PRACTICAL BOOKLET

ROSÉ WINES:
IN SEARCH OF RELIABLE AND LASTING TARTARIC STABILITY

In response the the change in regulations concerning the use of Carboxymethylcellulose (CMC)[1], this practical booklet brings together all of the alternatives and solutions to best respond to the current issues surrounding tartaric stabilisation for rosé wines.

Clearness and the absence of deposits are essential for rosé wines. Therefore, stabilisation is a crucial step.

Lamothe-Abiet provides specific solutions to obtain tartaric, protein and aromatic stabilisation in rosé wines, whilst respecting their organoleptic characteristics.

WHAT IS TARTARIC PRECIPITATION ?

Tartaric acid is the acid with the highest concentration in grapes. When the concentration is too high (saturation) in musts or wines, it precipitates during the vinification or storage. The crystals (tartar, potassium bitartrate or KHT) can then be seen at the bottom of the bottle. Although these crystals do not affect the organoleptic qualities of the wines, **many consumers reject wines that contain them, thinking that they are a fault** (perhaps sugar residues, or even pieces of glass).

This crystal precipitation is formed when tartaric acid forms a complex with potassium bitartrate or calcium tartrate. It then precipitates due to cold temperatures, forming large crystals which are visible to the naked eye.

This phenomenon of tartaric precipitation can occur in all types of wines at unforeseeable times. It is however a greater problem for white or rosé wines because these deposits can be seen at the bottom of the bottle (the colour of red wine helps to mask the potential presence of these crystals).

TO GO FURTHER

Tartaric acid is found in equilibrium in wines in the form of two salts: potassium hydrogen tartrate (KHT) and neutral calcium tartrate (CaT).

These salts have specific solubilities which vary according to the **temperature**, the **pH** and the **alcohol content**. If the amount of KHT or CaT are greater than the solubility limit at a given temperature, there is therefore the risk of "precipitation".

Precipitation of tartar crystals in two steps:

CaT KHT

1.

NUCLEATION

tartaric acid forms a complex with potassium bitartrate or calcium tartrate

2.

CRYSTAL GROWTH

crystals appear that are visible to the naked eye

[1] *Regulation effective in December 2019 (EU Regulation n°2019/934).*
Use of Carboxymethylcellulose only autorised on white and sparkling wines.

WHAT FACTORS CONTRIBUTE TO TARTRATE PRECIPITATION?

- The **tartrate concentration** and the **concentration in potassium and calcium ions**.
- **pH variations** (ex: AF, MLF, blending, deacidification or acidification before bottling)
- **Temperature variations**: exposure to cold, heat shock
- **Alcohol content increase**
- **Quality of pre-bottling filtration**
- **Colour matter instability** (ex: young wine, cooling, poor fining)

HOW TO STABILISE WINE?

Tartaric stabilisation should be carried out before bottling (just before bottling or during/after fermentation)**.** For this, several methods help to prevent precipitation in the bottle:

- **Subtractive method**:

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**.

- **Inhibitor method:**

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

LABORATORY TEST

For correct tartaric stabilisation:

In order to adapt the treatment, whatever method and dosage is used, it is important to carry out tartaric instability tests systematically on the wines: crystallisation test, cold stabilisation test (-4ºC for 6 days), mini-contact test, DTI (degree of tartaric instability), saturation temperature, post-treatment ISTC50 test, etc. (ask your enological laboratory for more information).

CREAM OF TARTAR (POTASSIUM BITARTRATE OR HYDROGEN TARTRATE)

L.A SOLUTIONS

Added directly to the wine, potassium bitartrate has a **natural catalyst role** for tartaric stabilisation, along with a cold treatment (saturation at 0ºC).

It starts and **helps the formation of other potassium bitartrate crystals** through saturation, whilst also accelerating the sedimentation of exogenous crystals in the wine.

Crystallization induced by **Lamothe-Abiet's cream of tartar** is **faster** and more **complete**.

BIO Product usable for organic wines in Europe and NOP

USAGE

- Use on clarified wine for optimal effectiveness
- **Dosage**: 4g/L. It is possible to recycle the bitartrate 3 to 10 times on rosé wines.
- **Reactivation**: Cool the wine to be treated to 0ºC. Dissolve the potassium bitartrate in cold water. Mix the resulting solution directly into the wine to be treated.
- **Addition**: Mix vigorously, all the cream of tartar must be in suspension in the wine. Keep mixing gently for 4 to 6 hours. Filter after treatment.

METATARTARIC ACID

L.A SOLUTIONS

To prevent tartaric precipitations, **products that inhibit crystallization can be added** such as **metatartaric acid**.

This polyester is the result of an intermolecular esterification of tartaric acid. **. It inhibits the growth of the nucleation points that start crystal formation**.

Variable effectivenesses are observed **for different available metatartaric acids** since there are many different preparations with different anti-crystalline properties according the the average esterification rate of their acid groups.

To best meet the issues faced by winemakers, **Lamothe Abiet** has developed two metatartaric acid solutions, produced under vacuum with **high esterification indexes**: **Antitartre 36** and **Antitartre 40**.

Care must be taken to ensure that **the metatartaric acid dissolves quickly** if the temperature is too high.

The lifespan of wines treated with metatartaric acid ranges widely depending on **transport and storage conditions.**

BIO Product usable for organic wines in Europe

USAGE

- **Maximum dose**: 10 g/hL. Dissolve in 10 times its weight in water.
- Add metatartaric acid 24 to 48 hours before the final filtration.
- Avoid treating wines at temperatures below 10ºC.

YEAST MANNOPROTEINS

L.A SOLUTIONS

Ageing on lees for an extended time can give naturally give **wines tartaric stability** ; Bordeaux's University's Institute of Enology showed that **yeast mannoproteins** play a role in this.

Crystal nucleation is inhibited by the association between tartrates and mannoproteins. Indeed, mannoproteins are colloïdal protector molecules that slow down the crystallisation of tartaric acid salts, but do not inhibit the growth of crystals.

GOOD TO KNOW

Mannoproteins are naturally present in the yeasts' cell walls, especially in *Saccharomyces Cerevisiae*. They have diverse compositions and have **many different properties** (tartaric stabilisation, colour stabilisation, organoleptic improvement...).

Mirroring these mechanisms of lees ageing, **STAB K®** is a **natural and lasting alternative** for tartaric stabilisation of rosé wines. **STAB K®** is a liquid solution of specific mannoproteins from *Saccharomyces Cerevisiae* cell walls. It has been specially selected by **Lamothe-Abiet** for its potential to inhibit potassium bitartrate salts, without a negative impact on the wine.

STAB K® preserves all of the wine's organoleptic properties (acidity, balance, aromas, etc.) and **has a longer lasting colour stabilisation effect.** Its use does not require **energy consumption, as opposed to other subtractive inhibitory treatments**.

BIO Can be used for organic wines in Europe and NOP. It does not affect rosé wines' filterability. It is effective and lasting and a great alternative to CMC.

USAGE

- Use on wines that are ready for bottling (**STAB K®** does not modify the filterability of wines that have been correctly prepared).
- **Dosage**: 10 to 20 cL/hL
- The optimal treatment dosage should be determined by crystallisation tests on samples (on rosé wines the ISTC50 measurement can be used): see "Crystallisation test, 6 days at -4°C" available on our website.

Trial results:

Base wine: DIT 28.4% (highly unstable)		STAB K® dosage (cL/hL)				
		Control	5	10	15	20
Type of test	Cristallisation test (Obs.)	Positive	Positive	Positive	Negative	Negative
	Turbidity (NTU)	**0.4**	**1.2**	**2.9**	**1**	**2.7**
	Filtrability (CFLA)	Good	Good	Good	Good	Good
Results of crystallisation test		many	+/- 10	+/- 5	absent	absent

NB : On a highly unstable rosé wine, 15 cl/hL of **STAB K®** was able to give tartaric stability without impacting the wine's filterability. This shows the benefit of carrying out tests to determine the optimal dosage.

WHAT TO REMEMBER ABOUT TARTARIC STABILISATION?

L.A SOLUTION

STAB K® (Mannoproteins)
10-20 cL/hL

⊖ → CaT, KHT

1.

INHIBITION OF NUCLEATION
tartaric acid forms a complex with potassium bitartrate or calcium tartrate

L.A SOLUTION

Antitartre 36
Antitartre 40
10 g/hL

⊖ → 2.

BLOCKS CRYSTAL GROWTH
crystals appear that are visible to the naked eye

L.A SOLUTION

Cream of tartar + cold
4 g/hL

⊕ →

FAVOURS CRYSTALLISATION
fast and complete formation of crystals to can then be removed

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