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Inspiring innovation.



HANDBOOK

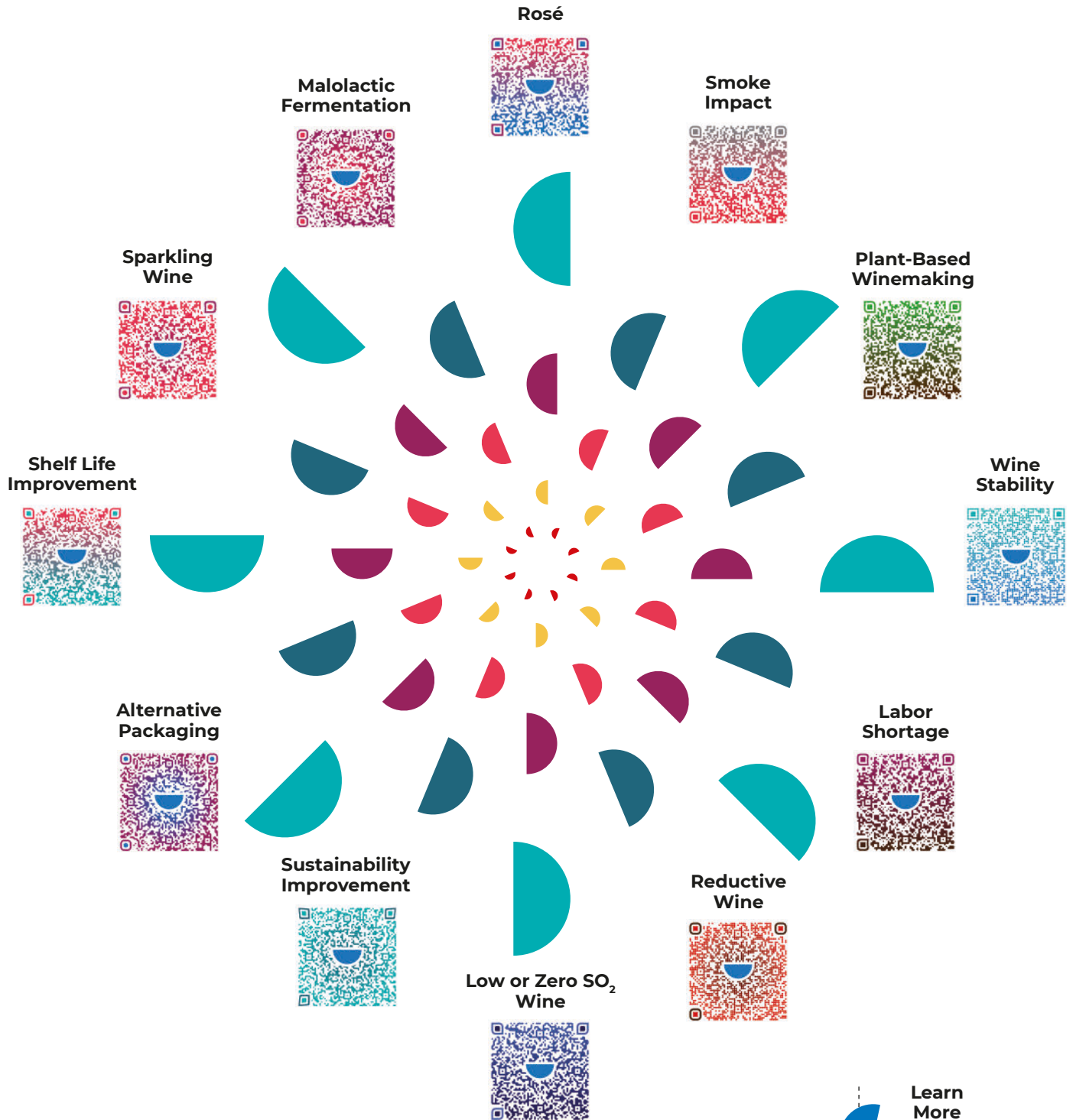
2023

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# 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.



CREATING A SUSTAINABLE FUTURE

# 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. When used 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.



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## PURE POTASSIUM METABISULFITE WINY

WINY is produced from high quality raw materials, without metals which could favor oxidation of potassium metabisulfite. WINY undergoes a purification process that eliminates oxygen and sulfites that could create sulfates. Enartis controls and guarantees the technical specifications of its products. The specifications of WINY are often better than those specified by law and the average concentration values are often higher.

- 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.

**Dosage:** 1 g of WINY contains approximately 0.56 g of SO<sub>2</sub>

**1 kg (Item #35-820-0001) \$ 8.00**  
**25 kg (Item #35-820-0025) \$ 147.50**

### CALCULATION FOR ADDITION OF WINY

$$\frac{(\text{ppm Total SO}_2 \text{ desired}) \times (\text{Liters of Wine})}{(0.56 \times 1,000)} = \text{grams WINY to add}$$



Competitor's KMBS: 20% W/V Solution | WINY: 20% W/V Solution

### POTASSIUM METABISULFITE ADDITION GUIDELINES

	SO <sub>2</sub> 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
	EFFERGRAN / EFFERBARRIQUE	SO <sub>2</sub> addition (mg/L)	g/hL	g/barrel	g/1,000 gal
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

## EFFERVESCENT POTASSIUM METABISULFITE

Effervescent sulfiting agents combine the benefits of KMBS with several additional advantages. Upon contact with wine or juice, these products release CO<sub>2</sub>, creating natural mixing for homogenization of the product with no further agitation needed.

### Advantages of EFFERGRAN/EFFERBARRIQUE

- Reduces risk of incorrect additions and poor SO<sub>2</sub> distribution in wine
- Reduces labor time for sulfiting barrel or small vessels
- Reduces risk for cellar worker health (low odor, low irritation)
- Rapid, complete and homogeneous distribution of SO<sub>2</sub> without mixing in barrels and tanks up to 50,000 L (13,200 gal)

## EFFERBARRIQUE/EFFERGRAN DOSE 5

- Effervescent, granulated potassium metabisulfite.
- Strong antioxidant and antimicrobial effect.
- Individually packaged for single use in barrels or small vessels.
- Homogeneous and rapid distribution of SO<sub>2</sub> without requiring mixing.

**Recommendations:** Sulfiting barrel; small vessels; homogeneous SO<sub>2</sub> released.

**Dosage:** 1 package of EFFERBARRIQUE releases 2 g of SO<sub>2</sub>  
 1 package of EFFERGRAN DOSE 5 releases 5 g of SO<sub>2</sub>

**EFFERBARRIQUE (40 packs) (Item #35-800-0000) \$ 25.00**  
**EFFERGRAN DOSE 5 (25 packs) (Item #35-805-0000) \$ 23.00**

## EFFERGRAN

- Effervescent, granulated potassium metabisulfite.
- Strong antioxidant and antimicrobial effects.
- When added to grapes, it assures a homogeneous and a rapid release of SO<sub>2</sub>, minimizing oxidation during transport from vineyard to winery.
- When added to wine, it rapidly dissolves, assuring a homogeneous and rapid distribution of SO<sub>2</sub> without requiring pump-overs in tank volumes of up to 50,000 L (13,200 gal).

**Recommendations:** Sulfiting tank; homogeneous SO<sub>2</sub> released; wines; juices; grapes; grapes transport.

**125 g (Item #35-810-0000) \$ 4.50**  
**250 g (Item #35-815-0000) \$ 8.00**  
**1 kg (Item #35-810-0001) \$ 22.00**

### CALCULATION FOR ADDITION OF EFFERGRAN/EFFERBARRIQUE

$$\frac{(\text{ppm Total SO}_2 \text{ desired}) \times (\text{Liters of Wine})}{(0.42 \times 1,000)} = \text{grams EFFERGRAN to add}$$

## COMPLEX ANTI-OXIDANT BLEND

### AST

- Potassium metabisulfite, L-ascorbic acid and gallic tannin.
- Strong antioxidant and antimicrobial actions. When used on grapes, AST acts as an antibacterial and antioxidant.

**Recommendations:** Antioxidant; Botrytis cinerea affected fruit; antimicrobial; harvest machine; grape transport.

**Dosage:** 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<sub>2</sub>

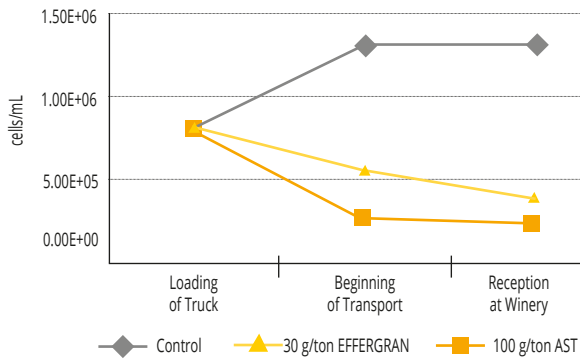
1 kg (Item #35-825-0001) \$ 45.00



Wonderful product with regards to getting some good protection out in the vineyards. Tractor drivers throw it onto the trailers as soon as the machine offloads. Juice keeps its green color for a very long period 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)**

ANTIMICROBIAL ACTION OF EFFERGRAN AND AST EFFECT IN GRAPES AND MUST



# ENZYMES

Enzymes are biological catalysts of reactions and naturally present in all living systems. Highly specific, they act on one or a limited number of substrates to facilitate and accelerate reactions. Enological enzymes are “cocktails” in which each enzyme’s activity plays a role to reach a specific objective. The main enological enzymes are pectinases, glucanases and glycosidases which contain naturally-occurring side activities such as hemicellulasic, cellulosic and/or proteasic. In order to offer optimum quality and performance, all Enartis enzymes undergo a purification process to remove any potentially detrimental activities such as cinnamyl-esterase activity (a side activity that puts wine at risk of aromatic spoilage through the production of vinyl-phenols), anthocyanase (side activity that causes color loss) and oxidase (side activity that promotes oxidation of polyphenols and aromatic compounds).



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## WHITE AND ROSÉ WINE FERMENTATION

### Clarification

#### EnartisZym EZFILTER

- 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 pectins and polysaccharides from grapes and polysaccharides produced by microorganisms, such as glucans.
- Can be used also to accelerate the release of mannoproteins both in fermentation and during maturation on lees.

**Recommendations:** *Improve clarification and filterability of must and wine; accelerate mannoprotein extraction; improve wine stability.*  
**Dosage:** 2-4 mL/hL (75-150 mL/1,000 gal)

1 kg (Item #35-177-0001) \$ 92.00  
 10 kg (Item #35-177-0020) \$ 850.00



My initial impressions of EnartisZym EZFILTER from Enartis are very promising. Cider is notorious for being difficult to filter. I am trying to turn over 8,500 gallons of cider in a 25 day period (fermentation to bottle ready cider) with one assistant and two plate and frame filters. One dose with EnartisZym EZFILTER pre-fermentation and we were able to move from 8 microns to .4 microns with great efficiency in a short amount of time. Justin Paolicelli, Production Manager for Three Brothers Wineries & Estates (NY)



We've filtered hundreds of thousands of gallons of cider over the years and there is no question that ciders treated with both a pectinase and a glucanase filter more easily than those that are not. If the dosing and timing is right, we've literally seen a 40-50-60% increase in filtration speeds. EnartisZym EZFILTER alone worked just as well as what we've seen from separate pectinase and glucanase enzyme treatments. Allan Whetstone, Cascade Wine Services (OR)

#### EnartisZym RS

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

**Recommendations:** *Difficult-to-clarify juice; varieties rich in pectins; mechanical grape processing.*

**Dosage:** 1-3 mL/hL (38-113 mL/1,000 gal)  
 1 kg (Item #35-160-0001) \$ 180.00



#### EnartisZym RS(P)

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

**Recommendations:** *Difficult-to-clarify juice; varieties rich in pectins; mechanical grape processing.*

**Dosage:** 0.5-3 g/hL (0.04-0.25 lb/1,000 gal)  
 0.1 kg (Item #35-160-0100) \$ 21.00

### Flotation

#### EnartisZym QUICK

- Liquid pectolytic enzyme preparation developed for juice clarification by flotation.
- High pectin-lyase content for fast depectinization and quick decrease in viscosity.

**Dosage:** 0.5-2 mL/hL (19-75 mL/1,000 gal)  
 1 kg (Item #35-110-0001) \$ 120.00



## Maceration

### EnartisZym AROM MP

- Micro-granulated pectolytic enzyme preparation developed to increase aromatic compounds extraction, press yield and improve juice clarification.
- Rich in cellulosic, hemicellulosic and proteasic side activities.
- Contributes to protein stability.

**Dosage:** 20-40 g/ton

**0.25 kg (Item #35-130-0250) \$ 65.00**

HEAT STABILITY TEST AT END OF ALCOHOLIC FERMENTATION ( $\Delta$ TU) (Wine considered stable when $\Delta$ TU<2)	SAUVIGNON BLANC	PINOT GRIS
Control	11	3.7
40 g/hL PLUXBENTON N	5.3	2.1
80 g/hL PLUXBENTON N	0.27 (stable)	0 (stable)
2 g/hL EnartisZym AROM MP + 40 g/hL PLUXBENTON N	0 (stable)	0 (stable)

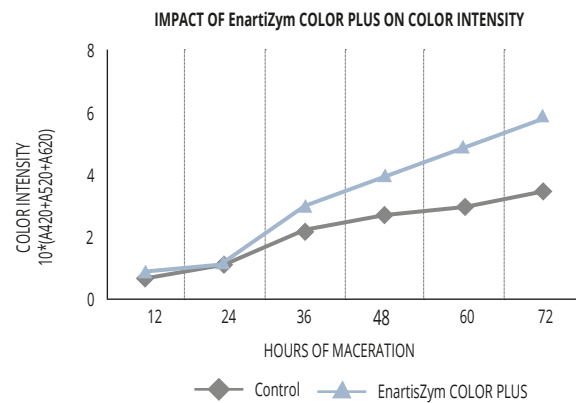
The use of EnartisZym AROM MP during fermentation improves protein stability and reduces the amount of bentonite needed to stabilize wine.

### EnartisZym COLOR PLUS

- Micro-granulated enzyme preparation developed to increase phenolic compounds and improve color stability.
- Cellulosic and hemicellulosic side activities accelerate and increase extraction of phenolic compounds.
- Hydrolyzes proteins and reduce precipitation of tannins and pigments.
- Improves color stability and intensity.

**Dosage:** 20-40 g/ton

**0.25 kg (Item #35-141-0250) \$ 65.00**  
**1 kg (Item #35-141-0001) \$ 230.00**



EnartisZym COLOR PLUS increased color extraction speed, color intensity and stability.

## RED WINE FERMENTATION

The final quality of wine - aromatic profile, color stability and intensity, structure, tannic quality and ageing potential - is largely dependent on maceration. Enzymes are effective tools for winemakers to optimize and accelerate the effects of maceration.

### EnartisZym T-RED PLUS

- Pectolytic enzyme specifically developed for thermovinification.
- Contains thermostable activities which are resistant to temperatures up to 65°C (149°F).
- Rich in secondary activities (cellulases, hemicellulases and proteases) which accelerate and intensify the extraction of color and tannins from grape skins.
- Protease activity hydrolyzes grape proteins, limiting their ability to precipitate tannins. As a result, wine is richer in tannins that contribute to the formation of stable color complexes.

**Application:** Red wine produced using thermovinification.

**Dosage:** 20-40 mL/ton for grapes or must

**1 kg (Item #35-144-0001) \$ 95.00**  
**10 kg (Item #35-144-0010) \$ 850.00**



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 aging. Color intensity in red wines are also better when using EnartisZym COLOR PLUS vs a control.  
**Louwritz Louw, Winemaker at KWV (South Africa)**

**EnartisZym CHARACTERISTICS**

	Clarification/ Cold Settling	Clarification of Difficult Juices	Clarification by Flotation	Maceration of White Grapes	Rosé Wine Production	Maceration of Red Grapes	Color Stability	Flash Détente/ Thermovinification	Aromatic Enhancement	Yeast Lysis	Improve Filtration	Botrytis	Form	Dosage	Package Size
EnartisZym AROM MP	●			●●●	●●●				●●		●		Powder	20-40 g/ton	0.25 kg
EnartisZym COLOR PLUS					●●●	●●●	●●●	●●			●		Powder	20-40 g/ton	0.25 kg   1 kg
EnartisZym EZFILTER	●●●	●●●			●●●					●●●	●●●●	●●●●	Liquid	2-4 mL/hL	1 kg   20 kg
EnartisZym QUICK	●●		●●●		●●						●		Liquid	0.5-2 mL/hL	1 kg
EnartisZym RS	●●●	●●●	●●		●●						●●●		Liquid	1-3 mL/hL	1 kg
EnartisZym RS(P)	●●●●	●●●●	●●		●●						●●●		Powder	1-3 g/hL	0.1 kg
EnartisZym T-RED PLUS								●●●			●●		Liquid	20-40 mL/ton	1 kg   10 kg

## 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*.

### 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.

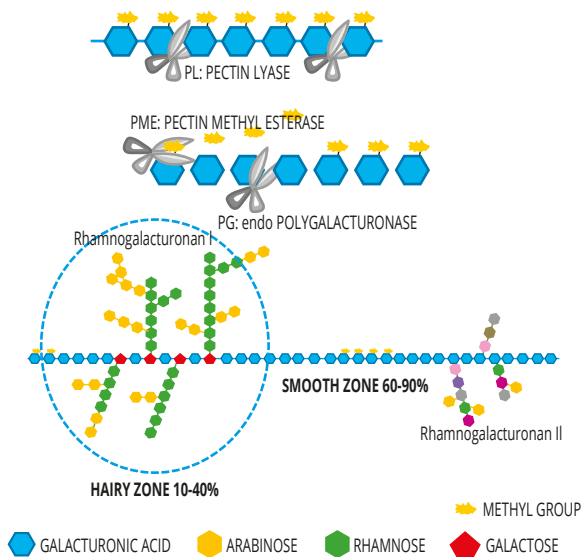


Figure 1: Representation of main pectolytic activities on pectin chains.

### 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 require no preservatives. Liquid enzymes are convenient to use and dose. They 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 (140°F) and inactivated at temperatures below 5°C (40°F). Optimum temperature for enological enzymes is around 40°C (104°F).

### DOES SO<sub>2</sub> AFFECT ENZYME ACTIVITY?

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

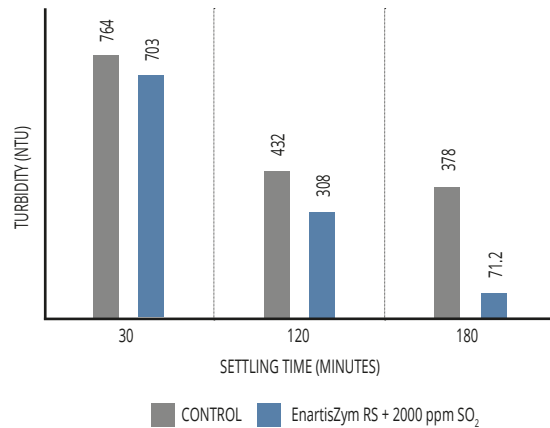


Figure 2: Impact of SO<sub>2</sub> addition on EnartisZym RS effect.

### 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.

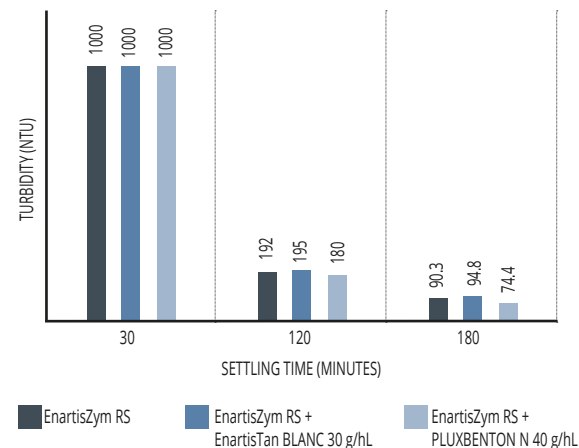


Figure 3: Impact of tannin and bentonite addition on EnartisZym RS effect.

### 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 or alcohol presence can be compensated for by higher dosages.

# YEAST

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 to suggest the application of each yeast to achieve the best quality wine.



**17. EnartisFerm Q RHO**

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## 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.

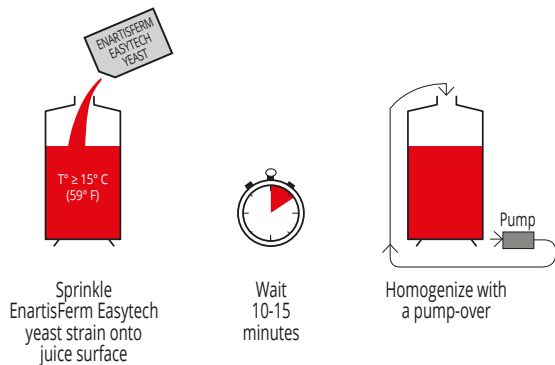
## EASYTECH YEAST APPLICATION

**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. 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. Enartis offers **four yeasts** that have been selected to ensure optimal fermentation performance in juices with temperatures above 15°C:



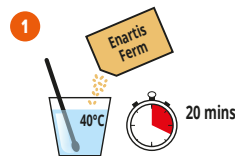
- EnartisFerm WS
- EnartisFerm AROMA WHITE
- EnartisFerm Q ET
- EnartisFerm VINTAGE RED

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

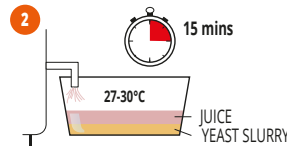


Enartis Easytech range is also suitable for traditional yeast rehydration.

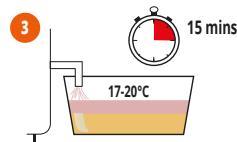
## PROTOCOL FOR YEAST REHYDRATION



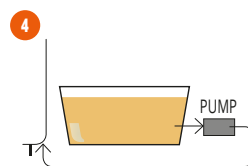
Rehydrate 20-40 g/hL of active dry yeast in 10 times its weight of chlorine-free water at 35-40°C (95-104°F). Stir gently to break up any clumps. Wait 20-30 minutes.



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 EnartisFerm ES U42.

## WHITE AND ROSÉ WINE FERMENTATION

### EnartisFerm AROMA WHITE

- Moderate speed fermenter.
- Medium/high nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Expresses thiols (β-lyase activity).
- Fermentation at 15-17°C favors fresh citrus and mineral notes; 18-21°C favors tropical and stonefruit aromas.
- Low producer of riboflavin: reduce risk of light-struck defect.

**Recommendations:** Thiol production; varietal expression; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-110-0500)	\$ 46.00
10 kg	(Item #45-110-0010)	\$ 580.00

### EnartisFerm ES123

- Medium speed fermenter.
- Medium lag phase.
- Medium/high nutrients requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Expresses thiols (β-lyase activity).
- Fermentation at 15-17°C favors fresh citrus and mineral. Fermentation at 18-21°C favors tropical and stonefruit aromas.

**Recommendations:** Neutral grapes; ester and acetate production; elegant wines.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-105-0500)	\$ 46.00
10 kg	(Item #45-105-0010)	\$ 580.00

### EnartisFerm ES181

- Fast fermenter.
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Expresses thiols (β-lyase activity) in reductive conditions and produces intense varietal and fermentation aromas.
- Produces complex wines with grapefruit, tropical fruit, passion fruit and fresh fruit aromas.

**Recommendations:** Intense aromas; thiol production; varietal expression; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-120-0500)	\$ 46.00
10 kg	(Item #45-120-0010)	\$ 580.00

### EnartisFerm ES FLORAL

- Blend of *S. cerevisiae* and *S. bayanus*.
- Moderate speed fermenter.
- Medium nutrient requirements.
- Low VA and SO<sub>2</sub> production.
- Produces intense fresh aromas of peach, pear, apricot, white flowers, violet and roses.

**Recommendations:** Neutral grapes; fruity and floral aromas; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-160-0500)	\$ 46.00
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### EnartisFerm PERLAGE

- Fast fermenter.
- Alcohol tolerant (up to 17%), resistant to SO<sub>2</sub> and low pH.
- Wide range of fermentation temperatures (10-30°C).
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Produces clean, elegant, delicate and complex wines with round and balanced mouthfeel.

**Recommendations:** Base wines; sparkling wines; traditional method; varietal expression.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-180-0500)	\$ 46.00
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### EnartisFerm Q4

- Enhances vegetal characteristics of thiolic varieties.
- Ideal for grassy style Sauvignon Blanc.
- The main feature of this strain is that it's a homozygote for the complete, long version of the IRC7 gene. This gene codifies the synthesis of a β-lyase enzyme, uniquely involved in the liberation of thiols (mainly 4-MMP) bound to cysteine.
- When used for the fermentation of thiolic varieties, EnartisFerm Q4 expresses the varietal aroma and specifically enhances the notes of box tree, tomato leaf and blackcurrant associated with 4-MMP.

**Recommendations:** Thiolic varieties; grassy-style Sauvignon blanc.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-075-0500)	\$ 46.00
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 I have been using EnartisFerm ES181 for more than 10 years. Without fail, it has been a reliable companion helping me produce the quality white wines my clients have become accustomed to. **Henri Swiegers, Production Manager and Winemaker at Badsberg Wine Cellar (South Africa)**


### EnartisFerm Q9

- Fast fermenter.
- High nutrient requirements.
- Low VA, SO<sub>2</sub> and H<sub>2</sub>S production.
- Expresses thiols (β-lyase activity).
- Produces complex wines with high mineral, roasted coffee and flinty notes. Intense gunpowder, citrus, grapefruit, tropical fruit, pear and pineapple aromas.

**Recommendations:** Minerality; "flinty"; varietal expression; thiol production; ester and acetate production; intense aromas.


**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg (Item #45-047-0500) \$ 46.00



We trialed EnartisFerm VINTAGE WHITE on our unoaked Chardonnay and Grenache Blanc during our 2020 harvest. We were delighted by the resulting wines. The yeast lived up to its promise of increased varietal aromas and increased weight on the pallet. Although fermentation takes place at a moderate speed, it is well worth the wait!

**Craig Christians, Winemaker at Rustenberg Wines (South Africa)**



EnartisFerm Q CITRUS builds whites and rosés with incredible citrus and tropical aromatics. 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 (CA)**

### EnartisFerm Q CITRUS

- Fast fermenter.
- Medium nutrient requirements.
- Low VA and H<sub>2</sub>S production.
- Expresses terpenes and norisoprenoids (β-glycosydase activity).
- Produces complex wines with intense zesty, citrus, grapefruit, tropical fruit, peach, pear and pineapple aromas.

**Tip:** Increase terpenes and norisoprenoids production by using EnartisTan CITRUS during fermentation.

**Recommendations:** Varietal expression; citrus aromas; thiol production; terpenes and norisoprenoids production; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg (Item #45-302-0500) \$ 46.00  
10 kg (Item #45-302-0010) \$ 580.00

### EnartisFerm VINTAGE WHITE

- Moderate speed fermenter.
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Release high amount of polysaccharides and create compact lees.
- Preserves varietal fruit, produces delicate wines with round and complex mouthfeel.

**Recommendations:** Barrel fermentation; varietal expression; lees ageing; complexity; elegant wines; roundness.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg (Item #45-115-0500) \$ 46.00  
10 kg (Item #45-115-0010) \$ 580.00

## RED AND ROSÉ WINE FERMENTATION

### EnartisFerm AMR-1

ISOLATE FROM DRIED GRAPES DESTINATED FOR AMARONE WINE

- Fast fermenter.
- Wide fermentation temperature range (10-30°C).
- Alcohol tolerant (up to 17%) and resistant to low pH.
- Low nutrient requirements.
- Produces elegant, clean, fresh wines with round and smooth mouthfeel.

**Recommendations:** Late harvest; high °Brix grapes; fruity and spicy aromas; varietal expression; white, rosé and red wines; low temperature fermentation.

**Dosage:** 200 g/ton

0.5 kg (Item #45-511-0500) \$ 46.00

### EnartisFerm D20

CABERNET SAUVIGNON ISOLATE FROM DAOU VINEYARDS & WINERY, CALIFORNIA



- Moderate speed fermenter.
- High alcohol tolerant (up to 17%) and resistant to high temperatures (up to 38°C).
- Medium nutrient requirements.
- Produces powerful, complex and structured wines with long ageing potential.

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

**Dosage:** 200 g/ton

0.5 kg (Item #45-060-0500) \$ 55.00  
10 kg (Item #45-060-0010) \$ 700.00



EnartisFerm D20 has improved the mouthfeel of our wines while delivering a more balanced wine that had increased phenolics.

**Daniel Daou, Co-Proprietor and Winemaker of Daou Vineyards & Winery (CA)**

### EnartisFerm ES454

- Moderate speed fermenter.
- Medium nutrient requirements.
- Produces elegant, complex, varietal wines with spicy aromas and balanced structure.

**Recommendations:** *Varietal expression; complexity; structure and roundness; Bordeaux varieties.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-170-0500)	\$ 46.00
10 kg	(Item #45-170-0010)	\$ 580.00

### EnartisFerm ES488

- Moderate speed fermenter.
- High nutrient requirements.
- Expresses thiols (β-lyase activity).
- Produces intense floral, spicy and red berry aromas.
- Reduces herbaceous notes in unripe grapes.

**Tip:** *Increase spicy aromas by using EnartisPro BLANCO at inoculation.*

**Recommendations:** *Thiol production; varietal expression; fruity, floral and spicy aromas; reduce herbaceous notes; unripe grapes.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-185-0500)	\$ 46.00
10 kg	(Item #45-185-0010)	\$ 580.00

### EnartisFerm Q5

- Moderate speed fermenter.
- Medium nutrient requirements.
- High production of glycerol.
- Expresses terpenes and norisoprenoids (β-glycosydase activity).
- Produces intense red fruit (strawberry, raspberry, black cherry) and floral notes with soft structure.

**Tip:** *Increase terpenes and norisoprenoids production by using EnartisTan RED FRUIT at inoculation.*

**Recommendations:** *Ester and acetate production; terpenes and norisoprenoids production; varietal expression; complexity; fruity and spicy aromas.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-301-0500)	\$ 46.00
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### EnartisFerm Q7

Formerly EnartisFerm PRIMITIVO.

- Alcohol tolerant (up to 16.5%).
- Medium nutrient requirements.
- High production of fresh fruit, plum, dark cherry, ripe berry and spicy aromas.

**Recommendations:** *Hot climate areas; varietal expression; medium-to-long ageing; freshen overripe grapes; high °Brix grapes.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-054-0500)	\$ 46.00
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### EnartisFerm RED FRUIT

- Fast fermenter.
- High nutrient requirements.
- Expresses terpenes and norisoprenoids (β-glycosydase activity).
- Produces intense floral, red fruit and berries aromas.

**Tip:** *Increase terpenes and norisoprenoids production by using EnartisTan RED FRUIT during fermentation.*

**Recommendations:** *Ester and acetate production; fruity and spicy aromas; varietal expression; roundness; young wines.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-140-0500)	\$ 46.00
10 kg	(Item #45-140-0010)	\$ 580.00

### EnartisFerm VINTAGE RED

- Medium nutrient requirements.
- Wide fermentation temperature range (18-35°C).
- High production of glycerol and mannoproteins.
- Produces elegant, complex wines with ripe red fruit, leather and spicy aromas and round, full-bodied mouthfeel.

**Recommendations:** *Varietal expression; complexity; long ageing; lees ageing; roundness and structure.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-125-0500)	\$ 46.00
10 kg	(Item #45-125-0010)	\$ 580.00

### EnartisFerm WS

ZINFANDEL ISOLATE FROM WILLIAMS SELYEM WINERY, CALIFORNIA

- Fast fermenter.
- High alcohol tolerant (up to 18%).
- Low nutrients requirements.
- Produces elegant, clean, fresh, fruity and spicy wines with round and smooth mouthfeel.

**Recommendations:** *High °Brix grapes; white, rosé and red wines; fruity and spicy aromas; restart stuck fermentations; direct inoculation.*

**Dosage:** 200 g/ton

0.5 kg	(Item #45-053-0500)	\$ 52.00
10 kg	(Item #45-052-0010)	\$ 640.00




In 2017, I used EnartisFerm WS on our 2017 Zinfandel and 25% of our Cabernet Sauvignon to produce intense color, rich mouthfeel and balanced tannin structure and was very happy with the results. **David Bradley, Owner/Winemaker of Vindemia Vineyards (CA)**





I love the fruity and clean aromas that EnartisFerm WS gives to the wine. **Heather Perkin, Associate Winemaker at Elk Cove Vineyards (OR)**



I use EnartisFerm WS on my late harvest wines; it ferments up to 18% alcohol with no problem. **Ken Wright, Winemaker at Ken Wright Cellar (OR)**



## POLYVALENT YEASTS

### EnartisFerm SB

- Fast fermenter.
- Short lag phase.
- Wide fermentation temperature range (10-30°C).
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S production.
- Produces clean wines.

**Recommendations:** White, rosé and sparkling wines; large volume fermenter; ester and acetate production; charmat method.

**Dosage:** 20-40 g/hL (1.67-3.4 lb/1,000 gal)

0.5 kg	(Item #45-155-0500)	\$ 34.00
10 kg	(Item #45-155-0010)	\$ 440.00

### EnartisFerm Q ET



- EnartisFerm Q ET is a multipurpose yeast that does not require rehydration.
- Direct inoculation (Easytech) saves time and labor and facilitates yeast preparation, but above all, it reduces the risk of mistakes that can compromise a good fermentation process.
- EnartisFerm Q ET is a varietal strain, good fermenter in a wide temperature range that is well suited to the fermentation of quality white, red and rosé wines.

**Recommendations:** Direct inoculation; white, red and rose wines.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

10 kg	(Item #45-520-0010)	\$ 580.00
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NEW

### EnartisFerm Q RHO

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

**Recommendations:** 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)

0.5 kg	(Item #45-077-0500)	\$ 70.00
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### EnartisFerm EZFERM 44

- Moderate speed fermenter.
- *Saccharomyces cerevisiae* and *bayanus*.
- Wide fermentation temperature range (12-34°C).
- Alcohol tolerant (up to 17.5%).
- Fructophilic.
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Ideal to prevent or restart sluggish/stuck fermentations.

**Recommendations:** Restart stuck fermentation; high fructose content; hot climate grapes and drought areas.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-175-0500)	\$ 46.00
10 kg	(Item #45-175-0010)	\$ 580.00

### EnartisFerm ES U42

- Blend of a cryophilic strain *Saccharomyces uvarum* and a strain of *Saccharomyces cerevisiae* ex ph. r. *bayanus*.
- In fermentations at low temperatures, it finds the ideal conditions to express its enological qualities: low yield sugar/alcohol, high glycerol, low volatile acidity, high β-phenyl alcohol (rose and spicy aromas).
- Preserves juice acidity producing malic and succinic acids.

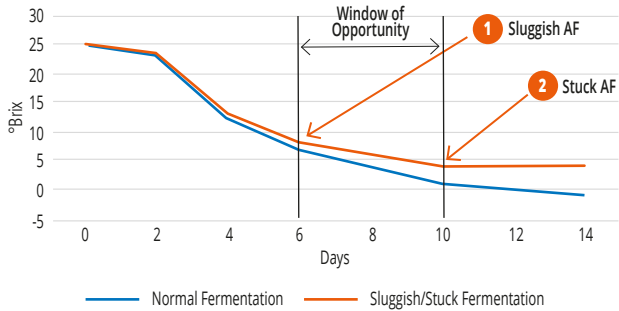
**Recommendations:** White, red and rosé wines; low temperature fermentations; late harvest.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 kg	(Item #45-070-0500)	\$ 52.00
10 kg	(Item #45-070-0010)	\$ 840.00

## PROTOCOLS TO RESTART AND COMPLETE SLUGGISH OR STUCK FERMENTATIONS

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



### PROTOCOL 1 : Sluggish Fermentation

The moment a fermentation becomes sluggish sees a 'window of opportunity': a quick intervention may help restore yeasts vitality and avoid a full restart later

1. Maintain temperature 15°C - 20°C (59°F - 68°F).
2. Press off skins or rack off lees (recommended).
3. Treat must or juice with 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 ( $\Delta$ °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 not viable anymore: it will be necessary to acclimatize and add a new population of yeast to the wine.

#### STEP 1: Prepare starter

Tip: Use a sanitized tank able to hold the entire volume of stuck wine.

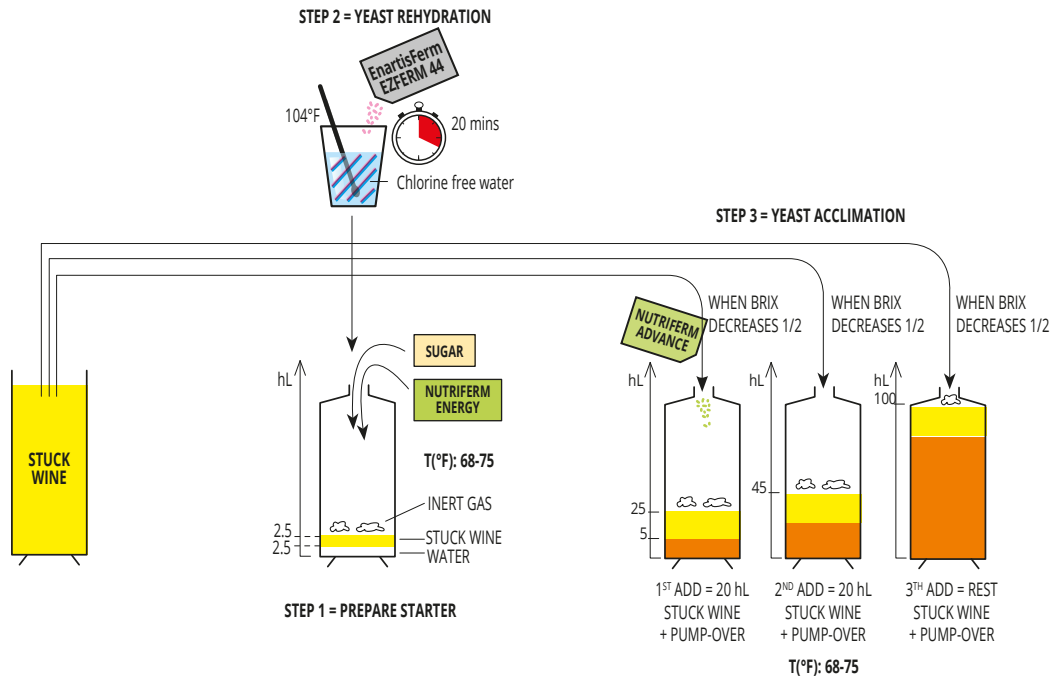
- Take 2.5% of stuck wine.
- Add the same amount of water (2.5% of total volume).
- Add 10 g/hL of NUTRIFERM ENERGY (calculated on the volume of stuck wine).
- Adjust sugar level to 50 g/L (5° Brix).
- Maintain temperature at 20-23°C (68-73°F).

#### STEP 2: Yeast rehydration

Rehydrate 30 g/hL (calculated on the volume of stuck wine) of EnartisFerm EZFERM 44 in 10 times its weight of chlorine-free water at 40°C (104°F) and wait 20 minutes.

#### STEP 3: Acclimate yeast and start fermentation

- Add rehydrated yeast to STEP 1 and monitor °Brix and temperature.
- At 1/2 °Brix depletion, add 20% of stuck wine + 5 g/hL of NUTRIFERM ADVANCE (calculated on volume of stuck wine).
- At 1/2 °Brix depletion, add another 20% of stuck wine.
- At 1/2 °Brix depletion, add the remaining stuck wine.



## YEAST/VARIETAL RECOMMENDATIONS

VARIETAL	EnartisFerm AMR-1	EnartisFerm AROMA WHITE	EnartisFerm D20	EnartisFerm ES123	EnartisFerm ES181	EnartisFerm ES454	EnartisFerm ES488	EnartisFerm ES FLORAL	EnartisFerm ES U42	EnartisFerm EZ FERM 44	EnartisFerm PERLAGE	EnartisFerm Q4	EnartisFerm Q5	EnartisFerm Q7	EnartisFerm Q9	EnartisFerm Q CITRUS	EnartisFerm Q ET	EnartisFerm Q RHO	EnartisFerm RED FRUIT	EnartisFerm VINTAGE RED	EnartisFerm VINTAGE WHITE	EnartisFerm WS
AGLIANICO						•	•		•					•			•			•		
BARBERA	•					•	•		•				•	•			•	•				
CABERNET FRANC			•				•		•				•	•			•			•		
CABERNET SAUVIGNON	•		•			•	•		•	•			•	•			•			•		•
CARIGNANE/ MONESTEL	•		•						•										•			•
CARMENERE			•				•		•													•
CHARBONO/DOLCETTO						•			•									•	•			
CINSAULT						•	•		•										•			
DORNFELDER						•	•		•										•			
GRENACHE	•		•				•		•				•						•			•
MALBEC	•		•			•	•		•				•	•			•		•	•		
MERLOT			•			•	•		•	•			•	•			•			•		•
MOURVEDRE	•		•			•	•		•				•	•					•			•
NEBBIOLO						•			•					•			•		•			
PETITE SIRAH	•		•				•		•					•						•		
PETIT VERDOT	•		•			•			•					•								•
PINOTAGE	•		•			•			•				•					•				
PINOT NOIR						•			•													•
SANGIOVESE							•		•								•	•	•			
SYRAH	•		•			•	•		•				•	•			•		•	•		•
TANNAT	•		•			•			•										•			
TEMPRANILLO			•				•		•				•				•	•				
TEROLDEGO							•		•									•				
ZINFANDEL	•		•			•	•		•	•				•			•					•
ALBARIÑO					•				•		•				•							
ARNEIS		•		•			•		•								•					•
CHARDONNAY		•		•				•	•						•	•	•					•
CHENIN BLANC		•		•	•			•	•		•				•	•						•
GEWÜRZTRAMINER		•		•	•			•	•		•				•	•		•				
MARSANNE		•		•			•		•								•					•
MUSCAT		•		•	•			•	•							•	•	•				
PETIT MANSENG				•	•				•													
PETIT MANSENG - LATE HARVEST		•			•				•													
PINOT BLANC		•		•	•				•						•	•						
PINOT GRIS		•		•				•	•		•				•	•		•				•
RIESLING		•			•			•	•		•					•						•
ROUSANNE		•		•					•								•					
SAUVIGNON BLANC		•		•	•				•		•				•	•						
SEMILLON		•		•				•	•		•				•	•						•
VIOGNIER		•		•	•				•		•					•						

## YEAST/WINE STYLE RECOMMENDATIONS

	VARIETAL EXPRESSION	HIGH AROMATIC IMPACT	THIOL EXPRESSION	ESTER AND ACETATE PRODUCTION	YOUNG WHITES	AGED WHITES	ROSÉS	YOUNG REDS	RESERVE REDS	LATE HARVEST	SPARKLING BASE WINES	STUCK FERMENTATIONS
EnartisFerm AMR-1	•						•	•	•	•		
EnartisFerm AROMA WHITE	•	•	•	•	•	•	•					
EnartisFerm D20	•			•		•		•	•			
EnartisFerm ES123		•		•	•		•	•				
EnartisFerm ES181	•		•	•	•	•	•			•		
EnartisFerm ES454	•								•			
EnartisFerm ES488	•	•	•				•	•				
EnartisFerm ES FLORAL		•		•	•		•					
EnartisFerm ES U42		•		•	•		•	•	•			
EnartisFerm EZFERM 44										•	•	•
EnartisFerm PERLAGE	•				•	•					•	
EnartisFerm Q4			•		•		•					
EnartisFerm Q5	•			•					•			
EnartisFerm Q7	•							•	•			
EnartisFerm Q9	•	•	•	•	•	•	•					
EnartisFerm Q CITRUS		•	•	•	•		•					
EnartisFerm Q ET	•				•	•	•	•	•	•		
EnartisFerm Q RHO		•		•	•		•	•		•		
EnartisFerm RED FRUIT	•	•		•			•	•				
EnartisFerm SB				•	•		•				•	
EnartisFerm VINTAGE RED	•								•			
EnartisFerm VINTAGE WHITE	•				•	•						
EnartisFerm WS	•	•		•			•	•	•		•	•

**ENARTIS YEAST CHARACTERISTICS**

	OPTIMAL TEMPERATURE RANGE (°C)	LAG PHASE	FERMENTATION SPEED	ALCOHOL TOLERANCE (% V/V)	KILLER FACTOR	NITROGEN NEEDS	OXYGEN NEEDS	VA PRODUCTION	H <sub>2</sub> S PRODUCTION	SO <sub>2</sub> PRODUCTION	COMPATIBILITY MLF	RESISTANCE TO SO <sub>2</sub>
<b>EnartisFerm AMR-1</b>	10-22	short	high	18	N	med	low	low	low	low	neutral	high
<b>EnartisFerm AROMA WHITE</b>	15-24	short-med	med	15	K	med-high	med	low	low	low	neutral	med
<b>EnartisFerm D20</b>	18-38	short	high	17	N	med	med	low	med	low	neutral	med
<b>EnartisFerm ES123</b>	15-25	short	med	15	K	high	med	low	low	low	low	high
<b>EnartisFerm ES181</b>	10-20	med	high	16.5	K	low	low-med	low	low	low	low	high
<b>EnartisFerm ES454</b>	15-30	short	medium	16	K	med	med	med	low	low	good	med
<b>EnartisFerm ES 488</b>	15-28	short	med-low	16	K	high	high	low	med	low	good	med
<b>EnartisFerm ES FLORAL</b>	10-25	med	med	15	N	med	med	low	med	low	good	high
<b>EnartisFerm ES U42</b>	8-28	med	med	15	N	low	low-med	low	low	low	good	high
<b>EnartisFerm EZFERM 44</b>	15-30	short	high	17.5	N	low	low	med	low	low	neutral	high
<b>EnartisFerm PERLAGE</b>	10-30	short	high	17	K	low	low	low	med	low	low	high
<b>EnartisFerm Q4</b>	14-18	med	med	15	K	med	med	low	low	low	neutral	med
<b>EnartisFerm Q5</b>	15-32	med	med	16	N	med	high	low	low	low	good	med
<b>EnartisFerm Q7</b>	16-30	med	med	16.5	N	med	med	med	low	low	neutral	med
<b>EnartisFerm Q9</b>	14-20	short	high	14.5	N	med-high	med	low	low	low	neutral	med
<b>EnartisFerm Q CITRUS</b>	10-20	short	high	15	N	med	med	med	low	med	low	high
<b>EnartisFerm Q ET</b>	15-30	med	med	16	N	med	med	low	low	low-med	good	high
<b>EnartisFerm Q RHO</b>	8-26	med	med	13.5	N	low-med	med	low	low	med	low	high
<b>EnartisFerm RED FRUIT</b>	14-34	short	high	16	K	high	high	med	low	med	low	high
<b>EnartisFerm SB</b>	10-30	med	high	15	N	low	low	low	low	low	neutral	med
<b>EnartisFerm VINTAGE RED</b>	15-32	short-med	med	16	K	med	med	med	med	low	good	med
<b>EnartisFerm VINTAGE WHITE</b>	14-24	short	med	15.5	K	med	med	low	low	low	good	med
<b>EnartisFerm WS</b>	16-30	med	med-high	18	N	low	low	low	low	low	neutral	med

*K: killer factor; N: neutral; S: sensitive*

**WHAT IS A YEAST "KILLER" FACTOR?**

Killer yeast contain a toxin in their cell wall structure that allows them to kill toxin-sensitive yeast cells. Most killer strains of *S. cerevisiae* have good fermentation kinetics and a greater chance of dominating the fermentation. Yeast strains can be killer, sensitive to killer factor or have a neutral reaction to this factor. A killer yeast will inhibit the development of most indigenous yeast and yeast sensitive to killer factor.

## NUTRIENTS

Understanding the nutritional requirements of yeast is fundamental to accomplish successful fermentations and prevent stuck fermentations. Managing nutrient requirements allows for regular and complete fermentations, as well as minimizing sulfur compound production, such as H<sub>2</sub>S, and enhancing sensory qualities. Enartis recommends a two-step nutrient addition; providing amino acids and micro-nutrients at inoculation and inorganic nitrogen with survival factors at 1/3 sugar depletion.



**enartis**

Inspiring innovation.

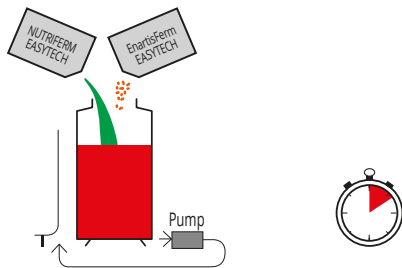
## EASYTECH NUTRIENTS

**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 and acclimatization 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 yeast inoculation **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, thanks to the high solubility rate.



Just one operation! Sprinkle Easytech yeasts and Easytech nutrients onto juice surface, wait 10-15 minutes, then homogenize with a pump-over.

Enartis Easytech range is also suitable for traditional yeast inoculations.

## ORGANIC NITROGEN NUTRIENTS (Do NOT contain inorganic sources of nitrogen)

The timing and form of nitrogen supplementation are important to manage a successful fermentation. During growth phase, yeast need amino acids, vitamins and minerals to build biomass and "healthy" cells resistant to stress. Since yeast assimilation of amino acids is inhibited by the presence of ethanol and high concentration of ammonium ions, the optimum time to add organic nitrogen is at inoculation

## NUTRIFERM AROM

- Autolyzed yeast with an elevated content of free amino acids and survival factors and thiamine hydrochloride (vitamin B1).
- The high content of selected amino acids are used by yeast as precursors of aromatic compounds to increase intensity, freshness and complexity.

**Tip:** To increase the aromatic impact of NUTRIFERM AROM, use an ester and acetate producing yeast.

**Usage:** Dissolve in 10 times its weight of water and add to juice after yeast inoculation.

**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

**1 kg** (Item #35-210-0001) \$ 50.00  
**10 kg** (Item #35-210-0010) \$ 440.00

## NUTRIFERM AROM PLUS Easutech CERTIFIED BY ENARTIS

- Autolyzed yeast with an elevated content of free amino acids and survival factors and thiamine hydrochloride (vitamin B1).
- Elevated content of selected amino acids used by yeast as precursors of aromatic compounds to strongly increase intensity, freshness and complexity.
- Provides survival factors to improve yeast viability and ensure successful fermentations.
- Easytech direct inoculation yeast nutrition.

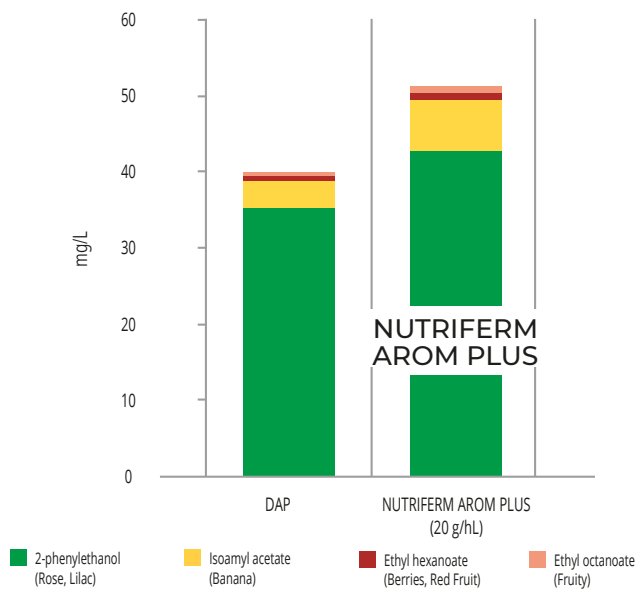
**Tip:** To increase the aromatic impact of NUTRIFERM AROM PLUS, use an ester and acetate producing yeast.

**Usage:** Dissolve in 10 times its weight of water and add after yeast inoculation.

**Dosage:** 15-30 g/hL (1.3-2.4 lb/1,000 gal)

**1 kg** (Item #35-211-0001) \$ 60.00  
**10 kg** (Item #35-211-0010) \$ 540.00

AROMATIC PROFILE OF WINE AFTER ALCOHOLIC FERMENTATION



NUTRIFERM AROM PLUS increases the production and content of aromatic compounds in wine.



**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)**



We've used Enartis nutrients almost exclusively for over a decade - at least 400 ferments. Stuck ferms, restarts, and copper fining are rarities for us. While NUTRIFERM ENERGY and ADVANCE are the backbone of our nutrient protocols, we are increasingly impressed by phenolic impact of NUTRIFERM AROM PLUS and the end-of-ferment benefits of No Stop. We rely on the consistency that the NUTRIFERM line provides for our wines and those of our clients. **Lucas Meeker, Winemaker at The Meeker Vineyard (CA)**

### NUTRIFERM ULTRA EASY TECH CERTIFIED BY ENARTIS

- Autolyzed yeast, thiamine hydrochloride (vitamin B1).
- Supplements the must with all nutritional factors necessary for yeast fermentative metabolism: amino acid nitrogen, long chain fatty acids, sterols, vitamins and microelements.
- Stimulates a regular and complete fermentation leading to the production of wines without defects, flawless both in the mouth and nose.
- Granulated nutrient that is less powdery, easier to dissolve and safer to use.
- Easytech direct inoculation yeast nutrition.

**Dosage:** 10-40 g/hL (0.8-3.4 lb/1,000 gal)

1 kg	(Item #35-217-0001)	\$ 65.00
10 kg	(Item #35-217-0010)	\$ 600.00

### NUTRIFERM ENERGY

- Autolyzed yeast with an elevated content of free amino acids and thiamine hydrochloride (vitamin B1).
- Shortens lag phase, prevents formation of H<sub>2</sub>S and acetic acid, and increases production of polysaccharides.
- Vital in initial phases of yeast multiplication.

**Usage:** Dissolve in 10 times its weight of water and add to juice after yeast inoculation.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

1 kg	(Item #35-200-0001)	\$ 50.00
10 kg	(Item #35-200-0010)	\$ 440.00



I've been using NUTRIFERM ENERGY on red wines at yeast inoculation. It's a very reliable nutrient that allows smooth and clean fermentations without challenges. NUTRIFERM ENERGY respects the aromatic profile of the fruit. **Alberto Bianchi, Winemaker at Newton Vineyards (CA)**



## NUTRIENTS CONTAINING DI-AMMONIUM PHOSPHATE (DAP) DIAMMONIUM PHOSPHATE (DAP)

5 kg	(Item #30-015-5000)	\$ 55.00
50 lb	(Item #30-015-0055)	

Please inquire for pricing.

### NUTRIFERM ADVANCE

- Complex nutrient containing DAP, inactivated yeast and cellulose.
- Prevents irregular kinetics while maintaining efficient sugar transport.
- Improves yeast alcohol tolerance, prevents H<sub>2</sub>S formation and detoxifies must.

**Usage:** Suspend in 10 times its weight of warm water and add at 1/3 sugar depletion.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

1 kg	(Item #35-215-0001)	\$ 28.00
10 kg	(Item #35-215-0010)	\$ 240.00

### NUTRIFERM GRADUAL RELEASE

- Innovative nutrient composed of DAP, gallic tannin and untoasted oak tannins.
- Specific packaging that controls the release of its content during fermentation. Due to the particular permeability of the bag, yeast nutrients are gradually released into fermenting must. Release begins at end of yeast growth phase and continues for up to 8 days.
- Ensures complete fermentation, prevents H<sub>2</sub>S production, prevents stuck or sluggish fermentation and improves aromatic cleanliness.
- Facilitates nutrition management by limiting cellar operations.

**Recommendations:** Barrel fermentation; Tank fermentation; Sparkling tank fermentation (Charmat method).

**Usage:** Anchor bag to bottom of tank or to barrel bung before filling.

**Dosage:** See Technical Data Sheet

0.5 kg	(Item #35-216-0500)	\$ 30.00
1 kg	(Item #35-216-0001)	\$ 56.00
5 kg	(Item #35-216-0005)	\$ 200.00

### NUTRIFERM SPECIAL

- Ammonium phosphate, inactivated yeast and thiamine.
- Facilitates fermentation and prevents stuck fermentations.
- Prevents production of H<sub>2</sub>S.

**Usage:** Dissolve in 10 times its weight of water and let stand 15-20 minutes before addition to juice.

**Dosage:** 30-50 g/hL (2.4-4.2 lb/1,000 gal)

10 kg	(Item #35-225-0010)	\$ 200.00
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I am very happy with NUTRIFERM SPECIAL. We inoculated six red wine tanks just this morning together with NUTRIFERM SPECIAL. It is so easy to work with, and works with any yeast! Fermentation starts quickly when using this product. I can definitely recommend it to other winemakers. **Hanlie Schönborn, Assistant Winemaker at Napier Winery (South Africa)**





## FERMENTATION AIDS

### NUTRIFERM CONTROL

- Inactivated yeast.
- Removes toxins and promotes clean and complete fermentations.

**Usage:** Dissolve in 10 times its weight of water.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

25 kg (Item #30-024-0020) \$ 400.00

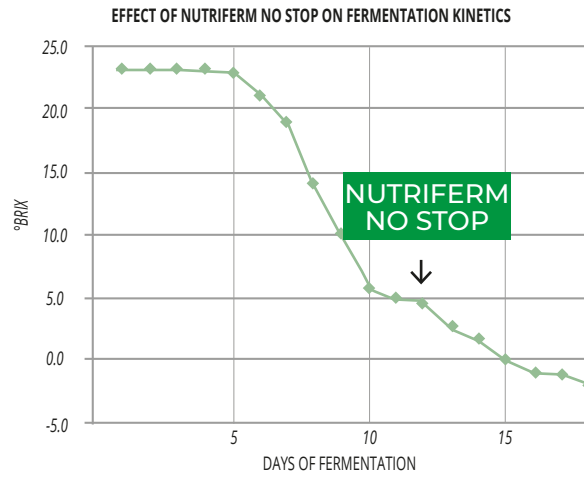
### NUTRIFERM NO STOP

- Inactivated yeast, autolyzed yeast, thiamine hydrochloride (vitamin B1).
- Helps maintain yeast membrane integrity, prevents and corrects fermentation anomalies.

**Usage:** Dissolve in 10 times its weight of water.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

1 kg (Item #35-212-0001) \$ 35.00  
 10 kg (Item #35-212-0010) \$ 300.00



The addition of NUTRIFERM NO STOP helped complete fermentation. In addition to having a detoxifying effect, NUTRIFERM NO STOP provides essential elements for yeast to stay resistant, active and complete fermentation.

## KNOW MORE ABOUT YEAST NUTRITION

Yeast nutrition is an essential factor in managing the overall health and success of fermentations. Without proper nutrition introduced at the right stage of their growth cycle, yeast can face stress and produce undesirable characteristics. Stuck or sluggish fermentations are also hazards of poor yeast nutrition.

### WHAT NITROGEN FORMS ARE NATURALLY PRESENT IN GRAPES?

Grapes provide nitrogen in the form of proteins, peptides, alpha amino acids and ammonium ions.

### WHAT ARE YEAST NUTRITIONAL NEEDS?

Yeast require Assimilable Nitrogen (YAN), vitamins (thiamine), mineral salts (Mg, Zn), sterols and long-chain unsaturated fatty acids to succeed at fermentation. The quantity and quality of these compounds play an essential role in yeast metabolism, fermentation kinetics and the organoleptic profile of wine.

- Vitamins have a role in cell growth, fermentation activity and nitrogen metabolism.
- Minerals impact yeast fermentative metabolism.
- Sterols and unsaturated fatty acids help yeast survive and resist stress.

### WHAT IS YEAST ASSIMILABLE NITROGEN (YAN)?

YAN is the sum of ammonium ions and alpha amino acids (except proline). Yeast use nitrogen for growth, structural protein synthesis, cell wall components, enzyme synthesis and sugar transport.

- Ammonium ions are fast and preferentially assimilated by yeast.
- Amino acids are a more efficient form of nitrogen for cell metabolism and aromatic production than ammonia. Yeast use them as a source of nitrogen and to synthesize esters and acetates.

A balanced diet of organic nitrogen, inorganic nitrogen, vitamins and minerals produce healthier fermentations with better aromatics and fewer off-flavors.

### HOW MUCH YAN IS NEEDED?

The range of YAN in grapes can vary depending on the vintage conditions, vineyard practices and grape variety. Generally, to build-up a sufficient yeast biomass for fermentation, a minimum YAN of 150 mg/L is required. The initial sugar content (°Brix) and initial YAN of juice are essential to determine the proper nutrition supplementation. The higher the initial sugar concentration, the more YAN is required to complete the fermentation.

Depending on the yeast strain and other juice factors, nitrogen needs for yeast can vary. To calculate the actual needs of a chosen strain, you can use the following guidelines and table:

- Low nitrogen requiring strains: sugar (g/L) x 0.75
- Medium nitrogen requiring strains: sugar (g/L) x 0.9
- High nitrogen requiring strains: sugar (g/L) x 1.25  
(conversion note: 1°Brix ~ 10 g/L sugar)

### WHICH OTHER FACTORS SHOULD BE CONSIDERED REGARDING YEAST NUTRITION?

- Temperature: An increase in temperature stimulates yeast growth and fermentation rate, thereby requiring increased levels of nitrogen.
- Turbidity: In whites and rosés, juice clarification eliminates some nutrients, sterols and fatty acids essential for yeast survival. If the turbidity after clarification is below 80 NTU, add 30 g/hL of NUTRIFERM NO STOP.
- Fruit affected by mold requires more amino acids and vitamins than healthy fruit.
- Yeast strains: Each yeast strain has specific nutritional requirements.

### WHAT IS THE YAN CONTRIBUTION OF DAP?

10 g/hL of DAP represents 20 mg/L of YAN.

### WHAT IS THE LEGAL LIMIT OF NUTRIENT ADDITIONS?

The legal limit in the USA for DAP is 96 g/hL (8 lb/1,000 gal).

### MY WINE IS AROUND 5°BRIX AND I MISSED THE 1/3 SUGAR DEPLETION NUTRIENT ADDITION, WHICH NUTRIENT CAN I ADD?

Nitrogen uptake is inhibited as soon as alcohol becomes a stress. At this point during fermentation, the addition of NUTRIFERM NO STOP will improve yeast resistance and help maintain an active sugar transport system.

### WHY USE NUTRIFERM NO STOP?

- Restores cell membrane
- Increases yeast viability
- Eliminates toxins such as short-chain fatty acids
- Restores sugar consumption
- Provides physical support to keep yeast in suspension

### YEAST NUTRITION GUIDELINES

Winemaking Stage	YAN<130 mg/L	130 mg/L<YAN<200 mg/L	YAN>200 mg/L
Inoculation	15 g/hL NUTRIFERM ENERGY or 30 g/hL NUTRIFERM AROM (PLUS)	15 g/hL NUTRIFERM ENERGY or 25 g/hL NUTRIFERM AROM (PLUS)	10 g/hL NUTRIFERM ENERGY or 20 g/hL NUTRIFERM AROM (PLUS)
12 hours after inoculation	10-40 g/hL DAP (adjust YAN ~ 150 mg/L)	-	-
1/3 sugar depletion	40 g/hL NUTRIFERM ADVANCE	30 g/hL NUTRIFERM ADVANCE	20 g/hL NUTRIFERM ADVANCE
	If Brix > 25°, add 15 g/hL DAP If Brix > 26°, add 25 g/hL DAP	If Brix > 25°, add 10 g/hL DAP If Brix > 26°, add 20 g/hL DAP	-
Add Oxygen: 1-3 mg/L each day for 3-4 days. Total oxygen addition between 10-20 mg/L during fermentation.			
1/2 sugar depletion	15 g/hL NUTRIFERM NO STOP		

## **POLYSACCHARIDES**

Enartis offers EnartisPro (fermentation) and SURLÌ (maturation) natural yeast and grape polysaccharide preparations. The polysaccharides contained in EnartisPro and SURLÌ contribute directly to wine quality by improving aroma complexity, balancing and reducing astringency perception, increasing softness, roundness and volume, and improving color, tartrate and protein stability.



## Fermentation

The EnartisPro range supplies yeast mannoproteins and natural antioxidants to increase the stabilizing and organoleptic effect of polysaccharides released from yeast during fermentation. Wines produced with the EnartisPro range have a longer shelf life, greater stability and better sensory qualities. The EnartisPro range was developed for addition at yeast inoculation or 1/3 alcoholic fermentation.

## STANDARD YEAST CELL WALLS

### EnartisPro AROM

- Inactivated yeast rich mannoproteins.
- Ensures antioxidant protection.
- Produces fresher and more intense aromatic profiles.

**Recommendations:** Antioxidant; improve mouthfeel; roundness and volume; white and rosé wines.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

**1 kg (Item #35-400-0001) \$ 80.00**

## YEAST CELL WALLS WITH HIGH READILY-SOLUBLE MANNOPROTEIN CONTENT

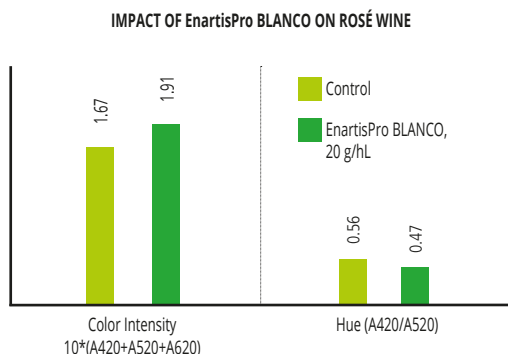
### EnartisPro BLANCO

- Inactivated yeast with high content of immediately soluble mannoproteins.
- High antioxidant protection.
- Enhances production of tropical and spicy aromas. Produces fresher, more intense and lasting aromas.
- Softens astringency and balances bitterness.
- Improves color, protein and tartrate stability.

**Recommendations:** Antioxidant; improve mouthfeel; white, rosé and red wines; fruity and spicy aromas; roundness and volume; softness; increase wine length.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**1 kg (Item #35-410-0001) \$ 135.00**



EnartisPro BLANCO added at inoculation improves color intensity and protects wine from browning (lower hue).



EnartisPro UNO is a vital component of building a wine and keeping it fresh. By adding EnartisPro UNO, it helps to build mouthfeel and keep color young and vibrant. We have also found that EnartisPro UNO helps to keep the cultivar expression much longer.  
**Pieter-Niel Rossouw, Head Winemaker at Darling Cellars (South Africa)**

### EnartisPro UNO

- Inactivated yeast rich in readily-soluble mannoproteins.
- Improves aroma persistence, color stability and wine shelf life.
- Softens astringency, balances bitterness and increases roundness.

**Recommendations:** Improve mouthfeel; roundness and volume; softness; increase wine length; white, rosé and red wines.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**1 kg (Item #35-921-0001) \$ 185.00**

### EnartisPro TINTO

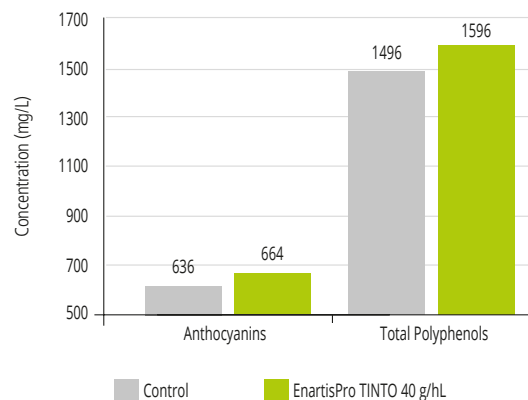
- Inactivated yeast rich in immediately soluble mannoproteins and ellagic and grape seed tannins.
- Specifically designed to favor anthocyanin/tannin condensation during fermentation, it increases color intensity and stability.
- Promotes bright and clean aromas, builds-up mid-palate, softens astringency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

**Recommendations:** Color stability; fruity aromas; improve mouthfeel; roundness, volume and structure; flash-détente; red and rosé wines.

**Dosage:** 150-400 g/ton; 15-40 g/hL (1.25-3.5 lb/1000 gal)

**1 kg (Item #35-415-0001) \$ 195.00**  
**10 kg (Item #35-415-0010) \$ 1,750.00**

EFFECT OF EnartisPro TINTO ON PHENOLIC COMPOSITION OF WINE



## BLENDS CONTAINING PVI/PVP

PVI/PVP is an adsorbent co-polymer (polyvinylimidazole and polyvinylpyrrolidone) capable of removing metals in wine such as copper (Cu), iron (Fe) and aluminum (Al) and binding with phenolic compounds, substrates of oxidative reactions. By removing catalyzers and precursors of oxidation reactions, PVI/PVP is an excellent wine stabilizer and limits oxidation reactions. Blends of PVI/PVP and yeast cell walls, EnartisPro FT is excellent antioxidant and improve wine stability, ageing potential and shelf life.

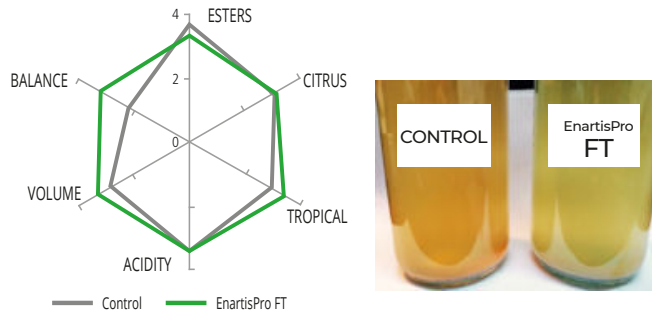
### EnartisPro FT

- Insoluble copolymers of polyvinylimidazole and polyvinylpyrrolidone (PVI/PVP), inactivated yeast with high content of soluble mannoproteins and thiolic group-containing peptides with antioxidant properties.
- Removes metals and limits the damaging effects of copper and iron responsible for wine oxidation.
- Enhances production of tropical and spicy aromas. Produces fresher, more intense and lasting aromas.
- Softens astringency and balances bitterness.
- Dramatically improves resistance to oxidation.

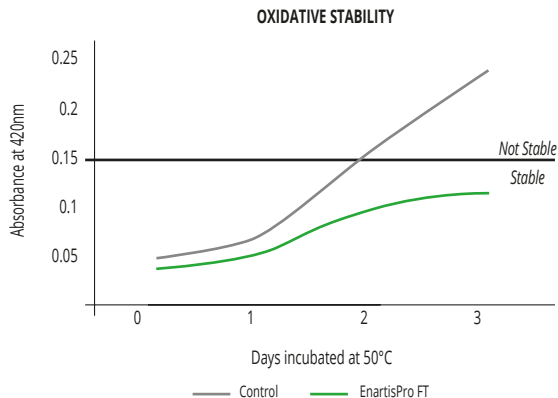
**Recommendations:** Antioxidant; fruity aromas; roundness and volume; resistance to oxidation; white and rosé wines.

**Dosage:** 30-50 g/hL (2.4-4.2 lb/1,000 gal)

**1 kg (Item #35-416-0001) \$ 180.00**



Sauvignon Blanc with EnartisPro FT at inoculation. Picture and sensory evaluation done two months after alcoholic fermentation. EnartisPro FT added at inoculation protects against color and aroma oxidation.



EnartisPro FT has been a revelation in ensuring wines that are aromatic with full mouthfeel. In conjunction with EnartisFerm Q CITRUS, EnartisPro FT allows for the assured production of high quality aromatic white wines. A combination that is extremely effective on Sauvignon Blanc, Chenin Blanc and Colombard. **Rianco Van Rooyen - Senior Winemaker at Robertson Winery (South Africa)**

## Maturation

During the maturation phase, yeast cell walls can be used as a substitute for natural yeast hulls or to amplify their effect. Enartis has generated a range of polysaccharide-based products that improve wine sensory properties and stability.

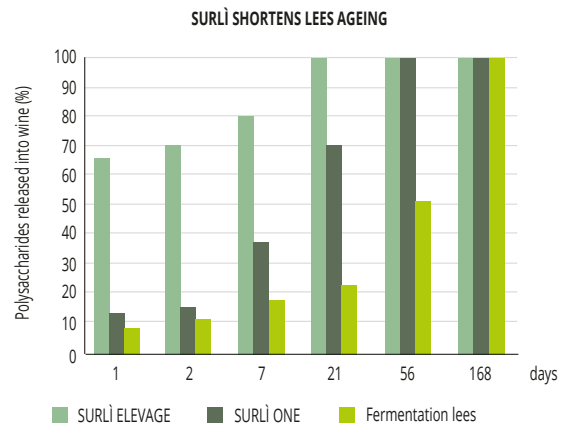
### SURLÌ ELEVAGE

- Inactivated yeast rich in free mannoproteins.
- Improves aromatic cleanliness while preserving original fruit characteristics.
- Improves wine balance, roundness, volume sensation and length. Balances and softens astringency.

**Recommendations:** Improve mouthfeel; volume and roundness; softness; increase wine length; lees ageing; white, rosé and red wines; pre-bottling.

**Dosage:** 5-30 g/hL (0.4-2.5 lb/1,000 gal)

**1 kg (Item #35-435-0001) \$ 195.00**



SURLÌ ELEVAGE and SURLÌ ONE quickly increase the content of mannoproteins in wine and allow for shorter lees ageing.



*SURLÌ ONE was a game changer for my 2015 Merlot. It improved the mouthfeel, filled-up the mid-palate, and increased the overall perception of roundness and length of the wine.* **Bénédicte Rhyne, Winemaker at Kuhlman Cellars (TX)**



### SURLÌ ONE

- Enzymatically treated inactivated yeast.
- Contributes to protein, tartrate and polyphenol stabilization.
- Improves aromatic complexity and longevity.
- Enhances natural sensation of volume and roundness, builds-up mid-palate and improves wine length.
- Mimics lees ageing, with the security of microbial stability.

**Recommendations:** Volume and roundness; improve mouthfeel; lees ageing; white, rosé and red wines.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

**2.5 kg (Item #35-425-0002) \$ 210.00**

### 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.

**Recommendations:** 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.

**Dosage:** 10-40 g/hL (0.8-3.3 lb/1,000 gal)

**2.5 kg (Item #35-470-0002) \$ 125.00**

### Pre-Bottling

*How to choose the proper SURLÌ product: In order to choose the best possible dosage and SURLÌ product for your wine, it is highly recommended to set up a tasting bench trial. (See page 80 for Preparing Lab Bench Trials.)*

### 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.

**Tip:** Filterable, SURLÌ VELVET can be added immediately prior to bottling.

**Recommendations:** Improve colloidal stability; improve mouthfeel; roundness and volume; softness; increase wine length; white, rosé and red wines; pre-bottling.

**Dosage:** 0.50-10 g/hL (0.04-0.8 lb/1,000 gal)

**0.5 kg (Item #35-455-0500) \$ 375.00**

### SURLÌ VELVET PLUS

- Yeast mannoproteins extracted from yeast cell walls.
- Antioxidant properties to extend shelf life of wine.
- Enhances aromatic complexity and intensity, increases volume and roundness and reduces the sensation of astringency.
- Improves colloidal structure and stability of wine.

**Tip:** Filterable, Surli Velvet Plus can be added immediately prior to bottling.

**Recommendations:** Antioxidant; improve colloidal stability; improve mouthfeel; roundness and volume; softness; increase wine length; white, rosé and red wines; pre-bottling.

**Dosage:** 1-10 g/hL (0.08-0.8 lb/1,000 gal)

**0.5 kg (Item #35-460-0500) \$ 390.00**

### SURLÌ VITIS

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

**Recommendations:** Improve overall wine quality and stability prior to bottling.

**Dosage:** 2-20 g/hL (0.2-1.6 lb/1,000 gal)

**1 kg (Item #35-445-0001) \$ 325.00**

	Composition	Antioxidant	Aroma Protection	Aroma Enhancement	Mouthfeel Improvement	Reduce Astringency	Color Stability	
Fermentation	EnartisPro AROM	<i>Inactivated yeast</i>	●●●	●●	●●	●●●	●●●	
	EnartisPro BLANCO	<i>Inactivated yeast</i>	●●●●	●●●	●●●	●●●	●	
	EnartisPro FT	<i>Inactivated yeast PVI/PVP</i>	●●●●	●●●	●●●●	●●●	●	
	EnartisPro TINTO	<i>Inactivated yeast Grape seed tannins Ellagic tannins</i>	●●	●●	●	●●●●	●●●●	●●●●
	EnartisPro UNO	<i>Inactivated yeast</i>	●	●●	●	●●●	●●●	●
Maturation	SURLÌ ÉLEVAGE	<i>Inactivated yeast rich free in mannoproteins</i>		●●	●	●●●●	●●●●	●
	SURLÌ KPA	<i>Inactivated yeast Potassium polyaspartate (KPA)</i>	●●	●	●	●●●●	●●●●	●
	SURLÌ ONE	<i>Inactivated yeast</i>		●●	●	●●●●	●●●●	●
Pre-Bottling	SURLÌ VELVET	<i>Yeast mannoproteins</i>		●●	●	●●●●	●●●●	●
	SURLÌ VELVET PLUS	<i>Yeast mannoproteins</i>	●●	●●●	●●	●●●●	●●●●	●
	SURLÌ VITIS	<i>Grape skin tannins Plant polysaccharides</i>	●●	●	●●●	●●●●	●●●	●●

# TANNINS

Tannins can act as an antioxidant and/or antioxidasic, improve color and protein stability, contribute to wine flavor, structure and body and prevent pinking and the “light-struck” defect. The different origins and properties of enological tannins can produce substantially different results. In association with research centers, Enartis has studied exogenous tannins and their effects for many years to select and produce an extensive range of the highest quality tannins for winemaking.



**enartis**

Inspiring innovation.



## WHITE AND ROSÉ WINE FERMENTATION

### Antioxidant Tannins

#### EnartisTan AROM

- Ellagic tannin, inactivated yeast and gallic tannin.
- Highly reactive tannin, strong antioxidant effect, inhibits oxidative enzymes (laccase) and facilitates clarification.
- Inactivated yeast provide a source of thiol precursors.

**Recommendations:** Antioxidant; fruity and spicy aromas; white and rosé wines.

**Dosage:** 2-20 g/hL (0.17-1.7 lb/1,000 gal)

**1 kg (Item #35-500-0001) \$ 195.00**

#### EnartisTan BLANC

- Gallic tannins.
- High antioxidant activity and antimicrobial activity, it strengthens the protective action of SO<sub>2</sub>.
- Protects wine from browning, "light-struck" defects and oxidation.

**Recommendations:** Antioxidant; prevent browning; prevent "light-struck" defects; white and rosé wines.

**Dosage:** 3-10 g/hL (0.25-0.8 lb/1,000 gal)

**1 kg (Item #35-310-0001) \$ 75.00**  
**12.5 kg (Item #35-310-0012) \$ 800.00**

### Tannins for Aroma Enhancement

#### EnartisTan CIT (CITRUS)

- Blend of gallic tannins and condensed tannins extracted from exotic species wood.
- Production process at cold temperature to preserve aromatic precursors from wood (nor-isoprenoids and terpenes).
- Enhances floral, citrus, spicy and fruity notes.

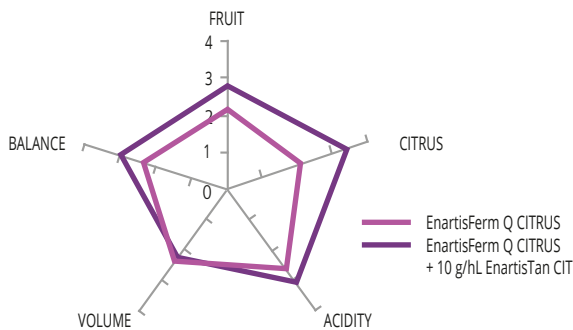
**Tip:** To optimize aromatic effect, use EnartisTan CITRUS during fermentation in combination with a yeast that expresses terpenes and nor-isoprenoids.

**Recommendations:** Floral and citrus aromas; white and rosé wines.

**Dosage:** 2-15 g/hL (0.17-1.3 lb/1,000 gal)

**1 kg (Item #35-306-0001) \$ 220.00**

SENSORY IMPACT OF EnartisTan CIT ADDED AT 1/3 OF FERMENTATION



#### EnartisTan ELEGANCE

- Condensed tannin extracted from exotic species wood, grape skin tannin and gallic tannin.
- Antioxidant, protects from browning and preserves aromatic freshness.
- Enhances fruit and floral notes, balances mouthfeel and increases wine length.
- Improves aromatic stability and freshness throughout ageing.

**Recommendations:** Antioxidant; increase wine length; floral aromas; white and rosé wines.

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

**1 kg (Item #35-350-0001) \$ 220.00**

## RED AND ROSÉ WINE FERMENTATION

### Sacrificial & Antioxidant Tannins

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.

#### EnartisTan ANTIBOTRYTIS

- Mixture of gallic tannins and ellagic chestnut tannin.
- Intense antioxidant, antiradical and antioxidasic properties, protects color and aromatic compounds from oxidation with a long lasting effect.
- Protects from oxidation, limits oxidasic enzyme activities and strengthens the protective action of SO<sub>2</sub>.

**Recommendations:** "Sacrificial" tannin; antioxidant; antioxidasic; moldy grapes; white, rosé, sparkling and red wines.

**Dosage:** 50-200 g/ton, 3-20 g/hL (0.25-1.7 lb/1,000 gal)

**1 kg (Item #35-386-0001) \$ 80.00**  
**10 kg (Item #35-386-0010) \$ 750.00**

PRODUCT	DOSAGE	REDUCTION OF OXIDASIC ENZYME ACTIVITY
SO <sub>2</sub>	50 ppm	25%
	75 ppm	62%
EnartisTan ANTIBOTRYTIS	20 g/hL	60%

#### EnartisTan FERMCOLOR

- Blend of condensed tannins extracted from exotic species wood 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.

**Recommendations:** "Sacrificial" tannin; antioxidant; thermovinification; flash détente.

**Dosage:** 200-400 g/ton

**1 kg (Item #35-304-0001) \$ 55.00**  
**10 kg (Item #35-304-0010) \$ 480.00**



We have been using EnartisTan FERMCOLOR and EnartisTan 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 (CA)**



### EnartisTan ROUGE

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

**Recommendations:** "Sacrificial" tannin; antioxidant; color stability; red and rosé wines.

**Dosage:** 100-400 g/ton

1 kg	(Item #35-305-0001)	\$ 45.00
15 kg	(Item #35-305-0015)	\$ 570.00

### Tannins for Co-Pigmentation

Co-pigmentation is the formation of complexes between anthocyanins and co-factors such as flavonols, hydroxycinnamates 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 protects pigments from oxidation during the early stages of winemaking, limits color loss and has hyperchromic and bathochromic effects (higher intensity and darker colored wines). These molecules, important in young red wines, are considered 'semi-stable' pigments.

### EnartisTan FT (FRUITAN)

- Condensed tannin extracted from exotic species wood, grape skin tannin and gallic tannin.
- Protects anthocyanins from oxidation and improves color stability.
- Reduces herbaceous notes, enhances fruit characters and freshens aromas.
- Improves structure and length without imparting astringency.

**Recommendations:** Color stability; fruity aromas; reduce herbaceous notes; unripe grapes; smoke tainted grapes; thermovinification; flash détente; red and rosé wines.

**Dosage:** 10-20 g/hL (0.8-1.7 lb/1,000 gal)

1 kg	(Item #35-345-0001)	\$ 200.00
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### EnartisTan XC

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

**Tip:** Fraction the addition in two parts: at crushing and after inoculation.

**Recommendations:** Color stability; co-pigmentation; young wine red and rosé wines.

**Dosage:** 100-400 g/ton / Rosé: 5-15 g/hL (0.4-1.3 lb/1,000 gal)

1 kg	(Item #35-919-0001)	\$ 115.00
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### Tannins for Condensation

Condensed pigments can be formed via direct bonds between anthocyanins and tannins or in oxidative conditions via acetaldehyde bridges. They lead to more stable color.

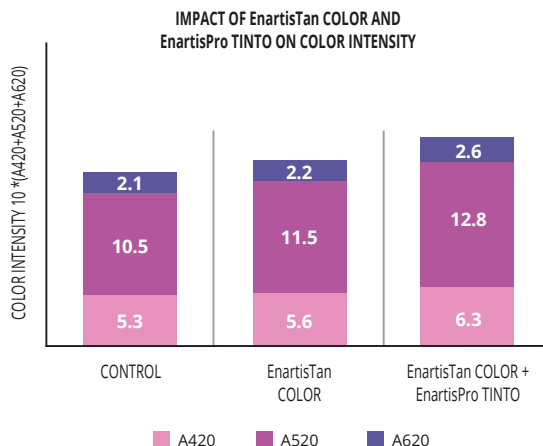
### EnartisTan COLOR

- Condensed tannin from grape seeds and exotic species wood, inactivated yeast, ellagic tannin and gallic tannin.
- Protects anthocyanins and aromatic compounds from oxidation.
- Highly reactive in condensing with anthocyanins to form stable and soluble color pigments with vibrant hue.
- Promotes production of spicy and dark fruit aromas.

**Recommendations:** Antioxidant; color stability; condensation; freshen aromas; fruity and spicy aromas; increase wine length.

**Dosage:** 100-400 g/ton

1 kg	(Item #35-920-0001)	\$ 200.00
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The addition of EnartisTan COLOR at inoculation and EnartisPro TINTO at 1/3 fermentation improves color intensity and stability of wine. EnartisTan COLOR and EnartisPro TINTO have a synergistic effect on color intensity and stability. Data after MLF.

### 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.

**Recommendations:** Color stability; condensation; short maceration; thermovinification; flash détente; balance mouthfeel; increase wine structure.

**Dosage:** 10-30 g/hL (0.8-2.5 lb/1,000 gal)

1 kg (Item #35-311-0001) \$ 230.00

### Tannins for Condensation using Micro-Oxygenation

Oxygen added at the end of alcoholic fermentation promotes the production of acetaldehyde, a product of ethanol oxidation. This compound acts as a bridge in polymerization reactions involving tannins and anthocyanins, creating more stable color compounds. The time frame (end of alcoholic fermentation, before malolactic fermentation) and the following are essential:

- Warm temperatures to promote faster reactions (~15°C/ 59°F).
- Free anthocyanins and enough tannins available for condensation.
- Ethanol can be oxidized into acetaldehyde.
- No SO<sub>2</sub> present to bind with acetaldehyde.
- Limited microbial activity that would consume oxygen and acetaldehyde.

### EnartisTan E

- Condensed tannin extracted from unfermented white grape seeds with a high concentration of mono-catechins.
- Highly reactive, specifically condenses free anthocyanins to promote a long-lasting color.
- One of our best tannins for color stabilization, particularly efficient during macro-oxygenation to condense with anthocyanins via acetaldehyde bridges.
- Increases wine structure, aromatic complexity and prevents premature oxidation.

**Recommendations:** Color stability; condensation; macro-oxygenation; micro-oxygenation; increase wine structure; thermovinification; flash détente.

**Dosage:** Red and rosé must: 5-20 g/hL (0.4-1.7 lb/1,000 gal);  
Micro-oxygenation and red wines: 3-15 g/hL;  
(0.25-1.3 lb/1,000 gal);  
White and rosé wines: 0.5-3 g/hL (0.04-0.25 lb/1,000 gal)

1 kg (Item #35-312-0001) \$ 325.00

### EnartisTan MICROFRUIT

- Blend of condensed tannins extracted from exotic species wood, ellagic oak tannins and condensed tannins extracted from grape seeds.
- Specifically developed for micro-oxygenation, it has a synergistic effect with oxygen on color stabilization.
- Enhances aromas of fresh red fruit, reduces herbaceous notes, increases softness and reduces bitterness.

**Tip:** EnartisTan MICROFRUIT can be added any time wine comes in contact with oxygen.

**Recommendations:** Color stability; macro-oxygenation; micro-oxygenation; fruity aromas; reduce herbaceous notes; red and rosé wines.

**Dosage:** During racking: 5-10 g/hL (0.4-0.8 lb/1,000 gal);  
During micro-oxygenation: 5-20 g/hL (0.4-1.7 lb/1,000 gal)

1 kg (Item #35-303-0001) \$ 230.00

### Tannins for Aroma Enhancement

#### EnartisTan RF (RED FRUIT)

- Blend of condensed tannins extracted from exotic species wood.
- Production process at cold temperature to preserve aromatic precursors from wood such as norisoprenoids.
- Provides aromatic precursors responsible for berry, red fruit, floral and spicy notes in wine.
- Improves color stability.

**Tip:** To optimize the aromatic effect, use EnartisTan RF during fermentation in combination with a yeast that expresses norisoprenoids.

**Recommendations:** Fruity and spicy aromas; freshen aromas; red and rosé wines.

**Dosage:** 20-300 g/ton

1 kg (Item #35-385-0001) \$ 230.00

## MATURATION & FINISHING TANNINS

For finishing tannins, we recommend doing preliminary lab bench trials to select the appropriate combinations and dosages for each wine. (See page 80 for Preparing Lab Bench Trials)

### Antioxidant & Antimicrobial Tannin

#### HIDEKI

- Tannin made of molecular fractions obtained through the selection and purification of gallic, ellagic and condensed tannins that are the most effective in terms of antioxidant and antimicrobial activity.
- To be used during wine preparation for bottling as a natural and allergen-free replacement for SO<sub>2</sub> to protect wine from oxidation and to prevent spoilage by unwanted microorganisms.
- The combination of different tannins, in terms of composition and structure that are microbiostatic in nature against various pathogens, makes HIDEKI a suitable tool over a wide range of pH values.

**Recommendations:** Natural and allergen-free alternative to SO<sub>2</sub>; antioxidant protection of wine; prevent growth of unwanted microorganisms.

**Dosage:** 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 (Item #35-931-0001) \$ 250.00**

### Oak Tannins

Enartis oak tannins are produced from wood used for barrels: same ageing in open air, same processing and same quality. After seasoning and toasting, tannins are extracted with an appropriate solvent to obtain smoother tannins while avoiding bitter and astringent substances. The tannin solution is then concentrated and spray-dried, in order to maintain the aromatic and sensory properties of the tannin.

#### EnartisTan CŒUR DE CHÊNE

- 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.

**Recommendations:** Extend barrel life; oak aromas; complexity; balance mouthfeel; increase wine length; softness; roundness; white, rosé, red and sparkling wines.

**Dosage:** 3-10 g/hL (0.25-0.8 lb/1,000 gal)

**1 kg (Item #35-330-0001) \$ 450.00**

#### EnartisTan DC (DARK CHOCOLATE)

- Tannin extracted from French oak.
- Boosts heavy-toasted oak characters in neutral barrels.
- Increases dark chocolate, roasted coffee and spice aromas.
- Softens astringency and increases wine length and complexity.

**Recommendations:** Extend barrel life; toasted oak aromas; balance mouthfeel; structure; complexity.

**Dosage:** 0.5-15 g/hL (0.04-1.3 lb/1,000 gal)

**0.5 kg (Item #35-361-0500) \$ 550.00**

#### EnartisTan ELEVAGE

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

**Recommendations:** Eliminate and prevent reductive notes; clean aromas; reduce off-aromas; rosé and red wines.

**Dosage:** 2-15 g/hL (0.17-1.3 lb/1,000 gal)

**1 kg (Item #35-340-0001) \$ 275.00**

#### EnartisTan EXTRA

- Tannin extracted from seasoned oak.
- Enhances vanilla, caramel, cocoa and toasted oak aromas.
- Contributes to softness and "sweetness" sensation and balances astringency.

**Recommendations:** Oak aromas; improve mouthfeel; softness; roundness; white, rosé and red wines.

**Dosage:** 2-10 g/hL (0.16-0.8 lb/1,000 gal)

**1 kg (Item #35-335-0001) \$ 690.00**

#### EnartisTan MAX NATURE

- Condensed tannin extracted from exotic species wood.
- Removes reductive characters, masks herbaceous notes and increases aromatic freshness and complexity.
- Increases roundness and builds mid palate.

**Recommendations:** Balance mouthfeel; reduce off-aromas; eliminate and prevent reductive notes; reduce herbaceous notes; complexity; white, rosé, sparkling and red wines.

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

**1 kg (Item #35-320-0001) \$ 85.00**  
**10 kg (Item #35-320-0010) \$ 700.00**

#### EnartisTan MEL

- Liquid preparation of ellagic tannin extracted from French oak.
- Designed to be used during wine maturation to prevent reduction and protect wine from oxidation.
- In barrel-aged wines, it helps to enhance oak profile (caramel, coconut, coffee and cocoa).
- The liquid form makes it easy-to-use.

**Recommendations:** Wine maturation; finishing; increase aroma complexity and structure.

**Dosage:** 1-30 mL/hL (38-1,100 mL/1,000 gal)

**1 kg (Item #35-363-0001) \$ 285.00**

### EnartisTan NAPA

- Tannin extracted from 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” and balances astringency.

**Recommendations:** *Extend barrel life; oak aromas; complexity; balance mouthfeel; increase wine length; softness; white, rosé, red and sparkling wines.*

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

1 kg (Item #35-307-0001) \$ 1,100.00

### EnartisTan RICH

- Condensed tannin extracted from exotic species wood, gallic tannin and oak tannin.
- Protects from oxidation, helps color stability, protein stability and clarification.
- Contributes to elegant oak notes, gently increases structure and volume.

**Recommendations:** *Oak aromas; complexity; structure; balance mouthfeel; color stability; clarification; white, rosé and red wines.*

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

1 kg (Item #35-325-0001) \$ 100.00

### 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<sub>2</sub> and improves wine shelf life.

**Recommendations:** *Antioxidant; stabilize wine redox potential; improve shelf life; complexity; freshen aromas; clean aromas; reduce off-aromas; eliminate and prevent reductive notes.*

**Dosage:** 0.5-15 g/hL (0.04-1.3 lb/1,000 gal)

0.5 kg (Item #35-308-0500) \$ 220.00

### EnartisTan SUPEROAK

- Oak tannin and condensed tannin extracted from exotic species wood.
- Protects from oxidation and helps stabilize color.
- Enhances toasted oak aromas and increases structure and “sweetness” perception.

**Recommendations:** *Oak aromas; complexity; structure; color stability; white, rosé and red wines; barrel ageing.*

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

1 kg (Item #35-370-0001) \$ 114.00

### EnartisTan TOF (TOFFEE)

- Ellagic tannins extracted from medium-plus toasted French oak, aged in open air spaces for minimum two years.
- Balances redox potential and prevents reductive characters.
- Increases butterscotch, caramel, toffee and coffee aromas.
- Improves wine structure, length and softens astringency.

**Recommendations:** *Prevent reductive notes; increase vanilla and toffee aromas; structure; softness.*

**Dosage:** 1-15 g/hL (0.08-1.3 lb/1,000 gal)

0.5 kg (Item #35-313-0500) \$ 295.00

### EnartisTan VNL (VANILLA)

- Ellagic tannins extracted from medium-toasted French oak.
- Balances redox potential and prevents reductive characters.
- Increases vanilla, custard and coconut aromas.
- Improves wine structure and “sweetness” perception.

**Recommendations:** *Prevent reductive notes; vanilla and coconut aromas; structure; softness.*

**Dosage:** 1-15 g/hL (0.08-1.3 lb/1,000 gal)

0.5 kg (Item #35-314-0500) \$ 295.00

## Grape Tannins

*Grape tannins mostly come from white grape skins and seeds. They are condensed tannins used to balance mouthfeel, build structure, improve wine length and enhance aromas.*

### EnartisTan FF (FRESH FRUIT)

- Blend of condensed tannins extracted from exotic species wood and fresh white grape skins.
- Production process at cold temperature to preserve aromatic precursors from wood such as norisprenoids and terpenes.
- Good antioxidant capacity.
- Freshens wine aromas, reduces overripe fruit notes, increase wine softness and wine length.

**Recommendations:** *Freshen aromas; floral and citrus aromas; antioxidant; balance mouthfeel; white, rosé and sparkling wines.*

**Dosage:** 0.5-10 g/hL (0.04-0.8 lb/1,000 gal)

1 kg (Item #35-362-0001) \$ 480.00

### EnartisTan SKIN

- High molecular weight condensed tannins obtained from fresh white grape skins.
- Improves aromatic cleanliness, enhances fruitiness and brightness.
- Builds mid palate, improves mouthfeel and complexity.
- Contributes to color stability.

**Tip:** *Highly recommended for varieties poor in skin tannins, short maceration and grapes with low phenolic extraction ratio.*

**Recommendations:** *Color stability; freshen aromas; fruity aromas; balance mouthfeel; white, rosé and red wines.*

**Dosage:** 3-20 g/hL (0.25-1.7 lb/1,000 gal)

1 kg (Item #35-360-0001) \$ 490.00

### EnartisTan TFT (TOTAL FRUITY)

- Blend of condensed tannins extracted from exotic species wood and fresh white grape skins.
- Freshens wine aromas, reduces overripe fruit notes and increases softness, structure and wine length.

**Recommendations:** Freshen aromas; fruity and spicy; antioxidant; balance mouthfeel; red and rosé wines.

**Dosage:** 0.5-20 g/hL (0.04-1.7 lb/1,000 gal)

**1 kg (Item #35-371-0001) \$ 450.00**

### EnartisTan UVA

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

**Recommendations:** Fruity aromas; structure; balance mouthfeel; freshen aromas; complexity; color stability.

**Dosage:** 1-10 g/hL (0.08-0.8 lb/1,000 gal)

**1 kg (Item #35-355-0001) \$ 425.00**

### EnartisTan UVASPEED

- Condensed tannins extracted from unfermented white grape skins.
- Provides intense fruit notes, freshens wines, increases wine structure and softness.

**Recommendations:** Fruity aromas; freshen aromas; balance mouthfeel; softness.

**Dosage:** 3-20 g/hL (0.25-1.7 lb/1,000 gal)

**1 kg (Item #35-365-0001) \$ 450.00**

*I believe in the concept of continuous improvement and thanks to Enartis' vast range of finishing tannins, we always manage to improve our wines from great to excellent.*  
**James Ochse, Winemaker at Stellenbosch Hills (South Africa)**

### EnartisTan Unico Range

Enartis is constantly looking for new botanical species and raw materials (wood, leaf, seed, etc.) to obtain tannins with unique sensory characteristics. Developed by Enartis, the EnartisTan UNICO range is a unique line of tannins with no close matches in the market.

#### Why are EnartisTan UNICO tannins different from other tannins?

The extraction, as well as the spray-drying, is made at low temperatures (approx. 20°C or 68°F) and low pressure. This unique process, proprietary to Enartis, extracts flavors of the raw material and prevents loss of aromatic compounds and formation of off-flavors caused by high temperatures. EnartisTan UNICO tannins have intense, distinct aromas that account for the lower addition rates compared to normal enological tannins.

#### EnartisTan UNICO #1

- Ellagic oak tannin.
- Intense and delicate vanilla, chocolate and toasted oak aromas.
- Contributes to volume and structure of wine.

**Recommendations:** Medium-toasted oak aromas; structure; balance mouthfeel; white, rosé, red and sparkling wines.

**Dosage:** 1-15 g/hL (0.08-1.2 lb/1,000 gal)

**0.25 kg (Item #35-380-0250) \$ 380.00**

#### EnartisTan UNICO #2

- Condensed tannin extracted from exotic species wood.
- Significantly enhances red fruit aromas such as cherry, fresh berries and black currant.
- Increases softness, structure and "sweetness."

**Recommendations:** Red fruit aromas; freshen aromas; structure; rosé and red wines.

**Dosage:** 1-15 g/hL (0.08-1.2 lb/1,000 gal)

**0.25 kg (Item #35-375-0250) \$ 225.00**

#### EnartisTan UNICO #3

- Blend of hydrolyzable and condensed tannins extracted from exotic species wood.
- Freshens wine aroma, enhances citrus, botanical and floral notes.

**Tip:** Particularly suitable for white, sparkling and late harvest wines.

**Recommendations:** Freshen aromas; citrus, floral and botanical aromas; structure; white, rosé and sparkling wines.

**Dosage:** 1-10 g/hL (0.08-0.8 lb/1,000 gal)

**0.25 kg (Item #35-395-0250) \$ 225.00**

	PROTEIN REMOVAL	ANTIOXIDANT	COLOR STABILITY	STRUCTURE ENHANCEMENT	ASTRINGENCY	SOFTNESS	AROMA INTENSITY	WHITE/ROSE WINES	RED/ROSE WINES	AROMA CONTRIBUTION
<b>GRAPE/FERMENTATION TANNINS</b>										
EnartisTan ANTIBOTRYTIS	●●	●●●●●●	●	●●	●	●	●	✓	✓	Elder, Wood
EnartisTan AROM	●●	●●●	●●	●●	●●	●●	●●●	✓	✓	Tropical fruit, Pineapple
EnartisTan BLANC	●●	●●●●●●	●	●●	●●	●	●	✓		Elder, Wood
EnartisTan CIT	●	●●●	●	●●	●●	●●	●●●●	✓		Citrus, White flowers, Orange blossom
EnartisTan COLOR	●●	●●●	●●●●	●●	●●	●●●	●●		✓	Black currant, Spices
EnartisTan ELEGANCE	●●	●●	●●	●●	●	●●●	●●●	✓		Stonefruit, White flower
EnartisTan FERMCOLOR	●●●	●●●	●●●●	●●●	●●	●●	●●		✓	Oak, Cherry
EnartisTan FT	●●●	●●●	●●●	●●●	●●●	●●	●●		✓	Red fruit, Spices
EnartisTan ROUGE	●●	●●●●	●●●	●●●	●●●	●	●		✓	Oak
EnartisTan RF	●●●	●●	●●	●●	●●	●●	●●●		✓	Strawberry, Plum, Cherry
EnartisTan V	●●	●●●	●●●●●	●●●●	●●●	●●	●●	✓	✓	Grapes, Stonefruit, Tea
EnartisTan XC	●●●	●●	●●●	●●	●●	●	●		✓	Oak
<b>POST FERMENTATION TANNINS</b>										
EnartisTan E	●●	●●	●●●●	●●●●	●●●	●	●●		✓	Grapes, Stonefruit
EnartisTan ÉLEVAGE	●●	●●	●	●●●	●●	●●	●●		✓	Toasted oak
EnartisTan MICROFRUIT	●●●	●●●	●●●●●	●●●	●●●	●●●●	●●●●		✓	Red fruit, Grape, Wood
EnartisTan SKIN	●●	●●	●●●	●●	●●	●●	●●●	✓	✓	Grapes, Stonefruit, Tea
EnartisTan UVA	●●	●●	●●	●●	●●	●●	●●	✓	✓	White flower, Honeydew
<b>MATURATION/FINISHING TANNINS</b>										
EnartisTan CŒUR DE CHENE	●	●	●●	●●	●	●●●	●●●●	✓	✓	Caramel, Spices, Medium-toasted oak
EnartisTan DC	●	●	●●	●●●	●	●●●	●●●●	✓	✓	Cocoa, Toasted hazelnut, Coffee
EnartisTan EXTRA	●	●	●	●●	●●	●●●	●●●●		✓	Vanilla, Caramel, Coffee
EnartisTan FF	●●	●●	●	●●	●	●●	●●●●	✓		Lemon, Citrus, Flowers
EnartisTan MEL	●	●	●	●●	●	●●●	●●●●	✓	✓	Caramel, Coconut, Coffee, Vanilla
EnartisTan MAX NATURE	●	●	●●	●	●	●●●●	●	✓	✓	Chamomille
EnartisTan NAPA	●	●	●	●●	●	●●●	●●●●	✓	✓	Coconut, Vanilla, Cocoa
EnartisTan RICH	●●	●	●	●●	●●	●●●	●●●		✓	Toasted oak, Coffee, Spices
EnartisTan SLI	●●	●●●	●●	●●	●	●●●	●●	✓	✓	Oak, Coconut, Vanilla
EnartisTan SUPEROAK	●	●	●	●●	●	●●	●●		✓	Vanilla, Caramel, Tobacco
EnartisTan TOF	●	●	●	●●	●●	●●●	●●●	✓	✓	Toffee, Vanilla, Caramel
EnartisTan TFT	●●	●	●	●●	●●	●●	●●●		✓	Plum, Cherry, Berries
EnartisTan UVASPEED	●	●●	●●●	●●	●	●●●●	●●●	✓	✓	Grape, Honeydew, Flowers
EnartisTan VNL	●	●	●	●●	●●	●●	●●●●	✓	✓	Vanilla, Butterscotch, Coconut, Almond
EnartisTan UNICO #1	●	●●	●	●●●●	●	●●●●	●●●●●	✓	✓	Vanilla, Caramel, Spices, Medium-toasted oak
EnartisTan UNICO #2	●	●	●	●●●	●	●●●●	●●●●●		✓	Red berries, Plums, Cherry
EnartisTan UNICO #3	●	●●	●	●●	●	●●●●	●●●●●●	✓		Lemon, Mint, Herbal

## 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. Flavanoids include three main groups: tannins, flavanols 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<sub>2</sub> and H<sub>2</sub>O, this reaction can lead to color loss. Stabilization of wine pigments can occur via co-pigmentation, condensation or cycloaddition.

**Co-pigmentation** is the enhancement of color due to formation of complexes between anthocyanins and cofactors such as flavanols, 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 <sub>2</sub> 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 protease 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: 150 g/ton of EnartisTan XC
		Condensation: 200 g/ton of EnartisTan COLOR or EnartisTan V
		Condensation: Co-pigmentation: 250-400 g/ton of EnartisPro TINTO
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 MICROFRUIT or EnartisTan E



# OAK ALTERNATIVES

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 profile for their brand or label.



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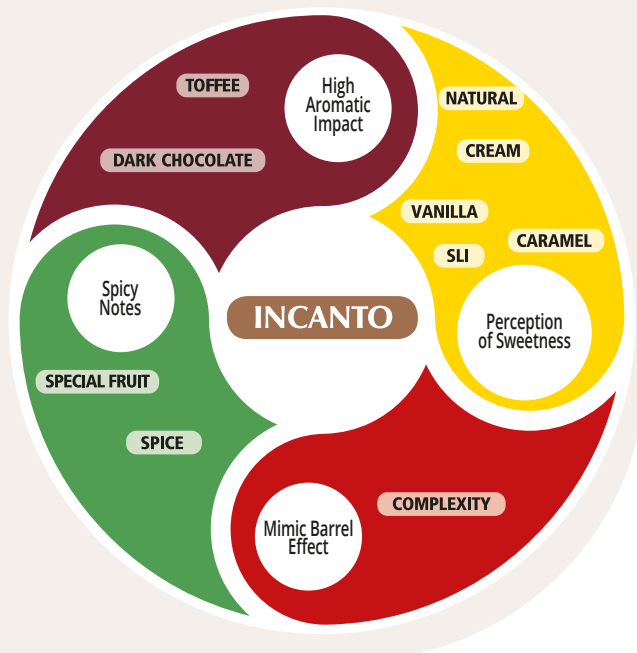
## INCANTO: OUR RANGE OF OAK ALTERNATIVES

INCANTO CHIPS are produced from French and American oak aged 18-36 months and toasted using a unique process to ensure high quality products. The convection toasting with a progressive heating scheme allows for a deep, homogeneous and consistent toast. The process of oak selection, leaching, drying and toasting time/temperature are defined based on the final aromatic profile of the product and the consistency across lots and quality.

Size: 2-4 mm

Dosage: 1-4 g/L for white wines; 1-6 g/L for red wines

Contact time: Minimum of 4 weeks



### PERCEPTION OF SWEETNESS

#### INCANTO SLI

- American oak, untoasted.
- Enhances varietal characteristics and increases freshness and longevity of aromas.
- Increases volume, softness and structure without increasing tannic sensations.
- Increases ageing potential.

10 kg (Item #35-927-0010) \$ 120.00

#### INCANTO NATURAL

- French oak, untoasted.
- Fresh fruit, white fruit, vanilla and coconut. Preserves aromatic characteristics of wine.
- Increases wine structure, volume, and smoothness and improves balance and finesse.

10 kg (Item #35-922-0010) \$ 120.00

#### INCANTO VANILLA

- American oak, light-medium toast.
- Vanilla, coconut, cinnamon, Bourbon, honey, tropical fruit, hazelnut, toasted almond, butter and caffè latte.
- Increases softness, volume and freshness accompanied by a pleasant increase in tannic sensation.

10 kg (Item #35-925-0010) \$ 170.00

#### INCANTO CREAM

- French oak, medium toast.
- Custard, coconut, butter, cappuccino, licorice and dried fruit.
- Increases softness, volume and sweetness without imparting excessive tannins.

10 kg (Item #35-920-0010) \$ 170.00

#### INCANTO CARAMEL

- French oak, medium toast.
- Caramel, cappuccino, toasted sugar, butter, almond, toasted hazelnut, vanilla and light spice.
- Increases smoothness and sweetness.

10 kg (Item #35-919-0010) \$ 170.00

### ENHANCE SPICY NOTES

#### INCANTO SPECIAL FRUIT

- French oak, medium toast.
- Light spice, toast, chocolate, caramel and vanilla notes that enhance fruitiness and complexity.
- Increases smoothness, volume and structure without imparting excessive tannins.

10 kg (Item #35-923-0010) \$ 170.00

#### INCANTO SPICE

- French and American oak, various toast levels.
- Spicy aromas - cloves, black pepper, licorice, cocoa, coffee made complex by notes of Bourbon, fruit, dried fruit and coconut.
- Increases softness and structure.

10 kg (Item #35-926-0010) \$ 250.00

### MIMIC BARREL EFFECT

#### INCANTO COMPLEXITY

- French oak, heavy toast.
- Coffee and toast made complex by sweeter aromas of vanilla, coconut and caramel.
- Increases structure, softness and sweetness perception.

10 kg (Item #35-928-0010) \$ 120.00

## HIGH AROMATIC IMPACT

### INCANTO TOFFEE











- French oak, medium-plus toast.
- Caffè macchiato, toasted bread, toasted almond, hazelnut, vanilla and apricot.
- Very smooth, sweet and complex.

10 kg (Item #35-924-0010) \$ 170.00

### INCANTO DARK CHOCOLATE

- French oak, heavy toast.
- Cocoa, bitter chocolate, black coffee, toasted almond, toasted hazelnut, licorice and pepper.
- Increases softness, volume and pleasant tannins.

10 kg (Item #35-921-0010) \$ 170.00

INCANTO RANGE	OAK	TOAST	AROMATIC IMPACT	MOUTHFEEL
 INCANTO SLI	US	Untoasted	Fresh, neutral	Volume, soft, structure
 INCANTO NATURAL	FR	Untoasted	Fruit, fresh, vanilla, coconut	Sweetness, structure, smooth
 INCANTO VANILLA	US	Light-medium	Vanilla, coconut, bourbon, butter	Soft, volume, fresh
 INCANTO CREAM	FR	Medium	Custard, coconut, cappuccino, dried fruit	Sweetness, soft, volume
 INCANTO CARAMEL	FR	Medium	Caramel, toasted hazelnut, butter	Sweetness, smooth
 INCANTO SPECIAL FRUIT	FR	Medium Plus	Spice, chocolate, fruit, complexity	Smooth, structure, volume
 INCANTO SPICE	FR, US	Various	Black pepper, licorice, complexity	Structure, soft
 INCANTO COMPLEXITY	FR	Heavy	Coffee, caramel, vanilla, coconut, complexity	Structure, smooth, sweet
 INCANTO TOFFEE	FR	Medium Plus	Caffè macchiato, toasted bread, hazelnut	Smooth, sweet, complex
 INCANTO DARK CHOCOLATE	FR	Heavy	Cocoa, black coffee, toasted almond, licorice	Volume, soft

## INCANTO NC RANGE

INCANTO NC (No Chips) products are soluble wood extracts containing only the active molecules used in oak powder:

- Wood tannins to protect against oxidation, improve color stability and enhance structure.
- Polysaccharides to increase volume and soften tannins.
- Aromatic compounds derived from wood and toasting.

### Dosage:

5-30 g/hL for white must  
20-50 g/hL for red must

### Applications of INCANTO NC:

- Increase complex oak aromas
- Highlight fruit and floral notes
- Improve wine mouthfeel and structure
- Increase sweetness perception
- Minimize herbaceous notes in underripe grapes
- Decrease reductive characters during fermentation

### Why use the INCANTO NC Range?

- Low dosage
- Low cost
- Easy-to-use for winery staff
- Better integration in wine
- NO color adsorption by solids
- NO microbial contamination
- NO solids = NO damage to harvest machinery



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 NC 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 (South Africa)**



**INCANTO NC WHITE**

- Inactivated yeast, oak tannin and condensed tannin extracted from exotic wood and gallic tannin.
- Mimics the effect of untoasted oak powder.
- Protects juice from oxidation and prevents the appearance of reductive odors. Additionally, it provides light floral and vanilla notes, increases fresh fruit aromas and enhances softness and volume.

**Recommendations:** Untoasted oak; antioxidant; complexity; volume and structure.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

2.5 kg	(Item #35-918-0002)	\$ 250.00
10 kg	(Item #35-918-0010)	\$ 900.00

**INCANTO NC CHERRY**

- Inactivated yeast, oak tannin, and condensed tannin extracted from exotic wood.
- Mimics the effects of oak powder.
- Promotes color stabilization, prevents oxidation, enhances fresh red fruit notes and increases wine volume, structure and length.

**Recommendations:** Color stability; antioxidant; complexity; fruity and spicy aromas; volume and structure; freshen overripe fruit.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

2.5 kg	(Item #35-913-0002)	\$ 290.00
10 kg	(Item #35-913-0010)	\$ 1,000.00

**INCANTO NC**

- Inactivated yeast, oak tannin and condensed tannin extracted from exotic wood.
- Mimics the effect of medium-toasted oak powder.
- Enhances oak aromas and aromatic complexity, increases roundness, structure and balance.
- Improves color stability.

**Recommendations:** Medium-toasted oak; color stability; complexity; volume and structure.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

2.5 kg	(Item #35-916-0002)	\$ 225.00
10 kg	(Item #35-916-0010)	\$ 800.00

**INCANTO NC RED**

- Oak tannin and inactivated yeast.
- Mimics the effect of medium-plus toasted oak powder.
- Decreases green aromas of unripe grapes, prevents reduction and increases structure, volume and sweetness.
- Increases color stability.

**Recommendations:** Medium-plus toasted oak; reduce herbaceous notes; complexity; volume and structure.

**Dosage:** 10-50 g/hL (0.8-4.2 lb/1,000 gal)

2.5 kg	(Item #35-917-0002)	\$ 250.00
10 kg	(Item #35-917-0010)	\$ 900.00

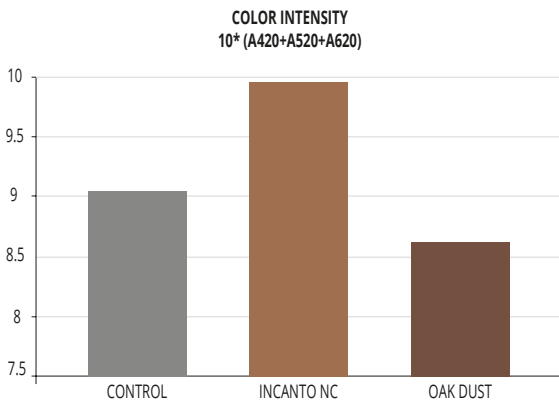
**INCANTO NC DARK CHOCOLATE**

- Oak tannin and inactivated yeast.
- Mimics the effect of French oak, heavy-toast oak powder.
- Enhances toasted oak aromas and aromatic complexity, increases volume, structure and balance. Masks herbaceous notes from unripe grapes
- Improves color stability.

**Recommendations:** Heavy-toasted oak; reduce herbaceous notes; color stability; complexity; volume and structure.

**Dosage:** 10-50 g/hL (0.8-4.2 lb/1,000 gal)

2.5 kg	(Item #35-914-0002)	\$ 362.50
10 kg	(Item #35-914-0010)	\$ 1,350.00



INCANTO NC during fermentation improves color intensity and stability.

## KNOW MORE ABOUT OAK AGEING

### WHAT DOES OAK BARREL AGEING DO TO WINE?

There are two main reactions happening during oak ageing: the extraction of oak compounds and oxygen diffusion. During oak ageing, wine aromatic complexity increases, color stability is enhanced, astringency is reduced and 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.
- Stave position on a trunk has been shown to influence its aroma composition.
- Stave seasoning and drying: Kiln drying or air drying, time, humidity, etc.
- 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-methylguaiaicol) and "smoky" characters (4-methylguaiaicol, guaiaicol, 2-methylphenol).

### WHY USE BARREL ALTERNATIVES?

- Cost is the most common reason for using barrel alternatives. Oak chips are, on average, 20 times less expensive than barrel ageing. Additionally, using barrel alternatives reduces cellar work, storage space and microbiological risks.
- Timing: Contact time for Enartis INCANTO CHIPS is 4 weeks.
- Consistency: INCANTO CHIPS provide a consistent oak aromatic profile to wine. Additionally, bench trials can be done with the oak alternatives to confirm the product choice and ensure consistency of the oak profile before using.

### ABOUT OAK AROMA COMPOUNDS

By determining the oak aroma profile of a targeted wine, winemakers can choose the appropriate INCANTO CHIPS blend for matching wine style.

### WHAT ABOUT STORAGE AND REUSE OF OAK ALTERNATIVES?

Oak alternatives should be treated with care and stored in a clean, dry warehouse and in original packaging. Reuse is not recommended: the extraction and result in wine will be different and the risk microbial contamination increases.

### HOW MUCH OXYGEN DO INCANTO OAK CHIPS DISSOLVE INTO WINE?

When added to wine, oak chips transfer air from their porosity to wine, thus dissolving oxygen. 5 g/L of INCANTO CHIPS will dissolve 0.6 ppm of oxygen into wine.

### SET-UP LAB BENCH TRIALS WITH OAK ALTERNATIVES

The extraction of oak compounds (oak aromas, polyphenols, polysaccharides, etc.) and the sensory impact on wine depend on many variables including the physiochemical characteristics of the wine, storage temperature, contact time, etc. It is important to set up bench trials in order to base decisions on accurate and representative data.

Setting up the trial is easy. Just follow the steps below to get started:

- Request INCANTO OAK CHIP samples from Enartis USA.
- Use a 0.750 L bottle for each sample.
- Select desired dosages (2-10 g/L).
- Write the date, wine lot, INCANTO OAK CHIP type and dosage on a label for each sample. Prepare a control sample bottle, without oak chips.
- Calculate the amount of INCANTO OAK CHIPS for each 0.750 L wine sample: (dosage g/L) x 0.750 L = g of INCANTO OAK CHIPS.
- Weigh the INCANTO OAK CHIPS, add to the sample bottle and fill with wine up to 0.750 L.
- To prevent potential oxidation, add 5 mg/L SO<sub>2</sub> at this time.
- After 3-4 weeks contact time, the samples are ready to be tasted.

*Tip: Consider blending samples to determine the optimum INCANTO OAK CHIP BLEND.*

# MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) is the conversion of malic acid into lactic acid by *Oenococcus oeni* which impacts wine quality and stability. The success of MLF depends on wine conditions, choice of ML strain and preparation of the inoculum. Enartis is proud to offer a complete portfolio of malolactic bacteria, activators and nutrients for an easy, clean and successful MLF.



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## ML BACTERIA

### How to choose ML bacteria strains

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<sub>2</sub> and alcohol content. Additionally, ML bacteria can be selected for their effects on wine aroma and mouthfeel.

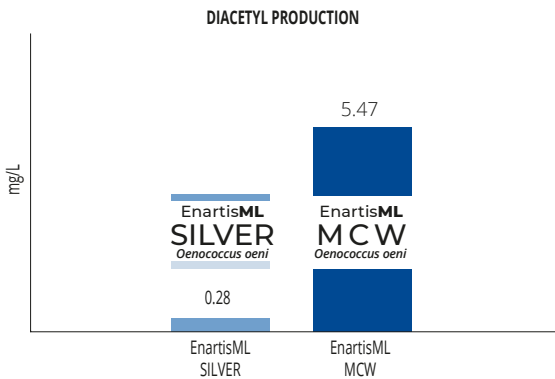
### EnartisML MCW



- 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.

#### Package designed for:

2.5 hL (66 gal)	(Item #30-031-0003)	\$ 36.00
25 hL (660 gal)	(Item #30-031-0025)	\$ 145.00
250 hL (6,600 gal)	(Item #30-031-0250)	\$ 805.00



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

### EnartisML SILVER

- Freeze-dried form for direct addition after rehydration.
- Fast and complete malolactic fermentation even under difficult conditions such as high alcohol and high polyphenol content.
- Respects aromatic characteristics of wine and does not produce biogenic amines.

#### Package designed for:

2.5 hL (66 gal)	(Item #35-505-0000)	\$ 28.00
25 hL (660 gal)	(Item #35-505-0025)	\$ 145.00
250 hL (6,600 gal)	(Item #35-505-0250)	\$ 785.00
1,000 hL (26,400 gal)	(Item #35-505-1000)	\$ 2,800.00

### EnartisML UNO

- Freeze-dried form for direct addition after rehydration.
- Provides a quick start and complete malolactic fermentation.
- Reduces the risk of spontaneous fermentations thereby contributing to the production of wines with better sensory attributes.

#### Package designed for:

2.5 hL (66 gal)	(Item #35-501-0002)	\$ 20.00
25 hL (660 gal)	(Item #35-501-0025)	\$ 100.00
250 hL (6,600 gal)	(Item #35-501-0250)	\$ 670.00

ENARTIS STRAINS	EnartisML MCW	EnartisML SILVER	EnartisML UNO
SPECIES	<i>Oenococcus oeni</i>		
pH TOLERANCE	>3.1	>3.1	>3.3
TOTAL SO <sub>2</sub> RESISTANCE (mg/L)	<40	<45	<40
FREE SO <sub>2</sub> RESISTANCE (mg/L)	<10	<10	<10
ALCOHOL TOLERANCE (%v/v)	>15	>15	<15
CONVERSION SPEED	Moderate/High	High	Moderate
AROMATIC CHARACTERISTICS	Buttery, “Sweet”	Fruity, Floral	Fruity, Varietal

## ML NUTRIENTS AND ACTIVATORS

### What nutrients do ML bacteria need?

After alcoholic fermentation has completed, yeast usually leave a wine deficient in vitamins, amino acids, minerals and other necessary nutrients for ML bacteria. To increase the survival rate of ML bacteria, increase their resistance to the hostile wine environment, activate their metabolism and ensure the completion of MLF, Enartis offers NUTRIFERM OSMOBACTI and NUTRIFERM ML, specifically designed for the needs of ML bacteria.

### NUTRIFERM ML

- Nutrient specific for ML bacteria: amino acids, vitamins, polysaccharides, cellulose, and co-factors.
- Stimulates bacterial growth, ensures domination of inoculated strain over natural flora, improves cell division and reduces the length of malolactic fermentation.

**Recommendations:** ML in difficult conditions; prevent stuck/sluggish MLF; increase MLF speed.

**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

**1 kg (Item #35-510-0001) \$ 37.00**

### NUTRIFERM OSMOBACTI

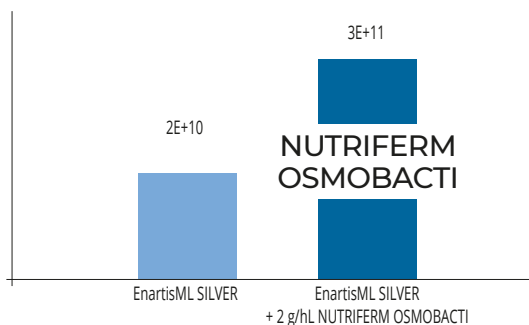
- Activator and regulator of osmotic pressure specific for ML bacteria.
- Autolyzed yeast, cellulose, L-malic acid and bi-ammonium phosphate.
- Improves survival rate of ML bacteria during rehydration and resistance in difficult wine conditions.
- Activates ML bacteria, allowing a faster start and completion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

**Recommendations:** Nutrient during rehydration; ML in difficult conditions; increase MLF speed.

**Dosage:** 50 g per 25 hL (660 gal) dose of bacteria

**100 g (Item #35-511-0100) \$ 8.50**

EFFECT OF NUTRIFERM OSMOBACTI



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

## PROTOCOL FOR ML BACTERIA PREPARATION AND INOCULATION

### DIRECT ADDITION, 25 hL

- Rehydrate 25 hL pack of ML bacteria in 500 mL of chlorine-free water at 20-25°C. Stir gently and wait 15 minutes.
- Add NUTRIFERM OSMOBACTI to the ML bacteria slurry in order to improve survival rate and activate ML bacteria. Stir gently and let stand for 4 hours at 18-20°C.
- Stir the suspension gently and add to wine during pump-over or mixing.



## KNOW MORE ABOUT MALOLACTIC 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 enzymes improve wine microbial stability, aroma complexity, mouthfeel and color stabilization. They also reduce the total acidity of wine and bentonite and SO<sub>2</sub> 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<sub>2</sub> (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 < 1g/L, wine temperature < 65°F or > 80°F, total SO<sub>2</sub> > 30 mg/L and/or free SO<sub>2</sub> > 10 mg/L.

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

Wines with a malic acid content below 1.0g/L have higher 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?

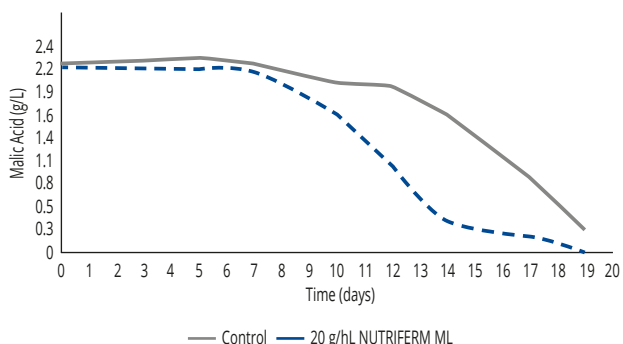
Uncontrolled, spontaneous MLF may increase the risk of spoilage organisms such *Brettanomyces*, as well as the production of undesirable compounds. Volatile acidity, excess of diacetyl, acrolein (bitter), and ropiness are the most common negative sensory characters expected in spontaneous MLF by wild 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 by 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 wine due the total loss of aroma. Their formation can be prevented by inhibiting indigenous lactic acid bacteria and other spoilage microbes with **EnartisStab MICRO M**.

### 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<sub>2</sub>. 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. The selected bacteria are added 24-48 hours after yeast inoculation, 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** under controlled conditions. 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<sub>2</sub> 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 an in-house or outside laboratory 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 ML bacteria.
- At ½ of malic acid depletion, add 200 L of wine to the bacteria culture.
- At ½ malic acid depletion, add the ML bacteria culture to the remaining wine volume.

# MICRO- OXYGENATION

Oxygen is essential in winemaking to promote fermentation health, aid the condensation of color for stability, and throughout maturation to integrate oak, tannins and round mouthfeel. It is an important tool in the production of quality wine and to help craft different wine styles intended to meet specific needs of the market.



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Transitioning away from barrel-ageing towards increased tank maturation, combined with tannins and oak alternatives allows wineries to be more competitive.

This provides the opportunity to increase the volume produced, take control of the wine ageing process for consistent maturation, as well as last minute refinement prior to packaging.

Enartis provides an innovative micro-oxygenation control system to improve facility operations, reduce overall costs, benefit fermentation health, and influence sensory impact prior to packaging.

• **Innovation**

A comprehensive technology to integrate into forward thinking equipment, developing a dynamic system which accurately controls increasing aspects of winery operation.

• **Integration**

Access and control across onsite network, enhancing winemaking productivity and reducing labor.

• **Performance**

Highly accurate, combined with a simple easy to use interface, creates a robust platform of complete analytical data points for increasing consistency across vintages.

• **Cost Effectiveness**

When applied to a single tank, capable of being easily distributed into every batch which is treated, comfortably amortizing quickly during moderate production schedules.

## Enartis WIN-IQ: OX

Enartis has developed a new micro-oxygenation device with simplified network control. Enartis WIN-IQ: OX system offers wineries the opportunity to precisely diffuse measured amounts of oxygen, creating solutions for various winemaking objectives.

- High accuracy: oxygen dosage controlled by mass flow meter
- Automatic adjustments to changes in temperature and pressure
- Fully user defined programs
- Intuitive and user friendly
- Control via touchscreen or any network connected device.
- Remote access for dynamic and complete control
- Automated software push updates
- Applicable across a broad range of tank volumes
- Individualized tank mounted devices, independently controllable and completely network connectable

**(Item #50-300-1001)** *Please inquire for pricing. Quantity discounts available.*



**WANT TO LOCATE YOUR WIN-IQ: OX DEVICES CENTRALLY FOR YOUR TANKS?**  
Ask about our individual or multiple device mounting options.

FEATURES	ENARTIS WIN - IQ OX
<b>WINERY SPECIFICATIONS</b>	
WINERY PRODUCTION	50,000 cases and up
MINIMUM TANK CAPACITY	1,000 gals
MAX TANK CAPACITY	600,000 gals
TYPICAL APPLICATION	Heavy application throughout all periods of production on larger tanks
CELLAR CONNECTIVITY	Wi-Fi & Ethernet
<b>APPLICATION PERIOD CAPABILITY</b>	
FERMENTATION	✓
COLOR STABILITY BETWEEN AF-MLF	✓
MATURATION	✓
PRE-BOTTLING	✓
<b>TECHNICAL SPECIFICATIONS</b>	
INSTALLATION AND STARTUP TIME	30 minutes
DIFFUSION METHOD	Stainless Steel Sintered Diffusion Stone
OXYGEN SUPPLY	O <sub>2</sub> Cylinder from gas supplier
INFORMATION DISPLAY	Online Dashboard & 7" LCD (1024x600) touch screen
ELECTRICAL INPUT	AC 120V or 240V
<b>PRODUCT FEATURES</b>	
PORTABLE	✓
MOUNTABLE	✓
INTERNET CONNECTED	✓
USER LEVEL SECURITY	✓
"OVER THE AIR" UPDATES	✓
DOWNLOADABLE DATA	✓
REMOTE MONITORING	✓
TOUCH DISPLAY	✓

## KNOW MORE ABOUT MICRO-OXYGENATION (MOX)

### WHAT ARE THE APPLICATIONS OF MOX?

#### CONTROLLED JUICE/MUST OXYGENATION

<b>Objective</b>	Improve resistance to oxidation and pinking, reduces bitterness and astringency in white grapes.
<b>Rate</b>	5-30 mg/L
<b>Timing</b>	After pressing. Treatment usually done over 0.5-2 hours.
<b>Comments</b>	No SO <sub>2</sub> , healthy grapes, no spoilage microbes, temperature 10-13°C (50-55°F). Fining after MOX with <b>CLARIL AF</b> (or CLARIL SP).

#### PREPARATION OF STARTER CULTURES

<b>Objective</b>	Increase yeast biomass. Improve yeast cell membrane resistance by increasing the production of unsaturated fatty acids.
<b>Rate</b>	3 mg/L every 3-4 hours
<b>Timing</b>	After yeast rehydration.
<b>Monitor</b>	Yeast cell count and viability.

#### DURING ALCOHOLIC FERMENTATION

<b>Objective</b>	Improve yeast cell membrane resistance by increasing the production of unsaturated long-chain fatty acids. Decrease production of sulfur off-aromas such as H <sub>2</sub> S.
<b>Rate</b>	1-3 mg/L every dose. Maximum 10-15 mg/L total.
<b>Timing</b>	At 1/3 of sugar depletion and 2/3 sugar depletion.
<b>Comments</b>	Effect reinforced with addition of <b>NUTRIFERM ADVANCE</b> .

#### BETWEEN ALCOHOLIC FERMENTATION AND MALOLACTIC FERMENTATION (MLF)

<b>Objective</b>	Stabilize color compounds: production of acetaldehyde acting as a bridge in polymerization reactions. Improve wine structure by increasing polyphenol polymerization. Minimize herbaceous and reductive characters.
<b>Rate</b>	1-4 mg/L/day for 3-10 days or until MLF begins
<b>Timing</b>	After alcoholic fermentation and pressing, prior to malolactic fermentation.
<b>Comments</b>	Temperature: 15-20°C (59-68°F). Remove any spoilage microbes with <b>EnartisStab MICRO M</b> . Use <b>EnartisTan MICROFRUIT</b> or <b>EnartisTan E</b> to increase tannin/anthocyanin ratio. Do not apply oxygen once MLF begins.
<b>Monitor</b>	Daily sensory analysis to detect acetaldehyde (green apple aroma), <b>Micro-Ox Panel</b> and <b>acetaldehyde</b> .

#### POST MLF MATURATION

<b>Objective</b>	Improve, develop and harmonize mouthfeel and aromas. Mimic barrel ageing.
<b>Rate</b>	0.5-3 mg/L/month for 2-3 months, 0.5-2 mg/L/month for 3-12 months. 30 mg/L/year maximum
<b>Timing</b>	After MLF, until bottling. Maintain 20-30 ppm free SO <sub>2</sub> .
<b>Comments</b>	Depending on objectives, use tannins, polysaccharides and oak alternatives: - To mimic barrel ageing, use <b>INCANTO CHIPS</b> with <b>SURLI ONE</b> . - To reduce green characters, use <b>EnartisTan MAX NATURE</b> . - To increase fruitiness, use <b>EnartisTan MICROFRUIT</b> .
<b>Monitor</b>	Weekly tasting, <b>Microscopic Scan</b> , <b>Free &amp; Total SO<sub>2</sub></b> , <b>Dissolved Oxygen</b> , <b>Volatile Acidity</b> , <b>Color Profile</b> .

**WHAT ARE THE RECOMMENDED PARAMETERS TO MONITOR THROUGHOUT MICRO-OXYGENATION TREATMENT?**

**Temperature:** Temperature impacts the solubility of oxygen and speed of reactions in wine. Temperatures between 59-68°F (15-20°C) are appropriate for treatment. Temperatures less than 55°F (13°C) can lead to accumulation of dissolved oxygen due to the increase of oxygen solubility and decrease the speed of wine consumption. Above 68°F (20°C), oxidation reactions occur faster, increasing the risk of premature ageing. Typical temperature during treatment is ~59°F (15°C).

**Dissolved Oxygen (DO) mg/L:** Oxygen should be added in a manner that does not cause an accumulation of dissolved oxygen. Monitoring DO twice weekly throughout the application will help make adjustments to level of treatment and find the appropriate dosage rate for each wine. Maintaining DO levels below 0.8 mg/L for red wine is recommended.

**Free SO<sub>2</sub> (FSO<sub>2</sub>) mg/L:** This parameter should be monitored in wines treated after MLF once SO<sub>2</sub> has been added. A rapid decrease in Free SO<sub>2</sub> indicates too high of an oxygen addition rate or potential microbial spoilage. During maturation, average Free SO<sub>2</sub> should be maintained above 20 mg/L. Research has shown that 1 mg/L of oxygen depletes 4 mg/L Free SO<sub>2</sub> (Boulton et al. 1996), however it should be noted that if there is headspace in the tank, Free SO<sub>2</sub> can interact with headspace oxygen, depleting at an expedited rate. Consistent monitoring can help ensure that any movement of Free SO<sub>2</sub> level can be addressed.

**Volatile Acidity (VA) g/L:** Volatile acidity should be monitored during the treatment. An increase in VA could be an indicator of bacterial spoilage and high levels of oxygen. Micro-oxygenation in wines with high VA levels is not advised.

**Acetaldehyde:** Acetaldehyde is a byproduct of wine oxidation and serves as a bridge between unstable color pigments and tannin. This bridge helps bind color and tannin, forming long-lasting or stable color. The process of stabilizing color also has a softening effect on the astringency of wine. A build-up of acetaldehyde indicates there is more production of acetaldehyde occurring through oxidation, rather than color stabilization or bridging reactions occurring. Significant increases in acetaldehyde levels indicate that the amount oxygen being applied needs to be reduced or that the micro-oxygenation needs to be suspended.

**Color Profile:** Measurement of color using CIELab-based color identification can differentiate between minor shifts as the wine ages. Understanding the progression of color throughout the treatment of wine allows the reproduction of results between vintages and the recognition of potential issues.

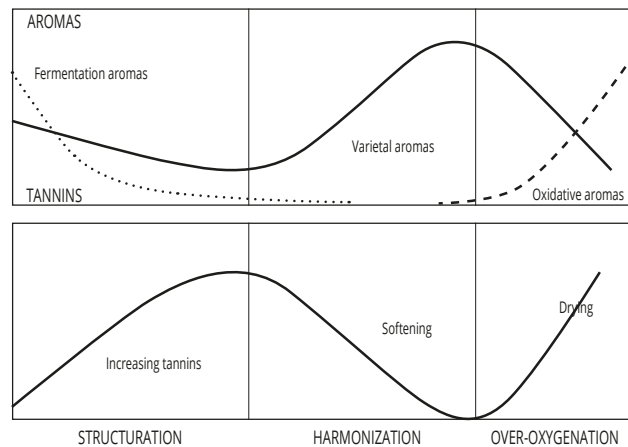
**Phenolic Compounds:** Phenolic measurement can provide information about the potential for a wine to be treated with oxygen, as well as to guide on starting dosage.

**Turbidity (NTU):** High turbidity can decrease the effectiveness of treatment as dissolved oxygen will be consumed by yeast lees instead of wine components.

**TASTING AND SENSORY**

During micro-oxygenation treatment, tasting and sensory analysis is crucial to fine tune the oxygen dosage. Therefore, the optimal oxygen dosage of micro-oxygenation should be adjusted based on the evolution of the above parameters and weekly sensory evaluation. With micro-oxygenation during ageing, wines go through three stages that can be distinguished by changes in aroma and tannin appearance:

- 1 Structuring:** Structuring can happen pre or post MLF. During this phase, wine tannins become more reactive and aggressive as the degree of polymerization increases tannin astringency. This change is combined with the degree of aromatic complexity.
- 2 Harmonization:** This stage is marked by the formation of a fuller, rounder palate. Tannins become less reactive and are softer throughout the mouth. Aromas integrate more fully while increasing in complexity.
- 3 Over-oxygenation:** This stage is when the treatment has gone too far. Mid palate becomes thinner and tannins are dryer, resulting from excessive polymerization and increasing development of aldehyde/oxidase aromas and flavors. Tasting is the best way of checking the results and deciding when it's time to stop treatment.



*Classic evolution of aromas and tannins in wine during micro-oxygenation. Adapted from (Parish et al., 2000)*

# FINING AGENTS

## ALLERGEN-FREE FINING AGENTS

New labeling restrictions for wines sold or produced in Europe and Canada have made it mandatory to declare the use of co-adjuncts derived from eggs, milk and fish (Canada) on the label. Enartis has developed an allergen-free line of fining agents, suitable for vegetarian and vegan wines, as alternatives to egg albumin, casein, potassium caseinate, isinglass and fish gelatin.



55. PLANTIS AF-Q

**enartis**

Inspiring innovation.

## PLANT PROTEINS

Plant proteins, free of genetically modified organisms and allergenic proteins, are suitable for vegetarian and vegan beverage production. Often used to correct oxidation, browning and bitterness, plant proteins have excellent clarifying and stabilizing properties.

### PLANTIS AF

- Allergen-free, pure plant protein.
- Gluten-free and vegan.
- Removes catechins and short chain-length polyphenols responsible for oxidation and bitterness.
- Reduces astringency and some off-flavors present in wine.
- Alternative to gelatin, casein and potassium caseinate.

**Recommendations:** Allergen-free; vegan; treat oxidation; remove browning; reduce astringency bitterness.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**20 kg (Item #35-760-0002) \$ 515.00**



PLANTIS AF exceeded my expectations! It had an amazing effect on our wine's overall appearance and palette. The color of the white wine improved and it had an amazing fining effect on impurities. I will definitely recommend this product to other winemakers in the industry. At Boland Cellar, we are more than happy with Enartis' service and business ethics - they are excellent. **Monique de Villiers, Winemaker at Boland Kelder (South Africa)**



### NEW PLANTIS AF-Q

- Allergen-free preparation made of pea protein and activated chitosan.
- Activated chitosan and hydrolyzed vegetable protein work synergistically to increase flocculant efficacy in improving clarity.
- Assures clarification while forming small, compact lees, especially when used during flotation.
- 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.

**Recommendations:** Allergen-free; vegan; flotation; prevent and treat oxidation and pinking.

**Dosage:** 5-30 g/hL (0.4-2.4 lb/1,000 gal)

**1 kg (Item #35-759-0001) \$ 50.00**  
**10 kg (Item #35-759-0010) \$ 460.00**



### PLANTIS AF-P

- Pure potato protein stabilized with SO<sub>2</sub>.
- Gluten-free, vegan and free of allergenic proteins.
- One of the most reactive proteins.
- Removes catechins and small molecular weight polyphenols responsible for oxidation and astringency.
- Alternative to gelatin, casein and potassium caseinate.

**Recommendations:** Free of allergenic proteins; vegan; treat oxidation; remove browning; reduce astringency.

**Usage:** Dissolve in 10 times its weight of cold water. Stir constantly during addition.

**Dosage:** 5-30 g/hL (0.4-2.4 lb/1,000 gal)

**1 kg (Item #35-761-0001) \$ 110.00**

### PLANTIS PQ

- Vegan friendly fining agent made of potato protein and chitosan.
- Effective in improving wine clarification, filterability and aromatic cleanliness.
- Removes oxidized and oxidable compounds and, in red wine, it reduces the perception of astringency and dryness.

**Recommendations:** Wine clarification.

**Dosage:** 4-10 g/hL (0.3-0.8 lb/1,000 gal)

**1 kg (Item #35-764-0001) \$ 90.00**



## GELATINS

Gelatins are obtained from the partial hydrolysis of collagen contained in animal bones and skin. Gelatin is often used to improve clarification and reduce phenolic compounds responsible for dryness, bitterness and astringency. Gelatin effects and applications can vary depending on the type of hydrolysis (isoelectric point), degree of hydrolysis (molecular weight) and charge density. Gelatin is positively charged at wine pH and binds via hydrogen bonds to polyphenols. Enartis has developed a wide range of high quality gelatins to provide solutions for many situations.

#### TANNIN REMOVAL

Low MW  
High degree of hydrolysis  
Low density of charge

	MW (kDa)	Density of charge
HYDROCLAR 45	<9	300-400
HYDROCLAR 30	12	450-650
PULVICLAR S	150	800-1000
GOLDEN INSTANT	250	1100-1200

High MW  
Low degree of hydrolysis  
High density of charge

#### CLARIFICATION

### GOLDENCLAR INSTANT

- Granulated food-grade gelatin. High molecular weight, very low hydrolysis and very high charge density.
- Improves clarity and filterability.
- Reduces astringency and softens mouthfeel without affecting structure.
- Allergen-free alternative to egg albumin.

**Recommendations:** Allergen-free; clarification; reduce bitterness; reduce astringency; soften mouthfeel; aged red wines.

**Usage:** Dissolve in 20 times its weight of room temperature water. Stir constantly during addition.

**Dosage:** 2-12 g/hL (0.17-1 lb/1,000 gal)

1 kg (Item #35-626-0001) \$ 50.00

### HYDROCLAR 30

- 30% liquid solution of food grade gelatin. Medium hydrolyzed gelatin.
- Good for clarification.
- Reduces dryness and astringency at the middle-end of the palate.

**Recommendations:** Flotation; clarification; reduce astringency; reduce dryness.

**Usage:** Add directly to juice/ wine via Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 10-60 mL/hL (0.4-2.3 L/1,000 gal)

1 L (Item #35-610-0001) \$ 20.00  
20 kg (Item #35-610-0025) \$ 425.00

### HYDROCLAR 45

- 45% liquid solution of food grade gelatin stabilized with sulfur dioxide. Extremely hydrolyzed gelatin and low charge density.
- Powerful effect on removing undesirable polyphenols.

**Recommendations:** Reduce excessive astringency; reduce dryness; press wines.

**Usage:** Add directly to juice using Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 7-40 mL/hL (0.27-1.5 L/1,000 gal)

5 kg (Item #35-615-0005) \$ 125.00  
20 kg (Item #35-615-0025) \$ 400.00

### PULVICLAR S

- Granulated food-grade gelatin. High molecular weight, low hydrolysis and high charge density.
- Highly effective for clarification by flotation.

**Recommendations:** Flotation; clarification; juice.

**Usage:** Dissolve in 20 times its weight of warm water (40°C, 104°F). Stir constantly during addition.

**Dosage:** 4-15 g/hL (0.3-1.3 lb/1,000 gal)

1 kg (Item #35-630-0001) \$ 35.00  
20 kg (Item #35-630-0020) \$ 480.00

### ISINGLASS

Isinglass is a form of collagen obtained from the dried swim bladders of fish. Used to improve brilliance and clarity of wine, it also reduces monomers and smaller polyphenolic compounds responsible for wine bitterness. Isinglass is usually used as a final touch before bottling or even as a riddling aid for sparkling wines.

### FINECOLL

- Granular isinglass, citric acid and potassium metabisulfite.
- Good for clarification and improving brilliance.
- Reduces bitterness, oxidative and herbaceous characteristics without affecting wine structure.

**Tip:** Isinglass is more efficient at low temperatures (<15°C, 59°F). Use in combination with SIL FLOC or PLUXCOMPACT to help settling and compacting lees.

**Recommendations:** Reduce bitterness; clarification; brilliance.

**Usage:** Dissolve in 100 times its weight of room temperature water. Allow to swell for 1-2 hours. Stir constantly during addition.

**Dosage:** 1-4 g/hL (0.08-0.3 lb/1,000 gal)

10 kg 35-650-0010 \$ 1,700.00

### POTASSIUM CASEINATE

Potassium caseinate is the major protein in milk. With its positive charge, it adsorbs negatively-charged particles as it settles. It is usually used to reduce browning, bitterness and oak flavors (good "sponge" effect). Potassium caseinate has a strong affinity with condensed tannin, primarily responsible for astringency.

### PROTOCLAR

- Pure potassium caseinate containing over 90% protein.
- Prevents and treats oxidation, browning and pinking.
- Reduces bitterness.
- Removes off-flavors.

**Recommendations:** Treat oxidation; remove browning; reduce astringency; reduce off-flavors.

**Usage:** Dissolve in 20 times its weight of cold water. Stir constantly during addition.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

1 kg (Item #35-645-0001) \$ 90.00



## PVPP

Polyvinylpyrrolidone (PVPP) specifically binds with low molecular weight polyphenols such as monomers and dimers responsible for oxidation, browning, pinking and bitterness.

## STABYL

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

**Recommendations:** Treat and prevent oxidation; reduce browning; remove bitterness; press wines.

**Usage:** Suspend in 10 times its weight of warm water (40°C, 104°F). Allow to swell for 1 hour. Stir constantly during addition.

**Dosage:** 2-50 g/hL (0.2-4.2 lb/1,000 gal)

1 kg (Item #35-655-0001) \$ 105.00  
20 kg (Item #35-655-0020) \$ 1,400.00

## PVI/PVP

PVI/PVP is an adsorbent co-polymer (polyvinylimidazole and polyvinylpyrrolidone) capable of removing metals in wine such as copper (Cu), iron (Fe) and aluminum (Al). Also, PVI/PVP has the ability to bind with phenolic compounds, the substrates of oxidative reactions. Wines treated with PVI/PVP are fresher, more aromatic, more balanced, have a lower oxidation potential and improved shelf life.

### Why use PVI/PVP?

- To remove any trace of metals and limit oxidation reactions at any stage of winemaking process.
- To stabilize wine with regards to oxidation and improve wine shelf life.
- To remove any excess copper or iron.

### Why is it important to remove residual metals?

It is through redox reactions, catalyzed by transition metals such as Cu<sup>+</sup> and Fe<sup>2+</sup>, that oxygen is converted into highly reactive radicals, capable of oxidizing a number of organic compounds. Removing metals such as Cu<sup>+</sup> and Fe<sup>2+</sup>, limits oxidation reactions, reduces reaction speed and increases wine resistance to oxidation.

## STABYL MET

- PVI/PVP (polyvinylimidazole/ polyvinylpyrrolidone) and silica.
- Absorbs metals (high affinity with Cu) and removes hydroxycinnamic acids and low molecular weight catechins.
- Limits oxidation, browning and destruction of varietal thiols.
- Prevents pinking and formation of copper haze.

**Tip:** To increase effectiveness, keep STABYL MET in suspension in wine for at least 1-2 hours.

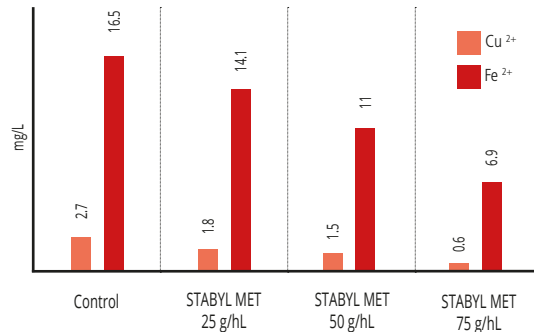
**Recommendations:** Prevent oxidation; reduce browning; remove bitterness.

**Usage:** Suspend in 20 times its weight of room temperature water. Allow to swell for 1 hour. Stir constantly during addition.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

2.5 kg (Item #35-657-0002) \$ 625.00

EFFECT OF STABYL MET ON METAL COMPOSITION OF WINE



STABYL MET reduces the content of Cu<sup>2+</sup> and Fe<sup>2+</sup> in wine. The effectiveness of the treatment is directly related to the dosage of STABYL MET.

## PREPARING WINES FOR ZENITH

### CLARIL ZR

- Vegan fining agent made from plant protein, chitosan and bentonite.
- Designed for the clarification of red wines meant to be tartrate stabilized with colloid addition of ZENITH.
- Removes unstable color compounds, improves wine clarification and filterability and reduces sulfur off-flavors.

**Recommendations:** Clarification of red wine intended to be tartrate stabilized with ZENITH.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

2.5 kg (Item #35-663-0002) \$ 92.50  
10 kg (Item #35-663-0010) \$ 340.00

### CLARIL ZW

- Vegan fining agent made from plant protein, chitosan and sodium activated bentonite.
- Designed for the clarification of white and rosé wines that are meant to be tartrate stabilized with colloid addition (ZENITH and CMC).
- Effective in improving protein stability and eliminating unstable colloids that can affect wine clarification and filterability.

**Recommendations:** Clarification of white and rosé wine intended to be tartrate stabilized with ZENITH or CMC.

**Dosage:** 20-80 g/hL (1.7-6.7 lb/1,000 gal)

2.5 kg (Item #35-664-0002) \$ 85.00  
10 kg (Item #35-664-0010) \$ 300.00

## BLENDS

Enartis has developed blends of fining agents which combine specific characteristics to create unique products that provide solutions for many situations.

### CLARIL AF



- Bentonite, PVPP, plant protein and silica.
- Prevents and treats oxidation, prevents pinking and reduces bitterness.
- Improves protein stability and clarification.
- Alternative to casein and potassium caseinate.

**Recommendations:** Prevent oxidation; reduce browning; remove bitterness; protein stability.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell for 3-6 hours. Stir constantly during addition.

**Dosage:** 30-150 g/hL (2.4-12.6 lb/1,000 gal)

1 kg (Item #35-666-0001) \$ 64.00  
10 kg (Item #35-666-0010) \$ 540.00

### CLARIL HM



- PVI/PVP (polyvinylimidazole/polyvinyl pyrrolidone) and pre-activated chitosan.
- Adsorbs heavy metals (Cu, Fe, Al) and removes hydroxycinnamic acids and low molecular weight catechins.
- Prevents oxidation, browning, pinking and destruction of varietal thiols.

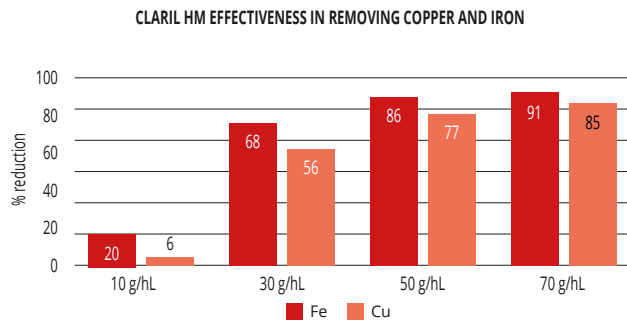
**Tip:** To increase effectiveness, keep CLARIL HM in suspension in wine for at least 1-2 hours.

**Recommendations:** Prevent oxidation; reduce browning; preserve aromas; prevent copper haze.

**Usage:** Suspend in 20 times its weight of room temperature water. Allow to swell for 1 hour. Stir constantly during addition.

**Dosage:** 30-50 g/hL (2.5-4.2 lb/1,000 gal)

2.5 kg (Item #35-661-0001) \$ 625.00



CLARIL HM effectively reduces wine copper and iron content, preventing oxidations and haze. The combination of PVI/PVP and chitosan helps to increase its action on iron removal.

### CLARIL SMK

- Carbon, pea protein and chitosan.
- Mitigates the impact of smoke exposure in all types of wine.
- Removes compounds associated with smoke taint.
- Low impact on color and phenolic content, even at high addition rates.
- Restores fruity character and freshness, as well reduces the "ashy" and bitter aftertaste common in smoke affected wines.

**Recommendations:** treatment of juice or wine produced from grapes exposed to smoke; can be used in all types of wine during juice settling, fermentation or ageing.

**Usage:** Suspend in 10 times its weight of room temperature water. Stir constantly during addition.

**Dosage:** 25-300 g/hL (2.1-25.2 lb/1,000 gal)

1 kg (Item #35-674-0001) \$ 65.00  
10 kg (Item #35-674-0010) \$ 540.00

### CLARIL SP

- Bentonite, PVPP, potassium caseinate and silica.
- Prevents and treats oxidation, browning and pinking.
- Improves aromatic cleanliness and reduces bitterness.

**Recommendations:** Improve cleanliness; treat oxidation; reduce browning; reduce bitterness.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell for 3-6 hours. Stir constantly during addition.

**Dosage:** 20-150 g/hL (1.7-12.6 lb/1,000 gal)

1 kg (Item #35-665-0001) \$ 60.00  
10 kg (Item #35-665-0010) \$ 520.00

### COMBISTAB AF

- PVPP, plant protein and silica.
- Prevents and treats oxidation, prevents pinking.
- Reduces bitterness.
- Alternative to casein and potassium caseinate.

**Recommendations:** Prevent oxidation; reduce browning; remove bitterness.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell 1 hour. Stir constantly during addition.

**Dosage:** 10-50 g/hL (0.8-4.2 lb/1,000 gal)

1 kg (Item #35-667-0001) \$ 66.00

### NEOCLAR AF

- Bentonite, gelatin and activated carbon.
- Ensures fast clarification with minimal volume of lees.
- Improves organoleptic cleanliness of wine, reduces herbaceous characters and contributes to protein stability.

**Recommendations:** Improve cleanliness; reduce herbaceous notes; remove off-flavors.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 40-150 g/hL (3.4-12.6 lb/1,000 gal)

1 kg (Item #35-670-0001) \$ 38.00

## BENTONITE

Many types of bentonites are available for winemakers including sodium bentonite, calcium bentonite and activated bentonite. Based on its composition, bentonites can have different properties and act differently regarding its ability to remove proteins, to compact lees and the aromatic impact.

### What type of bentonite should I use?

There are three type of bentonite commercially available. It is important to test and treat wines with the same bentonite.

- Sodium bentonite: the most reactive with proteins
- Calcium bentonite: used to compact lees
- Calcium bentonite sodium activated: good reactivity with proteins and good lees compaction.

### Should I rehydrate my bentonite in water or wine?

Water. Bentonite should be rehydrated with clean, chlorine-free water.

### Can I use bentonite in red wines?

Yes. Low rates of bentonite help eliminate unstable color, proteins and clarify wines.

HOW TO CHOOSE BETWEEN ENARTIS BENTONITES	
FUNCTION	ENARTIS PRODUCT
CLARIFICATION	PLUXCOMPACT > PHARMABENT > PLUXBENTON N
LEES COMPACTION	PLUXCOMPACT > PHARMABENT > PLUXBENTON N
PROTEIN REMOVAL	PHARMABENT > BENTOLIT SUPER > PLUXBENTON N
ORGANOLEPTIC IMPACT	BENTOLIT SUPER > PLUXBENTON N > PHARMABENT

## BENTOLIT SUPER

- Powdered calcium bentonite sodium activated.
- Excellent clarification with good protein removal.

**Usage:** Dilute in 20 times its weight of cold water. Allow to swell 12-24 hours. Stir constantly during addition.

**Dosage:** 20-200 g/hL (1.7-17 lb/1,000 gal)

25 kg (Item #35-675-0025) \$ 150.00



## PHARMABENT

(Formerly Pure Bento)

- Powdered calcium bentonite sodium activated. Selected from the purest natural bentonites to meet the strictest requirements from the food industry.
- Very large adsorption surface, high protein removal capacity.
- Removal of unstable color and pinking matter.

**Usage:** Dilute in 20 times its weight of room temperature water. Allow to swell 1 hour. Stir constantly during addition.

**Dosage:** 5-40 g/hL (0.4-3.2 lb/1000 gal). The actual rate should be determined by preliminary bentonite fining trials. If addition rates over 10 g/hL are needed, it is recommended to make two separate additions of PHARMABENT, with a 24 to 48 hours interval between additions.

1 kg (Item #35-681-0001) \$ 60.00  
25 kg (Item #35-681-0025) \$ 1,250.00



## PLUXBENTON N

- Granular sodium bentonite.
- Excellent protein removal and good clarification properties.
- Reduces riboflavin, the molecule responsible for "light-struck" defect in white wines.

**Usage:** Dilute in 20 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 20-200 g/hL (1.7-16.7 lb/1,000 gal)

1 kg (Item #35-685-0001) \$ 5.50  
20 kg (Item #35-685-0020) \$ 90.00



## PLUXCOMPACT

- Granulated calcium bentonite sodium activated.
- Generates limited amount of compact lees.

**Usage:** Dilute in 10 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 10-200 g/hL (0.8-16.7 lb/1,000 gal)

1 kg (Item #35-680-0001) \$ 6.00  
20 kg (Item #35-680-0020) \$ 100.00



## SILICA SOL

### SIL FLOC

- Pure silicon dioxide in aqueous solution.
- Acts as a counter-fining agent with protein fining agents.

**Usage:** Add directly to juice/wine via Venturi tube or dosing pump. Add before gelatin or after other clarifying agents. Stir constantly during addition.

**Dosage:** 25-100 mL/hL (1-3.8 L/1,000 gal)

5 kg (Item #35-690-0005) \$ 85.00  
25 kg (Item #35-690-0025) \$ 350.00



## CARBON

### ENOBLACK PERLAGE

- Vegetable carbon and bentonite in pellet form (reduces spread of carbon dust).
- High decolorizing capacity.
- Removes ochratoxin A (OTA).
- Removal of glycosylated smoke compounds in white juice.

**Usage:** Disperse in small amount of water or directly to wine. Keep in suspension for 15-20 minutes.

**Dosage:** 5-120 g/hL (0.4-10 lb/1,000 gal)

1 kg (Item #35-701-0001) \$ 37.00  
15 kg (Item #35-701-0015) \$ 450.00



**ENOBLACK SUPER**



- Enological activated carbon in powder form.
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

**10 kg (Item #35-700-0010) \$ 190.00**

**FENOL FREE**



- Enological activated carbon in powder form.
- Deodorizing, high affinity with volatile phenols related to *Brettanomyces* and smoke taint.
- Little effect on wine color.

**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

**1 kg (Item #35-705-0001) \$ 42.00**  
**10 kg (Item #35-705-0010) \$ 320.00**

ENARTIS PRODUCT	COMPOSITION	DOSAGE	CLARIFICATION	COMPACT LEES	PROMOTE PROTEIN STABILITY	REMOVE UNSTABLE COLOR	REMOVE BITTERNESS	REDUCE ASTRINGENCY	TREAT/PREVENT OXIDATION	REMOVE METALS	REMOVE VOLATILE PHENOLS	REMOVE OFF-FLAVORS	DECOLORIZING
BENTOLIT SUPER	Bentonite	20-120 g/hL	●		●●●	●							
CLARIL AF	Bentonite, PVPP, Plant Protein, Silica	50-150 g/hL	●●		●●		●●	●	●●●			●	
CLARIL HM	PVI/PVP, Chitosan	20-50 g/hL	●				●●		●●●	●●●●			
CLARIL SMK	Carbon, Pea Protein, Chitosan	20-300 g/hL	●●			●	●●				●●●	●●●	●
CLARIL SP	Bentonite, PVPP, Potassium Caseinate	30-150 g/hL	●●		●●		●●●	●	●●●			●	
CLARIL ZR	Bentonite, Plant Protein, Chitosan	20-40 g/hL	●●●			●●●	●●	●			●	●●	
CLARIL ZW	Bentonite, Plant Protein, Chitosan	20-80 g/hL	●●●		●●●●				●			●●	
COMBISTAB AF	PVPP, Plant Protein, Silica	10-50 g/hL					●●●	●	●●●				
ENOBLACK PERLAGE	Carbon	5-100 g/hL										●●	●●●
ENOBLACK SUPER	Carbon	20-100 g/hL										●●	●●●
FENOL FREE	Carbon	20-40 g/hL									●●●	●●●	●●
FINECOLL	Isinglass	1-4 g/hL	●●●	●●			●●●	●					
GOLDENCLAR INSTANT	Gelatin	2-12 g/hL	●●●			●	●●	●●	●			●	
HYDROCLAR 30	Gelatin	10-60 mL/hL	●●				●	●●●	●			●	
HYDROCLAR 45	Gelatin	5-40 mL/hL	●				●●	●●●●	●				
NEOCLAR AF	Bentonite, Gelatin, Carbon	40-150 g/hL	●				●●	●●				●●	
PHARMABENT (Formerly Pure Bento)	Bentonite	5-30 g/hL	●		●●●●	●							
PLANTIS AF	Plant Protein	10-30 g/hL	●●				●●	●●	●●●	●●		●	
PLANTIS AF-P	Plant Protein	5-30 g/hL	●				●●	●●	●●			●	
PLANTIS AF-Q	Plant Protein, Chitosan	5-30 g/hL	●●●				●●	●●	●●●	●●		●●	
PLANTIS PQ	Potato Protein, Chitosan	4-10 g/hL	●●					●●●	●●			●●	
PLUXBENTON N	Bentonite	20-120 g/hL	●		●●●	●							
PLUXCOMPACT	Bentonite	20-120 g/hL	●●	●●●	●●●	●							
PROTOCLAR	Potassium Caseinate	20-100 g/hL					●●●	●●	●●●		●	●●●	
PULVICLAR S	Gelatin	4-15 g/hL	●●●●			●		●●					
SIL FLOC	Silica	25-100 mL/hL	●●	●●●									
STABYL MET	PVI/PVP	20-50 g/hL	●					●●●	●●●	●●●●			
STABYL	PVPP	5-50 g/hL				●	●●●	●●	●●●				

## 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 its origin, density of charge, molecular weight and chemical properties. Fining is based on two main principles:

- Flocculation: Molecular interactions based on charge, chemical bonds, adsorption 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.

### HOW TO CHOOSE THE RIGHT FINING AGENT

Set up a bench trial with different fining agents and dosages. (See page 80 for Preparing Lab Bench Trials)

EFFECT	TRADITIONAL FINING AGENT	PLANT-BASED FINING AGENT
TREAT OXIDIZED COLOR	PROTOCLAR - STABYL	PLANTIS AF-Q - PLANTIS PQ
CLARIFICATION	GOLDENCLAR INSTANT - PULVICLAR S	PLANTIS PQ - CLARIL ZR - CLARIL ZW - CLARIL AF
REDUCE ASTRINGENCY	HYDROCLAR 45 - HYDROCLAR 30	PLANTIS PQ
REDUCE BITTERNESS	PROTOCLAR - STABYL - FINECOLL	CLARIL AF
TREAT OFF-FLAVORS	PROTOCLAR - FENOL FREE	CLARIL SMK - CLARIL ZR

### PLANTIS: A NEW RANGE FOR ALLERGEN-FREE AND PLANT-BASED WINES

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

Enartis has developed a range of plant-based adjuvants, based on pea and potato proteins, which allow the replacement of animal proteins such as gelatin, casein, and egg albumin. They achieve comparable results while adhering to labeling standards and consumer demands that are becoming stricter around the world.

#### The benefits of using plant based fining agents:

- Fast clarification, reduce suspended solids, and eliminate unwanted compounds that can alter the quality of the wine.
- Reduce oxidized or easily oxidizable polyphenols that cause darkening of color, dull appearance, and bitter flavors.
- Efficiency in reducing oxidized color (OD 420nm), primarily with pea protein-based products (**PLANTIS AF, PLANTIS AF-Q**).
- Decrease the concentration of heavy metals involved in oxidation reactions. **PLANTIS AF-Q** is especially effective in removing iron.
- Improve sensory quality through cleanliness and aromatic freshness, plus greater preservation of youthful and brilliant colors with less oxidized tones.

#### HOW CAN UNSTABLE COLOR BE REMOVED WITHOUT AFFECTING THE 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 to remove unstable colloids and color compounds, preserving the color intensity of wine.

#### Superior flotation performance with the PLANTIS AF range:

After standard pectinase enzyme treatment (with EnartisZym EZFILTER or EnartisZym RS), use **PLANTIS AF-Q** or **PLANTIS PQ** to achieve successful flotation. The synergistic action between the hydrolyzed plant protein and chitosan improves efficacy of the formation of floccules by increasing charge density. This aids in forming a denser and more compact cap with excellent clarification of juice.

# STABILIZING AGENTS

In today's wine market, it is crucial for wines to be visually appealing to consumers. Any haze or precipitate is commonly perceived as a fault and can damage brand reputation. This section will cover the main instabilities that we encounter in wine and the Enartis approach for successfully managing them. Because of their purity and microbial stability, all of our stabilizers can be added with confidence at any stage during preparation for bottling.



**enartis**

Inspiring innovation.

## TARTARIC STABILIZATION ZENITH RANGE

US Patent No. US 10,508,258 B2



### ZENITH COLOR

- Potassium polyaspartate and Arabic Gum from Acacia Verek solution.
- Strongly effective for tartrate and color stabilization in red and rosé wines.
- Completely filterable.
- Long-lasting stabilizing effect.
- Environment sustainable, practical, easy to use and respectful of wine quality.
- Increase roundness, wine length and volume.

**Recommendations:** Tartrate stability; volume and roundness; color stability; red and rosé wines.

**Dosage:** 200 mL/hL (7.6 L/1,000 gal)

5 kg	(Item #35-793-0005)	\$ 125.00
20 kg	(Item #35-793-0020)	\$ 420.00
1000 kg	(Item #35-793-1000)	\$ 19,000.00

### ZENITH PERLAGE

- Solution of potassium polyaspartate (KPA), mannoproteins and sulfur dioxide.
- Specifically designed to prevent potassium bitartrate precipitation in sparkling wine and improve perlage stability.
- Does not modify wine sensory characteristics or filterability, even at low temperatures.
- Environmentally sustainable, practical, easy-to-use and respectful of wine quality.

**Recommendations:** Tartrate stability; perlage stability; sparkling wine.

**Dosage:** 100 mL/hL (3.8 L/1,000 gal)

5 kg	(Item #35-791-0005)	\$ 110.00
20 kg	(Item #35-791-0020)	\$ 380.00

### ZENITH UNO

- Potassium polyaspartate solution.
- Strongly effective for tartrate stabilization in white and rosé wines.
- Completely filterable.
- Long-lasting stabilizing effect.
- Environment sustainable, practical, easy to use and respectful of wine quality.

**Recommendations:** Tartrate stability; white, rosé and red wines.

**Dosage:** 100 mL/hL (3.8 L/1,000 gal)

5 kg	(Item #35-792-0005)	\$ 100.00
20 kg	(Item #35-792-0020)	\$ 340.00
1000 kg	(Item #35-792-1000)	\$ 16,000.00



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 to Brick & Mortar Wines (CA)**

KNOW MORE ABOUT ZENITH

**WHAT IS POTASSIUM POLYASPARTATE?**

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

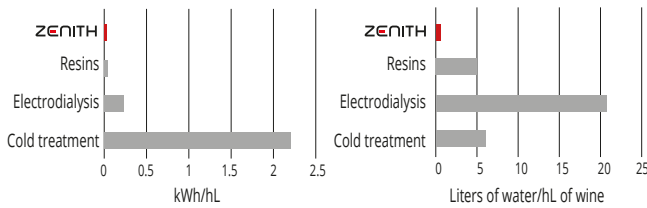
**WHY USE ZENITH?**

The revolution in colloid stabilization for all wines and all levels of instability! Suitable for all wineries currently using cold stabilization for their wines 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.

**ZENITH IS**

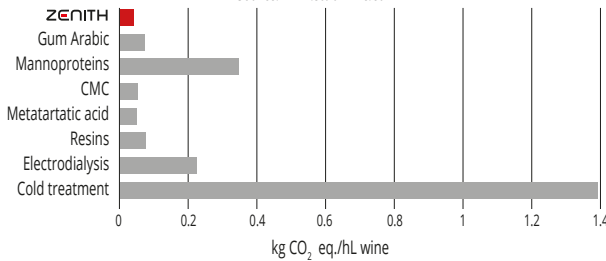
- **INNOVATION**  
An ambitious challenge and six years of passionate research in collaboration with public and private European institutions, universities and major players in the winemaking industry to develop a cutting-edge product.
- **PERFORMANCE**  
The most effective tartaric and color stabilizer overtime, under all conditions and temperature stress. Maximum filterability up to 0.45µm.
- **QUALITY**  
Respects organoleptic aspects of wine.
- **COST-EFFECTIVENESS**  
Easy-to-use, eliminates wine loss during stabilization and dramatically cuts energy and water consumption while reducing labor and ancillary costs. Up to 80% saving in energy and water consumption.
- **SUSTAINABILITY**  
An eco-friendly product that guarantees 90% reduction of CO<sub>2</sub> emissions for greater environmental sustainability. ZENITH loves the planet!

UP TO 80% SAVINGS IN ENERGY AND WATER CONSUMPTION

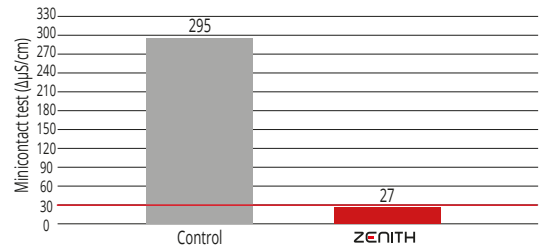


90% REDUCTION ON CO<sub>2</sub> EMISSIONS

Source: www.stabiwine.eu



THE BEST STABILIZATION PERFORMANCE UP TO 300 ΔMS OVER TIME AND UNDER TEMPERATURE STRESS



Millions of hL of wine stabilized with ZENITH



Thousands of tons of CO<sub>2</sub> not emitted into the atmosphere



Millions of gallons of water saved



## CARBOXYMETHYL CELLULOSE

### What is Carboxymethyl Cellulose (CMC)?

CMC is a cellulose derivative characterized by its polymerization and substitution degrees; parameters affecting viscosity and solubility. Due to its negative charge at wine pH, CMC interacts with the electropositive surfaces of crystals, thus inhibiting their growth and precipitation. CMC flattens the crystal surface, which becomes unable to grow.

### How CMC works?

CMC interferes with potassium bitartrate crystal nucleation and growth, hence inhibiting their precipitation. CMC, negatively charged at wine pH, competes with bitartrate ions by attracting K<sup>+</sup> ions, thus inhibiting the formation of crystals and tartrate precipitation.

### CMC and proteins: what are the interactions?

CMC has the ability to crosslink with proteins in wine to form a haze. Consequently, wines must be protein and colloid stable before any CMC additions. Lysozyme is a protein and will generate a haze if present with CMC.

### What about CMC in red wines?

CMC can react with color compounds and result in color precipitation. To use CMC in red wines, it is important to stabilize color compounds by using MAXIGUM F in combination with CMC.

## EnartisStab CELLOGUM LV20

- Solution of carboxymethyl cellulose (CMC) with low viscosity and high substitution degree.
- Stabilizes against tartrate precipitation over long-term. Inhibits the formation, growth and precipitation of potassium bitartrate crystals.
- Low impact on wine filterability.

**Recommendations:** Tartrate stability; white, rosé and sparkling wines.

**Dosage:** 25-100 mL/hL (0.95-3.8 L/1,000 gal)

**1 L** (Item #35-794-0001) **\$ 41.00**  
**20 kg** (Item #35-794-0025) **\$ 860.00**



Since 2012, I have used EnartisStab CELLOGUM LV20 as one of my preferred tartrate stabilizing additives on all my white and rosé wines. Using EnartisStab CELLOGUM LV20 in the cellar makes my life easy, just add the required dosage to the tank and agitate. It is a very cost-effective product saving me time and money, with the benefit of no blocking of filters during final filtration (0.45um) at bottling. What I love about EnartisStab CELLOGUM LV20 is that I can use it on very young wines, early in the vintage for early market release, due to its higher value of

tartrate loading. Where I usually had to tartrate stabilize wine with costly physical stabilization treatments such as cold stabilization and/or electro dialysis, I can now use EnartisStab CELLOGUM LV20. It is a great product to use and I will recommend it to any winemaker bottling white and/or rosé wines. **Anton Swarts, Senior Winemaker at Spier Wine Farm, ellenbosch (South Africa)**

## BLENDS

### EnartisStab CELLOGUM MIX

- Solution of carboxymethyl cellulose (CMC) and gum Arabic, selected for their high filterability.
- Synergistic effect to stabilize against tartrate precipitation. Inhibits the formation, growth and precipitation of potassium bitartrate crystals.

**Recommendations:** Tartrate stability; white, rosé and sparkling wines; volume and roundness.

**Dosage:** 20-200 mL/hL (0.95-7.6 L/1,000 gal)

**20 kg** (Item #35-797-0025) **\$ 360.00**

## GUM ARABIC

Gum Arabic, extracted from Acacia Verek or Acacia Seyal is widely used in food, beverages and 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.

## AROMAGUM

- Gum Arabic solution.
- Stabilizes wine aromas, intensifies fruit aroma perception and maintains freshness over time after bottling.
- When used at recommended dosages, it has a limited blocking effect on filtration membranes and can be added to wine before microfiltration.

**Recommendations:** Aromas stability; reduce astringency perception; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 50-100 mL/hL (1.9-3.8 L/1,000 gal)

**20 kg** (Item #35-720-0025) **\$ 280.00**

## CITROGUM

- Solution of gum Arabic extracted from Acacia Seyal with low calcium content and high hydrolysis.
- Prevents precipitation of colloids, pigments and tartrates.
- Improves wine balance and organoleptic features.
- Enhances aroma, reduces bitterness and astringency perception and increases softness and body.
- The most filterable gum on the market: No filter membrane clogging effect.

**Recommendations:** Tartrate stability; reduce astringency perception; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

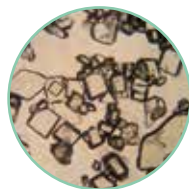
**Dosage:** 50-200 mL/hL (1.9-7.6 L/1,000 gal)

1 L	(Item #35-725-0001)	\$ 15.00
20 kg	(Item #35-725-0025)	\$ 220.00
200 kg	(Item #35-725-0200)	\$ 1,800.00
1,000 kg	(Item #35-725-1000)	\$ 8,000.00

CITROGUM: TARTRATE STABILIZATION MECHANISM



CONTROL



200 mL/hL CITROGUM

The addition of CITROGUM prevents crystal growth by competing with potassium and tartrate ions for attachment sites on the surfaces of microcrystals.

## CITROGUM PLUS

- Solution of gum Arabic extracted from Acacia Seyal and yeast mannoproteins.
- Prevents precipitation of colloids, pigments and tartrates.
- Reduces bitterness and astringency perception, increases sweetness, softness and volume perception.
- Low filter clogging effect.

**Recommendations:** Tartrate stability; reduce astringency perception; increase sweetness; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 100-300 mL/hL (3.8-11.3 L/1,000 gal)

20 kg	(Item #35-728-0025)	\$ 400.00
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## COLOR STABILIZATION

### MAXIGUM F

- Gum Arabic solution obtained from Acacia Verek.
- Highly effective in preventing color compound precipitation, softening astringency and increasing mouthfeel.
- MAXIGUM F undergoes a special treatment that makes it filterable; therefore, it can be added before microfiltration.

**Recommendations:** Color stability; volume and roundness; reduce astringency perception.

**Dosage:** 50-100 mL/hL (1.9-3.8 L/1,000 gal)

20 kg	(Item #35-737-0020)	\$ 800.00
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### MAXIGUM PLUS

- Solution of gum Arabic obtained 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 a special filtration treatment which makes it microfilterable.

**Recommendations:** Color stability; reduce astringency; aroma improvement.

**Dosage:** 50-100 mL/hL (1.9-3.8 L/1,000 gal)

20 kg	(Item #35-738-0020)	\$ 360.00
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## KNOW MORE ABOUT STABILIZATION

### Tartaric Stabilization

#### HOW TO TEST FOR TARTARIC INSTABILITY?

The most accurate test, and the reference test in the United States, is the mini-contact test. It measures the drop in conductivity for a 20 minute period after a sample has been cooled to 0°C and seeded with potassium bitartrate crystals. The wine is considered cold stable if  $\Delta\mu S < 3\%$ .

#### WHY LOOK AT ALTERNATIVE METHODS TO STABILIZE WINE?

Traditional tartrate stabilization methods such as cooling, contact seeding and electrolysis prevent precipitation by separating unstable ions or salts from wine. These methods are expensive, require copious amounts of water and energy, impact organoleptic qualities of wine and might require more time than anticipated. Enartis offers superior alternatives to traditional methods of tartrate stabilization. The use of colloidal stabilizers helps speed-up wine preparation, respects wine sensory properties, removes the need for refrigeration and reduces production costs and wine losses.

	Traditional Method (Chilling)	Physical Treatments	Additive Methods (CMC, Arabic Gum, Mannoproteins, ZENITH)
Tartaric Stability	★★★★	★★★★	★★★★
Cost	★★★	★★★★★★★★	●
Time for Treatment	★★★★★★	★★	●
Labor	★★★★	★★	●
Energy and Water Consumption	★★★★	★★★	0
Wine Quality	---	●	●

#### HOW COLLOIDAL STABILIZERS WORK?

Colloidal stabilizers work by inhibiting the nucleation and growth of tartrate crystals, thus preventing their precipitation. Nothing is removed from the wine; the crystallization process is simply disrupted for efficient long-term cold stability.

#### WHICH PRODUCTS CAN BE USED TO COLD STABILIZE WINE?

**CITROGUM** is effective in wines that show a 3-7% conductivity change after mini-contact testing. It has a positive impact on the palate, enhancing mouthfeel and flavor intensity.

**EnartisStab CELLOGUM LV20** is effective in wines with up to 20% conductivity change after mini-contact testing and has no organoleptic impact.

**EnartisStab CELLOGUM MIX** can stabilize wines with up to 20% conductivity change after mini-contact testing and enhances roundness and volume sensations.

**ZENITH UNO** can stabilize wines with very high tartaric instabilities (up to 30% conductivity change) without impacting other wine components and mouthfeel.

**ZENITH COLOR** corrects tartrate and color instabilities. It is effective in wines with very high instabilities (up to 30% conductivity change).

**ZENITH PERLAGE** prevents potassium bitartrate precipitation in sparkling wine and improves *perlage* stability.

#### HOW DO I DETERMINE THE DOSAGE RATE?

ZENITH doesn't need to be tested before addition: 100 mL/hL for ZENITH UNO and 200 mL/hL for ZENITH COLOR. The other colloidal stabilizers need to be tested to determine the dosage required and assure the efficacy of treatment. Another reason is due to possible interactions between CMC and residual proteins in wine, leading to the formation of undesirable hazes.

#### CAN I ADD A COLLOIDAL STABILIZER TO WINE BEFORE CROSSFLOW FILTRATION?

If used prior to crossflow filtration, these colloids can damage the membranes of your equipment. Furthermore, we recommend doing the addition when wines are ready to be bottled with a turbidity of <1 NTU.

	EnartisStab CELLOGUM LV20	CITROGUM	ZENITH UNO	ZENITH COLOR	ZENITH PERLAGE
Tartaric Stability	★★★	★★	★★★	★★★	★★★
Length	★★★	★★★	★★★	★★★	★★★
Filterability	★★★	★★★	★★★	★★★	★★★
Color Stability	-	0	0	★★★	●
Colloid Stability	---	0	0		●
Mouthfeel	0	●	0	●	0

#### WHAT IS THE MAXIMUM DOSAGE APPROVED BY THE TTB FOR CMC AND GUM ARABIC ADDITION?

TTB limits are 16 lb/1,000 gal (1.92 g/L) of pure gum Arabic and 0.8% of wine volume for CMC.

#### WHAT ARE THE REQUIREMENTS FOR ADDING STABILIZING COLLOIDS TO A WINE?

Prior to the addition of ZENITH, CITROGUM, EnartisStab CELLOGUM LV20 and EnartisStab CELLOGUM MIX, we recommend wines be:

- Heat stable
- Have a turbidity <1 NTU
- Have a Filterability Index (FI) <12, (filterable)
- Colloid stable (for CMC use)

#### HOW STABLE ARE THESE PRODUCTS ONCE ADDED TO WINE?

ZENITH, CITROGUM, EnartisStab CELLOGUM LV20 and EnartisStab CELLOGUM MIX are not hydrolyzable in wine, therefore they are excellent choices for long-term stability.

#### HOW MUCH SO<sub>2</sub> CAN THE ADDITION OF A LIQUID STABILIZER IMPART TO WINE?

An addition of 100 mL/hL can increase the SO<sub>2</sub> of wine by 2-4 ppm.

### Protein Stabilization

#### WHERE DO WINE PROTEINS COME FROM?

Most proteins found in wine come from grapes. Their content in grapes varies with vintage, grape variety, soil, climate and vineyard practices.

#### TESTING FOR PROTEIN STABILITY

One of the reference tests used to evaluate heat stability is the Heat Test: Filter 20 mL through a 0.45 micron membrane and measure turbidity (T1). Place wine in a water bath at 60°C for 24 hours. Allow sample to cool to room temperature and measure turbidity again (T2). The wine is considered protein stable if T2-T1 < 2.

#### HOW TO PROTEIN STABILIZE A WINE

Unstable proteins are commonly removed using bentonite. Protein stability can be improved from the earliest stages of winemaking using tannins, enzymes with side protease activity and mannoproteins, thus reducing bentonite treatments and consequently preserving better aromatic quality.

#### HOW TO FIND THE APPROPRIATE DOSAGE OF BENTONITE TO ACHIEVE STABILITY

Perform bench trials to determine the amount of bentonite needed to stabilize a wine.

#### CAN BLENDING TWO PROTEIN-STABLE WINES COMPROMISE FINAL STABILITY?

Yes. Even small changes in alcohol content, pH and colloid composition can significantly modify protein solubility leading to protein instability. A new test of the final blend must be conducted and additional fining may be needed.

## SHELF LIFE IMPROVEMENT

Enartis has developed a program dedicated to the improvement of wine shelf life that helps to prevent premature ageing when wine is stored for a prolonged period of time before or after bottling.

### What is premature ageing?

Mainly caused by oxidation, premature ageing in wine, is characterized by browning, pinking, loss of varietal and fresh aromas and loss of complexity, balance, identity and terroir.

### What is pinking?

Pinking is when white or rosé wines turn pink after bottling. Pinking, caused by phenolic instability, may occur in conjunction with rapid exposure to air during bottling. Certain varieties, and especially wines made under reductive winemaking techniques, are prone to these alterations, and in most cases these changes are not reversible.

### What is redox potential?

Redox reactions involve the transfer of electrons from a reductant to an oxidant. Redox potential refers to the tendency to gain or yield electrons of a specific atom, molecule or solution.

Wine redox potential is impacted by its composition (phenolic compounds, metals compounds, ethanol, pH...), its "life story," the presence of microorganisms and lees ageing. During ageing, the redox potential of wine tends to increase, which facilitates and increases the risk of oxidation. Stabilizing redox potential is an essential key to 'slow down' oxidation reactions and preserve young, vibrant, fresh and stable wine over time.

## CITROSTAB rH

- Citric acid, ascorbic acid, potassium metabisulfite and gallic tannins.
- Balanced formulation to stabilize wine redox potential and prevent post-bottling oxidation reactions.
- Protects bottled wine from oxidation alteration: pinking, and atypical ageing.

**Recommendations:** Stabilize wine redox potential; prevent browning; prevent light-struck; antioxidant; prevent pinking.

**Dosage:** 50 g/hL (4.2 lb/1,000 gal)

**1 kg (Item #35-760-0001) \$ 39.00**



50 g/hL CITROSTAB rH prevents the appearance of pinking even in hyper-oxidative conditions.

## EnartisStab SLI

- Inactivated yeast, PVPP and untoasted tannins.
- Prevents degradation and oxidation of wine aroma during storage.
- High capacity for consuming dissolved oxygen, lowers wine redox potential and protects from oxidation and browning.
- Extends wine shelf life.

**Tip:** Highly recommended to protect wines that have been clarified, filtered and eventually stabilized.

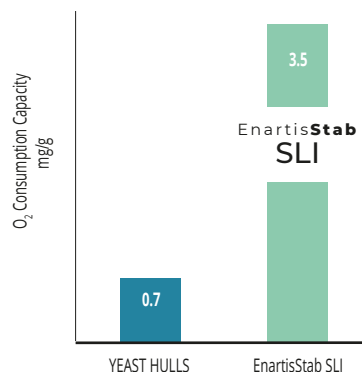
**Recommendations:** Antioxidant; stabilize wine redox potential; prevent browning; prevent pinking.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

**2.5 kg (Item #35-763-0001) \$ 170.00**



Control (left) and EnartisStab SLI (right) in Chardonnay. Picture six months after shelf ageing. Control is oxidized and brown. EnartisStab SLI protected wine and kept it fresh, vibrant and young.



EnartisStab SLI, selected for its affinity with O<sub>2</sub>, consumes more dissolved O<sub>2</sub> than any other yeast hulls.

## MICROBIOLOGICAL STABILIZATION

### EnartisStab MICRO

- Pure, activated chitosan from *Aspergillus niger*.
- Allergen-free, vegan alternative to lysozyme and SO<sub>2</sub> for antimicrobial properties.
- Removes spoilage organisms through fining.
- Recommended after fermentation in low turbidity wines.
- Interacts with a wide spectrum of microorganisms, reduces their activity and growth and precipitates them.
- Reduces sulfide defects and volatile phenols.
- Improves clarification and filterability.

**Dosage:** 2-15 g/hL (0.17-1.3 lb/1,000 gal)

**0.5 kg (Item #35-761-0500) \$ 345.00**

### CANNING WINE?

EnartisStab MICRO can help reduce the need to use SO<sub>2</sub>, minimizing the potential for hydrogen sulfide development in canned packaging.

### EnartisStab MICRO M

- Preparation of pre-activated chitosan from *Aspergillus niger* and purified yeast hulls.
- Allergen-free, vegan alternative to lysozyme and SO<sub>2</sub> for antimicrobial properties.
- Designed for treatment of grapes, juice or must.
- Interacts with a wide spectrum of microorganisms, reduces their activity and growth and precipitates them.
- Reduces sulfide defects, volatile phenols, VA and off-flavor production.
- Improves clarification and filterability.

**Tip:** Use EnartisStab MICRO M as a preventive treatment on grapes or juice to improve *Saccharomyces* dominance, limit stuck fermentations and produce clean aromas.

**Dosage:** 10-40 g/hL (0.8-3.4 lb/1,000 gal)

**1 kg (Item #35-762-0001) \$ 325.00**  
**10 kg (Item #35-762-0010) \$ 2,950.00**

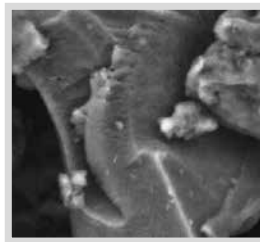
Starting from a no-SO<sub>2</sub> trial, using EnartisStab MICRO M has now become a part of my winemaking protocol on all of my red wines. It not only helps me to control spoilage organisms proactively, but also helps to reduce my SO<sub>2</sub> addition with a better protection than SO<sub>2</sub> on its own. **Matthieu Finot, Winemaker, King Family Vineyards (CA)**

#### WHAT IS CHITOSAN?

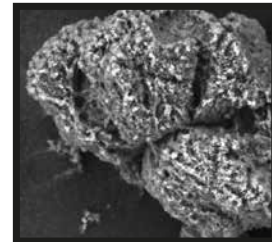
Produced from the partial de-acetylation of Chitin (from *Aspergillus niger*), chitosan is a cationic polysaccharide that interacts with a wide spectrum of microorganisms, alters their cell wall permeability, inhibits cell growth and leads to cell death. The antimicrobial activity of chitosan is attributed to its positive charges (NH<sub>3</sub><sup>+</sup> groups) that interfere with the negatively-charged residues of macromolecules on the microorganism's cell wall surface.

#### WHY IS ENARTIS' CHITOSAN MORE EFFICIENT?

It's pre-activated. Enartis developed a pre-activation process which increases the molecular charge, solubility and contact surface of chitosan. Pre-activated chitosan is very effective in eliminating potentially harmful microorganisms such as acetic acid bacteria, *Pediococcus*, *Lactobacillus*, *Oenococcus*, *Brettanomyces*, *Zygosaccharomyces*, *Schizosaccharomyces* and some other non-*Saccharomyces* yeast. Pre-activated chitosan-based products, EnartisStab MICRO M and EnartisStab MICRO react faster and at lower concentrations than standard chitosan available on the market.



Standard chitosan



ENARTIS ACTIVATED CHITOSAN  
(EnartisStab MICRO  
and EnartisStab MICRO M)

APPLICATION OF EnartisStab MICRO AND EnartisStab MICRO M

WIDE SPECTRUM ANTIMICROBIAL AT ANY TIME

EnartisStab MICRO & EnartisStab MICRO M are used:

- To control a wide spectrum of microbes: *Acetobacter*, *Lactobacillus*, *Pediococcus*, *Oenococcus*, *Brettanomyces*, *Zygosaccharomyces* and some other non-*Saccharomyces* yeast (Figure 1).
- As a treatment to remove/reduce high populations of microbes. Dosage: 10-20 g/hL followed by racking
- As a preventive measure to eliminate small populations before they become spoilage. Dosage: 3-4 g/hL
- As an alternative to SO<sub>2</sub> for microbial control.

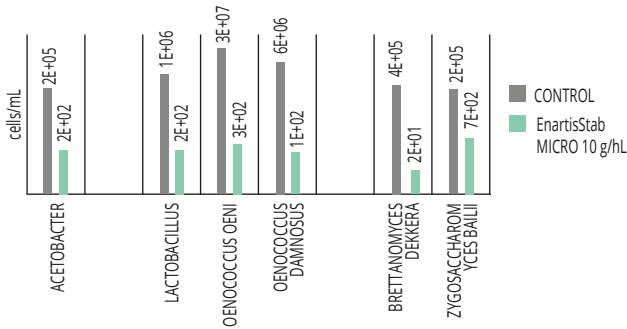


Figure 1: EnartisStab MICRO can reduce populations of the main spoilage microorganisms present in wines.

PREVENT VA PRODUCTION DURING COLD SOAK AND GRAPE TRANSPORT

EnartisStab MICRO M on grapes, during crushing, in the juice pan, or in must reduces wild non-*Saccharomyces* yeast and bacteria populations, thus limiting VA production during the first stages of the winemaking process (Figure 2). Dosage: 20 g/hL

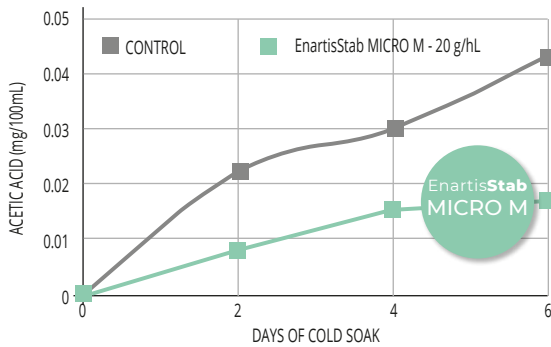


Figure 2: The addition of EnartisStab MICRO M on grapes controls VA production during cold soak.

REDUCE VOLATILE PHENOLS

After fining with EnartisStab MICRO, wines appear cleaner, fresher and often fruitier. EnartisStab MICRO can reduce volatile phenols (Figure 3), treat "reduction" issues and remove other off-flavors. Dosage: 2-15 g/hL

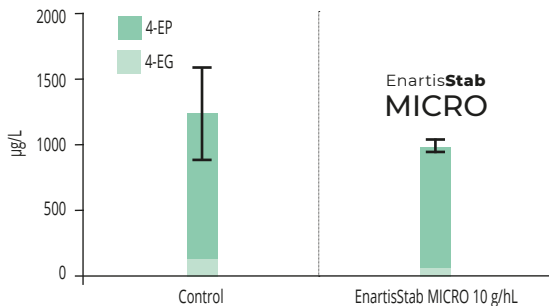


Figure 3: EnartisStab MICRO can reduce volatile phenols (4-EP/4-EG) concentration in wine. Results from 15 wines.

CONTROL MLF

AN ALLERGEN-FREE ALTERNATIVE

EnartisStab MICRO and EnartisStab MICRO M are allergen-free and vegan-friendly fining agents that can prevent, delay, or stop MLF. They can control *Oenococcus Oeni* development in any condition. These bioregulators' antimicrobial activity is not influenced by wine pH, unlike sulfur dioxide (Figure 4).

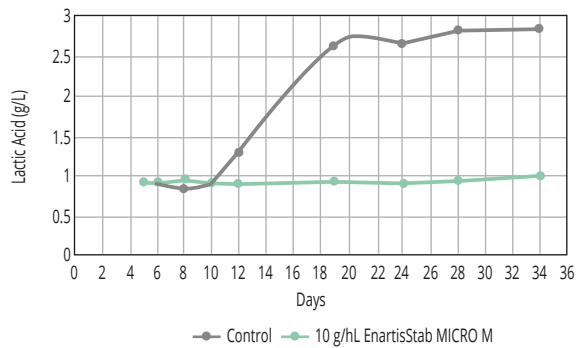


Figure 4: Difference of microbiological coverage between low SO<sub>2</sub> protection versus the addition of 10 g/hL EnartisStab MICRO M in a wine with a high pH (3.9). The wine was inoculated with 1 g/hL of Enartis bacteria (*EnartisML SILVER*).

LIMIT STUCK FERMENTATIONS

PROMOTE CLEAN AND COMPLETE FERMENTATIONS

EnartisStab MICRO M:

- Improves fermentation kinetics and ensures completion by removing spoilage microbes that inhibit yeast (Figure 5). Dosage: 10 g/hL
- Improves the start native fermentations by reducing microbial competition. Dosage: 5 g/hL
- Does not impact fermentation kinetics of *Saccharomyces cerevisiae*

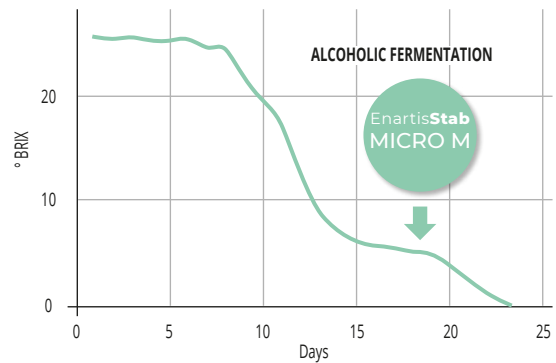


Figure 5: The addition of EnartisStab MICRO M to a sluggish fermentation helps complete fermentation.

# SPARKLING WINES

To optimize each stage of sparkling wine production and provide winemakers quality tools, Enartis has developed the Perlage range. These products are designed to fill the specific needs of sparkling wine production, whether made by traditional or modern methods. Enartis USA offers assistance to help winemakers adapt the production process and improve sparkling wine quality.



**enartis**

Inspiring innovation.

## YEAST

Key words for alcoholic fermentation in sparkling winemaking are "complete" and "clean." Base wine must have good fermentation capacity, no residual toxins from the first fermentation, low free SO<sub>2</sub> (<15 ppm), low VA, low total SO<sub>2</sub>, low residual CO<sub>2</sub> and low alcohol (<11.5%).

Specific resistant yeast should be used for the "prise de mousse." At this stage, the choice of yeast will define the wine's personality.

Our sparkling-specific yeasts have the criteria required to produce high-quality sparkling wine.

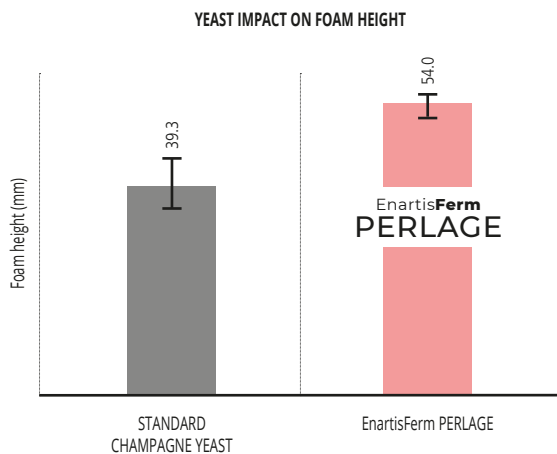
### EnartisFerm PERLAGE

Yeast selected for the production of traditional method sparkling wines. Resistant to extreme conditions such as pressure, high °Brix, high alcohol content, low pH and low temperatures, it produces elegant, delicate and clean wines. It respects varietal and terroir characteristics.

**Recommendations:** High quality base wines; prise de mousse; traditional method; Charmat method; white and rosé wines.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal).

**0.5 kg (Item #45-180-0500) \$ 42.00**



EnartisFerm PERLAGE during "prise de mousse" improves the foaming capacity of wine.

### EnartisFerm PERLAGE D.O.C.G

Used for primary fermentation of base wines and prise de mousse in pressure tanks, it assures a regular and complete fermentation. It produces very clean wines characterized by delicate white fruit aromas, low volatile acidity and an elegant palate.

**Recommendations:** Base wine; prise de mousse; pressure tank; Charmat method; clean aromas; elegant.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal)

**0.5 kg (Item #45-182-0500) \$ 42.00**

### EnartisFerm PERLAGE FRUITY

In addition to ensuring a complete and clean fermentation, this yeast strain is used to produce 'modern' style base white with intense aromas of fresh fruit. It releases a large amount of mannoproteins during *sur lies* ageing that improve mouthfeel and color stability.

**Recommendations:** White, rosé and red sparkling base wines; aromatic sparkling wines; prise de mousse; pressure tank; Charmat method.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal)

**0.5 kg (Item #45-181-0500) \$ 42.00**

## FERMENTATION POLYSACCHARIDES

Yeast mannoproteins in sparkling wines are used to amplify natural lees effects. Yeast autolysis and natural release of mannoproteins in wine is a very slow process. Using EnartisPro PERLAGE increases the amount of mannoprotein released in wine and improves wine balance, roundness, volume, foaming capacity and antioxidant capacity.

### 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.
- Improves colloidal, protein and tartrate stability and foaming properties
- Increases shelf life of base wines and protects wine during storage before second fermentation.
- Produces fresh, round and balanced sparkling base wines.

**Recommendations:** Antioxidant; aroma protection; improve mouthfeel; improve foaming properties; protect base wine during storage.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

**1 kg (Item #35-418-0001) \$ 105.00**

## YEAST NUTRITION

### NUTRIFERM GRADUAL RELEASE

- Innovative nutrient composed of DAP, gallic tannin and untoasted oak tannins.
- Specific packaging that controls the release of its content during fermentation. Due to the particular permeability of the bag, yeast nutrients are gradually released into fermenting must. Release begins at the end of yeast growth phase and continues for up to 8 days.
- Ensures complete fermentation, prevents H<sub>2</sub>S production, prevents stuck or sluggish fermentation and improves aromatic cleanliness.
- Facilitates nutrition management by limiting cellar operations.

**Recommendations:** Barrel fermentation; tank fermentation; Charmat method.

**Usage:** Anchor bag to bottom of tank or to barrel bung before filling.

**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

**1 kg (Item #35-216-0001) \$ 52.00**  
**5 kg (Item #35-216-0005) \$ 170.00**



### NUTRIFERM PDC

- Amino acids, vitamins (thiamine), mineral salts, oligo-elements and survival factors.
- Specific nutrient for *pie de cuve* preparation, it provides essential elements for yeast to survive and ferment in difficult conditions.
- Stimulates yeast growth and shortens lag phase.
- Prevents formation of H<sub>2</sub>S and acetic acid.

**Usage:** Dissolve in 10 times its weight of water and add during preparation of *pie de cuve*.

**Dosage:** 1 g/g of yeast

1 kg (Item #35-209-0001) \$ 48.00

### NUTRIFERM PDC AROM

- Amino acids, vitamins, mineral salts and micro-nutrients.
- Specific nutrient for *pie de cuve* preparation, it provides essential elements for yeast to survive and ferment in difficult conditions.
- High content of selected amino acids used by yeast as precursors of aromatic compounds to increase intensity, freshness and complexity.
- Stimulates yeast growth and shortens lag phase.
- Prevents formation of H<sub>2</sub>S and acetic acid.

**Tip:** Recommended for the production of aromatic and fruity sparkling wines in combination with EnartisFerm PERLAGE FRUITY.

**Usage:** Dissolve in 10 times its weight of water and add during preparation of *pie de cuve*.

**Dosage:** 1 g/g of yeast

1 kg (Item #35-207-0001) \$ 60.00

### NUTRIFERM REVELAROM

- Complex nutrient containing DAP, purified yeast cell walls and copper salts.
- Specific yeast nutrient for second fermentation.
- Supplies yeast with essential nitrogen elements and survival factors needed for second fermentation, even in difficult conditions.
- Prevents formation of H<sub>2</sub>S, sulfur compounds and off-flavors.

**Tip:** 10 g/hL of NUTRIFERM REVELAROM gives 0.5 ppm of copper.

**Usage:** Dissolve in 10 times its weight of water and add to wine before tirage or second fermentation.

**Dosage:** 5-15 g/hL (0.4-1.3 lb/1,000 gal)

1 kg (Item #35-206-0001) \$ 32.00

### NUTRIFERM TIRAGE

- Complex nutrient containing DAP and autolyzed yeast.
- Specific yeast nutrient for second fermentation.
- Supplies yeast with essential nitrogen elements and survival factors needed for second fermentation.
- Ensures a complete and regular fermentation in both traditional and Charmat methods.

**Usage:** Dissolve in 10 times its weight of water and add to wine before tirage or second fermentation.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000gal) in base wine

1 kg (Item #35-208-0001) \$ 48.00

### FINING AGENTS FOR JUICE AND BASE WINE

It is important to consider the quality variations from press juices to choose and adapt the winemaking process. Removal of undesired elements present in juice (solids, polyphenols, color, proteins, lipids...) before starting fermentation is fundamental. Enartis developed fining agents specific for sparkling wine production that remove unwanted elements while respecting foaming properties.

### CLAIRPERLAGE DUE

- PVPP and pea protein.
- Prevents and treats oxidation notes in juice and sparkling base wines.
- Eliminates polyphenols responsible for oxidation, bitterness and brown color.

**Recommendations:** Prevent oxidation; treat oxidation; freshen base wine; respect foaming properties.

**Usage:** Sprinkle directly over must or wine surface during pump-over. Stir constantly during addition.

**Dosage:** 15-40 g/hL (1.3-3.3 lb/1,000 gal)

1 kg (Item #35-672-0001) \$ 65.00  
10 kg (Item #35-672-0010) \$ 190.00

### CLAIRPERLAGE UNO

- Selected bentonites and plant proteins.
- Highly effective in removing unstable proteins while preserving mannoprotein content and wine foaming properties.
- Improves clarity and eliminates components that have negative effect on foam.

**Recommendations:** Base wine; clarification; protein stability; respect foaming properties; lees compaction; allergen-free.

**Usage:** Dissolve in 20 times its weight of warm water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

10 kg (Item #35-673-0010) \$ 190.00



To be able to ensure a fast, clean and complete secondary fermentation in sparkling wine production is key to a successful bottle of bubbles. NUTRIFERM REVELAROM is a fantastic product and I would recommend it to anyone who makes sparkling wine!

**Matthew Iaconis, Winemaker at Brick & Mortar Wines (CA)**

## ENOBLACK PERLAGE

- Vegetable carbon and bentonite in pellet form (reduces spread of carbon dust).
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

**Recommendations:** Decolorizing; juice; base wine; treat oxidation.

**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 5-100 g/hL (0.4-8.3 lb/1,000 gal)

1 kg	(Item #35-701-0001)	\$ 37.00
15 kg	(Item #35-701-0015)	\$ 450.00



ENOBLACK PERLAGE

## BOTTLE CLARIFICATION - RIDDLING AGENTS

### CLAIRBOUTEILLE P

- Powdered riddling agent containing blend of selected bentonites.
- Improves clarity of sparkling wines produced with traditional method and compacts lees.
- Prevents yeast adhesion to bottle walls during ageing.
- Reduces processing time for automatic and manual riddling.

**Recommendations:** Riddling agent; automatic and manual riddling; clarification; compact lees.

**Usage:** Dissolve in 30 times its weight of cold water. Allow to swell for 24-48 hours. Add homogeneously to pied de cuve. Stir constantly during addition and keep in suspension for 30 minutes.

**Dosage:** 3-5 g/hL (0.25-0.4 lb/1,000 gal)

0.5 kg	(Item #30-208-0500)	\$ 67.00
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## WINE SENSORY IMPROVEMENT

Enartis developed a range of products designed for the production of sparkling wines to "fine-tune," customize and improve the wine profile to meet the needs of each market: softness, mouthfeel, elegance and finesse, foam quality, freshness or aromatic complexity. These products can be added during tirage or with the liqueur d'expedition, at disgorgement.

Before using any finishing products, we recommend to setting up bench trials (See page 80 for Preparing Lab Bench Trials).

### EnartisTan LAST TOUCH

- White grape skin tannin and oak tannin.
- Freshens and widens aromatic bouquet and wine complexity.
- Balances wine, increases aromatic persistence and opens wines for early consumption.

**Recommendations:** Sparkling wine; complexity; improve wine balance; freshen aromas.

**Dosage:** 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

1 kg	(Item #35-319-0001)	\$ 680.00
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### EnartisTan STYLE

- Tannins extracted from untoasted oak.
- Aromatically neutral and very soft, it enhances wine roundness and structure.
- Prevents production of sulfur compounds during second fermentation.

**Tip:** EnartisTan STYLE can be added to base wine for prise de mousse or at disgorging.

**Recommendations:** Prevent reductive notes; reduce off-flavors; balance structure; second fermentation; volume and roundness.

**Dosage:** 1-10 g/hL (0.08-0.8 lb/1,000 gal)

1 kg	(Item #35-321-0001)	\$ 110.00
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## SURLÌ MOUSSE

- Inactivated yeast.
- Improves foaming capacity, bubble persistence and quality of sparkling wines.
- Enhances natural sensation of volume and roundness, builds mid-palate and improves aromatic complexity.

**Recommendations:** *Improve foaming properties; increase roundness; complexity; lees ageing; Charmat method; traditional method; white, rosé and red sparkling wines.*

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1000 gal)

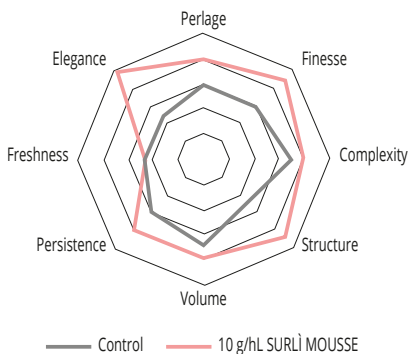
**1 kg (Item #35-421-0001) \$ 210.00**

EFFECT ON FOAMING CAPACITY

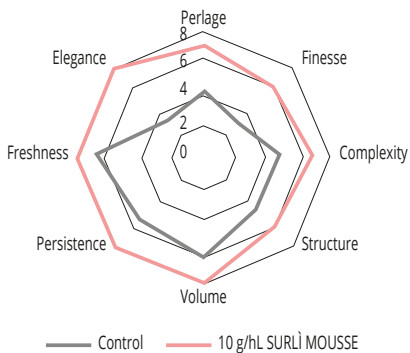


*SURLÌ MOUSSE improves foaming capacity of base wine. Additionally, it increases roundness, volume and structure.*

TRADITIONAL METHOD



CHARMAT METHOD



*SURLÌ MOUSSE sensory improvement: traditional method vs Charmat method.*

## TARTRATE STABILIZATION

### ZENITH PERLAGE

- Solution of potassium polyaspartate (KPA), mannoproteins and sulfur dioxide.
- Specifically designed to prevent potassium bitartrate precipitation in sparkling wine and improve perlage stability.
- Does not modify wine sensory characteristics or filterability, even at low temperatures.
- Environmentally sustainable, practical, easy-to-use and respectful of wine quality.

**Recommendations:** *Tartrate stability; perlage stability; sparkling wine.*

**Dosage:** 100 mL/hL (3.8 L/1,000 gal)

**5 kg (Item #35-791-0005) \$ 110.00**  
**20 kg (Item #35-791-0020) \$ 380.00**

## KNOW MORE ABOUT SPARKLING WINE PRODUCTION

## PERLAGE RANGE: WHICH PRODUCT FOR WHICH SPARKLING WINE STYLE?

	FRESH, FRUIT FORWARD, MODERN	AGED, CLASSIC, COMPLEX
CLAIRPERLAGE DUE	✓	
CLAIRPERLAGE UNO	✓	✓
EnartisFerm PERLAGE D.O.C.G	✓	
EnartisFerm PERLAGE FRUITY	✓	
EnartisFerm PERLAGE		✓
EnartisPro PERLAGE	✓	
EnartisTan LAST TOUCH		✓
EnartisTan STYLE	✓	✓
NUTRIFERM PDC		✓
NUTRIFERM PDC AROM	✓	
NUTRIFERM REVELAROM	✓	
NUTRIFERM TIRAGE		✓
ZENITH PERLAGE	✓	✓

## PERLAGE RANGE: WHICH PRODUCT FOR WHICH PRODUCTION METHOD?

	TRADITIONAL METHOD	CHARMAT METHOD
CLAIRPERLAGE DUE	◆◆◆	◆◆◆
CLAIRPERLAGE UNO	◆◆◆	◆◆◆
CLAIRBOUTEILLE P	◆◆◆	
EnartisFerm PERLAGE	◆◆◆	◆◆◆
EnartisFerm PERLAGE D.O.C.G	◆	◆◆◆
EnartisFerm PERLAGE FRUITY	◆	◆◆◆
EnartisTan LAST TOUCH	◆◆◆	◆◆
EnartisTan STYLE	◆	◆◆◆
NUTRIFERM PDC	◆◆◆	◆◆◆
NUTRIFERM PDC AROM	◆	◆◆◆
NUTRIFERM REVELAROM	◆	◆◆◆
NUTRIFERM TIRAGE	◆◆◆	◆◆◆
SURLÌ MOUSSE	◆	◆◆◆
ZENITH PERLAGE	◆◆◆	◆◆◆

## BEFORE STARTING SECOND FERMENTATION, A BASE SPARKLING WINE NEEDS TO BE PREPARED:

## 1. Stabilization of Base Wine:

**Protein stability:** Determine the amount of bentonite needed to stabilize a specific wine. The degree of stability needs to be determined in context to the winemaker's goal, the future of the wine or consumer expectations.

**Malolactic bacteria control:** Good cellar hygiene, regular microbial monitoring, temperature, SO<sub>2</sub> and pH management are all important for microbial control. Even if still commonly used for microbial stability, sterile filtration reduces foaming capacity and foam quality by removing positively charged colloids. As an alternative to sterile filtration, **EnartisStab MICRO**, a pre-activated chitosan fining agent, reduces spoilage microbe populations, while maintaining excellent foaming capacity.

**Tartaric stabilization:** Using colloidal stabilizers such as ZENITH PERLAGE allows winemakers to stabilize base wines, thus preventing crystallization during and after fermentation. Perform laboratory trials to determine the appropriate dosage needed to stabilize wine after fermentation.

## 2. Improve Foaming Capacity of Base Wine

Quality of sparkling wine is visually assessed by its color, bubble behavior and foam retention. The two main parameters that define mousse quality are bubble size and foam retention.

Foaming capacity can be improved by increasing the quantity of pro-foam agents such as colloids, mannoproteins and arabic gums or by reducing the quantity of anti-foam agents such as fatty acids with fining.

## 3. Make Base Wine a Healthy Environment for Yeast

Before starting second fermentation, some parameters need to be checked in the base wine: No residual toxins from the first fermentation, low Free SO<sub>2</sub> (<15 ppm), low total SO<sub>2</sub>, low residual CO<sub>2</sub> and low alcohol (<11.5%).

# WINEMAKING CHEMICALS



**enartis**

Inspiring innovation.

### ASCORBIC ACID POWDER, Food Grade

1 kg	(Item #30-014-1001)	\$ 38.00
25 kg	(Item #30-014-0050)	\$ 800.00

### CITRIC ACID, Food Grade

1 kg	(Item #30-036-1000)	\$ 21.00
25 kg	(Item #30-036-0025)	\$ 325.00

### DISACIDIFICANTE BIANCONEVE

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

1 kg	(Item #35-391-0001)	\$ 12.00
25 kg	(Item #35-391-0025)	\$ 275.00

### DIAMMONIUM PHOSPHATE (DAP)

5 kg	(Item #30-015-5000)	\$ 55.00
25 kg	(Item #30-025-0025)	
50 lb	(Item #30-015-0055)	

Please inquire for pricing.

### 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.

1 kg	(Item #35-715-0001)	\$ 25.00
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### L-MALIC ACID, Food Grade

25 kg	(Item #30-136-0025)	\$ 425.00
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### D,L-MALIC ACID POWDER, Food Grade

1 kg	(Item #30-137-0001)	\$ 52.00
50 lb	(Item #30-037-0050)	\$ 450.00

### POTASSIUM BITARTRATE, Food Grade

25 kg	(Item #30-130-0050)	\$ 350.00
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### TARTARIC ACID, Food Grade

1 kg	(Item #30-038-1000)	\$ 26.00
25 kg	(Item #30-038-0025)	

Please inquire for pricing.

### WINY - Potassium Metabisulfite

1 kg	(Item #35-820-0001)	\$ 8.00
25 kg	(Item #35-820-0025)	\$ 147.50

# TIPS & TRICKS



Inspiring innovation.

### PREPARING LAB BENCH TRIALS

Bench trials are essential to determine proper dosing and the efficiency of a treatment (addition of fining agents, tannins or polysaccharides). To set-up bench trials, follow these steps:

- Prepare 1% (1 g in 100 mL), 2% (2 g in 100 mL) or 5% (5 g in 100 mL) treatment solutions of the product to be tested:
  - For fining agents: prepare solution in water as recommended in the technical data sheet.
  - For tannins: prepare solution in neutral alcohol-water solution (~ 13%).
  - For polysaccharides, prepare solution in warm water, let rehydrate for two hours and allow to cool down before use.
  - For liquid products: use solution as it is or dilute if necessary.
- Label each sample bottle. Keep one untreated sample as a control.
- Fill samples with wine up to 80% of final volume, leaving space for the addition.
- Add the treatment solution. Refer to the tables to the right.
- Mix immediately after addition, top each bottle with wine and mix again.
- For fining agents: store in refrigerator for settling (usually 1-2 days). Let come to room temperature before evaluating.
- For tannins, polysaccharides and gum Arabic, wines can be tasted immediately after addition.

### Product Density

PRODUCT	AVERAGE DENSITY (kg/dm <sup>3</sup> )
AROMAGUM	1.100
EnartisStab CELLOGUM LV20	1.102
CITROGUM	1.100
CITROGUM PLUS	1.081
HYDROCLAR 30	1.100
HYDROCLAR 45	1.160
MAXIGUM F	1.100
MAXIGUM PLUS	1.100
SIL FLOC	1.210
EnartisZym EZFILTER	1.190
EnartisTan MEL	1.190
EnartisZym QUICK	1.170
EnartisZym RS	1.080
EnartisZym T-RED	1.190
ZENITH COLOR	1.107
ZENITH PERLAGE	1.050
ZENITH UNO	1.050

### ADDITIONS WITH 1% SOLUTION

wine sample (mL)	50	100	125	375	750
rate (g/hL)					
5	0.3	0.5	0.6	1.9	3.8
7	0.4	0.7	0.9	2.6	5.3
15	0.8	1.5	1.9	5.6	11.3
20	1.0	2.0	2.5	7.5	15.0

### ADDITIONS WITH 2% SOLUTION

wine sample (mL)	50	100	125	375	750
rate (g/hL)					
25	0.6	1.3	1.6	4.7	9.4
30	0.8	1.5	1.9	5.6	11.3
40	1.0	2.0	2.5	7.5	15.0
50	1.3	2.5	3.1	9.4	18.8

### Conversion Charts

#### TEMPERATURE CONVERSIONS

$C^{\circ}$ to $F^{\circ} = (C^{\circ} \times 9/5) + 32$	$F^{\circ}$	0	32	40	50	60	70	80	90	100	110	120
$F^{\circ}$ to $C^{\circ} = (F^{\circ} - 32) \times (5/9)$	$C^{\circ}$	-18	0	4	10	16	21	27	32	38	44	49

#### WEIGHT EQUIVALENTS

1.0 kg	1,000 g	2.2 lbs
1.0 g	1,000 mg	
1.0 mg	1,000 $\mu$ g	
1 lb	454 g	16 oz
1 oz	28.35 g	
1 ton	2,000 lbs	907 kg

#### VOLUME EQUIVALENTS

1 mL	1,000 $\mu$ L	
1 oz	29.6 mL	
1 L	1,000 mL	33.8 oz
1 hL	100 L	26.4 gal
25 hL	660 gals	
1 gal	3.78 L	128 oz

#### WEIGHT/VOLUME EQUIVALENTS

1 lb/1,000 gal	0.12 g/L
	120 ppm
	12 g/hL
1 g/hL	37.8 g/1,000 gal
	0.084 lb/1,000 gal

#### VOLUME/VOLUME EQUIVALENTS

1 mL/L	100 mL/hL
	3780 mL/1,000 gal
	3.78 L/1,000 gal



**CRAFTING WINE NATURALLY**

Sometimes Mother Nature provides grapes that are, shall we say, challenging in terms of producing the kind of wine you want to deliver to the eager wine lover. Other times the market may ask for something completely unexpected and you are then faced with a market demand that was not exactly planned for.

So, what can you do? Well, tannins and polysaccharides are strategic tools that can allow for wine polishing with increased wine quality.

**Perfecting Mouthfeel**

Common opinion is that adding a tannin means increasing wine astringency. Nothing could be more wrong. Tannin additions can help to balance the taste of wine by minimizing alcoholic sensation or increasing the perception of structure and volume. Similarly, this can be done with polysaccharides.

**Perfecting Aroma**

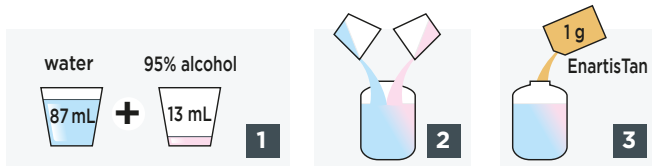
Depending on their origin, tannins can heighten specific wine aroma features such as fruit, oak and spice notes. A tannin extracted from grape skin, for example, can be used to enhance the fruitiness in a wine with an overwhelming oaky character. At the opposite end of the spectrum, an oak tannin can perfect the under-oaked character of a wine that must be bottled before the ideal maturation period in barrel is completed.

**Correcting or Preventing Defects**

Tannins and polysaccharides can prevent and treat defects that diminish overall wine quality. For this application, they are often more effective and more respectful of wine quality and less labor intensive than traditional, corrective tools.

**How to choose Enartis Tannins**

When deciding which EnartisTan to use and at what dosage, it is important to understand the organoleptic and technical characteristics of each tannin and perform preliminary tasting trials. A simple and rapid method consists of dissolving 1 g of EnartisTan in a solution made with 87 mL water and 13 mL 95% alcohol (190 proof).



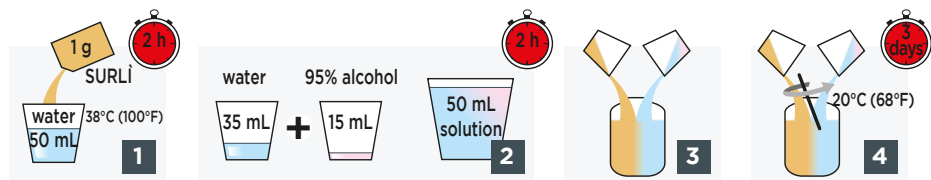
This solution can be used for rapid sensory tests: 1 mL of this solution in 100 mL of wine is equivalent to 10 g/hL of EnartisTan.

! Tannin solution prepared as above can be used for four months when stored below 25°C (77°F).

**How to choose SURLÌ Products**

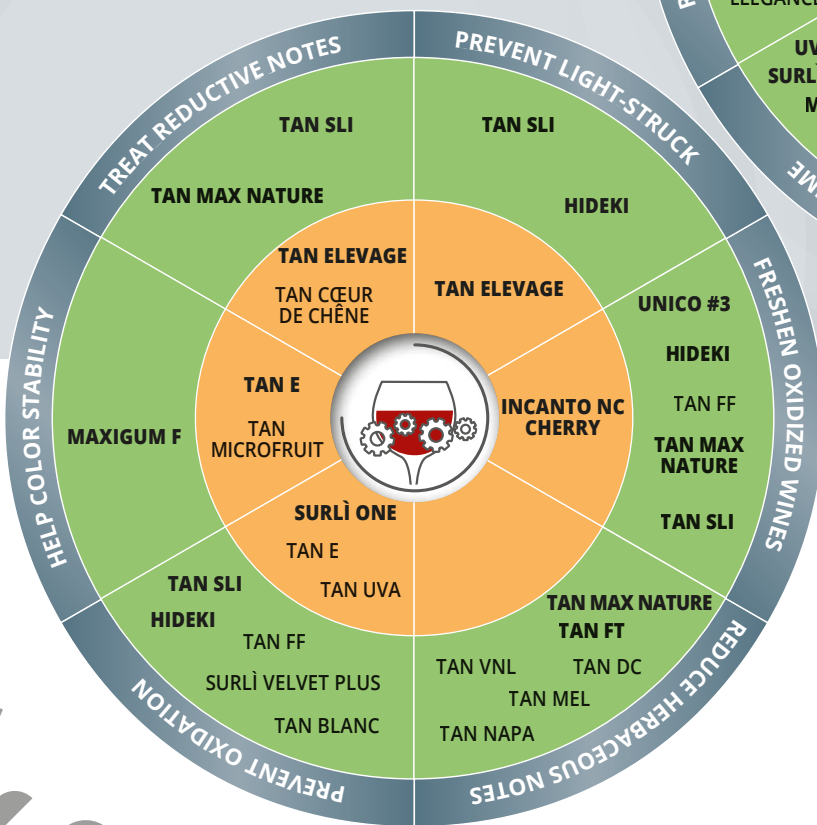
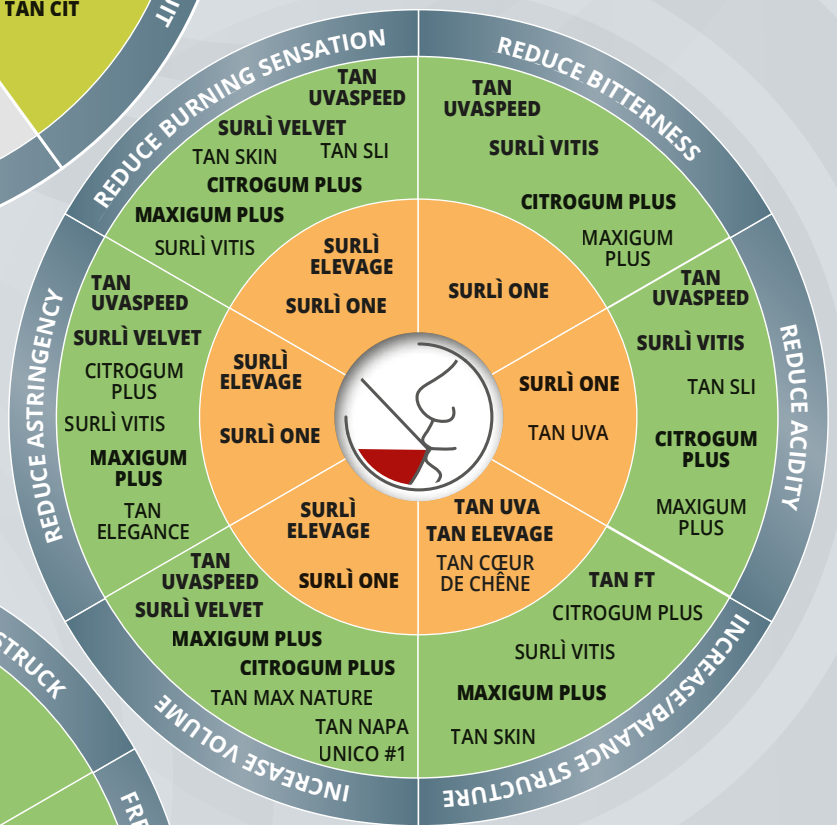
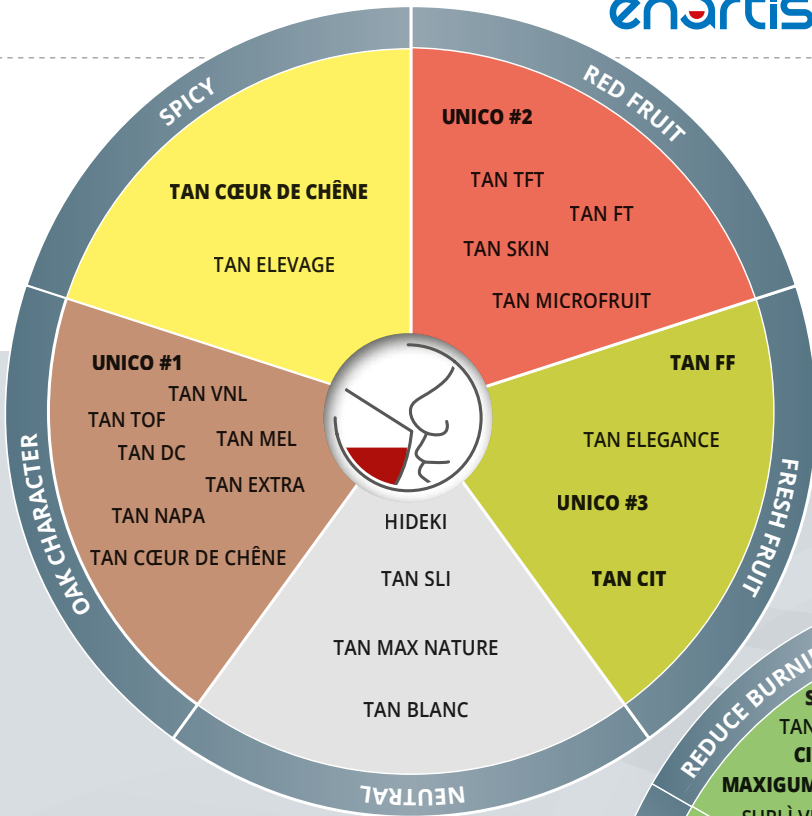
To determine which SURLÌ to use and the appropriate dosage, we recommend doing the following lab bench trial:

1. Rehydrate 1 gram of SURLÌ in 50 mL of water at 38°C (100°F) for 2 hours.
2. Meanwhile, prepare a 50 mL solution with 15 mL 95% alcohol and 35 mL water.
3. After 2 hours, add the 50 mL alcohol solution to the suspension and let cool at room temperature with periodic mixing.
4. The final solution must be kept at a temperature of at least 20°C (68°F) 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.

! SURLÌ ELEVAGE, SURLÌ VITIS, SURLÌ VELVET, and SURLÌ VELVET PLUS can be simply dissolved in a 15% alcohol solution and be used immediately, as EnartisTan.



LEGEND

- Maturation
- Anytime from maturation to bottling



Perfecting aroma



Perfecting mouthfeel



Correcting or preventing defects

+ INTENSE/EFFECTIVE

PAGE	PRODUCT
<b>SULFITING AGENTS</b>	

6	AST
5	EFFERBARRIQUE/EFFERGRAN DOSE 5
5	EFFERGRAN
5	WINY

<b>EMZYMES</b>	
9	EnartisZym AROM MP
9	EnartisZym COLOR PLUS
8	EnartisZym EZFILTER
8	EnartisZym QUICK
8	EnartisZym RS
8	EnartisZym RS(P)
9	EnartisZym T-RED PLUS

9	EnartisZym AROM MP
9	EnartisZym COLOR PLUS
8	EnartisZym EZFILTER
8	EnartisZym QUICK
8	EnartisZym RS
8	EnartisZym RS(P)
9	EnartisZym T-RED PLUS

<b>YEAST</b>	
15	EnartisFerm AMR-1
14	EnartisFerm AROMA WHITE
15	EnartisFerm D20
14	EnartisFerm ES Floral
17	EnartisFerm ES U42
14	EnartisFerm ES123
14	EnartisFerm ES181
16	EnartisFerm ES454
16	EnartisFerm ES488
17	EnartisFerm EZFERM 44
14	EnartisFerm PERLAGE
15	EnartisFerm Q CITRUS
17	EnartisFerm Q ET
17	EnartisFerm Q RHO <b>NEW</b>
14	EnartisFerm Q4
16	EnartisFerm Q5
16	EnartisFerm Q7
15	EnartisFerm Q9
16	EnartisFerm RED FRUIT
17	EnartisFerm SB
16	EnartisFerm VINTAGE RED
15	EnartisFerm VINTAGE WHITE
16	EnartisFerm WS

15	EnartisFerm AMR-1
14	EnartisFerm AROMA WHITE
15	EnartisFerm D20
14	EnartisFerm ES Floral
17	EnartisFerm ES U42
14	EnartisFerm ES123
14	EnartisFerm ES181
16	EnartisFerm ES454
16	EnartisFerm ES488
17	EnartisFerm EZFERM 44
14	EnartisFerm PERLAGE
15	EnartisFerm Q CITRUS
17	EnartisFerm Q ET

17	EnartisFerm Q RHO <b>NEW</b>
14	EnartisFerm Q4
16	EnartisFerm Q5
16	EnartisFerm Q7
15	EnartisFerm Q9
16	EnartisFerm RED FRUIT
17	EnartisFerm SB
16	EnartisFerm VINTAGE RED
15	EnartisFerm VINTAGE WHITE
16	EnartisFerm WS

<b>NUTRIENTS</b>	
24	DIAMMONIUM PHOSPHATE (DAP)
24	NUTRIFERM ADVANCE
23	NUTRIFERM AROM
23	NUTRIFERM AROM PLUS
25	NUTRIFERM CONTROL
24	NUTRIFERM ENERGY

24	DIAMMONIUM PHOSPHATE (DAP)
24	NUTRIFERM ADVANCE
23	NUTRIFERM AROM
23	NUTRIFERM AROM PLUS
25	NUTRIFERM CONTROL
24	NUTRIFERM ENERGY

PAGE	PRODUCT
24	NUTRIFERM GRADUAL RELEASE
25	NUTRIFERM NO STOP
24	NUTRIFERM SPECIAL
24	NUTRIFERM ULTRA

24	NUTRIFERM GRADUAL RELEASE
25	NUTRIFERM NO STOP
24	NUTRIFERM SPECIAL
24	NUTRIFERM ULTRA

<b>POLYSACCHARIDES</b>	
28	EnartisPro AROM
28	EnartisPro BLANCO
29	EnartisPro FT
28	EnartisPro TINTO
28	EnartisPro UNO
29	SURLÌ ELEVAGE
30	SURLÌ KPA
30	SURLÌ ONE
30	SURLÌ VELVET
30	SURLÌ VELVET PLUS
30	SURLÌ VITIS

28	EnartisPro AROM
28	EnartisPro BLANCO
29	EnartisPro FT
28	EnartisPro TINTO
28	EnartisPro UNO
29	SURLÌ ELEVAGE
30	SURLÌ KPA
30	SURLÌ ONE
30	SURLÌ VELVET
30	SURLÌ VELVET PLUS
30	SURLÌ VITIS

<b>TANNINS</b>	
33	EnartisTan ANTIBOTRYTIS
33	EnartisTan AROM
33	EnartisTan BLANC
33	EnartisTan CIT (CITRUS)
36	EnartisTan CŒUR DE CHÊNE
34	EnartisTan COLOR
36	EnartisTan DC (DARK CHOCOLATE)
35	EnartisTan E
33	EnartisTan ELEGANCE
36	EnartisTan ELEVAGE
36	EnartisTan EXTRA
33	EnartisTan FERMCOLOR
37	EnartisTan FF (FRESH FRUIT)
34	EnartisTan FT (FRUITAN)
36	EnartisTan MAX NATURE
36	EnartisTan MEL
35	EnartisTan MICROFRUIT
37	EnartisTan NAPA
35	EnartisTan RF (RED FRUIT)
37	EnartisTan RICH
34	EnartisTan ROUGE
37	EnartisTan SKIN
37	EnartisTan SLI
37	EnartisTan SUPEROAK
38	EnartisTan TFT (TOTAL FRUITY)
37	EnartisTan TOF (TOFFEE)
38	EnartisTan UNICO #1
38	EnartisTan UNICO #2

33	EnartisTan ANTIBOTRYTIS
33	EnartisTan AROM
33	EnartisTan BLANC
33	EnartisTan CIT (CITRUS)
36	EnartisTan CŒUR DE CHÊNE
34	EnartisTan COLOR
36	EnartisTan DC (DARK CHOCOLATE)
35	EnartisTan E
33	EnartisTan ELEGANCE
36	EnartisTan ELEVAGE
36	EnartisTan EXTRA
33	EnartisTan FERMCOLOR
37	EnartisTan FF (FRESH FRUIT)
34	EnartisTan FT (FRUITAN)
36	EnartisTan MAX NATURE
36	EnartisTan MEL
35	EnartisTan MICROFRUIT
37	EnartisTan NAPA
35	EnartisTan RF (RED FRUIT)
37	EnartisTan RICH
34	EnartisTan ROUGE
37	EnartisTan SKIN
37	EnartisTan SLI
37	EnartisTan SUPEROAK
38	EnartisTan TFT (TOTAL FRUITY)
37	EnartisTan TOF (TOFFEE)
38	EnartisTan UNICO #1
38	EnartisTan UNICO #2

PAGE	PRODUCT
38	EnartisTan UNICO #3
38	EnartisTan UVA
38	EnartisTan UVASPEED
35	EnartisTan V
37	EnartisTan VNL (VANILLA)
34	EnartisTan XC
36	HIDEKI

38	EnartisTan UNICO #3
38	EnartisTan UVA
38	EnartisTan UVASPEED
35	EnartisTan V
37	EnartisTan VNL (VANILLA)
34	EnartisTan XC
36	HIDEKI

<b>OAK ALTERNATIVES</b>	
42	INCANTO CAMEL
42	INCANTO COMPLEXITY
42	INCANTO CREAM
43	INCANTO DARK CHOCOLATE
42	INCANTO NATURAL
44	INCANTO NC
44	INCANTO NC CHERRY
44	INCANTO NC DARK CHOCOLATE
44	INCANTO NC RED
44	INCANTO NC WHITE
42	INCANTO SLI
42	INCANTO SPECIAL FRUIT
42	INCANTO SPICE
43	INCANTO TOFFEE
42	INCANTO VANILLA

42	INCANTO CAMEL
42	INCANTO COMPLEXITY
42	INCANTO CREAM
43	INCANTO DARK CHOCOLATE
42	INCANTO NATURAL
44	INCANTO NC
44	INCANTO NC CHERRY
44	INCANTO NC DARK CHOCOLATE
44	INCANTO NC RED
44	INCANTO NC WHITE
42	INCANTO SLI
42	INCANTO SPECIAL FRUIT
42	INCANTO SPICE
43	INCANTO TOFFEE
42	INCANTO VANILLA

<b>MALOLACTIC FERMENTATION</b>	
47	EnartisML MCW
47	EnartisML SILVER
47	EnartisML UNO
48	NUTRIFERM ML
48	NUTRIFERM OSMOBACTI

47	EnartisML MCW
47	EnartisML SILVER
47	EnartisML UNO
48	NUTRIFERM ML
48	NUTRIFERM OSMOBACTI

<b>MICRO-OXYGENATION</b>	
51	ENARTIS WIN-IQ: OX

51	ENARTIS WIN-IQ: OX
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<b>FINING AGENTS</b>	
59	BENTOLIT SUPER
58	CLARIL AF
58	CLARIL HM
58	CLARIL SMK
58	CLARIL SP
57	CLARIL ZR
57	CLARIL ZW
58	COMBISTAB AF
59	ENOBBLACK PERLAGE
60	ENOBBLACK SUPER
60	FENOL FREE
56	FINECOLL
56	GOLDENCLAR INSTANT

59	BENTOLIT SUPER
58	CLARIL AF
58	CLARIL HM
58	CLARIL SMK
58	CLARIL SP
57	CLARIL ZR
57	CLARIL ZW
58	COMBISTAB AF
59	ENOBBLACK PERLAGE
60	ENOBBLACK SUPER
60	FENOL FREE
56	FINECOLL
56	GOLDENCLAR INSTANT

PAGE	PRODUCT
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56	HYDROCLAR 45
58	NEOCLAR AF
59	PHARMABENT
55	PLANTIS AF
55	PLANTIS AF-P
55	PLANTIS AF-Q <b>NEW</b>
55	PLANTIS PQ
59	PLUXBENTON N
59	PLUXCOMPACT
56	PROTOCLAR
56	PULVICLAR S
59	SIL FLOC
57	STABYL
57	STABYL MET
STABILIZING AGENTS	
65	AROMAGUM
66	CITROGUM
66	CITROGUM PLUS
68	CITROSTAB rH

PAGE	PRODUCT
65	EnartisStab CELLOGUM LV20
65	EnartisStab CELLOGUM MIX
69	EnartisStab MICRO
69	EnartisStab MICRO M
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66	MAXIGUM PLUS
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63	ZENITH PERLAGE
63	ZENITH UNO
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74	CLAIRBOUTEILLE P
73	CLAIRPERLAGE DUE
73	CLAIRPERLAGE UNO
72	EnartisFerm PERLAGE
72	EnartisFerm PERLAGE D.O.C.G
72	EnartisFerm PERLAGE FRUITY
72	EnartisPro PERLAGE
74	EnartisTan LAST TOUCH
74	EnartisTan STYLE

PAGE	PRODUCT
74	ENOBLOCK PERLAGE
72	NUTRIFERM GRADUAL RELEASE
73	NUTRIFERM PDC
73	NUTRIFERM PDC AROM
73	NUTRIFERM REVELAROM
73	NUTRIFERM TIRAGE
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75	ZENITH PERLAGE
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78	CITRIC ACID
78	D,L-MALIC ACID POWDER
78	DIAMMONIUM PHOSPHATE (DAP)
78	DISACIDIFICANTE BIANCONEVE
78	ENOCRISTAL SUPERATTIVO
78	L-MALIC ACID
78	POTASSIUM BITARTRATE
78	TARTARIC ACID
78	WINY - POTASSIUM METABISULFITE

# HOURS OF OPERATION

MONDAY-FRIDAY 8:30 AM TO 5:00 PM



## PRICING

Enartis USA makes every attempt to keep our pricing stable, but as our suppliers' prices change, we must pass along changes, whether an increase or decrease. Prices vary slightly every year; this catalog is a guideline to pricing. If you require confirmed prices for your purchase, please contact the supply department at our Windsor branch: 707 838 6312.



## RETURNS & ORDER CANCELLATIONS

All returns must be authorized; call 707 838 6312 and ask for a Merchandise Return Authorization (MRA) number. Include the MRA number with your shipment. Returns must be made within 15 days of receipt and are subject to a 20% restocking charge. All items must be returned in an unused and resalable condition.

All winemaking products along with supplies that require refrigeration or freezing cannot be returned.

Live cultures, analytical standards, and special order items are available according to demand. Orders of these products are considered to be final.

Any cancellation or modification of a pending order will result in a charge up to the full dollar amount of the order.

## TEMPERATURE AND BACTERIA VIABILITY

Don't worry! If ice packs melted during shipment or the container arrived warm, a few days out of the freezer at temperatures below 25°C (77°F) will not spoil the product or affect bacteria viability.

However, we always advise our customers to select the most expeditious shipping means possible and to store bacteria in the freezer at -18°C (0°F) upon arrival.

## HAZARDOUS MATERIALS

Materials considered hazardous to ship are marked with this symbol in the catalog. Hazardous materials are subject to a shipping surcharge, must be shipped via ground service and may have other limitations on their shipment. Ask us for details



## DAMAGED SHIPMENTS

Items damaged in shipping should be reported to the carrier immediately. Containers and packing material must be kept for inspection.



## TERMS

Shipping charges and sales tax (as required) are additional. Due to manufacturers' changes, our prices may change without prior notice.

Terms for payment are 30 days net. A service charge of 2% (minimum \$ 5.00) will be added to any outstanding balance after 30 days.

For international orders, please call or fax for details of shipment and payment.



## CREATING A SUSTAINABLE FUTURE

The integration of sustainability in our commercial and production activities allows us to promote operational efficiency, provide the best solutions for customers and support communities.



**We used FSC paper to print this catalog.**

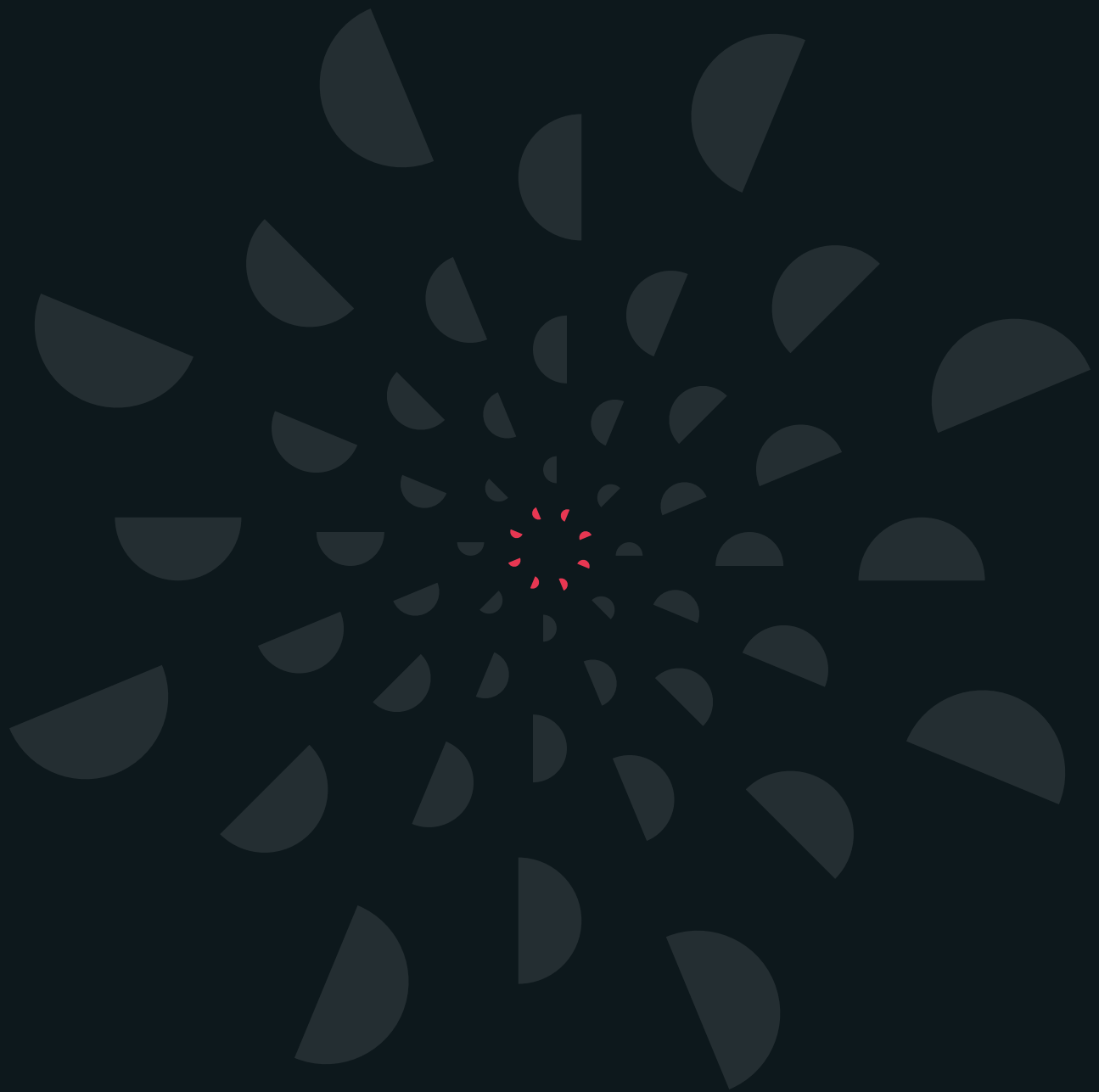
*What does it mean?*

The Forest Stewardship Council® (FSC) is an independent, not for profit, non-government organization established to support environmentally appropriate, socially beneficial, and economically viable management of the world's forests.

FSC's vision is that the world's forests meet the social, ecological, and economic rights and needs of the present generation without compromising those of future generations.

**ENARTIS  
LOVES  
THE PLANET.**





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