YEAST PRODUCT

MANNOSTAB® LIQUIDE 200

Specific yeast cell wall mannoprotein for the stabilisation of potassium bitartrate salts in wine.

Qualified for the elaboration of products for direct human consumption in the field of the regulated use in oenology. In accordance with the current EU regulation n° 2019/934.

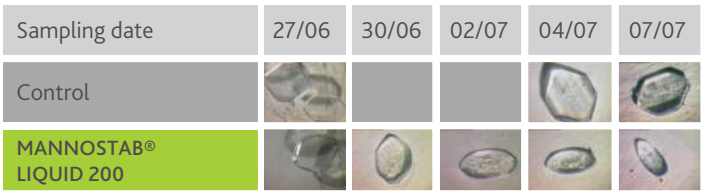
SPECIFICATIONS AND OENOLOGICAL APPLICATIONS

MANNOSTAB® LIQUIDE 200 contains the only mannoprotein naturally present in wine with the ability to **stabilise potassium bitartrate salts**: MP40. It is enzymatically extracted from yeast cell walls by a patented process (Patent n° 2726284) that preserves and ensures the tartaric stabilisation capacity of MP40.

- Inhibition of potassium bitartrate crystallisation.
- Treatment organoleptically neutral to the wine.
- Naturally present in wine.
- Stabilises white, rosé and red wines; still or sparkling wines; filtered or unfiltered.
- No waste, no water or energy consumption.

SCIENTIFIC RESULTS

Microscopic observation of potassium bitartrate crystal development in the presence and absence of **MANNOSTAB® LIQUIDE 200** shows that **MANNOSTAB® LIQUIDE 200** addition prevents the preferential growth of certain crystal faces, thereby flattening the shape of the crystals. The crystal only grows in a certain orientation, thus preventing it from precipitating.



*Microscopic observation of potassium bitartrate crystals evolution at -4°C (25°F) in solutions with and without **MANNOSTAB® LIQUIDE 200**.*

PHYSICAL CHARACTERISTICS

Aspect	liquid
Colour	dark brown
Density (g/L)	1080
Soluble in water (dark brown colour), insoluble in ethanol.	

CHEMICAL AND MICROBIOLOGICAL ANALYSES

SO_2 (g /L)	1.5 ± 0.3
Dry residues (%)	≥ 20
Analysis on dry product:	
Ashes (%)	< 8
Total nitrogen (g/kg)	[5 - 75]
Polysaccharides eq. mannose (g/kg)	> 600
Yeast (CFU/g)	$< 10^2$
Mould (CFU/g)	< 50
Aerobic mesophile bacteria (CFU/g)	$< 10^4$
Lactic acid bacteria (CFU/g)	$< 10^4$
Coliformes (CFU/g)	< 10
E. coli (/25 g)	none
Staphylococcus (/g)	none
Salmonella (/25 g)	none
Heavy metals (Pb) (ppm)	< 30
Lead (ppm)	< 5
Arsenic (ppm)	< 1
Mercury (ppm)	< 0.15
Cadmium (ppm)	< 0.5

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PROTOCOL FOR USE

OENOLOGICAL CONDITIONS

MANNOSTAB® LIQUIDE 200 is the last treatment before bottling (after blending, fining and pre-filtration, etc.). No treatment should be made post **MANNOSTAB® LIQUIDE 200** application with the exception of SO_2, Gum Arabic and ascorbic acid.

In the case of filtered wines, **MANNOSTAB® LIQUIDE 200** should be added between preparation filtration and bottling filtration and at least 48 hours prior to bottling. Filterability of the wine should be tested before and after addition of **MANNOSTAB® LIQUDE 200**. Where **MANNOSTAB® LIQUIDE 200** addition does not increase the Filterability Index (Clogging Index) of wines prepared to the above specifications (CI < 50), a forced blocking filtration may retain colloids and/or **MANNOSTAB® LIQUIDE 200** and may make the treatment ineffective.

In the case of non-filtered wines the treatment must be added the day before bottling.

Red wine specific case: unstable colouring matter can result in tartrate salts by precipitating over time. Make certain the colouring matter of the wine is stable before treating with **MANNOSTAB® LIQUIDE 200** for long term tartaric stability.

MANNOSTAB® LIQUIDE 200 will not prevent the neutral calcium tartaric salts precipitation.

DOSAGE

The average dosages (between 50 and 150 mL/hL) are determined by stability tests in order to prevent any risks of overdose. Two stability tests can be implemented:

- **The cold test,** easy to implement in wineries.
- **The mini-contact test,** realised in laboratory (DIT, Stabilab® – Patent Eurodia)

Tartaric instability degree (%)	**MANNOSTAB® LIQUIDE 200** Dosage (mL/hL)
< 4.8	stable
4.8 to 8	50
8.1 to 11	75
11.1 to 14	100
14.1 to 17	100 - 120
17 to 20	150
20.1	**Not stabilisable with only MANNOSTAB® LIQUIDE 200**

IMPLEMENTATION

- Homogenise the **MANNOSTAB® LIQUIDE 200** solution.
- For still wines, incorporation should be completed before the last filtration with a dosing pump or an **OENODOSEUR** on wines already fined and clarified. Make sure the homogenization is perfect.
- We recommend incorporating **MANNOSTAB® LIQUIDE 200** at least 48 hours before filtration.
- For sparkling wines, incorporation of **MANNOSTAB® LIQUIDE 200** should be done either during tirage (less stacking risks) or during disgorging (in this case anticipate the filtration of the **MANNOSTAB® LIQUIDE 200** solution) in the expedition liqueur.

STORAGE RECOMMENDATION

- Store above ground level in a dry area not liable to impart odours. Ensuring stock is kept at a moderate temperature (in frost-free conditions), in its original, unopened packaging.
- Optimal date of use: 2 years.
- Do not use opened packaging.

PACKAGING

1 L and 10 L can.

IMPORTANT: To the extent that the conditions of use are beyond its control, LAFFORT® cannot be held responsible for failure to successful treatment and the appearance of salt crystals of tartaric acid.

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