



catalog *Laffort*  
2018 2019



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# vent d'anges

2018 — 2019

**F**ounded in 1895 in Bordeaux by Jean Laffort, the **LAFFORT®** Company was oriented from its very beginning in research and in particular, the work of Louis Pasteur. Today, there are 21 people working in the **LAFFORT®** Research & Development department, and 18 patents and 20 theses have been funded by **LAFFORT®** in the last 25 years.

For 120 years, **LAFFORT®** has specialized in its core business: developing, producing and marketing quality winemaking products. Innovation has always characterized the company: innovation in the production process, in the application of the product, or in the product itself. Innovation has constantly resulted in the continued improvement of quality, reliability and specificity of our products.

Today, the **LAFFORT®** group is a leader in its field. Its commitment to quality is at the heart of the organization. **LAFFORT®** continues to invest to ensure the highest level of quality, consistency and reproducibility, while assuring top priority to ingredient security and regulatory compliance. **LAFFORT®** has great confidence in the future of its partnership with winemakers and producers from around the world.

**I**n 2016, **LAFFORT®** expanded its premises with the addition of a new building specially dedicated for the expansion in research and for quality control. The fitout of the reception foyer at these new premises was born out of the idea of using pictures illustrating the various stages of wine production, by drawing on the talents of Bordeaux artist JOFO, who is well known for his "Toto" characters which are defined by their small round figures and deceptively innocent appearance. Displayed on the cover of this catalog is the painting "Vent d'ange", a collaboration between **LAFFORT®** and JOFO, created out of a desire to take an entirely fresh approach to our profession, in this instance, to vintages specifically.



"Angles", vintages, vintagers, wine professionals, we wish you a good "vent d'anges" 2018!

Luc LAFFORT

## TRAVEL IN THE HEART OF ENOLOGY

To watch our corporate video, scan this code or go to: [www.laffort.com/en/video](http://www.laffort.com/en/video)



La Cité du Vin  
Mécène Bâtisseur

**LAFFORT®**, pioneering sponsor of  
«La cité du vin».

# NEW PRODUCTS

2018  2019

## ZYMAFLORE® ÉGIDE<sup>TDMP</sup>

*A formulation of two strains (*Torulaspora delbrueckii* and *Metschnikowia pulcherrima*) for grape bioprotection and as an SO<sub>2</sub> reduction strategy.*

These strains, which were selected from among the grape's indigenous flora for their organoleptic neutrality, will colonize the medium and restrict the growth of degrading organisms in the pre-fermentation stages.

P. 8



## LACTOENOS® B7 DIRECT

A new highly efficient and easy to use large-spectrum bacterium which is directly inoculated into the wine. LACTOENOS® B7 DIRECT has been extensively tested over the past three years and has proven reliable in conditions of low pH levels (from 3.2), high alcohol (up to 16% by vol.) and high SO<sub>2</sub> (up to 60 mg/L in total) levels.

P. 28



## LAFASE® XL PRESS

*A purified liquid enzyme for maceration and pressing during the white wine and rosé vinification processes.*

This specific enzyme increases high quality juice yields, thereby decreasing the duration of press cycles. Achieving juice yields at lower pressure reduces the crushing of skins and seeds to limit the extraction of phenolic compounds.

P. 33



## Decision - Making Tool

FOR AN OPTIMIZED YEAST NUTRITION

Available on [www.laffort.com/en/research-and-innovation/decision-making-tool](http://www.laffort.com/en/research-and-innovation/decision-making-tool)



For further information about this decision-making support tool see end of catalog (inside back cover).



## MICROControl®

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### *Microbiological Stabilization of wines.*

In order to reduce the microbial load of wine during maturation, LAFFORT® developed this formulation based on the combined action of chitosan from *Aspergillus niger*, a plant protein (potato protein isolate) and a blend of pectinase and  $\beta$ -glucanase enzymes.

Through its wide-spectrum action on microorganisms (yeast, lactic acid bacteria and acetic acid bacteria\*), MICROControl® can be integrated into wine production methods utilizing an SO<sub>2</sub>-reducing strategy, and can offer an alternative to lysozyme, as well as surpass lysozyme in providing better protection.

*\*By means of a binding action and overall microbial load reduction.*

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## BACTIControl®

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### *Specific microbiological protection against lactic acid bacteria.*

Inspired by years of observations in the field, this formulation was created using chitosan from *Aspergillus niger*, lysozyme and a blend of pectinase and  $\beta$ -glucanase enzymes. BACTIControl® is intended for use in the microbiological protection of wines and particularly in the reduction of lactic acid bacteria populations as a means of halting or delaying malolactic fermentation. The synergistic effect of the  $\beta$ -glucanase and lysozyme enzymes also effectively counteracts the growth of ropy *pediococcus*.

P. 61



## Nobile® Blocks 18

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*Being thicker than our 7 mm or 12 mm blocks, the new Nobile 18 mm blocks impart an abundance of volume and body in the mid-palate.*

### 18 - XBASE

Fruity without toasty notes. Lingering full-bodied finish with a soft oak bouquet.

### 18 - XTREME

Very fragrant expression of ripe fruit. Sweetness with notes of mocha and roasted coffee.

### 18 - DIVINE

Texture. Long fruity notes with a complex finish (Burgundy-barrel elegance).



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# LAFFORT® QUALITY MANAGEMENT



As part of our global quality management policy, based on ISO 9001 certification (since 1999) and HACCP evaluation (since 2005), we continuously strive to meet your needs to the best of our ability. Certificates are available on the **LAFFORT®** website, which prove the quality of **LAFFORT®** products with regard to the following points:

- List of allergenic products
- REACH certificate
- General certificate
- List of **LAFFORT®** products usable in the organic winemaking and/or the U.S. National Organic Program (NOP) winemaking regulations.
- Kosher certificates

To download our certificates, scan this code or go to: <http://www.laffort.com/en/quality-management/245>



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# ZYMAFLORE®

*Yeast excellence*

## ALL TYPES OF WINES

## RED WINE

VARIETALS	Yeast	Alcohol Resistance* (%v/v)	Nitrogen Requirements	Optimal Fermentation Temperature °F	Fermentation Kinetics	Sensory Impact
WHITES AND REDS FOR COMPLEX AROMATIC PROFILE AND INCREASED MOUTHFEEL.	<b>Alpha</b>	8-10%	Medium	50 – 79	Slow	Varietal, Volume
CABERNET, MERLOT, PINOT NOIR, MALBEC	<b>F15</b>	16%	Medium	68 – 90	Rapid	Fruit, Mouthfeel
GRENACHE, SYRAH, BARBERA	<b>F83</b>	16.5%	Medium	68 – 86	Regular	Fruit, Mouthfeel
CABERNET, CABERNET FRANC, MERLOT, TEMPRANILLO	<b>FX10</b>	16%	Low	68 – 95	Regular	Neutral, Mouthfeel
PINOT NOIR, MERLOT	<b>RB2</b>	15%	Low	68 – 90	Regular	Varietal
ZINFANDEL, PETITE SIRAH, SYRAH	<b>RX60</b>	16.5%	High	68 – 86	Regular	Varietal
ALL REDS	<b>XPURE</b>	16%	Low	59 – 86	Regular	Fruit, Volume
CHARDONNAY	<b>CH9</b>	16%	Medium	57 – 72	Regular	Varietal, Volume
GRENACHE BLANC, RIESLING, PINOT GRIS, VIOGNIER	<b>Delta</b>	15%	High	57 – 72	Regular	Varietal
ALL SPARKLING BASE WINES TIRAGE BOTTLING	<b>Spark</b>	17%	Low	50 – 90	Rapid	Neutral
LATE HARVEST, SEMILLON, RIESLING	<b>ST</b>	15%	High	57 – 68	Regular	Varietal
CHARDONNAY, RIESLING, GEWÜRZTRAMINER, MUSCAT	<b>VL1</b>	14.5%	High	61 – 68	Regular	Varietal
CHARDONNAY, VIOGNIER, ROUSSANNE	<b>VL2</b>	15.5%	Medium	57 – 68	Regular	Varietal, Volume
SAUVIGNON BLANC, VERMENTINO, GEWÜRZTRAMINER PINOT GRIS, ROSÉ	<b>VL3</b>	14.5%	High	59 – 70	Regular	Varietal, Volume
SAUVIGNON BLANC, ALBARIÑO, ROSÉ	<b>X5</b>	16%	High	55 – 68	Rapid	Varietal, Esters
CHARDONNAY, VIOGNIER PINOT GRIS, CHENIN BLANC, ROSÉ	<b>X16</b>	16.5%	Medium	54 – 64	Rapid	Esters
ORGANIC	<b>011 BIO</b>	16%	Low	57 – 79	Rapid	Neutral

## ORGANIC

ZYMAFLORE® EGIDE<sup>TDMP</sup> is not included in this table due to the fact that it is a bioprotective agent. Rather than for fermentation it is used to colonize the medium prior to using a fermentation yeast.

\* Yeast alcohol tolerance depends on nutrition, temperature, etc. It is recommended to use **SUPERSTART® ROUGE** (for red wines) or **SUPERSTART® BLANC** (for white and rosé wines) and a higher yeast dose rate for wines with high alcohol potential.



## ZYMAFLORE® XPURE

**Yeast for red varietal wines, which enhances aromatic purity.**

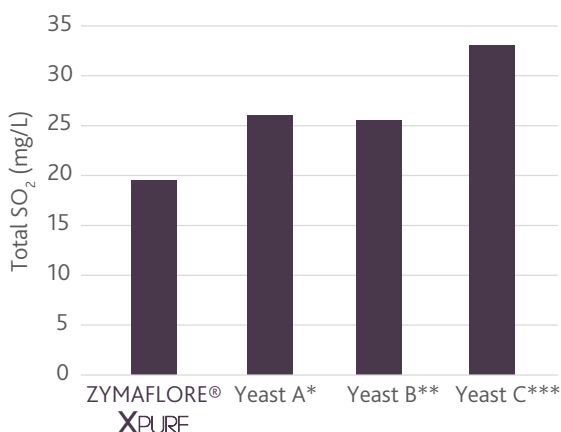
Due to its very low production of undesirable sulfur compounds (notably SO<sub>2</sub> and H<sub>2</sub>S) as well as compounds binding SO<sub>2</sub>, ZYMAFLORE® XPURE is suited to developing red wines of great aromatic purity, fully expressing the aromatic potential of the grapes.

ZYMAFLORE® XPURE also contributes to decreasing the perception of vegetal characters, and promotes the expression of dark fruit and aromatic freshness. Wines from this strain have great suppleness in the mouth.

ZYMAFLORE® XPURE is a result of successive controlled non-GMO cross breeding; its fermentation capabilities are excellent.



500 g  
10 kg

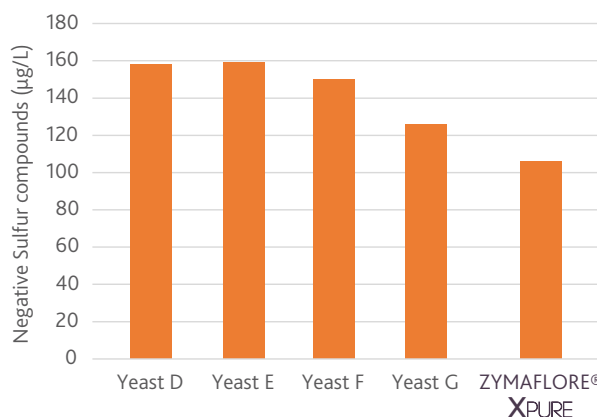


Total SO<sub>2</sub> concentrations at the end of fermentation.  
Merlot 2014 (15.5% v/v, pH 3.50).

\* Yeast A: Popular commercial yeast recommended for red wines.

\*\* Yeast B: Commercial yeast producing low amounts of SO<sub>2</sub> and H<sub>2</sub>S.

\*\*\* Yeast C: Commercial yeast promoted for its low H<sub>2</sub>S production.



Negative Sulfur compound concentrations at the end of fermentation. Merlot 2014 (13.5% v/v, pH 3.49, TA 4.09 g/L H<sub>2</sub>SO<sub>4</sub>, Total Phenolic Index 54).

In the same trial as above, CL35\* was also measured, in addition to negative Sulfur compounds. ZYMAFLORE® XPURE (58 ppm) shows similar CL35 levels to yeast D (55 ppm), and significantly lower than yeast E, F, and G. ZYMAFLORE® XPURE produces very low amounts of SO<sub>2</sub> combining compounds, such as pyruvate, 2-oxoglutarate and acetaldehyde).

\*CL35: Required total SO<sub>2</sub> to reach 35 ppm of free SO<sub>2</sub>. The higher the value (of CL35), the more the wine contains compounds binding SO<sub>2</sub>.

Yeast rehydration  
protocol





# Non SACCHAROMYCES

Yeast excellence

## ZYMAFLORE® ÉGIDE<sup>TDMP</sup>

A formulation of two strains (*Torulaspora delbrueckii* and *Metschnikowia pulcherrima*) for use in harvest bioprotection of grapes and juices, and as an SO<sub>2</sub> reduction strategy.

These strains selected from among the grape's indigenous flora for their organoleptic neutrality will colonize the medium and control the microflora in the pre-fermentation stages.

Combining these two high implantation capacity species, one cryophilic and more SO<sub>2</sub> resistant (*Torulaspora* -in situations where SO<sub>2</sub> is added to grapes) and the second ensuring a healthy grape inoculation (*Metschnikowia*-ensures that the medium is protected by micro-organisms) produces a positive result in a wide range of circumstances.

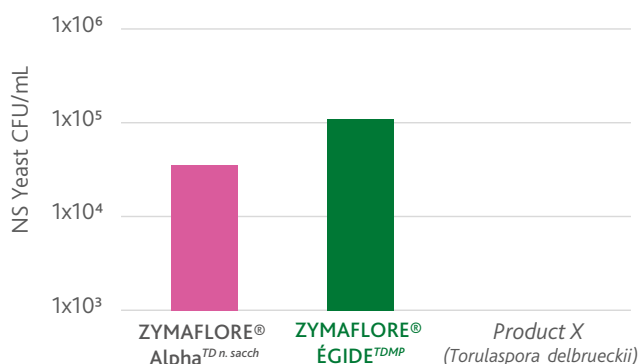
The bioprotective effects of this preparation have been validated by the results of studies:

- Colonization of the medium without any detected fermentation activity (no assimilation of sugars or nitrogen, no difference in turbidity levels at the end of the settling process).
- Restriction of the growth of indigenous flora.
- Implantation of the inoculated *Saccharomyces cerevisiae* strain facilitated.

Dosage: 50 ppm of ZYMAFLORE® ÉGIDE<sup>TDMP</sup> directly, rehydrated or non-rehydrated, on grapes or must (healthy grapes). Use a dosage of 100 ppm in case of temperature below 40°F. Next, inoculate with *Saccharomyces cerevisiae* (at usual dosage) to ensure complete alcoholic fermentation.



500 g



181 g/L sugars, initial 160 mg N/L content, settling temperature of 55°F for 14h.

Enumeration of non-Saccharomyces yeasts at the end of the settling process. Must inoculation with different species after pressing at 100 ppm with no sulfiting.

The control represents a non-inoculation procedure. Bioprotection is clearly evident after inoculation with ZYMAFLORE® ÉGIDE<sup>TDMP</sup> and the non-Saccharomyces yeasts detected represent only the *T. delbrueckii* and *M. pulcherrima* species.

## ZYMAFLORE® Alpha<sup>TD n. Sacch</sup>

Non-Saccharomyces yeast (*Torulaspora delbrueckii*) for a complex aromatic profile and increased mouthfeel. For red wines during pre-fermentation maceration, and all white and rosé varieties.

- Allows for reduced dosage of SO<sub>2</sub>.
- Controls microbial flora during pre-fermentation maceration.
- Increases aromatic complexity of both varietal and fermentation aromas.
- Increases mouthfeel volume through high polysaccharides production.
- Low volatile acidity production in high sugar and *Botrytis* infected musts.
- Inoculate with a strain of *Saccharomyces cerevisiae* of your choice 24 to 72 hours after the addition of ZYMAFLORE® ALPHA to secure the completion of the alcoholic fermentation and to benefit from the sensory impact of ZYMAFLORE® ALPHA.

Dosage: 300 ppm for dry wines; 400 ppm for desert wines.



500 g







# RED WINES

Yeast excellence

## ZYMAFLORE® RX60

**Yeast for fruity, spicy red wines. Syrah, Petite Sirah, Zinfandel, Grenache, Tempranillo and fruit forward wines....**

- Very high aroma production (fresh currant and berry aromas).
- Low production of H<sub>2</sub>S.
- LACTOENOS® 450 PREAC® recommended in early co-inoculation to preserve aromatic freshness.

Dosage: 150 - 300 ppm.

500 g  
10 kg



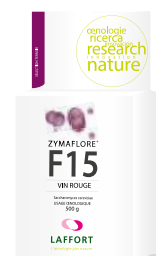
## ZYMAFLORE® F15

**Yeast for rounded, full bodied wines. Merlot, Cabernet Sauvignon, Malbec, Pinot Noir...**

- Isolated from one of the best terroirs in Bordeaux.
- Broad aromatic spectrum.
- Fermentation security, high compatibility with bacteria strains.
- Produces wines suitable for extended aging.

Dosage: 150 - 300 ppm.

500 g  
10 kg



## ZYMAFLORE® RB2

**Yeast for fruity and elegant red wines. Pinot Noir, Nebbiolo, Merlot...**

- Strain isolated from a premium estate in Burgundy.
- Low color matter adsorption.
- Good aptitude for expressing varietal aromas of cherry/kirsch.

Dosage: 150 - 300 ppm.

500 g  
10 kg



“On the recommendation of our LAFFORT Representative, we conducted a trial using the LAFFORT Tannin Synergy protocol (LAFASE HE GRAND CRU®, VR SUPRA® ELEGANCE and VR COLOR® with ZYMAFLORE® RB2) on two 20 Ton ferments of our 2016 Pinot Noir. The results were exactly what we were looking for! Better color and color stability, richly structured wines with efficiency and predictability. Even across clones of Pinot Noir, the tannin Synergy allows the clones to speak for themselves. In 2017 we expanded the protocol to 100 Tons of Pinot Noir ferments and from our early tastings we cannot wait to see the end result!” ”

Chris Bertsche, Winemaker, Coelho Winery, Amity, Oregon

## ZYMAFLORE® F83

**Yeast for supple, fruity and floral red wines. Grenache, Barbera, Nebbiolo, Sangiovese, Tempranillo, Syrah...**

- Strain isolated in Tuscany from Sangiovese.
- High production of red fruit aromas.
- Respects the typicity of Mediterranean grape varieties.

Dosage: 150 - 300 ppm.

500 g





# WHITE & ROSÉ WINES

Yeast excellence

ZYMAFLORE®  
YEAST

## ZYMAFLORE® DELTA

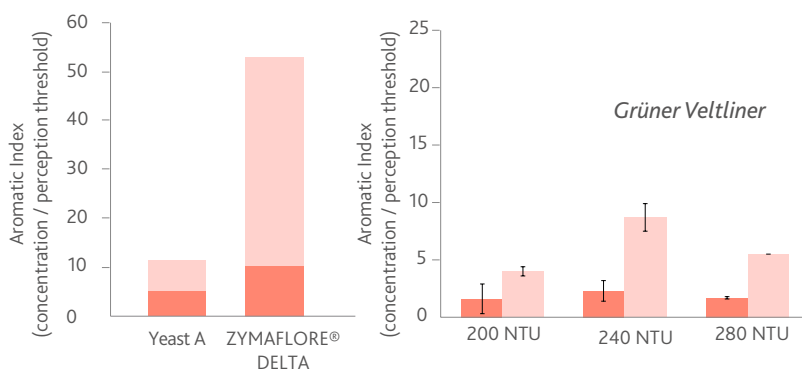
Yeast for aromatic white and rosé wines. Riesling, Pinot Gris, Viognier, Chenin Blanc, Gewürztraminer...

- Complex and elegant wines, clean aromatic profile.
- Optimal conditions: 150 - 250 NTU turbidity.
- Very low formation of sulfur-containing compounds even at high turbidities.
- High expression of citrus notes, especially grapefruit.

Dosage: 200 - 300 ppm.



500 g



Passion fruit  
(A35H)



Grapefruit  
(3SH)



## ZYMAFLORE® X5

Yeast for aromatic white wines with excellent thiol expression. Sauvignon blanc, Pinot Gris, Riesling, Gewürztraminer & rosé...

- Strong expression of volatile thiols (boxwood, tropical fruits) and production of fermentation aromas.
- Fresh and complex wines.

Dosage: 200 - 300 ppm.



500 g  
10 kg

### SELECTING YOUR YEAST STRAIN FOR HIGH-THIOL WINE VARIETIES

	ZYMAFLORE® DELTA	ZYMAFLORE® X5	ZYMAFLORE® VL3	ZYMAFLORE® X16
Varietal expression	+++++ (grapefruit / 3SH)	+++++ (boxwood / 4MSP)	++++	+
Production of fermentation esters	-	+++	-	+++++
Aromatic intensity	++++	+++++	+++	+++++
Volume and sweetness on the palate	+++	+++	+++++	-
Fermentative capability	+++	+++++	++++	+++++
Optimal conditions	150-250 NTU, 64-68°F	80-150 NTU, 60-68°F	100-150 NTU, 64-68°F	<50 NTU, 52-64°F





# WHITE & ROSÉ WINES

Yeast excellence

## ZYMAFLORE® X16

Yeast for modern and aromatic style white and rosé wines. Chardonnay, Viognier, Pinot Gris, Chenin Blanc, and Rosé...

- Very strong fermenter.
  - High aromatic production (peach, white flowers, stone fruits).
  - Pof(-) character (no vinyl phenol formation), generating a delicate and clean wine profile.
  - Low production of H<sub>2</sub>S.
- Dosage: 200 - 300 ppm.

500 g  
10 kg



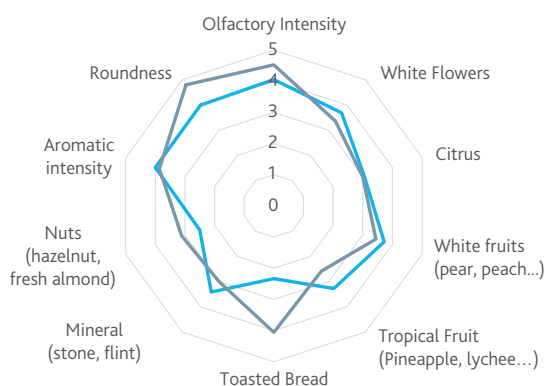
## ZYMAFLORE® CH9

Selected from one of the best terroirs in Burgundy. Chardonnay.

- Reveals the typicity of Chardonnay from great terroirs; notes of almond, fresh hazelnut, lemon and toasted bread.
  - Brings roundness to the wine, helping to balance potential high acidity.
- Recommended for broad, complex and creamy Chardonnay.  
Dosage: 200 - 300 ppm.



500 g



Tasting results on barrel fermented Chardonnay 2013  
(tasting panel 17 people). Yeast 200 ppm,  
**SUPERSTART® BLANC** 200 ppm. Alcohol 13 % v/v, pH  
3.50, TA 7.2 g/L H<sub>2</sub>T.

— ZYMAFLORE® VL1 — ZYMAFLORE® CH9

### SELECTING YOUR YEAST STRAIN FOR CHARDONNAY WINES

	ZYMAFLORE® CH9	ZYMAFLORE® VL1	ZYMAFLORE® VL2	ZYMAFLORE® X16
Varietal expression	++++ (hazelnut, toasted bread)	++++ (minerality, exotic fruits)	+++	+
Production of fermentation esters	-	-	++(+)	++++
Aromatic intensity	+++	+++	++++	++++
Volume on the palate	+++	+++++	+++	-
Fermentative capability	+++	+++	++++	++++
Ability to achieve MLF	+	+++	+++	+++



# WHITE & ROSÉ WINES

Yeast excellence

ZYMAFLORE®  
YEAST

## ZYMAFLORE® VL1

**Yeast for elegant and refined white wines. Chardonnay, Riesling, Gewürztraminer, Muscat....**

- Pof(-) character (no vinyl phenol formation), generating a **delicate and clean** wine profile.
- High  $\beta$ -glucosidase enzymatic activity.
- Expression of floral terpene varietal aromas.

Dosage: 200 - 300 ppm.

500 g  
10 kg



## ZYMAFLORE® VL2

**Yeast for delicate and clean barrel fermented wines. Chardonnay, Roussanne, Viognier....**

- Pof(-) character (no vinyl phenol formation), generating a **delicate and clean** wine profile.
- High polysaccharide production.

Dosage: 200 - 300 ppm.

500 g  
10 kg



## ZYMAFLORE® VL3

**Yeast for wines of elegance and finesse with high expression of volatile thiols. Sauvignon Blanc, Gewürztraminer, Riesling, Vermentino, Roussanne, Colombard & Pinot Gris.**

- Isolated from one of the best Sauvignon Blanc vineyards in Bordeaux.
- Good aptitude for expressing the **varietal aromas** of Sauvignon Blanc from the odorless precursors in the must.
- Volume and length of finish by the release of the Hsp12 protein (which gives the sweetness perception).

Dosage: 200 - 300 ppm.

500 g  
10 kg



## ZYMAFLORE® ST

**Yeast for sweet wines from Botrytised grapes. Late Harvest, Semillon, Riesling...**

- Strain selected in Sauternes.
- Sensitive to  $\text{SO}_2$  for arresting fermentation easily and **low production** of  $\text{SO}_2$  binding compounds.
- Resistance to high sugar concentration.

Dosage: 200 - 300 ppm.

500 g



*“I first started using ZYMAFLORE® VL3 in 2006 and have since made it my yeast selection for all my Sauvignon Blanc. Having used it in the past on both stainless steel as well as barrel fermentations on grapes grown in various regions of both Sonoma and Napa, I feel that it performs well in all winemaking environments. In stainless tanks, the fermentations are slow and steady while allowing the fruit to speak for itself. Explosive citrus, stone-fruit and tropical notes are created and retained. In barrel fermentations I find that the balance between the fruit, yeast, and oak aromas integrate seamlessly while the mouthfeel remains fresh and vibrant. ZYMAFLORE® VL3 is a reliable yeast selection that I can trust to perform and deliver the fermentation profile I am looking for.”*

*Christopher Louton, St Francis Vineyards, Sonoma, California*



# ORGANIC & SPARKLING WINES

Yeast excellence

## Organic Yeast

### ZYMAFLORE® 011 BIO



Organic certified yeast according to European organic production regulations CE 834/2007 and 889/2008 and compliant with U.S. National Organic Program (NOP) for organic production.

This *Saccharomyces cerevisiae* strain has been selected for its remarkable fermentation capabilities, its high alcohol tolerance, its respect for varietal typicity, and its low production of medium-chain fatty acid compounds inhibiting malolactic bacteria.

Its alcohol tolerance makes ZYMAFLORE® 011 BIO well adapted to restarting stuck fermentations or re-inoculation in case of sluggish spontaneous fermentations to ensure a healthy completion of fermentation.

Dosage : 200 - 300 ppm.  
300 - 500 ppm in the case of stuck fermentation.



500 g

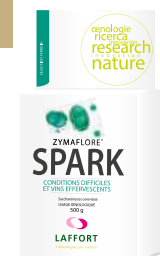
## Sparkling wines

### ZYMAFLORE® SPARK

White, sparkling wines & difficult conditions.

- Still wine fermentation and secondary fermentation of sparkling wines.
- Resistant to difficult fermentation conditions (potential alcohol, turbidity, temperature).
- Tolerates high SO<sub>2</sub> and alcohol levels.

Dosage: 200 - 300 ppm.  
300 - 500 ppm in case of stuck fermentation.



500 g



*“The SPARK line has been a tremendous set of products to use. Highly reliable and of the highest quality, I can always rely on Spark to deliver results. You can't leave much to chance when undergoing secondary fermentation in the bottle, and with SPARK I am leaving nothing to chance. I can only highly recommend these products to those looking to venture into the world of bubbly!”*

*Christian Grieb, Winemaker, Treveri Cellars, Wapato, Washington*

**LAFFORT** spark®

See page 81 for the complete range of products for sparkling wines and LAFFORT® recommendations.





Yeast	Alcohol Resistance (%v/v)	Nitrogen Requirements	Optimal Fermentation Temperature °F	Fermentation Kinetics	Aromatic Impact
BO213	> 18%	Low	50 - 90	Rapid	Neutral
F5	16%	Medium	68 - 86	Regular	Fruity, Spicy
F33	16%	Low	55 - 86	Regular	Fruity, Varietal
RMS2	17%	Low	50 - 86	Rapid	Neutral
ROSÉ	15%	Medium	55 - 64	Regular	Esters

\* Yeast alcohol tolerance depends on nutrition, temperature, etc. It is recommended to use **SUPERSTART® ROUGE** or **SUPERSTART® BLANC** (white and rosé wines) and a higher yeast dose rate for wines with high alcohol potential.

## ACTIFLORE® F33

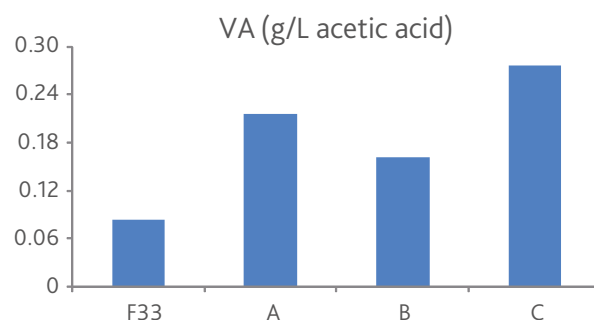
Low VA, high polysaccharide release, fermentation security. Red & White wines.

- Superior balance & softness due to high polysaccharide release.
- Excellent fermentation characteristics & kinetics over a wide temperature range.
- Very good alcohol tolerance and low nitrogen demand.
- Very low VA production.

Dosage: 150 - 300 ppm.



500 g  
10 kg



Comparison of VA production by 4 different strains of yeasts, at end of alcoholic fermentation (13.5% v/v, pH 3.6). Cabernet Sauvignon 2010.



# ACTIFLORE®

Natural performance

## ACTIFLORE® ROSÉ

### White & Rosé wines.

- Specifically selected for making premium rosé wines.
- Strong implantation ability and fermentation rates.
- Produces high levels of **fermentation aromas**.
- Excellent strain for the production of fruit-driven rosé wines, especially when they are made from grapes of low aromatic potential.

Dosage: 200 - 300 ppm.

500 g



## ACTIFLORE® F5

### Spicy and fruity notes.

- Yeast selected for its aptitude to easily implant in the must.
- In red winemaking, it allows regular fermentations, producing structured wines with spicy and fruity aromas.

Dosage: 150 - 300 ppm.

500 g



## ACTIFLORE® BO213 (EX ACTIFLORE BAYANUS)

### Aromatic clean profile. Restarting stuck fermentations, and very high Brix level grapes, red & white wines.

- Very strong ability to restart sluggish or stuck fermentations.
- Excellent fermentation capacity.
- Ferments at low temperatures (50-54°F).
- Tolerates high sugar and extremely high alcohol (18% v/v) levels.
- Bacteria compatible.

Dosage: 200 - 300 ppm; 300 - 500 ppm for stuck fermentations.

Refer to the restart protocol page 88

500 g  
10 kg



## ACTIFLORE® RMS2

### Difficult conditions, low production of reduction compounds.

- Yeast selected for its superb white wine fermentation capabilities.
- Adapted to extreme white winemaking conditions (high volume, low turbidity, low temperature, anaerobic conditions...).
- Very low production of H<sub>2</sub>S.

Dosage: 200 - 300 ppm.

500 g  
10 kg





A stressful fermentation results in aroma defects and production of factors inhibiting bacteria. Yeast must have complete nutrition for a stress-free fermentation. Grape nutrition and nutrient additions need to be balanced in both growth and survival factors for the yeast to ensure a clean and strong fermentation finish.

ENOLOGICAL CONCERN	YEAST METABOLISM FACTOR	PRACTICAL RECOMMENDATION
<b>Regular fermentation</b> Avoid rapid fermentation or heat spikes.	Nutritional balance between mineral and organic nitrogen. Slower assimilation of organic nitrogen compared to mineral nitrogen.	Partially or completely correct with organic nitrogen (not only with ammonium salts). Make two additions during the first third of fermentation.
<b>Healthy fermentation completion</b>	Yeast viability and vitality. Membrane resistance to acid and alcohol stresses.	Use yeast rehydration products during the rehydration phase to add sterols and long-chain fatty acids to strengthen the cell membrane.
<b>Clean aromatic profile</b> Low H <sub>2</sub> S and reduced sulfur compound production, low VA, low masking of aromas.	Stress minimization and good membrane permeability.	Rehydrate the yeast with specific rehydration nutrients. Add nutrients before mid-fermentation. Incorporate pantothenic acid (vitamin B5) from yeast nutrients to regulate and minimize H <sub>2</sub> S production.
<b>Aromatic optimization</b> Expression of varietal aromas and/or production of fermentation aromas.	Membrane permeability. Vitamins, minerals and precursors of fermentation esters (amino acids).	Use yeast rehydration nutrients to add sterols during rehydration for good fluidity and membrane transport. Nutrition quality and quantity to be determined in relation to desired aromatic profile.

For optimal nutrition and protection of yeast, LAFFORT® highly recommends rehydration with SUPERSTART® ROUGE or SUPERSTART® BLANC. Then add NUTRISTART® ORG and NUTRISTART® as required.

## YAN CONTRIBUTION OF NUTRIENTS

	Product	YAN contribution from 200 mg/L
Protection	SUPERSTART® ROUGE	2 mg/L (organic nitrogen)
	SUPERSTART® BLANC	4 mg/L (organic nitrogen)
	SUPERSTART® SPARK	2 mg/L (organic nitrogen)
Nutrition	THIAZOTE® PH	42 mg/L (mineral nitrogen)
	NUTRISTART®	30 mg/L (organic and mineral nitrogen)
	NUTRISTART® ORG	14 mg/L (organic nitrogen)
Detoxification and Physical Support	OENOCCELL® BIO	0
	OENOCCELL®	0
	BI-ACTIV®	0
	TURBICEL®	0



# YEAST PERFORMANCE OPTIMIZATION

*The best for your yeast*

**SUPERSTART® products are yeast rehydration nutrients to be used at the active dry yeast rehydration step to ensure healthy fermentation completion and optimal fermentation and aromatic performance (contains inactivated yeast, autolysates). Patent FR 2736651. These products:**

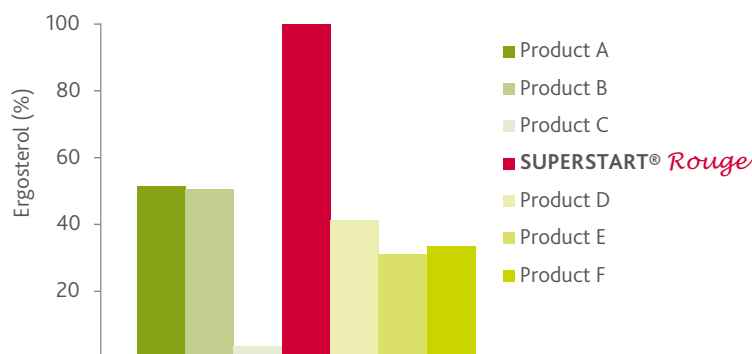
- Provide during yeast rehydration the essential elements of the yeast membrane (long-chain fatty acids and ergosterol) and ensure membrane fluidity, alcohol tolerance and higher efficiency of the sugar and nutrient transporters until the last yeast generation.
- Significantly reduce production of VA and H<sub>2</sub>S.
- Promote MLF onset (the yeast produces fewer compounds inhibiting malolactic bacteria because they undergo less stress).
- In nitrogen deficient musts, an additional supply of ammonium salts or organic nitrogen (i.e. **NUTRISTART® ORG** or **NUTRISTART®**) remains essential.
- To be used particularly in cases of potentially high alcohol degrees, white wine fermentation with low turbidity and low temperature, and for yeast starters for restarting fermentations.

Dosage: 200 - 300 ppm (increase the dosage for potentially high alcohol musts).

To be added into yeast rehydration water.

## **SUPERSTART® Rouge** (Red wines)

Thanks to its high ergosterol content, **SUPERSTART® ROUGE** improves yeast cell longevity under stressful conditions and increases yeast tolerance to high temperatures and alcohol.

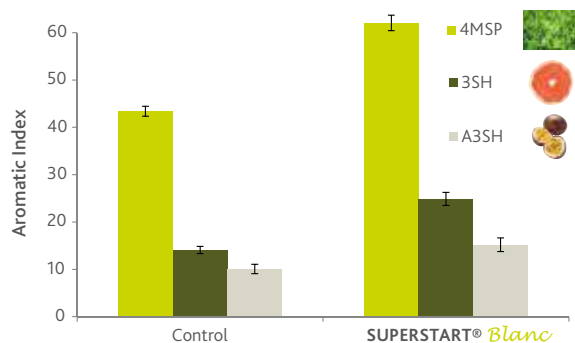


Comparison of ergosterol\* contents (%) in different equivalent application products, standardized against the product with the highest concentration (100%), in this case, **SUPERSTART® ROUGE**.

\*This sterol gives yeast a higher resistance to ethanol

## **SUPERSTART® Blanc** (White and Rosé wines)

Thanks to its specific formulation, particularly rich in certain vitamins and mineral salts, **SUPERSTART® BLANC** optimizes the production and aromatic revelation by yeasts, producing more aromatic wines while also guaranteeing stronger fermentation completion.



Sauvignon Blanc. Alc. 12.5 % vol. **ZYMAFLORE® XS**



1 kg  
5 kg



5 kg



1 kg  
5 kg

See also **SUPERSTART® SPARK** (p. 83) which can be used for *pie de cuve* fermentation as well as secondary fermentation in bottle.



“We use **DYNASTART®**, **SUPERSTART® ROUGE**, and **SUPERSTART® BLANC** in our yeast rehydration procedure. All three are easy to use, with minimal clumping and high solubility in water. The high solubility means that the rehydration water does not need to be as hot initially, which lowers our rehydration times by up to an hour. We are happy with the level of nutrition that these products provide, and believe that they contribute to strong, consistent, and clean fermentations.”

*Liz Kelly-Campanale, Assistant Winemaker and Cidermaker, Edgefield Winery, Troutdale, Oregon*



“I started using **SUPERSTART® BLANC** in 2015 and have found it to be a critical step in our white wine making by properly preparing our white yeast strains to produce their aromatic potential while respecting varietal character. It prepares the yeast for lower fermentation temperatures and varying YAN values, paving the way for **NUTRISTART® ORG** to provide real organic nitrogen which can be utilized as much as four times more efficiently, lowering the need for DAP and preventing stuck or sluggish ferments and diminished aromatics from DAP-based heat spikes”

*Justin Wylie, Winemaker and Owner, Va Piano Vineyards, Walla Walla, Washington*



## NUTRISTART® ORG

**100% organic nutrient from inactivated yeast (yeast autolysates), rich in amino acids, vitamins (thiamine, niacin, pantothenic acid, folic acid...) minerals and micro-nutrients (magnesium, manganese, zinc, iron, etc.) favoring cell multiplication.**

- Ensures regular and complete alcoholic fermentation in the case of slight to moderate nutritional deficiencies.
- Limits the development of unwanted compounds.
- In the case of large nitrogen deficiencies and/or high potential alcohol, use **NUTRISTART® ORG** with a supplementary nitrogen source to guarantee improved nutritional balance in the yeast.
- 300 ppm of **NUTRISTART® ORG** brings the equivalent of 20 ppm of assimilable nitrogen. Dosage: 300 - 600 ppm according to the necessary nitrogen addition. Add to the tank in the first 1/3 of alcoholic fermentation.



1 kg  
5 kg

## NUTRISTART®

**All-round yeast activator combining growth and survival factors and promoting yeast multiplication (inactivated yeast, yeast autolysates, ammonium phosphate and thiamine).**

- To be used in the case of nutrient deficiency in the must.
- 100 ppm provides about 14 ppm assimilable nitrogen. Dosage: 200 to 400 ppm according to the necessary nitrogen addition. Add to the tank in the first 1/3 of alcoholic fermentation.



1 kg  
5 kg  
20 kg





# YEAST NUTRITION

*The best for your yeast*

## THIAZOTE® PH

**Alcoholic fermentation activator (diammonium phosphate and thiamine).**

100 ppm of THIAZOTE® PH provides about 21 ppm assimilable nitrogen.

Dosage: depends on the initial content of assimilable nitrogen of must, alcohol degree and turbidity.

Refer to the product datasheet for maximum legal dosage.



1 kg  
5 kg

Nutristart® Org	Nutristart®	Thiazote®
←++++	Survival Factors	0
++	Growth Factors	++++→
←Organic	Assimilable Nitrogen	Mineral→
←++++	Vitamins and Minerals	++
←++++	Nutritional Balance	+
←Varietal	Aromas	Fermentation→

## BI-ACTIV®

**A formulation of survival factors to be used when fermentation slows down or becomes stuck.**

**Does not contain DAP (yeast cell walls, inactivated yeast, inert supporting elements).**

- In the case of slow alcoholic fermentation, BI-ACTIV® detoxifies the must, provides survival factors for the yeasts and enables fermentation to be completed.
- In the case of stuck fermentation, BI-ACTIV® detoxifies the wine and prepares it for the new inoculation.
- It can be used in the vinification of highly clarified must and immediately provides support elements and survival factors, which are essential for yeast membrane stress-resistance.

**BI-ACTIV® does not provide assimilable nitrogen.**

Dosage: 300 - 600 ppm. Refer to the restart protocol p. 88.



1 kg



“BI-ACTIV® has been a life-saver at times. My first experience with it was in 2014 with an addition to a rapidly slowing fermentation. It worked! BI-ACTIV® provided the necessary survival factors and nutrients, without the addition of DAP. I've since incorporated it into my fermentation protocol on historically difficult lots and haven't had a stuck fermentation since.”

*Josh Baker, Phase 2 Cellars, San Luis Obispo, California*



# BACTERIA NUTRITION & YEAST PERFORMANCE OPTIMIZATION

*The best for your bacteria and yeast*

## ENERGIZER®

**Specific preparation to strengthen bacteria for malolactic fermentation (composed of inactivated yeast).**

- Included with all PREAC LACTOENOS Strains
  - Incorporated at the pre-acclimatization phase as part of this innovative process.
  - Provides the necessary and specific nutrients that the bacteria need during their final stage of acclimatization. This last step is crucial to ensure critical numbers and bacteria survival prior to incorporation into the wine being inoculated.
- Dosage: 50 ppm.

250 g  
1.25 kg



## MALOSTART®

**Yeast activator facilitating malolactic fermentation (MLF) onset, restart, and accelerating fermentation kinetics.**

- Combines nutritional elements (inactivated yeast, support elements) and detoxification agents (yeast cell walls) and thus:
    - \* **Optimizes lactic acid bacterial survival** (by adsorbing short or medium-chain fatty acid-type inhibitors),
    - \* **Encourages lactic acid bacterial activity** (by supplying them with nitrogen compounds which they directly assimilate).
  - Can be used on all types of wine.
  - Composition formulated to optimize the supply of amino acids essential to the bacteria (glutamic acid, valine...) while reducing the quantities of biogenic amine precursors of amino acids (histidine, tyrosine).
  - Also rich in vitamins required by the bacteria and in minerals (magnesium and manganese) which are essential co-factors for enzymatic function.
- Dosage: 300 ppm.

1 kg



## OENOCCELL®

**Highly purified yeast cell walls to stimulate and activate alcoholic fermentation (yeast cell walls).**

- High power to detoxify musts/wines thanks to its adsorption ability.
  - Preventive use: ensures a regular and complete fermentation while limiting the risks of off-odor production and toxic environment for bacteria.
  - Curative use: favors the restart of stuck or sluggish fermentations.
- Dosage: 200 - 400 ppm, depending on the type of treatment.  
*Refer to the restart protocol p. 88*

1 kg



## TURBICEL®

**Cellulose powder for over-clarified juice.**

- Compensates **highly clarified** white and rosé juice by adding back neutral solids to help keep yeast in suspension.
  - Can be incorporated into an existing nutrient blend to help promote a healthier, faster fermentation.
  - **100 ppm increases the juice/must turbidity by 20 NTU.**
- Dosage: 200 - 500 ppm, according to the necessary turbidity correction.

5 kg



# YEAST NUTRITION & THE USE OF ORGANIC NITROGEN

## THE DEMAND FOR YEAST NITROGEN

The nitrogen sources that can be used by *Saccharomyces cerevisiae* are ammonium ( $\text{NH}_4^+$ ) and amino acids (organic nitrogen). They both represent assimilable nitrogen and are present in must at varying concentrations, sometimes not in sufficient quantities to meet the requirements of the yeast. The three following factors must be taken into consideration:

- Below 150 mg N/L, must is deficient. It is therefore important to supplement it with nitrogen elements.
- Yeast nitrogen requirements depend on sugar concentration. The higher this concentration, the greater the amount of yeast biomass needed to successfully achieve a thorough breakdown of the sugars during alcoholic fermentation. Although, the yeast biomass must not be too excessive to avoid an induced nitrogen deficiency.
- The nitrogen initially present in must is rapidly assimilated during the first third of the alcoholic fermentation (to 15-18° Brix), at the point when the biomass is at its highest density. Consequently, irrespective of the initial nitrogen content, its addition during alcoholic fermentation at this time allows preservation of the biomass formed, which is dependent on the yeast strain and proportional to the initial nitrogen concentration.

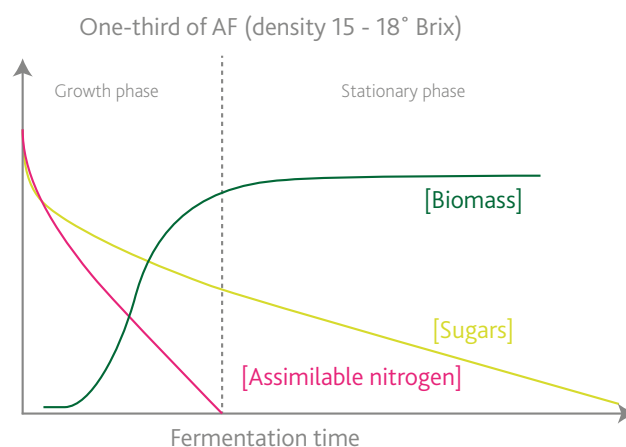
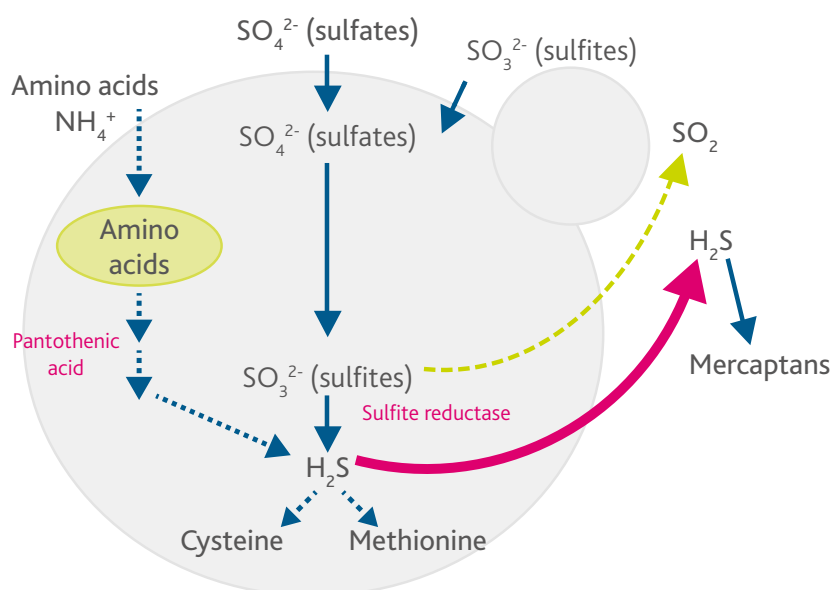


Figure 1: Assimilation of nitrogen and production of biomass during alcoholic fermentation.

## Did you know?

The key enzyme in the production of  $\text{H}_2\text{S}$  is sulfate reductase. When the  $\text{H}_2\text{S}$  and amino acids pathways meet, the sulfur amino acids (cysteine and methionine) are produced. Where there is an imbalance between these two pathways and a nitrogen deficiency, the precursors of these sulfur amino acids are limiting, leading to an accumulation of  $\text{H}_2\text{S}$ .



## WHY ORGANIC NUTRITION?

Organic nitrogen is supplied by adding yeast derivatives (usually autolyzed yeast). In addition to amino acids, these yeast derivatives include lipids, vitamins and minerals which also contribute to the efficient performance of the yeast.

Yeast has the ability to simultaneously assimilate organic nitrogen and mineral nitrogen from the beginning of the alcoholic fermentation. Organic nitrogen must be present in order to:

- Limit the production of SO<sub>2</sub> and sulfur compounds (H<sub>2</sub>S and mercaptans).
- Produce healthy, but not excessive, biomass.
- Limit the risk of stuck or sluggish fermentation.

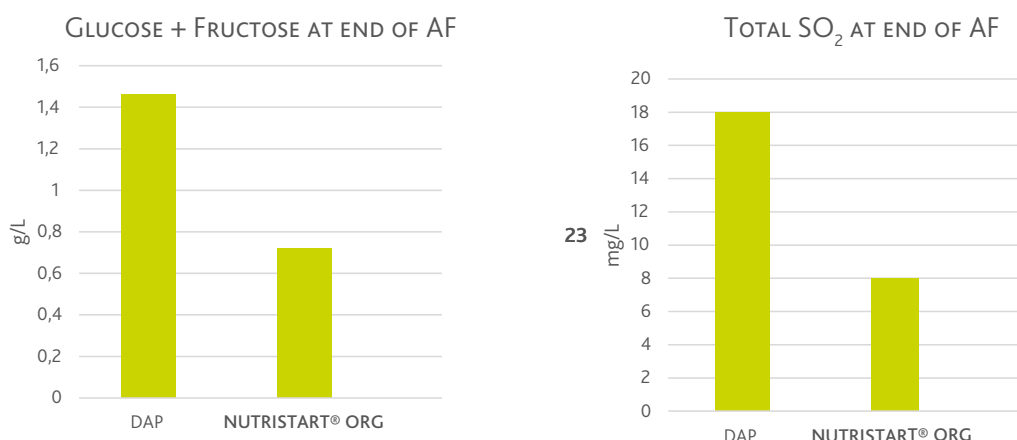


Figure 2: Concentrations of Glucose + Fructose and total SO<sub>2</sub> at the end of alcoholic fermentation. Must derived from sauvignon blanc (ABV 13.9%, initial assimilable Nitrogen: 125 mg N/L, 2016. At the one-third point of alcoholic fermentation, 35 mg N/L were added with DAP or NUTRISTART® ORG, deliberately making yeast conditions difficult.

## ORGANOLEPTIC EFFECTS OF ORGANIC NUTRITION

Numerous experiments show that improved outcomes of alcoholic fermentation can be achieved with the use of organic nitrogen. Even in the case of wines considered dry (glucose + fructose < 2 g/L), small amounts of fermentable sugars can be used by degrading microorganisms and can have an adverse effect on the quality of the wines (Figure 2).

Besides its effects on fermentation kinetics, the addition of organic nitrogen can increase the fruitiness of wines and limit the aromatic mask linked to the production of sulfur compounds during the alcoholic fermentation.

Except for the source of the nitrogen added, a comparison of wines produced under the same conditions reveals significant preferences for wines derived from musts supplemented with NUTRISTART® ORG (table 1). The wines are considered fruitier, fresher, less vegetal and subject to less reduction than those supplemented with mineral nitrogen alone.

	Mineral / Organic Comparison
Number of tasters	20
Number of correctly detected differences	13
Results	99% significant difference
Preference	Organic: 13/13

Table 1: Triangular tasting tests (ISO 4120-2004) of red wines. Comparison of two vinified Merlot wines with 65 mg N/L nitrogen added in the form of THIAZOTE® or NUTRISTART® ORG.

## WHEN RESEARCH LEADS TO A BETTER UNDERSTANDING OF THE NUTRISTART® ORG PERFORMANCE

By carrying out an extensive study on **NUTRISTART® ORG**, we were able to learn about this product's subtle composition after developing specific assay methods (Figure 3).

Figure 3: Elements detected in NUTRISTART® ORG.

\* Other minerals are in the process of being assayed.

### LIPIDS

Palmitic acid (C16:0), Stearic acid (C18:0), Palmitoleic acid (C16:1), Oleic acid (C18:1), Squalene, Zymosterol, Lanosterol, Ergosterol

### AMINO ACIDS

ASP, GLU, CYS, ASP, SER, GLN, GLY, THR, ARG, ALA, GABA, TYR, ETN, VAL, MET, TRP, PHR, ILE, LEU, ORN, LYS

### VITAMINS

Para aminobenzoic acid, Pyridoxine, Riboflavin, Biotin, Pantothenic acid

### MINERALS\*

Mg, Ca

An experiment design setting up models for 58 trials and omitting various compounds was then carried out to discover the impact of these various nutrients on alcoholic fermentation.

ASP	CYS	ABA
ARG	GABA	ARG
C18	GLN	ASN
C18:1	GLY	ORN
Calcium	Pyridoxine	Lanosterol
GLU	TRP	
Lanosterol	VAL	
Riboflavin		

Table 2: Effect of the various constituents of **NUTRISTART® ORG** on alcoholic fermentation parameters (Results obtained following a statistical analysis based on a multiple linear regression and a Kruskal-Wallis test – methods performed according to a Hadamard experiment design).

\*Nutrition must enable an optimum, but not excessive, population to be attained.

Our latest research shows that not all of the constituents have the same effect on yeast and alcoholic fermentation. We will continue with this study in order to have a detailed understanding of the role of each constituent.

NEWS 2016 - TRY OUR

## Decision-Making Tool

FOR AN OPTIMIZED YEAST NUTRITION

Available on [www.laffort.com/en/research-and-innovation/decision-making-tool](http://www.laffort.com/en/research-and-innovation/decision-making-tool)

For further information about this decision-making support tool see end of catalog (inside back cover).





## Yeast products

**OENOLEES®** is a specialty oenological product derived from natural constituents found in wine and obtained using innovative and patented production processes. It is paving the way for a new type of enology: more natural, and more specific, while enhancing and preserving the integrity of wine.

### OENOLEES®

*All types of wine*

**Specific preparation of yeast cell walls with a high sapid peptide content for premium red wine fining (Patent EP 1850682) (Yeast cell walls, inactivated yeasts).**

**OENOLEES®**, the result of **LAFFORT®**'s research on the properties of yeast lees and their importance in wine, contributes toward improving organoleptic quality in wine by:

- Reducing aggressive sensations: the cellular envelopes have a refining action that promotes elimination of certain polyphenols responsible for bitterness and astringency.
- Increasing sweet sensations: **OENOLEES®** has a high content of a specific peptide fraction that is released naturally by yeasts during autolysis and has an excessively low perception threshold (only 16 mg/L compared to 3g/L for sucrose).

Dosage: 200 - 400 ppm.



1 kg  
5 kg

## Aromatic preservation

### FRESHAROM®

*White and rosé wines*

**Specific preparation of inactivated yeasts with a high antioxidant capacity.**

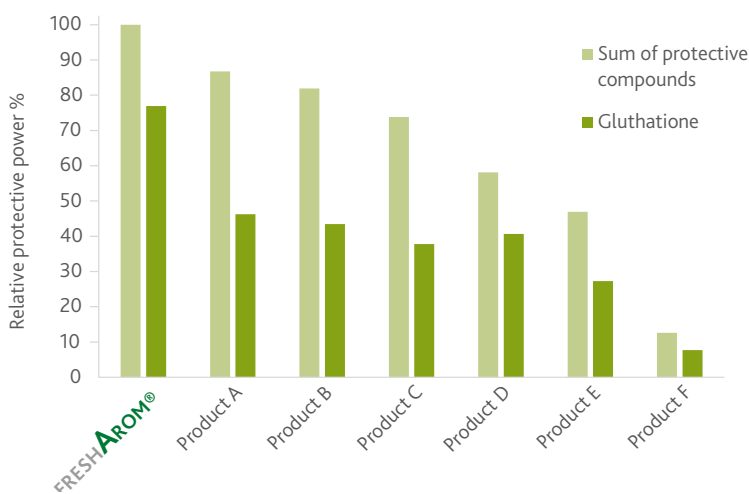
- Rich in glutathione and reductive metabolites, glutathione has a significantly higher antioxidant potential than SO<sub>2</sub> or ascorbic acid.
- Enables the yeast to assimilate glutathione precursors (cysteine, N-acetylcysteine...) during alcoholic fermentation and thus synthesise more of this tripeptide.
- Efficiently protects the wine's aromatic potential and significantly delays the appearance of oxidized notes.
- Obtains more aromatic wines with improved aging potential.

Dosage: 200 - 300 ppm.

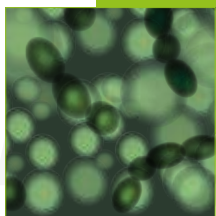


1 kg  
5 kg

**Incorporate into the tank during the first 1/3 of alcoholic fermentation.**



*Comparison of relative protective power of different products on the market rich in glutathione and its precursors.*



# LACTOENOS<sup>®</sup> BACTERIA

*Managing MLF differently*

## **What are the different techniques of bacteria addition?**

Fermentation management typically involves the addition of yeasts, then the addition of bacteria for malolactic fermentation (MLF) following the completion of alcoholic fermentation (AF). More and more winemakers are choosing yeast/bacteria co-inoculation, where bacteria are added before the primary fermentation is complete.

There are different techniques. **Early co-inoculation** is when bacteria are added 24 hours after the beginning of AF. The main goal is to optimize the bacterial acclimatization and survival (close to 100% after inoculation) and to save time. Bacteria can also be added to the wine toward the end of AF, at about 3° Brix, in case of a **late co-inoculation**. The main goal of this technique is to prevent microbial spoilage: selected bacteria will take over after yeast, and dominate the ecosystem avoiding spoilage micro-organism growth (*Brettanomyces* yeasts, biogenic amine-producing bacteria, etc.). These two co-inoculation techniques are **also economically significant: the total energy costs are greatly reduced**, since bacteria are added to a warm wine and MLF is faster. Lastly, these two techniques allow quick completion of MLF which minimizes the production of SO<sub>2</sub> combining compounds, and thus decreases total SO<sub>2</sub> addition over the life of the wine.

## **What are the key points and how to perform a co-inoculation?**

SO<sub>2</sub> management on the grapes, pH, yeast strain and nutrition, maceration and fermentation temperature, bacteria strain and inoculation are extremely important factors. The alcoholic fermentation has to be steady until completion to make sure the bacteria population do not commence aerobic metabolism (sugar consumption).

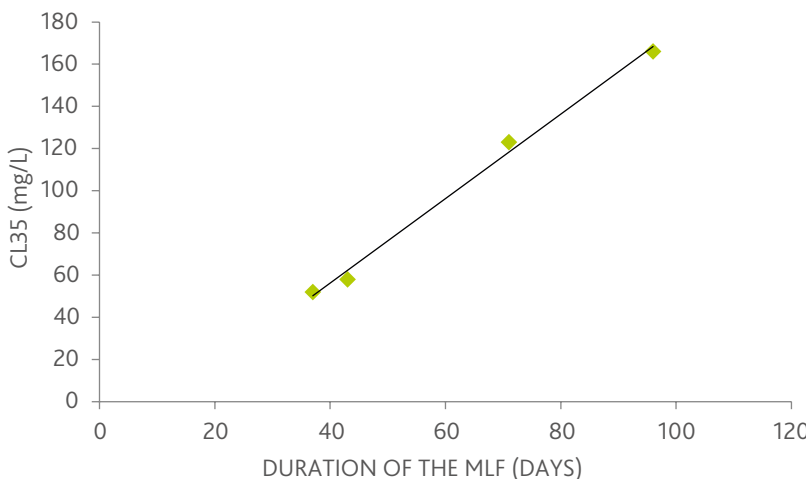
In case of co-inoculation, LAFFORT<sup>®</sup> recommends the **LACTOENOS<sup>®</sup> SB3 DIRECT, 450 PreAc<sup>®</sup> or B28 PreAc<sup>®</sup>** bacteria, depending on your wine conditions. Ask your LAFFORT<sup>®</sup> representative for the specific co-inoculation protocol.

## **Inoculating for the malolactic fermentation is an excellent tool to limit the production of compounds that combine with SO<sub>2</sub> in the wine.**

The rate of production of SO<sub>2</sub> binding compounds (measured by CL35, or the amount of SO<sub>2</sub> required to be added to achieve 35 ppm free SO<sub>2</sub>) after MLF is directly proportional to the duration of MLF (see figure below).

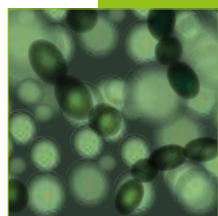
Furthermore co-inoculation of malolactic bacteria (during the yeast fermentation activity) reduces the diacetyl content, which has two advantages: more fruit in the wine and a lower rate of binding of SO<sub>2</sub>.

**THE RATE OF SO<sub>2</sub> COMBINATION AFTER MLF IS DIRECTLY PROPORTIONAL TO THE DURATION OF THE MLF**



\* CL35: dose of total SO<sub>2</sub> required to obtain 35 ppm free SO<sub>2</sub>. The higher the value, the higher the content of SO<sub>2</sub> binding components in the wine

Source: Coulon J. & al, Revue Des Oenologues No. 151, April 2014, p. 44-46. Sulfite Management  
How to maximize the impact of SO<sub>2</sub> while controlling its intake.



# LACTOENOS® BACTERIA

Managing MLF differently

## CHOOSING THE RIGHT TYPE OF INOCULATION

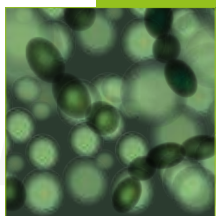
Inoculation Type	Stage	Recommended LACTOENOS® preparation	Objectives
Early Co-inoculation*	24 to 48 hours after the start of alcoholic fermentation.	LACTOENOS® SB3 Direct LACTOENOS® 450 PreAc	Save time and prevent degradation. Optimize management of the fermentation processes. Reduce the production of diacetyl. Reduce the potential of SO <sub>2</sub> to combine with wine.
Late Co-inoculation	At 3° Brix.	LACTOENOS® SB3 Direct LACTOENOS® B7 Direct LACTOENOS® 450 PreAc	Complete control of the ecosystem. Safeguarding a conventional vinification sequence (AF followed by MLF).
Sequential Inoculation	At dryness and post pressing.	LACTOENOS® SB3 Direct LACTOENOS® B7 Direct LACTOENOS® 450 PreAc	Red wine MLF post pressing. MLF in barrel. Thermo-vinification.
Curative Inoculation	To restart a stuck MLF.	LACTOENOS® B16 Standard LACTOENOS® B7 Direct LACTOENOS® 450 PreAc <i>See MLF restart protocol p. 90</i>	Restarting stuck MLF. Spring MLF.

\* during the first few days of AF, must pH drops 0.2 units. This parameter is to be taken into account when selecting the strain.  
Do not hesitate to contact your LAFFORT® representative to check on the inoculation time and quantity to incorporate.

## STRAIN SPECIFICATIONS

Preparation	Alcohol	pH	SO <sub>2</sub> total	Temperature
LACTOENOS® B7 Direct	≤ 16 % vol.	≥ 3,2	≤ 60 mg/L	≥ 60°F
LACTOENOS® SB3® Direct	≤ 15 % vol.	≥ 3,3	≤ 40 mg/L	≥ 64°F
LACTOENOS® 450 PreAc	≤ 17 % vol.	≥ 3,3	≤ 60 mg/L	≥ 60°F
LACTOENOS® B16 Standard	≤ 16 % vol.	≥ 2,9	≤ 60 mg/L	≥ 60°F

The fatty acids produced by yeast in stress conditions also perform the function of inhibitors during activation of malolactic fermentation. In instances of problematic or sluggish alcoholic fermentation, it is advisable to process with yeast hulls to reduce fatty acid load and promote MLF.



# LACTOENOS<sup>®</sup> BACTERIA

*Managing MLF differently*

## LACTOENOS<sup>®</sup> B7 DIRECT

**Direct inoculation bacteria for all types of wines.**

- A strain that performs reliably in wide-ranging conditions of pH, alcohol, SO<sub>2</sub>, temperature and tannic structure, in red, white and rosé wines.
- Owing to the Direct process and the quality of the product, **LACTOENOS B7<sup>®</sup> DIRECT** can be inoculated directly into the wine.
- With well-managed MLF the fruitiness of the wine can be retained (low VA, no biogenic amines or diacetyl) and the combination rate in the wine (ethanol and other molecules combining SO<sub>2</sub>) can be minimized, to achieve an increase in active SO<sub>2</sub>.
- **LACTOENOS B7<sup>®</sup> DIRECT** is particularly suitable for co-inoculation on must with a pH of > 3.4 (during the first few days of AF, the pH can drop 0.2 units)

Dosage: refer to the packaging.



2.5 hL,  
25 hL, 250 hL

## LACTOENOS<sup>®</sup> SB3 DIRECT

**Direct inoculation bacteria for red wines.**

- Thanks to the direct process, **LACTOENOS<sup>®</sup> SB3 DIRECT** can be inoculated directly into wines.
- In association with good fermentation management and correct yeast nutrition, **LACTOENOS<sup>®</sup> SB3 DIRECT** can be inoculated at the start of alcoholic fermentation (early co-inoculation) and ensures rapid MLF immediately afterwards.

Dosage: refer to packaging.



2.5 hL,  
25 hL, 250 hL

## LACTOENOS<sup>®</sup> 450 PREAC

**A pre-acclimatized *Oenococcus oeni* strain distinguished by its high malolactic activity.**

- Strong implantation capacity in wines at any stage of its inoculation in wine or must (wide range of pH, fatty acids...)
- Especially selected for its resistance to high alcohol (up to 17% v/v).
- An exclusive production process, developed by **LAFFORT<sup>®</sup>**, that ensures a higher bacterial survival rate and a shortened latency phase. **ENERGIZER<sup>®</sup>** starter supplied with the bacterium.

Dosage: refer to packaging.



50 hL, 250 hL

## LACTOENOS<sup>®</sup> B16 STANDARD KIT

**Bacterium and reactivator kit for all types of wine.**

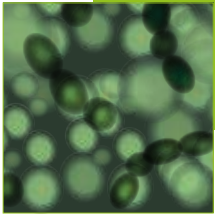
- Very resistant strain particularly suited for restarting MLF due to its precise protocol of acclimatization.
- The adaptation is made by pied de cuve (multiple step protocol, 3 to 5 days duration, please refer to package label or product data sheet). The nutrient is supplied with the bacterium.

Dosage: refer to packaging.



50 hL, 250 hL

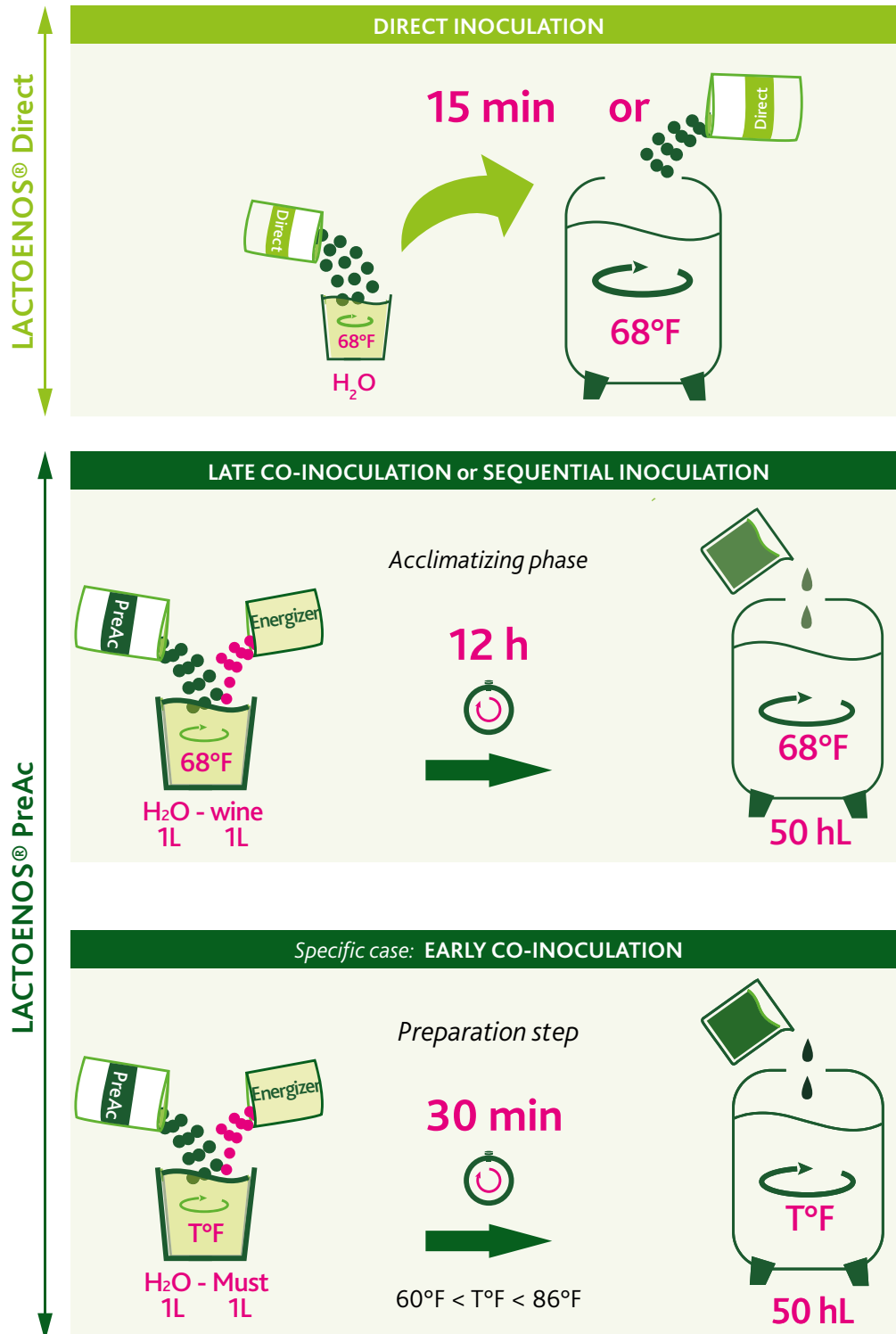
*In instances where the wine displays limiting characteristics (low pH, high level of clarification, high ABV or SO<sub>2</sub> levels, nutritional deficiencies, problematic AF, etc.), the addition of an MLF nutrient is essential for the activation and progress of MLF.*



# research LACTOENOS® BACTERIA

Managing MLF differently

BACTERIA







# ENZYMES

*Natural accelerators*

Enzymes occur naturally in grape berries and in microorganisms, and their use in winemaking dates from the 1970's. Since then, **LAFASE®** and **LAFAZYM®** enzymes have become standard aids in a broad spectrum of enological applications. These enzymes not only ease pressing, clarification and filtration processes, they also allow for aroma expression, improved wine mouthfeel, color and structure. Making use of the appropriate enzyme will reduce the amounts of other interventions, as well as lower environmental impact.

## ***Enzymology and biochemistry: behind the scenes of enzyme formulation***

Enzymes are highly-specific complex catalytic proteins. In the wine industry, the principal activities are the pectinases (polygalacturonase [PG], pectin methyl esterase [PME], pectin lyase [PL], arabinanase, rhamnogalacturonase and galactanase). In addition, there are some glucanases and glycosidases complemented with many naturally occurring side activities such as hemicellulases, cellulases, and proteases. Without entering the complex science of enzymology, there is not one single form for one enzyme. Specificity for one substrate is not the only parameter, each type of enzyme has many variations (iso-enzymes) resulting in different pH and temperature ranges for peak performance. Winemaking enzymes, except for Lysozyme which is extracted from egg white, are produced in fermentors by microorganisms that belong, as do yeast, to the fungus family. The precise selection of the production strain and the unique composition of the growing medium induces optimal concentration of the targeted principal enzymatic activities accompanied with numerous side activities. Of the side activities naturally produced, some are essential, some are neutral but unfortunately some activities can potentially damage wine flavors.

## ***LAFASE® and LAFAZYM® guarantees***

**LAFFORT®** enzymes comply with international enological specifications. A compliance list is available for use in organic wine production.

Each product contains the enzymatic activities required for best results in wine or juice. In order to offer optimum security and performance, some of our enzymes undergo a unique purification process to remove any potentially detrimental activity such as:

- Cinnamoyl esterase (CE) activity (formerly Cinnamyl Esterase or depsidase): a side activity that puts the wine at risk of aromatic spoilage through the production of vinyl-phenols.
- Anthocyanase, a side activity that causes color loss.

**P** *Purified enzymes are identified by this logo in our catalog.*

## ***Why different forms?***

- ⚙ **Micro granulate** offers easy room temperature storage and best stability. This form has no risk of being contaminated even after opening, no preservatives required.
- 💧 **Liquid enzymes** are the most convenient to handle and dose but require cold storage. Their shelf life is shorter because microbiological stability is more difficult to ensure for longer periods.



	<div><div>LAFASE® HE GRAND CRU</div><div>LAFASE® FRUIT</div><div>LAFAZYM® CL</div><div>LAFAZYM® PRESS</div><div>LAFAZYM® EXTRACT</div><div>EXTRALYSE</div><div>LAFAZYM® AROM</div><div>LAFAZYM® 600XL</div><div>LAFASE® XL PRESS</div><div>LAFASE® XL Clarification</div><div>LAFASE® XL Extraction</div></div>											
Form												
CE-Free	✓	✓	✓	✓	✓	✓	*	✓	✓	**	**	
Purified preparation												
Pre-fermentation maceration												
Conventional red wine maceration												
Pressing												
Clarification of white and rosé musts												
Clarification of red grape musts treated by thermo-vinification												
Clarification of wines (free-run and/or press)												
Maturation on lees												
Filtration and/or botrytised harvests												
Emergence of terpene aromas												

Legend

Microgranular

Liquid

Red

White

Rosé

Legend	☼	Microgranular
	●	White
	●	Red
	💧	Liquid

✓ = Purified in order to optimize the required actions.

\* CE is inhibited by 3% ethanol; purified preparations are not necessary during use of these enzymes.

\*\* Enzymes produced by means of technology may maintain unwanted activity at non-significant levels.



# RED WINEMAKING

*Natural accelerators*

## P Purified enzymes

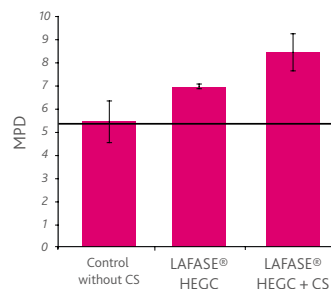
### LAFASE® HE GRAND CRU P

*Red wines with aging potential*

**Specific to traditional macerations. Produces structured wines rich in color and elegant tannins.**

- Preparation of pectolytic enzymes with secondary activities.
  - Increases wine aging ability by promoting the extraction of stable phenolic compounds and polysaccharides.
  - Increases the sensation of sweetness and decreases the astringency in wines by the preferential extraction of smaller size polysaccharides (RGII) and other polysaccharides rich in arabinose and galactose.
  - Optimizes free run wine yield.
  - Optimizes wine clarification.
- Dosage: 25 - 35 g/ton of grapes.

*Comparison of mean polymerization degrees (MPD) of tannins  
Enzyme: LAFASE® HE GRAND CRU With and without CS: Cold  
Soaking. Cabernet Sauvignon*



100 g  
500 g

### LAFASE® FRUIT P

*Premium red wines*

**Specific to short macerations with or without cold pre-fermentation maceration, for fruity colored red wines intended for early release.**

- Pectolytic enzymes preparation rich in secondary activities.
  - Optimizes the fruit potential of wines by promoting gentle extraction of phenolic compounds and aromas from the grape skin while minimizing the need for mechanical actions.
  - Optimizes free run wine yield.
  - Optimizes wine clarification.
- Dosage: 25 - 35 g/ton of grapes.

250 g



### LAFASE® XL *Extraction*

*Red and white wines*

**Specific to maceration in red winemaking and skin contact in white winemaking.**

- Pectolytic enzymes with secondary activities.
  - Increases free run juice or wine yields.
  - Improves grape skin compound release.
  - Limits mechanical actions.
- Dosage: 20 - 40 mL/ton of grapes.

1.16 kg  
11.6 kg





# MACERATION & PRESSING OF WHITES & ROSÉS

Natural accelerators

## P Purified enzymes

### LAFAZYM® EXTRACT P

Specific for skin contact at low temperatures for aromatic varietal wines.

- Pectolytic enzymes rich in secondary activities.
- Helps reduce maceration times.
- Enhances aroma precursor extraction.
- Improves the aromatic potentials of must.
- Improves juice yield and juice clarification.

Dosage: 20 - 30 g/ton of grapes.

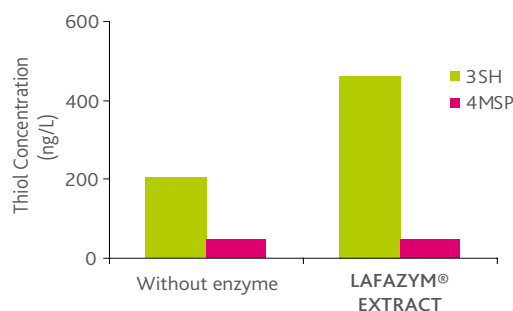
#### Volatile thiols analyzed

3SH: 3-sulfanyhexanol (grapefruit and passionfruit).  
4MSP: 4-methyl-4-sulfanylpentan-2-one (boxwood).

Varietal white & rosé wines



250 g



### LAFAZYM® PRESS P

Specific for white and rosé pressing.

- Preparation of pectolytic enzymes rich in secondary activities.
- Improves free run juice and first pressing yields (white and rosé).
- Decreases the length and number of pressing cycles.
- Improves juice clarification and filtrability.

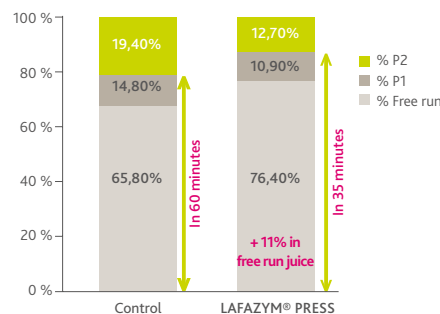
Dosage: 20 - 50 g/ton of grapes.

The effect of the use of **LAFAZYM® PRESS**, a specialized skin contact enzyme, versus the use of no enzyme on juice yield. It is evident that apart from a significant process time saving, an increase in quality free run juice is obtained, coupled with a decrease in the quantity of lower quality press juice. Vignobles Ducourt (Bordeaux)

Premium white & rosé wines



100 g  
500 g



### LAFASE® XL PRESS P

Specifically formulated for white, and red grape pressings to produce rosé wines.

- A preparation of pectolytic enzymes with secondary activity.
- Increases high-quality juice yields.
- Protects musts from oxidation.
- Shortens the pressing cycles, and prevents over-maceration.
- Limiting mechanical actions.

Dosage: 10 - 40 mL/ton of grapes.

White and rosé wines



1.2 kg  
12 kg



# WHITE & ROSÉ WINE CLARIFICATION

*Natural accelerators*

**P** *Purified enzymes*

## LAFAZYM® CL **P**

**Specific for clarification of juice.**

- Preparation of pectolytic enzymes rich in secondary activities.
  - Decrease the time of juice settling.
  - Improves lees settling.
  - Increases the volume of free run juice.
  - Contributes to aromatic finesse of wines.
- Dosage on must: 5 - 20 ppm.

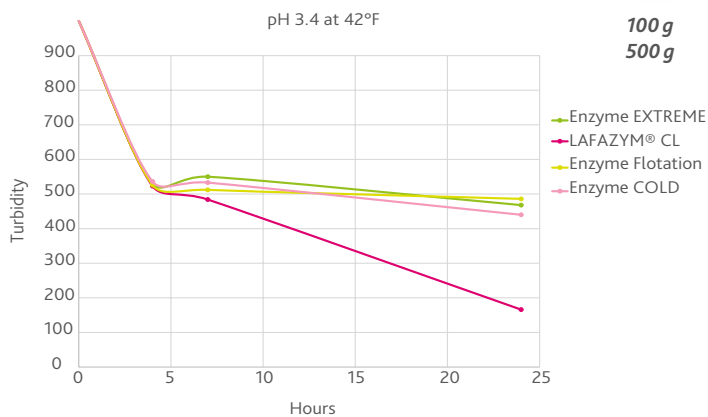
### RELIABLE PERFORMANCE UNDER EXTREME CONDITIONS:

Application testing under laboratory conditions confirmed that our clarification enzymes, particularly LAFAZYM® CL, are among the hardest on the market. They perform reliably throughout a vast range of physicochemical conditions, including the most extreme ones encountered in vinification (low pH and low temperatures, high acid and ethanol concentrations, etc.).

*Premium white & rosé wines*



100 g  
500 g



*Trials made in 2016 on Ugni blanc from Charentes, juice pH 3,4*

## LAFAZYM® 600 XL **P**

**Specific for quick and efficient clarification within a wide range of pH (2.9 - 4.0).**

- Pectolytic enzymes with secondary activities
  - Reduces settling time and improves lees compaction.
  - Increases the volume of free-run juice.
  - Adds to the aromatic finesse of the wines.
  - Especially adapted for free run and press juice from grape varieties that are difficult to settle (Ugni blanc, Melon, Gewürztraminer, Pinot gris, Chardonnay mûrs...).
- Dosage: 20 - 80 mL / 1,000 gal.

*White, rosé*



0.290 kg  
11.6 kg

## LAFASE® XL *Clarification*

**Specific to white and rosé must clarification.**

- Pectolytic enzymes with secondary activities.
  - Fast depectinization over a wide temperature range (8-55°C)
  - Well adapted for flotation clarification.
  - Allows the clarification of musts from heat treatment or flash detente.
- Dosage: 40 - 120 mL / 1,000 gal.

*White & rosé wines*



1.16 kg  
11.6 kg

To determine the presence of pectin, consider using our pectin test. The procedure is available on our website:  
[www.laffort.com/en/products/laboratory](http://www.laffort.com/en/products/laboratory)







# SPECIFIC APPLICATIONS & MATURATION

*Natural accelerators*

**P** Purified enzymes

## EXTRALYSE® **P**

**Specific to lees aging for the production of rounded wines.**

- Preparation of pectolytic enzymes and b- (1-3 ; 1-6) glucanase secondary activities.
- Brings roundness and suppleness in wines by releasing a larger quantities of molecules derived from the yeast.
- Improves the filterability of wines especially in case of *Botrytis* pressure.

Dosage: 60 - 100 ppm.

*Red, white and rosé wines*



250 g

## LAFAZYM® AROM

**Specific to aromatic wines from grapes such as Riesling, Gewürztraminer, Chenin, Grenache, Syrah, etc.**

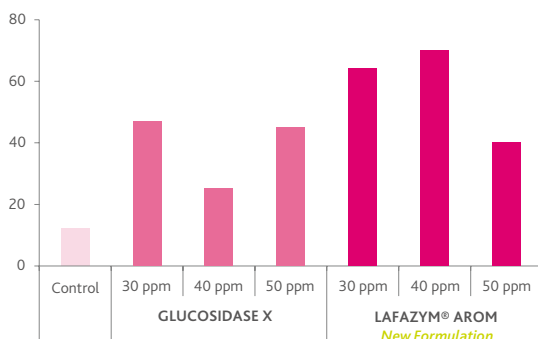
- Preparation of pectolytic enzymes and  $\beta$ -glucosidase.
- Improves the aromatic intensity of wines from grapes with glycosylated precursors (terpenes, norisoprenoids...).
- Use on finished wine and base wines.

Dosage: 20 - 40 ppm.

*White and rosé wines*



100 g



### Blind tasting results

Contact time of the enzymes 6 weeks, enzyme action stopped with 10 g/hL of MICROCOL® ALPHA bentonite. Chardonnay 2013. Wines were rated from 1 to 10, 10 being the best wine. The favorite wines are treated with the new formulation of LAFAZYM® AROM at a low or average dose.

## LYSOZYM

**Specific to microbial management of Gram positive bacteria.**

- Muramidase enzyme activity degrades Gram + lactic acid bacteria cell wall.
- Delays the action of lactic bacteria reducing total SO<sub>2</sub> requirement.
- Reinforces SO<sub>2</sub> action on sweet white wines and increases the microbiological stability.
- In red winemaking, prevents early start of the malolactic fermentation before the alcoholic fermentation is finished (in case of sluggish or stuck fermentation) or in the case of micro-oxygenation.
- Limits the competition between yeast and bacteria.

Dosage: 100 - 500 ppm.

*Red, white and rosé wines*



1 kg



# RED PRESS WINE

*Natural accelerators*

For best treatment efficiency, add the enzymes as early as possible, as soon as wine is released from the press.

## LAFAZYM® CL P

A purified granular pectinase blend for ease of storage, high efficiency and ethyl phenol control.

Dosage: 10 - 30 ppm.

*Red press wine*

100 g  
500 g



## EXTRALYSE® P

A purified and concentrated granular pectinase blend with a high  $\beta$ -(1-3; 1-6) glucanase activity, for improved filtration.

Dosage: 100 - 150 ppm.

*Red press wine*



250 g

The  $\beta$ -glucanase in Extralyse is derived from *Trichoderma harzianum*, which is administratively permitted for domestic use per 27 CFR § 24.250. You may use this product in the commercial production of wine for domestic use without having to file an application for approval with TTB. Please contact us for further information.

## LAFAZYM® 600 XL P

A purified highly concentrated liquid pectinase preparation.

▪ For best efficiency and ethyl phenol control.

Dosage: 40 - 120 mL / 1,000 gal.

*Red press wine*

0.290 kg  
11.6 kg



## LAFASE® XL *Clarification*

A liquid pectinase preparation as an efficient and cost effective solution.

Dosage: 80 - 200 mL / 1,000 gal.

*Red press wine*

1.16 kg  
11.6 kg



### FOCUS ON THE TREATMENT OF RED PRESS WINES

Red press wines contain many macromolecules that hinder clarification before blending and bottling. These wines are rich in macromolecules, mainly polysaccharides derived from the grape (homogalacturonans, rhamno galacturonans RGI and RGI, Polysaccharides rich in arabinose and galactose...), or fungi, whether from fermentation yeasts or from contamination from *Botrytis* (mannoproteins and glucans). The interaction of these substances with other compounds can inhibit wine settling.

Enzyme preparations are an effective treatment to improve sedimentation and facilitate filtration. The benefits of enzymatic treatment can be demonstrated on a technical level (improvement of filterability, sedimentation, lower turbidity, reduction in lees volumes), on a quality level (reduction of oxidation, aroma protection) and on an economic level (labor reduction, time management, yield increase...).

Depending on the particle interactions responsible for haze formation, more concentrated preparations of pectinases with targeted secondary activities, as well as preparations containing  $\beta$ -glucanases have given excellent results. Enzymes on the list above are particularly effective preparations to accelerate red press wines treatment. Dosage, temperature and contact time are of course interrelated criteria to consider for obtaining the best results.



For over 20 years, LAFFORT® has been investing in research to:

- Identify and select the best vegetal tannin sources that complement the phenolic structure of wine.
- Constantly improve production and purification methods for raw materials.
- Build a greater understanding of the enological implications of tannin usage.
- Develop the methods of tannin application in accordance with implemented enological practices.

Thanks to its expertise, LAFFORT® guarantees consistent quality formulation.

### *Tannins, for what purpose?*

Hydrolysable tannins (mainly ellagic from oak or chestnut, and gallic from chestnut galls) and condensed tannins (proanthocyanidic from grapes or exotic woods) are used in winemaking for different purposes:

- Unstable protein precipitation.
- Anti-oxidation.
- Structure enhancement.
- Regulate redox phenomena.
- Protection and stabilization of coloring matter.
- Reductive character minimization.
- Improves clarification.

### *How to use tannins?*

All LAFFORT® tannins benefit from LAFFORT's unique formulation called the Instant Dissolving Process (IDP); a revolutionary process for ease of use!

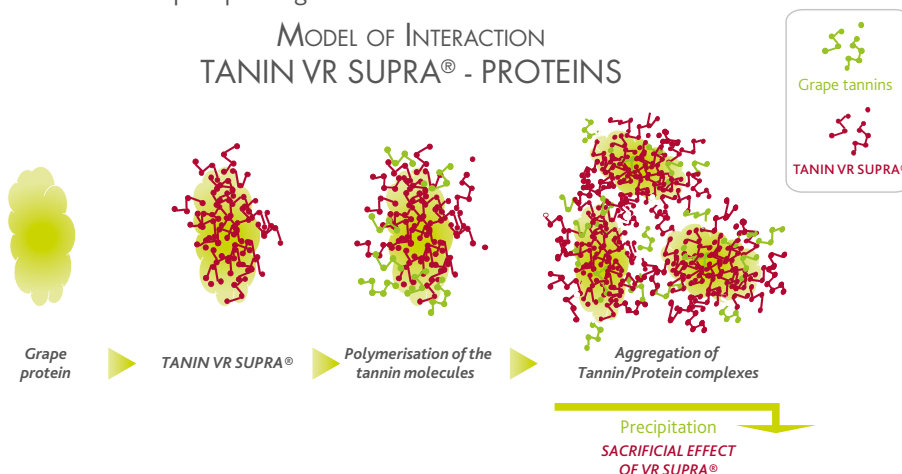
The Instant Dissolving Process enables perfect solubility in wine and thus no preliminary dissolution of the tannins in water is required. Homogenous introduction into the bulk of the must or wine is, however, advised. It is recommended to carry out a systematic pump-over or other homogenizing action during the application.



For more information on the exclusive IDP process, a video is available on the LAFFORT® website.

### *The sacrificial effect of VR SUPRA®!*

During the first crushing of the fruit, proteins in the must bind with tannins and begin to precipitate. The first tannins available are the skin tannins, which are usually ripe and soft, and the ones that matter most for the future wine structure. Some tannin compounds of VR SUPRA®, when added on grapes, are readily available to react with the proteins in the must, thus preserving skin tannins from precipitating.





# FERMENTATION TANNINS

*The essential element*

OBJECTIVE	GRAPE OR MUST TYPE	TANNIN	DOSAGE	NOTE
<i>Botrytised</i> grapes, anti-oxidant action, laccase inhibition	Red	VR SUPRA® VR SUPRA® <i>Élégance</i>	100 - 800 ppm, according to the health of the grapes.	Add as soon as possible to grapes, even before arrival in the winery. Perform laccase test in case of <i>Botrytis</i> .
	White and Rosé	GALALCOOL®	50 - 200 ppm, according to the health of the grapes.	
Protein precipitation and skin tannin preservation	Red	VR SUPRA® VR SUPRA® <i>Élégance</i>	100 - 800 ppm	Sacrificial effect. Add as soon as possible to grapes.
Protein precipitation	White and Rosé	GALALCOOL®	50 - 200 ppm	
Color stabilization	Red	VR COLOR® VR GRAPE®	150 - 800 ppm	Add during the first third of fermentation.
Structure contribution	Red	VR GRAPE® VR SUPRA®	100 - 400 ppm 100 - 800 ppm	

## TANIN VR SUPRA®

*Red wine*

### Instantly dissolving (IDP) ellagic and proanthocyanidic tannin preparation.

TANIN VR SUPRA® combines the effects of different tannins, selected and prepared for optimal technological efficiency, without adding bitterness, to facilitate:

- Anti-oxidant action providing protection of the must and the pigmented matter.
- Wine structure improvement by supplementation of the midpalate.
- Inhibition of natural oxidation enzymes (laccase, polyphenol oxidase) during harvesting of *Botrytis* affected vintages (more efficiently than SO<sub>2</sub>).
- Sacrificial effect: preserves the grape tannins from precipitation with the grape proteins, to favor indigenous tannin / anthocyanin reactions.

Dosage: 100 - 800 ppm.



1 kg  
5 kg



“ I have enjoyed using TANIN VR SUPRA® with great success over the years. It has been my go-to tannin for structure and color stability. There are a lot of products that claim to offer similar benefits, but I find TANIN VR SUPRA® to be the best all around.”

*Chad Joseph, Oak Farm Vineyards, Lodi, California*



# FERMENTATION TANNINS

*The essential element*

## TANIN VR SUPRA® *Élégance*

**Instantly dissolving (IDP) oak ellagic and proanthocyanidic tannin preparation.**

TANIN VR SUPRA® ELEGANCE is recommended for lighter varieties such as Pinot Noir, Sangiovese and Gamay.

Dosage: 100 - 800 ppm.

*Red Wine*

1 kg  
5 kg



## TANIN VR COLOR®

**Instantly dissolving (IDP) formulation of catechin tannins.**

TANIN VR COLOR is a non-astringent tannin which can be integrated in to all profiles of wine.

TANIN VR COLOR® is used to improve the active tannin / anthocyanin ratio in such cases:

- Grapes harvested at sub-optimal phenolic ripeness.
- Grape varieties with a naturally poor tannin/anthocyanin ratio.
- Varieties that have color management problems (extraction/stabilization).

Dosage: 100 - 800 ppm.

*Red Wine*

1 kg  
5 kg



## TANIN GALALCOOL®

**Gallic tannins using instantly dissolving process (IDP), to be used for white and rosé juice/ must.**

TANIN GALALCOOL® is a highly purified extract of chestnut gall tannins, with physio-chemical properties that are particularly well adapted to white and rosé must vinification, including:

- Inhibition of **natural oxidation** enzymes (laccase, polyphenol oxidase), more efficiently than SO<sub>2</sub>.
- Precipitation of some of the **unstable proteins**, as efficiently as bentonite but without aroma loss.
- Facilitates clarification.

Dosage: 50 - 200 ppm.

*White & rosé wine*

1 kg



## TANIN VR GRAPE®

**Proanthocyanidic tannins extracted from grapes using instantly dissolving process (IDP).**

During the fermentation phase TANIN VR GRAPE® allows:

- Compensation for natural grape tannin deficiency.
- Stabilization of color due to the formation of tannin-anthocyanin polymeric pigments.

Dosage: 100 - 400 ppm.

*All types of wine*

500 g





# TANIN VR SUPRA® AND VR COLOR®, THE WINNING TEAM

Tannins in winemaking have 4 points of interest:

- The "sacrificial" effect,
- The antioxidant effect,
- The co-pigmentation effect in the presence of color components,
- The effect of stabilization in the presence of acetaldehyde.

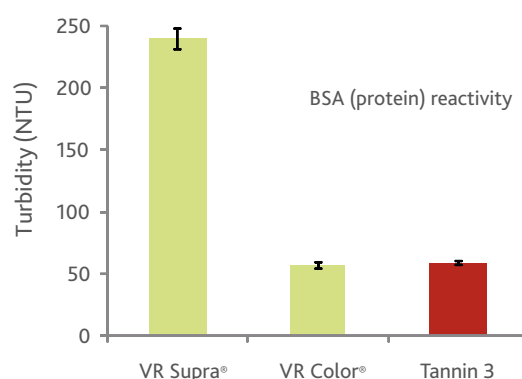


## PRECIPITATION OF PROTEINS OR "SACRIFICIAL" EFFECT

Grape proteins combine and precipitate with phenolic compounds. This precipitation reduces the natural amount of grape tannins and can be limited due to the "sacrificial" effect: by using extra tannins that will combine specifically to the proteins.

This "sacrificial" effect can be evaluated in the laboratory by measuring the tannins reactivity with a reference protein such as BSA.

VR SUPRA® provides a **strong protective effect** for natural grape phenolic compounds. Its **reactivity is 5 times superior** than other vinification tannins.



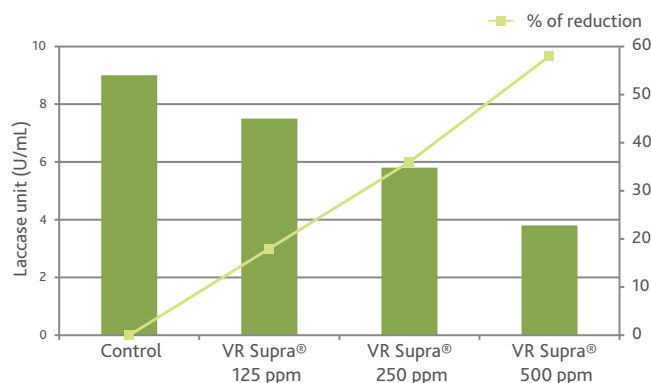
## THE ANTIOXIDANT EFFECT

The use of tannins has always been linked to their ability to moderate the effects of oxygen. They have antioxidant properties and protect the oxidizable compounds.

It has been proven that **300 ppm of VR SUPRA® (added in increments during fermentation) reduces the amount of dissolved O<sub>2</sub> three fold** in must at the beginning of the fermentation which limits the oxidation risk of easily oxidizable compounds.

## THE INHIBITION OF LACCASE ACTIVITY

*Botrytis* on grapes brings with it some laccase and polyphenol oxidase activities that are negative for wine quality. In *Botrytis* affected musts, the addition of VR SUPRA® efficiently limits the negative enzymatic oxidase activities.





## THE COPIGMENTATION EFFECT

Co-pigmentation comes from the association of colored pigments with other polyphenolic compounds, usually non-colored. This association leads to stable copigments showing a more intense color than the single colored molecules. Red wines that are rich in co-pigments will have a more intense color at both early and late stages of the vinification. VR SUPRA® and VR COLOR® are both tannins with a high co-pigmentation ability.

## CONDENSATION EFFECT (STABILIZATION OF COLORING MATTER)

Acetaldehyde molecules are involved in stabilizing simple colored phenolic structures through reactions leading to more complex molecules.

The efficiency of the tannin/anthocyanin bond via an acetaldehyde bridge can be simply demonstrated by saturating a tannin solution with acetaldehyde and then observing the evolution of turbidity over time. A benchmarking study has been done with many tannins available on the market using this method: **VR COLOR® was more than 100 times more reactive than** the closest competitor product.



*"Results of ethanal test with four products on the market; VR COLOR® is the most reactive to acetaldehyde (ethanal), key step in the color stabilization and formation of tannin-anthocyanin complexes."*

When harvest is not at optimal phenolic ripeness, the qualities of VR SUPRA® and VR COLOR® are complementary. Thanks to its remarkable "sacrificial" effect, VR SUPRA® helps protect the natural extractable grape tannins from precipitating with naturally occurring proteins, while VR COLOR® brings balance to the tannin/anthocyanin ratio and promotes the production of stable colored compounds.

	VR SUPRA®	VR COLOR®
"Sacrificial" effect	*****	*
Anti-laccase reaction	*****	**
Antioxidant effect	****	***
Co-pigmentation effect	***	****
Condensation effect (stabilization CM)	*	*****

VR SUPRA® is added to the must after the crusher or during the first pump over (if no evidence of *Botrytis*) (100 - 800 ppm according to the sanitary state of the harvest).

VR COLOR® is added during the alcoholic fermentation during the color extraction phase at 100 to 300 ppm.

Whenever the vintage looks like a difficult one with challenges for grapes with optimal phenolic ripeness, the use of proper tannins, for example, VR SUPRA® and VR COLOR® will be a key point to successful vinifications.

# FLOTATION

Flotation is a technique that allows the elimination of polyphenols and the clarification of juice, while ensuring time and energy savings in the winery. In a few hours, without refrigeration, the juice is depectinized, the lees are floated and removed, and the juice can be inoculated with yeast. New tools like the vegetal protein-based **VEGECOLL®** help to optimize wine quality (color and aroma precursors), better than traditional fining agents while also being allergen-free. Several years of experimentation in both hemispheres have led to the following recommendations:

## PECTIN TEST

Perform pectin tests regularly until the juice is completely depectinized (negative test).

*An efficient enzyme addition and a negative pectin test is the key to a successful flotation.*

## PECTIN TEST PROTOCOL

Consult our protocol available on [www.laffort.com/en/product/laboratory](http://www.laffort.com/en/product/laboratory).



**LAFASE® XL  
CLARIFICATION**  
10-30 ppm

Wait for a  
negative  
pectin test.



**VEGECOLL®**  
VEGETAL CLARIFICATION

**VEGECOLL® : 30-100 ppm or  
Homogenization**

Flotation

Racking Yeast Addition

Pressing Enzyme Addition

Temperature: 15 to 20°C  
(compact lees).

Tank: wider than tall if possible.

Airflow: 25-40 liters per minute  
according to specific device.

Fining agent flow: 2.5 - 5.0 liters per minute.

- Possibility to add carbon, bentonite and silica gel.

- Low final turbidity; possibility to add fine lees.

- Fast yeast addition at 20 g/hL to avoid spontaneous fermentation, using **SUPERSTART® BLANC** or **SUPERSTART® ROUGE** to compensate the lack of sterols. Addition of nutrients.

For more information on our products for flotation, please don't hesitate to contact us.

For more information on this clarification method, watch our video on flotation.





# VEGETAL PROTEIN

## VEGECOLL®

White and rosé juice, thermo treated reds

### Vegetal protein (potato protein isolate) for juice clarification.

- Allergen-free, non-animal, non-GMO.
- Very high Zeta potential, fast clarification.
- The most reactive vegetal protein in enology to this day.
- No risk of overfining.
- Fast flotation at low dosage, with better aroma preservation than traditional flotation fining agents.

Dosage:

\*Flotation: 30-100 ppm.

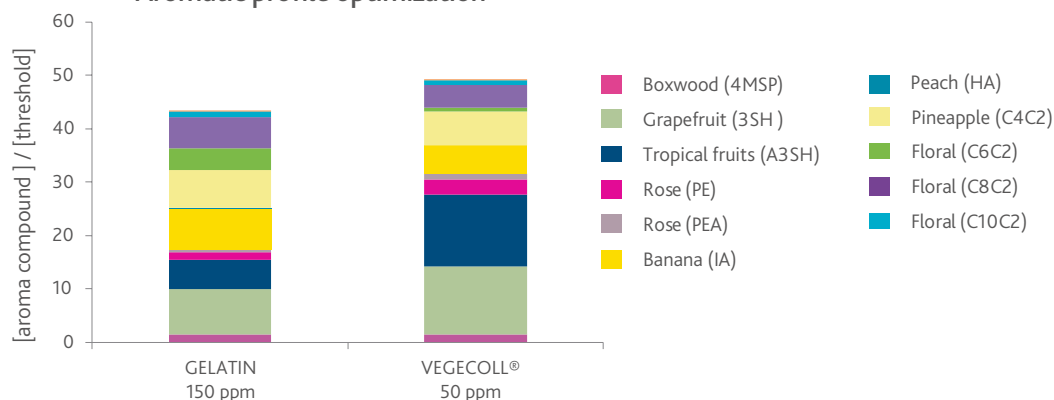
\*Fining of free run white and rosé juice for oxidation prevention: 100-200 ppm.

\*Fining of press juice (light press) to eliminate oxidized phenolic compounds: 200-300 ppm.



500 g

### Aromatic profile optimization



### Flotation: short compaction time and very compact lees.

	Lees compaction time	Lees height	Final Turbidity (NTU)
VEGECOLL® 50 ppm	≈ 30 min	< 10%	56
Gelatin 100 ppm	≈ 1h 30 min	> 10%	53

The vegetal protein (potato protein isolate) in VEGECOLL® is administratively permitted by the TTB for domestic use per 27 CFR § 24.250. You may use this product in the commercial production of wine without having to file an application for approval with TTB. Please contact us for further information.

Trial with Colombard juice (2012) volume of 26,000 gal.



“I’ve used VEGECOLL® extensively in my white and rose’ programs for the last two vintages and have been very pleased with the results. I’ve implemented VEGECOLL® in the past for fining purposes with great success, but where this product really shines for me is in its performance during clarification, specifically during flotation. I’ve trialed numerous enological proteins for the purposes of float clarification, and in terms of ease of use, performance and organoleptic contribution, there’s no comparison!”

Karl Weichold, Assistant Winemaker, Erath Winery, Dundee, Oregon





# VEGETAL PROTEIN

A COMPLETE RANGE OF **ALLERGEN-FREE** PRODUCTS FOR FINING OF WINE AND JUICE.



Formulations and applications of the POLYMUST® range of products

	Name	Formulation	Applications	Dosage
 	<b>POLYMUST® ROSÉ</b>	PVPP Vegetal Protein (potato protein isolate)	Elimination of acid phenols. Preservation of must and rosé wines colors during fermentation.	300 - 800 ppm
	<b>POLYMUST® PRESS</b>	Calcium Bentonite PVPP Vegetal Protein (potato protein isolate)	Management of the phenolic content of white and rosé press juice.	400 - 1,000 ppm (White and rosé press juices) 150 - 500 ppm (red press wines)



1 kg  
10 kg



1 kg  
10 kg



## CASEI PLUS

Potassium caseinate developed for treatment of oxidation phenomena and maderization in juice (white and rosé).

- In the case of Botrytis infected grapes, **CASEI PLUS** is recommended for the treatment of young white or rosé wines (reds in certain cases) to decrease the oxidized character.

- Decreases the iron content in white juice.

Dosage: 50 - 200 ppm for clarification.

200 - 600 ppm for maderization treatment and color correction.

1 kg  
5 kg



## POLYLACT®

Combination of PVPP and casein for preventing and treating oxidation in juice (white and rosé).

- Inhibits browning and pinking while diminishing bitterness.

- Gentle and complete fining action on phenolic compounds.

- Enhances the freshness of the purple hue when used in rosé juice and wines.

Dosage: preventative treatment: 150 - 300 ppm - curative treatment: 300 - 700 ppm.

1 kg  
10 kg



## ARGILACT®

Combination of casein and bentonite for treating wines (white and rosé) against oxidation.

- Prevents oxidation in white wines (in the presence of laccase).

- Eliminates substances responsible for bitterness and herbaceous flavors.

Dosage: 400 - 1,000 ppm.

1 kg  
25 kg



## MICROCOL® FT

Natural calcium bentonite for protein Stabilization of wine during crossflow filtration.

- Highly purified, contains very little crystalline silica responsible for membrane abrasion.

- A defined particle size avoids both filter blockage and residual micro-particles post filtration

Dosage: 300 - 800 ppm.

15 kg



## VINICLAR®

Preparation of PVPP for preventive and curative treatment of the oxidation of juice.

- Reduces and prevents the risk of maderization, and pinking in white juice.

- Selectively removes the polyphenols responsible for bitterness.

VINICLAR® contains a small amount of cellulose for a better clarification and easier filtration

Dosage: 150 - 300 ppm for preventive use.

300 - 800 ppm for curative use of oxidized wine or must.

1 kg





# JUICE FINING

## GELATINE EXTRA N° 1

Heat soluble gelatin.

- Adapted to flotation.
- Dosage: 60 - 100 ppm.

1 kg



## GECOLL® SUPRA

Liquid gelatin produced from a selection of exceptionally pure raw materials, exclusively of porcine origin.

- Contributes to softening of hard press wines.
- Adapted use in flotation.
- Dosage: 400 to 1,000 ppm.

1.05 kg  
5.25 kg  
21 kg



## SUPRAROM®

Preparation containing condensed tannins, potassium metabisulphite and ascorbic acid. Preventive and curative treatment for must oxidation.

- Preserves aroma freshness and intensity.
- Antioxidant for white, rosé and red juice.
- Dosage: 100 - 250 g/ton of grapes.

1 kg



## GEOSORB® GR

Decontaminant for fermenting musts and young wines for reducing geosmin and octenone content.

- Activated plant-origin enological charcoal characterized by a specific porosity, which enables selective adsorption of geosmin (moist earth, beetroot) and octenone (mushroom).
- Corrects the organoleptic character of wines from musts which have been affected by fungi such as rot or powdery mildew.
- Dosage: Action on geosmin: 150 - 250 ppm - Action on octenone: 350 - 450 ppm.

5 kg



## CHARBON ACTIF PLUS GR

Activated carbon for white and rosé wine

- Color correction in juice, particularly for sparkling wines.
- Dosage: 200 - 1,000 ppm.

5 kg





# AGING PRODUCTS



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# YEAST PRODUCTS

*Innovation born from nature*

**AUTOLEES®** is a specialty enological product derived from natural yeast constituents and a specially purified gum arabic, obtained using innovative and patented production procedures. It is paving the way for a new type of enology: more natural, more specific, while enhancing and preserving the best of wine.

The proprietary composition of **AUTOLEES®** contributes to wine stabilization, and improves mouthfeel in all types of wine allowing the winemaker to both balance acidity and mask bitterness.

## AUTOLEES®

*All type of wine*

**Specific preparation of yeast mannoproteins rich in sapid (pleasant tasting) peptides and polysaccharides.**

- Contributes to the stability of wines.
- Contributes to the colloidal structure of wines, increasing the sensations of balance and roundness (red and white wines).
- Naturally contains the yeast membrane peptide (coming from protein Hsp12), giving the sensation of sweetness.

Dosage: 100 - 300 ppm.



1 kg



*Concentration in Hsp12 (membrane protein at the origin of the peptide, giving the sensation of sweetness in the wine) in different products of equivalent application standardized according to the most concentrated product at 100%.*



“**AUTOLEES®** enhances the fresh, vibrant, and floral aromatics of our white wines while rounding off any harsh, acidic notes. An additional benefit is that it provides weight on the palate. In red wine, addition of **AUTOLEES®** facilitates structure and balance with a decrease in overall astringency. At Robert Hall Winery, what prompted us to use **AUTOLEES®** was the effectiveness of the product's ability to integrate into our wine right before or after filtration.”

*Kevin Johansing, Assistant Winemaker, Tooth and Nail Winery (CA)*

The Mannoproteins in **AUTOLEES®** are administratively permitted by the TTB per 27 CFR § 24.250. You may use this product in the commercial production of wine for domestic use without having to file an application for approval with TTB. Please contact us for further information.



ricerca  
vación  
research  
vation  
ure

# YEAST PRODUCTS

*Innovation born from nature*

## MANNOFEEL®

MANNOFEEL® is the result of global research by LAFFORT® on Mannoproteins to identify and understand the mechanism of action and production. The selected mannoproteins in MANNOFEEL® significantly increase the perception of volume, roundness and length on the palate.

- Participates in tartaric stabilization of wine.
- Pure product, 100 % mannoproteins.
- Natural compound present in wine.
- Respects the freshness and fruit in wine.
- 100% soluble with an immediate action.
- Participates in stabilizing the coloring matter.
- Excellent filterability; MANNOFEEL® does not change the filterability of wine.

Dosage: 25 - 150 mL/hL (950 - 5700 mL/1,000 gal).



1.08 kg

## Sensory Analysis by Dominant Temporal Sensation (DTS).

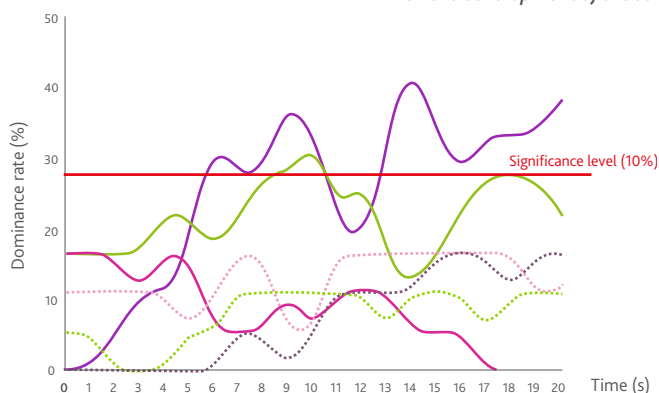
This new method for sensory analysis allows the description of the evolution of wine in time for mouthfeel and the dynamics of perceptions in the course of the tasting.

The sensory evaluation (below) of the products has been made by a panel composed of 18 experts at the LACO Laboratory (COFRAC accredited accreditation No. 1-0522). Six sensory descriptors underwent evaluation: astringency, tannic intensity, sweetness, roundness associated with the mouthfeel, bitterness, and acidity. The evolution of these 6 descriptors over time can be seen in the graphs below.

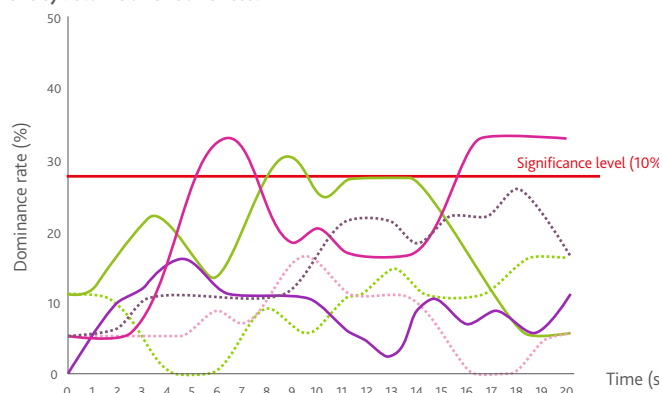
### Evaluation results via DTS of Italian red wine. (Barbera).

Sensory analysis by Dominant Temporal Sensation can prove the impact of MANNOFEEL® on the development of the sensations of volume and roundness.

..... Tannic intensity



The sample wine is dominated by acidity and a slight sweetness peak in the mid-palate. The evaluation results via DTS indicated treating the wine with MANNOFEEL® at 1 mL/L.



The sample wine treated with MANNOFEEL® at 1 mL/L shows a slight sweetness at the beginning, with a sweet sensation in the middle of mouth and a lingering finish of volume/roundness.



“I’ve used MANNOFEEL® in my dry white and rosé wines with great results. It has certainly helped to shorten the period of time required to achieve cold stability but it has also improved the mouthfeel without compromising aromatics in the least. These wines don’t undergo MLF and I’ve found that MANNOFEEL® helps to round out the more angular and sharp acidic profile associated with malic acid while simultaneously contributing to the weight and viscosity of the wine without making it feel sweet on the palate. I have found it to be a great tool for wines like rose that need to be bottled and in the market quickly.”

*Justin Neufeld, winemaker for Gilbert Cellars, Yakima, WA*



# ENZYMES FOR AGING

*Natural accelerators*

## EXTRALYSE® <sup>P</sup>

Specific enzyme for aging of wines on lees and producing well-rounded wines.

- Pectolytic enzyme preparation and  $\beta$ -(1-3; 1-6) glucanases secondary activities.
- Brings roundness and softness to the wine by releasing larger quantities of yeast-derived molecules.
- Improves the filterability of wines especially in case of Botrytis cinerea pressure.

Dosage: 60 - 100 ppm.

*Red, white & rosé wine*

250 g



The  $\beta$ -glucanase in Extralyse is derived from *Trichoderma harzianum*, which is administratively permitted for domestic use per 27 CFR § 24.250. You may use this product in the commercial production of wine without having to file an application for approval with TTB. Please contact your representative for further information.

## LAFAZYM® AROM

Specific for aromatic Muscat wines from such grapes as Riesling, Gewürztraminer, Chenin, Grenache, Syrah etc.

- Preparation of pectolytic and  $\beta$ -glycosidase with  $\beta$ -glycosidase secondary activities enzyme.
- Increases aromatic intensity of wines from the grape varieties with glycosylated precursors of terpenes and norisoprenoids.
- Use on finished wine and base wines.

Dosage: 20 - 40 ppm.

*Red, white & rosé wine*

100 g



## LYSOZYM

Specific microbial management of wines.

- With muramidase activity, which degrades the wall of lactic acid bacteria (Gram +).
- Delays the action of lactic acid bacteria, reducing the need for SO<sub>2</sub>.
- Strengthens the action of SO<sub>2</sub> on the sweet white wines and improves microbiological stability.
- In red winemaking, avoids early onset of MLF during long maceration, sluggish or stuck alcoholic fermentation or in the case of a micro-oxygenation.
- Limits competition between yeast and bacteria.

Dosage: 100 - 500 ppm.

*Red, white & rosé wine*

1 kg



## FOR YOUR RED PRESS WINE, TRY

LAFAZYM® CL, EXTRALYSE®, LAFAZYM® 600 XL, LAFASE® XL CLARIFICATION (p.36)



100 g  
500 g



250 g



0.290 kg  
11.6 kg



1.16 kg



# AGING TANNINS

*The essential element*

OBJECTIVE	WINE TYPE	TANNIN	DOSAGE
Balance or wine structure improvement	White and Rosé	TANFRESH®	10 - 60 ppm
	Red	VR GRAPE® TAN'COR® TAN'COR GRAND CRU® QUERTANIN® RANGE	100 - 400 ppm 100 - 300 ppm 50 - 300 ppm 20 - 200 ppm
Regulation of oxidation-reduction phenomena.	White and Rosé	TANIN GALALCOOL SP TANFRESH®	50 - 200 ppm 5 - 60 ppm
	Red	QUERTANIN® TAN'COR GRAND CRU®	20 - 200 ppm 100 - 200 ppm
Stabilization of coloring matter.	Red	VR GRAPE® TAN'COR GRAND CRU® QUERTANIN®	100 - 400 ppm 50 - 300 ppm 20 - 200 ppm

## TANIN GALALCOOL® SP

**Instantly dissolving (IDP), highly purified extract of chestnut gall tannins.**

- Improves wine structure.
- Regulates oxidation-reduction phenomena.
- Precipitates unstable proteins.
- Inhibits laccase action.
- Facilitates clarification.

Dosage: 50 - 200 ppm

*White & rosé wine*



1 kg

## TAN'COR®

**Proanthocyanidic and ellagic tannin preparation, using LAFFORT®'s instantly dissolving process (IDP), to be used in red wine maturation.**

TAN'COR® combines the properties of ellagic and proanthocyanidic tannins specially prepared for the protection of red wines after the fermentation phase or during maturation, and is used to:

- Enhance and modify the structure of the wine and prepare it for maturation.
- Protect of the wine with regards to oxidation phenomena.
- Regulate oxidation-reduction phenomena.

Dosage: 100 - 300 ppm.

*Red wine*



1 kg  
5 kg

For more information on the exclusive IDP process, a video is available on the LAFFORT® website.





# AGING TANNINS

*The essential element*

## TAN'COR® GRAND CRU

Red wine

Preparation of proanthocyanidic tannins derived from grapes and ellagic tannins from oak, using LAFFORT®'s instantly dissolving process (IDP), to be used during red wine maturation.

After the fermentation phase or during maturation, TAN'COR® GRAND CRU is used to:

- Enhance and modify the wine's structure and palate length.
- Stabilize color by combining the remaining free anthocyanins.
- Regulate oxidation-reduction phenomena.

Dosage: 50 - 300 ppm.



1 kg



“TAN'COR® GRAND CRU is my go-to tannin when I want to improve mouthfeel and lengthen the palate of my wines. I typically find a dosage in the 100 mg/L range brings depth to the wine and extends the mid palate, building on the fruit forward character of our wines. Having successfully used TAN'COR® GRAND CRU for three vintages I know what this great tool will do and am able to incorporate the tannin early in the maturation process.”

Steve Hovanes, Hyatt Vineyards, Zillah, WA

## TANIN VR GRAPE®

Red wine

Proanthocyanidic tannins extracted from grapes using LAFFORT®'s instantly dissolving process (IDP).

During maturation, TANIN VR GRAPE® allows:

- Compensation for natural grape tannin deficiency.
- Stabilization of color due to the formation of tannin-anthocyanin polymeric pigments.

Dosage: 100 - 400 ppm.



500 g

## TANFRESH®

White & rosé wine

Instantly dissolving (IDP) ellagic and proanthocyanidic tannin preparation based on grape tannins.

- To refresh white and rosé wine (against oxidation, atypical aging).
- To boost structure and mouthfeel.
- To help eliminate reductive odors.

Dosage: 5 - 60 ppm.



250 g



“Even when working with premium fruit, finding harmony in a wine between aromas, color, texture and structure is no easy task. In larger scale production we've found our fruit forward and aged reds sometimes need a refresh button. TANFRESH®, does just that by allowing the buried fruit characters to re-bloom and express themselves. We've found great benefits in the aroma and flavors profile during the final blending stages. It is a product usually recommended on whites but we had the opportunity to try it on light reds and have seen these great results. We have also included it in trials of different white wines with good results too, and we will continue to include it regularly as a tool in blending and finishing trials.”

Victor Palencia, Director of Winemaking/Head Winemaker, J&S Crushing LLC-&-Jones of Washington Winery-&-Shaw Estates





Stave wood-quality ellagic tannins, extracted from oak heartwood, using **LAFFORT®**'s instant dissolving form (IDP). For post-fermentation use in red, rosé and white wines.

## QUERTANIN®

**QUERTANIN®** is a high quality complex ellagitannin preparation, which:

- Enhances the wines structure and palate length.
- Protects wines with regards to oxidation.
- Increases the wines aromatic intensity.
- Eliminates reductive odors.

Dosage: 10 - 75 ppm

## QUERTANIN SWEET®

- Emphasizes the aromatic profile with developing the perception of sweetness.

Dosage: 20 - 60 ppm

## QUERTANIN® CHOC'

- Emphasizes the aromatic profile with developing sweetness and chocolate notes.

Dosage: 20 - 100 ppm

## QUERTANIN INTENSE®

- Amplifies mouthfeel together with toasty characteristics.

Dosage: 5 - 20 ppm

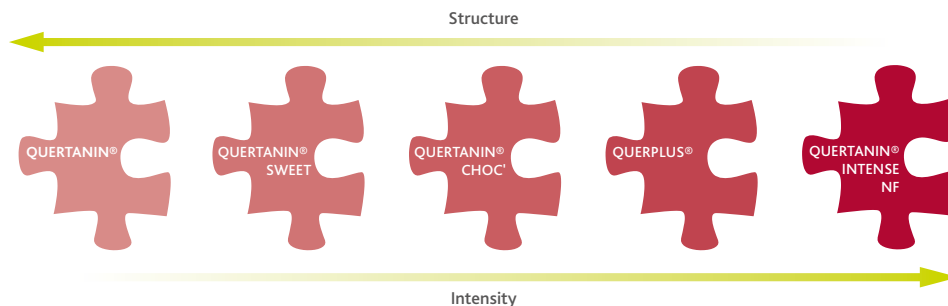
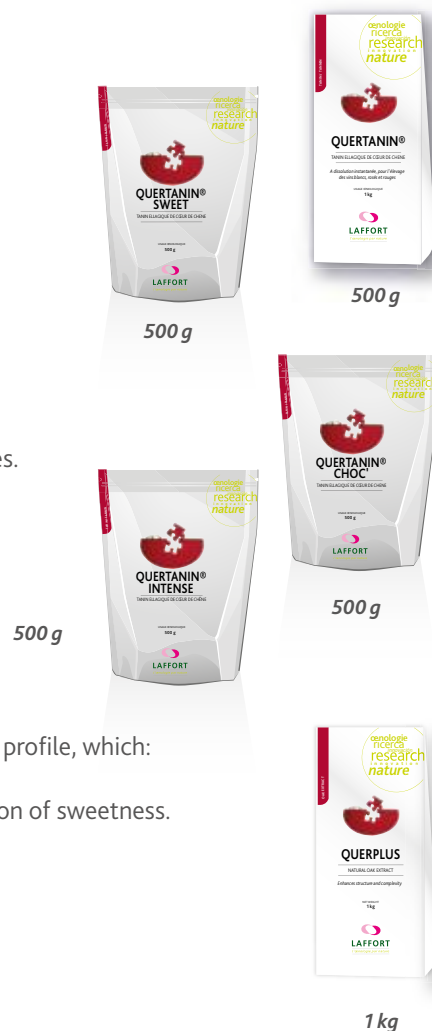
## QUERPLUS®

Oak extract from stave wood quality american oak.

The specific manufacturing process of **QUERPLUS®** allows a unique component profile, which:

- Enhances structure and mouthfeel.
- Increases the wine's aromatic intensity and complexity, enhancing the perception of sweetness.
- Protects wine with regard to oxidation.

Dosage: 20 - 75 ppm





## FINING AND CO-FINING AGENTS PREPARATION AND TREATMENT TIME

	BENCH TRIAL CONTACT TIME BEFORE TASTING *	PREPARATION / ADDITION ** (check labels and technical data sheet for more information)	USE WITH SILICA GEL	TREATMENT CONTACT TIME BEFORE RACKING OR FILTRATION***	WINE TYPES
VEGECOLL®	1-3 days	Dissolve in 10 times its weight in water, avoiding foam. Homogenize.		1-2 weeks	All types
POLYMUST® Range	1-3 days	Dissolve in 10 times its weight in water. Add to the tank during a pump-over.		1-3 weeks	All types
Gelatin	2-3 days	Liquid: gradually add with a venturi, then homogenize carefully. Solid: dissolve carefully in hot water (104°F) at 50 g/L and keep in hot water bath during incorporation.	✓	7 days - 3 weeks	All types
Dried egg albumin	2-3 days	Dissolve in 10 times its weight in water. Add to the wine and homogenize.		2-4 weeks	Red wines
Isinglass	2-3 days	Dissolve at 10g/L. Let swell for 2 hours, and stir to optimize dispersion. If gelling appears too fast, add more water. Add to the wine and homogenize.	✓	2-4 weeks	White and rosé wines
Casein	1 day	Mix in 10 times its weight in water, until dissolution. Add to the wine with a venturi then homogenize.		10 days - 3 weeks	White and rosé wines
PVPP	1 day	Suspend in 4 times its weight in water, 1 hour prior use.		10 days - 3 weeks	All types
Bentonite	2-3 days	Dissolve in 10 times its weight in water, and keep stirring for 2 hours (Hot water 122°F is recommended). Let it hydrate for 12-24 hours. Mix to obtain a homogenous preparation before incorporation. Homogenize after addition.		5 days - 2 weeks	White and rosé wines Red press wines
OENOLEES®	1-2 days	Dissolve in 5-10 times its weight in water. Homogenize after addition.		4 - 6 weeks	All types

\* During fining bench trials in laboratory.

\*\* Preparation: The efficiency of the treatment highly depends on the quality of the preparation. For a perfect homogenization, use of a venturi system is strongly recommended.

\*\*\* Contact time: the settling time will depend on the temperature of the wine, the volume and the shape of the tank, the use of Silica gel, etc...



## FINING

ALLERGEN FREE  
VEGETA ORIGIN

carotologie  
ricerca  
nature

ALLERGEN FREE  
VEGETA ORIGIN

**VEGECOLL®**  
PROTEINE VEGETALI PURIFICATE  
DE COMPLETO DI TIRRE  
Colloide di origine vegetale  
100 g

**LAFFORT**  
SOCIETÀ AGRICOLA ITALIANA



**VEGECOLL®**  
VEGETAL CLARIFICATION

## 55



# OXIDATION TREATMENT

## CASEI PLUS

**Potassium caseinate developed for treatment of oxidation phenomena and maderization in wines (rosé and white).**

*White and rosé wine*

- In the case of oxidized wines (browning), **CASEI PLUS** decolors the wine, contributing to color refreshment while also refining sensory characteristics.
- In the case of Botrytis infected grapes, **CASEI PLUS** is recommended in the treatment of young white or rosé wines (reds in certain cases) to decrease the oxidized character.
- Clarification agent which contributes to preparing wine for filtration.
- Decreases the iron content in white wines.

Dosage: 50 - 200 ppm for clarification.

200 - 600 ppm for maderization treatment and color correction.



1 kg  
5 kg

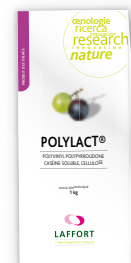
## POLYLACT®

**Combination of PVPP and casein for preventing and treating oxidation in wine (white and rosé).**

*White and rosé wine*

- Inhibits browning and pinking while diminishing bitterness.
- Gentle and complete fining action on phenolic compounds.
- Enhances the freshness of the hue (purple) when used in rosé juice and wines.

Dosage: preventive treatment: 150 - 300 ppm - curative treatment: 300 - 700 ppm.



1 kg  
10 kg

## ARGILACT®

**Combination of casein and bentonite for treating wines (white and rosé) against oxidation.**

*White and rosé wine*

- Prevents oxidation in white wines (in the presence of laccase).
- Eliminates substances responsible for bitterness and herbaceous flavors.

Dosage: 400 - 1,000 ppm.



1 kg  
25 kg



# SENSORY FINE-TUNING

## POLYMUST® PRESS

Blend of PVPP, bentonite and vegetal protein for preventative fining of red press wines and reduction of oxidized notes

- Fining of press wines: fining, stabilization of color and reduction of astringency, greenness and metallic notes, microbial stabilization.

Dosage: 150 - 500 ppm.

Red wine



1 kg

**POLYMUST® PRESS** is administratively permitted by the TTB per 27 CFR § 24.250. You may use this product in the commercial production of wine for domestic use without having to file an application for approval with TTB. Please contact your representative for further information.

## OVOCLARYL (EGG ALBUMIN POWDER)

Egg albumin fining agent which is particularly adapted for reducing and harmonizing excess polyphenolic fractions in red wines.

- For red wines with a tannin structure that lacks balance and refinement at the finish, **OVOCLARYL** rounds-off and refines the structure, while preserving the wine aromatic character and specificity.
- For young red wines or those ready for bottling, **OVOCLARYL** enables unstable tannins to be eliminated and facilitates polyphenolic stability.
- Clarification agent which contributes towards preparing wines for filtration.

Dosage: 50 - 100 ppm.

4 g of **OVOCLARYL** corresponds to 1 fresh egg white.

Red wine



1 kg

## ICHTYOCOLLE

Fish-based (Isinglass) fining agent adapted to high-grade white and rosé wine fining and clarification. **ICHTYOCOLLE** restores high organoleptic clarity and remarkable brilliance to treated wines.

- For wines with bitterness, **ICHTYOCOLLE** enables the elimination, by flocculation, of the polyphenols which are responsible for this character, while maintaining organoleptic qualities.
- In the case of viscous wines (sweet white wine types derived from botrytised grapes), **ICHTYOCOLLE** improves filterability by acting on gums and mucilages.
- Reduces the risk of wine browning.

Dosage: 5 - 15 ppm equivalent to dry matter.

White and rosé wine



250 g



LAFFORT® has decreased the SO<sub>2</sub> concentration in its liquid solutions to limit the SO<sub>2</sub> addition to wine while assuring the stability of its product.

# SENSORY FINE-TUNING

## GECOLL® SUPRA

Liquid gelatin produced from a selection of exceptionally pure raw materials, exclusively of porcine origin.

*All types of wine*

GECOLL® SUPRA is recommended for treating:

- High quality red wines, young red wines with highly reactive tannins.
- Rosé wines (and dry or sweet white wines).

Dosage: 40 - 100 mL/hL (1,500 - 4,000 mL/1,000 gal).

1.05 kg  
5.25 kg  
21 kg



## GELAROM®

Liquid gelatin produced from a selection of exceptionally pure raw materials, exclusively of porcine origin.

*All types of wine*

For young closed wines, fruitiness and delicate aromas are restored with GELAROM® treatment.

Dosage: 30 - 60 mL/hL (1,200 - 2,400 mL/1,000 gal).

1.05 kg  
5.25 kg  
21 kg



## GELATINE EXTRA N°1

Heat soluble gelatin.

*All types of wine*

- Rapid elimination of undesirable phenolics (clarification and stabilization effect).
- Improvement of the wines aging potential (refinement of the phenolic composition).
- This highly purified gelatin retains the wine's balance and aromatic finesse.

Dosage: 60 - 100 ppm.

1 kg



To watch our video "Gélatine extra n°1 implementation", scan this code or go to: [www.laffort.com/en/video](http://www.laffort.com/en/video)





## Fining Aids

### SILIGEL

Colloidal silica solution that may be used in combination with all organic fining agents.

- Improves fining efficiency: flocculation and settling.
- Prevents over-fining.

Dosage: 10 - 100 mL/hL (400 – 4,000 mL/1,000 gal). Use 0.5 to 1 mL of SILIGEL for 1 mL of gelatin  
Add **SILIGEL** prior to gelatin or fining agent.



1.2 kg  
6 kg

## Protein Stabilization

### MICROCOL® ALPHA

High quality natural sodium microgranular bentonite with a high adsorption capacity, intended for protein stabilization in wines over a large pH range.

- Stabilizing properties in regard to heat-sensitive proteins.
- Wide stabilizing action spectrum.
- Clarifying capacity and compact lees.
- Aromatic preservation.
- Color preservation.

Dosage: 100 - 800 ppm.



1 kg  
5 kg  
25 kg



### MICROCOL® FT

Natural sodium-calcium bentonite for protein stabilization of wines during cross-flow filtration.

- Highly purified, **MICROCOL® FT** contains very little crystalline silica responsible for membrane abrasion.
  - A defined particle size avoids both filter blockage and residual micro-particles post filtration.
- Dosage: 300 - 800 ppm.

15 kg





# FINING

PVPP / Carbon

## VINICLAR® & VINICLAR® P

### Preparation of PVPP for preventive and curative treatment of the oxidation of wines.

- Reduces and prevents the risk of maderization, and pinking in white wines.
- Removes preferentially the polyphenols responsible for bitterness.
- **VINICLAR® P** is 100 % pure PVPP, **VINICLAR®** contains PVPP and a little bit of cellulose for a better clarification and an easier filtration.

Dosage: 150 - 300 ppm for preventive use.

300 - 800 ppm for curative use of oxidized wine or must.

*White wine*



1 kg

## CHARBON ACTIF PLUS GR

### Activated carbon

- Color correction in musts, particularly for sparkling wines.

Dosage: 200 - 1,000 ppm.

*White & rosé wine*



5 kg

## CHARBON ACTIF SUPRA 4

### Activated carbon

- Treatment of oxidized white wines.

Dosage: 200 - 1,000 ppm.

*White wine*



5 kg

## SPECIFIC TREATMENTS

**NEW PRODUCTS**  
**2018**

**MICROControl®**

A specific combination comprising a natural fungal polysaccharide, chitosan, plant protein (potato protein isolate) and an enzymatic blend made from pectinases and  $\beta$ -glucanases, for the microbiological management and control of wines.

- Microbiological protection of wines after fermentation, by reducing the overall microbial load (yeast, lactic acid bacteria, acetic acid bacteria\*).
- "Antioxidant" function of eliminating oxidized or oxidizable phenolic compounds occurring in white and rosé wines.
- A wine vinification tool for use in a SO<sub>2</sub> reduction protocol.
- Improvement in the clarification and filterability of wines.

Dosage: 100 ppm.

\* reduction in microbial populations by binding.



**NEW PRODUCTS**  
**2018**

**BACTIControl®**

A specific combination comprising a natural fungal polysaccharide, chitosan, lysozyme and an enzymatic blend made from pectinases and  $\beta$ -glucanases, for the microbiological management and control of wines.

- Microbiological protection of white, red and rosé wines after fermentation.
- A wine vinification tool for use in a SO<sub>2</sub> reduction sequence.
- Slows down or halts in-progress MLF or prevents its activation.
- Synergistic action by β-glucanases and lysozyme on lactic acid bacteria, particularly *Lactobacillus pediococcus* (as enzymatic action on polysaccharides can create a widespread barrier around the bacteria and interfere with the action of lysozyme).
- **BACTIControl®** is neutral in taste and prevents organoleptic deviation due to degrading microorganisms.
- Improvement in the clarification and filterability of wines.

Dosage: 150 - 200 ppm.



**OENO**Brett®

OENOBrett® is a specific combination of a natural polysaccharide (chitosan) and a pectinase / glucanase enzymatic preparation that facilitates the lysis and the elimination of *Brettanomyces* yeast.

- Disruption of the membrane and the cell space by chitosan.
- The synergistic effect of enzymes accelerate the settling of lysed cells. The decrease of the *Brettanomyces* population is significant and thus prevents spoilage.
- The antimicrobial action of **OENOBrett®** is an essential tool within a SO<sub>2</sub> reduction strategy.
- To be used after fermentations (AF and MLF).
- Ease of use formulation.
- Available in barrel doses (23g).

Dosage: 100 ppm.



23 g  
(Barrel dose)



# COLLOIDAL STABILIZATION

LAFFORT® has decreased the SO<sub>2</sub> concentration in its liquid solutions to limit the SO<sub>2</sub> addition to wine while assuring the stability of its product.

## STABIVIN®

Pure Verek arabic gum solution with high grade protection index (>8) for stabilizing unstable coloring matter in red wines.

Hydrophilic colloid which aims to counter hazes and colloidal deposits, allowing the wine to retain maximum clarity:

- Stabilizes unstable coloring matter.
- Increases protection with regard to metallic or protein casses.

Dosage: 70 - 150 mL/hL (2650 - 5700 mL/1,000 gal).



1.1 kg  
5.5 kg  
22 kg

## STABIVIN® SP

Gum arabic solution manufactured from highly purified gums.

- Due to its specific manufacturing procedure and the strict selection of the arabic gum used, STABIVIN® SP contributes to the colloidal structure of the wines (softness and mouthfeel).
- Stabilizes unstable coloring matter.
- Very low clogging index.
- Softening of wines by tannins "coating".
- STABIVIN® SP is an arabic gum solution with low SO<sub>2</sub> concentration (2 g/L).

Dosage: 100 - 300 mL/hL (3800 - 11,300 mL/1,000 gal).



1.1 kg  
5.5 kg  
22 kg

## OENOGOM® INSTANT

Pure gum arabic in rapid dissolving micro-granular form (IDP process).

- Stabilization of the coloring matter of red wines.
- Softening of wines by "coating" the tannins.
- Decreased need for SO<sub>2</sub> and preservation of flavors.

Dosage: 200 - 1,000 ppm.



2.5kg



# TARTARIC STABILIZATION

MannOstab®  
NATURAL STABILITY OF WINES

*Red, white and rosé wines.  
Still and sparkling wines.*

**MANNOSTAB® contains the only mannoprotein naturally present in wines with the ability for potassium tartrate stabilization: MP40. It is enzymatically extracted from the yeast cell wall according to a patented process (Patent N° 2726284) which preserves and ensures the tartaric stabilization capacity of MP40.**

- Inhibition of potassium bitartrate salts crystallization.
- Treatment organoleptically neutral to the wine.
- Natural compound already present in the wines.
- Stabilizes white, rosé and red wines; still and sparkling wines; filtered and non-filtered wines.
- No waste, no water or energy consumption.

Dosage: 100 - 300 ppm.

**MANNOSTAB® is now available in a liquid form.**

Dosage: 50 - 150 mL/hL (1890 - 5700 mL/1,000 gal).



500 g



1.04 kg  
10.4 kg

Sampling date	27 June	30 June	02 July	04 July	07 July
Control					
MANNOSTAB®					

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

MannOstab®

NATURAL STABILITY OF WINES





# COLLOIDAL STABILIZATION

LAFFORT® has decreased the SO<sub>2</sub> concentration in its liquid solutions to limit the SO<sub>2</sub> addition to wine while assuring the stability of its product.

## CELSTAB®

STABILITY OF WINES

### CELSTAB®

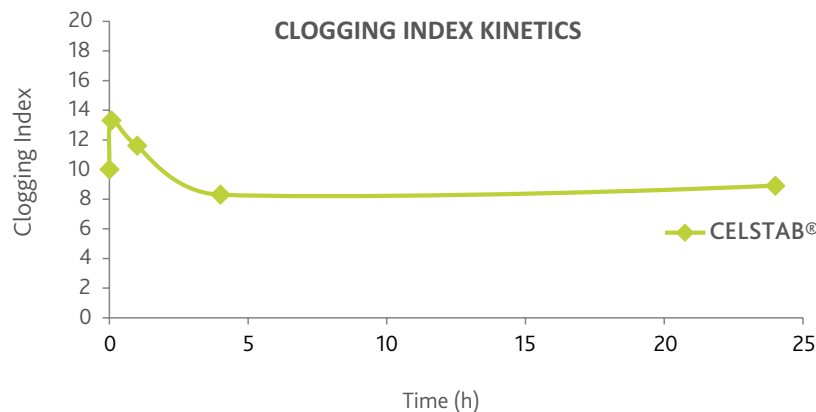
CELSTAB® is a solution of cellulose gum, a highly purified polymer of vegetable origin (from wood) with a low degree of polymerization and lower viscosity. Its liquid formulation at a concentration of 100 g/L facilitates its incorporation in wine.

- Intended for wine stabilization in relation to potassium bitartrate crystallization.
- CELSTAB® is a highly purified cellulose gum. Its composition is uniform (only one peak - HPLC).
- Inhibits microcrystal nucleation and growth phases (through disruption of surfaces responsible for the formation of crystals).
- CELSTAB® has a very high inhibitory power (by optimal degree of substitution), and allows stabilization of highly tartaric-unstable wines.
- CELSTAB® is the liquid CMC with the lowest SO<sub>2</sub> concentration on the market.



1.05 kg  
5.25 kg  
21 kg

*In the case of use on red or rosé wines, there is a strong risk of CELSTAB® interacting with coloring matter potentially leading to the formation of haze and/or a precipitate. On rosé wines, we recommend to systematically test for crystallization (6 days at -4°C) before use.*



Measures taken at  
T = 0, T = 4 mn,  
T = 1h, T = 4 h,  
T = 24 h

*Clogging index of a white wine with added 1mL/L of CELSTAB®, Millipore membrane 0.65µm  
The filterability of the wine returns to the initial state a few hours after treatment CELSTAB®.*



# Checklist for Potassium Tartrate Stabilization with **CELSTAB®** STABILITY OF WINES

LAFFORT® offers a revolutionary solution for stabilizing potassium tartrate (KHT) in white and rosé wines. Please follow the checklist below to ensure that your wine is properly prepared for trial and production use of **CELSTAB®**. Please keep in mind that **CELSTAB®** should be the last treatment to your wine before final filtration and bottling, excluding **STABIVIN®**,  $\text{SO}_2$ ,  $\text{CO}_2$  and ascorbate.

**RED WINES** > **CELSTAB® is not recommended, consider MANNOSTAB® for tartrate stabilization of red wines.**

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**WHITE WINES** > **CELSTAB® is recommended as a cost effective and efficient potassium tartrate stabilization treatment.**

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## PRE-FERMENTATION

- ☐ Calcium concentration should be below 60 mg/L. Test juice to allow correction with **CA2+STAB®** as early as possible, during fermentation if necessary. Calcium carbonate de-acidification can elevate calcium levels above 60 mg/L, as can the use of untreated concrete tanks and vines grown on high calcium soils. Elevated calcium levels can cause calcium tartrate precipitation, and **CELSTAB®** is efficient in preventing only potassium tartrate precipitation.

## POST-FERMENTATION

- ☐ Wine must be protein (heat) stable as measured on filtered wine held at 80°C for 30 minutes with a final NTU of less than 2.0.
- ☐ In the case of a late addition of finishing tannins, specifically those added after the addition of bentonite for protein stability, it is recommended to perform a protein stability test again.
- ☐ **CELSTAB®** may form a haze in wines treated with Lysozyme. If wines are treated with Lysozyme after heat stability is verified, perform an additional heat stability test.
- ☐ Prepare all sample wines for lab trials in the same manner as the bottling protocol.
- ☐ The initial tartrate instability must be measured by the **STABILAB®** Degree of Tartrate Instability (DIT) Test and must be < 25%.
- ☐ For 'Unfiltered' wines, the clarity of the wine must be < 3.0 NTU prior to **CELSTAB®** addition.
- ☐ For wines that will be passed through a membrane filter at the bottling, prior pad or cross-flow filtration is highly recommended.
- ☐ Add **CELSTAB®** at 1 mL per liter of wine.
- ☐ Add **CELSTAB®** after pad or cross-flow filtration and at least 48 hours before membrane filtration and bottling.
- ☐ Dilute **CELSTAB®** in 2 times the dosage volume with wine and mix into wine thoroughly.
- ☐ At membrane filtration and bottling, the wine temperature should be >15°C and the membrane differential pressure should not exceed 0.8 bar.

**ROSÉ WINES - CELSTAB® is recommended as a cost effective and efficient potassium tartrate Stabilization treatment.**

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- ☐ Adhere to the checklist of all items above.
- ☐ Confirm color stability for treatment of rose wines.  
Prepare 100mL of 0.65 µm filtered wine with 100 µL **CELSTAB®**, measure and record turbidity NTU<sub>i</sub>.  
Place in refrigerator at 39°F for 48 hours, then remove and allow 30 minutes at room temperature. Record turbidity NTU<sub>f</sub>  
If (NTU<sub>f</sub> – NTU<sub>i</sub>) < 5, the wine color is stable  
If (NTU<sub>f</sub> – NTU<sub>i</sub>) < 20, the wine color is moderately unstable  
If (NTU<sub>f</sub> – NTU<sub>i</sub>) > 20, the wine color is unstable  
In case of an unstable wine color, treat with fining agent (**GECOLL® SUPRA**, **OENOCCELL®**) or **STABIVIN®** until the test is positive.

## Validation of **CELSTAB®** Performance.

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- ☐ To verify the efficacy of **CELSTAB®** treatment use the Critical Index of Tartrate Stability test (ISTC-50 by **STABILAB®**) or the Checkstab Mini Contact Test .

# Preparing wines for using **CELSTAB®**

## **CELSTAB®** does not inhibit calcium tartrate crystallization

You need to be aware of the calcium level in your wine. If the calcium is above 60ppm, your wine is at risk of developing calcium tartrate crystals.

## **Wine must be heat (protein) stable before **CELSTAB®** addition. Heat Stable = < 2 NTU change after wine is heated for 30 min at 80°C**

**CELSTAB®** can interact with unstable proteins in the wine, forming a haze. It is important to check your heat stability after your bentonite treatment to make sure the wine is heat stable. If your wine cannot achieve heat stability, **MANNOSTAB®** might be a better option for your cold stability treatment.

## **The initial degree of instability (%DIT) needs to be less than 25%**

If the DIT% IS >25% the wine is too unstable for **CELSTAB®** to be effective. You can use the traditional cold treatment for a short time and then retest to see if it has come into range for **CELSTAB®** treatment.



## **CELSTAB® is the last thing you add post-filtration**

The wine must be less than 3 NTU at the time of addition. If pre-filtration is part of the preparation before bottling, **CELSTAB®** is added after the cellar filtration. **CELSTAB®** can interact with the components of the colloidal matrix, so you can only add it to a wine that is bottle ready. If **CELSTAB®** is added to a high NTU wine, it may interact with those solids in suspension and cause haze, precipitates or filtration issues.

## **CELSTAB® addition is one standard addition rate:**

**1mL **CELSTAB®** per liter of wine**

Dilute **CELSTAB®** in 2 x the dosage volume with wine and meter into the tank – mix the tank to turn wine volume over two times in order to thoroughly mix the tank. **CELSTAB®** is a 10% solution so you are actually adding 100ppm of pure CMC to the wine.

## **ISTC 50 Test to confirm cold stability**

To confirm that **CELSTAB®** does cold stabilize the wine, do a bench trial with a filtered wine sample. Add 1 mL/L (0.75 mL or 750 µl) of **CELSTAB®** to 750 mL wine sample and send in for the ISTC 50 test. This is a modified conductivity test, taking into account that all the tartrate ions are still in solution with **CELSTAB®** treatment. You should see less than a 4 µS (micro siemens) change from minute 40 to minute 120 in a passing ISTC 50 test.

## **Wait at least 48 hours between **CELSTAB®** addition and filtering through a 0.45 micron membrane**

**CELSTAB®** needs time to react and equilibrate with colloidal matrix components of the wine.

Filterability decreases initially – but recovers within the 48 hour window. If you add **CELSTAB®** the morning of bottling you will have difficulty getting through the (0.45µm) sterile membrane on the bottling line.

Temperature of the wine at bottling should be >60°F

## **Rosé wines need to be color stable before **CELSTAB®** addition**

**CELSTAB®** can react with free anthocyanins in addition to the tartrates in the wine, therefore the wine will not be adequately protected and can develop precipitates if the wine is not color stable at the time of addition. See the test for color stabilization at the bottom of the **CELSTAB®** checklist.



## POTASSIUM METABISULFITE

### Wine sulfiting.

- Conform to the  $\text{SO}_2$  limit specified by legislation in force for the maximum legal dosage of Sulfur Dioxide in the wine.

1 kg



## SULFUR LOZENGE

### Sulfiting of barrels and wooden vats.

- Sulfiting of vat to be filled: burn between 10 and 40 ppm of sulfur (repeat regularly depending on the storage).
- Preservation of empty vats: burn between 10 and 20 ppm once the barrels drained.
- Available in 2.5 g, 5 g and 10 g in boxes of 1 kg.

## OENOSTERYL®

### Effervescent tablets of Potassium Metabisulfite.

- To sulfite wine barrels during aging.
- In transport bins to inhibit the oxidation of musts and *botrytis* mold or indigenous yeast growth.
- Odorless, safe, and self-mixing tablet form.
- 2 g tablet in 60 gallon barrel = adds 9 ppm.
- 5 g tablet in 60 gallon barrel = adds 22 ppm.



Boxes of 48 tablets

### SEE THE DISSOLUTION OF OENOSTERYL® TABLETS IN WINE



“We have over 4,000 barrels in our cellar and found that using the OENOSTERYL®  $\text{SO}_2$  tablets has saved us significant time and money (labor hours) compared to our previous method, adding liquid KMBS solution to barrels and stirring. The tablets mix the wine, dissolve entirely and the  $\text{SO}_2$  numbers show the correct rate of addition in our monthly analysis. The staff really enjoys not having to wear protective gas masks while adding the  $\text{SO}_2$  tablets and the aging cellar never smells of sulfur gas when we are topping.”

Derek Devries, Winemaker, Michael David Winery (California)

“The LAFFORT®  $\text{SO}_2$  tablets are a welcomed addition to our cellar. They provide great protection of the wine and, at the same time, they make our regular  $\text{SO}_2$  additions easier, faster and safer for the cellar team. Simply put, they help us save time and money.”

Jessica Tarpy, Assistant Winemaker, Favia Wines

# LAFFORT®:

## The

# ORGANIC

## Commitment

### Organic Wine

The products and families of products for use in Organic winemaking are supervised by the EU Regulation n° 203/2012 and NOP (National Organic Program) USDA (United States Department of Agriculture). Many are approved by OMRI and CCOF.

### The Certifications

The list of LAFFORT® products used within the regulated framework of Organic wine and / or NOP is available on our website (direct access by scanning the QR code below). We have chosen the following external certification organizations; Ecocert, OMRI and USDA. Our products have their own certification, corresponding to individual specifications defined by each organization. ([www.ecocert.fr](http://www.ecocert.fr), [www.omri.org](http://www.omri.org), [www.usda.gov](http://www.usda.gov), [www.ccof.org](http://www.ccof.org)).

### To Find our Certificates

Log on [www.laffort.com](http://www.laffort.com), "Downloads", "Certificates" category.



[www.laffort.com/en/downloads/certificates](http://www.laffort.com/en/downloads/certificates)

### CCOF Approved for use in "Made with Organic Grapes":

TAN'COR®  
TAN'COR® GRAND CRU  
QUERTANIN® SWEET  
TANIN GALALCOOL®  
TANIN VR SUPRA®

TANIN VR COLOR®  
TANIN VR SUPRA® ELEGANCE  
TANIN VR GRAPE  
GELAROM®  
CASEI PLUS



### CCOF Approved for use in "Made with Organic Grapes" and "Organic Wine":

ACTIFLORE® F33\*  
ACTIFLORE® ROSE\*  
ACTIFLORE® B0213\*  
ZYMAFLORE® X5\*  
ZYMAFLORE® X16\*  
ZYMAFLORE® VL3\*  
ZYMAFLORE® VL2\*  
ZYMAFLORE® VL1\*  
ZYMAFLORE® CH9\*  
ZYMAFLORE® ST\*  
ZYMAFLORE® F15\*  
ZYMAFLORE® FX10\*  
ZYMAFLORE® F83\*  
ZYMAFLORE® RB2\*  
ZYMALOFRE® RX60\*  
ZYMAFLORE® 011BIO\*  
LAFAZYM® AROM

LAFAZYM® EXTRACT  
LAFAZYM® CL  
LAFASE® HE GRAND CRU  
DYNASTART®\*  
SUPERSTART® BLANC\*  
SUPERSTART® ROUGE\*  
FRESHAROM®\*  
MALOSTART®  
BI-ACTIV®  
OENOLEES®\*  
AUTOLEES®\*  
MANNOSTAB®\*  
GELATINE EXTRA N°1\*  
MICROCOL® ALPHA\*  
LACTOENOS® 450 PREAC  
LACTOENOS® SB3 DIRECT



*\*Must demonstrate commercial unavailability for organic equivalent for use in organic wine*

### OMRI Certification

DYNASTART®  
SUPERSTART® ROUGE

SUPERSTART® BLANC  
OENOLEES®



ricerca  
innovación  
research  
innovation  
nature



# NOBILE®

## L'œnologie du bois

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# NOBILE®

## L'œnologie du bois

**LAFFORT®**'s enological oak brand, **NOBILE®** offers practical and innovative solutions that reveal the full expression of your wines.

### MATERIAL SELECTED

Carefully selected for their enological quality, all oak lots are 'barrel quality' and are subject to strict traceability standards. Thanks to our knowledge of the aromatic potential of oak from different origins (*Quercus Petraea*, *Quercus Robur*, *Quercus alba*), we can select and assemble the wood in order to limit the natural variability and ensure reproducibility.

The woods have a maturation phase on site for a minimum period of 24 months in the open air. **NOBILE®** controls the maturation by monitoring the evolution of wood compounds responsible for the enological potential of each product.



### PRECISION TECHNOLOGY

As a producer of wood for use in enology, **NOBILE®** boasts technologically advanced production equipment.

Extremely delicate, the heating operations are carried out by hot air convection, providing homogeneously heated products from the surface through to the center, or by specific methods for reproducing heated gradients comparable to barrel toasting. Experience and control of the release of volatile compounds from the wood, and experience and control of heating techniques can ensure aromatic and tannic reproducibility for elaborate flavor profiles.

### DOSAGE & CONTACT TIME

The dosage or quantity, depending on the alternative used, must be considered and will be based on the characteristics of the wine's style.

Contact time is defined by tasting throughout aging.

For more usage tips, consult the **NOBILE®** team, specializing in the enology of wood.

### REGULATIONS

The use of oak wood chips is subject to regulation. Refer to the legislation.



**NOBILE®**  
L'œnologie du bois







# CHIPS & GRANULARS

A full range of high quality products combining tradition,  
expertise, innovation and research

---

## UNTOASTED OAK



**NOBILE® FRESH  
GRANULAR 24M**  
Granulars

► Antioxidant & structure.

## TOASTED OAK



**NOBILE® FRESH**  
Chips

► Freshness, fruit & structure.



**NOBILE® BASE**  
Chips

► Volume & roundness.  
Without toasted notes.



**NOBILE® SPICE**  
Chips

► Fruity & spicy.



**NOBILE® SWEET**  
Chips & Granulars

► Vanilla & toasted.



**NOBILE® INTENSE**  
Chips


► Volume & roasted almonds.



**NOBILE® AMERICAN  
BLEND**  
Chips

► Caramel & smoky.

## AGING OBJECTIVES

	STAVES <b>7</b> MM	STAVES <b>12</b> MM	STAVES <b>18</b> MM
RESPECTS THE FRUIT WITHOUT TOASTED NOTES		<b>FRESH</b> <sup>7</sup> Structure & fruit	<b>18 - XBASE</b> Volume & sweetness
AROMATIC		<b>SENSATION</b> <sup>7</sup> Vanilla & toasted notes <b>INTENSE</b> <sup>7</sup> Chocolate & roasted notes	<b>18 - XTREME</b> Roasted coffee & mocha
COMPLEXITY SIMILAR TO BARREL AGING		<b>RÉVÉLATION</b> <sup>7</sup> Structure & fruit <b>ELITE</b> <sup>12</sup> Complex & traditional	<b>18 - DIVINE</b> Burgundy barrel style

## THE NOBILE® TOASTING PROCESSES

### HOMOGENEOUS TOASTING

Toasting program dedicated to reproducing complex aromatic expression.

### HOMOGENEOUS TOASTING

### GRADIENT TOASTING

Surface heating process which creates a heating gradient identical to a traditional barrel.

### GRADIENT TOASTING

### DOUBLE TOASTING

The precise selection of oak combined with double toasting achieves a good balance between the ellagitannins and polysaccharides naturally present in oak, developing an aromatic complexity similar to barrel aging.

### DOUBLE TOASTING

### SOFT OAK

Exclusive to the NOBILE® 18 mm range, the "Soft Oak " method is used to optimize the toasting process of the Staves. This pre-heating program contributes to the creation of unique characteristics.

### SOFT OAK PROCESS



# STAVES & BLOCKS

Character and complexity whilst respecting the fruit

STAVES  
**7**  
MM

## HOMOGENEOUS TOASTING



**FRESH**



Freshness, fruit & structure.



**SENSATION**



Sweetness, vanilla & toasted.



**INTENSE**



Volume, roasted coffee & chocolate.

## GRADIENT TOASTING



**RÉVÉLATION**



Structure & aromatic complexity.



**AMERICAN  
RÉVÉLATION**



Sweetness, gingerbread & lactone.

STAVES  
**12**  
MM

## DOUBLE TOASTING



**ELITE**



Toasted nuances. Volume. Similar to traditional barrel aging.

STAVES  
**18**  
MM

## HOMOGENEOUS TOASTING



**18 - XBASE**



Intensity and palate weight. Fruity, without overt oak characters.



**18 - XTREME**



Expression of ripe fruit. Sweetness with mocha notes and roasted coffee.

## GRADIENT TOASTING



**18 - DIVINE**



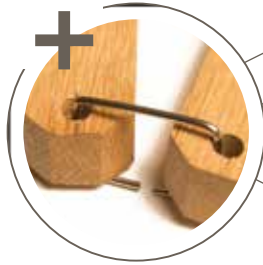
Gives texture. Extends the fruit to a complex finish (such as the elegance of Burgundian barrels).



Take advantage of  
our range of  
**18mm**  
Block profiles



## ENOLOGICAL +

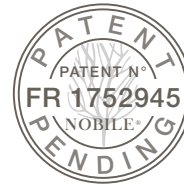


Innovative attachment system for ultra-easy implementation.

20 to 100% new oak equivalent (1 Nobile® Barrel Refresh = ± 20% new oak).

Maximizes the beneficial oxygen from barrels.

Barrel preservation.



## CUSTOM MADE



**BARREL REFRESH SPECIAL**



A custom blend of 7 & 12 mm profiles can be made to specification to achieve particular characteristics and style.

**BARREL REFRESH SPECIAL 18**



A custom blend of 18 mm profiles can be made to specification to achieve particular characteristics and style.

**Profiles available** (refer to the Staves range): Fresh, Sensation, Intense, Révélation, American Révélation, Elite, 18-XBase, 18-Xtreme, 18-Divine.

## OXYGEN AND OAK



**During aging, the wine needs oxygen to evolve.**

Oxygen contributes to the stabilization of color, the softening of tannins and the integration of wood compounds. The quantity of oxygen in contact with the wine must be controlled throughout aging, adapted to the quality of the wine, the cellaring potential or the desired consumption time after purchase.

# BARREL REFRESH

Give new life to your barrels

BARREL REFRESH  
**7**  
MM

## HOMOGENEOUS TOASTING



**BARREL REFRESH  
SENSATION**



Sweetness, vanilla & toasted.

## GRADIENT TOASTING



**BARREL REFRESH  
RÉVÉLATION**



Structure & aromatic complexity.

BARREL REFRESH  
**18**  
MM

## HOMOGENEOUS TOASTING



**|8 - XBASE**



Intensity and palate weight.  
Fruity, without overt oak characters.



**|8 - XTREME**



Expression of ripe fruit.  
Sweetness with mocha notes and roasted coffee.

## GRADIENT TOASTING



**|8 - DIVINE**



Gives texture. Extends the fruit to a complex finish (such as the elegance of Burgundian barrels).



# POLYMUSTR® ROSÉ

*Long-term stability of the color of your rosé wines*

Preventive removal of phenolic acids.

Decreases oxidizable compounds.



Seriously Rosé







## Seriously Rosé

**LAFFORT®** is keenly aware of the highly technical nature of producing rosé wines with numerous complex hues and aromas. Via our experimental center and a team of dedicated staff from different specialized fields, we have expanded our expertise to offer **a range of targeted products** adapted for producing superior rosé wines.



## KEYS STEPS DURING ROSÉ WINEMAKING

### Protection against oxidation

To avoid the oxidation of polyphenols into quinones and to protect aromas, it is essential to implement all available techniques: **evaluation of best manufacturing practices** (avoid oxidation, check all gaskets, fittings, etc.), **rigorous process control** and **use of inert gases**.

---

### Refrigeration and cooling capacity

Cold conditions limit enzyme activity in terms of color extraction and oxidation by polyphenol oxydases. It is therefore essential to **work on these pre-fermentation phases as quickly as possible at low temperature**.

---

### Pressing

The objective for rosé wines that are pressed directly is **fast, qualitative release of juices** to obtain the best aromas without extracting color. It is strongly recommended to use enzymes during the filling of the press.

---

### Fermentation

The choice of yeast strain and nutrition both help direct and optimize the aromatic profile of a wine according to its objective.

---

### Fining

**Early fining** of rosé wines, on must or during alcoholic fermentation, helps **act on the phenolic compounds that trap aromas**, and allows wine color to develop and modify wine structure. An appropriate fining will help you produce high quality rosé wines.

---

### Stabilization

At the end of process, certain choices can alter the aromatic profile or color of wines; there are stabilization options that respect the wine.

The **LAFFORT®** team is available for any further information or advice.

Do not hesitate to contact us!



**LAFFORT**

*l'œnologie par nature*



## To each rosé a specific fining...

Our expertise in the field of fining products has allowed us to select a range of products adapted to each winemaking step for you to achieve great rosé wines. The products can have a broader spectrum of action than the ones proposed below based on matrices of wines to treat. For further advice please contact your LAFFORT® Technical Representative or Retailer.

### Objectives

### Recommendations

**Controlling color intensity**

#### **CHARBON ACTIF PLUS GR**

(Activated carbon)  
Color correction in musts.

**Reducing phenolic content**

#### **POLYMUST® PRESS**

(PVPP, calcium bentonite, potato protein).  
Control of coloring matter. Reduces astringency.  
Reduces vegetal characteristics.

#### **ICHTYOCOLLE**

(Isinglass fining agent).  
Removes bitterness. Wine brilliance.

**Refining the wine**

#### **CASEI PLUS**

(Potassium caseinate).  
Treatment of oxidation phenomena and maderization in wines.

#### **POLYLACT®**

(PVPP, casein).  
For treating oxidation in wine.

**Controlling oxidation**

#### **POLYMUST® ROSÉ**

(Potato protein, PVPP).  
Stabilizes hue, reduces phenol acids.



#### **VEGECOLL®**

(Potato protein).  
Significant action on oxidizable polyphenol.

#### **POLYLACT®**

(PVPP, potassium caseinate).  
Inhibits browning.



## Our seriously rosé selection...



**LAFAZYM® PRESS**

**LAFAZYM® 600XL**

**LAFASE® XL CLARIFICATION**

### Purified enzymes:

- For fast and qualitative juice release.
- To avoid potential aromatic defects.



**ACTIFLORE® ROSÉ**

**ZYMAFLORE® X16**

**ZYMAFLORE® X5**

**ZYMAFLORE® VLI**

**ZYMAFLORE® DELTA**

↑  
FERMENTATION  
AROMAS

↓  
VARIETAL  
AROMAS



### **SUPERSTART® BLANC & ROSÉ**

Yeast rehydration product with a high vitamin and mineral content for optimizing yeast metabolism throughout fermentation.

### **FRESHAROM®**

Specific preparation of inactivated yeasts with a high glutathione and glutathione precursor content. Preserves aroma and enhances body on the palate.

### **NUTRISTART® & NUTRISTART® ORG**

Complete or purely organic nutrition to supplement nitrogen deficiencies in must.



### **MICROCOL® ALPHA**

Sodium bentonite respecting color and aromas while also having a good protein removal capacity.

### **CELTAB®**

CMC for tartaric stabilization, with good filterability. To be used following specific laboratory testing.

ricerca  
innovación  
Spark®  
RANGE

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TIRAGE MIXTURE 84

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# BASE WINE PREPARATION

*Bubbles by nature*

To optimize each stage of production and provide winemakers with new tools, LAFFORT® has gathered, under the LAFFORT® SPARK® range, the products best suited not only to producing traditional sparkling wines, but also the products enabling the production of wines suitable for the modern consumer.

## JUICE PREPARATION

*Elegance and finesse of base wines with excellent foaming power.*

*Juice clarification*

**LAFAZYM® CL:** *Purified pectolytic enzymes for quick settling whole-cluster pressed juice.*

**LAFAZYM® PRESS:** *Pectolytic enzymes suitable for fruit destemmed prior to pressing.*

- Enhances the aroma extraction while limiting the extraction of phenolic compounds (bitterness, oxidation,...).

*Juice Fining*

**POLYMUST® PRESS:** *For precise fining of the different press fractions.*

- Removes the oxidizable and oxidized phenolics.
- Protects the aromatic precursors that play an essential role in foaming capacity and persistence of the finished sparkling wine.

*Juice Decoloration*

**CHARBON ACTIF PLUS GR:** *Selected activated carbon to decolorize tinted juice.*



## BASE WINE FERMENTATIONS

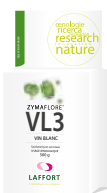
*Our specific selected yeasts enable the development of the greatest potential of your juice.  
The choice of yeast significantly contributes to the personality of the base wine.*



+



or



**SUPERSTART® spark**

*Elegance, finesse*

*Freshness, aromatic intensity and varietal characters.*



## MALOLACTIC FERMENTATION



**LACTOENOS® B16 STANDARD KIT**

- *Oenococcus oeni* selected in Champagne.
- Very resistant strain particularly adapted to low pH characteristic of base wines.
- Pre-acclimatization is necessary before inoculation (3 to 5 days).



## TARTARIC Stabilization OF BASE WINES

**CELSTAB®**  
STABILITY OF WINES

**CELSTAB®** is a highly purified vegetal-origin cellulose polymer, with a low degree of polymerization and viscosity. The liquid (10% solution) formula makes it easy to incorporate into the wine.  
*The addition is made entirely before tirage.*





The right management of wine physical and chemical parameters at tirage (such as turbidity, pH, temperature, SO<sub>2</sub>, dry extract, proteins ...) is a crucial factor for the success of the secondary fermentation.

## YEAST BUILD UP PREPARATION for Traditional and Charmat methods

### SUPERSTART® spark

Patent F 2.736.651. Yeast rehydration preparation especially rich in growth factors to ensure a strong, clean and complete "prise de mousse".

- Provides upon rehydration of yeast the essential components of the cell membrane (sterols), and thus guarantees to the last generation of yeast optimum membrane fluidity, resistance to alcohol and good conformation of transporters.
- Improves cell viability in the yeast build up and ensures resistance to the physicochemical conditions of the base wines to be fermented.

Average dose: 300 ppm in water for yeast rehydration.

### ZYMAFLORE® spark

Chardonnay, Pinot Noir, Pinot Meunier, Pinot Blanc...

- *Saccharomyces cerevisiae* (ex *bayanus*) selected in Champagne.
- Fast autolysis for optimal bottle aging.
- Good fermentation kinetics.
- High resistance to the most difficult conditions (Alcohol, Turbidity, Temperature).
- High resistance to alcohol and SO<sub>2</sub>.

#### YEAST STRAIN RECOMMENDED FOR:

- \* *Fine, elegant and full sparkling wines.*
- \* *Wine meant to be aged with tertiary aroma production.*
- \* *To obtain powerful and round wines together with an elegant and aromatic profile.*
- \* *Well adapted for Traditional Method.*

### ZYMAFLORE® X5

Pinot Noir, Sauvignon Blanc, Riesling,...

- Reveals varietal aromas such as volatile thiols and fermentation aromas (esters).
- Fresh and complex wines.

#### YEAST STRAIN RECOMMENDED FOR:

- \* *Aromatic and fresh styles.*
- \* *Wine with strong varietal character and fermentation aromas (boxwood, grapefruit, exotic fruits).*

### ZYMAFLORE® X16

Chardonnay, Chenin Blanc, Pinot Blanc, Muscat,...

- Very strong fermentation abilities.
- Very high aroma production (esters).
- Low production of H<sub>2</sub>S.

#### YEAST STRAIN RECOMMENDED FOR:

- \* *Aromatic and fresh styles.*
- \* *Wine with strong varietal character and fermentation aromas (boxwood, grapefruit, exotic fruits).*

### THIAZOTE® PH

Diamonium phosphate and thiamine.

- Contains growth factors necessary to increase populations of yeast in the build up and in the tirage mixture.
- Contains mineral nitrogen source that stimulates the yeast during secondary fermentation.
- To be added in the yeast build up as well as in the tirage mixture.

Average dosage: 50 ppm in the mixture of tirage of the base wine to be fermented.

## Preparation of yeast



TESTED AND  
VALIDATED BY THE  
MICROBIOLOGICAL  
TECHNICAL  
DEPARTMENT  
OF THE CIVC

## Yeast for prise de mousse

## Fermentation nutrition





# TIRAGE MIXTURE

*Bubbles by nature*

*Riddling  
adjuvant  
(Traditional  
Method)*

## CLEANSpark®

*Riddling adjuvant (bentonite / alginate) for automatic and manual riddling that allows:*

- A perfect clarification of the wine in bottles.
- A rapid and complete removal of particles in wines.
- A perfect slide of the yeasts into the neck of the bottles.

Dosage: 60 to 80 mL/hL (2 - 3 mL/gal).



*Tirage  
tannins*

## TANSpark®

*Combination of tannins in liquid form, involved in fining and protection of the wine structure.*

Average dosage: 60 to 80 mL/hL (2 - 3 mL/gal). Add in the tirage mixture before adding the yeast build-up.

## TANFRESH®

*Proanthocyanidin tannins and oak ellagic tannins. It allows refreshment of the aromatic profiles of an oxidized base wine.*

Average dosage: 5 to 10 ppm. Add in the tirage mixture before adding the yeast build-up.



## OPTIMIZED LEES AGING For Traditional and Charmat Methods

## OENOLEES®

*Specific preparation of inerted yeast with a high peptide sapid content (Patent n° 0452803). Accelerates lees aging for improved finesse and foam persistence.*

*Traditional method:*

- Using OENOLEES® at tirage reinforces the volume and roundness perception of the wine with a short bottle aging.
- Particularly adapted to early disgorging (6 to 15 months).

Average dosage: 100 ppm. Add in the tirage mixture before adding the yeast build-up.

*Charmat method:*

- OENOLEES® brings roundness, sweetness sensation as well as tertiary aromatic profiles.
- Enables reduced time for aging on lees.

Average dosage: 200 to 300 ppm. Add in the tirage mixture before adding the yeast build-up.

## FRESHAROM®

*Specific preparation of inactivated yeast with high protective power, for aroma preservation in white and rosé wines.*

- Particularly adapted to the Charmat method.
- Protects the aromatic potential of wine and significantly delays the onset of oxidized notes.
- Obtains more aromatic sparkling wines with better potential.
- Thanks to its composition, FRESHAROM® participates actively to the bubble finesse and foam persistence.

Dosage: 300 ppm. Add in the tirage mixture before adding the yeast build-up.





# EXPEDITION LIQUEUR

*Bubbles by nature*

SPARK®

The best kept secret of every house and the final touch to give an identity to the product is the expedition liqueur. It expresses all the little details and allows customizing and adapting the product to the needs of each market: softness, mouthfeel, elegance and finesse, foam quality, fresh fruit aromas or aromatic complexity.

## ARABIC GUM

*For Traditional and Charmat Methods*



### STABIVIN®

*A filtered, purified solution of «100% Verek» arabic gum, with a high stabilization index (>8) to stabilize the coloring matter of red and rosé sparkling wines.*

- Stabilizes unstable coloring matter.
- Increases protection with regard to metallic or protein casses.
- Dosage: 70 to 100 mL/hL (26 – 38 mL/gal). Add directly into the expedition liqueur.



## PROTECTION AND OPTIMIZATION OF ORGANOLEPTIC CHARACTERS

*For Traditional and Charmat Methods*



### AUTOLEES®

*A specific preparation of yeast cell wall extract (Mannoprotein), rich in sapid peptide content (Patent n°. 0452803) and polysaccharides.*

Enables adjustment of sweetness without sugar.

- Allows the winemaker to delicately balance both acidity and bitterness.
- Actively participates in restitution of the foaming properties of the sparkling wines.
- Formulation entirely soluble for an easy use.

For Traditional or Charmat Method, the usage of **AUTOLEES®**, in the expedition liqueur brings volume and roundness to the finish of sparkling wines, which enables to significantly lower the quantity of liqueur and thus sugar in the wine.

Average dosage: 50 - 200 ppm. Dissolve **AUTOLEES®** in the expedition liqueur.



### QUERTANIN® CHOC'

*Stave wood quality ellagic tannins, extracted from oak heartwood, using LAFFORT®'s Instant Dissolving Process.*

- Used in the expedition liqueur to restructure wines.
- Average dosage: 20 - 50 ppm. Dilute **QUERTANIN® CHOC'** directly in the expedition liqueur.



### QUERTANIN® SWEET

*Stave wood quality ellagic tannins, extracted from oak heartwood, using LAFFORT®'s Instant Dissolving Process.*

- Used in the expedition liqueur to restructure wines.
- Average dosage: 20 - 50 ppm. Dilute **QUERTANIN® SWEET** directly in the expedition liqueur.

PURITY DARK FRUITS  
RED WINES

CLEAN H<sub>2</sub>S<sup>12</sup> VELVETY

SULFUR COMPOUNDS COMBINING TERROIR YEAST  
CL35 PRODUCTION SO  
FRESHNESS

AROMATIC  
ROUNDNESS

IDENTITY



EXPERTISE<sup>2</sup>  
H<sub>2</sub>S EXPRESSION

REDUCE

GREEN CHARACTER

INTENSITY

SWEETNESS

ZYMAFLORE® XPURE



LAFFORT

*l'œnologie par nature*

[www.laffortusa.com](http://www.laffortusa.com)

# APPENDIX

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# FERMENTATION RESTART PROTOCOL

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## STEP 1: PRELIMINARY DETOXIFICATION OF STUCK WINE

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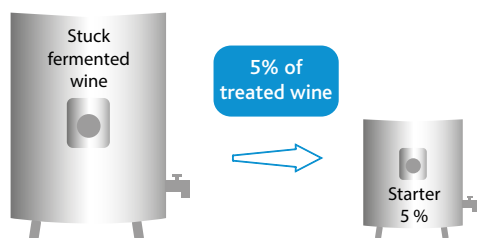
1. Rack/centrifuge avoiding air.
2. Adjust wine temperature to 68°F.
3. Adjust SO<sub>2</sub> at 10-20 ppm.
4. Add:  
For white wines: **BI-ACTIV®** 400 ppm  
For red wines: **OENOCELL®** 200-400 ppm



5. Mix wine anaerobically (closed circulation) every 12 hrs, or continuously if possible, for 48h (minimum).

## STEP 2: PREPARATION OF THE YEAST INOCULUM

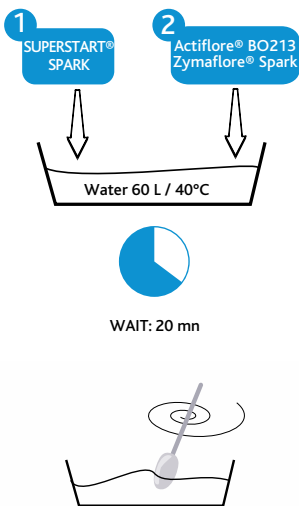
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### 2-1. PREPARATION OF THE WINE FOR THE YEAST INOCULUM

1. Take 5 % of the volume of the treated stuck wine from step 1.
2. Adjust the alcohol to 8 %, the sugar to 20 g/L and the temperature to 20°C.
3. Add **THIAZOTE® PH**: 200 ppm in this 5 % volume of stuck wine.

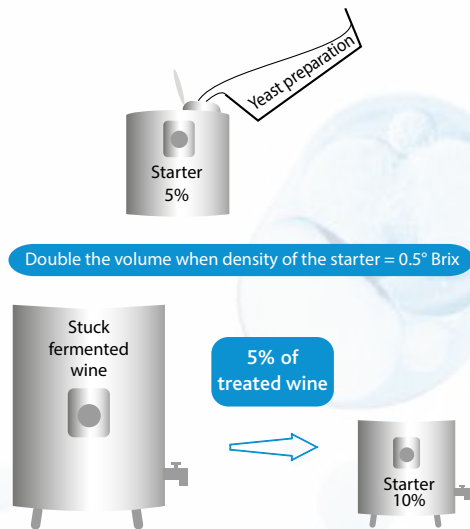




## 2-2. YEAST PREPARATION

For 1,000 gal of stuck fermented wine:

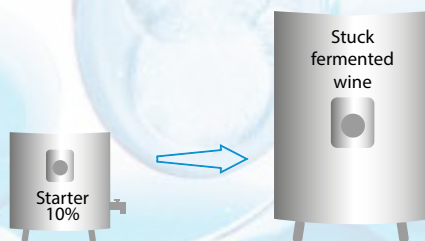
1. Prepare 6 gal of water at 104°F.
2. Add the yeast rehydration nutrient **SUPERSTART® SPARK**: 2.4 lbs (300 ppm), then homogenize.
3. Add **ACTIFLORE® B0213** or **ZYMAFLORE® SPARK**: 2.4 lbs (300 ppm).
4. Wait 20 minutes, homogenize.
5. Add immediately 5 gal of treated wine from step 2-1.
6. Wait 10 minutes, let cool to 68°F (not below) and maintain the temperature between 68-77°F.
7. The total time of the yeast rehydration must not exceed 45 minutes.



## 2-3 ACCLIMATIZATION OF THE YEAST PREPARATION

1. Add the yeast preparation (Step 2.2) to the prepared wine for the yeast inoculum (Step 2.1), and maintain the temperature around 68°F.
2. Measure the Brix level and maintain the inoculum at 68°F with aeration until density = 0.5 Brix, then add another 5% volume of stuck wine (Step 1) at 68°F. Avoid the total exhaustion of sugars in the inoculum and a fall in the yeast activity
3. Double the volume with treated wine (Step 1) at 68°F.
4. Measure the density and maintain again the inoculum at 68°F with aeration until density = 0.5 °Brix.

## STEP 3: INCORPORATION OF YEAST INOCULUM IN THE TANK



1. Add the yeast inoculum to the treated wine (Step 1), maintain at 68°F.
2. Add 300 ppm of **NUTRISTART® ORG** to the total volume of the tank to treat (Step 1).

---

# MLF RESTART PROTOCOL

---

Problems regarding malolactic fermentation (MLF) in wine can have different origins:

- Competition from residual yeasts.
- Wine toxicity: the presence of inhibiting compounds (ethanol, SO<sub>2</sub>, medium-chain fatty acids).
- Bacterial deficiency.
- Low level of nutrients necessary for the bacteria.

***For each of these situations, there is a specific protocol:***

## 1- DECREASE COMPETITION WITH RESIDUAL YEASTS

---

In order to eliminate the yeasts, there are different techniques such as racking, filtration (1 µm) or flash-pasteurization. In all cases, once the yeasts are eliminated, it is important to add the selected bacteria soon, in order to rapidly colonize the wine.

## 2- DETOXYFY THE MEDIUM

---

To eliminate the molecules inhibiting lactic acid bacteria, yeast hull addition (**OENOCELL®** 200 to 400 ppm) during an anaerobic circulation is the most efficient treatment. This must be done 24 to 48 hours before the bacterial addition, mixing continuously if possible, in order to optimize their survival rate.



## 3- USE A RELIABLE BACTERIA PREPARATION

---

Bacterial strains have different levels of resistance to difficult wine conditions depending on their individual genetic profiles. **LACTOENOS® B16 STANDARD KIT** is one of the strongest strains available, especially for its resistance to medium-chain fatty acids.



## 4- ACTIVATE THE BACTERIA

---

When the wine has a notably low nutrient content, **MALOSTART®** addition is recommended after the bacterial inoculation to provide essential nutrients for increased malolactic activity.



## PROTOCOL FOR MLF RESTART

All aforementioned situations are linked: when residual yeasts are active after primary fermentation (*Saccharomyces* or *Brettanomyces*), they tend to consume any remaining nutrients and produce compounds toxic to bacteria. An efficient restart MLF protocol will therefore combine the following strategies:

### STEP 1:

Rack/centrifuge anaerobically.

Note: if *Brettanomyces* population is higher than  $10^3$  cell/mL, filter the wine ( $1\ \mu\text{m}$ ).



### STEP 2:

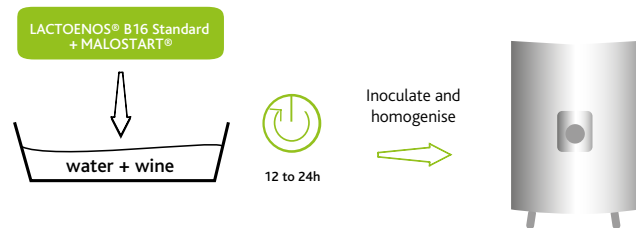
Add **OENOCELL®** (200 to 400 ppm).

Mix wine anaerobically every 12 hours for 48 hours, or continuously if possible.



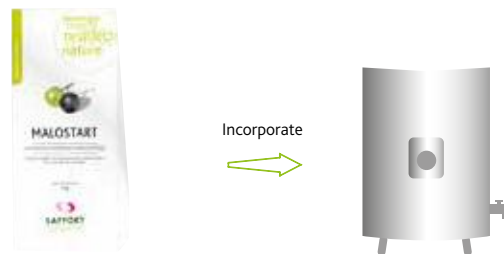
### STEP 3 (48 hours after OENOCELL® addition):

Inoculate with **LACTOENOS® B16 STANDARD KIT**. Follow the protocol indicated on the packaging.



### STEP 4:

Add **MALOSTART®** (200 to 400 ppm). Homogenize anaerobically.



**Important: maintain a stable temperature, between 66°F-75°F, during all stages and until the end of MLF.**

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# TOOLS FOR ACIDIFICATION IN MUSTS AND WINES

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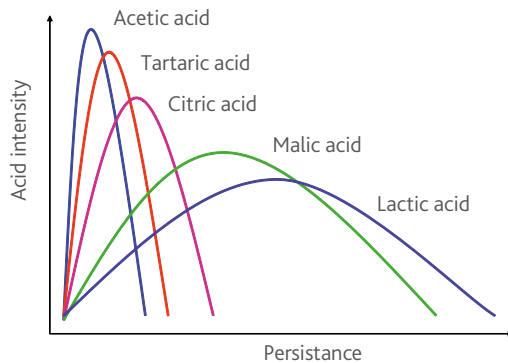
Three acids are authorized for acidifying musts and wines:

- Tartaric acid (L(+) tartaric).
- Malic acid (L-Malic – D,L-Malic).
- Lactic acid (DL- Lactic).

These acids are naturally present in grapes. They differ in structure, acidification capacity, and organoleptic impact. Operations can consist of a mix of additions of different acids (especially appropriate on wines for organoleptic purposes).

The goals pursued must be the object of prior testing. Variations in pH and total acidity for the same treatment are not the same, the ionic strength and the buffering capacities can have a significant influence from one must or wine to another.

Acidification of musts and wines



**Lactic: soft, balanced**  
**Tartaric: lively, immediate**  
**Malic: sharp, less immediate**

Below, a summary of the commercial products available and their principal enological characteristics.

	TARTARIC ACID	MALIC ACID	LACTIC ACID	COMMENTS
<i>Chemical formula</i>	$\text{CH}_4\text{H}_6\text{O}_6$ E334 L	$\text{CH}_4\text{H}_6\text{O}_5$ E296 DL/L	$\text{CH}_3\text{H}_5\text{O}_3$ E270 DL	Malic and lactic acids are achiral molecules. They exist in the form of two enantiomers: L and D form. Only the L form of malic acid exists naturally in grapes. Lactic acid is a natural result of lactic bacteria metabolism produced by the latter only in the L form when they consume malic acid, and in a mix of L and D form when they consume sugars.
<i>pKa</i>	3.05 / 4.2 Di-acid	3.4 / 5.1 Di-acid	3.85 Mono-acid	The acids are classified according to their pKa (acidity constant). The higher the pKa, the weaker the acid.
<i>Correspondence 1 Eq.</i>	75 g	67 g	90 g	
<i>Recommended targets</i>	Red – Rosé White	White – Rosé	Red – Rosé White	
<i>Treatment on must (at 20 meq/L)</i>	1.50 g/L	1.34 g/L	1.80 g/L	
<i>Treatment on wine (at 33 meq/L)</i>	2.5 g/L	2.23 g/L	3.00 g/L	
<i>Effect on pH</i>	+++	++	+	Tartaric acid remains the most effective on pH. To avoid an excessive precipitation of salts, it is recommended to use it during fermentation on must.
<i>Effect on total acidity</i>	++	+++	+++	
<i>Chemical stability</i>	- (potassium bitartrate precipitation)	+++	+++	Potassium or calcium salts from malic and lactic acids are significantly more soluble than tartaric acid salts, the risk of precipitation is thus lower.
<i>Microbiological stability</i>	+ Only risk is acetic acid degradation (tourne disease) by certain lactic bacteria	--- During MLF the L form of malic acid is consumed by the lactic bacteria	-	Malic and lactic acids interact with the bacteria metabolisms. However, increased control over MLF (usage of selected yeast starters) and good hygiene regulations significantly reduce the risks of alterations.
<i>Organoleptic impact</i>	Lively. immediate. dryness. hardness.	Freshness. greenness (green apple).	Soft and tart acidity.	
<i>Formulation</i>	Powder	Powder	Liquid	Lactic acid is in liquid form, powder formulations contain unauthorized lactates. Powders can be directly dissolved into the wine.



# KOSHER PASSOVER PRODUCTS

- ACTIFLORE® F33\*
- ACTIFLORE® F5\*
- ACTIFLORE® RMS2\*
- BISULFITE 15
- BISULFITE 18
- BISULFITE NH400
- CAUSTIC SODA
- CHARBON ACTIF SUPRA 4
- DECAPOL ACTIF
- DECAPOL CHLORE
- DECAPOL H
- DECARTRATE LIQUID
- PHOSPHATE D'AMMONIUM\*
- DIATOMYL P
- GEOSORB®
- LAFAZYM® EXTRACTION KP
- LAFAZYM® CLARIFICATION KP
- MICROCOL®
- MICROCOL® CL G
- NOBILE® (range)
- NUTRISTART® KP\*
- NUTRISTART® ORG KP\*
- OENOSTERYL® EFFERVESCENT
- PERL, 2, 4, 6, 8, 10, 15
- POTASSIUM BICARBONATE
- POTASSIUM BITARTRATE
- POTASSIUM METABISULPHITE
- SOLUTION 10%
- SULFUR (RINGS, CANDLES & BITS)
- SULFIREDOX
- TANIN VR KP\*
- THIAMINE KP\*
- VINICLAR® P
- ZYMAFLORE® F15\*
- ZYMAFLORE® RB2\*
- ZYMAFLORE® RB4\*
- ZYMAFLORE® FX10\*
- ZYMAFLORE® RX60\*
- ZYMAFLORE® ST\*
- ZYMAFLORE® VL1\*
- ZYMAFLORE® VL2\*
- ZYMAFLORE® VL3\*
- ZYMAFLORE® X16\*
- ZYMAFLORE® X5\*
- ZYMAFLORE® XPURE\*

Please contact us for availability of KP products listed above.

Before using the product, please confirm with your Rabbinat's that the Kosher certificates available in our website download area are correct. Certificates are available for download before each delivery as stock lots and certificates evolve each year.

## WHAT IS THE DIFFERENCE BETWEEN KOSHER AND KOSHER FOR PASSOVER?

The Kosher certification allows wine consumption throughout most of the year; the Kosher for Passover certification enables the consumption of wine during the Passover holiday as well as throughout the year.

*\*Yeast, nutrients, tannins: available depending on stocks*



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# CONVERSION CHARTS

Temperature (°F)	0	32	50	59	68	77	86	95
Temperature (°C)	-18	0	10	15	20	25	30	35

ppm or mg/L	100	200	300	400	500	600	700	800	900	1000
g/hL	10	20	30	40	50	60	70	80	90	100
lbs/1,000gal	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0

1 gal = 3.785 L	1 ha = 2.47 acre
1 L = 1,000 mL	1 case = 2.3775 gal
1 hL = 100 L = 26.40 gal	1 barrel = 225 L = 59.40 gal = 25 cases of wine
1 lbs = 453.60 g	1 ton = 165 gal approx.
1 US ton = 2,000 lbs = 907 Kg	1 metric ton = 1,000 Kg = 2,205 lbs

1 g/L tartaric acid = 0.6535 g/L H <sub>2</sub> SO <sub>4</sub>
1 g/L H <sub>2</sub> SO <sub>4</sub> = 1.5302 g/L tartaric acid

mL/L	0.01	0.02	0.03	0.04	0.05	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
cl/hL	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5	10	20	30	40	50
mL/hL	1	2	3	4	5	10	20	30	40	50	100	200	300	400	500
mL/100 gallons	3.8	7.6	11.4	15	19	38	76	114	151	189	379	757	1,136	1,514	1,893
ml/gallon	0.04	0.08	0.11	0.15	0.19	0.38	0.76	1.1	1.5	1.9	3.8	7.6	11.4	15.1	18.9

# BENCH TRIALS SOLUTIONS

## ■ For powder or granulate products.

Prepare a 5% solution, e.g. 2.50 grams dissolved in 50 mL water. Mix thoroughly and allow solution to swell for two hours before use.

Using the table below, add the indicated number of microliters of the solution to the trial sample to achieve the specified ppm.

Exception – for ICHTYOCOLLE, prepare a 1% solution and multiply the volume indicated by 5.

	Volume of Trial Sample			
	50 mL	100 mL	250 mL	375 mL
10 mL/hL	10 µL	20 µL	50 µL	75 µL
20 mL/hL	20 µL	40 µL	100 µL	150 µL
30 mL/hL	30 µL	60 µL	150 µL	225 µL
40 mL/hL	40 µL	80 µL	200 µL	300 µL
50 mL/hL	50 µL	100 µL	250 µL	375 µL
60 mL/hL	60 µL	120 µL	300 µL	450 µL
70 mL/hL	70 µL	140 µL	350 µL	525 µL
80 mL/hL	80 µL	160 µL	400 µL	600 µL
90 mL/hL	90 µL	180 µL	450 µL	675 µL
100 mL/hL	100 µL	200 µL	500 µL	750 µL
125 mL/hL	125 µL	250 µL	625 µL	940 µL
150 mL/hL	150 µL	300 µL	750 µL	1125 µL
200 mL/hL	200 µL	400 µL	1,000 µL	1,500 µL



Soluble products, such as the **QUERTANIN®** Range and **AUTOLEES®**, can use this table for direct addition and tasting immediately afterwards.

Fining treatments need time to settle before evaluating. In general, 2-4 days is recommended settling time. Look for a compact lees layer at the bottom of the sample bottle, decant clean for sensory evaluation.

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# BENCH TRIALS SOLUTIONS

■ For liquid products.

Use direct.

Using the table below, add the indicated number of microliters to the trial sample to achieve the specified dose rate in mL/hL.

	Volume of Trial Sample			
	50 mL	100 mL	250 mL	375 mL
10 mL/hL	5 µL	10 µL	25 µL	38 µL
20 mL/hL	10 µL	20 µL	50 µL	75 µL
30 mL/hL	15 µL	30 µL	75 µL	113 µL
40 mL/hL	20 µL	40 µL	100 µL	150 µL
50 mL/hL	25 µL	50 µL	125 µL	188 µL
60 mL/hL	30 µL	60 µL	150 µL	225 µL
70 mL/hL	35 µL	70 µL	175 µL	263 µL
80 mL/hL	40 µL	80 µL	200 µL	300 µL
90 mL/hL	45 µL	90 µL	225 µL	338 µL
100 mL/hL	50 µL	100 µL	250 µL	375 µL
125 mL/hL	63 µL	125 µL	313 µL	469 µL
150 mL/hL	75 µL	150 µL	375 µL	563 µL
200 mL/hL	100 µL	200 µL	500 µL	750 µL

Soluble products, such as STABIVIN® SP, can use this table for direct addition and tasting immediately afterwards.

Fining treatments, such as gelatins, need time to settle before evaluating. In general, 2-4 days is recommended settling time. Look for a compact lees layer at the bottom of the sample bottle, decant clean for sensory evaluation.

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# LAFFORT® USA

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### DISTRIBUTORS

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# Decision Making Tool



## MUST NUTRITION CORRECTION

For the success of fermentation, both fermentative and organoleptic, proper yeast nutrition is crucial. This nutrition should be complete and include organic as well as mineral nitrogen, sterols, vitamins and minerals at specific stages of the fermentation. The nutrition adjustment should be considered precisely and different factors taken into account to provide the must needs and the expectations of the winemaker. Taking into account the different parameters (potential, available nitrogen level, yeast strain, etc.), **LAFFORT®** now offers a decision support tool for the nutritional correction of must.

Check it out on [www.laffort.com/en/research-and-innovation/decision-making-tool](http://www.laffort.com/en/research-and-innovation/decision-making-tool)

### Must nutrition correction

#### What are the nutritional needs of the must?

What colour is the must?	<input type="text" value="Select..."/>
What is the potential alcohol degree? (% v/v)	<input type="text" value="Select..."/>
What is the initial assimilable nitrogen of the must? (mg/L)	<input type="text" value="Enter a value between 0 and 350 mg/L."/>
What is the yeast strain used?	<input type="text" value="Select..."/>
What is the turbidity of the must? (NTU)	<input type="text" value="Enter a value between 0 and 300 NTU."/>

#### Are there any risk conditions for this fermentation?

What is the peak temperature of the fermentation? (°C/°F)	<input type="text" value="Select..."/>
Is the health status of the grapes good?	<input type="text" value="Select..."/>
Will there be aeration or oxygenation during the alcoholic fermentation?	<input type="text" value="Select..."/>

Do not hesitate to contact your LAFFORT® rep for any question about this tool.



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