



TECHNICAL BOOKLET

FOR OENOLOGICAL USE

WINE STABILISATION, AVOID CLOUDINESS AND HAZES

Oxidative, protein, iron, copper hazes, tartrate precipitations, colour precipitations... it is essential to anticipate the appropriate treatments to avoid certain faults which can irreversibly impact wines.

The mechanisms which cause cloudiness and deposits in wines are particularly complex and, quite often, interact with one another. This is why preventative total stabilisation should be practiced, thus limiting the number of treatments, and ensuring optimal effectiveness with minimal dosage.

Consumers demand that white, rosé and red wines must be clear and free of deposits. This practical booklet presents all of the stabilisation solutions proposed by Lamothe-Abiet for use during maturation to avoid certain faults and to guarantee optimal conservation of the wine over time.



PREVENTING TARTARIC INSTABILITY

1. What is tartaric precipitation?



Crystals can sometimes be seen at the bottom of bottles: these are generally tartrate crystals which are formed when tartaric acid complexifies with potassium or calcium, then precipitates due to cold temperatures. This phenomenon of tartaric precipitation can occur unpredictably in all types of wine during the fermentations or the maturation.

This instability does not have an impact on the wine's intrinsic quality but many consumers reject wines with tartrate crystals in the bottle, judging them as faults (perhaps sugar residues, or even pieces of glass).

2. How to avoid tartrate precipitation in the bottle?

Tartrate stabilisation should be carried out before bottling (just before bottling or during/after fermentation). Several methods can be used to prevent precipitation in the bottle:

◆ Subtractive methods:

This involves forcing a preventive precipitation of the crystals (by prolonged cold stabilisation, contact, ion exchange resin, electrodialysis, etc.) then removing them through filtration. However these techniques are usually difficult and costly to implement, and can also impact the wines' organoleptic properties.

◆ Inhibitory method:

This involves treating the wine to inhibit the formation and/or growth of tartrate crystals, using products that have an "colloid protector" effect. The enological treatments are inspired by natural mechanisms, offering winemakers effective tools that respect their wines.



WHAT FACTORS CONTRIBUTE TO TARTRATE PRECIPITATION?

- ◆ **pH variations** (ex: AF, MLF, blending, deacidification or acidification before bottling)
- ◆ **Temperature variations**: exposure to cold, heat shock
- ◆ **Colloidal structure variations**: clogged filtration (extraction of colloid protectors)
- ◆ **Instability of colour matter** (young wine, cold, poor fining)

Range of Lamothe-Abiet products for preventive treatment of tartrate precipitation:

PRODUCT	FORMULATION	CENOLOGICAL INTERESTS	DOSAGE
STAB K	Specific yeast Mannoproteins (<i>saccharomyces cerevisiae</i>)	Inhibit the formation and growth of potassium bitartrate crystals	5 to 20 g/hL depending the degree of instability of the wine
VINOPROTECT	Carboxymethylcellulose (CMC)	Inhibit the growth of potassium bitartrate (only for white wines)	≤ 40 cL/hL
BITARTRATE DE POTASSIUM	Potassium bitartrate	Triggers precipitation of unstable potassium bitartrate (by saturation) in the wine (requires cooling to 0°C and racking)	4 g/L
ACIDE MÉTATARTRIQUE INDICE 40	Metatartaric acid	Inhibits the growth of potassium bitartrate crystals. For quick rotation wines (less than 2 years, low temperature storage)	≤ 10 g/hL



THE KEYS FOR A GOOD PROTEIN STABILISATION

1. What is protein haze?

In white or rosé wines, a **“milky” deposit can form due to heat** (summer temperatures, transport, poor storage conditions, etc.) which acts on intermediary compounds, which flocculate with **proteins that are not heat stable**.

2. How to avoid protein haze?

Bentonites are currently the only simple and effective tool for protein stabilisation. Their dosage should be determined for each individual wine, through a protein stability test (heat test).



CARRYING OUT A BENTONITE TREATMENT

To guarantee optimal efficacy, **bentonite must be rigorously prepared**. It should be well diluted in water and left to swell before being incorporated whilst properly mixing:

- ◆ Sprinkle the bentonite slowly into 10 times its weight in warm water, whilst stirring continually,
- ◆ Leave the bentonite to swell for at least two hours, then incorporate evenly (pumpovers or a dosing pump).

Natural bentonites for avoiding protein haze:

PRODUCT	FORMULATION	ŒNOLOGICAL INTERESTS	DOSAGE
BENTOSOL PROTECT AND BENTOSOL POWDER	Natural bentonites (montmorillonites)	Highly reactive with proteins, helping them to flocculate and be removed without impacting the wine's quality	10 to 120 g/hL
BENTOSOL FT	Purified calcium-sodium bentonite	Deproteinizing and compacting, specifically developed for its compatibility with cross flow filters	10 to 120 g/hL depending on the results of protein tests and fining tests



MAINTAIN COLOUR STABILITY

1. What is colour instability?

Some of the colouring matter of red and rosé wines is prone to precipitating, which causes a **decrease in colour** and the **formation of a deposit**. Unstabilised colour provokes **colloidal instabilities** and can thus result in **tartrate precipitation**. It is therefore necessary to **stabilise the colour of red or rosé wines before bottling**.

2. How to avoid a loss of colour?

Colour stabilisation often needs to be done in several steps. To start, it is advised to maintain and fix wine's colour through an **extraction and stabilisation as early as possible**.

A suitable fining helps to **remove the unstable fraction of the colouring matter** (see practical booklet *Clarification and Fining*). Finally, the stability of the colour can be prolonged **using gum arabics during bottling**.

TO KNOW

As well as stabilising the wine's colour, gum arabics help to avoid slight iron and copper instabilities in white wines as well as the precipitation of tartrate microcrystals. Gum arabic also improves the wine's organoleptic qualities, adding roundness and decreasing astringency.

**Gum arabics and other Lamothe-Abiet products
for colour stabilisation:**

PRODUCT	FORMULATION	ŒNOLOGICAL INTERESTS	DOSAGE
GOMME LA	Purified and filtered solution of selected gum arabic with high protection index	Colloidal stabilisation, particularly for colour. Long lasting protection.	10 cL /hL
GOMME STANDARD	Gum arabic solution with high protection index	Colloidal stabilisation, particularly for colour. Long lasting protection.	10 cL /hL
POLYGOM	Blend of gums in liquid formulation	Colloidal stabilisation (intermediate protection) and addition of "roundness".	10 to 30 cL /hL
VINO GOM	Selection of best arabic gums, in solution	Participates in colloidal structure ("roundness" effect)	<i>red</i> : 10 to 30 cL/hL <i>white</i> : 5 to 10 g /hL
EXCELGOM	Sélection des meilleures gommés arabiques en granulé	Participates in colloidal structure ("roundness" effect)	20 to 120 g/L
STAB K	Mannoproteins	Colour and tartaric stabilisation.	10 to 20 cL /hL

Gomme LA and Gomme Standard are two gum arabics specifically used for their effect on the colloidal stability, especially on the colour. Used at a rate of 10cl/hL, they give lasting stability.

Polygom combines colour stability with roundness. The double effect can be achieved using between 5 and 30cl/hL depending on the type of wine.

RECOMMENDATIONS

Carry out a colour stability test (Cold test: 48h at 4°C). Each gum arabic has its own characteristics in terms of protection index and organoleptic impact. The choice of the gum to use, as well as the dosage, must therefore be determined through prior laboratory trials. Gum arabic must be used on stabilised, fined, and limpid wines.



WHAT TO BEAR IN MIND FOR WINE STABILITY?

Preventative stabilisation helps to **optimise the treatment's efficacy**, to limit the number of interventions, but also to **avoid any organoleptic losses** (colour, aromas...).