STABILIZING AGENTS

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

enartis

Inspiring innovation.

TARTARIC STABILIZATION ZENITH RANGE

ZENITH UNO

BEST KHT STABILIZER

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

Application: *tartrate stability*

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

5 kg	**(Item #35-792-0005)**
20 kg	**(Item #35-792-0020)**
1000 kg	**(Item #35-792-1000)**

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

ZENITH COLOR

BEST KHT & COLOR STABILIZER

- Solution of Potassium polyaspartate and Arabic Gum from Acacia Verek.
- Strongly effective for tartrate and color stabilization in red and rosé wines, with minimal impact on the filterability index of wine.
- Long-lasting stabilizing effect.
- Environmentally sustainable, practical, easy-to-use and respectful of wine quality.
- Increase roundness, wine length and volume.

Application: *tartrate stability; color stability*

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

5 kg	**(Item #35-793-0005)**
20 kg	**(Item #35-793-0020)**
1000 kg	**(Item #35-793-1000)**

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

ZENITH PERLAGE

- Solution of potassium polyaspartate (KPA) and mannoproteins.
- 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.

Application: *tartrate stability; perlage stability; sparkling wine*

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

5 kg	**(Item #35-791-0005)**
20 kg	**(Item #35-791-0020)**

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

KNOW MORE ABOUT ZENITH

WHAT IS POTASSIUM POLYSPARTATE?

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

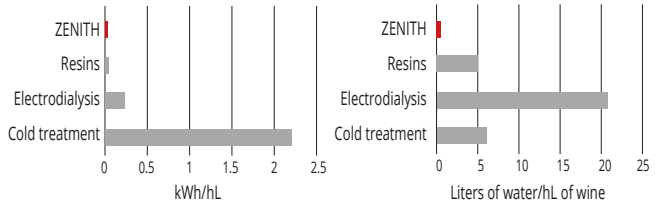
WHY USE ZENITH?

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

ZENITH IS

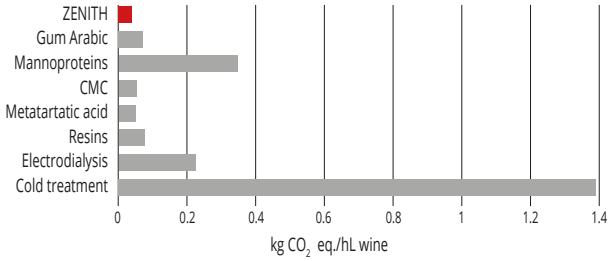
- INNOVATION
  An ambitious challenge and six years of passionate research in collaboration with public and private European institutions, universities and major players in the winemaking industry to develop a cutting-edge product.
- PERFORMANCE
  The most effective tartaric and color stabilizer overtime, 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_2 emissions for greater environmental sustainability. ZENITH loves the planet!

UP TO 80% SAVINGS IN ENERGY AND WATER CONSUMPTION

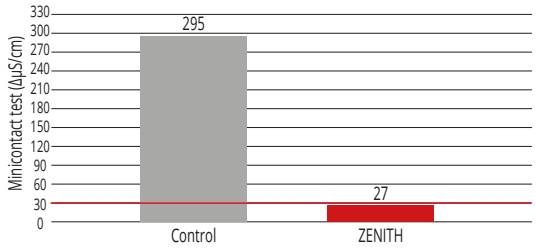


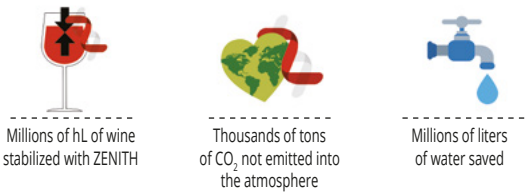
90% REDUCTION ON CO_2 EMISSIONS

Source: www.stabiwine.eu



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





Millions of hL of wine stabilized with ZENITH

Thousands of tons of CO_2 not emitted into the atmosphere

Millions of liters of water saved

CARBOXYMETHYL CELLULOSE

What is Carboxymethyl Cellulose (CMC)?
CMC is a cellulose derivative characterized by its polymerization and substitution degrees, parameters which affect 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^+ ions, thus inhibiting the formation of crystals and tartrate precipitation.

Interactions between CMC and proteins
CMC can crosslink with proteins in wine, leading to haze formation. 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 concentration.
- Stabilizes against tartrate precipitation long-term. Inhibits the formation, growth and precipitation of potassium bitartrate crystals.
- Low impact on wine filterability.
- Alternative to physical stabilization treatments such as cold stabilization and electrodialysis (lower energy costs and processing times).

Application: *tartrate stabilization; white, rosé and sparkling wines*

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

20 kg **(Item #35-794-0025)**

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 electrodialysis, 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**

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.
- At recommended dosages, it has a limited blocking effect on filtration membranes and can be added to wine before microfiltration.

Application: *stabilize wine aromas, reduce astringency*

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

20 kg **(Item #35-720-0025)**

CITROGUM

- Solution of gum Arabic from Acacia Seyal with low calcium content and high hydrolysis.
- Prevents precipitation of colloids, pigments and tartrates.
- Improves wine balance 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.

Application: *tartrate stabilization; reduce astringency; soften mouthfeel*

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

1 L **(Item #35-725-0001)**
20 kg **(Item #35-725-0025)**
200 kg **(Item #35-725-0200)**
1,000 kg **(Item #35-725-1000)**

CITROGUM PLUS

IMPROVE MOUTHFEEL

- Solution of gum Arabic from Acacia Seyal and yeast mannoproteins.
- Prevents precipitation of colloids, pigments and tartrates.
- Reduces bitterness and astringency, increases sweetness, softness and volume.
- Highly filterable.

Application: *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)**

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

MAXIGUM F

- Gum Arabic solution from Acacia Verek.
- Highly effective in preventing color compound precipitation in red and rosé wines ready for bottling.
- The gum Arabic undergoes a special filtration treatment which makes it microfilterable.

Application: *color stability; increase structure and mouthfeel; microfilterable*

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

20 kg **(Item #35-737-0020)**

MAXIGUM PLUS

IMPROVE MOUTHFEEL

- Solution of gum Arabic from Acacia Verek and mannoproteins.
- Highly effective in preventing color compound precipitation in red and rosé wines ready for bottling.
- The mannoproteins reinforce gum stabilization effect and, due to their interaction with aromatic and polyphenolic compounds, soften astringency, reduce dryness and improve aroma complexity.
- The gum Arabic undergoes a special filtration treatment which makes it microfilterable.

Application: *reduce astringency; soften mouthfeel; color stability*

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

20 kg **(Item #35-738-0020)**

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

SHELF LIFE IMPROVEMENT

Enartis has developed a program dedicated to the improvement of wine shelf life to help 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.

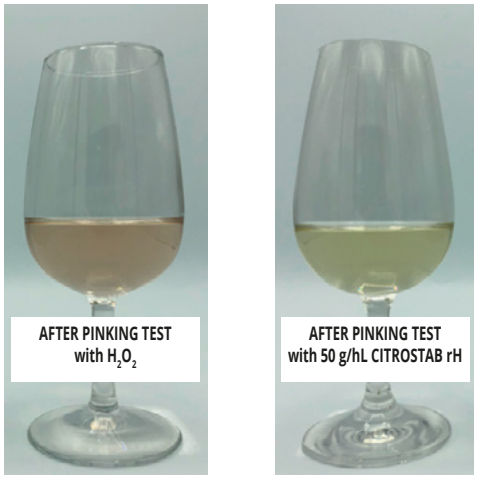
CITROSTAB rH

- Citric acid, ascorbic acid, potassium metabisulfite and gallic tannins.
- Formulation to stabilize wine redox potential and prevent post-bottling oxidation reactions.
- Protects bottled wine from oxidation alteration: pinking, and atypical ageing.

Application: *bottling; prevent oxidation; prevent pinking; stabilize redox potential; wine shelf life improvement*

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

1 kg **(Item #35-760-0001)**



50 g/hL CITROSTAB rH prevents the appearance of pinking even in hyper-oxidative conditions.

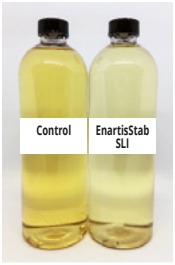
EnartisStab SLI

- Inactivated yeast, PVPP and untoasted tannins.
- Prevents degradation and oxidation of wine aroma during storage.
- High capacity to consume dissolved oxygen, lowers wine redox potential and protects from oxidation and browning.
- Extends wine shelf life.

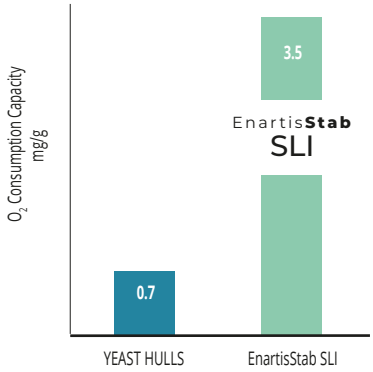
Application: *antioxidant; prevent browning and pinking; stabilize wine redox potential*

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

2.5 kg **(Item #35-763-0001)**



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_2, consumes more dissolved O_2 than any other yeast hulls.

MICROBIAL STABILIZATION

EnartisStab MICRO M

BEST MICROBIAL COVERAGE

- Preparation of pre-activated chitosan from *Aspergillus niger* and inactivated yeast.
- Allergen-free, vegan alternative to lysozyme and SO_2 for antimicrobial properties.
- Designed for treatment of grapes, must, and wine.
- Interacts with a wide spectrum of microorganisms, reduces their activity and growth, and precipitates them.
- Protects wine from oxidation and inhibits oxidative enzymatic activity in compromised grapes.
- Reduces sulfide defects, volatile phenols, VA and off-flavor production.
- Improves clarification and filterability.

Application: *reduce unwanted microorganisms; must and wine*

Dosage: *5-40 g/hL (0.4-3.4 lb/1,000 gal)*

1 kg **(Item #35-762-0001)**
10 kg **(Item #35-762-0010)**

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

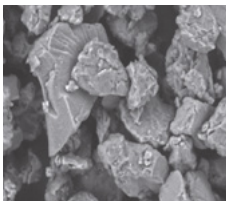
WHAT IS CHITOSAN?

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^{3+} groups) that interfere with the negatively-charged residues of macromolecules on the microorganism's cell wall surface.

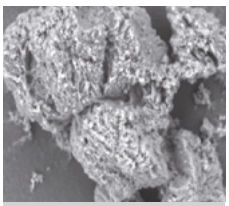
WHY IS ENARTIS' CHITOSAN MORE EFFICIENT?

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 *Brettanomyces*, *Oenococcus*, *Pediococcus*, *Acetobacter*, *Lactobacillus*, *Zygosaccharomyces*, *Schizosaccharomyces* and some other non-*Saccharomyces* yeast. EnartisStab MICRO M reacts faster and at lower concentrations than standard chitosan available on the market.

This product can prevent the spoilage of contaminated wines, has side activities which improve clarity and filterability, and removes some of the unwanted aromas caused by microbial activity.



Standard Chitosan



Enartis Activated Chitosan

APPLICATION OF EnartisStab MICRO M

WIDE SPECTRUM ANTIMICROBIAL AT ANY TIME

EnartisStab MICRO M is used:

- To control a wide spectrum of microbes: *Acetobacter, Lactobacillus, Pediococcus, Oenococcus, Brettanomyces, Zygosaccharomyces* and some other non-*Saccharomyces* yeast.
- As a treatment to remove/reduce high populations of microbes. Dosage: 10-20 g/hL followed by racking
- As a preventative measure to eliminate small populations before they become spoilage. Dosage: 3-4 g/hL
- As an alternative to SO_2 for microbial control.

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 1).

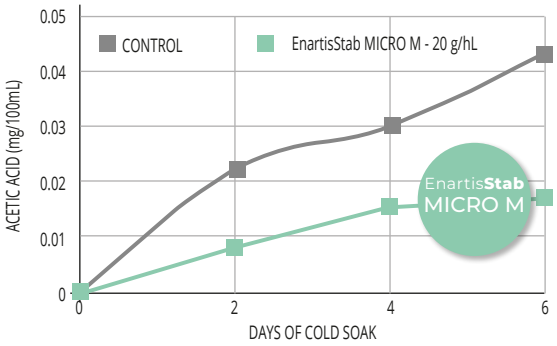


Figure 1: The addition of EnartisStab MICRO M on grapes controls VA production during cold soak.

REDUCE VOLATILE PHENOLS

After fining with EnartisStab MICRO M, wines appear cleaner, fresher and often fruitier. EnartisStab MICRO M can reduce volatile phenols, treat reduction issues and remove other off-flavors. Dosage: 2-15 g/hL

CONTROL MLF
AN ALLERGEN-FREE ALTERNATIVE

EnartisStab MICRO M is a allergen-free and vegan-friendly fining agent that can prevent, delay, or stop MLF. It can control *Oenococcus Oeni* development in any condition. This bioregulators' antimicrobial activity is not influenced by wine pH, unlike sulfur dioxide (Figure 2).

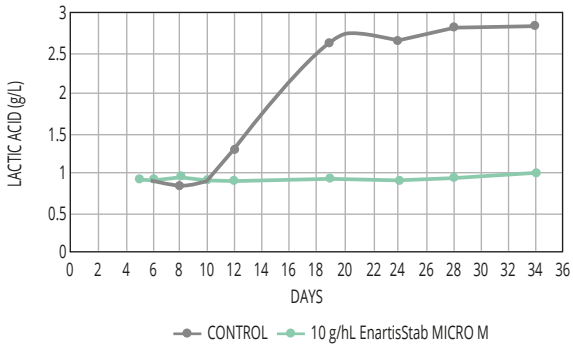


Figure 2: Difference of microbiological coverage between low SO_2 protection versus the addition of 10 g/hL EnartisStab MICRO M in a wine with a high pH (3.9). Treatment of wine with 10^{12} CFU/mL of selected highly resistant bacteria adapted to the medium.

LIMIT STUCK FERMENTATIONS
PROMOTE CLEAN AND COMPLETE FERMENTATIONS

EnartisStab MICRO M:

- Improves fermentation kinetics and ensures its completion by removing spoilage microbes that inhibit yeast (Figure 3). Dosage: 10 g/hL
- Improves the start of native fermentations by reducing microbial competition. Dosage: 5 g/hL
- Does not impact fermentation kinetics of *Saccharomyces cerevisiae.*

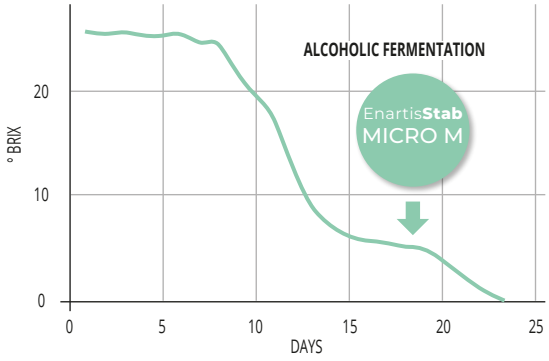


Figure 3: The addition of EnartisStab MICRO M to a sluggish fermentation helps complete fermentation.