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 regulation (EC) n° 606/2009.

SPECIFICATIONS

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 (Paten 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.

PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Aspect</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>dark brown</td>
</tr>
<tr>
<td>Density</td>
<td>1.08 kg/L</td>
</tr>
</tbody>
</table>

Soluble in water (dark brown colour), insoluble in ethanol

CHEMICAL AND MICROBIOLOGICAL ANALYSES

<table>
<thead>
<tr>
<th></th>
<th>Dry residues</th>
<th>SO₂</th>
<th>Analysis on dry product:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≥ 20%</td>
<td>1,5 g/L ± 0,3</td>
<td>Ashes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt; 8%</td>
</tr>
<tr>
<td>Total nitrogen</td>
<td>[5-75] g/Kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polysaccharides eq. mannose</td>
<td>&gt; 600 g/Kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy metals (Pb)</td>
<td>&lt; 30 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerobic mesophile bacteria</td>
<td>&lt; 10^4 UFC/g</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Staphylococcus aureus</th>
<th>none/g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coliformes</td>
<td>&lt; 10 UFC/g</td>
<td></td>
</tr>
<tr>
<td>Salmonella</td>
<td>none/25g</td>
<td></td>
</tr>
<tr>
<td>E. coli</td>
<td>none/25g</td>
<td></td>
</tr>
<tr>
<td>Lactic acid bacteria</td>
<td>&lt; 10^4 UFC/g</td>
<td></td>
</tr>
<tr>
<td>Yeast</td>
<td>&lt; 10^2 UFC/g</td>
<td></td>
</tr>
<tr>
<td>Mould</td>
<td>&lt; 50 UFC/g</td>
<td></td>
</tr>
</tbody>
</table>

Microscopic observation of potassium bitartrate crystals evolution at -4°C in solutions with and without 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.

**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)

<table>
<thead>
<tr>
<th>Tartaric instability degree (%)</th>
<th>MANNOSTAB® LIQUIDE 200 Dosage (mL/hL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4.8</td>
<td>stable</td>
</tr>
<tr>
<td>4.8 to 8</td>
<td>50</td>
</tr>
<tr>
<td>8.1 to 11</td>
<td>75</td>
</tr>
<tr>
<td>11.1 to 14</td>
<td>100</td>
</tr>
<tr>
<td>14.1 to 17</td>
<td>100 - 120</td>
</tr>
<tr>
<td>17 to 20</td>
<td>150</td>
</tr>
<tr>
<td>20.1</td>
<td>Not stabilisable with only MANNOSTAB® LIQUIDE 200</td>
</tr>
</tbody>
</table>

**Storage**

- Store in original packaging in a dry cool place and odourless environment.
- Optimal date of use: 2 years.
- Do not use opened can.

**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.