



PN4™

Oenococcus oeni

MBR™ process
direct inoculation

Robust wine bacteria for a wide range of wine conditions



As a producer of wine lactic acid bacteria, Lallemand developed a specific MBR™ production process that subjects the wine bacteria cells to various biophysical stresses, making them 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).

DESCRIPTION

PN4™ was isolated from nature and selected by Fondazione Edmund Mach in Trentino, Italy.

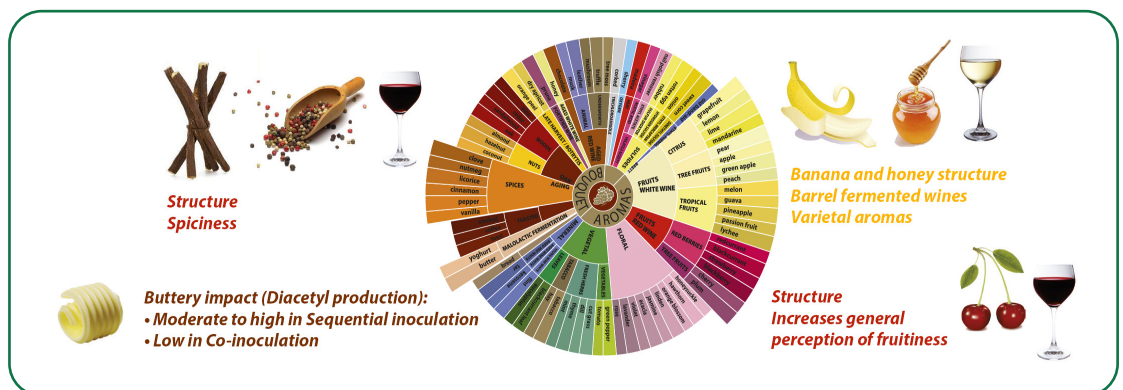
Produced with our MBR™ process, PN4™ is very competitive which helps to a rapid start of MLF with its good dominance in the must or wine. PN4™ has the capacity to achieve malolactic fermentation for red and white wines in limiting conditions.



BENEFITS & RESULTS

PN4™ is a robust and reliable wine bacteria for difficult wine conditions (up to 15.5% vol. of alcohol, pH > 3.1 or total SO₂ up to 60 mg/L), with an easy-to-use protocol (direct inoculation without any rehydration step).

Beyond bio-deacidification PN4™ contributes to the wine sensory profile. In red wines, PN4™ highlights spiciness and structure; in traditional white wines, it will contribute to buttery flavor and mouthfeel, which will support the integration of oak.



PN4™ is a bio-protection tool to protect wines against *Brettanomyces* when inoculated as soon as possible to prevent the excessive development of the spoilage yeast.

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 nutritional demand
- Good implantation
- MLF kinetic: fast
- Low volatile acidity production
- No production of biogenic amines
- Co-inoculation possible
- Bacteria cinnamoyl esterase negative: cannot produce precursors for ethylphenol production by *Brettanomyces*

INSTRUCTIONS FOR OENOLOGICAL USE

Use one sachet for right quantity of hL indicated on label. Lowering the dosage or doing cross seeding or pitching methods will reduce the bacteria performance.

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:

- SO₂ addition < 5 g/hL: wait for 24 hours
- SO₂ addition 5-8 g/hL: 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 % alcohol is reached.
 - Complex nutrients addition at 1/3rd of alcoholic fermentation is recommended.
 - Monitor malic acid and volatile acidity.
 - Top the wine after alcoholic fermentation (AF).
 - Otherwise rack and stabilize after MLF.

Sequential inoculation (post-alcoholic fermentation)

Bacteria inoculation: two options

- 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 emptying the tank.
- 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 the alcoholic fermentation.
 - Stir gently to evenly distribute the selected wine bacteria and minimize the oxygen pickup.
 - Under more difficult conditions, add a specific bacteria nutrient.
 - Monitor malolactic fermentation activity (malic acid degradation) every 2 to 4 days.
 - Stabilize wine once malolactic fermentation (MLF) is finished.

Recommended temperatures:

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

If limiting conditions (high alcohol > 14.5 vol, or high SO₂ > 45 ppm): from 18 to 22°C.

PACKAGING & STORAGE

- Product in powder form obtained by lyophilization.
- Dose for 25 hL (660 US gal) and for 250 hL (6,600 US gal).
- Once opened, the sachet must be used immediately.
- This product can be stored for 18 months at 4°C / 39°F and 36 months at - 18°C / 0°F in original sealed packaging.
- During delivery, sealed packets can be held at ambient temperature for 3 weeks (< 25°C / 77°F) without significant loss of viability.

Distributed by:

The information in this document is correct to the best of our knowledge. However, this data sheet should not be considered to be an express guarantee, nor does it have implications as to the sales condition of this product. January 2022.



WINE
YEASTS



WINE
BACTERIA



NUTRIENTS
/PROTECTORS



SPECIFIC
YEAST DERIVATIVES



ENZYMES



CHITOSAN



VINEYARD
SOLUTIONS



LALLEMAND OENOLOGY

Original by culture