



QUESTIONS & ANSWERS

ML Prime™

What is ML PRIME™?

ML PRIME™ is a **unique wine bacteria** (100% *Lactiplantibacillus plantarum*) **with unrivalled oenological properties**, associated with a highly specific production process activating its enzyme pool necessary for a very fast consumption of malic acid.

Thanks to its very high malolactic activity, ML PRIME™ is able to achieve malolactic fermentation in 3 days with no risk of volatile for high pH red wines. [TDS ML PRIME RED EN.pdf \(sharepoint.com\)](#)

ML PRIME™ is also able to perform MLF in rosé and white wines. In these conditions, ML PRIME™ tolerates lower pH, higher content of malic acid, but the window of applications is not as easy to build as for red wines, to secure 100% of MLF. [TDS ML PRIME WHITE EN.pdf \(sharepoint.com\)](#)

What are its main benefits ?

ML PRIME™ achieves a very quick malolactic fermentation (< 7 days) during alcoholic fermentation without any risk of volatile acidity production in red vinification process.

What is the difference between ML PRIME™ and our selected *Oenococcus oeni*?

ML PRIME™ is a *Lactiplantibacillus plantarum* strain and behaves very different from *Oenococcus oeni*. It does not have the capacity to grow (multiply in wine). ML PRIME™ also has a facultative heterofermentative metabolism (while *Oenococcus oeni* has an obligatory heterofermentative metabolism) which means that ML PRIME™ cannot produce volatile acidity from glucose and fructose, and neither from citric acid (no citric acid metabolism). It is powerful because it is not the case of NOVA bacteria range for instance!

In which conditions can I use ML PRIME™?

To ensure a complete malolactic fermentation, the window of application of ML PRIME™ must be respected: only in co-inoculation of red must, SO₂ addition ≤ 5 g/h, pH ≥ 3.4, malic acid ≤ 3 g/L, temperature between 20 and 26°C.

ML PRIME™ can be used in co-inoculation in white or rose musts or in post AF inoculation, with different recommendations. Please see below.

What is the best moment of addition?

ML PRIME™ can be used directly in co-inoculation in red must (or in Rosé or White must) 24 hours after yeast inoculation. For a use in post-alcoholic fermentation, a pre-lab test is mandatory to determine the success of the malolactic fermentation. [PROTOCOL ML PRIME LAB TEST 2.5G EN.pdf](#)



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Is an inoculation of ML PRIME™ before the yeast inoculation possible?

Chr Hansen (now Novogenesis) had a patent protecting this moment of application, but this patent is not valid anymore. So, yes, we could use ML PRIME™ before yeast inoculation. However, our recommendations remain 24 hours after yeast inoculation to get the best efficiency of ML PRIME™.

What is the temperature tolerance of ML PRIME™?

Between 20°C and 26°C in red must.

Between 17°C and 22 °C in white must.

Between 20°C and 22°C in sequential inoculation (post AF inoculation). A pre-lab test is mandatory to determine the success of the malolactic fermentation.

What is the pH tolerance of ML PRIME™?

pH ≥ 3.4 in red must.

pH ≥ 3.05 in white and rosé must.

pH ≥ 3.05 in sequential inoculation (post AF inoculation) - A pre-lab test is mandatory to determine the success of the malolactic fermentation.

What is the alcohol tolerance of ML PRIME™?

Alcohol tolerance up to 16% v/v.

In sequential inoculation (post AF inoculation), a pre-lab test is mandatory to determine the success of the malolactic fermentation. Depending on wine conditions, the alcohol tolerance can be higher 16% v/v.

Which levels of SO₂ ML PRIME™ can withstand?

When used in co-inoculation: total SO₂ tolerance max is 5 g/hL (total addition before inoculation with ML PRIME™).

When used in sequential inoculation with a mandatory lab pre-test, the tolerance of SO₂ can be higher depending on the wine matrix and the dosage of ML PRIME™.

How long does it take to complete the malolactic fermentation?

ML PRIME™ has no lag phase and ultra-fast malolactic fermentation kinetic (malic acid can be consumed between 3 and 10 days depending on grapes and musts matrix). Malolactic fermentation is achieved before the end of alcoholic fermentation. It allows a very early stabilization of wines.

Can I reduce the dosage?

No. To ensure a successful malolactic fermentation in red must, it is very important to respect the dosage of 10 g/hL (25g for 2.5 hL, 250g per 25 hL or 1kg per 100 hL, 2.5kg for 250hL).

For white must, some markets want to achieve a partial malolactic fermentation and can adapt the dosage, following an Austrian study done with an institute (case of Lallemmand GmbH team).

For sequential inoculation, in case of difficult wine conditions, double dosage can be a solution but a pre-lab test is mandatory.



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Do I have to rehydrate ML PRIME™?

ML PRIME™ can be inoculated directly in the must. But for a better distribution, ML PRIME™ can also be quickly rehydrated in a mix of must and drinking water (50/50). In both cases, it is important to ensure an homogenization of the must after ML PRIME™ inoculation.

Is there a risk of increasing the volatile acidity with ML PRIME™?

No risk of production of volatile acidity due its facultative heterofermentative metabolism (does not produce acetic acid out of glucose and fructose and from citric acid).

Does it ML PRIME™ produce diacetyl?

ML PRIME™ does not degrade citric acid, so it does not produce diacetyl.

Does ML PRIME™ produce acetaldehyde?

No, ML PRIME™ does not produce acetaldehyde, and it is not a positive acetaldehyde strain (wording coming from competition and does not mean nothing !). ML PRIME™, which is associated with ultra-fast malolactic fermentation activity, concludes MLF before the end of alcoholic fermentation (AF), potentially leaving some residual acetaldehyde content. This residual acetaldehyde can be beneficial for enhancing colour intensity and stability in red wines. Notably, no oxidative issues have been reported with this product over the past decade

Does ML PRIME™ produce biogenic amines?

No. ML PRIME™ does not produce biogenic amines.

Does ML PRIME™ increase the levels of precursors of volatile phenols?

No. ML PRIME™ is a bacteria cinnamoyl esterase negative. It cannot produce precursors for volatile phenols production by *Brettanomyces*.

Does ML PRIME™ offer an efficient bioprotection against Brettanomyces?

No. ML PRIME™ is not capable of inhibiting or controlling the growth of *Brettanomyces*. The use of *Oenococcus oeni*, which is well known for its bioprotective properties against Brettanomyces, is recommended in any known risk situation.

Is ML PRIME™ sensitive to chitosan-based products such as BACTILESS™ or ALLIANCE™?

ML PRIME™ shows a good resistance to chitosan-based products. When added on must, MLF is fully achieved when it is not possible with *Oenococcus oeni*.

When BACTILESS™ or ALLIANCE™ is added post alcoholic fermentation/before malolactic fermentation, ML PRIME™ can work, but a lab pre-test has to be done to confirm its efficiency on the concerned wine.



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Is there any incompatibility with a selected *Saccharomyces cerevisiae*?

ML PRIME™ is compatible with all selected *Saccharomyces cerevisiae*, except specific selections producing malic acid (such as IONYS_{WF}™).

ML PRIME™ has already finished to degrade malic acid present in the must and started to “die” while these specific *Saccharomyces* will continue to produce malic acid so there is a potential risk of “residual malic acid”.

Can ML PRIME™ be used in a protocol containing selected *Lachancea thermotolerans* strains?

Yes. In that case, it is possible to inoculate ML PRIME™ at the same time than *Lachancea thermotolerans* (LEVEL² LAKTIA™, BLIZZ™, etc.) or at the same time as *Saccharomyces cerevisiae*.

Is ML PRIME™ resistant to fumaric acid?

No (same as *Oenococcus oeni*). ML PRIME™ like other lactic acid bacteria die in presence of fumaric acid at dosage > 0.3g/L.

Is there other product incompatible with ML PRIME™?

Yes, there is: IONYS_{WF}™ is not compatible with ML PRIME™ use, because IONYS_{WF}™ will produce malic acid until the end of alcoholic fermentation while ML PRIME™ will already have finished to degrade malic acid present in the must and started to “die”. Therefore final wine can have residual malic acid content produced by IONYS_{WF}™.

How ML PRIME™ impact the color of red wines?

ML PRIME™ has a positive impact on colour intensity and stabilisation. As ML PRIME™ achieves a faster malolactic fermentation than *Oenococcus oeni*, the content of acetaldehyde is higher and allows an early natural wine color stabilization. Trials showed that ML PRIME™ can give better results than the usual combination of alcoholic fermentation / micro-oxygenation / sequential inoculation with *Oenococcus oeni*.

What is the sensorial contribution of ML PRIME™?

ML PRIME™ contributes to produce fresh red wines with good structure. Its ability to induce a slight increase of L-lactic acid production preserves the freshness of wine.

On white and Rosé wines, ML PRIME™ contributes produce fresher wines and fruit-driven wines.

Can I use ML PRIME™ on white wines?

For a partial deacidification, ML PRIME™ can be used in co-inoculation or sequential inoculation of must or wine with high initial malic acid content. The percentage of malic acid degradation depends on the must or wine conditions and can vary between 20% and 90%. A precise prediction of how much malic acid will remain in the wine is not possible and the degradation of malic acid does not exceed two weeks after inoculation with ML PRIME™. A pre-lab test can be used to estimate the degradation of malic acid.



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On white vinification processes, our Lallemand GmbH colleagues manage well the calculating of inoculation rate of ML PRIME™ to perform a partial or a complete MLF in their areas, depending on the must/wine conditions.

Can I use ML PRIME™ to restart a stuck malolactic fermentation?

Yes, but a pre-lab test is mandatory to determine the success of the stuck malolactic fermentation.



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Summary of ML PRIME™ and its application

MATRIX	EFFICIENCY	TIMING OF INOCULATION	CONDITIONS	DOSAGE	COMMENTS
Red must/grapes	Complete MLF	24h after yeast inoculation	SO ₂ addition ≤ 5 g/hL pH ≥ 3.4 malic acid ≤ 3 g/L 20°C ≤ T ≤ 26°C	10 g/hL	Also good protection of colour and impact on wine freshness
White must/wine	Complete or partial MLF in white (depends on matrix)	24h after yeast inoculation or in sequential inoculation	To obtain a partial degradation of malic acid (at least 20%): SO ₂ addition ≤ 5 g/hL in must and ≤ 10 mg/L in wine pH ≥ 3.05 malic acid ≤ 8 g/L 17°C ≤ T ≤ 22°C	10 g/hL	% of malic acid degradation: between 20% and 90% A pre-lab test can be used to estimate the degradation of malic acid
White & Red wines	Curative solution (stuck MLF, high SO ₂ wine content, high alcohol ...)	Post-AF	A pre-lab test is mandatory 20°C ≤ T ≤ 22°C	Depending on the pre-lab test: 10 g/hL or 20 g/hL	Obligatory lab pre-test with specific protocol