



## TECHNICAL NEWSLETTER

### PREPARING WINES FOR BOTTLING

In today's wine market, it is crucial for wines to be visually appealing to consumers, which means they need to be clear and free of sediment. The process of stabilization can sometimes be confusing if how and when to assess the stability of a wine is not known. This can lead to missing key checkpoints throughout the stabilization period, triggering issues in bottle.

One of the major sources of frustration for winemakers happens after a wine is thought to be stable, yet last minute modifications are required due to oversights. It is important to remember that two wines that are individually stable might not be stable together, so before you start working on your wine, make sure the blend is finalized! Even a small fraction of additional wine can change wine's chemical balance. Furthermore, stabilizing components separately won't always lead to a stable wine when it is blended back. **Finish your blend and make appropriate adjustments before you start stability checks!**

#### Sources of wine instabilities

Wine instability comes from several sources including microbial, chemical and colloidal. Below, we will discuss testing offered at Vinquiry Laboratories by Enartis USA to assess these instabilities as well as the treatments available for their correction.

#### EVALUATING OXIDATIVE STABILITY AND PINKING POTENTIAL

Vinquiry Laboratories by Enartis USA provides two assessments to help you identify if you have a potential problem: **Pinking Potential** and **Oxidative Stability**. These tests evaluate the presence of precursors that can lead to color issues in the bottle, particularly for white and rosé wines.

Both pinking and browning are triggered by oxidation reactions that lead to noticeable changes in color. Certain varieties, and especially wines made under reductive winemaking techniques, are more prone to these alterations, and in most cases these changes are not reversible. Prevention is key to avoiding an issue. Testing wine to assess the **oxidative and pinking** potential is the first step in working towards prevention.

#### Treatments available

**Stabyl PVPP** is a fining agent with an affinity for low-molecular-weight phenolics such as catechins as well as anthocyanins. These compounds are precursors to browning and pinking in white wines, thus if your wine has a potential for pinking, using PVPP is recommended as a preventive treatment **by removing compounds prone to oxidation**.

**Stabyl PVI-PVP** is an insoluble polymer that can bind to metals and phenols and reduce the catalytic effect they have in the oxidative reactions leading to pinking and browning. PVI-PVP is recommended as a preventive measure **by removing the catalysts of oxidation**.

**Citrostab rH** is a pre-bottling coadjunct with a balanced formulation to stabilize redox potential. It protects wines from undergoing oxidation alterations, pinking, as well as atypical ageing. Citrostab rH is recommended as a preventive measure **to block the oxidation process**.

#### EVALUATING PROTEIN STABILITY AND TREATMENTS AVAILABLE

The majority of proteins found in wine are produced in grapes; but yeast, bacteria, enzymes and protein fining agents also account for a substantial fraction. Protein solubility depends on wine temperature, alcohol content and pH. Changes in these parameters can lead to their precipitation and undesirable haze formation. Their content in grapes varies from year to year. For this reason, wines need to be evaluated every year to find the level of bentonite needed to achieve stability.

**Bentonite Fining Trials** are intended to determine the amount of bentonite needed to stabilize a wine. The degree of stability needs to be determined in context to the winemaker's goal, the potential for heat exposure, consumer expectations, or the worst case scenario.

#### Assessing wine stability prior to bottling

White and Rosé Wines	Red Wines
Oxidation, Pinking	Color stability
Protein stability	Tartrate stability
Tartrate stability	Microbial stability
Microbial stability	

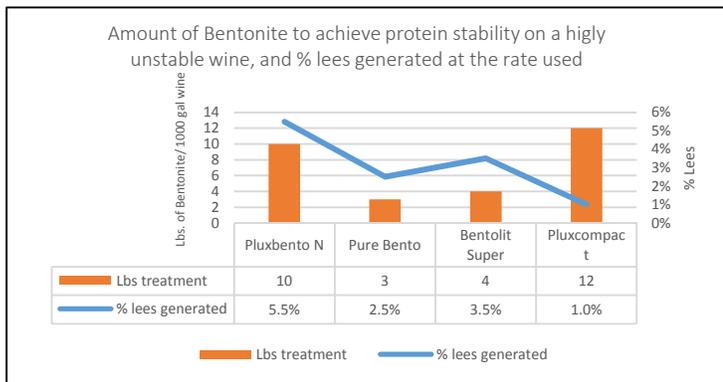


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Protein stability is considered an issue mainly for white and rosé wine quality, although some young red wines with low tannin content and treated with protein fining agents may suffer from protein instability. Protein in wine can lead to the formation of haze and sediments in bottle. Still, some winemakers refuse to treat their wines to prevent “stripping” the wine. However, newer purified bentonites now available in the market are allowing winemakers to address this issue while limiting organoleptic impact to wine.

### What type of bentonite products are available?

Bentonites are not all the same. Bentonites are swelling clays that differ in composition which impacts swelling and their ability to bind to proteins. Remember, it is important to use the same bentonites in the cellar as were used for lab trials. Bentonites, as with many other fining additives, were developed for different abilities. Make sure you choose the best for the job!



Function	Product
Clarification, co-fining agent	Pluxcompact, Pluxbenton N
Protein removal	Pure Bento, Bentolit Super, Pluxbenton N
Low organoleptic impact	Pure Bento, Pluxcompact
Prevention of light - truck defects	Pluxbenton N

### EVALUATING TARTRATE STABILITY AND TREATMENTS TO CORRECT IT

Since most white and rosé wines will be refrigerated at some point, nearly all need to be tartrate stabilized before bottling. Red wines, on the other hand, often do not require tartrate stabilization as the ageing process allows the wines to naturally achieve stability. However young red wines or wines that are blended within a short period of time prior to bottling might not reach this balance, making them susceptible to tartrate and color instabilities.

#### Measuring Tartrate Stability

To evaluate tartrate stability, Vinquiry Laboratories by Enartis USA offers a fast and reliable **Mini-contact conductivity test**, this test measures the change in conductivity over time and relates it to a level of stability.

#### Treatments for Tartrate Stability

Traditional tartrate stabilizing methods such as cooling, contact seeding and electro dialysis prevent precipitation by separating unstable natural ions or salts from wine. While these methods have been widely used in the industry, they can be expensive, require copious amounts of water, impact the organoleptic qualities of wine, and might require more time than anticipated.

Enartis offers superior alternatives to traditional methods of tartrate stabilization. These are colloidal stabilizers that work by inhibiting the nucleation and growth of tartrate crystals and preventing their precipitation. The use of colloidal stabilizers helps speed up wine preparation, respects wine sensory properties, removes the need for refrigeration and reduces production costs. Colloidal stabilizers need to be tested to determine the dosage required and assure the efficacy of treatment. Another reason for testing is due to possible interactions between the colloidal stabilizers, (**mainly CMC**) and residual proteins in the wine, leading to the formation of undesirable hazes. Therefore, we recommend to ensure that your wine is heat and colloidal stable in advance.



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To measure the degree of tartrate instability on your wines Vinqury Laboratories by Enartis USA offers the **CMC Panel for White and Rosé Wines** and the **Colloidal Stabilization Panel for Red Wines**. These panels are divided into two parts;

**Part 1** Evaluates the tartrate stability in white and rosé wines, and color and tartrate stability for red wines.

**Part 2** Determines the right colloidal stabilizer and amount needed. This portion accounts for any possible interaction of stabilizing colloids with wine components.

### What are the treatments available?

Colloidal stabilizers such as **Cellogum L** (Carboxymethyl Cellulose) do not modify organoleptic qualities of blends and effectively stabilize wines at dosage rates of 50 to 200 mL/hL. Its broad range of application allows for cold stabilization of highly unstable wines.

**Cellogum LV 20**, higher concentration and lower viscosity Carboxymethyl Cellulose is highly filterable and capable of stabilizing tartrates at very low rates. The formulation of this product allows it to be used within 24 hours prior to microfiltration.

**Cellogum Mix** is a combination of highly branched Gum Arabic and low viscosity CMC that works in synergy to stabilize highly unstable wines. The portion of Gum Arabic contained in **Cellogum Mix** can have a positive organoleptic impact on wine. We recommend doing bench trials to evaluate this effect.

**Citrogum®** is a Gum Arabic that is effective at the rate of 50 to 300 mL/hL and is recommended for wines that show a 3-7% change in electrical conductance. **Citrogum®** also improves and enhances mouthfeel and reduces bitterness and astringency. These organoleptic improvements occur with doses above 80 mL/hL. We recommend doing bench trials to confirm that the product is suitable for your wine.

**Enartis Stab CLK+** is a blend of soluble polysaccharides (mannoproteins) extracted from yeast cell walls. Its effectiveness varies from wine to wine, thus requiring evaluation prior to use. **Enartis Stab CLK+** provides a positive impact enhancing the wine's sensory quality and overall mouthfeel.

**Maxigum** is a high molecular weight and highly branched Gum Arabic. It can be used in combination with other treatments such as **Enartis Stab CLK+** and **Cellogum L** to enhance colloidal stability as it prevents the precipitation of colored matter.

**Enartis Stab Mega** combines the action of all three stabilizers: CMC, Gum Arabic and mannoproteins. The synergistic action of these molecules allows Stab Mega to achieve stability of moderate to highly unstable wines.

		Cellogum L	Cellogum LV	Cellogum Mix	Enartis Stab Mega	Citrogum	Enartis Stab CLK+
<b>Composition</b>		5% Solution Carboxymethyl Cellulose (CMC)	20% Solution Carboxymethyl Cellulose (CMC)	Mixture of Gum Arabic and Carboxymethyl Cellulose (CMC)	Mixture of Gum Arabic and Carboxymethyl Cellulose (CMC) and Mannoproteins	Gum Arabic Solution (min 20.5%)	Yeast mannoproteins and plant polysaccharides
<b>Type of wines</b>	White	+++++	+++++	+++++		+++	++
	Rosé	+++++	+++++	+++++	+++++	+++	++
	Red	+++++ (in combination with Maxigum)	+++++ (in combination with Maxigum)		+++++	+	+++++
	Sparkling	+++++	+++++	+++		+++	
<b>Level of instability</b>		All levels	All levels	All levels	All levels	Medium- Low Instability	Medium- Low Instability
<b>Recommended testing</b>		CMC Panel	CMC Panel	CMC Panel	Colloidal Stabilization Panel	Citrogum Panel	Colloidal Stabilization Panel
<b>Organoleptic impact</b>		NO	NO	YES	YES	YES	YES
<b>Addition prior to bottling micro-filtration</b>		48-72 hours	24 hours	24 hours	24 hours	24 hours	2-7 days
<b>Recommended Addition Rate</b>		100-200 mL/hL	25-50 mL/hL	20-100 mL/hL	150 mL/hL	50-200 mL/hL	5-20 g/hL



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### Evaluation and Management of Microbial Stability

Microbial stability is achieved by employing yeast and bacteria-proof levels of filtration at bottling. Commonly, inline **0.45µm absolute membrane filters** (continuous process) are recommended to avoid cross contamination. Microbial issues are more common in bottled wines that didn't go through sterile-filtration prior to bottling, or in wines where sterile filtration failed.

Nevertheless, sterile filtration prior to bottling a wine requires a wine's turbidity to be <1NTU. That means having to put wine through a process of clarification and filtration to achieve these conditions, conditions which could deviate from the winemaker's style.

When unfiltered wine is the desired style, Vinquiry Laboratories by Enartis USA offers the **Unfiltered Bottling Panel** which provides information on the risks associated with bottling a wine unfiltered. This panel checks for stability regarding both primary and malolactic fermentations, as well as bacterial populations; and spoilage microorganisms including *Brettanomyces* and their sensory effects.

If you have any questions or would like to set-up trials, please give us a call at (707) 838-6312.