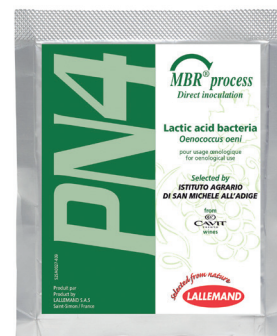


PN4™



APPLICATION

PN4™ was isolated and selected by the Institute of San Michele in Trentino, Italy. This lactic acid bacteria stood out as a robust microorganism that demonstrates its capacity to achieve malolactic fermentation for red and white wines in limiting conditions for pH, alcohol, SO₂ and temperature. In red wines, **PN4™** is recognized to highlight spiciness and structure ; in traditional white wines, it will contribute to buttery flavour and mouthfeel, which will support the integration of oak.



MICROBIAL AND OENOLOGICAL PROPERTIES

- pH tolerance > 3.1
- Alcohol tolerance: up to 15.5% vol.
- SO₂ tolerance: up to 60 mg/L total SO₂
- Pay attention to molecular SO₂ at low pH
- T° tolerance > 16°C
- Moderate nutrient demand
- Good implantation
- MLF kinetic: Fast
- Low volatile acidity production
- No production of biogenic amines
- Co-inoculation possible.

The MBR® form of lactic acid bacteria represents a Lallemand specific process that subjects the lactic acid bacteria cells to various biophysical stresses, making them better able to withstand the rigors of direct addition to wine. The conditioned MBR® lactic acid bacteria that survive are robust and possess the ability to conduct reliable malolactic fermentation (MLF).

SENSORY PROPERTIES

Beyond bio-deacidification, **PN4™** is a true winemaking agent, which contributes to the sensory complexity and the quality of wine as follows:

Structure Spiciness

Buttery impact (Diacetyl production):

- Moderate to high in Sequential inoculation
- Low in Co-inoculation

Banana and honey structure
Barrel fermented wines
Varietal aromas

Structure
Increases general perception of fruitiness

This sensory contribution can be further supported by the combination with an appropriate selected yeast and timing of ML bacteria inoculation.

INSTRUCTIONS FOR USE

SEQUENTIAL INOCULATION (Post-alcoholic fermentation)

Bacteria inoculation: two options:

- 1) Direct inoculation without rehydration : open the sachet and add the bacteria directly into the wine after the end of alcoholic fermentation at the top of the tank or while racking the tank and ensure good mixing.
 - 2) Direct inoculation with rehydration step: for best distribution, you can rehydrate the packet of freeze-dried selected wine bacteria in 20 times its weight of clean chlorine free water at 20°C for a maximum 15 minutes. Add this suspension directly to the wine towards the end of or after the alcoholic fermentation.
- Stir gently to evenly distribute the selected wine bacteria and minimize the oxygen pickup.
 - Check malolactic fermentation activity (malic acid degradation) every 2 to 4 days.
 - Stabilize wine once malolactic fermentation (MLF) is finished.

Recommended temperature range:

- White wine / rosé wine: from 16 to 20°C.
- Red wine: from 17 to 25°C.

If limiting conditions (high alcohol > 14.5 vol, or low pH < 3.1, or high SO₂ > 45 ppm), from 18 to 22°C, check malolactic fermentation activity (malic acid degradation) every 2 to 4 days.

CO-INOCULATION

(Simultaneous alcoholic fermentation)

1) Yeast addition

Rehydrate the selected dry yeast according to the instructions. Preferably in presence of a rehydration nutrient and inoculate the must.

2) Bacteria addition

Depending on the SO₂ addition at crush:

- < 5 g/hL (50 ppm SO₂ added): wait for 24 hours
- 5-8 g/hL (50-80 ppm SO₂ added): wait for 48 hours
 - Direct inoculation of bacteria without rehydration : open the sachet and add the bacteria directly to the must/ wine to be fermented from the top of the tank (white must) or during a pumping-over (red must).
 - Direct inoculation with rehydration step: for best distribution, you can rehydrate the packet of freeze-dried lactic acid bacteria in 20 times its weight of clean chlorine free water at 20°C for a maximum of 15 minutes and add the suspension to the must/ wine to be fermented.
- Assure a good distribution.
- Carefully monitor must temperature, which must be below 30°C at lactic acid bacteria inoculation (alcohol < 5% vol) and below 27°C when the level of 10% of alcohol is reached.
- Complex nutrients addition at 1/3rd of alcoholic fermentation is recommended.
- Monitor malic acid and volatile acidity.
- If MLF takes place during AF and an unusual increase in volatile acidity is observed add **Bactiless™** (20-50 g/hL).
- Top the wine to ensure minimum ullage after alcoholic fermentation (AF) if MLF is not completed.
- Otherwise rack and stabilize after MLF

PACKAGING AND STORAGE

- Product in powder form obtained by lyophilisation.
- Available for 2,5 hL, 25 hL and 250 hL.
- This product can be stored for 18 months at 4°C and 36 months at - 18°C in original sealed packaging. Once opened, the sachet must be used immediately.
- During delivery, sealed packets can be held at ambient temperature for 3 weeks (< 25°C) without significant loss of viability.

The information herein is true and accurate to the best of our knowledge; however, this data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.