibiting indigenous lactic acid bacteria and other spoilage microbes with EnartisStab **MICRO M** and then treat the wine with selected LAB.

HOW TO MANAGE A SUCCESSFUL SEQUENTIAL FERMENTATION IN UNFAVORABLE BACTERIA CONDITIONS

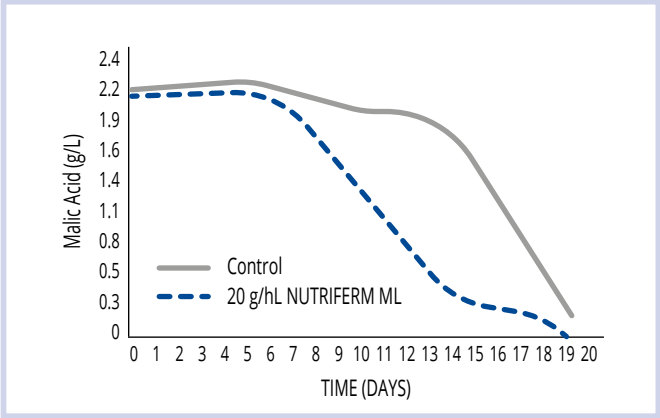
In difficult conditions, it is recommended to add an activator developed to promote the growth of bacteria with necessary nutritional requirements to ensure the total completion of MLF. **NUTRIFERM ML** addition is advised to shorten the length of MLF. It is also useful in cases of stuck MLF as it promotes restart.

DOES THE YEAST STRAIN USED FOR ALCOHOLIC FERMENTATION AFFECT MLF?

Yes. Some yeast strains can negatively impact lactic acid bacteria development by producing toxins and SO_2. All Enartis bacteria have been validated for sequential fermentation and co-inoculation, and none are affected by Enartis yeast strains.

WHEN TO PERFORM CO-INOCULATION

Co-inoculation is the best strategy to shorten MLF duration and obtain a microbiologically stable wine. It is strongly recommended when sequential MLF is compromised by high alcohol content or pH>3.8 or cellar temperatures are low. The selected bacteria are added 24-48 hours after yeast inoculation or SO_2 addition, taking advantage of alcoholic fermentation conditions: better temperature and nutrition, acclimatizing slowly with the increase of ethanol content. Wines subjected to co-inoculation are fruitier and have a lower diacetyl content, as diacetyl is suppressed by the sugar content during this phase.



HOW TO MONITOR MLF

The most common way to monitor MLF is by tracking malic acid degradation. MLF is considered complete when malic acid is below 200 mg/L.

ABOUT THE PRODUCTION OF DIACETYL

Diacetyl is a compound characterized by buttery notes produced by yeast, but mainly it is LAB during MLF that modulate its final concentration. LAB are responsible for its biosynthesis through citric acid metabolism. EnartisML **MCW** is the bacteria with the highest capacity to produce diacetyl, followed by EnartisML **UNO** and EnartisML **SILVER**. Selected bacteria along with the entire winemaking process impacts the production of diacetyl. A slower MLF speed (with low inoculation rate and/or low temperature) and slightly oxidative environment will increase diacetyl production, while yeast lees contact will break down diacetyl. Furthermore, SO_2 can bind diacetyl, thus reducing its content in wine, and co-inoculation practices also can lead to less diacetyl content due to the reductive conditions.

Restart and/or Complete a Stuck ML Fermentation - 100 hL

The successful restart of a stuck ML fermentation depends upon three critical factors:

1. Diagnosis of the fermentation arrest causes.
2. Appropriate wine treatment.
3. Proper acclimation of ML bacteria.

1. DIAGNOSIS

Use in-house or outside laboratories to determine the cause(s) of the problem(s) and the degree of fermentation completion.

2. TREAT STUCK WINE BEFORE RESTART - 24 HOURS PRIOR TO ML BACTERIA PREPARATION

- Adjust pH and alcohol.
- Remove spoilage microbes with EnartisStab **MICRO M** (5 g/hL).
- Absorb toxins with 20 g/hL **NUTRIFERM CONTROL**.
- Rack off lees 24 hours after treatment.

3. PREPARE AND ACCLIMATE ML BACTERIA

- Rehydrate 4x25 hL pack of EnartisML **SILVER** in chlorine-free water at 20-25°C (68-77°F) and wait 15 minutes.
- Add 200 g of **NUTRIFERM OSMOBACTI** to the suspension and wait 2-4 hours.
- Prepare 50 L of wine + 50 L water + 1 kg **NUTRIFERM ML** and rehydrated ML bacteria.
- At ½ of malic acid depletion, add 200 L of wine to the bacteria culture + 1 kg **NUTRIFERM ML**.
- At ½ malic acid depletion, add the ML bacteria culture to the remaining wine volume.

BACK

OAK ALTERNATIVES

If properly dosed, the use of oak alternatives improves wine aroma and taste in a way that makes it pleasing to the international and “new” consumers market. Enartis offers a diverse portfolio of oak chips and soluble alternatives to meet all wine needs and expectations. With INCANTO oak alternatives, winemakers have ultimate control over their oak program and can create a unique signature for their brand or label.

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Produced from selected French and American oak, the INCANTO range is toasted using a unique and original process that employs a progressive heating scheme which results in a deep and homogenous toast.

INCANTO CHIPS

SIZE	DOSAGE	CONTACT TIME	PACKAGING
2-4 mm	1-4 g/L white wines; 1-6 g/L red wines	minimum of 4 weeks	10 kg

INCANTO NATURAL

- French oak, untoasted.
- When used during fermentation or wine ageing, it enhances fruit, freshness, coconut and cedar notes. It helps mitigate reduction and herbaceous notes.
- Due to the polysaccharides released, it increases smoothness, volume, and structure, as well as improves balance and finesse.

INCANTO CREAM

- French oak, medium toasted.
- Enhances notes of custard, coconut, butter, and liquorice.
- Increases smoothness, volume, and sweetness perception, without imparting excessive tannins.

INCANTO VANILLA

- American oak, medium toasted.
- Enhances sweetness perception with notes of vanilla, cocnut, Bourbon, honey, and tropical fruit.
- Increases smoothness, volume, and freshness.

INCANTO CARAMEL

- French oak, medium toasted.
- Enriches wine with notes of caramel, cappuccino, butter, spices.
- Significantly increases sweetness perception and smoothness.

INCANTO SPECIAL FRUIT

- French oak, medium toasted.
- Enhances elegance, fruitiness, and complexity with notes of spices, toasted, chocolate, and caramel.
- Increases volume and structure, without imparting excessive tannins.

INCANTO TOFFEE

- French oak, medium-plus toast.
- Enhances notes of cappuccino, toasted bread, dried fruit, and vanilla.
- Significantly increases smoothness, sweetness perception, and complexity.

INCANTO DARK CHOCOLATE

- French oak, medium-plus toast.
- Contributes notes of dark chocolate, coffee, spices, and toasted nuts.
- Increases volume, structure, and tannins.

NEW

INCANTO BLACK SPICE

- French oak, heavy toast.
- Notes of black pepper, cocoa, licorice, spices, red fruit, dried fruit, and vanilla.
- Increases smoothness and sweetness perception.
- White and red wine ageing.

ALSO **AVAILABLE**

INCANTO SPICE

French and American oak chips that add complex spice, coffee, and roasted notes, enhancing aromatic richness, softness, and structure.

INCANTO COMPLEXITY

Heavy-toast French oak. Coffee and toasted notes increase complexity along with sweeter aromas of vanilla, coconut, and caramel.

INCANTO SLI

Untoasted American oak. Enhances varietal characteristics and increases freshness, longevity of aromas, and ageing potential.

INCANTO NC Range

The INCANTO NC products are completely soluble formulations containing just the active molecules that make oak powder application during fermentation interesting:

- Tannins for antioxidant protection, color stabilization and enhancement of the structure.
- Polysaccharides, that increase volume sensations, soften wine tannins, stabilize color and indirectly protect aromas from oxidation.
- Aromatic substances, derived from wood and toasting, that bring aromatic complexity to the final wine.

GOALS

- Increase aromatic complexity
- Highlight fruit and floral notes
- Prevent reduction during fermentation
- Minimize herbaceous notes in underripe grapes
- Improve color stabilization
- Increase volume and structure

Why use the INCANTO NC range?

INCANTO NC products provide the efficacy of oak powder while offering some advantages:

- Precise dosages
- Consistent quality
- No burnt or green wood notes
- No solids that can damage the mechanical parts of harvest machinery or render cleaning difficult
- No antimicrobial contamination
- Ease of use for the winery staff
- Zero loss of color by solids absorption
- Low dosage

Since INCANTO NC products only contain the active molecules that can be extracted from wood, dosages are 10 times smaller than the usual oak powder ones. This makes the work of winery staff easier and reduces wastage.

INCANTO NC

SENSORY OPTIMIZATION

- Inactivated yeast, oak tannin, and condensed tannin extracted from exotic wood.
- Alternative to oak adjuncts, contributing medium toasted oak characteristics.
- Improves color stability, aromatic complexity, and balance.
- Adds notes of vanilla and custard, enhances volume, structure, and smoothness.

APPLICATION	DOSAGE	PACKAGING
Medium-toasted oak; color stability; complexity; volume and structure	10-50 g/hL for red must; 5-15 g/hL for white and rosé juice	2.5 kg 10 kg

INCANTO NC WHITE

- Inactivated yeast, oak tannin, and acacia tannin.
- Alternative to oak adjuncts, contributing untoasted oak characteristics.
- Protects juice from oxidation and prevents the appearance of reductive odors.
- Provides light floral and vanilla notes, increases fresh fruit aromas and enhances softness and volume.

APPLICATION	DOSAGE	PACKAGING
Untoasted oak; increase fruit aroma; reduce green notes; increase volume and structure	5-50 g/hL (0.4-4.2 lb/1,000 gal)	2.5 kg 10 kg

INCANTO NC DARK CHOCOLATE

- Oak tannin and inactivated yeast rich in polysaccharides.
- Alternative to oak adjuncts, contributing heavy toasted French oak characteristics.
- Enhances toasted oak aromas and masks herbaceous notes from unripe grapes.
- Improves volume, structure, balance, and color stability.

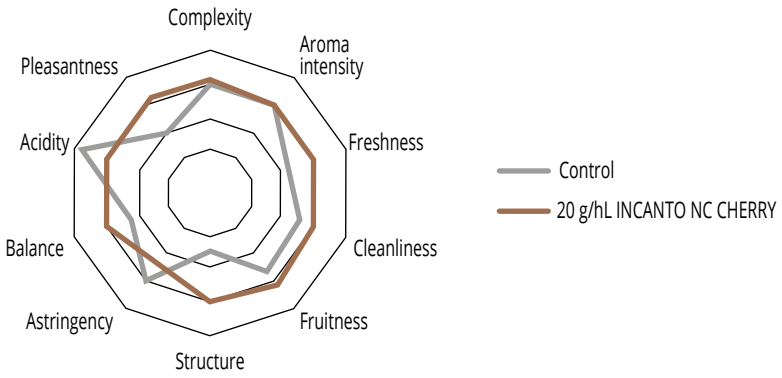
APPLICATION	DOSAGE	PACKAGING
Heavy-toasted oak; reduce herbaceous notes; color stability; complexity; volume and structure	10-50 g/hL (0.8-4.2 lb/1,000 gal)	2.5 kg 10 kg

INCANTO NC CHERRY

- Inactivated yeast, oak tannin, and condensed tannin extracted from exotic wood.
- Alternative to oak adjuncts, contributing oak characteristics.
- Promotes color stabilization, prevents oxidation, and increases volume, structure, and length.
- Contributes cherry and fresh red fruit notes.

APPLICATION	DOSAGE	PACKAGING
Fruity and spicy aromas; color stability; antioxidant; complexity; increase volume and structure; freshen overripe fruit	5-50 g/hL (0.4-4.2 lb/1,000 gal)	2.5 kg 10 kg

Tasting profile after fermentation with INCANTO NC CHERRY vs Control.



I have been using the INCANTO NC range on all red wine fermentation tanks since 2009. Sometimes with oak chips and other times with tannin. INCANTO is, for me, a perfect balance between a tannin and an oak powder. I believe it contributes greatly to mouthfeel, color intensity and stability. **Alicia Rechner, Winemaker at Backsberg Estate Cellars - Paarl, South Africa**

We have been using INCANTO NC CHERRY for several years now and apart from adding structure, we appreciate the contribution to fruit purity. When used in larger scale wineries, there is a cost saving benefit too, with no disposal of product later, as with other oak alternatives. **Chris Kelly, Winemaker - Escapades - Stellenbosch**

INCANTO NC RED

- Oak tannin and inactivated yeast.
- Alternative to oak adjuncts, contributing medium-plus toasted oak characteristics.
- Ideal for red wine vinification, it decreases green aromas of unripe grapes, prevents reduction, and increases color stability.
- Contributes toasted oak notes, and enhances structure, volume, and sweetness perception.

APPLICATION	DOSAGE	PACKAGING
Medium-plus toasted oak; reduce herbaceous notes; complexity; increase volume and structure	10-50 g/hL (0.8-4.2 lb/1,000 gal) for red must	2.5 kg 10 kg

Know More about Oak Ageing

WHAT DOES OAK BARREL AGEING DO TO MY WINE?
There are two main reactions that happen during oak ageing: the extraction of oak compounds and oxygen diffusion. During oak ageing, wine aroma complexity increases, color stability is enhanced, astringency is reduced, and overall structure becomes softer.

WHY THERE IS SO MUCH VARIATION IN OAK AROMAS?
There are many causes of variation and many of them interact to form a wide array of potential aroma profiles.
- Source of the oak: oak species, geographic origin, growing conditions and age can strongly affect wood structure and composition.
- Staves position on a trunk has been shown to influence its aroma composition.
- Staves seasoning and drying: Kiln drying or air drying, time, humidity...
- Cooperage processes add a considerable layer of variability.

WHAT IS THE EFFECT OF TOASTING?
Toasting oak during barrel processing modifies the structure and chemical properties of wood. Increasing temperature and length of toasting will:

- Reduce oak lactone content that contributes to "fresh oak" and coconut aromas.
- Increase "vanilla", "caramel-like" and "roasted coffee" aromas associated with vanillin, furfural, 4-methylfurfural and maltol. At heavy toast levels these compounds decrease and are replaced by "spicy" (eugenol, isoeugenol, 4-methylguaiacol) and "smoky" characters (4-methylguaiacol, guaiacol, 2-methylphenol).

WHY USE BARREL ALTERNATIVES?
- Cost is the most common reason of using barrel alternatives. Using barrel alternatives reduces 'oak' investment (at least 10 times lower), cellar work, storage space and microbiological risks.
- Timing can be reduced. Contact time: 4 weeks for Enartis INCANTO Chips.
- Consistent and qualitative product for enological expectations and requirements.

HOW TO FIND THE RIGHT OAK ALTERNATIVE?
Define the targeted wine profile, the time available for ageing and the budget. Enartis offers trial kits containing small bags of oak chips to soak in wine for 3 weeks to run bench trials to help find the right product or blend for you.

WHAT ABOUT STORAGE AND REUSE OF OAK ALTERNATIVES?
Oak alternatives should be treated with care and stored in a clean, dry warehouse in its original packaging. Reuse is not recommended: the extraction and result will be different and risk microbial contamination.

OAK CHIP TRIALS
A WIDE RANGE OF OAK ALTERNATIVES
The extraction of oak compounds (oak aromas, polyphenols, polysaccharides,...) as well as the sensory impact on wine depends on many variables including the physiochemical characteristics of wine (pH, alcohol, titratable acidity, volatile acidity and SO_2), wine buffer capacity, storage temperature, contact time, etc.
When deciding which oak chips to use, we always recommend setting up trials. This way, winemakers can base their oak derivatives decision on accurate data and tasting.

Trial Set-Up:

- Use a 1.5 L wine bag or 750 mL bottle.
- Weigh the selected oak chips (dosages recommended for trials = 2-5 g/L).
- Add chips to bag or bottle.
- Write the date, wine lot, oak chips name and dosage on the label. Also prepare a control sample, without oak chips.
- Fill bag/bottle with wine. Be cautious of the oxygen input during filling and head space. We suggest an addition of 5 ppm SO_2 at filling to protect wine against oxidation.
- Taste after three weeks of soaking.

BACK

TANNINS

Many wines benefit from the addition of tannins, provided that the treatment is carried out at the most appropriate time. Since the different origins and properties of tannin can produce substantially different results, care must be taken to select the best tannin for each winemaking application. In conjunction with the foremost research centers, Enartis has studied exogenous tannins and their effects for many years. These studies have enabled Enartis to select and produce a comprehensive range of the highest quality tannins for winemaking.

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White wine fermentation

EnartisTan **CIT**

- Blend of gallic tannins and condensed tannins extracted from exotic wood species.
- Specific production process at cold temperatures ensures the preservation of aromatic compounds from the wood, contributing to floral, citrus, and fresh fruit aromas in the wine.
- Ideal when used in combination with high ß-glucosidase activity yeast for enhanced varietal expression.

APPLICATION	DOSAGE	PACKAGING
Enhancement of floral and fruit aromas; improve protein stability; increase antioxidant protection	2-15 g/hL (0.17-1.3 lb/1,000 gal)	1 kg

Red wine fermentation

EnartisTan **FERMCOLOR**

- Blend of condensed tannins extracted from exotic wood species and ellagic tannins from chestnut trees and tara.
- High antioxidant activity, protects color and aromatic compounds from oxidation, and contributes to color stabilization.
- Enhances aromatic complexity, softens structure, and improves length and ageing potential.

APPLICATION	DOSAGE	PACKAGING
Antioxidant protection; color stabilization; reds intended for ageing	200-400 g/ton	1 kg 10 kg

We have been using EnartisTan FERMCOLOR and ROUGE as sacrificial tannins pre and post flash détente. We saw an impressive impact on color stability, mid-palate and wine structure, especially on our Bordeaux varietals and Zinfandels. **Megan McCollough, Winemaker at Hahn Family Wines - California, USA**

EnartisTan **ROUGE**

- Micro-granulated blend of condensed tannin extracted from exotic wood species, chestnut tannin, and tara tannin.
- Intense antioxidant and antioxidasic activities, inhibits laccase and polyphenol oxidase (PPO), and protects color and aromatic compounds from oxidation.
- Favors the formation of stable color compounds.
- Reinforces wine structure and improves wine balance.

APPLICATION	DOSAGE	PACKAGING
"Sacrificial" tannin; antioxidant protection; color stabilization	100-400 g/ton	1 kg 15 kg

EnartisTan **V**

- Condensed tannin extracted from unfermented white grape seeds.
- Highly reactive, it specifically condenses with free anthocyanins to protect them from oxidation and promote long-lasting color stability.
- Improves protein stability of white and rosé wines.
- Reduces the action of oxidase enzymes (tyrosinase and laccase) and the chemical oxidation of wine.
- Enhances fruity notes, smoothness, and structure, decreases herbaceous notes, and increases shelf-life.

APPLICATION	DOSAGE	PACKAGING
Long-term color stability; thermovinification; phenolic unripe grapes	10-30 g/hL (0.8-2.5 lb/1,000 gal)	1 kg

EnartisTan **XC**

- Low molecular weight monocatechins and condensed tannins extracted from exotic wood species and untoasted oak.
- Due to its high reactivity, it promotes co-pigmentation and increases color stability in young red and rosé wines.

APPLICATION	DOSAGE	PACKAGING
Color stabilization through co-pigmentation; young to medium aged red wines; rosé	100-400 g/ton on red grapes; 5-15 g/hL (0.4-1.3 lb/1,000 gal) in rosé juice	1 kg

TECHNICAL TANNINS

EnartisTan **ANTIBOTRYTIS**

- Mixture of gallic tannins and ellagic chestnut tannin.
- Intense antioxidant, antiradical, and antioxidasic properties.
- Protects color and aromatics compounds from oxidation, limits oxidasic enzyme activities (laccase), and strengthens the protective action of SO_2.
- Limits color and aroma loss caused by *Botrytis cinerea*.

APPLICATION	DOSAGE	PACKAGING
Moldy grapes; antioxidant protection of aroma and color compounds	3-20 g/hL (0.25-1.7 lb/1,000 gal)	1 kg 10 kg

EnartisTan **E**

- Micro-granulated, condensed tannin obtained through a process of extraction and purification of unfermented white grape seeds.
- Use early in the vinification process and during micro-oxygenation. It favors the formation of anthocyanin-tannin complexes via acetaldehyde bridges.
- Promotes long-lasting color and contributes to the elimination of unstable proteins.
- Increases wine structure, aromatic complexity, and prevents premature oxidation.

APPLICATION	DOSAGE	PACKAGING
Color stabilization by condensation; micro-oxygenation; enhance body and structure	50-200 g/ton during maceration; 3-15 g/hL (0.25-1.3 lb/ 1,000 gal) during micro-oxygenation	1 kg 5 kg

EnartisTan **MAX NATURE**

- Condensed tannin extracted from exotic wood species.
- Removes reductive characters, masks herbaceous notes, and increases aromatic cleanliness and complexity.
- Increases roundness and builds mid-palate without contributing astringency.

APPLICATION	DOSAGE	PACKAGING
Remove reductive and herbaceous notes; increase fruit and floral characters	3-15 g/hL (0.25-1.3 lb/1,000 gal)	1 kg 10 kg

EnartisTan **SLI**

- Tannin extracted from untoasted American oak at low temperature.
- Extraordinary capability to scavenge oxygen and radicals, chelate metals, and reduce wine redox potential.
- Binds to mercaptans and eliminates other sulfur off-aromas.
- Protects from oxidation, strengthens action of SO_2, and improves wine shelf life.

APPLICATION	DOSAGE	PACKAGING
Antioxidant protection; improve the shelf life of wine; treat reduction; natural and allergen-free alternative to SO_2	0.5-2 g/hL (0.04-0.17 lb/1,000 gal) as antioxidant; 2-15 g/hL (0.17-1.3 lb/1,000 gal) to improve the sensory	0.5 kg

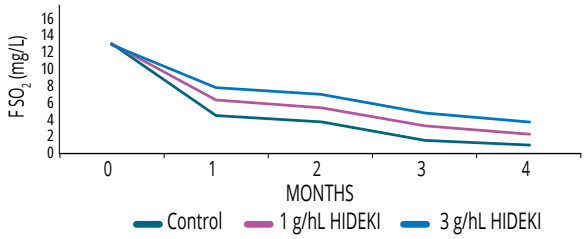
HIDEKI

DECREASE SO_2 USE

- Micro-granulated tannin made of molecular fractions obtained through the selection and purification of the most effective gallic, ellagic, and condensed tannins in terms of antioxidant and antimicrobial activity.
- To be used prior to bottling as a natural and allergen-free replacement for SO_2 to protect wine from oxidation and to prevent spoilage by unwanted microorganisms.
- This combination of different microbiostatic tannins makes HIDEKI a valuable tool for wines over a wide pH range.

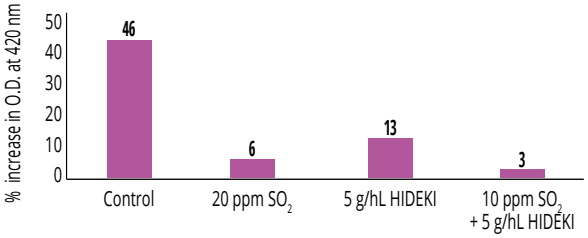
APPLICATION	DOSAGE	PACKAGING
Natural and allergen-free alternative to SO_2; antioxidant protection of wine; prevention of the growth of unwanted microorganisms	1-3 g/hL (0.08-0.25 lb/1,000 gal) as an antioxidant; 5-10 g/hL (0.4-0.8 lb/1,000 gal) as microbiostatic	1 kg

White wine with pH 3.5 exposed to air for 10 days. Lower optical density (O.D.) at 420 nm shows that HIDEKI aids SO_2 management.



Effect on Free SO_2 preservation over time

Bottling simulation: White wine into 0.5 L bottles at pH 3.5. HIDEKI is effective in protecting Free SO_2 (FSO_2) concentration over time.



Effect on Oxidized Color

OAK TANNINS

EnartisTan **CDC**

- Ellagic tannin extracted from toasted oak.
- Extends barrel life and boosts oak characters in neutral barrels.
- Contributes to elegant and delicate aromas of vanilla, caramel, and spices.
- Balances mouthfeel and improves length, softness, and oak integration.
- Control and prevention of reductive aromas.

APPLICATION	DOSAGE	PACKAGING
Finishing; extend the life of barrels	3-10 g/hL (0.25-0.8 lb/1,000 gal)	1 kg

EnartisTan **DC**

- Tannin extracted from medium-toasted French oak.
- Reinforces or mimics the impression of ageing in fine barrels.
- Enhances dark chocolate, roasted coffee, and spice aromas, as well as structure and softness.
- Softens astringency and increases wine length and complexity.

APPLICATION	DOSAGE	PACKAGING
Finishing; extend barrel life	0.5-15 g/hL (0.04-1.3 lb/1,000 gal)	0.5 kg

EnartisTan **ELEVAGE**

- Tannin extracted from seasoned, lightly-toasted French oak.
- Binds with mercaptans and eliminates sulfur off-aromas.
- Contributes to elegant vanilla, caramel, and licorice notes.

APPLICATION	DOSAGE	PACKAGING
Increase structure; prevent and treat reductive characters	2-15 g/hL (0.17-1.3 lb/1,000 gal)	1 kg

EnartisTan **NAPA**

- Tannin extracted from toasted American oak.
- Extends barrel life and boosts oak aromas in neutral barrels.
- Enhances aromas of vanilla, caramel, coconut, coffee, and cocoa.
- Increases wine structure and "sweetness", balances astringency, and improves color stabilization.

APPLICATION	DOSAGE	PACKAGING
Finishing; increase aroma complexity and structure	3-15 g/hL (0.25-1.3 lb/1,000 gal)	1 kg

EnartisTan **TOF**

- Tannin extracted from medium-plus toasted French oak.
- Increases antioxidant protection and improves wine ageing potential.
- Enhances the aromatic notes of oak (coffee, caramel) when used in barrel-aged wines.
- Provides structure, increases color stability, and helps to soften astringent and bitter sensations.

APPLICATION	DOSAGE	PACKAGING
Finishing; extend barrel life	1-15 g/hL (0.08-1.3 lb/1,000 gal)	0.5 kg

EnartisTan **VNL**

- Tannin extracted from medium and toasted French oak.
- Increases antioxidant protection, improves wine stability and ageing potential.
- Enhances aromatic notes of oak (vanilla, custard, coconut) when used in barrel-aged wines.
- Provides structure and helps to soften astringent and bitter sensations.

APPLICATION	DOSAGE	PACKAGING
Finishing; extend barrel life	1-15 g/hL (0.08-1.3 lb/1,000 gal)	0.5 kg

EnartisTan **TFT**

- Blend of condensed tannins extracted from exotic wood species and unfermented white grape skins.
- Ideal on red and rosè wines during ageing or pre-bottling, it enhances freshness, fruitiness, structure, softness, and antioxidant protection.

APPLICATION	DOSAGE	PACKAGING
Enhances red fruit notes; increase softness; red and rosé wines	0.5-20 g/hL (0.04-1.7 lb/1,000 gal)	1 kg

GRAPE TANNINS

EnartisTan **FF**

- Blend of condensed tannins extracted from exotic wood species and unfermented white grape skins.
- Use at cold temperature to preserve aromatic precursors from wood.
- High antioxidant capacity.
- When used during ageing or pre-bottling, it freshens wine aromas, reduces overripe fruit notes and increases wine softness and length.

APPLICATION	DOSAGE	PACKAGING
Freshen wine aroma; increase antioxidant protection; white and rosé wines	0.5-10 g/hL (0.04-0.8 lb/1,000 gal)	1 kg

EnartisTan **SKIN**

- Micrograniulated, high molecular weight condensed tannin obtained from unfermented white grape skins.
- For a wide range of wines, it strengthens antioxidant protection and increases structure, volume, and complexity.
- Enhances fruitiness and aromatic cleanliness, especially when used in must.
- Contributes to color stability.

APPLICATION	DOSAGE	PACKAGING
Antioxidant protection; increase structure and fruit notes	3-20 g/hL (0.25-1.7 lb/1,000 gal)	1 kg

EnartisTan **UVA**

- High molecular weight condensed tannin extracted from white grape seeds.
- Promotes color stability by condensation with anthocyanins.
- Enhances fruit aromas, balances astringency, improves structure, mouthfeel, and complexity.
- Improves protein stabilization in white and rosé wines.

APPLICATION	DOSAGE	PACKAGING
Color stabilization by condensation; increase structure and fruit notes	1-10 g/hL (0.08-0.8 lb/1,000 gal)	1 kg

EnartisTan **UVASPEED**

- Micrograniulated, condensed tannins extracted from unfermented white grape skins.
- Softens bitterness and astringency, enhances varietal fruit notes.

APPLICATION	DOSAGE	PACKAGING
Decrease astringent and bitter sensations; increase softness and structure	3-20 g/hL (0.25-1.7 lb/1,000 gal)	1 kg

ALSO **AVAILABLE**

EnartisTan **COLOR**

Tannin blend designed to protect anthocyanins and aromatic compounds from oxidation. Stabilizes and enhances color in red wines. Contributes spicy and dark fruit aromas.

EnartisTan **EXTRA**

Improves mouthfeel balance and aromatic complexity, contributing elegant vanilla, caramel, cocoa, and toasted oak notes.

EnartisTan **AROM**

Contributes to protein stabilization and protects aromas and color due to its antioxidant properties. Enhances thiols and reduces herbaceous notes.

EnartisTan **ELEGANCE**

Designed to create a smoother palate, improving balance, structure, and integration in wines. Increased antioxidant protection.

EnartisTan **FT**

Protects anthocyanins from oxidation, improving color stability. Reduces herbaceous notes, improves structure, enhances fruit characters, and freshens aromas.

EnartisTan **MICROFRUIT**

Developed for micro-oxygenation, it promotes color stabilization. Enhances red and dark fruit aromas while contributing to roundness and softness.

EnartisTan **RF**

Provides aromatic precursors responsible for berry, red fruit, and floral notes in wine. Improves color stability.

EnartisTan **MEL**

Liquid tannin designed to prevent reduction and protect wine from oxidation. Enhances oak profile (caramel, coconut, coffee, and cocoa).

EnartisTan **BLANC**

High antioxidant and antimicrobial activity. Protects wine from browning, “light-struck” defects, and oxidation.

EnartisTan **UNICO** *range*

ELEGANCE & STRUCTURE

UNICO #1

- Ellagic oak tannin, selected for its quality.
- Extracted at low temperature and low pressure to preserve the noble characteristics of fine oak.
- Intense and delicate vanilla, chocolate, and toasted oak aromas.
- Contributes to volume and structure of wine.

APPLICATION
Finishing; enhance aroma complexity

DOSAGE
1-15 g/hL
(0.08-1.2 lb/1,000 gal)

PACKAGING
0.25 kg

BRIGHT, RED FRUIT

UNICO #2

- Condensed tannin extracted from exotic wood species.
- Significantly enhances red fruit aromas such as cherry, fresh berries, and black currant.
- Successful on white, red, and rosé wines, it increases softness, structure and sweetness perception.

APPLICATION
Finishing; enhance aroma complexity

DOSAGE
1-15 g/hL
(0.08-1.2 lb/1,000 gal)

PACKAGING
0.25 kg

ENHANCE FRESHNESS

UNICO #3

- Blend of hydrolyzable and condensed tannins extracted from exotic wood species.
- Formulated to reveal aromas in wine and increase its complexity, it enhances citrus, botanical, and floral notes.
- Excellent for treating wines with slightly oxidized and overripe aromas.

APPLICATION
Increase aromatic freshness and complexity

DOSAGE
1-10 g/hL
(0.08-0.8 lb/1,000 gal)

PACKAGING
0.25 kg

DISTINCT OPULENT NEW

BACK

UNICO #1 XO

- Unique ellagic tannin extracted from aged French oak.
- The specific cold extraction technique prevents the oxidation of aromatic compounds from the oak, and careful oak selection ensures top quality.
- Selected for its impact on elegance and improved aromatic profile.
- Ideal for ultra-premium wines, it enhances complexity and oak-aged characteristics.

APPLICATION
Finishing tannin; enhance structure in aged white and red wines

DOSAGE
1-15 g/hL
(0.08-1.2 lb/1,000 gal)

PACKAGING
0.25 kg

Tannins Effects on Wine Profile

	Color Stabilization	Antioxidant Effect	Increase of Aromatic Cleanliness	Structure	Astrigency	Softness	Aroma
FERMENTATION TANNINS							
EnartisTan **CIT**	●●●	●●●●	●●	●●	●●	●●	●●●●●
EnartisTan **FERMCOLOR**	●●●●	●●●●	●●●	●●●●	●●	●●●	●●●●
EnartisTan **ROUGE**	●●●	●●●●	●●●	●●●	●●●	●●	●●
EnartisTan **V**	●●●●●	●●	●●	●●●●●	●●●●	●●	●●●
EnartisTan **XC**	●●●●	●●	●●	●●	●●●	●●●	●
OAK TANNINS							
EnartisTan **CDC**	●●	●●	●●	●●	●●	●●●	●●●●
EnartisTan **DC**	●●	●●●	●●	●●●	●	●●●●	●●●●●
EnartisTan **ELEVAGE**	●●	●●●	●●●	●●●	●●●	●●	●●●
EnartisTan **NAPA**	●●	●●●	●●	●●●	●	●●●●	●●●●●
EnartisTan **TOF**	●●	●●●	●●●	●●●●	●●	●●●	●●●●
EnartisTan **VNL**	●●	●●●	●●●	●●●●	●●	●●●	●●●●
EnartisTan **TFT**	●●	●●●	●●	●●●	●●	●●●●	●●●●●
TECHNICAL TANNINS							
EnartisTan **ANTIBOTRYTIS**	●	●●●●●	●●	●●	●●	●	●
EnartisTan **E**	●●●●●	●●	●●	●●●●●	●●●●	●●	●●●
HIDEKI	●●	●●●●●	●●●●	●●	●	●●●●	●
EnartisTan **MAX NATURE**	●●●	●●	●●●●	●	●	●●●●●	●
EnartisTan **SLI**	●●	●●●●●	●●●●	●●	●	●●●●	●●●●
GRAPE TANNINS							
EnartisTan **FF**	●	●●●	●●	●●	●	●●●●	●●●●
EnartisTan **SKIN**	●●●●	●●●	●●	●●	●●	●●	●●●●
EnartisTan **UVA**	●●●●	●●●	●●	●●●	●●●●	●●	●●●●●
EnartisTan **UVASPEED**	●●●●	●	●	●●	●	●●●●●	●●●●
UNICO TANNINS							
EnartisTan **UNICO #1**	●●	●●	●●	●●●●	●	●●●●	●●●●●●●
EnartisTan **UNICO #2**	●●●	●●●	●●	●●●●	●	●●●●	●●●●●●●
EnartisTan **UNICO #3**	●	●●●●	●●●●●	●●	●	●●●●	●●●●●●●
EnartisTan **UNICO #1 XO**	●	●●●●	●●●●●	●●	●	●●●●	●●●

Know More about Polyphenols in Winemaking

DIFFERENT CATEGORIES OF POLYPHENOLS:

Grape polyphenols:

- **Non-flavonoids**: The major non-flavonoid phenolic compounds in grapes are hydroxycinnamates. They are the preferred substrate for polyphenol oxidase and usually the first compounds involved in the oxidation of grape juice.
- **Flavanoids**: One of the major classes of phenolic compounds in grapes.
  They are localized in skins and seeds. Flavonoids include three main groups: tannins, flavonols and anthocyanins.
  - The tannin group contains complex combinations of catechins (also Flavan-3-ols) found in grape seeds and skins, correctly described as condensed tannins.
  - Anthocyanins are mostly found in grape skins and are the main source of color pigments in red wine.
  - Flavonols: found in grape skins, they are known as co-factors for the color-enhancing phenomenon known as co-pigmentation.

Hydrolyzable tannins: Derived from wood, they are oligomeric forms of gallic acid and can be specified as gallotannins or ellagitannins whether they are constituted of gallic acid or ellagic acid moieties.

A LITTLE BIT ABOUT COLOR IN WINE...

The initial color of red wine is mainly due to anthocyanins, extracted from grapes during the winemaking process. In their cationic form, anthocyanins are highly reactive with any nucleophile. In the presence of SO_2 and H_2O, this reaction can lead to color loss. Stabilization of wine pigments can occur via co-pigmentation or condensation.

Co-pigmentation is the enhancement of color due to formation of complexes between anthocyanins and cofactors such as flavonols, hydroxycinnamates and/or colloids via a weak electrostatic bond. The desirable feature of a co-factor is its planarity, which allows the stacking of anthocyanins, thus keeping them stable and soluble. Co-pigmentation has hyperchromic and bathochromic effects, which initially lead to higher intensity and darker colored wines. These molecules, important in young red wines, are considered "semi-stable" pigments.

Condensation leads to more stable pigments. They can be formed via direct bonds between anthocyanins and tannins or in oxidative environments via acetaldehyde bridges.

COLOR STABILIZATION IN RED WINES

Enartis continually develops color stabilization strategies and technology to achieve stability during maceration. Color stability has to be managed as soon as possible, starting in the vineyard. Most red grape varieties have more anthocyanins than tannins, which can lead to color stability issues.

Winemaking stage	Reactions	Enartis products
HARVEST	Prevent oxidation of color/phenolic compounds with antioxidant protection.	100-150 g/ton of AST
COLD SOAK	"Sacrificial" tannins reinforce SO_2 antioxidant effect and eliminate proteins that would react with grape polyphenols, thus protecting grape tannins.	150-200 g/ton, EnartisTan Rouge or EnartisTan FERMCOLOR
	Maceration enzymes improve grape skin tannin extraction, favoring anthocyanin/tannin reactions and stabilizing color pigments. The proteasic activity decreases protein capacity to precipitate grape tannins.	30 g/ton of EnartisZym COLOR PLUS
YEAST INOCULATION	At the first stage of alcoholic fermentation, anthocyanins are extracted much faster than tannins. To encourage the stabilization of anthocyanins via co-pigmentation and condensation, increase the concentration of grape tannin and use mannoproteins.	Co-pigmentation: 100 g/ton of EnartisTan XC
		Condensation: 100 g/ton of EnartisTan V
		Condensation & co-pigmentation: 200 g/ton EnartisPro TINTO or INCANTO NC range
AFTER AF, BEFORE MLF	At this stage, short macro-oxygenation encourages the formation of stable color compounds produced by condensation between free anthocyanins and tannins through acetaldehyde bridges.	10 g/hL EnartisTan E

WHAT DOES A "SACRIFICIAL" TANNIN DO?

When grapes are crushed, proteins are released, bound to tannins and precipitated. The first tannins released in wine and lost by precipitating with proteins are skin tannins, the most interesting tannins for future wine structure and mouthfeel. "Sacrificial" tannins are added to crushed grapes in order to bind with grape proteins and precipitate instead of freshly extracted skin tannins.

WHY IS CO-PIGMENTATION IMPORTANT?

Co-pigmentation protects pigments from oxidation during the early stages of winemaking and limits color loss. Furthermore, it improves anthocyanins solubilization in hydroalcoholic environment.

CAN I USE TANNINS IN WHITE MUSTS AND WINES?

In white musts, the addition of tannin prevents the formation of off-odors, improves clarification and antioxidant protection, inhibits laccase produced by *Botrytis*. Tannins can be used in white wines to improve their structure, softness and antioxidant protection.

STABILIZING AGENTS

In today's wine market, it is crucial for wines to be visually appealing to Consumers. Any haze or precipitate is unacceptable and can damage brand reputation. The appropriate use of stabilizing agents ensures the production of wines that maintain their sensory characteristics up to the time of their consumption.

enartis

Inspiring innovation.

EnartisStab **MICRO M**

BEST MICROBIAL COVERAGE

Microbial Stabilization

- Preparation of pre-activated chitosan from *Aspergillus niger* and inactivated yeast.
- Allergen-free, vegan alternative to lysozyme and SO_2 for antimicrobial properties, designed for treatment of grapes, must, and wine.
- Prevents or postpones malolactic fermentation..
- Interacts with a wide spectrum of microorganisms, such as *Brettanomyces*, non-*Saccharomyces* yeasts, lactic and acid bacteria, reducing their activity and growth, and precipitates them.
- Protects wine from oxidation and inhibits oxidative enzymatic activity in compromised grapes.
- Reduces sulfide defects, volatile phenols, VA, and off-flavor production.
- Improves clarification and filterability.

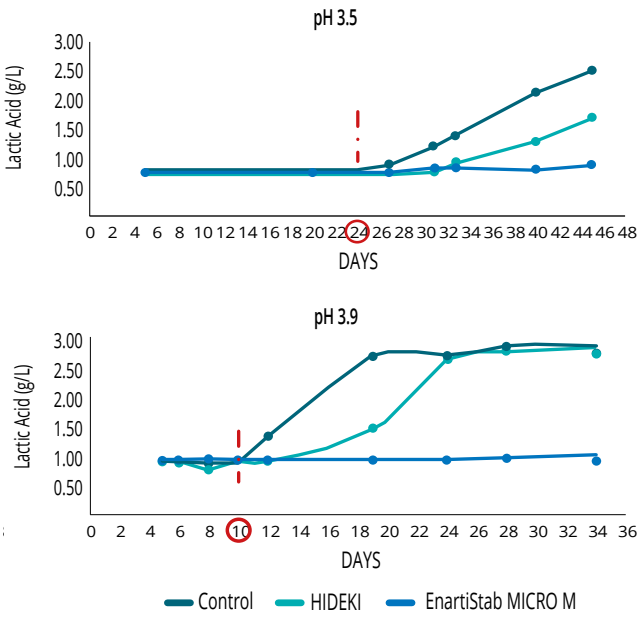
APPLICATION
Varietal expression; medium to long ageing; premium red wines; oak ageing; structure and roundness; direct inoculation

DOSAGE
200-400 g/ton,
5-20 g/hL
(0.4-1.7 lb/1,000gal)

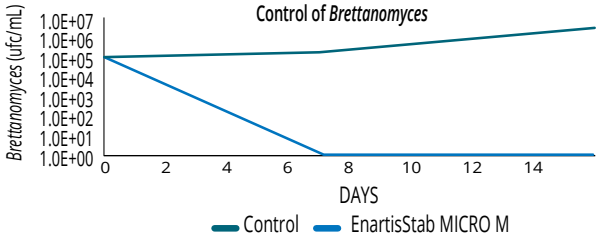
PACKAGING
1 kg
10 kg

Starting from a no-SO_2 trial, using EnartisStab MICRO M has now become a part of my winemaking protocol on all of my red wines. It not only helps me to control spoilage organisms proactively, but also helps to reduce my SO_2 addition with a better protection than SO_2 on its own. **Matthieu Finot, Winemaker at King Family Vineyards - Virginia, USA**

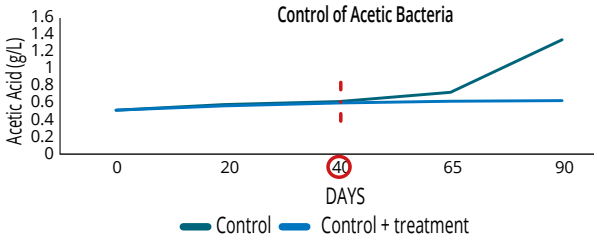
Effect of 10 g/hL EnartisStab MICRO M and 5g/hL HIDEKI on white wines at different pH with <0.1 mg/L of molecular SO_2 and inoculated with 1 g/hL (10^6 CFU/mL) of a highly resistant *Oenococcus oeni* strain.



Effect of 10 g/hL EnartisStab MICRO M on red wine at pH 3.55 and 0.36 mg/L of molecular SO_2. The wine was inoculated with 10^5 CFU/mL of *Brettanomyces*.



Effect of combined treatment with 5 g/hL EnartisStab MICRO M followed by 5 g/hL HIDEKI on a white wine at pH 3.4 and 0.12 mg/L of molecular SO_2. The wine was inoculated with 10^3 CFU/mL of *Acetobacter*.



TOOLS AND SUGGESTIONS FOR IMPROVING

MICROBIOLOGICAL STABILIZATION

Ongoing climate change is causing a significant imbalance in grape ripening. This is reflected with must with higher pH values, which are more susceptible to microbiological contamination, exacerbated by the reduced effectiveness of SO_2 at high pH values. Under these conditions, it is essential to adopt a strategy of prevention and microbiological control throughout the winemaking process to prevent deterioration in quality.

Alternative Bioprotection Solutions

Enartis Bioprotective Solutions are a viable alternative to sulfur dioxide, providing natural protection against a wide range of contaminating micro-organisms. Allergen-free and unaffected by pH, these solutions are easily adapted to all winemaking steps.

1

Antimicrobial protection and cleanliness at an early stage

The use of **EnartisFerm Q MCK** beginning at grape harvest and during pre-fermentation stages helps to limit the proliferation of contaminating microorganisms and improve the sensory cleanliness of final wines.

2

All-around prevention and treatment of contaminants

EnartisStab MICRO M eliminates and prevents the development of contamination bacteria and yeast in must and wine. It prevents the development of indigenous non-*saccharomyces* and oxidative yeast, controls the development of *Brettanomyces*, and reduces lactic and acetic bacteria.

3

Controlling unwanted malolactic fermentation

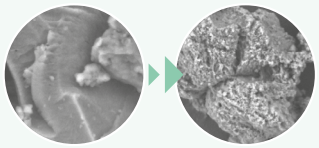
EnartisStab MICRO M effectively inhibits the development of lactic acid bacteria and stops unwanted malolactic fermentations in progress.

4

Pre-bottling microbiological control

The use of **HIDEKI**, a blend of tannins with powerful antioxidant effects and high bacteriostatic action, provides complete protection against bacterial proliferation. It is recommended in synergy with chitosan treatment.

Why is Enartis chitosan more efficient?



Enartis has developed a unique chitosan activation process obtained from *Aspergillus niger* that aims to increase the positive molecular charge and enlarge the contact surface of the chitosan.
This process increases the spectrum of action on contaminating microorganisms, making the product more effective and faster acting than traditional chitosan.

A Focus on Microbiological Stabilization

Enartis recommendation	Purpose	Dosage
EnartisFerm Q MCK *Metschnikowia pulcherrima*	Tool for bioprotection; control contamination microorganisms in pre-fermentation stages	5 - 15 g/hL (0.4-1.3 lb/1,000 gal)
EnartisStab MICRO M Activated chitosan Inactivated yeast	Broad-spectrum antimicrobial for must and wine	5 - 20 g/hL (0.4-1.6 lb/1,000 gal)
HIDEKI Gallic, ellagic, and condensed tannins	Bacteriostatic and antioxidant	5 - 10 g/hL (0.4-0.8 lb/1,000 gal)

See pag. 18

What are the microbiological risks during winemaking?

During the life of wine, it is possible to encounter various microbiological hazards. These can occur from grape harvest to bottling.
The presence of contaminants such as non-*Saccharomyces* and oxidative yeast, acetic or lactic acid bacteria, or numerous others (e.g. *Brettanomyces, Oenococcus, Pediococcus, Acetobacter, Lactobacillus, Zygosaccharomyces, Schizosaccharomyces*) can generate considerable problems that impact final wine quality.

Poorly managed contamination can lead to:

- ✓ stuck fermentations
- ✓ increased volatile acidity
- ✓ production of undesirable sensory compounds (e.g. volatile phenols)
- ✓ oxidation leading to loss of color and aroma
- ✓ production of high quantities of acetaldehyde

TARTARIC STABILIZATION

EnartisStab **CELLOGUM LV20**

- Solution of carboxymethyl cellulose (CMC) with low viscosity and high concentration.
- Ideal for white, rosé, and sparkling wines, it stabilizes against tartrate precipitation long-term.
- Low impact on wine filterability.
- Alternative to physical stabilization treatments such as cold stabilization and electrodialysis (lower energy costs and processing times).

APPLICATION	DOSAGE	PACKAGING
Tartrate stabilization; white, rosé and sparkling wines	25-100 mL/hL (0.95-3.8 L/1,000 gal)	20 kg

ZENITH Range

The use of stabilizing colloids decreases energy consumption and the environmental impact of tartaric stabilization, while making it easier to manage. The ZENITH range represents the pinnacle of this technique.

There have been very few products that I have looked forward to as much as the ZENITH line. Cold stability can be very expensive, time intensive and inexact. Both ZENITH UNO and ZENITH COLOR offer cost-effective alternatives to traditional cold stabilization methods. **Matthew Iaconis, Winemaker at Brick & Mortar Wines - California, USA**

ZENITH COLOR fits in with our vision of sustainability at Perdeberg. It allows me quick and cost effective stabilization of my red wines without compromising quality. It also gives us a quicker route to market. **Albertus Louw, Cellar Master at Perdeberg Group - South Africa**

ZENITH UNO

BEST KHT STABILIZER

- Potassium polyaspartate (KPA) solution.
- Rapid and highly effective for tartrate stabilization in red, white, and rosé wines.
- Completely filterable.
- Environmentally sustainable alternative to cold stabilization.
- Long-lasting stabilizing effect, practical, easy-to-use, and respectful of wine quality.

APPLICATION	DOSAGE	PACKAGING
Tartrate stability	100 mL/hL (3.8 L/1,000 gal)	5 kg 20 kg 1,000 kg

ZENITH COLOR

BEST KHT & COLOR STABILIZER

- Solution of potassium polyaspartate (KPA) and Arabic gum from Acacia Verek.
- Rapid and highly effective for tartrate and color stabilization in red and rosé wines.
- Environmentally sustainable alternative to cold stabilization.
- Long-lasting stabilizing effect, practical, easy-to-use, and respectful of wine quality.
- Increase roundness, wine length, and volume.

APPLICATION	DOSAGE	PACKAGING
Tartrate stability; color stability	200 mL/hL (7.6 L/1,000 gal)	5 kg 20 kg 1,000 kg

ZENITH PERLAGE

- Solution of potassium polyaspartate (KPA) and mannoproteins.
- Rapid and highly effective for tartrate stabilization and improved *perlage* in sparkling wine.
- Does not react with riddling agents or yeast proteins. Maintains efficacy over time without causing clarification issues during riddling.
- Mannoproteins helps *perlage* quality and stability.
- Applicable to different sparkling methods.
- Completely filterable, even at low temperatures.
- Environmentally sustainable, long-lasting effect, practical, easy-to-use, and respectful of wine quality.

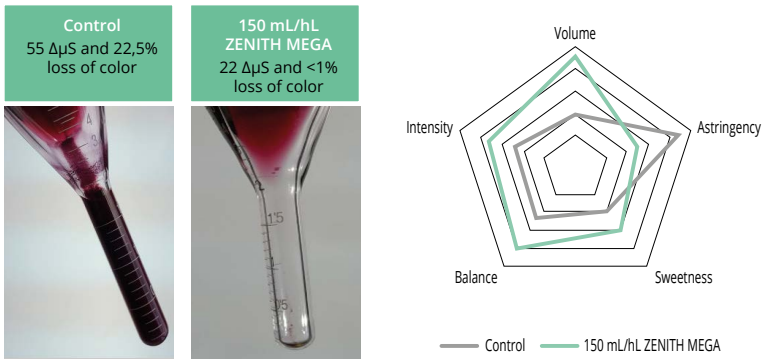
APPLICATION	DOSAGE	PACKAGING
Tartrate stability; perlage stability; sparkling wine	100 mL/hL (3.8 L/1,000 gal)	5 kg 20 kg

NEW ZENITH MEGA

- Solution of potassium polyaspartate (KPA), Arabic gum from Acacia Verek, and mannoproteins.
- Highly effective in tartaric and color stability in red wines, while improving the sensory profile. Enhances the sensation of volume, smoothness, and aromatic freshness.
- Environmentally sustainable alternative to cold stabilization.
- Long-lasting stabilizing effect, practical, easy-to-use, and respectful of wine quality.

APPLICATION	DOSAGE	PACKAGING
Tartrate stability; color stability; sensory improvement	200 mL/hL (7.6 L/1,000 gal)	20 kg

Comparison tasting of red wine from La Rioja before and after addition of ZENITH MEGA. Due to the mannoproteins and Verek gum Arabic, ZENITH MEGA is highly effective in reducing astringency and softening wines with high polyphenol content.



Red wine from La Rioja
Cold test 6 days -4°C.

The ZENITH line has dramatically improved process and quality for my wines. The sustainability gains alone should be reason enough to seriously consider replacing dated methods of stabilization. We're no longer spending months putting considerable amounts of energy and labor into the chilling and seeding of our tanks. With ZENITH, there's no pH shift either; the wine's finished right after the addition. Any winery serious about the environment and costs should consider this product.
Karl Weichold, Estate Winemaker at Stoller Wine Group - Oregon, USA

What is potassium polyspartate?

Potassium polyaspartate (KPA) is a polyamino acid produced from L-aspartic acid, an amino acid present in grapes. Enartis has used its expertise in wine stabilization to create a revolutionary range of products that harnesses the synergy and power of potassium polyaspartate and colloids for both tartaric and color stabilization.

What does ZENITH represent?

SUSTAINABILITY
Significant reduction in energy consumption, water usage, and CO_2.

CONFIDENCE IN RESULTS
Guaranteed stability of KHT and color over time.

QUALITY
Respects sensory characteristics of wine.

FILTERABILITY
Negligible impact on pre-bottling filtration.

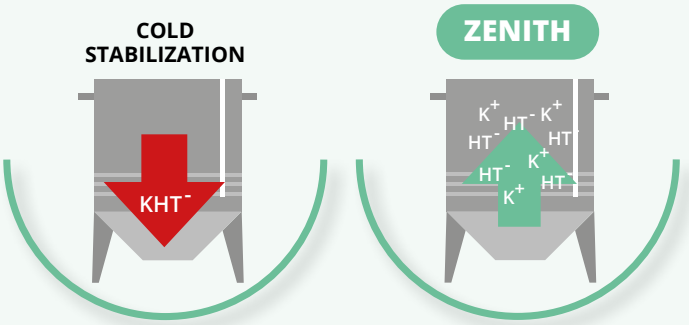
OPTIMIZATION
Process speed and labor reduction.

EXPERIENCE
Used worldwide in all types of wine.

Why use ZENITH?

The revolution in colloid stabilization for all wines and all levels of instability!

Suitable for all wineries currently using cold stabilization that want to reduce production costs and increase their sustainability standards, while simultaneously achieving ultimate stability. Enartis, the market leader in stabilization products, provides a cutting-edge, cost-effective and eco-friendly product range allowing you to switch off your cooling system and dramatically reduce production costs and gas emissions, while maintaining the organoleptic aspects of your wine and ensuring the best color and tartaric stabilization over time and under temperature stress.



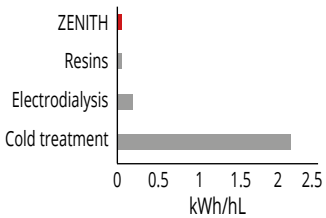
- Impact on sensory characteristics, decrease in acidity and structure
- Loss of shelf life
- Labor intensive
- Variable stabilization times, scheduling difficulties

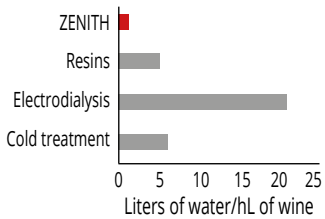
- Maintains sensory characteristics while preserving acidity and structure
- Preserves shelf life
- Negligible impact on filterability index
- Minimal stabilization time, increased process efficiency

Environmental and Economic Benefits

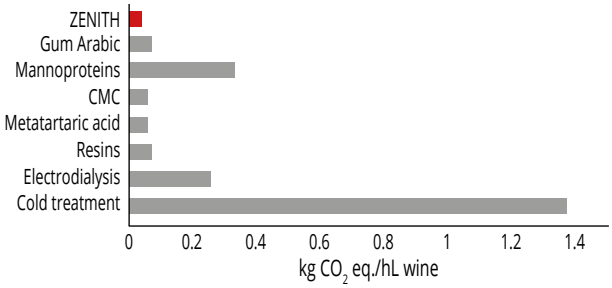
ZENITH, when compared to other commonly used stabilization techniques, drastically lowers electricity consumption, potable water consumption, and CO_2 emissions.

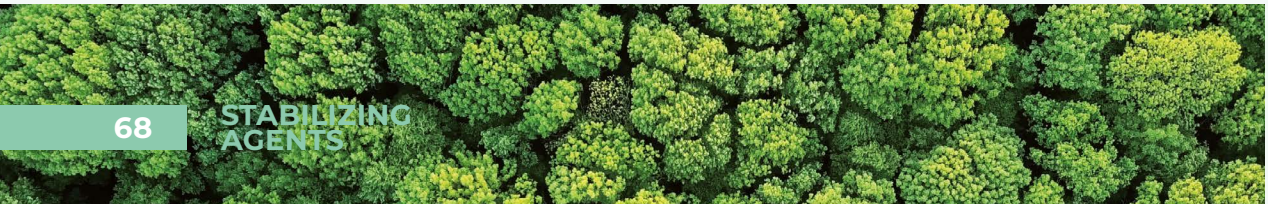
Up to 80% savings in energy and water consumption. (Source: www.stabiwine.eu)



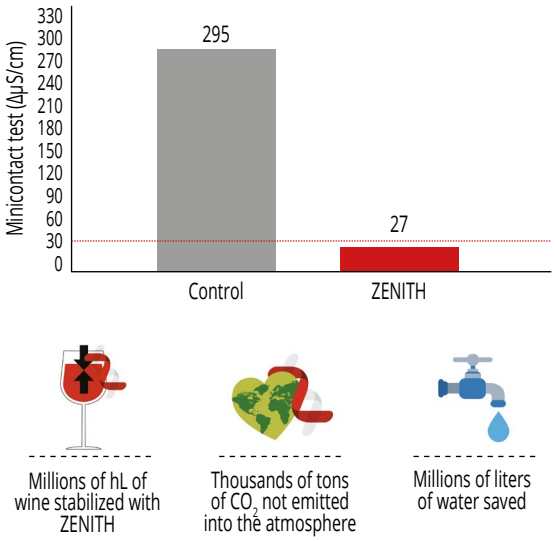


90% reduction on CO_2 emissions. (Source: www.stabiwine.eu)





The best stabilization performance up to 300 ΔμS over time and under temperature stress.



ZENITH is
the ideal solution for those looking for a sustainable, efficient and high quality method for tartaric stabilization, reducing the environmental impact.

Enartis' Commitment to Sustainability

Enartis is committed to sustainability.
We have performed The Life-Cycle Assessment (LCA) study on ZENITH's production process. This international method evaluates the environmental impacts associated with a product by considering resource consumption and emissions, from raw materials to finished the product. The results showed that ZENITH's environmental impact is minimal.
The use of ZENITH saves approximately **two kilowatt hours of electricity** and **six liters of water** per hectolitre of wine produced, avoiding the emission of **1.2 kilograms of CO_2** equivalent.
This makes ZENITH an environmentally friendly and efficient solution for the tartaric stabilization of wine.

2 kw/h electricity

6 L water

1.2 kg CO_2

Did you know?
If all wineries in Europe used potassium polyaspartate for wine stabilization, it is estimated that CO_2 emissions produced during the phase before bottling would be reduced by 95.5% per year. The same applies to water use: drinking water consumption would be reduced by 93%. All this without placing an economic burden on producers who would actually face considerable financial savings.

Source: Stabiwine project.

Broad-spectrum Stabilizers

CITROSTAB rH

- Citric acid, ascorbic acid, potassium metabisulfite, and gallic tannins.
- Designed to stabilize wine redox potential and prevent post-bottling oxidation reactions.
- Protects bottled wine from oxidation alterations such as pinking, metal casse, atypical or premature ageing.

APPLICATION	DOSAGE	PACKAGING
Bottling; prevent oxidation; prevent pinking; stabilize redox potential; wine shelf life improvement	10-50 g/hL (0.8-4.2 lb/1,000 gal)	1 kg

Gum Arabic

Gum Arabic, extracted from Acacia Verek or Acacia Seyal, is widely used in food, beverages, pharmaceutical industries to assist the formation and stabilization of emulsions and for the encapsulation of flavors. The major applications for gum Arabic in winemaking are to stabilize wine against tartrate precipitation, stabilize young red wines against color pigment precipitation and to improve mouthfeel.
In keeping with its philosophy of meeting different winemaking needs with appropriate products, Enartis has developed a complete range of gum Arabic preparations to meet all winemaking needs.

CITROGUM

- Solution of gum Arabic from Acacia Seyal with low calcium content and high hydrolysis.
- Prevents precipitation of colloids, pigments, and tartrates.
- Improves wine balance, enhances aroma, reduces bitterness and astringency perception, and increases softness and volume.
- The most filterable gum on the market: no filter membrane clogging even at high dosages.

APPLICATION	DOSAGE	PACKAGING
Tartrate stabilization; reduce astringency; soften mouthfeel	50-200 mL/hL (1.9-7.6 L/1,000 gal)	20 kg 200 kg 1,000 kg

CITROGUM PLUS is my go-to product when I need to improve palate weight and mouthfeel of a wine before bottling. It builds the mid-palate beautifully and offers a hint of perceived sweetness leaving a luscious and succulent finish! **Tami McKay, Winemaker at Ray's Station Winery & VWE Vintage Wine Estates - California, USA**

CITROGUM PLUS

IMPROVE MOUTHFEEL

- Solution of gum Arabic from Acacia Seyal and yeast mannoproteins.
- Prevents precipitation of colloids, pigments, and tartrates.
- Increases sweetness perception, softness, volume. Balancing aromas while reducing bitterness and astringency.
- Completely filterable.

APPLICATION	DOSAGE	PACKAGING
Tartrate stability; reduce astringency perception; increase sweetness; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines	100-300 mL/hL (3.8-11.3 L/1,000 gal)	20 kg

	GUM ARABIC SEYAL		GUM ARABIC VEREK	
	CITROGUM	CITROGUM PLUS	MAXIGUM F	MAXIGUM PLUS
Tartaric Stability	●●	●●	0	●
Color Stability	0	●	●●●●	●●●●
Filterability	●●●●	●●●●	●●●●	●●●●
Sensory Effect	●●● + Volume	●●●● + Volume + Softness – Bitterness	●●● + Structure	●●●● + Volume + Softness – Astringency

MAXIGUM F

- Gum Arabic solution from Acacia Verek.
- Highly effective in preventing color compound precipitation in red and rosé wines ready for bottling.
- Decreases astringency while respecting wine structure and sensory profile.
- The gum Arabic undergoes an innovative production process which makes it totally filterable, allowing for addition before microfiltration.

APPLICATION	DOSAGE	PACKAGING
Tartrate stability; color stability	200 mL/hL (7.6 L/1,000 gal)	20 kg

MAXIGUM PLUS

IMPROVE MOUTHFEEL

- Solution of gum Arabic from Acacia Verek and mannoproteins.
- Highly effective in preventing color compound precipitation in red and rosé wines ready for bottling.
- The mannoproteins reinforce gum stabilization effect and, due to their interaction with aromatic and polyphenolic compounds, soften astringency, reduce dryness, and improve aroma complexity.
- The gum Arabic undergoes an innovative production process which makes it totally filterable, allowing for addition before microfiltration.

APPLICATION	DOSAGE	PACKAGING
Color stability; increase structure and mouthfeel; microfilterable	50-100 mL/hL (1.9-3.8 L/1,000 gal)	20 kg

ALSO **AVAILABLE**

AROMAGUM

Gum Arabic solution. Stabilizes wine aroma, enhances fruitiness, and maintains freshness over time.

EnartisStab **MICRO**

Chitosan-based stabilizing agent, serving as a vegan alternative to lysozyme and SO_2. Removes spoilage organisms and enhances microbial stability. Recommended after fermentation in low turbidity wines.

ENOCRISTAL SUPERATTIVO

Blend of neutral and acidic potassium tartrate and filtering aids. Rapid crystallizer for cold stabilization of tartrates. Accelerates potassium bitartrate crystal formation and precipitation during cold treatment, without affecting wine pH.

POTASSIUM BITARTRATE Food Grade

Do Not Forget Winemaking Basics

ASCORBIC ACID POWDER, Food Grade

PACKAGING
1 kg

CITRIC ACID, Food Grade

PACKAGING
1 kg - 25 kg - 50 lb

DISACIDIFICANTE BIANCONEVE

PACKAGING
1 kg - 25 kg

- Blend of potassium bicarbonate and neutral potassium tartrate.
- Reduces acidity of overly acidic wines making them smoother and more pleasant.

L-MALIC ACID, Food Grade

PACKAGING
25 kg

D,L-MALIC ACID POWDER, Food Grade

PACKAGING
1 kg - 50 lb

TARTARIC ACID, Food Grade

PACKAGING
1 kg - 25 kg

BACK

SULFITING AGENTS

Enartis is proud to offer the highest purity potassium metabisulfite on the market: WINY. Potassium metabisulfite (KMBS) is one of the most widely used additives in winemaking. WINY can scavenge oxygen radicals responsible for oxidation, bind with oxidation byproducts such as acetaldehyde, inhibit oxidasic enzymes thus preventing browning, and reduce spoilage by inhibiting the growth of many microorganisms detrimental to wine.

enartis

Inspiring innovation.

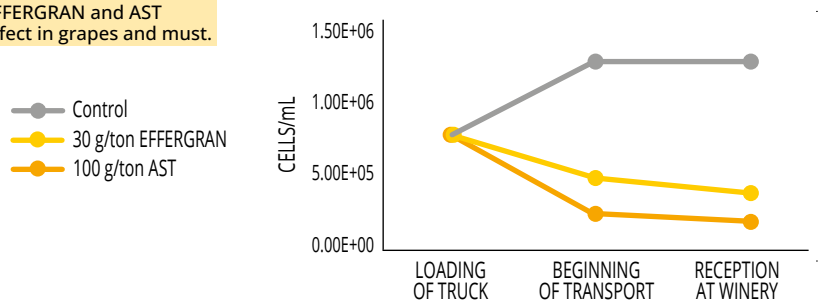
AST

EARLY PROTECTION

- Potassium metabisulfite, L-ascorbic acid, and gallic tannin.
- Strong antioxidant and antimicrobial. Reduces overall SO_2 needs and limits its macerative effects.
- Ideal for mechanically-harvested grapes, varieties rich in phenolic compounds, and sparkling base must.

APPLICATION	DOSAGE	PACKAGING
Antioxidant protection of grapes and juice; aromatic grapes; must for base wine for sparkling wines; prevention of atypical ageing	100-200 g/ton of grapes 15-20 g/hL (1.2-1.7 lb/1,000 gal) in juice 10 g/hL (0.8 lb/1,000 gal) of AST contains approximately 28 ppm SO_2 and 30 ppm ascorbic acid	1 kg

Antimicrobial action of EFFERGRAN and AST effect in grapes and must.



Wonderful product with regards to getting some good protection out in the vineyards, the tractor drivers throw it onto the trailers as soon as the machine offloads. Juice keeps its green color for very long periods due to good protection against oxygen. What I have noticed is how well the ascorbic acid first binds the oxygen then after that the sulfur binds. I gather info from my analyses once the juice arrives in the cellar. I use a drum filter (oxidative) to filter my lees and even then the juice is still green with minimal browning. **Philip Viljoen, Winemaker at Bon Courage Cellar - Robertson, South Africa**

WINY

- Pure and high quality potassium metabisulfite.
- Low odor (less irritation), easy to dissolve, low clumping formulation.
- Scavenges oxygen and oxidation byproducts.
- Prevents juice browning by inhibiting oxidasic enzymes.
- Wide spectrum antimicrobial.
- Accelerates extraction of phenolic compounds and color matter from grapes.

APPLICATION	DOSAGE	PACKAGING
Sulfiting grapes, juices and wines	1 g of WINY contains approximately 0.56 g of SO_2	1 kg 25 kg

Calculation for addition of WINY

$$\frac{\text{(ppm Total } SO_2 \text{ desired) x (Liters of Wine)}}{\text{(0.56 x 1,000)}} = \text{grams WINY to add}$$

EFFERGRAN/EFFERGRAN DOSE 5/EFFERBARRIQUE

- Effervescent, granulated potassium metabisulfite designed to be added directly to wine and grapes.
- Quick dissolution on the surface of juice or wine, ensuring antioxidant effect where needed.
- Homogenous and rapid distribution of the released SO_2 without requiring pump-overs in tank up to 50,000 liters.
- When added to the bottoms of picking bins, it ensures a rapid release of SO_2, minimizing oxidation during transport from vineyard to winery.

APPLICATION	DOSAGE	PACKAGING
Sulfiting wines, grapes and juice; homogeneous release of SO_2	1 package of EFFERBARRIQUE releases 2 g of SO_2 1 package of EFFERGRAN DOSE 5 releases 5 g of SO_2	EFFERBARRIQUE (40 packs) EFFERGRAN DOSE 5 (25 packs) EFFERGRAN 125 g EFFERGRAN 250 g EFFERGRAN 1 kg

Calculation for addition of EFFERGRAN/EFFERBARRIQUE

$$\frac{\text{(ppm Total } SO_2 \text{ desired) x (Liters of Wine)}}{\text{(0.56 x 1,000)}} = \text{grams EFFERGRAN to add}$$

POTASSIUM METABISULFITE ADDITION GUIDELINES

	SO_2 addition (mg/L)	g/hL	g/barrel	g/1,000 gal	lbs/1,000 gal
WINY	5	0.9	2	33	0.07
	10	1.8	4	65	0.14
	30	5.4	12	196	0.43
	50	8.9	20	326	0.72
	60	10.7	24	392	0.86

	SO_2 addition (mg/L)	g/hL	g/barrel	g/1,000 gal	lbs/1,000 gal
EFFERGRAN / EFFERBARRIQUE	5	1.25	2.7	46	0.10
	10	2.4	5.4	93	0.21
	30	7.1	16.1	278	0.63
	50	11.9	26.8	463	1.04
	60	14.3	32.1	556	1.25

BACK

ENARTIS ENGINEERING (EE) offers support and assistance for technical applications throughout the winemaking process: prior assessment of facilities, technical product advice, and safety training and equipment management for personnel.
EE also provides advice on the most suitable machinery for dosing, filtration, extraction, flotation, gas management, micro-oxygenation, cleaning, and laboratories.
By collaborating closely with winemakers and leveraging state-of-the-art technology, ENARTIS ENGINEERING provides tailored solutions that improve production efficiency, sustainability, and quality.

Comprehensive Technical Engineering Support

ENARTIS ENGINEERING supports wineries throughout every phase of production, customizing equipment based on specific needs. The department offers ongoing personalized consultation, ensuring that proposed solutions deliver optimal results. The team boasts in-depth engineering and enological skills, while understanding customer needs and expert support.

A Commitment to Sustainability and Quality

Daily, EE strives to provide conscientious assistance from a sustainability perspective, finding the best solutions to achieve processes with the least impact on the environment and associated labor and/or energy costs, while maintaining the highest sensory and physical qualities of wine.

By integrating cutting-edge technology, ENARTIS ENGINEERING equips wineries with tools that blend tradition with innovation and efficiency.

Eco Flot 300 hL and 500 hL

- Flotation unit that simplifies must fining with economic and qualitative benefits.
- Stainless steel pressurization pump with a closed impeller and sample valve for flotation tests.
- Flowmeter to adjust the amount of gas to be dissolved and sphere output valve to control pressurization.

MicroOX (from 1 to 5 dosing points)

- Micro-oxygenation system that guarantees high precision oxygen dosing at low flow levels with easy handling and data management.
- Minimum working pressure: oxygen is dispensed at the minimum pressure required to minimize bubble diameter and improve oxygenation effects.
- Ensures a linear and constant supply as it does not use dosing chambers, but instead uses sensors that measure gas flow in real-time.

Dosing pump CDS01

- Customized system for precise dosing of stabilizing agents such as gum Arabic, CMC, and KPA.
- Maximum safety and dosing precision due to real-time controls and self-regulation.
- Coordination with the bottling system and large, exportable data storage.

Tartarcheck Plus

- Provides rapid determination of tartaric stability using simple, intuitive software.
- Complete and compact with an LCD display and thermal printer. No auxiliary devices needed so the instrument can be placed anywhere in the laboratory.
- Offers two analytical methods determined by the electric conductivity of the wine in different thermal conditions: isothermal Test and TS Test.

BEST PRACTICES AND TIPS TO IMPROVE

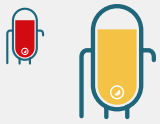
COLLOIDAL STABILIZATION

Colloidal stabilization is a critically important step in ensuring the clarity and stability of wine over time. This process aims to prevent the formation of colloidal aggregates that could precipitate, causing cloudiness and sediment in the bottle. This phenomenon results in a loss of aromatic quality and creates a negative impact for the consumer.

Inline Stabilization: Precision and Safety for the Stabilization of Your Wine

Colloidal stabilization using stabilizing colloids (ZENITH made from KPA and gums) represents an increasingly popular and sustainable strategy to achieve and guarantee wine stability over time, while respecting sensory characteristics.
To ensure precise dosing and sufficient homogenization of stabilizing colloids in wine, ENARTIS ENGINEERING has developed EE CDS01, a dosing system integrated with the bottling line that ensures a continuous, safe and precise stabilization process. At each step during winemaking, it is important to act in a targeted and timely manner.

1



Clarification

Eliminate proteins that cause cloudiness and unstable color. The use of **CLARIL ZR** in red wines and **CLARIL ZW** on whites prepares wine for subsequent stabilization with **ZENITH**.

2

Microfiltration

Once a pump is connected to the bottling line and a continuous, uninterrupted flow is generated, cartridges ensure maximum microbiological protection after filtration.

3

Dosing

The **EE CDS01** dispenser automatically takes the exact amount of stabilizer needed and injects it directly into the wine stream, ensuring accurate and consistent dosing even when flow rates change.

4

Bottling

The wine, completely microfiltered and stabilized, is transferred directly to the bottling machine without interruption, thus minimizing risks of oxidation and contamination by external agents.

Wine Stability Parameters

Prior to colloidal stabilization, it is necessary to carry out predictive stability tests and, if needed, to remove protein and unstable color through targeted clarification.

WHITE AND ROSÉ WINES

- ✓ Protein stability
- ✓ KHT tartaric stability
- ✓ Colloidal stability

RED WINES

- ✓ Color stability
- ✓ KHT tartaric stability

Why use Inline Stabilization with Protective Colloids

The use of stabilizing colloids makes it possible to drastically lower energy consumption and the environmental impact of the stabilization process, making it easier and more economical.

ZENITH (KPA)

- ✓ Reduction of energy consumption, drinking water and CO_2 emissions
- ✓ Respects sensory characteristics and maintains acidity and structure

GUM ARABIC

- ✓ Stabilization of color matter
- ✓ Improved sensory balance

The EE CDS01 metering pump enables safe and accurate dosing, reducing the risk of human error and labor costs. Inline stabilization is the winning strategy for an agile, accurate and sustainable process.

A Focus on Stabilizing Colloids

Enartis recommendation	Purpose	Dosage
ZENITH MEGA Potassium polyaspartate, Verek gum Arabic, and mannoproteins	Sensory improvement and tartaric stabilization of very unstable red wines	Up to 200 mL/hL
ZENITH WHITE NF Potassium polyaspartate, CMC, and Seyal gum Arabic	Tartaric stabilization of very unstable white and rosé wines and increase flavor balance	Up to 150 mL/hL
MAXIGUM PLUS Verek gum Arabic	Stabilization of color matter in red and rosé wines and decrease bitterness	50 - 100 mL/hL
CITROGUM PLUS Seyal gum Arabic and mannoproteins	Increase sensation of sweetness and volume and decrease astringency	100 - 300 mL/hL

The Answer to Digital Transformation You've been Waiting for

winegrid
Smart Oenology
by
enartis

WINEGRID technology, a brand of Enartis, provides winemakers with advanced remote monitoring systems. These tools offer real-time insights into fermentation kinetics, liquid levels, temperature, and density. By identifying potential issues early, such as fermentation delays, WINEGRID enables proactive solutions, ensuring process optimization and reducing waste. Its dashboard simplifies record-keeping, making it invaluable during critical periods like harvest.

Discover more on Winegrid technologies

TANK ALCOHOLIC FERMENTATION

Two precise and accurate systems that measure liquid height, temperature and density while monitoring fermentation kinetics and yeast behavior.

Wineplus Premium

Stainless steel casing with an innovative RGB LED visual alarm.

Wineplus

Polycarbonate casing.

BARREL ALCOHOLIC FERMENTATION

Barrelplus

Measures temperature and density for better management of fermentation progress and yeast requirements.

SECOND FERMENTATION

Solutions for monitoring sparkling wine production that allow winemakers to monitor the evolution of pressure and, as a result, to achieve a consistent. This proactive approach prevents pressure fluctuations, avoiding a reduction in quality.

e-aphrom

Designed for Champenoise method, measures temperature, pressure and detects bottle movement.

e-charmat

Designed for Charmat method, monitors temperature and pressure in tanks.

BARREL MATURATION

e-bung

Monitors temperature, headspace, and detects sensor movements, optimizing the management of top-offs. Better control of headspace reduces the potential presence of oxygen, and helps prevent the development of microorganisms (*Brettanomyces* and/or Acetobacter), and therefore, SO_2 losses.

WINERY ENVIRONMENT

Smartcellar

Allows winemakers to monitor the temperature, humidity and CO_2 levels in the winery, offering movement detection as well. It helps provide a healthy and safe environment for the operator, while also controlling the environmental conditions that play an important role in ensuring final wine quality.

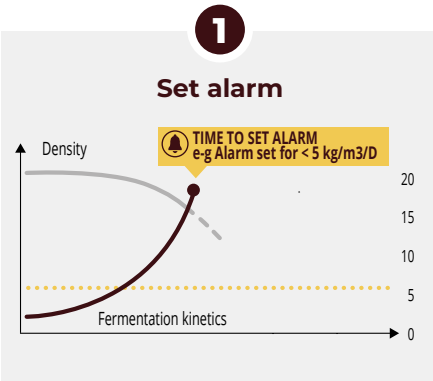
Better knowledge of your fermentation kinetics: forget sluggish and stuck fermentations!

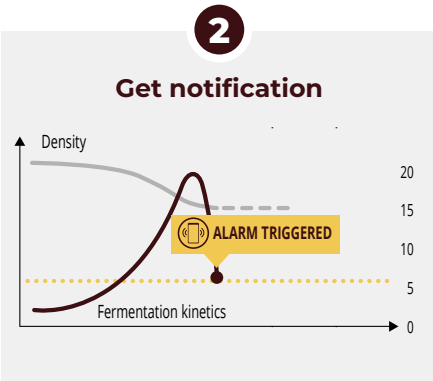
Global warming is one of the most important aspects of climate change that has a negative impact on the wine industry and beyond. Today's producers face multiple challenges: high temperatures combined with high variability of rainfall and extreme events such as hail, fires, floods, and long periods of drought.
This inevitably lead to an imbalance in ripeness, higher alcohol potential and inconsistent grape characteristics, leading to increasingly difficult fermentations.
Wineplus and Barrelplus sensors can help to control fermentation kinetics through real-time monitoring and traceability.
Through WINEGRID dashboard information, winemakers can always be updated on wine status, which allows for better management of the entire process. Reduced kinetics indicate delayed fermentation, which can lead to stuck fermentations translating into high production costs. With the Fermentation Monitoring System and by monitoring the evolution of kinetics, it is possible to completely avoid stuck fermentations, maximizing fermentative activity.
And finally, all additions and actions can be logged into the WINEGRID Dashboard for easy access and comparison, even during harvest.

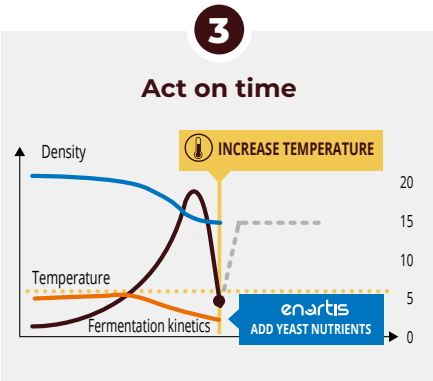
The importance of maximizing results through nutrition timing

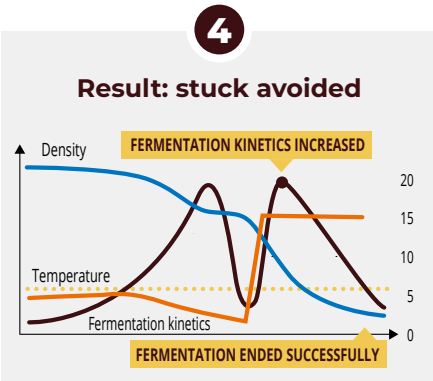
Improve alcoholic fermentation efficiency to ensure a successful end of fermentation and high-quality wine production.
This can now be achieved due to the knowledge of yeast nutritional needs at each stage of alcoholic fermentation with balanced nutrition and the continuous monitoring of fermentation parameters with WINEGRID sensors, both in tanks and barrels.

- ✓ Improvement of wine sensory profile depending on the type of nutrition chosen.
- ✓ Optimal status and biomass production leading to good yeast health and growth, preventing sluggish and stuck fermentations and the issues they can provoke (off-flavors, re-starting AF, labor, quality loss, etc.).
- ✓ Easy to manage, control and take the necessary measures at the required time, even remotely.
- ✓ Adaptable to any winemaking protocol, technology, and type of wine.
- ✓ Sustainable due to better fermentation temperature management.









DIGITAL ALCOHOLIC FERMENTATION MANAGEMENT

Organic Products

Products that can be used to produce organic wines certified according to European regulations (Reg. (EU) 2021/1165 - Reg. (EU) 848/2018 and subsequent amendments) and for the US regulation NOP (National organic program)

PRODUCT	EU	NOP
ENZYMES		
EnartisZym RS		●
EnartisZym AROM MP		●
EnartisZym COLOR FRUIT		●
EnartisZym COLOR PLUS		●
EnartisZym EZFILTER		●
YEASTS		
All products of EnartisFerm Range	●	●
YEAST NUTRIENTS		
NUTRIFERM AROM PLUS	●	
NUTRIFERM ULTRA	●	
NUTRIFERM TIRAGE	●	
NUTRIFERM NO STOP	●	
NUTRIFERM SPECIAL (also available)	●	
NUTRIFERM CONTROL (also available)	●	●
NUTRIFERM ENERGY (also available)	●	
YEAST DERIVATIVES		
EnartisPro AROM	●	●
EnartisPro PERLAGE	●	●
EnartisPro BLANCO	●	
EnartisPro UNO	●	
EnartisPro TINTO	●	
SURLÌ VITIS	●	●
SURLÌ ONE	●	●
SURLÌ ELEVAGE		●
SURLÌ VELVET	●	
EnartisPro R (also available)	●	●
SURLÌ VELVET PLUS (also available)	●	
FINING AGENTS		
PLANTIS AF-Q	●	

PRODUCT	EU	NOP
PLANTIS L	●	
PLANTIS PQ	●	
CLARIL OX	●	
CLARIL SMK	●	
CLARIL ZR	●	
CLARIL ZW	●	
ENOBLACK PERLAGE	●	
FENOL FREE	●	
PLUXCOMPACT	●	●
HYDROCLAR 45 (also available)	●	●
PULVICLAR (also available)	●	●
PHARMABENT (also available)	●	●
ENOBLACK SUPER (also available)	●	
HYDROCLAR 30 (also available)	●	●
PLUXBENTON N (also available)	●	●
BENTOLIT SUPER (also available)	●	●
SIL FLOC (also available)	●	
PROTOCLAR (also available)	●	
MALOLACTIC FERMENTATION		
EnartisML MCW	●	●
EnartisML SILVER	●	●
EnartisML UNO	●	●
OAK ALTERNATIVES		
INCANTO NATURAL	●	
INCANTO CREAM	●	
INCANTO VANILLA	●	
INCANTO CARAMEL	●	
INCANTO SPECIAL FRUIT	●	
INCANTO TOFFEE	●	
INCANTO DARK CHOCOLATE	●	

PRODUCT	EU	NOP
INCANTO BLACK SPICE	●	
INCANTO NC	●	●
INCANTO NC WHITE	●	●
INCANTO NC DARK CHOCOLATE	●	●
INCANTO NC CHERRY	●	●
INCANTO NC RED	●	●
INCANTO SPICE (also available)	●	
INCANTO COMPLEXITY (also available)	●	
INCANTO SLI (also available)	●	
TANNINS		
All products of EnartisTan Range	●	●
STABILIZING AGENTS		
EnartisStab MICRO M	●	
CITROSTAB rH	●	
CITROGUM	●	●
CITROGUM PLUS	●	
MAXIGUM PLUS	●	

PRODUCT	EU	NOP
MAXIGUM F	●	●
AROMAGUM (also available)	●	●
EnartisStab MICRO (also available)	●	●
ENOCRISTAL SUPER ATTIVO (also available)	●	
POTASSIUM BITARTRATE (also available)	●	●
WINEMAKING BASICS		
ASCORBIC ACID POWDER, Food Grade	●	●
CITRIC ACID, Food Grade	●	●
DISACIDIFICANTE BIANCONEVE	●	
L-MALIC ACID, Food Grade		●
TARTARIC ACID, Food Grade	●	●
SULFITING AGENTS		
AST	●	
EFFERGRAN	●	
EFFERBARRIQUE/EFFERGRAN DOSE 5	●	
WINY	●	

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Note

ENARTIS' STRATEGIES AND SOLUTIONS

Enartis highlights some of the most important topics in the wine industry. Depending on the oenological objective, these QR codes will provide technical information for different styles of wine production and how to prevent, manage and treat the most common situations that may arise.

Rosé

Smoke Impact

Plant-Based Winemaking

Wine Stability

Labor Shortage

Reductive Wine

Low or Zero SO_2 Wine

Sustainability Improvement

Alternative Packaging

Shelf Life Improvement

Sparkling Wine

Malolactic Fermentation

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Enartis Loves the Planet

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