LAFFORT®

CATALOG 2025

Jean LAFFORT - Founder

Precision Oenology, inspired by nature, innovative and responsible, reflecting the commitment of the women and men of LAFFORT® for 130 years.

LAFFORT

l'œnologie par nature

Dear winemakers,

This year, **LAFFORT®** is celebrating its 130th anniversary. We owe this longevity to the visionary and innovative spirit of the four generations that have succeeded each other since the company's creation.

This new vintage is intended to continue expressing our know-how in Precision Oenology with new products from nature, our expertise, and our research!

In 2025, **LAFFORT®** will continue developing its SPARK range with **ZYMAFLORE™ CGN24**, a yeast with a typical Prosecco flavour profile. This year, we are also launching **NUTRIFLOW™**, an organic nutrition product in liquid form suitable for cellar automation, and **OENOFEEL™**, a yeast derivative rich in mannoproteins.

Initiated last year, the concept of "**Market Re(a)dy Wine**", which consists of preparing red wines early in the fermentation phase, has been a great success, thanks to the launch of **OENOFINE™ REDY**. Building on the interest in this concept, we are enriching it this year with products and processes for producing fruity, fresh and modern red wines.

Finally, Beverages by **LAFFORT®** has allowed us to expand our skills to other fermented beverages thanks to **VOLUMAX**, a preparation of mannoproteins and polysaccharides of plant origin for colloidal stability and the improvement of volume and length perceptions in the mouth of No Low, Kombucha, and other Seltzers.

In this anniversary year, we thank you for trusting **LAFFORT®** and all its teams and partners and wish you all the best for this 2025 vintage.

Philippe GUILLOMET
Managing Director

LAFFORT® - NEW IN 2025

ZYMAFLORE™ CGN24

***Saccharomyces cerevisiae* yeast selected to enhance the typicity of Prosecco and other fresh, appealing sparkling wines.**

Its ability to produce a high quantity of fruity esters allows **ZYMAFLORE™ CGN24** to fully express green apple and fresh pear aromas. Its low production of aroma-masking compounds and strong fermentation performance ensure purity and precision on the palate. An ideal choice for producing fresh, distinctive, and authentic wines.

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NUTRIFLOW™

100% organic liquid nutrient

NUTRIFLOW™ is a 100% yeast origin (yeast autolysate) complete nutrient that supports cell multiplication and a regular metabolism for clean, well-managed fermentations.

Thanks to its liquid formulation, it is easy to use and perfectly suited to the needs of large wineries. Ideal for automated additions, it helps streamline processes while reducing the workload for operators.

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Oeno feel®
PURE YEAST DERIVATIVE

OENOFEEL™

Specific preparation of inactivated yeasts selected for their high mannoprotein content

OENOFEEL™ contributes to the pursuit of roundness and balance in wines. This solution fits perfectly into maturation protocols, enhancing wine volume and balance.

With a composition inspired by ageing on lees, **OENOFEEL™** is a processing aid not subject to labelling, which helps refine wines by enhancing their structure.

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ZYMAFLORE™ KLIMA

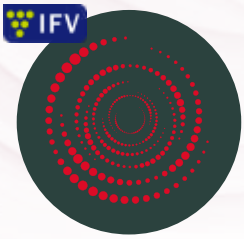
Saccharomyces cerevisiae yeast

Less alcohol | More acidity

ZYMAFLORE™ OMEGA^{LT}

Lachancea thermotolerans yeast

Microbiological BIOAcidification



LACTOENOS™ BERRY *Direct*

Oenococcus oeni bacteria

Fresh fruit expression | Faster MLF

LAFASE™ XL REDY

(EX LAFASE™ XL EXTRACTION ROUGE)

Liquid maceration enzyme

Faster post-fermentation clarification | Improved filterability

FOR
MODERN
FRESH
FRUITY
RED WINES

MARKET RE(A)DY WINE

OENOFINE™ RedY

Fermentation fining product

Volume and suppleness | Improved colour stability | Improved filterability | Faster market readiness

LAFFORT

l'œnologie par nature

www.laffort.com

LAFFORT® is certified as Committed to Corporate Social Responsibility (CSR) according to the ISO 26000 standard.

LAFFORT® had already paved the way in 1999 as the first producer of oenological products to be ISO 9001 certified for its quality management system. We are therefore proud today to be the first company in the sector to receive the Committed to CSR label (Confirmed level) according to the ISO 26000 standard.

LAFFORT
l'œnologie par nature

YEASTS

ZYMAFLORE™ RANGE

For many years, *Saccharomyces cerevisiae* has been the only strain used in winemaking because of its fermentative capacity and its influence on the aromatic profile of wines. This is an area that **LAFFORT®** has mastered, thanks to its collection of strains (a reserve of **BIO**Diversity) and its proficiency in Quantitative Trait Loci (QTL) marker-assisted and breeding techniques.

Over the years, the **ZYMAFLORE™** range has expanded to include non-*Saccharomyces* yeasts. These yeasts offer new possibilities for achieving different and specific winemaking objectives, such as **BIO**Protection to reduce the use of SO_2, **BIO**Acidification, and enhancing aromatic complexity.

Ana Hranilovic
Fermentation Range Manager

In 2025, all our ACTIFLORE™ yeasts will become ZYMAFLORE™.

NON-*SACCHAROMYCES*

BIOPROTECTION

YEASTS

- Red
- White
- Rosé
- Sparkling

ZYMAFLORE™ KHIO^{MP}

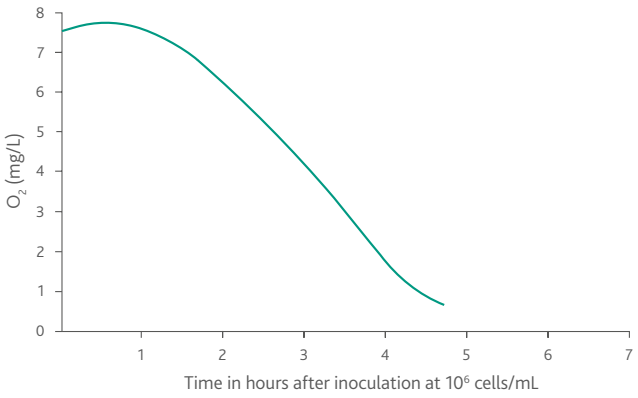
DIRECT INOCULATION

JUICE

Metschnikowia pulcherrima **has a high capacity to consume dissolved oxygen while limiting the development of potentially undesirable native flora.**

- BIOProtection of musts (white and rosé) and grapes during the extended pre-fermentation phases
- Colonisation of the medium and maintenance of the population at very low temperatures (0°C / 32°F)
- Protection of the juice against oxidation due to its strong capacity to consume dissolved oxygen

Fast consumption of dissolved oxygen in a juice in the presence of ZYMAFLORE™ KHIO^{MP}



ZYMAFLORE™ KHIO^{MP} helps to protect against oxidation by quickly consuming all the dissolved oxygen in the must. MORE BIOPROTECT project, 2021 - Windholtz, S., Masneuf-Pomarède, I., Nioi, C.

500 g

3 - 5 g/hL (30 - 50 ppm)

ZYMAFLORE™ ÉGIDE^{TDMP}

DIRECT INOCULATION

MUST GRAPES EQUIPMENT

Torulaspora delbrueckii **and** ***Metschnikowia pulcherrima*** **for BIOProtection on grapes, musts and equipment as an SO_2 reduction strategy**

- Colonisation of the medium without any detected fermentation activity under recommended conditions
- Restriction of the growth of indigenous flora
- Facilitation of the implantation of the inoculated *Saccharomyces cerevisiae* strain
- BIOProtection of the medium in various situations (grapes, equipment, juice transport)

Application of ZYMAFLORE™ ÉGIDE^{TDMP} on harvesters and grape bins: impact on the microflora of grapes (culture medium "total yeasts")

Without BIOProtection: significant presence of moulds and potentially undesirable micro-organisms

BIOProtection with ZYMAFLORE™ ÉGIDE^{TDMP}: colonisation by Torulaspora delbrueckii and Metschnikowia pulcherrima

500 g

2 - 5 g/hL (20 - 50 ppm)

NON-*SACCHAROMYCES*

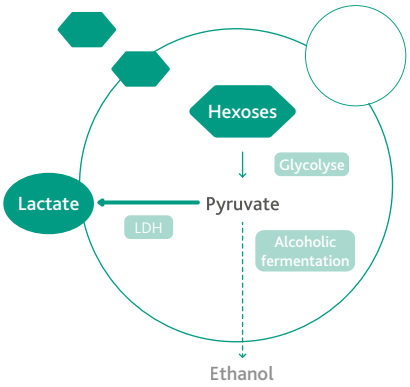
ZYMAFLORE™ OMEGA^{LT}

BIOACIDIFICATION

Lachancea thermotolerans **for the BIOAcidification of musts (red, white and rosé)**
Adjusts the acid balance and favours a fresh sensory profile.

- Selected for its **strong ability to produce L-lactic acid** from fermentable sugars
- **Decrease in the pH** and increase in the total acidity of wines accompanied by a **slight reduction in alcohol content**
- Recommended for healthy and lightly sulphited harvests (< 4 g/hL (40 ppm))
- To be used in co-inoculation (simultaneous yeast additions) or in sequential inoculation with the chosen strain of *Saccharomyces cerevisiae* to complete the alcoholic fermentation. Sequential inoculation favours the expression of **ZYMAFLORE™ OMEGA^{LT}**.
- Suitable for the preparation of batches used to increase acidity when blending: "**oMEGA FRESH TANK**" concept

Mechanism of BIOAcidification by *Lachancea thermotolerans*



ZYMAFLORE™ OMEGA^{LT} can convert some of the fermentable sugars into lactic acid at the expense of ethanol.

500 g

20 g/hL (200 ppm)

ZYMAFLORE™ ALPHA$^{TD\ N.\ SACCH}$

AROMATIC COMPLEXITY

Torulaspora delbrueckii **for enhanced aromatic complexity and mouthfeel**

- Brings out varietal and fermentation aromas
- Adds **mouthfeel** through a high production of polysaccharides
- Low volatile acidity production in high sugar and *Botrytis*-infected musts
- Inoculate with the chosen strain of *Saccharomyces cerevisiae* 24 to 72 hours after the addition of **ZYMAFLORE™ ALPHA$^{TD\ N.SACCH}$** to ensure the completion of alcoholic fermentation and to benefit from the sensory impact of **ZYMAFLORE™ ALPHA$^{TD\ N.SACCH}$**.

500 g

30 - 40 g/hL (300 - 400 ppm)

SACCHAROMYCES CEREVISIAE
RED WINES

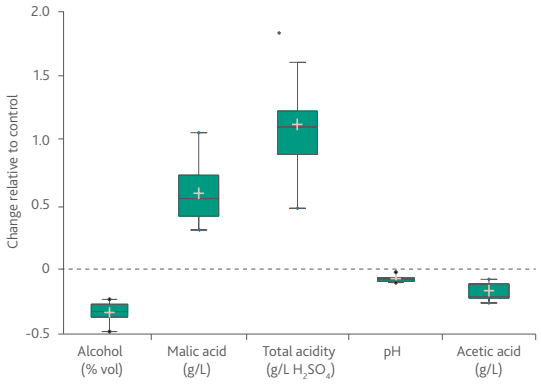
ZYMAFLORE™ KLIMA

LOW ALCOHOL | FRESHNESS

The result of a selection program assisted by molecular markers, ZYMAFLORE™ KLIMA can reduce the alcohol content of wine while increasing its acidity.

- **Lower alcohol yield by up to 0.5% vol**
- **Preservation or production of malic acid** during the AF: more lactic acid after MLF
- **Elegant, fruity, and floral aromas** for a fresh and well-defined profile

Adjustment of alcohol and acidity parameters in wines fermented with ZYMAFLORE™ KLIMA



Reduction of alcohol, pH and acetic acid
Increase in malic acid concentration and total acidity
Cumulative results of 16 field trials (2022 and 2023)

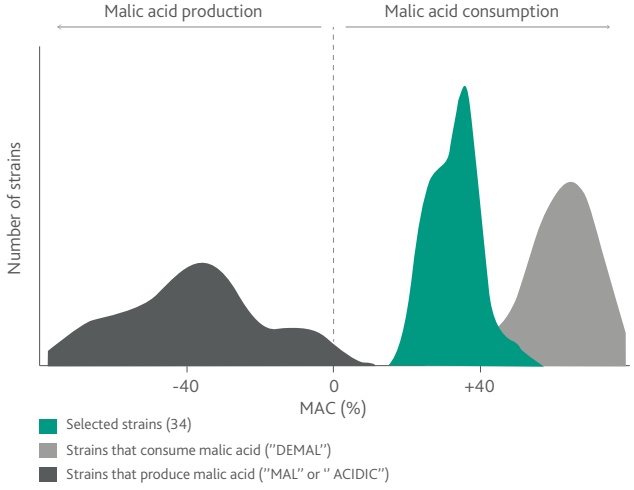
500 g

20 - 30 g/hL (200 - 300 ppm)

LESS ALCOHOL AND MORE ACIDITY WITH ZYMAFLORE™ KLIMA

Saccharomyces cerevisiae is an efficient yeast in alcohol production, with little variability in ethanol/sugar yield between strains. Regarding acidity, however, most selected strains consume some of the malic acid initially present in the grape juice during alcoholic fermentation.

BIOLAFFORT® R&D has made it possible to increase this variability through breeding and Quantitative Trait Loci (QTL) marker-assisted techniques. Strains selected in this way have a greater capacity to reduce the alcoholic content of wines by promoting other metabolic pathways. In the case of **ZYMAFLORE™ KLIMA**, the low alcohol yield is partly explained by the increased production of glycerol. The production of malic acid from the sugars also contributes to the reduction in alcohol, further enhancing wine freshness.



The MAC (“Malic Acid Consumption”) parameter represents malic acid consumption by *S. cerevisiae* during alcoholic fermentation.

The value is positive when malic acid is broken down and negative when malic acid is produced (Vion et al. 2021).

SACCHAROMYCES CEREVISIAE
RED WINES

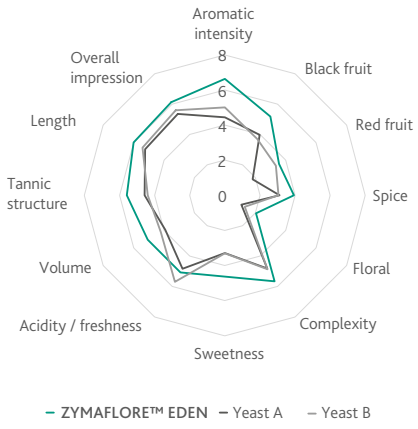
ZYMAFLORE™ EDEN

COMPLEXITY

From mass selection for a unique and lush fruity profile

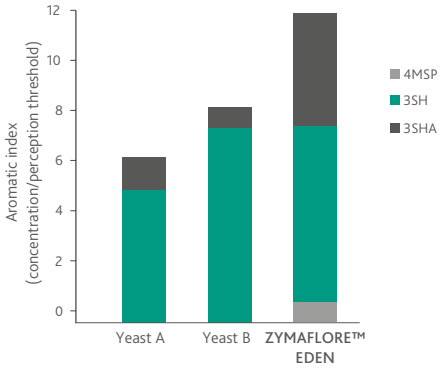
- Brings an **abundance of fruit flavours** combined with **fresh, spicy notes**
- Contributes to **suppleness**, **volume** and **length** on the palate
- Exceptional technological characteristics: low SO_2 and VA production

Sensory profile



*Compared with other strains on the market, **ZYMAFLORE™ EDEN** favours the aromatic expression of fruit, spices and flowers and adds suppleness on the palate. Trials on Merlot, France, 2023, 13.2% vol, pH 3.6*

Thiols - Aromatic index



Thiols accentuate the intensity of fruits and spices, with refreshing notes. Trials on Syrah, France, 2023, 15% vol, pH 3.8

500 g

20 - 30 g/hL (200 - 300 ppm)

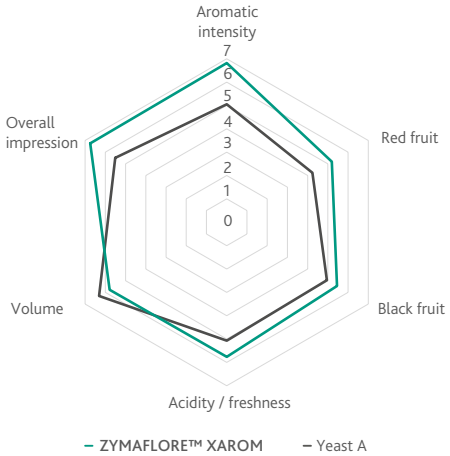
ZYMAFLORE™ XarOm

AROMATIC EXPRESSION

A preferred yeast for modern red wine styles: aromatic, expressive, and approachable

- Intense production of **fermentation aromas** (higher alcohol acetates) and varietal aromas (thiols)
- Great aromatic intensity even from grapes with **moderate aromatic potential**
- Preserve malic acid during AF: more lactic acid after MLF

Sensory profile



*The wine fermented with **ZYMAFLORE™ XAROM** presents a more intense and fruity sensory profile (27 tasters using TASTEL WEB software). Syrah trials, France, 2023*

500 g / 10 kg

20 - 30 g/hL (200 - 300 ppm)

SACCHAROMYCES CEREVISIAE
RED WINES

ZYMAFLORE™ XPURE

LOW SO_2

Wines of great aromatic purity, perfectly expressing their terroirs

- Suitable for fermentation with reduced doses of sulphites: low total SO_2
- **Full aromatic finesse expression and suppleness on the palate**
- Promotes the expression of **dark fruit** and reduces the perception of vegetal character

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ FX10

FRUCTOPHILIC YEAST

Wines showing structured and silky tannins

- Thermotolerant character allowing better cell viability at high fermentation temperatures
- **Preserves varietal specificity and terroir**: very low production of fermentation aromas
- Contributes to **sweetness** (Hsp12 protein) and **tannin softness** (release of polysaccharides)

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ RX60

DIRECT INOCULATION

Fruity, spicy red wines

- Very high aroma production (ethyl esters of fatty acids) and **thiols: fresh red fruits**
- Low production of H_2S for a clean and expressive profile
- LACTOENOS™ BERRY *Direct* is recommended in early co-inoculation to accentuate aromatic freshness.

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ F33

DIRECT INOCULATION

Perfectly suited to the production of elegant red wines

- **Very low VA production**
- Strong resistance to high alcohol levels and robust over a wide temperature range
- Superior **balance and softness** due to high polysaccharide release

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

Practical Advice

Consider **SUPERSTART™ ROUGE** to optimise yeast viability in juice and must with high sugar concentration.
See P. 25

Find Out More

Discover our "**yeast rehydration**" video on our website, **LAFFORT & YOU** section.

SACCHAROMYCES CEREVISIAE
RED WINES

ZYMAFLORE™ F15

STRUCTURE

Rounded, full-bodied wines with excellent ageing potential

- Isolated from one of the best terroirs in Bordeaux
- Broad aromatic spectrum, while respecting varietal typicity
- Round, structured and harmonious wines

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ RB2

COLOUR

Delicate and refined wines, inspired by the elegance of the great wines of Burgundy

- Strain isolated from a premium estate in Burgundy to enhance the typicity of Pinot Noir
- Low **colour matter** adsorption, allowing for colour preservation
- Expression of the aromatic typicity of Pinot Noir and similar varieties (red fruits, cherry, kirsch…)

500 g — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ F83

AROMATIC EXPRESSION

Supple, fruity and floral red wines with a Mediterranean signature

- Strain isolated in Tuscany
- Accentuates expressive **red fruit notes** (fermentative aromas)
- Respects the typicity of Mediterranean grape varieties

500 g — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ RB4

"PRIMEUR"

Aromatic wines, "primeur" style for rapid release to market

- Strain selected in Beaujolais
- **Strong production of fermentation esters**, giving notes of **intense red fruits**
- Fruity, aromatic and easy-to-drink wines

500 g — 20 - 30 g/hL (200 - 300 ppm)

Practical Advice

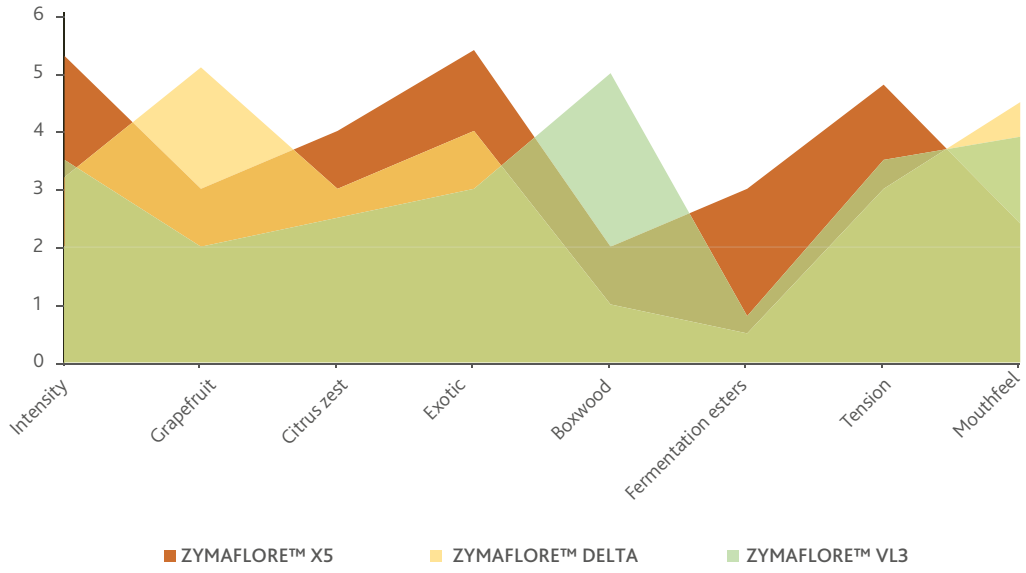
THINK NOBILE® !

The addition of **NOBILE® FRESH GRANULAR 24M** (untoasted oak) during alcoholic fermentation provides ellagitannins and polysaccharides of natural origin. It supports wine structure development for ageing and enhances fruity aromatic expression.

Dose: 2 - 4 g/L (2000 - 4000 ppm). *See P. 78*

SACCHAROMYCES CEREVISIAE
WHITE & ROSÉ WINES

GRAPE VARIETIES WITH VOLATILE THIOL CHARACTERS: HOW TO CHOOSE THE YEAST?



CHARDONNAY: HOW TO CHOOSE THE YEAST?

	ZYMAFLORE™ CX9	ZYMAFLORE™ VL1	ZYMAFLORE™ VL2	ZYMAFLORE™ X16
Varietal expression	●●●●● (Lemon, hazelnut, almond and toasted bread)	●●●● (Minerality, exotic fruits)	●●●	●
Production of fermentation esters	-	-	●●	●●●●●
Aromatic intensity	●●●●	●●●	●●●●	●●●●●
Volume and sweetness on the palate	●●●●	●●●●●	●●●	-
Fermentative capability	●●●●	●●●	●●●	●●●●●

Practical Advice

To increase the thiol concentration in wines, consider using LAFAZYM™ THIOLS[+].
See P. 38

SACCHAROMYCES CEREVISIAE
WHITE & ROSÉ WINES

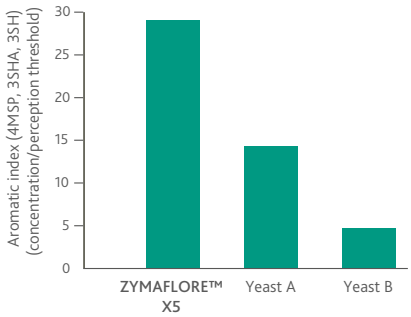
ZYMAFLORE™ X5

DIRECT INOCULATION | THIOLS

Aromatic white wines and thiols

- Strong expression of **thiols** (boxwood, tropical fruits) and fruity esters
- Fresh and vibrant on the palate
- Excellent fermentation robustness even under extreme conditions (e.g. low turbidity and temperature)

Release of thiols by ZYMAFLORE™ X5: comparison with two thiol-releasing strains



Trial on Sauvignon Blanc, France, 2022, potential alcohol: 12.7% vol, pH 3.3, AF at 16 - 18°C (60 - 65°F)

500 g / 10 kg

20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ DELTA

THIOLS

Aromatic white and rosé wines

- **Complex** and **elegant** wines with with good mouthfeel
- High expression of **citrus notes**, especially **grapefruit** (3SH and 3SHA)
- Optimal conditions for fermentation: 150 - 250 NTU turbidity; low production of negative sulphur compounds (even at high turbidity levels)

500 g

20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ VL3

THIOLS

Wines of elegance and finesse with high expression of volatile thiols

- Isolated from one of the best Sauvignon Blanc vineyards in Bordeaux
- Good aptitude for expressing **varietal aromas** such as volatile thiols
- **Volume and roundness** on the palate due to the release of the Hsp12 protein (sensation of sweetness)

500 g / 10 kg

20 - 30 g/hL (200 - 300 ppm)

Practical Advice

THINK NOBILE®!

The addition of **NOBILE® FRESH GRANULAR 24M** (untoasted oak) during alcoholic fermentation provides ellagitannins and polysaccharides of natural origin. It supports wine structure development for ageing and enhances fruity aromatic expression.

Dose: 0.5 - 2 g/L (500 - 2000 ppm). *See P. 78*

SACCHAROMYCES CEREVISIAE
WHITE & ROSÉ WINES

ZYMAFLORE™ CX9

CHARDONNAY

Selected from a great Burgundy vineyard and breeding technology

- Enhances notes of **lemon, fresh hazelnut, almond and toast**
- Contributes to the balance between **smoothness, tension and mouthfeel**
- POF(-) character [no vinyl phenol formation], **fine and clean aromatic profile**

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ X16

FERMENTATION AROMAS

Modern and aromatic style white and rosé wines

- High **aromatic** production (peach, white flowers, stone fruits)
- POF(-) character: **fine and clean aromatic profile**
- Low production of H_2S

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ VL1

ELEGANCE

Elegant and refined white wines

- POF(-) character: fine and clean aromatic profile
- High ß-glucosidase enzymatic activity
- Expression of floral **terpene varietal aromas**

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ VL2

BARREL FERMENTATION

Delicate and clean barrel-fermented wines

- POF(-) character: fine and clean aromatic profile
- High polysaccharide production contributes to the volume of wines

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ XarOm

AROMATIC EXPRESSION

Intense production of fermentation aromas (hard candy, strawberry, pineapple, etc.) and varietal aromas

- Production of wines with great aromatic intensity
- Suitable for the fermentation of many aromatic and neutral grape varieties
- Preserves malic acid during AF
- POF(-) character, **fine and clean aromatic profile**

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ XORIGIN

TERROIR

Production of well-balanced fine white wines, respecting the typical character of grape varieties and terroirs

- Suitable for vinifications with reduced sulphite additions: low SO_2 content
- **Revelation of the aromatic potential of the grape variety**: fine and elegant aromas of white-, and yellow-fleshed fruit, delicate flowers
- Adds **mouthfeel**
- POF(-) character: **fine and clean aromatic profile**

500 g — 20 - 30 g/hL (200 - 300 ppm)

SACCHAROMYCES CEREVISIAE
WHITE & ROSÉ WINES

ZYMAFLORE™ ROSÉ

AROMATIC EXPRESSION

Technological rosé wines, also suitable for grape varieties with low aromatic potential

- Strong production of **fermentative aromas**
- POF(-) character : **fine and clean aromatic profile**
- Strong implantation ability and fermentation rates

500 g / 10 kg — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ ST

SWEET WINES

Sweet wines from botrytised grapes. Late harvest

- Strain selected in Sauternes
- Sensitive to SO_2 for arresting fermentation easily and low production of SO_2 binding compounds
- Resistance to high sugar concentrations

500 g — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ F5

WINES FOR DISTILLATION

Yeast for wines intended for distillation

- Yeast selected for its fermentation robustness and its exceptional organoleptic impact
- Low production of SO_2, acetaldehyde, higher alcohols, and ethyl acetate
- Elegant and subtle profiles, while expressing a unique character

500 g — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ RMS2

FERMENTATION ROBUSTNESS

Difficult conditions, low production of reduction compounds

- Selected for its excellent fermentation capabilities
- Also recommended for secondary fermentation of sparkling wines
- Very low production of reductive compounds, particularly H_2S

500 g — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ CGN24

NEW

AROMATIC EXPRESSION

Aromatic, fruity, and balanced sparkling wines, in the style of Prosecco

- Selected for its **fermentation robustness** and **unique aromatic signature**
- Production of elegant fermentation aromas such as **green apple** and **fresh pear**
- Very low production of undesirable compounds and aroma-masking elements, resulting in a clean and precise profile

500 g — 20 - 30 g/hL (200 - 300 ppm)

ZYMAFLORE™ SPARK

SPARKLING WINES | FRUCTOPHILIC YEAST

Secondary fermentation and tough conditions

- Still wine fermentation and secondary fermentation of sparkling wines
- Resistant to difficult fermentation conditions (potential alcohol, turbidity, temperature)
- Tolerates high SO_2 and alcohol levels

Tested and approved by the microbiology laboratory of the Technical department of the CIVC (Comité Interprofessionnel du Vin de Champagne)

500 g — 20 - 30 g/hL (200 - 300 ppm)

SACCHAROMYCES CEREVISIAE SPECIFIC APPLICATIONS

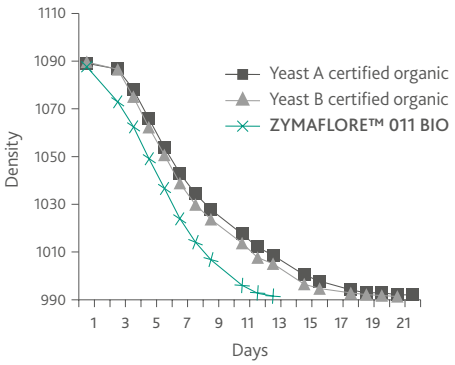
ZYMAFLORE™ 011 BIO

ORGANIC-CERTIFIED

Saccharomyces cerevisiae **organic-certified yeast (EU and NOP)**

- Remarkable fermentation capabilities, and respect for varietal typicity
- Alcohol tolerance well-adapted to restarting stuck fermentations or inoculation in case of sluggish spontaneous fermentations to ensure a healthy completion of fermentation
- Low production of medium-chain fatty acids, which inhibit lactic acid bacteria

Comparison of fermentation kinetics



Cabernet Franc, Entre deux Mers 2012.
Potential alcohol: 13.2% vol, TA (tartaric 5.66 g/hL), pH 3.2

500 g

20 - 30 g/hL (200 - 300 ppm); 30 - 50 g/hL (300 - 500 ppm) in case of stuck fermentation

ZYMAFLORE™ BO213

DIRECT INOCULATION | FRUCTOPHILIC YEAST

Fermentation restart and clean, aromatic profile

- Very strong ability to restart sluggish or stuck fermentations
- Tolerates extremely high alcohol levels (18% vol)
- Excellent fermentation capacity even in extreme conditions

Restarting fermentation protocol - *See P. 100*

500 g

20 - 30 g/hL (200 - 300 ppm); 30 - 50 g/hL (300 - 500 ppm) in case of stuck fermentation

Decision Making Tool

See our "**restarting fermentation" (AF)** DMT on our website at LAFFORT & YOU.

SACCHAROMYCES CEREVISIAE CHARACTERISTICS

RED

Yeast	Grape variety	Alcohol tolerance* (% vol)	Nitrogen requirements	Optimal fermentation temperature	Fermentation kinetics
011 BIO	Organic certified yeast	16	Low	14 - 26°C | 57 - 79°F	Rapid
BO213	Restarting alcoholic fermentation and high alcohol levels	18	Low	10 - 32°C | 50 - 90°F	Rapid
CEREVISIAE	Respects varietal character	13.5	Low	20 - 30°C | 68 - 86°F	Rapid
EDEN	Syrah, Merlot, Pinot Noir...	15	High	20 - 30°C | 68 - 86°F	Regular
F15	Merlot, Cabernet Sauvignon, Cabernet Franc, Pinot Noir…	16	Medium	20 - 32°C | 68 - 90°F	Rapid
F33	Cabernet Sauvignon, Cabernet Franc, Merlot...	16	Low	13 - 30°C | 55 - 86°F	Regular
F83	Grenache, Carignan, Sangiovese, Mourvèdre, Syrah, Merlot...	16.5	Medium	20 - 30°C | 68 - 86°F	Regular
FX10	Cabernet Sauvignon, Petit Verdot, Malbec...	16	Low	20 - 35°C | 68 - 95°F	Regular
KLIMA	Balanced wines	16	High	14 - 30°C | 57 - 86°F	Regular
RB2	Pinot Noir, Merlot, Gamay...	15	Low	20 - 32°C | 68 - 90°F	Regular
RB4	Aromatic wines, "primeur style"	15	Low	20 - 30°C | 68 - 86°F	Rapid
RX60	Syrah, Grenache, Tempranillo...	16.5	High	20 - 30°C | 68 - 86°F	Regular
XAROM	Aromatic intensity	15.5	High	14 - 30°C | 57 - 86°F	Regular
XPURE	Highlight terroir	16	Medium	20 - 30°C | 68 - 86°F	Regular

WHITE & ROSÉ

Yeast	Grape variety	Alcohol tolerance* (% vol)	Nitrogen requirements	Optimal fermentation temperature	Fermentation kinetics
011 BIO	Organic certified yeast	16	Low	14 - 26°C | 57 - 78°F	Rapid
CGN24	Fresh sparkling wines	13	Low	14 - 22°C | 57 - 72°F	Regular
CX9	Chardonnay, Sémillon...	16	Low	14 - 22°C | 57 - 72°F	Regular
DELTA	Chenin, Vermentino, Gewurztraminer, Sauvignon Blanc, Riesling, Pinot Gris, Viognier...	14.5	High	14 - 22°C | 57 - 72°F	Regular
F5	Base wines for distillation	15	Medium	13 - 25°C | 55 - 77°F	Regular
KLIMA	Balanced wines	16	High	14 - 30°C | 57 - 86°F	Regular
RMS2	PDM, white wine fermentations under difficult conditions	17	Low	10 - 30°C | 50 - 86°F	Rapid
ROSÉ	Cinsault, Syrah, Grenache…	15	Medium	13 - 18°C | 55 - 64°F	Regular
SPARK	Secondary fermentation	17	Low	10 - 32°C | 50 - 90°F	Rapid
ST	Sweet wines	15	High	14 - 20°C | 57 - 68°F	Regular
VL1	Sémillon, Chardonnay, Riesling, Gewurztraminer...	14.5	High	16 - 20°C | 60 - 68°F	Regular
VL2	Sémillon, Chardonnay, Viognier...	15.5	Medium	14 - 20°C | 57 - 68°F	Regular
VL3	Sauvignon Blanc, Colombard...	14.5	High	15 - 21°C | 59 - 70°F	Regular
X16	Chenin, Chardonnay, Ugni Blanc, Colombard...	16.5	Medium	12 - 18°C | 54 - 64°F	Rapid
X5	Sauvignon Blanc, Colombard, Vermentino, Manseng, Riesling...	16	High	13 - 20°C | 55 - 68°F	Rapid
XAROM	Aromatic intensity	15.5	High	14 - 30°C | 57 - 86°F	Regular
XORIGIN	Pinot Gris, Riesling, Pinot Blanc, Melon de Bourgogne, Sylvaner, Müller Thurgau…	15.5	Low	14 - 22°C | 57 - 72°F	Rapid

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

BACTERIA

LACTOENOS™ RANGE

Like yeasts, lactic acid bacteria play a vital role in the sensory profile of wines. As well as transforming malic acid into lactic acid, their metabolism helps to differentiate fruit profiles, increase or decrease buttery notes, enhance the freshness or suppleness of wines and influence the production of undesirable compounds (e.g. histamine).

The **LACTOENOS™** range offers a choice of lactic acid bacteria suited to different winemaking conditions and the type of inoculation (co-inoculation), enabling the expression of unique and distinctive wine styles.

Ana Hranilovic
Fermentation Brand Manager

LACTOENOS™ RANGE

TECHNICAL ITINERARY & PREPARATION OF LACTOENOS™ BACTERIA

Selecting malolactic bacteria demands considerable knowledge and skill to satisfy winemakers' oenological needs. Consequently, the **LACTOENOS™** bacteria range is the outcome of a rigorous selection process conducted over several years.

WITHOUT REACTIVATION	PRIOR REACTIVATION		
All types of wine		*Sparkling - low pH*	*Difficult conditions* Curative MLF
		STARTER	
LACTOENOS™ B7 *Direct* LACTOENOS™ BERRY *Direct*	LACTOENOS™ 450 PREAC	LACTOENOS™ B16 STANDARD	LACTOENOS™ B7 *Direct*
DIRECT SPRINKLING IN THE TANK	ACCLIMATATION: Sequential inoculation: 12 hours Early co-inoculation: 30 minutes	REACTIVATION IN MUST OR WINE *(depending on the malic acid concentration)* PREPARATION OF A STARTER: 5 to 10 days Correction of pH	REACTIVATION IN WINE Minimum 24 hours *(depending on the malic acid concentration)* PREPARATION OF A STARTER: 5 to 10 days

SPECIFIC STRAIN CHARACTERISTICS

● Red ● White ● Rosé		LACTOENOS™ B7	LACTOENOS™ BERRY	LACTOENOS™ 450	LACTOENOS™ B16
INOCULATION METHOD		*Direct*		*PreAc*	STARTER
SENSORY PROFILE		Aromatic complexity	Fruit freshness	Neutral, respect for fruity character	Neutral
WINE TYPE		●●●	●●●	●●●	Sparkling low pH
PHYSICO-CHEMICAL PARAMETERS	ALCOHOL (% Vol)	≤ 16	≤ 16	≤ 17	≤ 14
	pH	≥ 3.2	≥ 3.2	≥ 3.3	≥ 2.9
	TOTAL SO_2 (mg/L)	≤ 60			
	TEMPERATURE	≥ 16°C (≥ 61°F)			
TIME OF INOCULATION	CO-INOCULATION*	√			
	SEQUENTIAL	√			

* *During the first few days of AF, the pH may drop by up to 0.2 units. Take this parameter into account when choosing the strain. Do not hesitate to contact your **LAFFORT®** representative to check the time of inoculation and quantity to add.*

LACTOENOS™ RANGE

Bacteria are generally added after the completion of alcoholic fermentation. However, winemakers are increasingly opting for co-inoculation of yeast and bacteria, with the addition of bacteria before the completion of the alcoholic fermentation.

BENEFITS OF EARLY CO-INOCULATION (24 - 48H AFTER INOCULATION WITH *S. CEREVISIAE*)

1 SAVES TIME

Early microbiological and chemical stabilisation of the wine:

- Facilitates batch selection and blending before ageing
- Optimises the preparation of wines for the market

2 SAVES MONEY

Reduction in energy consumption by taking advantage of the more favourable temperature during alcoholic fermentation

3 FERMENTATION SECURITY

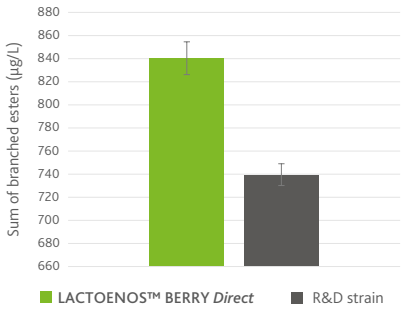
Promotes bacterial survival and establishment in milder conditions (temperature, ethanol)

SENSORY IMPACT OF SELECTED BACTERIA IN THE "*Direct*" RANGE

The LAFFORT® range includes two direct inoculation bacteria: LACTOENOS™ BERRY *Direct* and LACTOENOS™ B7 *Direct*. These bacteria, through their sensory properties, reinforce the overall aromatic intensity of wines.

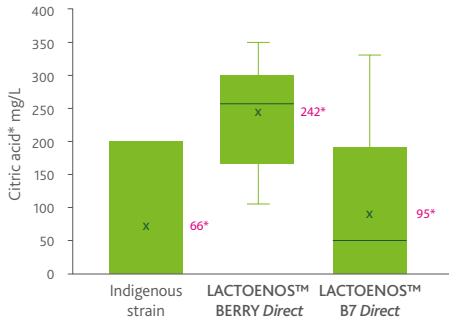
LACTOENOS™ BERRY *Direct* has a very slow citric acid degradation metabolism, ensuring its preservation. This is accompanied by a very low production of volatile acidity. Wines fermented with LACTOENOS™ BERRY *Direct* are thus fresh, with intense fruit expression.

Branched ester content



Analysis on the finished wines show a higher content of branched esters (contributors to fruity aromas) in the modality inoculated with ***LACTOENOS™ BERRY Direct.***

Citric acid concentration at the end of MLF



Summary of 9 field trials (sequential inoculation)
Dose of bacteria: 1 g/hL (10 ppm)
**Mean citric acid concentrations*

Did You Know?

In a high ethanol environment, a temperature above 20°C (68°F) favours membrane fluidity and thus the diffusion of ethanol into the intracellular medium, resulting in a higher bacterial mortality rate. Therefore, for sequential inoculation, aim for a temperature ≤ 20°C (68°F). For pH < 3.1, the maximum recommended temperature is 18°C (64°F).

LACTOENOS™ RANGE

BACTERIA

- Red
- White
- Rosé
- Sparkling

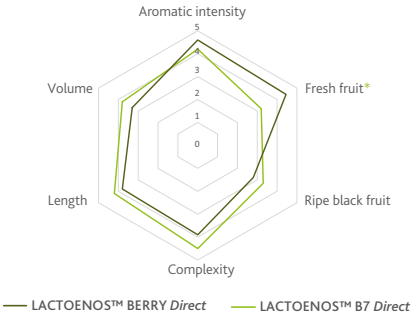
LACTOENOS™ BERRY *Direct*

FRESHNESS AND FRUIT | IFV

Oenococcus oeni for the production of wines with a fresh and fruity sensory profile due to its ability to preserve citric acid and its very low production of diacetyl

- The result of mass selection in association with IFV
- Very slow citric acid degradation metabolism: **very low production of volatile acidity and diacetyl**
- Particularly effective in the co-inoculation of red wines, allowing AF and MLF to finish almost simultaneously
- Robust strain over a wide range of pH, alcohol, SO_2 and temperature conditions, regardless of the wine type
- The *Direct* process allows for the inoculation of **LACTOENOS™ BERRY *Direct*** in must or wine without acclimatisation.

Sensory profiles



Gamay - Sequential inoculation - 12.2% vol - TA 5.8 g/L (tartaric)
pH 3.2 - Initial malic acid 1.3 g/L
**Statistical validation - ANOVA test*

2.5 hL / 25 hL / 250 hL

Dose: Refer to the packaging

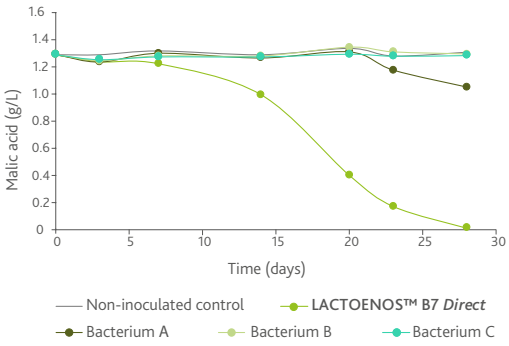
LACTOENOS™ B7 *Direct*

COMPLEXITY AND ROBUSTNESS

Oenococcus oeni for the production of wines with great aromatic complexity

- **Low production of volatile acidity**
- Efficient strain over a broad pH spectrum, alcohol, SO_2, temperature and tannic structure
- **Particularly suitable under difficult conditions or for curative MLF**
- Compatible with co-inoculation and sequential inoculation
- The *Direct* process allows for the inoculation of **LACTOENOS™ B7 *Direct*** in must or wine without acclimatisation.

Fermentation kinetics of different strains



Chardonnay 2015. Burgundy. 14.4% vol, pH 3.5,
TSO_2 60 mg/L, MLF at 19°C (66°F)

2.5 hL / 25 hL / 250 hL

Dose: Refer to the packaging

LACTOENOS™ RANGE

LACTOENOS™ 450 *PreAc*

A pre-acclimatised bacteria distinguished by its high malolactic activity

- Very good implantation capacity, regardless of the time of inoculation under optimal conditions (pH, SO_2, etc.)
- Especially selected for its resistance to **high alcohol** (up to 17% vol)
- An exclusive production process developed by **LAFFORT®** that ensures a higher bacterial survival rate and a shortened latency phase. **ENERGIZER™** starter supplied with the bacterium

50 hL / 250 hL — Dose: Refer to the packaging

LACTOENOS™ B16 *Standard*

Bacteria are to be reactivated in the form of a starter

- Strain is particularly suitable for producing **sparkling wines and wines at low pH**

50 hL / 250 hL — Dose: Refer to the packaging

BACTERIA NUTRITION

MALOBOOST™

A nutrient adapted to the specific nutritional needs of lactic acid bacteria *(Oenococcus oeni)*. Promotes a rapid start to the malolactic fermentation and optimal kinetics

Facilitating all MLFs, **MALOBOOST™** is used to:

- Start and complete MLF more rapidly.
- Help to restart stuck or sluggish MLFs.
- Encourage MLF under difficult conditions (low temperature and pH, high alcohol).

1 kg — 20 - 40 g/hL (200 - 400 ppm)

Practical Advice

In instances where the wine displays limiting characteristics (low pH, high level of clarification, high TA or SO_2 levels, nutritional deficiencies, problematic AF...), the addition of an MLF nutrient is essential for the activation and progress of MLF.

Find Out More

Consult our protocols for "**Reactivation of LACTOENOS™ B16 STANDARD - Sparkling wines**" and "**Restarting malolactic fermentation (MLF)**" in the **LAFFORT & YOU** section of our website.

NUTRIENTS

For fermentation to be successful from both kinetic and sensory perspectives, it is essential to provide adequate nutrition to the fermenting microorganisms. Such nutrition should be comprehensive and include a good balance between nitrogen (organic and mineral), lipids, vitamins and minerals at the different stages of vinification. The complete range of nutrients developed by **LAFFORT®** provides this nutritional balance according to the specific characteristics of the must.

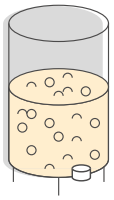
The yeast preparation additives in the **SUPERSTART™** range (Patent FR 2736651) optimise yeast performance.

The **LAFFORT®** range is not limited to yeasts; it also includes bacteria, thus promoting quality MLF, a key element in the final quality of the wine.

Charlotte Vion
Nutrition and Yeast Products Range Manager

YEAST NUTRITION

To ensure stress-free alcoholic fermentation and prevent aromatic spoilage or the development of compounds that inhibit yeasts and bacteria, it is essential to provide the yeasts with complete nutrition. Nutrient inputs, whether from the grapes or specific preparations, must be balanced in terms of growth and survival factors to ensure a clean and complete finish to the alcoholic fermentation.



REGULAR FERMENTATION

Avoid rapid fermentation or heat spikes.

NEEDS

- Nutritional balance between mineral and organic nitrogen

RECOMMENDATION

- Partially or completely correct with nutrients containing organic nitrogen (**NUTRISTART™** range), not just diammonium phosphate (DAP).
- Add during the first third of fermentation.

HEALTHY FERMENTATION COMPLETION

Avoid stuck fermentations and possible sensory defects.

NEEDS

- Yeast viability and vitality
- A cell membrane resistant to acid and alcohol stresses.

RECOMMENDATION

- Use yeast rehydration products during the rehydration phase to add sterols and long-chain fatty acids to strengthen the cell membrane (**SUPERSTART™** range).

CLEAN AROMATIC PROFILE

Low H_2S and sulphur compound production, low VA, low masking of aromas.

NEEDS

- Stress minimisation
- Good cell membrane permeability

RECOMMENDATION

- Rehydrate the yeasts with specific rehydratation (**SUPERSTART™** range) products. Add nutrients during the first half of AF.
- Supply yeasts with pantothenic acid (vitamin B5), naturally present in nutrients based on yeast derivatives, to control / minimise H_2S production.

AROMATIC OPTIMISATION

Expression of varietal aromas and / or production of fermentation aromas.

NEEDS

- Cell membrane permeability
- Vitamins, minerals and precursors of fermentation esters (amino acids)

RECOMMENDATION

- Supply sterols during rehydration to ensure the membrane fluidity and transport (**SUPERSTART™** range).
- Nutrition quality and quantity are to be determined in relation to the desired aromatic profile.

Yeast nutrition: nitrogen adjustment

Calculate organic and / or inorganic nitrogen additions to allow complete alcoholic fermentations, expressing the character of the harvest.

Decision-Making Tool

Discover our "**yeast nutrition**" **DMT** on our website, in the **LAFFORT & YOU** section.

YEAST PREPARATION

NUTRIENTS

- Red
- White
- Rosé
- Sparkling

SUPERSTART™ RANGE (Patent FR 2736651)

OPTIMAL PERFORMANCE

A yeast preparation additive should be used at the active dry yeast rehydration step to ensure optimal aromatic performance and a healthy and complete fermentation by the fermenting yeast. SUPERSTART™ products:

- Provide the essential building blocks for yeast membranes (mainly long-chain fatty acids and ergosterol).
- **Guarantee fluidity of the membrane**, its alcohol tolerance, and the correct conformation of transporters for better assimilation of sugars and nutrients.
- Significantly **reduce the production** of VA and H_2S.
- Must be used in the cases of juices with a high alcohol potential, low turbidity (white juice), low fermentation temperature, or yeast restart cultures.
- Must be added to the yeast rehydration water before adding the yeast.
- The dose must be increased for potentially high-alcohol juice and must.

SUPERSTART™ ROUGE

High ergosterol content formulation

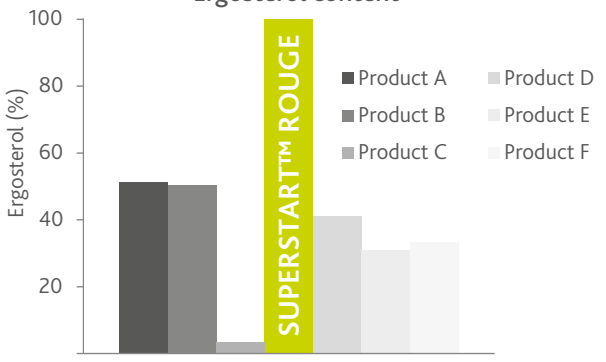
- **Improves yeast cell longevity** under stressful conditions and increases yeast tolerance to high temperatures and alcohol

SUPERSTART™ BLANC & ROSÉ

Formulation particularly rich in specific vitamins and mineral salts

- **Enhances the fermenting yeast's ability** to convert aroma precursors in the grape juice to their volatile, flavour-active forms
- Guarantees stronger fermentation completion

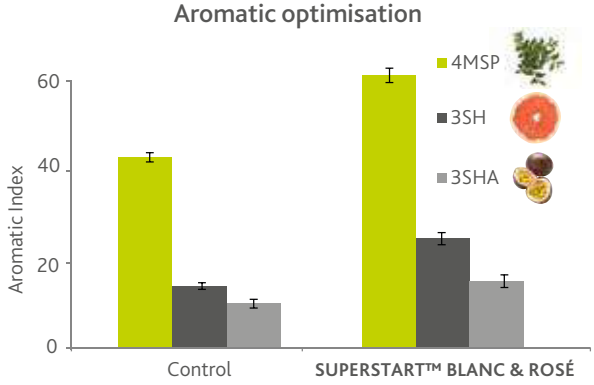
Ergosterol content



Comparison of ergosterol content (%) in different equivalent application products, standardised against the product with the highest concentration (100%), in this case, **SUPERSTART™ ROUGE***

**This sterol gives yeast a higher resistance to ethanol*

Aromatic optimisation



*Sauvignon Blanc. potential alcohol: 12.5% vol - **ZYMAFLORE™ X5***

*By improving the general assimilation of juice compounds, **SUPERSTART™ BLANC & ROSÉ** optimises the yeast metabolism to give more aromatic wines. 4MSP: boxwood / 3SHA: passion fruit / 3SH: grapefruit*

1 kg / 5 kg — 20 - 30 g/hL (200 - 300 ppm)

1 kg / 5 kg — 20 - 30 g/hL (200 - 300 ppm)

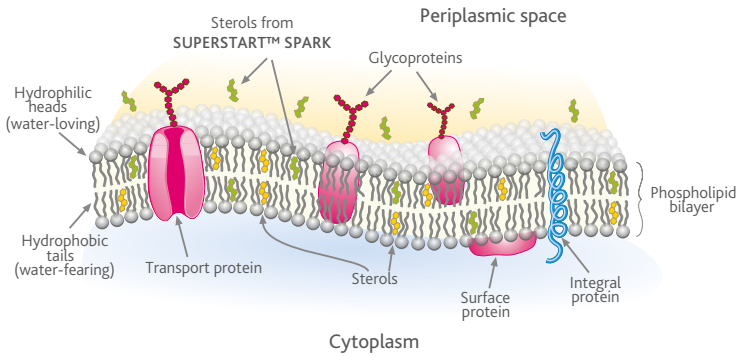
SUPERSTART™ SPARK

Yeast preparation additive suited to the difficult conditions of sparkling wines

- Combination of survival factors (lipids) and growth factors for a complete secondary fermentation

See our **SPARK** range sheet *P.91.*

The fluid mosaic model



1 kg / 5 kg — 20 - 30 g/hL (200 - 300 ppm)

ORGANIC NITROGEN

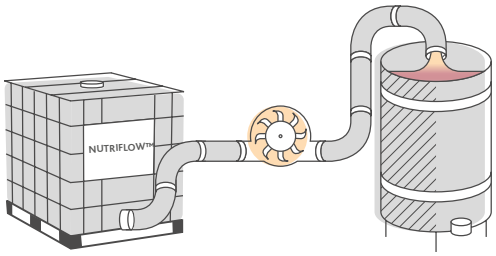
NUTRIFLOW™

NEW

Liquid nutrient 100% yeast-derived (yeast autolysate), rich in amino acids, vitamins, minerals, and trace elements. Supports cell multiplication and a steady metabolism for clean, well-managed fermentations

- Liquid formulation combining ease of use with fermentation process efficiency
- 100 mL/hL provides, on average, the equivalent of 20 mg/L of assimilable nitrogen
- The dosage should be adjusted according to nitrogen requirements

NUTRIFLOW™ is suitable for the automated processes used in large wineries.



20 L / 300 L / 1000 L

100 - 300 mL/hL

NUTRISTART™ ORG

Complex nutrient 100% yeast-derived (yeast autolysate), rich in amino acids, vitamins (particularly high in pantothenic acid), minerals and trace elements (magnesium, manganese, zinc, iron, etc.), promoting cell multiplication and a steady metabolism

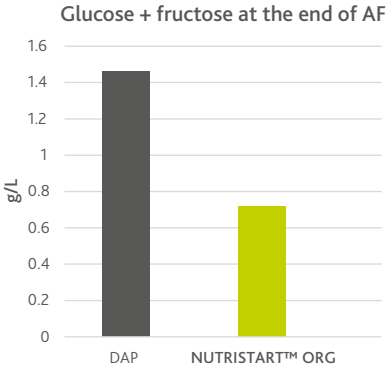
- Ensures **regular and complete alcoholic fermentation** in cases of low to moderate nitrogen deficiency in the must
- **Helps to produce more aromatic wines** and limits the formation of undesirable compounds (such as those binding with SO_2, H_2S, etc.)
- In cases of severe nitrogen deficiency and/or wines with high alcohol content, combine **NUTRISTART™ ORG** with an additional mineral nitrogen source (**THIAZOTE™**) to ensure better nutritional balance for the yeast.
- 10 g/hL (100 ppm) of **NUTRISTART™ ORG** provides the equivalent of 10 mg/L (10 ppm) of assimilable nitrogen.
- The dosage should be adjusted according to nitrogen requirements.

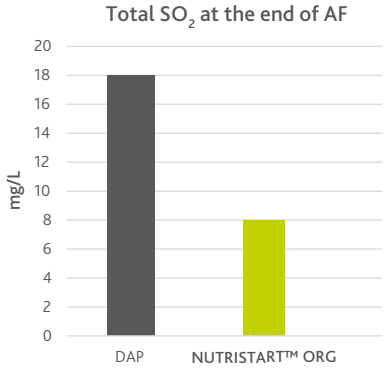
1 kg / 5 kg / 20 kg

30 - 60 g/hL (300 - 600 ppm)

WHY ORGANIC NUTRITION?

Organic nitrogen must be present to limit the production of SO_2 and sulphur compounds (H_2S and mercaptans), produce healthy (but not excessive) biomass, and limit the risk of stuck or sluggish fermentation.





Concentrations of glucose + fructose and total SO_2 at the end of alcoholic fermentation. Juice derived from Sauvignon Blanc (potential alcohol: 13.9% vol, initial assimilable N: 125 mg N/L), 2016

*At one-third of the alcoholic fermentation, 35 mg N/L was added with DAP or **NUTRISTART™ ORG**, deliberately putting yeasts in difficult conditions.*

OTHER SOURCES OF NITROGEN

MIXED NUTRITION

NUTRISTART™ AROM

Complete nutrient (inactivated yeast, yeast autolysate, including a fraction rich in glutathione, diammonium phosphate) to enhance the aromatic complexity of wines

- **Balanced sources of nitrogen** (organic and mineral) similar to those naturally found in grapes, enhancing the organoleptic complexity of wines (aroma and palate)
- Formulated with a **glutathione-rich fraction**, beneficial during the production of white and rosé wines to preserve their aromatic potential
- 10 g/hL (100 ppm) of **NUTRISTART™ AROM** provides the equivalent of 14 mg/L (14 ppm) of assimilable nitrogen.
- The dosage should be adjusted according to nitrogen requirements.

1 kg / 5 kg  20 - 60 g/hL (200 - 600 ppm)

NUTRISTART™

Complete nutrient combining growth and survival factors, promoting yeast multiplication (inactivated yeasts, yeast autolysate, diammonium phosphate, thiamine)

- To be used in the case of **nutrient deficiency in the must**
- 10 g/hL (100 ppm) of **NUTRISTART™** provides about 15 mg/L (15 ppm) of assimilable nitrogen.
- The dosage should be adjusted according to nitrogen requirements.

1 kg / 5 kg / 20 kg  20 - 60 g/hL (200 - 600 ppm)

MINERAL NUTRITION

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
THIAZOTE™	Alcoholic fermentation activator (ammonium sulphate and thiamine). 10 g/hL (100 ppm) of **THIAZOTE™** provides 21 mg/L (21 ppm) assimilable nitrogen.	To be determined according to fermentation conditions (Initial YAN, potential alcohol...)	1 kg 5 kg 25 kg
THIAZOTE™ PH	Alcoholic fermentation activator (diammonium phosphate and thiamine). Suitable for organic according to Commission Regulation (EU) 848/2018. 10 g/hL (100 ppm) of **THIAZOTE™ PH** provides 21 mg/L (21 ppm) assimilable nitrogen.	To be determined according to fermentation conditions (Initial YAN, potential alcohol...)	1 kg 5 kg 25 kg

ASSIMILABLE NITROGEN CONTRIBUTION BY NUTRIENT

	EQUIVALENCE	BALANCE AND COMPOSITION			
PRODUCT	NITROGEN CONTRIBUTION FROM 10 g/hL (100 ppm)	ORGANIC AVAILABLE NITROGEN	MINERAL AVAILABLE NITROGEN	VITAMINS AND MINERALS	NUTRITIONAL BALANCE
NUTRISTART™ ORG	10 mg/L	●●●●		●●●●	●●●
NUTRISTART™ AROM	14 mg/L	●●●	●	●●●	●●●●
NUTRISTART™	15 mg/L	●	●●●	●●	●●
THIAZOTE™	21 mg/L		●●●●	●●	●
SUPERSTART™ RANGE	Yeast rehydration products provide only a minute dose of assimilable nitrogen. They cannot be considered as nutrients.				

OTHER PRODUCTS

SUPPORT AND DETOXIFICATION

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
BI-ACTIV™	A formulation of survival factors, yeast cell walls, inactivated yeast, and inert supporting elements. **It is to be used when fermentation slows down or becomes stuck.** Does not contain DAP.	30 - 60 g/hL (300 - 600 ppm)	1 kg
OENOCELL™	Highly purified yeast cell walls. **Stimulate and activate alcoholic fermentation.**	20 - 40 g/hL (200 - 400 ppm), depending on the type of treatment	1 kg
OENOCELL™ BIO	Yeast cell walls certified organic according to organic production methods in European regulation (EU) 848/2018, and complies with American regulations (NOP) on organic production.	20 - 40 g/hL (200 - 400 ppm), depending on the type of treatment	1 kg
TURBICEL™	Cellulose powder **for over-clarified juice.** A dose of 10 g/hL (100 ppm) increases the juice turbidity by 20 NTU.	20 - 50 g/hL (200 - 500 ppm), depending on the turbidity correction to be made	5 kg

BACTERIA NUTRITION

MALOBOOST™

Nutrient adapted to the specific nutritional needs of lactic acid bacteria *(Oenococcus oeni)*

Facilitating all MLFs, **MALOBOOST™** is used to:

- Start and complete MLF more rapidly.
- Help to restart stuck or sluggish MLFs.
- Encourage MLF under difficult conditions (low temperature and pH, high alcohol).

1 kg	20 - 40 g/hL (200 - 400 ppm)

Find Out More

Discover our Focus on **"nitrogen nutrition"** on our website, section **LAFFORT & YOU.**

YEAST PRODUCTS

Yeast derivatives offer a diverse array of products and applications in winemaking, capitalising on the numerous benefits associated with lees ageing and yeast diversity.

LAFFORT® identified the potential of these derivatives and conducted research to create innovative and unique applications in oenology. Products include mannoproteins **(MANNOSTAB™** - patent FR 2726284) used for tartaric stabilisation and sapid peptides derived from the Hsp12 protein **(OENOLEES™ & OENOLEES™ MP** - patent EP 1850682).

Building on this research, products such as **FRESHAROM™** and **POWERLEES™ LIFE** were developed for their antioxidant properties attributed to their glutathione content.

Yeast products thus facilitate a novel, more natural approach to winemaking, aimed at enhancing and preserving the quality of wine.

Charlotte Vion
Nutrition and Yeast Products Range Manager

YEAST DERIVATIVES IN OENOLOGY

Yeast-derived products offer a wide range of applications, made possible by the precise control of their formulation. Thanks to rigorous work in the selection of raw materials, precision products have been developed. Today, these yeast-based solutions are used at various stages of winemaking, meeting a range of oenological objectives.

Yeast	Yeast autolysate	Inactivated yeast	GSH*-rich inactivated yeast	Yeast hulls	Mannoproteins
					
Nitrogen nutrition	Yeast rehydration Nitrogen nutrition Other practices: organoleptic refinement	Protection against oxidation	Detoxification	Refining: tartaric and colloidal stabilisation	

Yeast derivatives and their applications

** Glutathione*

REFINEMENT PRODUCTS: EXPRESSING THE FULL POTENTIAL OF THE WINE

The inactivated yeasts used for refinement result from LAFFORT®'s research into the properties of yeast lees.

Research on the sapid peptide derived from the Hsp12 protein (Patent EP 1850682) led to the development of **OENOLEES™** and **OENOLEES™ MP**, two solutions designed to enhance the sensation of sweetness on the palate, ideal for balancing perceptions of acidity and bitterness.

Added during ageing or as early as the fermentation stages, these processing aids improve the sensory quality of wines.

Mannoproteins

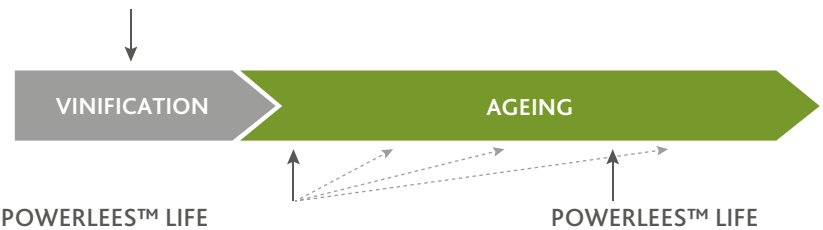
A pioneer in understanding the mechanisms of action of mannoproteins and their production through an innovative patented process (Patent No. 2726284), **LAFFORT®** has developed its **MannO** range, offering products that contribute to the tartaric and colloidal stabilisation of wines.

These 100% soluble additives are finishing treatments to be applied before bottling.

PROTECTION AGAINST OXIDATION

LAFFORT® research has highlighted the importance of reducing compounds, including glutathione, in protecting wines against oxidation. The selection of specific raw materials rich in these compounds has enabled the development of products with strong antioxidant capacity. These products can be used during fermentation or ageing, depending on the winemaking process and the desired effect.

FRESHAROM™
ONE-THIRD THROUGH AF
- Inactivated yeast, rich in reducing compounds and GSH precursors
- Protection of the wine's aromatic potential



POWERLEES™ LIFE
AT THE END OF AF / MLF (PREVENTIVE USE)
Wine with little or no SO_2
- Inactivated yeast, rich in reducing compounds
- Protection against oxidation
- Applied in one or several additions

POWERLEES™ LIFE
DURING AGEING (CURATIVE USE)
- Refreshing wines that are already oxidised

DURING AGEING (TECHNICAL USE)
- Used during risky operations such as racking or transfers

REFINEMENT PRODUCTS

YEAST PRODUCTS

- Red
- White
- Rosé
- Sparkling

OENOFEEL™

NEW

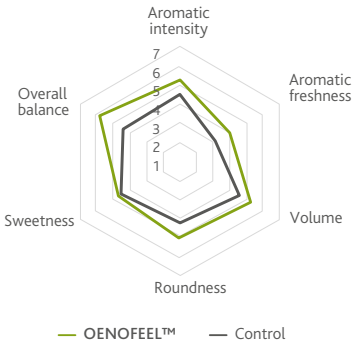
AGEING

Inactivated yeasts selected for their high mannoprotein content

- Contributes to the gustatory balance of wines.
- Enhances the sensation of roundness on the palate.
- Supports tartaric and colloidal stability through the release of yeast-derived mannoprotein fractions.
- Is used during the ageing of wines.

OENOFEEL™ enhances aromatic expression, thereby improving the overall balance of the wine. It significantly increases roundness on the palate.

Sensory profile



Merlot treated after 4 months of ageing (10 g/hL - 100 ppm).Tasting carried out 5 days after treatment and racking. Average scores from 10 expert tasters.

1 kg / 10 kg

10 - 30 g/hL (100 - 300 ppm)

POWERLEES™

FERMENTATION / AGEING | EARLY MATURITY

Specific preparation of inactivated yeasts and ß-glucanases

POWERLEES™ provides yeast constituents that help **soften wines** during fermentation. When used on racked wine, **POWERLEES™** helps to reconstitute lees for ageing.

- Enzymatic action accelerates the **sensory fining**
- **Extraction of components with high sensory potential** (sapid peptides)
- Contribution to wine stabilisation through fining and diffusion of mannoprotein fragments from yeast
- Specially adapted to wines for early release

1 kg

15 - 40 g/hL (150 - 400 ppm)

OENOLEES™

FERMENTATION / AGEING | LEES AGEING

Specific preparation of yeast cell walls with a high sapid peptide content for premium red wine fining (Patent EP 1850682)

OENOLEES™ contributes towards improving the sensory quality of wine by:

- **Reducing aggressive sensations**: the cell walls promote the elimination of polyphenols responsible for bitterness and astringency through a fining effect.
- 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 (16 ppm) compared to 3 g/L (3000 ppm) for sucrose).
- Aiding in reducing Ochratoxin A levels in wines.

1 kg / 5 kg

20 - 40 g/hL (200 - 400 ppm)

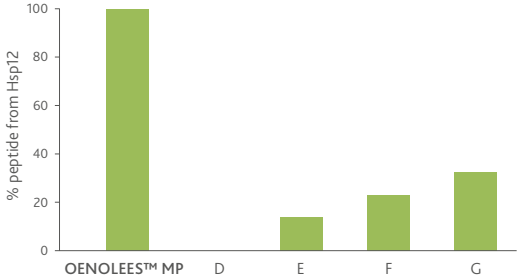
OENOLEES™ MP

AGEING

Extract of yeast cell walls (mannoproteins) rich in sapid peptides (Patent EP 1850682) and polysaccharides

- Contributes to increasing the sweetness sensation in wines thanks to its richness in Hsp12, a membrane protein responsible for the peptide that enhances the sensation of sweetness
- Supports improved balance between **acidity and bitterness**
- Can be used just prior to bottling

Sapid peptide concentration



Concentration of Hsp12 (origin of peptides responsible for the perception of sweetness in wine) in different products of equivalent application standardised according to the most concentrated product at 100%

1 kg / 10 kg

10 - 30 g/hL (100 - 300 ppm)

MANNOPROTEINS

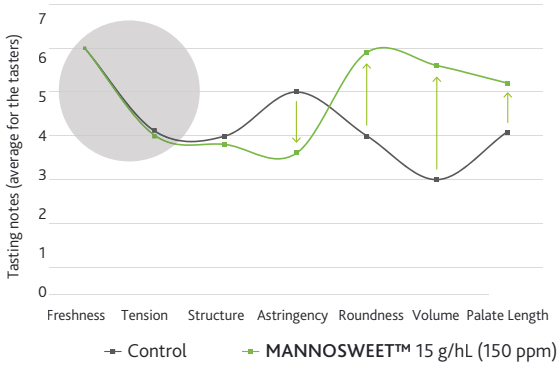
MANNOSWEET™

AGEING

100% natural preparation of specific pure mannoproteins and vegetable polysaccharides for colloidal and tartaric stabilisation while preserving the sensation of volume and roundness on the palate

- Contributes to the stabilisation of colouring matter with doses as low as 5 g/hL (50 ppm)
- Respects the aromatic profile of the wine
- Excellent filterability: **MANNOSWEET™** does not affect the initial filterability of the wine
- Added as a finishing treatment before bottling

Tasting results



*A blend of Grenache / Syrah / Mourvèdre treated with 15 g/hL (150 ppm) **MANNOSWEET™** after 9 months of ageing*

In addition to contributing to the stabilisation of colouring matter, the wine was perceived as less astringent and rounder, with more volume and length on the palate while retaining aromatic freshness. The tasting was carried out by a trained panel of 12 tasters.

1 kg / 10 kg

5 - 36 g/hL (50 - 360 ppm)

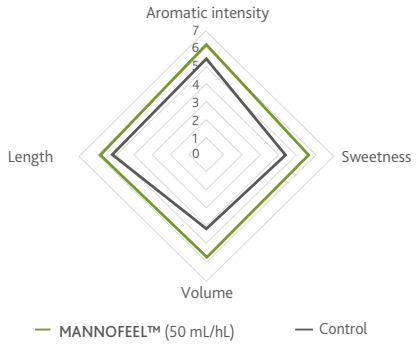
MANNOFEEL™

AGEING

MANNOFEEL™ is the result of global research by LAFFORT® on mannoproteins to identify and understand the mechanism of action and production.

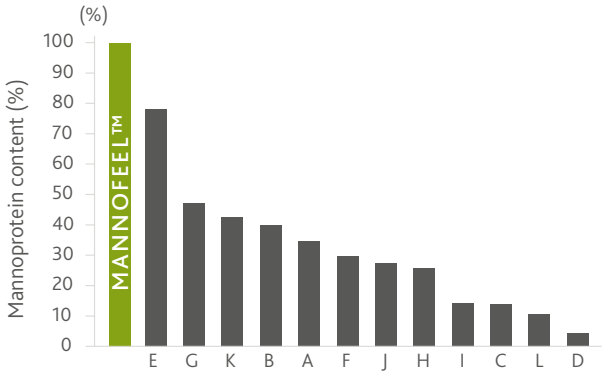
- 100% mannoprotein-based product, a component naturally present in wines
- Preserves the aromatic profile of wines
- 100% soluble and filterable product with immediate action on the wine
- Contributes to the colloidal and tartaric stabilisation of wine
- Can be used at the end of ageing and during wine preparation for bottling

Sensory profile



*Treatment of a Merlot-dominant blend after 14 months of ageing with 50 mL/hL of **MANNOFEEL™***
Tasting carried out by a panel of 12 professional tasters.

Mannoprotein content



Comparison of mannoprotein content in various products with an equivalent application, standardised in relation to the most concentrated product (100%)

In addition to its stabilising action, MANNOFEEL™ can positively influence certain organoleptic properties of the wine, such as the perception of volume on the palate. These effects may vary depending on the wine matrix and the conditions of use.

1 L / 10 L

25 - 150 mL/hL

PROTECTION AGAINST OXIDATION

FRESHAROM™

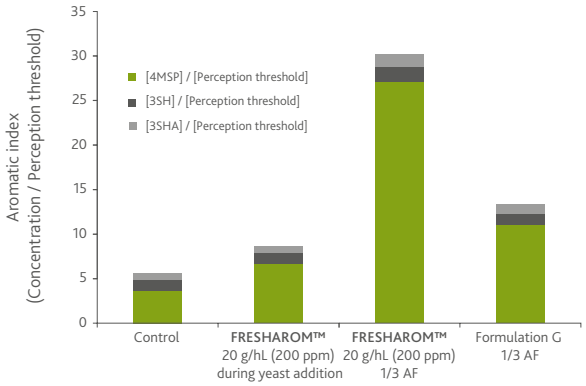
FERMENTATION

Specific preparation of inactivated yeasts with strong reducing power

- **Rich in reducing metabolites**, **FRESHAROM™** has a much greater antioxidant potential than SO_2 or ascorbic acid.
- Promotes the assimilation of glutathione precursors (cysteine, acetylcysteine, etc.) by the yeast during AF and thus increases the synthesis of this tripeptide
- **Effectively protects the aromatic potential** of the wine and significantly delays the appearance of oxidised notes for more aromatic wines with better ageing potential
- Inhibits wine browning mechanisms

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

Preservation and aromatic revelation with FRESHAROM™



*Study of the aromatic impact of **FRESHAROM™** on a Sauvignon Blanc juice inoculated with **ZYMAFLORE™ X5***

1 kg / 5 kg

20 - 30 g/hL (200 - 300 ppm)

POWERLEES™ LIFE

AGEING

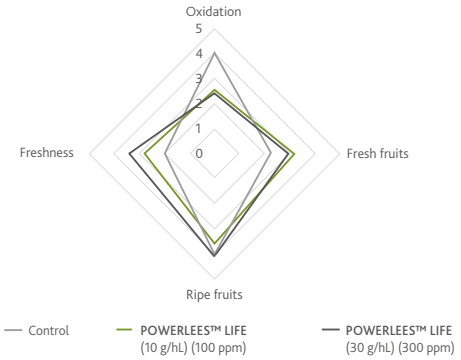
Formulation of inactivated yeasts rich in antioxidant compounds, including reduced glutathione, to preserve and refresh wines during ageing

POWERLEES™ LIFE was selected during a research program to study alternatives to sulphites to protect wines during storage. The specific inactivated yeasts that go into the composition make it possible to:

- **Protect wines from premature oxidation** during ageing, with or without added sulphites.
- **Significantly slow down oxygen consumption** by oxidisable compounds in the wine.
- Preserve wine colour.
- **Refresh the aromatic profile of already oxidised wines.**

POWERLEES™ LIFE can be added as a preventive or curative measure once or several times from the end of fermentation and throughout the ageing period. It is a complementary solution to SO_2 as part of a strategy to reduce sulphur additions.

Sensory profile



Treatment of a Cabernet Sauvignon wine after 16 months of ageing
Post-racking tasting 6 days after treatment
Mean of the scores of 12 trained tasters

1 kg / 5 kg

10 - 40 g/hL (100 - 400 ppm)

ENZYMES

LAFASE™ & LAFAZYM™

Enzymes are highly precise catalysts of biochemical reactions that facilitate clarification, extraction, aroma release, filtration, and more.

LAFFORT® offers a varied and specific range of enzymes for white, rosé, and red wine production, adapted to different technological applications.

To ensure safety and optimal performance, several of our enzymatic preparations undergo a unique purification process to eliminate any potentially harmful activities (such as cinnamoyl esterase and anthocyanase).

Julie Barthoux
Enzymes Brand Manager

ENZYMES IN OENOLOGY

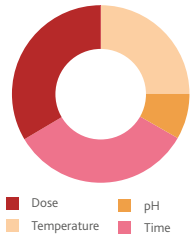
ENZYMOLOGY AND BIOCHEMISTRY

Enzymes are highly specific and complex catalytic proteins. The main activities used in oenology are the various pectinases (PG*, PL*, PME*, arabinanase, rhamnogalacturonase and galactanase), some glucanases and glycosidases, complemented by numerous naturally occurring secondary activities such as hemicellulases, cellulases, and proteases.

** PL: Pectin Lyase / PG: Polygalacturonase / PME: Pectin Methyl Esterase*

MANAGEMENT OF ENZYME ACTIVITY FOR OPTIMAL PERFORMANCE

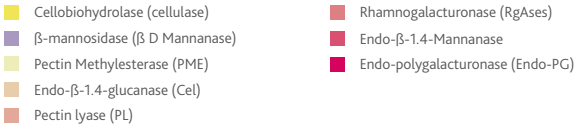
The four criteria - dose, must or wine temperature, contact time, and pH - have a major impact on enzyme performance and they are interrelated. **Each parameter can be modified according to the application and the winemaker's technical constraints.**



IMPORTANCE OF THE SECONDARY ACTIVITIES OF ENZYME PREPARATIONS

Each enzymatic preparation is a unique cocktail of primary and secondary activities, depending on the strain of the fungus used (*Aspergillus niger, Aspergillus aculeatus, Trichoderma harzianum*) and the medium on which it grows.

For matrices that are difficult to clarify, a richness in secondary activities ensures better performance and greater robustness of the formulations.



Example of the enzymatic spectra of an *Aspergillus aculeatus* strain

Distribution of activities from a quantitative and qualitative point of view

PERFORMANCE INDICATOR FOR ENZYME FORMULATIONS

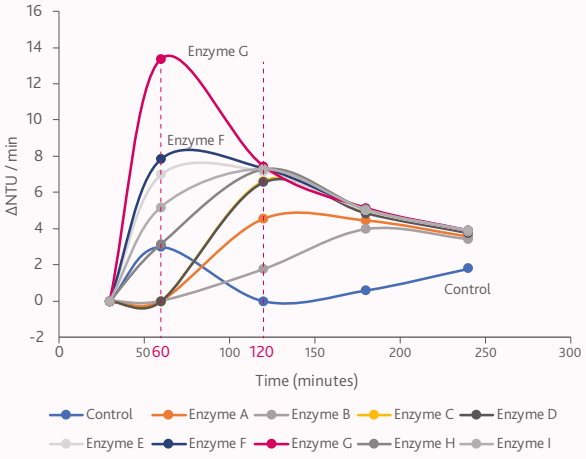
A new method for assessing the clarifying properties of our products was developed to help formulate the best preparations.

This example (Sauvignon Blanc juice - temperature 12°C / 54°F) illustrates the ability of certain enzyme formulations to hydrolyse pectin very quickly (significant drop in turbidity within the first hour).

All wines treated with enzymes showed a significant drop in turbidity (2 hours), in contrast to the control, demonstrating the benefits of enzyme addition.

	Enzyme G	Enzyme F	Control
Turbidity (NTU) after 60 min	197	529	> 1000
Turbidity (NTU) after 120 min	106	119	> 1000

Variability in enzyme performance



Calculation of the instantaneous clarification velocity
V clarif = (Turbidity 1 - Turbidity 2) / time 1 in min.

PRESSING AND SKIN CONTACT
WHITE & ROSÉ WINES

ENZYMES

- Red
- White
- Rosé
- Sparkling

USING ENZYME PREPARATIONS ON GRAPES:

- **Optimises press cycles:** easier press filling (improved juice drainage). Improves yields by facilitating juice extraction at lower pressure and reducing mechanical actions. Shortens the duration and number of pressing cycles.
- **Improves clarification and filterability of press juices.**

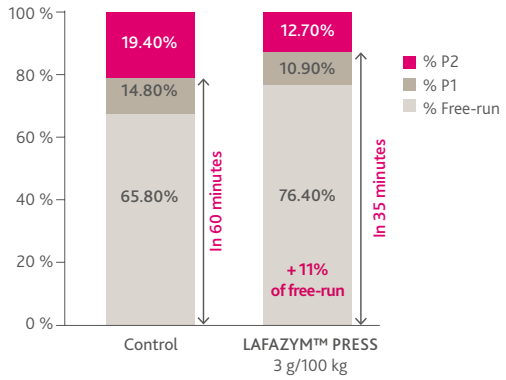
LAFAZYM™ PRESS

PRESSING

Higher quality press yields on whites and reds intended for rosé and sparkling wines

- Preparation of pectolytic enzymes rich in secondary activities
- Preserves aromatic finesse
- Improves free run juice and first pressing yields (white and rosé)

Increase of free-run juice with LAFAZYM™ PRESS



100 g / 500 g - MICROGRANULATED - PURIFIED (CE)

2 - 5 g/100 of grapes

LAFASE™ XL PRESS

PRESSING PROCESS

Higher quality press yields on whites and reds intended for rosé wines

- Preparation of pectolytic enzymes with secondary activities
- Increases high-quality juice yields and protects against oxidation

1 L / 10 L - LIQUID - PURIFIED (CE)

1 - 4 mL/100 kg of grapes

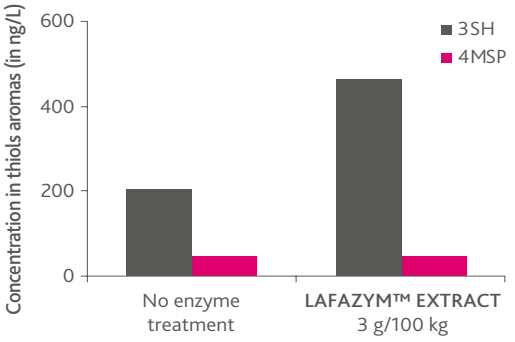
LAFAZYM™ EXTRACT

PRE-FERMENTATION SKIN CONTACT

Pre-ferment skin contact at low temperatures

- Preparation of pectolytic enzymes rich in secondary activities
- Helps **reduce maceration duration**
- **Allows for varietal aroma and precursor extraction, thereby increasing the aromatic potential of the juice**
- Purified from CE to help preserve the aromatic finesse of wines
- Improves yield and clarification of free-run juice

Volatile thiols analysed



3SH: 3-sulfanylhexanol (grapefruit and passion fruit).
4MSP: 4-methyl-4-sulfanylpentan-2-one (boxwood and broom).

250 g / MICROGRANULATED - PURIFIED (CE)

2 - 3 g/100 kg of grapes

CLARIFICATION
WHITE AND ROSÉ WINES

LAFAZYM™ CL

CLARIFICATION

Clarification of juice for the production of high-quality wines

- Preparation of pectolytic enzymes rich in secondary activities
- Improves lees settling and compaction
- Increases the volume of clear juice
- Purified from CE to help preserve the aromatic finesse of wines

100 g / 500 g - **MICROGRANULATED - PURIFIED (CE)** 0.5 - 2 g/hL (5 - 20 ppm)

LAFASE™ XL CLARIF

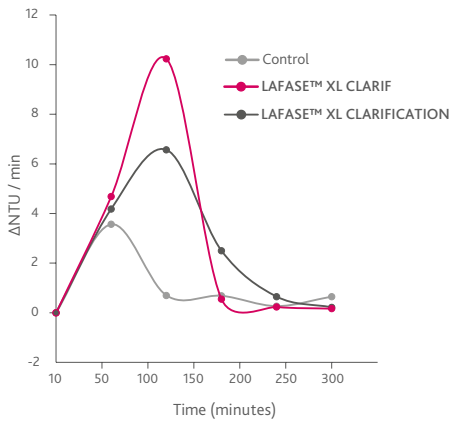
CLARIFICATION PROCESS

Clarification of juice and wines

- Preparation of pectolytic enzymes with secondary activities
- Rapid depectinisation
- Allows the clarification of must and juice from heat treatment or flash detente
- Perfectly suited to static and dynamic clarification

*Comparative trial with the new formulation of **LAFASE™ XL CLARIF** and **LAFASE™ XL CLARIFICATION**. The new formulation achieves even faster depectinisation and clarification. Trial carried out at 12°C (54°F) and 2 mL/hL - Sémillon.*

Clarification velocity kinetics at low temperature



1 L / 10 L - **LIQUID - LOW CE** 1 - 5 mL/hL

LAFAZYM™ 600 XL^{ICE}

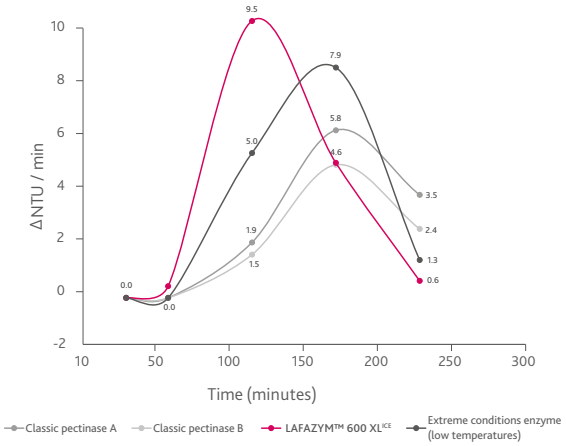
CLARIFICATION EXTREME CONDITIONS

Rapid and effective juice clarification over a wide pH range (2.9 - 4.0) and a broad range of temperatures for producing high-quality wines

- Preparation of pectolytic enzymes rich in secondary activities
- **Allows rapid depectinisation even at low temperatures (effective from 5°C /41°F)**
- Reduces settling time and improves compaction of solids

	LAFAZYM™ 600 XL^{Ice}	Extreme conditions enzyme	Classic pectinase A	Classic pectinase B
Turbidity (NTU) at 120 min	113	363	543	715

Cinetics of clarification velocity at low temperature



*At low temperatures (6°C / 43°F), **LAFAZYM™ 600 XL^{ICE}** (2 mL/hL) is more robust than the enzyme for the same purpose. Sauvignon Blanc.*

250 mL / 10 L - **LIQUID - PURIFIED (CE)** 0.5 - 2 mL/hL

AROMATIC EXPRESSION
WHITE & ROSÉ WINES

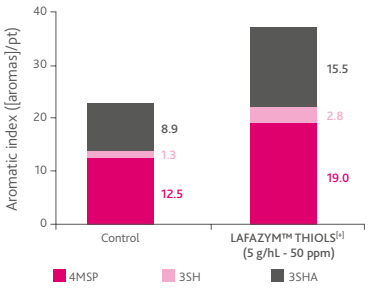
LAFAZYM™ THIOLS[+]

FERMENTATION

Bring out the aromas in grape varieties with volatile thiol characters

- Preparation of pectolytic enzymes with secondary activities
- Acts in synergy with yeasts to bring out volatile thiols
- Can be used on juice and added during the first third of the alcoholic fermentation, to increase the **aromatic potential of wines**

Increase in the aromatic potential (thiols) of a wine



Experimental cellar trial - Sauvignon Blanc
PT: perception threshold

250 g / MICROGRANULATED - LOW CE 3 - 6 g/hL (30 - 60 ppm)

LAFAZYM™ AROM

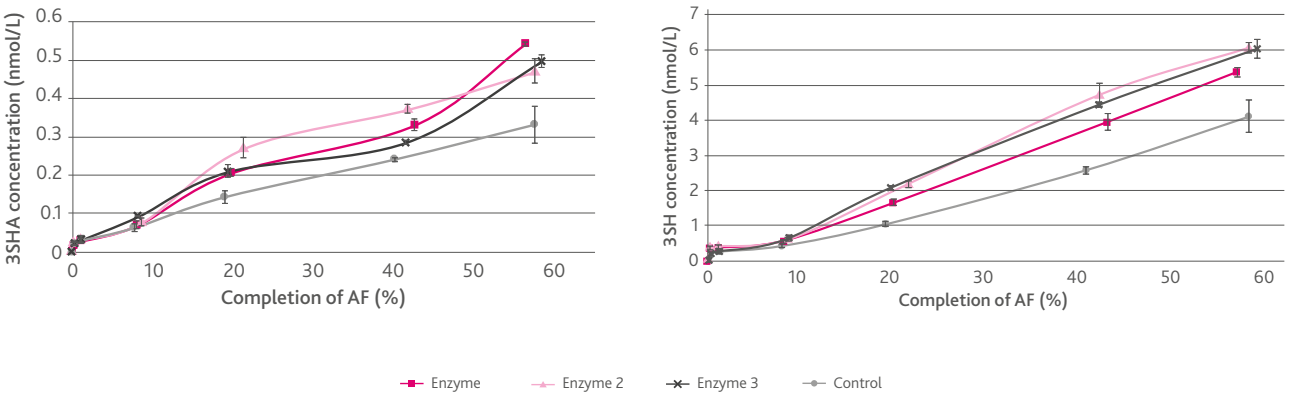
AFTER FERMENTATION

Aromatic wines made from grape varieties with terpene precursors

- Preparation of pectolytic and ß-glucosidase enzymes
- Increases the aromatic intensity of wines made from grape varieties with glycosylated terpene and norisoprenoid precursors

100 g / MICROGRANULATED 2 - 4 g/hL (20 - 40 ppm)

INCREASING THE BIOTRANSFORMATION OF VOLATILE THIOLS (3SH AND 3SHA)



*Enzyme preparations at 5 g/hL (50 ppm) compared with a control with no enzyme addition - Work by A. Minot 2016 - **BIOLAFFORT®** Sauvignon Blanc inoculated with **ZYMAFLORE™ X5** (20 g/hL (200 ppm)).*

HOW TO OPTIMISE THE BIOTRANSFORMATION OF THIOLS DURING ALCOHOLIC FERMENTATION?

- By using a yeast with the ability to release and convert volatile thiols such as **ZYMAFLORE™ X5**, **DELTA** or **VL3**.
- By adding an enzyme preparation that promotes yeast conversion of thiols, such as **LAFAZYM™ THIOLS[+]**.

RED EXTRACTION

BENEFITS OF ENZYMATIC PREPARATIONS IN RED WINE VINIFICATION

In general, enzymes from the **LAFASE™** range act on the vinification process by:

- Improving the yield of free-run wine.
- Facilitating microbiological management through better clarification and reducing the residual sugar content through drier pomace.

More importantly, enzymes assist in releasing valuable cellular compounds that significantly impact the organoleptic qualities and stability of wines, as demonstrated by several research studies, particularly with **LAFASE™ HE GRAND CRU**.

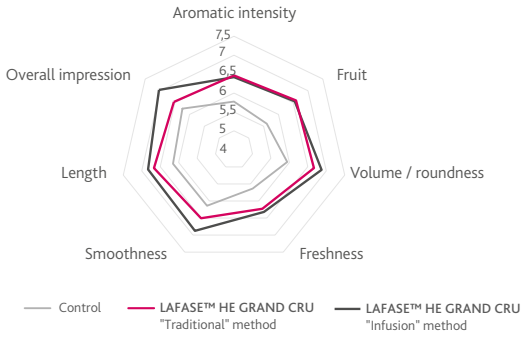
LAFASE™ HE GRAND CRU

FERMENTATION

Traditional maceration for the production of premium wines, rich with silky and elegant tannins

- Preparation of pectolytic enzyme rich in secondary activities
- **Improves the ageing potential of wines** by promoting the extraction of more stable phenolic compounds and polysaccharides
- **Increases the perception of sweetness and reduces the astringency** of wines by extracting smaller polysaccharides (RGII) at the expense of larger clogging polysaccharides (PRAG)

Organoleptic profile



*Diffusion of cellular compounds through punching down and pump-overs for the "traditional" method, and by cap immersion for the "infusion" method. **LAFASE™ HE GRAND CRU** enables the production of fruitier wines with increased volume and roundness on the palate. Traditional vinification on Syrah. Sensory profiles of each wine were significantly different (ANOVA test, 5% threshold). "Traditional" method: 4 g/hL (40 ppm); "Infusion" method: 8 g/hL (80 ppm) Panel of 62 tasters*

100 g / 500 g - **MICROGRANULATED - PURIFIED (CE)** — 3 - 5 g/100 kg of grapes

LAFASE™ FRUIT

FERMENTATION

Short macerations with or without pre-fermentation cold soaking for fruity, deeply-coloured, and rounded red wines

- Preparation of pectolytic enzyme rich in secondary activities
- Optimises the **fruit potential and suppleness** of wines by promoting gentle extraction of phenolic compounds and aromas from the grape skin while minimising the need for physical extraction

250 g - **MICROGRANULATED - PURIFIED (CE)** — 3 - 5 g/100 kg of grapes

LAFASE™ XL REDY

FERMENTATION PROCESS

Maceration of red grapes to optimise quality juice volumes

- Preparation of pectolytic enzyme with secondary activities
- Increases the diffusion of cellular compounds from the grape berry, particularly from the grape skins, while reducing mechanical interventions (optimised tank rotation)
- Increases the yield of free-run wine by 3 to 6%

1 L / 10 L - **LIQUID - LOW CE** — 2 - 4 mL/100 kg of grapes

CLARIFICATION & FILTERABILITY WINES

BENEFITS OF ENZYMATIC PREPARATIONS FOR THE OPTIMISATION OF AGEING STAGES

Early enzyme treatment during ageing simplifies several practical aspects of wine management:

- **Accelerates the natural clarification of finished wines**
- Significantly improves wine filterability through hydrolysis of wine polysaccharides
- Complete depectinisation optimises all stages in the preparation of wines for bottling (fining, filtration).

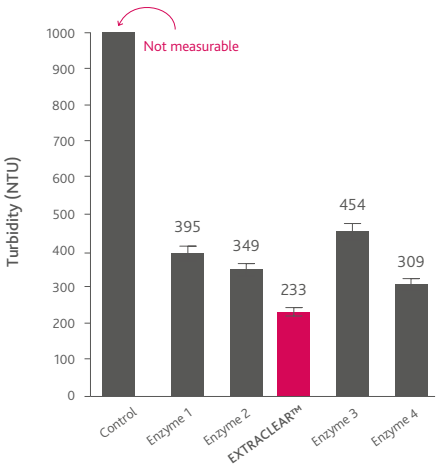
EXTRACLEAR™

FERMENTATION / AGEING | PROCESS

Very rapid clarification and significant improvement in filterability.

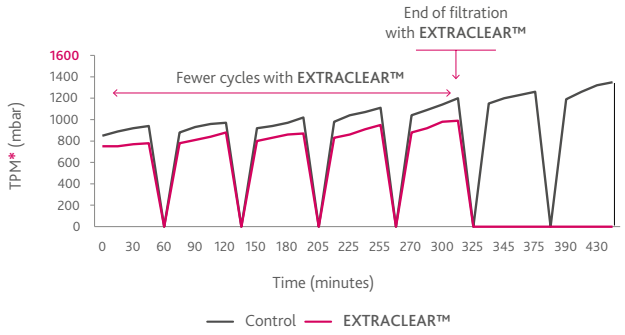
- Preparation of pectolytic enzymes, particularly rich in secondary activities, for the hydrolysis of complex branched chains
- Rapid and significant improvement in wine filterability through hydrolysis of a large number of clogging macromolecules
- Speeds up the natural clarification of even the most difficult wines (grape varieties rich in polysaccharides, press wine, thermovinification)
- Use from the last third of the AF and throughout ageing

Free-run juice yield



Thermovinified wine - Enzyme treatment at the end of MLF dose: 6 g/hL (60 ppm) or 6 mL/hL - Temperature: 12°C (54°F). Sedimentation: 48 h - Measure of the turbidity after racking

Early use of EXTRACLEAR™: impact on wine filterability



***EXTRACLEAR™** allows faster filtration of a larger volume of wine at lower pressures (less clogging wine).*
**TMP (transmembrane pressure)*

Optimisation of the filtration cycle using enzymes

	CONTROL	EXTRACLEAR™
Mean flow rate	16.5 hL/h	**18.8 hL/h (+14%)**
Duration of filtration cycle	7h40 (145 hL)	**5h40 (145 hL)**
Number of filter flushes	7*1.8 hL	5*1.8 hL
Stability of colouring matter	50	**35**

- **20% reduction in filtration time**
- Average of 14% reduction in TMP (transmembrane pressure) over the entire filtration period for the wine treated with the enzyme
- Preservation of colloidal stability

Practical Advice

Treatment of red press wines

Red press wines have an especially heavy "load" of macromolecules, which slows down clarification. These macromolecules come mainly from grape polysaccharides, fermentation yeasts, or contaminating fungi such as *Botrytis cinerea*.

EXTRACLEAR™ allows for effective clarification and facilitates the filtration of press wine.

1 L - LIQUID - LOW CE

3 - 6 mL/hL

SPECIFIC APPLICATIONS

EXTRALYSE™

AGEING

Enzymes with strong ß-(1-3; 1-6) glucanase activity intended for ageing on lees and improving the filterability of wines

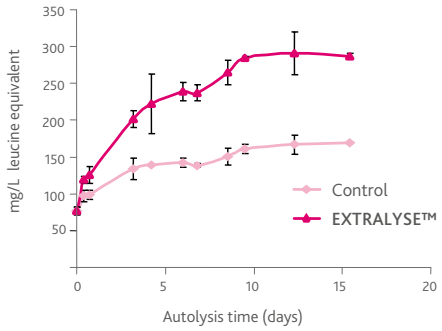
- Preparation of pectolytic enzyme with secondary ß-(1-3; 1-6) glucanase activities
- Accelerates all biological mechanisms linked to ageing on lees, especially yeast autolysis
- **Brings roundness and softness to the wine by releasing larger quantities of yeast-derived molecules**
- Improves clarification and filterability of wines, particularly in wines from *Botrytis*-affected grapes

250 g - **MICROGRANULATED - PURIFIED (CE)** 6 - 10 g/hL (60 - 100 ppm)

IMPACT OF EXTRALYSE™ ON THE SENSORY REFINING OF WINES:

During lees ageing, yeast cell walls are broken down enzymatically through autolysis. Research on enzymatic phenomena during wine ageing - Anne Humbert (2005).

Nitrogen compounds released



*Monitoring yeast autolysis by measuring the concentration of nitrogen compounds released in a medium model, with or without **EXTRALYSE™** (5 g/hL (50 ppm)). AF on synthetic must with S. cerevisiae 522 D.*

Peptide fraction during yeast autolysis

Modalities	**Molecular fraction 0.5 - 3 KDa**	Molecular fraction 3 - 10 KDa	Molecular fraction >10 KDa
Without added enzyme	**110 mg/L**	10 mg/L	60 mg/L
With **EXTRALYSE™** 5 g/hL (50 ppm)	**200 mg/L**	20 mg/L	90 mg/L

This work has made it possible to isolate three small-sized peptide fractions (0.5 to 3 kDa) that give **perceptible sensations of sweetness to dry wines after ageing on lees.**

EXTRALYSE™ speeds up yeast autolysis, promoting the release of a significantly larger quantity of specific peptide fractions of interest while improving the filterability and clarification of the wine.

OPTIZYM™

FERMENTATION / AGEING

Concentrated preparation of pectolytic enzymes for extraction and clarification of musts and wines

- Improves the yield of free-run juice and wine from red grape maceration
- Clarification of musts and finished wines

2.5 kg - **MICROGRANULATED - PURIFIED (CE)** 2 - 5 g/hL (20 - 50 ppm)

LYSOZYM

AGEING MICROBIOLOGICAL STABILITY

Specifically for the microbial management of wines

- Micro-granulated lysozyme (muramidase) enzyme preparation
- Degrades Gram-positive lactic acid bacteria cell walls
- Delays the action of lactic acid bacteria, reducing the need of SO_2
- Strengthens the action of SO_2 on sweet white wines and improves microbiological stability

1 kg - **MICROGRANULATED** 10 - 50 g/hL (100 - 500 ppm)

SPECIFIC APPLICATIONS

LAFASE™ DISTILLATION

FERMENTATION PROCESS

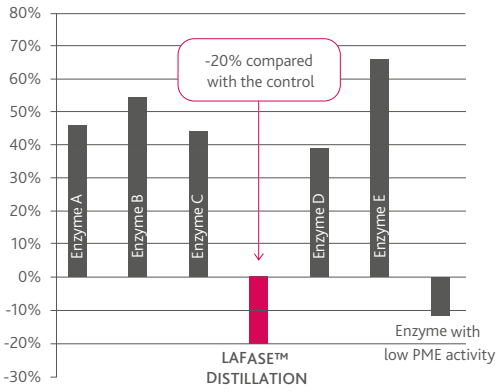
Pressing of grapes intended for distillation base wine (very low pectin methyl esterase activity)

- Preparation of pectolytic enzymes rich in secondary activities and with **low release of methanol**
- **Increases press yield** with the release of quality juice: drainage of juice to limit the quantity of solids and limits the extraction of herbaceous compounds (C6)
- Reduces juice viscosity to facilitate decanting and flotation

1 L- LIQUID - LOW CE - LOW PME 1 - 4 mL/100 kg of grapes

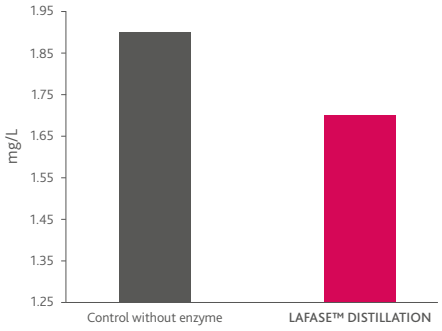
BENEFITS OF AN ENZYME FORMULATION WITH LOW RELEASE OF METHANOL

Change in methanol concentration at the end of AF after enzyme treatment



Cognac juice- Ugni Blanc - Dose: 3 mL/hL

Marker for crushing - Cis-3-hexanol



Micro-distillation of the wine (70% vol.) from a Cognac juice - Ugni Blanc - Dose: 3 mL/100 kg

LAFASE™ DISTILLATION enables gentler pressing of the pressing of grapes.

LAFASE™ THERMO LIQUIDE

THERMO-TREATMENT PROCESS

Thermo-treated juice to promote better clarification and pressing

- Preparation of pectolytic enzymes rich in secondary activities
- **Quick and efficient depectinisation juice over a large spectrum of temperatures (< 65°C (< 149°F))**
- Decreases the viscosity of musts and facilitates pressing

1 L - LIQUID - LOW CE 3 - 5 mL/100 kg of grapes

LAFASE™ XL FLOT

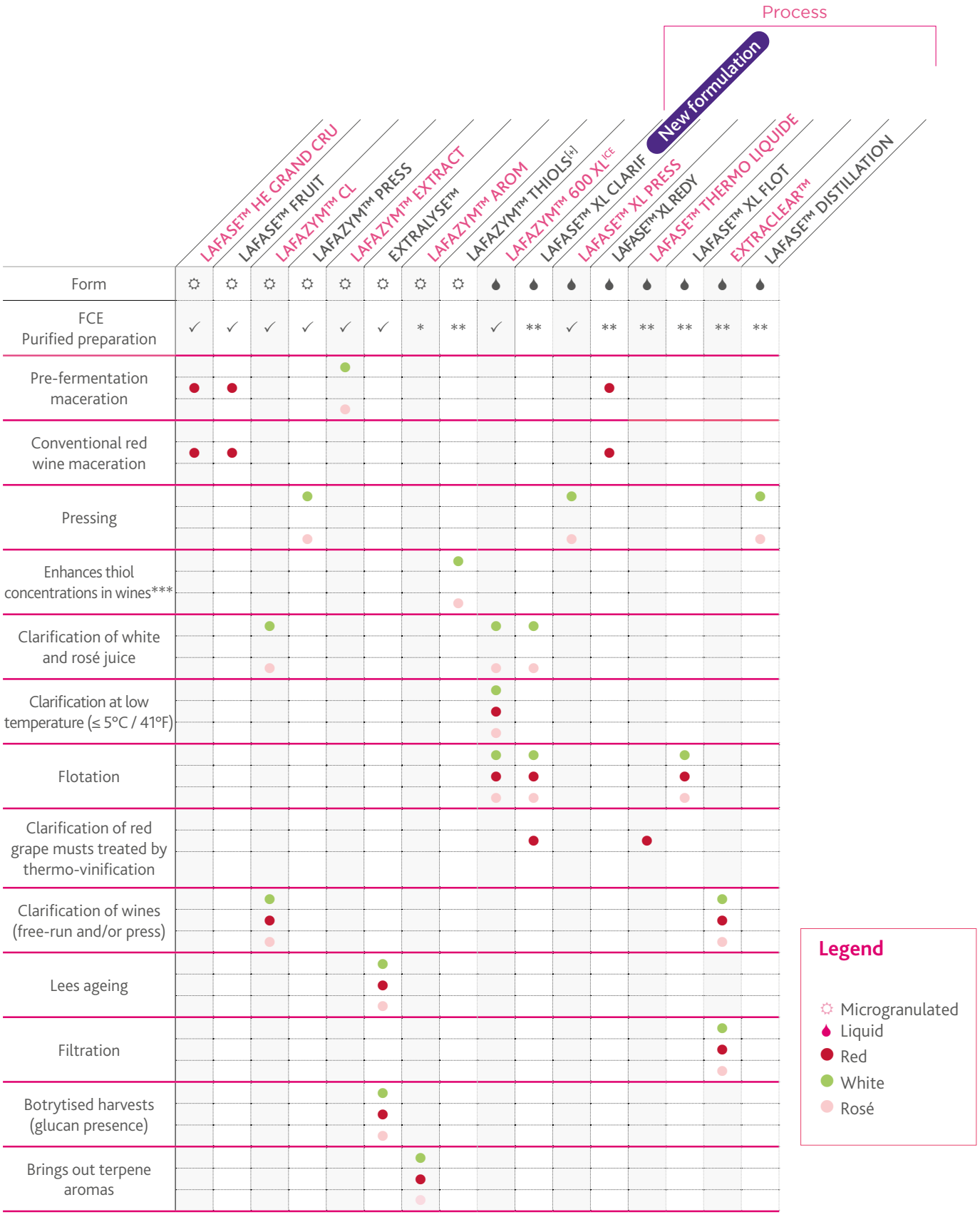
FLOTATION PROCESS

Rapid depectinisation of juice before flotation

- Preparation of pectolytic enzymes with secondary activities
- Low cinnamoyl esterase activity to preserve juice quality
- Rapid depectinisation to optimise clarification

10 L - LIQUID - LOW CE 1 - 4 mL/hL

CHARACTERISTICS OF OUR ENZYMES



✓= Purified to optimise the required actions
* CE is inhibited by 3% ethanol; purified preparations are not necessary during the use of this enzyme.
** Enzymes produced using technologies that maintain undesirable activities at negligible levels.
*** Acts in synergy with speciality yeast with thiol-enhancing abilities (**ZYMAFLORE™ X5**, **DELTA**, **VL3**, etc.).

FINING

Fining is no longer just about clarification.

For over 30 years, **LAFFORT®** has been innovating by relying on in-depth research and using Zêta potential, a key tool for characterising protein reactivity.

This ongoing development approach has enabled the offering of specific and effective oenological products and applications, using a broad range of raw materials, such as plant proteins and yeast derivatives.

The modern approach to fining white and rosé juice has led to major advances in wine quality. Today we are revisiting the fining of red wine by offering a unique preparation designed for the concept of "**Market Re(a)dy Wine**".

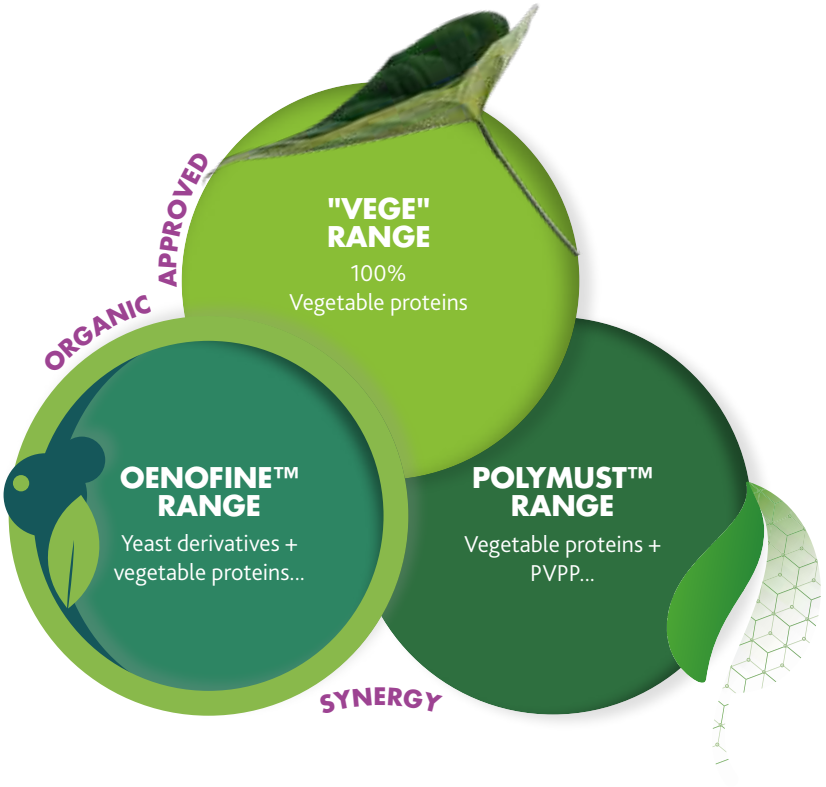
Sami Yammine
Fining & Stabilisation Brand Manager

FINING - NEW GENERATION

Over the past twenty years, fining has undergone major changes, fuelled by innovation and regulatory developments, among other factors. The availability of new preparations has been considerably enhanced with new sources of active ingredients and their synergies, enabling targeted and more precise fining.

LAFFORT® launched the first vegetable protein derived from patatin in 2014 and has since continued to explore new materials, such as yeast derivatives and other blends of active ingredients. This research is part of our precision oenology approach to meet specific winemaking objectives, such as flotation, fining on must or during fermentation, or linked to consumer concerns: PVPP replacements, vegan wine, etc.

LAFFORT® developed three distinct new ranges of fining products, adapted to various oenological applications as well as to a particular winemaking philosophies: **100% vegetable protein, POLYMUST™,** and **OENOFINE™.** This development demonstrates our commitment to responsible oenology, meeting market demands and the evolving needs of the oenological world.



"VEGE" RANGE	POLYMUST™ RANGE	OENOFINE™ RANGE
VEGEFLOT™	POLYMUST™ ROSÉ	OENOFINE™ PiNK
VEGEMUST™	POLYMUST™ BLANC	OENOFINE™ NATURE
VEGEFINE™	POLYMUST™ PRESS	OENOFINE™ RedY
VEGECOLL™	POLYMUST™ NATURE	

BIOSOURCED FORMULATIONS

VEGAN

FINING

- Red
- White
- Rosé
- Sparkling

Market Re(a)dy Wine (MRW) is a concept developed by **LAFFORT®** for the rapid preparation of red wines starting from the vinification stage. With **OENOFINE™ RedY**, the qualitative improvement enables earlier release to market - a valuable advantage for the winery.

OENOFINE™ REDY is an innovative formulation, the result of research into the specificity and diversity of inactivated yeasts. It is part of the "**Market Re(a)dy Wine**" concept, which enables the early release of red wines soon after fermentation. The yeast derivative selected for **OENOFINE™ RedY** promotes the abundant release of so-called "reactive polyphenol" polysaccharides naturally present in the yeast cell wall. To complement its action on the polyphenolic load and promote the early release of wines, this yeast derivative is combined with a vegetable protein (patatin) recognised for its exceptional capacity to clarify and stabilise wine colour.

Adding **OENOFINE™ RedY** to the must at the fermentation stage results in the rapid formation of less reactive polysaccharide-polyphenol complexes, which are thus more supple. This produces red wines with a cleaner, more intense colour and improved clarification characteristics.

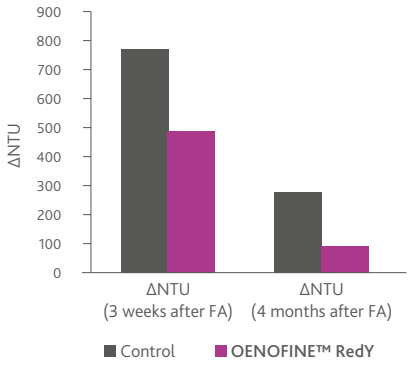
OENOFINE™ RedY

FERMENTATION

Inactivated yeasts, vegetable proteins (patatins)

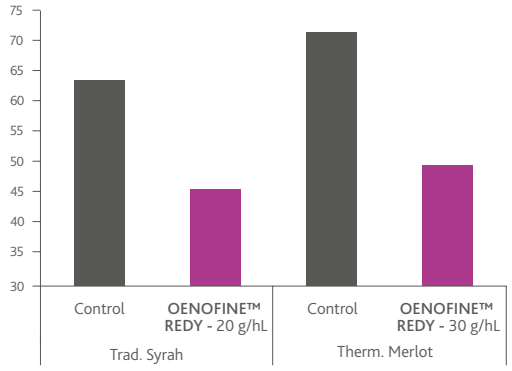
- Facilitates earlier release of wines
- Harmonious, elegant tannins
- Suppleness and volume
- Stabilisation of colouring matter
- Preservation and purity of fruit
- Optimisation of filterability

Stability of colouring matter and sensory profile



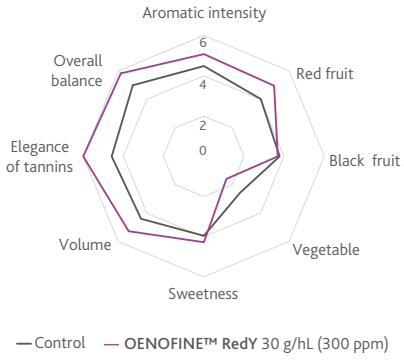
Fining of a fermenting Merlot must, 2023.

Salivary Protein Index – SPI



Fining during fermentation – Traditional fermentation (Syrah) and thermovinification (Merlot), 2024
The analysis of purified salivary proteins makes it possible to assess the perception of astringency, as these proteins interact directly with the tannins present in the wine.The greater the reduction in SPI, the less astringent the wine is perceived to be.

Sensory profile



*After treatment with **OENOFINE™ RedY** the wine has a more intense sensory profile with less bitterness. Tasting results by a panel of trained tasters.*

OENOFINE™ REDY can be used alone or in combination with enzymes for even more advanced wine preparation: **LAFASE™ XL REDY** or **EXTRACLEAR™** for wines with a high level of suspended solids or destined for early release.

1 kg / 5 kg	5 - 30 g/hL (50 - 300 ppm)

AN ALTERNATIVE TO PVPP BASED ON INACTIVATED YEASTS AND VEGETABLE PROTEINS

LAFFORT® has developed two unique preparations based on BIOSourced raw materials, specific inactivated yeasts acting in synergy with other fining agents. These preparations allow precise colour management and refinement of wines, with the particular aim of reducing the sensation of bitterness.

OENOFINE™ PiNK: a powerful tool for managing the hue of juice and wines
OENOFINE™ NATURE: a precise tool for the elimination of oxidised and oxidisable phenolic compounds

OENOFINE™ PiNK & OENOFINE™ NATURE are natural replacements for PVPP.

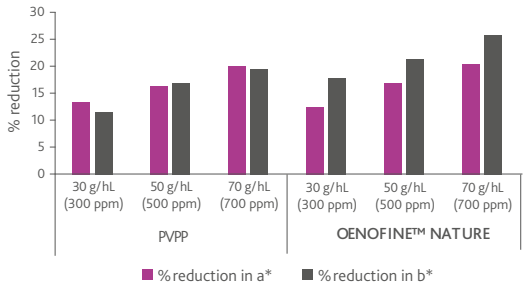
OENOFINE™ NATURE

FERMENTATION / AGEING

Inactivated yeast, vegetable proteins (patatin and pea), calcium bentonite

- Alternative to PVPP for fining juice and wine
- Stabilisation of hue and elimination of oxidised compounds
- Preservation of the aromatic potential of wines
- Effective for both curative and preventive fining

Reduction in a* and b* parameters



Cielab - Juice fining, Tavel rosé 2023.
***OENOFINE™ NATURE** performs comparable to PVPP in reducing a* and b* parameters*

1 kg / 5 kg

10 - 50 g/hL (100 - 500 ppm)

OENOFINE™ PiNK

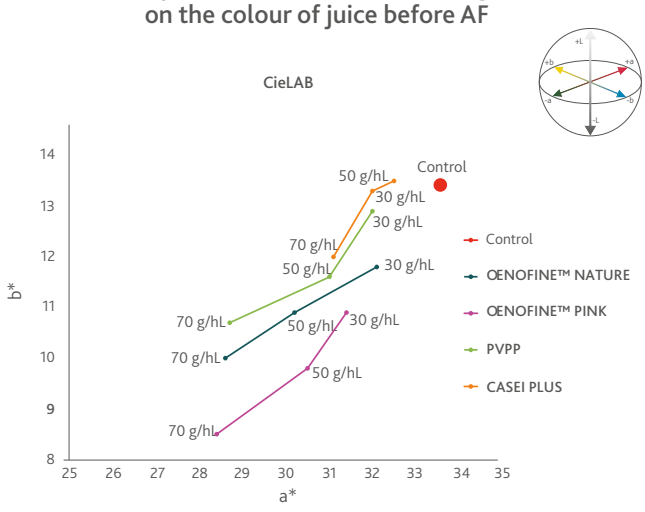
FERMENTATION / AGEING

Inactivated yeast, vegetable protein (patatin), activated carbon, sodium bentonite

- **Alternative to PVPP for fining juice and wines**
- Hue stabilisation of fermenting juice and rosé wines
- Colour correction of white and rosé juices and wines
- Very good sedimentation capacity

OENOFINE™ NATURE has a similar impact to PVPP - reducing colour factors a* and b*. **OENOFINE™ PiNK** is 40% more effective than PVPP for decolouration.

Impact of the OENOFINE™ range on the colour of juice before AF



Fining of Syrah rosé juice, 2022. The various fining agents differ in their effectiveness in reducing the orange-yellow hue.

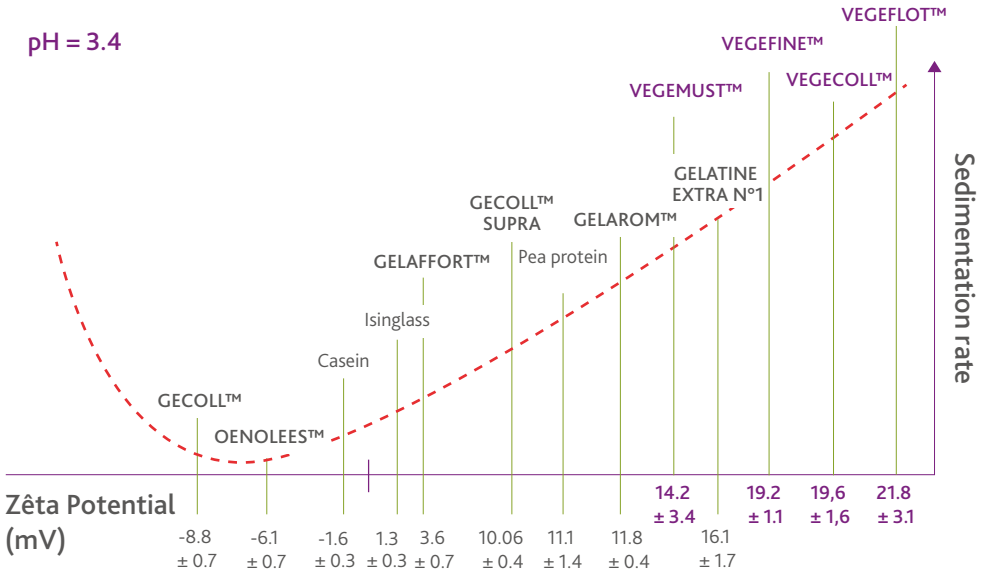
1 kg / 10 kg

10 - 70 g/hL (100 - 700 ppm)

VEGETABLE PROTEINS

FINING AND ZÊTA POTENTIAL

The addition of a protein fining agent to juice, must, or wine causes flocculation. The formation of flocs and their sedimentation over time leads to clarification.
Flocculation results from the interaction of the fining agent proteins with polyphenols in juice, must, or wine. Polyphenols group together under hydrophobic forces and are made unstable through attractive interactions with proteins. The flocs thus formed tend to grow, group together and precipitate. Their precipitation leads to the sedimentation of suspended particles and clarification of the wine. Not all plant proteins have the same ability to develop these interactions.
The Zêta potential is a measure of this capacity for attractive interactions. The speed of clarification depends on its value and the size of the particles (Iturmendi et al., 2012). For faster clarification, the Zêta potential values should be high (positive and negative).



Zêta potential
Classification of protein fining agents by sedimentation rate

ZÊTA POTENTIAL OF PROTEIN FINING AGENTS AS A FUNCTION OF pH
Typically, most proteins lose some of their effectiveness at higher pH.

		ZÊTA POTENTIAL (mV)	
	Fining products	pH 3.4	pH 3.8
Animal origin	Food-grade gelatines of animal origin	-8 to 16	-8 to 10
	Egg albumin	15	11
	Isinglass	1.3	2.8
	Casein	0.5	≈0
Vegetable origin	Pea protein	11	-3
	VEGECOLL™	19.6	14.1
	VEGEFINE™	19.2	11.47
	VEGEFLOT™	21.8	11.2
	VEGEMUST™	14.2	9.5

Thanks to their patatin fractions, VEGECOLL™, VEGEFINE™, VEGEMUST™ and VEGEFLOT™ retain strong activity over a broad pH spectrum.

VEGETABLE PROTEINS PATATIN

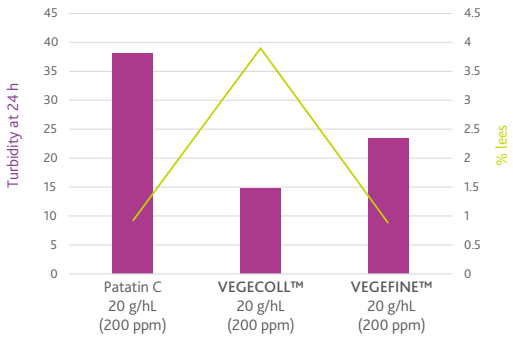
VEGEFINE™

FERMENTATION / AGEING

Vegetable proteins (100% patatin) for the clarification of musts and wines

- High zêta potential, synergistic effect of the proteins
- Multi-purpose and usable on a wide range of musts and wines with a high content of oxidised and oxidisable polyphenols
- Low quantity of lees after sedimentation
- Preservation of aromas
- Rapid clarification, no risk of over-fining

Comparison of turbidity and % lees



Static fining trial at 7°C (45°F) on Sauvignon Blanc juice (2019)

1 kg / 10 kg

2 - 50 g/hL (20 - 500 ppm)

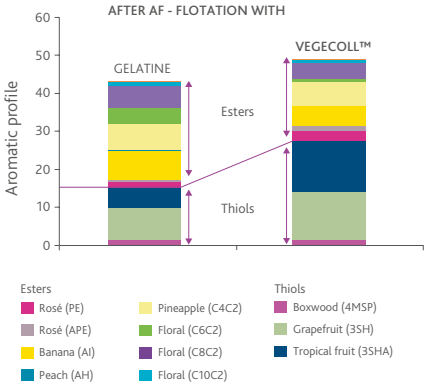
VEGECOLL™

FERMENTATION / AGEING

Vegetable proteins (patatin) for the clarification of juice and wines

- Very rapid clarification
- The most reactive vegetable protein in oenology to date
- Rapid flotation at low doses
- No risk of over-fining
- Preservation of aromas

Optimisation of the aromatic profile



*Dose: 5 g/hL (50 ppm) of **VEGECOLL™** and 100 mL/hL of gelatine*

500 g / 5 kg

2 - 30 g/hL (20 - 300 ppm)

VEGETABLE PROTEINS PATATIN & PEA

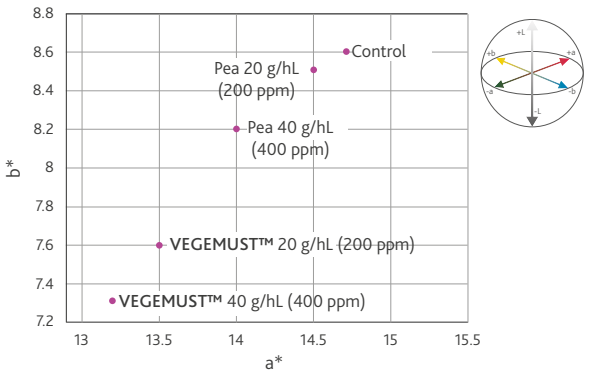
VEGEMUST™

FERMENTATION

Specific combination of vegetable proteins (patatins & pea) with a high flocculation capacity, suitable for static cold settling and fining in fermentation

- High Zêta potential, synergistic effect of the proteins
- High sedimentation rate
- The presence of patatins helps to reduce the risks of wine oxidation at an early stage
- Better juice yield (low percentage of solids)
- Flocculation capacity retained, even at high pH
- No risk of over-fining

CIELAB - The L*a*b* colour space



Addition of fining products a third of the way through fermentation, Grenache rosé 2020.

The graph shows greater effectiveness of **VEGEMUST™** compared with a pea protein for the decrease in colour and the increase in clarity.

CIELAB colour space is used to characterise the colours of juice and wine. The aim of fining white or rosé juice and wines is to increase L* (increased clarity) and decrease a* and b* (decrease in red and orange colours).

1 kg / 10 kg

10 - 40 g/hL (100 - 400 ppm)

VEGEFLOT™

FERMENTATION FLOTATION

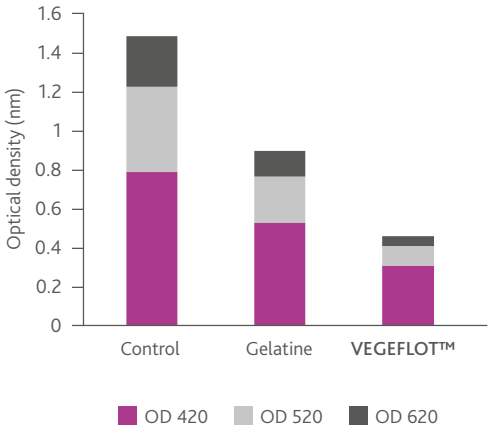
A combination of vegetable proteins (patatin & pea) with high flocculation capacity, suitable for flotation Optimised balance between plant protein sources

- Rapid flotation, highest zêta potential
- The presence of patatin contributes to the early reduction of oxidation risks
- **Stable flotation foams**
- Better juice yield (low percentage of lees)
- Flocculation capacity retained, even at high pH
- No risk of over-fining

***VEGEFLOT™** is available in liquid form (produced to order during the harvest - 20 L jerry can).*

Complementary use with **LAFASE™ XL FLOT**

Flotation of a Pinot Gris juice, South Africa, 2020



***VEGEFLOT™** is more effective than gelatine for the reduction of colour. Gelatine: 40 mL/hL - **VEGEFLOT™**: 15 g/hL (150 ppm)*

1 kg / 10 kg

10 - 40 g/hL (100 - 400 ppm)

Find Out More

Watch our **"Flotation"** video on our website, **LAFFORT & YOU** section.

POLYMUST™ RANGE

VEGAN

FINING

POLYMUST™ ROSÉ

FERMENTATION / AGEING

Association of PVPP with vegetable protein (patatin) for fining white and rosé juice and wines

- Elimination of phenolic acids
- **Stabilisation of the colour of rosé juice and wines in fermentation**
- When used on finished wine, it is best to rack within 5 days following treatment.

1 kg / 10 kg — 30 - 80 g/hL (300 - 800 ppm)

POLYMUST™ BLANC

FERMENTATION / AGEING

Association of vegetable protein (pea) with PVPP for the preventive treatment of oxidation in white and rosé juice and wines

- Prevention of oxidation
- **Elimination of oxidisable phenolic compounds liable to trap aromas and distort the colour**
- Compatible with flotation and for treatment of wines

1 kg / 10 kg — 30 - 80 g/hL (300 - 800 ppm)

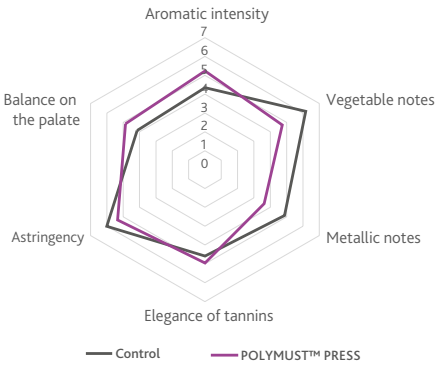
POLYMUST™ PRESS

FERMENTATION / AGEING

Association of PVPP, calcium bentonite and vegetable protein (patatin) for the preventive fining of press wines and the reduction of oxidised character

- **Preventive treatment of oxidation in white and rosé juice:** elimination of oxidisable and oxidised phenolic compounds, preservation of glutathione content and limitation of browning and pinking phenomena
- **Refining red press wines:** clarifies, reduces astringency as well as vegetal and metallic notes, and contributes to colour and microbial stabilisation
- Colour correction and sensory refinement of white and rosé wines

Tasting profile after fining



POLYMUST™ PRESS (30 g/hL (300 ppm)) reduces the perception of vegetal and metallic notes. The fined wines are perceived as better balanced and less astringent. Press wine (Merlot) before blending

1 kg / 10 kg — 15 - 100 g/hL (150 - 1000 ppm)

POLYMUST™ NATURE

FERMENTATION / AGEING

A combination of vegetable protein (pea), sodium bentonite and calcium bentonite for fining must and wines

- **Remarkable clarification effect**
- **Preventive and curative treatment** of polyphenol oxidation in white and rosé wines
- Contributes to protein stabilisation during the fermentation phase
- Contributes to the stabilisation of colouring matter in red wines

1 kg / 10 kg (on request) — 10 - 100 g/hL (100 - 1000 ppm)

FINING PRODUCTS

GELATINES

All our gelatines are of porcine origin and systematically developed according to their winemaking application.

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
GECOLL™ SUPRA	Juice and wine clarification **Eliminates astringent tannins**	40 - 100 mL/hL	1 L / 5 L / 20 L
GECOLL™ FLOTTATION	Highly reactive liquid gelatine **Flotation**	40 - 100 mL/hL	10 L
GELAROM™	**To enhance the sensory potential of the wine**	30 - 60 mL/hL	1 L / 5 L / 20 L
GELAFFORT™	**Wine clarification agent**	10 - 30 mL/hL	20 L
GECOLL™	Cold-soluble gelatine **Wine clarification agent**	8 - 10 g/hL (80 - 100 ppm)	1 kg 20 kg
GÉLATINE EXTRA N°1	Highly purified heat-soluble gelatine **Fining of red wines for ageing**	6 - 10 g/hL (60 - 100 ppm)	1 kg

PVPP

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
VINICLAR™	Microgranulated preparation of PVPP **VINICLAR™** contains a small fraction of cellulose, favouring the clarification and filterability of lees. **It is suitable for preventive and curative treatment of juice and wine oxidation.**	Preventive treatment: 15 - 30 g/hL (150 - 300 ppm) Curative treatment of oxidised wines: 30 - 80 g/hL (300 - 800 ppm)	25 kg
VINICLAR™ P	Microgranulated preparation of PVPP **It is suitable for preventive and curative treatment of juice and wine oxidation.**	20 - 50 g/hL (200 - 500 ppm)	1 kg 22.7 kg

OTHER FINING PRODUCTS

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
ALBUCOLL™ OVOCLARYL™	**Fining and clarification of red wines** Liquid preparation of egg white Powdered egg albumin	30 - 80 mL/hL 6 - 10 g/hL (60 - 100 ppm)	1 L 1 kg
ICHTYOCOLLE	Fish-based (Isinglass) fining agent adapted to high-grade white and rosé wine fining and clarification. **It restores high sensory clarity and remarkable brilliance to treated wines.**	0.5 - 1.5 g/hL (5 - 15 ppm)	250 g
CASEI PLUS	**Potassium caseinate** Treatment of **oxidation and maderisation** in juice (white and rosé) and wines	5 - 20 g/hL (50 - 200 ppm) for clarification 20 - 60 g/hL (200 - 600 ppm) for the treatment of juice and wine	1 kg 20 kg
POLYLACT™	Combination of PVPP and casein **Preventive and curative treatment of the oxidation of wines (white and rosé)**	Preventative treatment: 20 - 40 g/hL (200 - 400 ppm) Curative treatment: 40 - 100 g/hL (400 - 1000 ppm)	1 kg 10 kg
SILIGEL™	A colloidal silica solution that can be used in combination with all organic fining agents	20 - 100 mL/hL	1 L / 5 L / 20 L

TANNINS

Tannins are essential to the balance of the red wine matrix, but they also play a part in white and rosé production due to their many oenological properties: stabilisation of colour, anti-oxidant and anti-oxidase properties, reaction with proteins, clarification, etc.

A very diverse range of tannins is available to winemakers. **LAFFORT®** selects its tannins to develop formulations specifically adapted to each type of wine and each stage of the vinification.

Tannin addition is a natural technique that facilitates wine production and stabilisation.

Bruno Marquette
Tannin Range Manager

TANNINS IN OENOLOGY

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 wines.
- ✓ Constantly improve production and purification methods for raw materials.
- ✓ Build a greater understanding of the oenological implications of tannin usage.
- ✓ Develop the methods of tannin application in accordance with implemented oenological practices.

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

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:

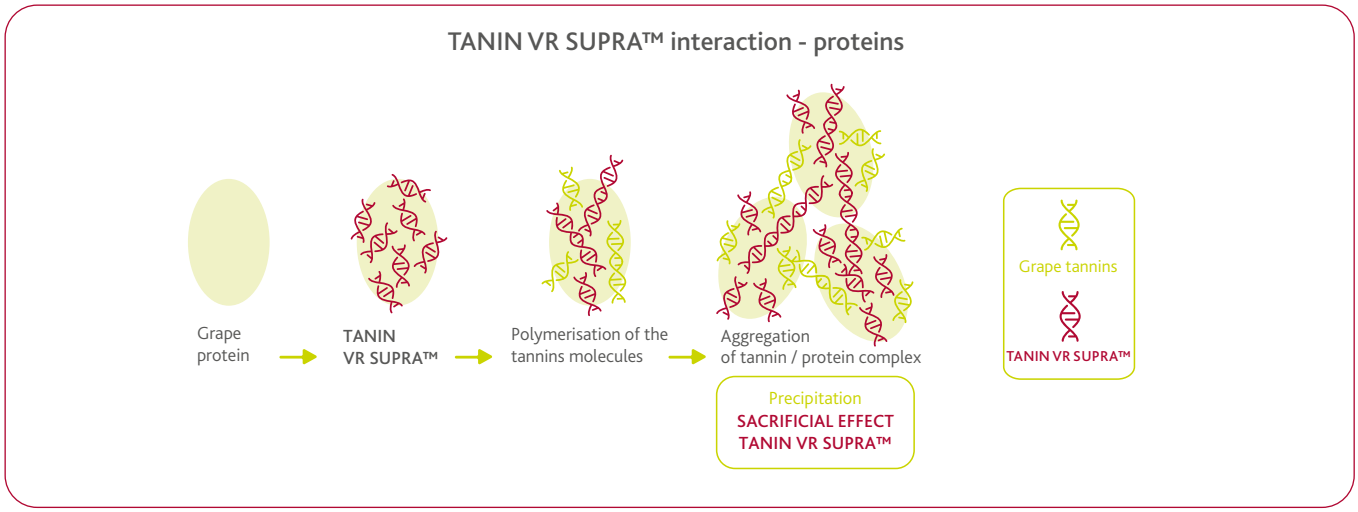
- ✓ Unstable protein precipitation
- ✓ Protection and stabilisation of colour
- ✓ Anti-oxidation
- ✓ Reductive character minimisation
- ✓ Structure enhancement
- ✓ Clarification improvement
- ✓ Redox phenomena regulation

IDP PROCESS

All **LAFFORT®** tannins benefit from the unique formulation Instant Dissolving Process (**IDP**), a revolutionary process for ease of use. The IDP process enables perfect solubility in wine; thus, no preliminary dissolution of the tannins in water is required. However, a homogeneous introduction into the bulk of the must or wine is advised. It is recommended that a systematic pump-over or other homogenising action be carried out during the application.

THE SACRIFICIAL EFFECT OF TANIN VR SUPRA™

When grapes are crushed, the proteins in the must bind to the tannins and start to precipitate. The first tannins available are skin tannins, which are generally silkier and softer than seed tannins which are extracted later, and they are also the most important for the structure of the wine. By adding **TANIN VR SUPRA™** directly to grapes, the proteins in the must interact with it, thus preserving the skin tannins.



WINEMAKING TANNINS

The role of tannins in winemaking

- ✓ Sacrificial effect
- ✓ Co-pigmentation in the presence of colour components
- ✓ Antioxidant effect
- ✓ Stabilisation in the presence of acetaldehyde

Sometimes, the joint use of two tannins can be complementary. When the harvest is not at optimal phenolic ripeness, the qualities of **TANIN VR SUPRA™** and **TANIN VR COLOR™** are complementary.

Find Out More: Discover our focus, "**TANIN VR SUPRA™ & TANIN VR COLOR™, the winning team**" on our website, **LAFFORT & YOU** section.

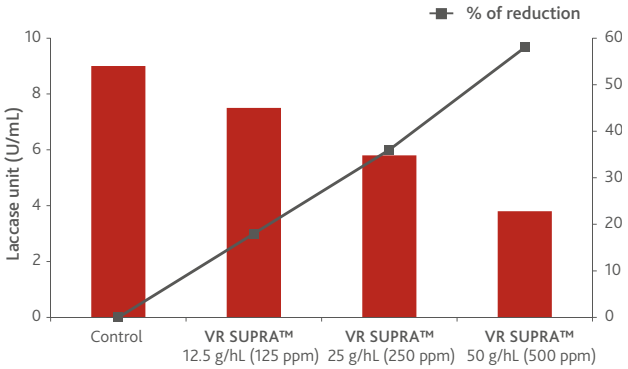
TANIN VR SUPRA™

Ellagic and proanthocyanidic tannin preparation

TANIN VR SUPRA™ combines the effects of selected tannins, prepared for optimal technological efficiency, without negative sensory impacts:

- **Antioxidant** action that helps protect the colour
- Improves **wine structure** by increasing mid-palate volume
- Inhibits natural oxidative enzymes (laccase, tyrosinase) in compromised harvests (used alongside SO_2)
- **Sacrificial effect**: protects grape tannins from precipitation with grape proteins and promotes natural tannin–anthocyanin reactions

The inhibition of laccase activity



*Due to the precipitation of proteins (the sacrificial effect) and the rapid consumption of O_2 by the tannins (antioxidant effect), **TANIN VR SUPRA™** ensures an effective reduction of these harmful oxidase activities.*

1 kg / 5 kg

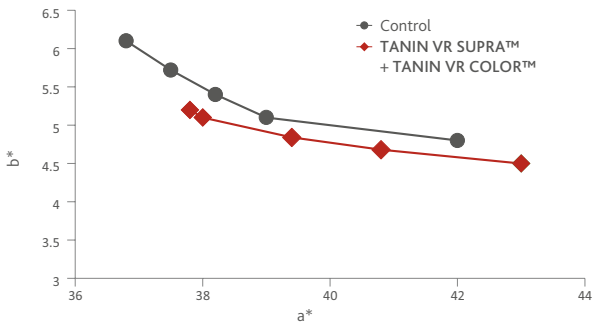
10 - 80 g/hL (100 - 800 ppm)

TANIN VR COLOR™

Specially formulated catechin tannins for colour stabilisation

- For grape varieties with an **unfavourable natural tannin-to-anthocyanin ratio**
- For varieties where **colour management** (extraction and stabilisation) is challenging
- Suitable for harvests with low phenolic maturity
- Low-astringency tannin that integrates well across all wine profiles

Evolution of Cielab over time



*The control wine develops yellow tones faster than the wine treated with **TANIN VR SUPRA™** + **TANIN VR COLOR™**. **TANIN VR SUPRA™** at 30 g/hL (300 ppm) added at **tank filling**, **TANIN VR COLOR™** at 30 g/hL (300 ppm) added during the **first third of fermentation***

1 kg / 5 kg

10 - 80 g/hL (100 - 800 ppm)

WINEMAKING TANNINS

TANNINS

- Red
- White
- Rosé
- Sparkling

TANIN VR SUPRA™ ÉLÉGANCE

Formulation of proanthocyanin and ellagic tannins from oak

TANIN VR SUPRA™ ÉLÉGANCE has been formulated to limit the astringency effect when tannin is added during fermentation. It allows for more precise management of extraction and maceration, mainly for the most delicate grape varieties (such as Pinot Noir) or when making red wines in a fruitier or lighter style. It is used under the same conditions as **TANIN VR SUPRA™**.

1 kg / 5 kg — 10 - 80 g/hL (100 - 800 ppm)

TANIN GALALCOOL™

Granulated gallic tannins, intended for the vinification of white and rosé musts

- **Inhibits natural oxidative enzymes** (laccase, tyrosinase), used alongside SO_2
- Precipitates some unstable proteins, complementing bentonite treatment
- Aids clarification

OPTION TANIN GALALCOOL™ SP - *See P. 58*

1 kg — 5 - 20 g/hL (50 - 200 ppm)

TANIN VR GRAPE™

Grape proanthocyanidic tannin preparation

- Compensates for natural grape **tannin deficiency**
- Stabilises the colour thanks to the formation of **tannin-anthocyanin polymeric pigments**

Thanks to the very high quality of its extraction, **TANIN VR GRAPE™** contains only a negligible quantity of phenolic acids (*Brettanomyces* substrates).

OPTION TANIN VR SKIN™ - *See P. 57*

500 g — 10 - 80 g/hL (100 - 800 ppm)

TANIN OENOLOGIQUE

Chestnut-derived ellagic tannins, particularly suited to protecting musts from oxidation

- Inhibits natural oxidative enzymes (laccase, tyrosinase), to complement SO_2
- Protects against the undesirable effects of oxygen
- Precipitates some unstable proteins, complementing bentonite treatment
- Aids clarification

5 kg — 8 - 15 g/hL (80 - 150 ppm)

OBJECTIVE	TYPE OF GRAPE OR MUST	TANNIN	DOSE	NOTE
Botrytised grapes Anti-oxidant action Laccase inhibition	Red	VR SUPRA™ RANGE	30 - 80 g/hL (300 - 800 ppm)*	Add as early as possible to the grapes (even before arrival at the cellar). Perform the laccase test in case of *Botrytis*.
	White, Rosé	TANIN GALALCOOL™	10 - 50 g/hL (100 - 500 ppm)*	
Protein precipitation and skin tannin preservation	Red	VR SUPRA™ RANGE	10 - 30 g/hL (100 - 300 ppm)	"Sacrificial effect" Add as early as possible to the grapes.
Protein precipitation	White, Rosé	TANIN GALALCOOL™	5 - 20 g/hL (50 - 200 ppm)	
Colour stabilisation	Red	TANIN VR COLOR™ TANIN VR GRAPE™	30 - 80 g/hL (300 - 800 ppm) 20 - 40 g/hL (200 - 400 ppm)	Add during the first third of fermentation.
Structure contribution Compensation for tannin deficiency	Red	TANIN VR GRAPE™ VR SUPRA™ RANGE	10 - 40 g/hL (100 - 400 ppm) 10 - 80 g/hL (100 - 800 ppm)	

* According to the health of the grapes.

AGEING TANNINS

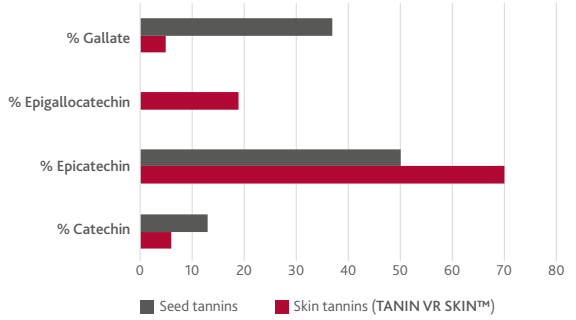
TANIN VR SKIN™

Preparation of proanthocyanidic tannins from grape skins

Due to its specific nature (grape skin tannin), **TANIN VR SKIN™** allows:

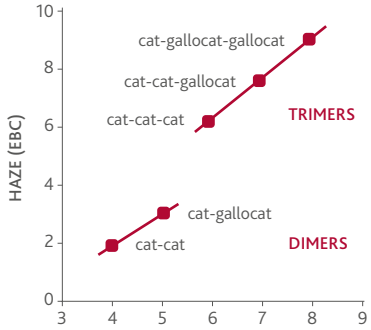
- Compensation for natural grape tannin deficiency (lack of phenolic maturity or adverse tannin-anthocyanin ratio).
- Stabilisation of colour due to the formation of tannin-anthocyanin combinations.
- Improved clarification.
- Refinement of wine structure and palate length.

Distribution of procyanidins in seed and skin tannins



*Seed tannins have a much higher proportion of gallate substituents (37%) than skin tannins (5%), and it is these compounds that react with proteins. **TANIN VR SKIN™** is a preparation naturally low in gallate compounds.*

Reactivity of procyanidins with proteins



The reactivity of tannins with proteins increases with the degree of polymerisation, but also according to the gallate content. A catechin dimer will therefore be less reactive with proteins than the same dimer bound to a gallate radical.

TANIN VR SKIN™ is structurally less reactive with proteins and therefore less astringent.

500 g 10 - 80 g/hL (100 - 800 ppm)

TAN'COR GRAND CRU™

Preparation of proanthocyanidic tannins derived from grapes and ellagic tannins from oak, for use 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.
- Stabilise colour by combining the remaining free anthocyanins.
- Regulate oxidation-reduction phenomena

1 kg 10 - 80 g/hL (100 - 800 ppm)

TAN'COR™

Preparation based on proanthocyanidin and ellagic tannins, intended for the maturation of red wines

TAN'COR™ combines the properties of ellagic and proanthocyanidin tannins for use after fermentation or during the ageing of red wines:

- Acts on structure and prepares wines for maturation
- Protects wines against oxidation
- Regulates redox reactions

1 kg / 5 kg 10 - 80 g/hL (100 - 800 ppm)

AGEING TANNINS

TANFRESH™

Preparation of proanthocyanidins and oak ellagitannins

- Refreshes white and rosé wine (against oxidation and atypical ageing)
- Boosts structure and mouthfeel
- Helps eliminate reductive odours

250 g 0.5 - 6 g/hL (5 - 60 ppm)

TANIN GALALCOOL™ SP

Preparation of pure gallic tannins

TANIN GALALCOOL™ SP has a specially adapted formulation that respects the sensory balance of wines on the palate while maintaining the same oenological properties as **TANIN GALALCOOL™** (*see P. 56*).

1 kg 2 - 5 g/hL (20 - 50 ppm)

OBJECTIVE	TYPE OF WINE	TANNIN	DOSE (g/hL)
Balance or wine structure improvement		TANFRESH™ TANIN GALALCOOL™ SP TANIN VR SKIN™	0.5 - 6 (5 - 60 ppm) 2 - 5 (20 - 50 ppm) 2 - 10 (20 - 100 ppm)
		TANIN VR SKIN™ TAN'COR™ TAN'COR GRAND CRU™ QUERTANIN™ RANGE	2 - 10 (20 - 100 ppm) 10 - 30 (100 - 300 ppm) 5 - 30 (50 - 300 ppm) 2 - 30 (20 - 300 ppm)
Regulation of oxidation reduction phenomena		TANFRESH™ TANIN GALALCOOL™ SP	0.5 - 6 (5 - 60 ppm) 2 - 5 (20 - 50 ppm)
		QUERTANIN™ RANGE TAN'COR GRAND CRU™	2 - 30 (20 - 300 ppm) 10 - 20 (100 - 200 ppm)
Stabilisation of colour		TANIN VR SKIN™ TAN'COR GRAND CRU™ QUERTANIN™ RANGE	20 - 40 (200- 400 ppm) 20 - 30 (200 - 300 ppm) 2 - 30 (20 - 300 ppm)

Find Out More

Watch our **IDP** video on our website, **LAFFORT & YOU** section.

AGEING TANNINS

QUERTANIN™ RANGE

A range of finishing and maturation ellagic and gallic tannin blends sourced from stave-quality oak heartwood

Instant-dissolving, and appropriate for use in white, rosé, and red wines

- It regulates oxidation-reduction phenomena during maturation in barrels or during micro-oxygenation.
- With used barrels, the **QUERTANIN™** range recreates a medium rich in ellagic tannins similar to a new barrel.
- After the addition, it is recommended to carry out normal rackings until fining or bottling preparation.

DOSE

It is specified in the Oenological Codex that tannins "must not change the olfactory properties and the colour of wine". The dose rates will therefore vary in function of the wine matrix and shall be determined after trials.

500 g

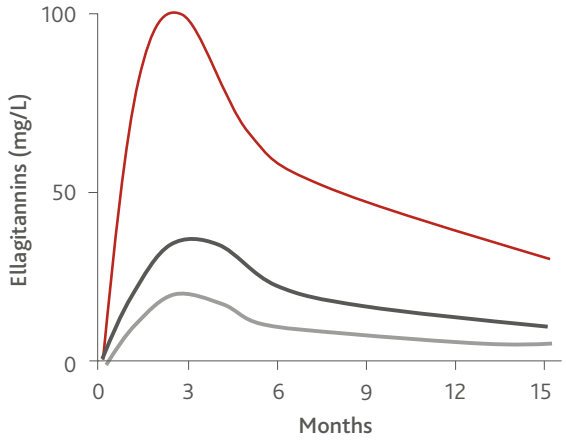
QUERTANIN™ Q1 and Q2

Ageing tannins for white, rosé, and red wines. QUERTANIN™ Q1 and QUERTANIN™ Q2 enhance tannin structure and support the overall balance of wines.

QUERTANIN® Q1: superior ellagitannins extracted from the stave-grade heartwood of French and American oak

QUERTANIN® Q2: ellagitannins extracted from the stave-grade heartwood of American oak

250 g



The tannin content extracted from the oak is lower in used barrels. The ellagic tannin protective effect decreases, and the wine becomes subject to premature oxidation.

*Adding **QUERTANIN™** recreates the buffering qualities provided by tannins extracted from new barrels, thus protecting the wine from oxidation.*

STABILISATION

Stabilisation is essential for wine presentation and appearance, preventing cloudiness and other deposits in the bottle.

Several treatments are available depending on the nature of the instability: tartaric, protein, microbiological, and colouring matter. **LAFFORT®** responds to each of these needs with a range of products adapted to winemaking and bottling conditions.

LAFFORT® is recognised for its expertise in wine stabilisation, with innovative products such as **MANNOSTAB™** (Patent FR 2726284) and analytical techniques for measuring stability.

Sami Yammine
Fining & Stabilisation Range Manager

COLLOIDAL STABILISATION

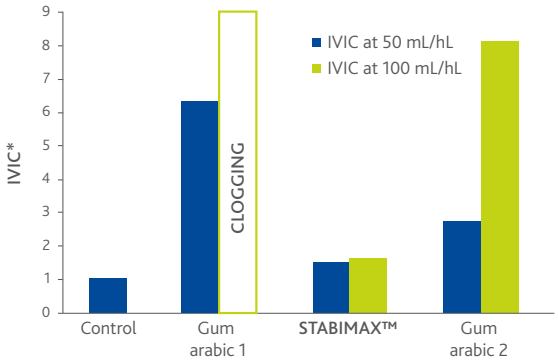
STABILISATION

- Red
- White
- Rosé
- Sparkling

STABIMAX™

Specifically selected (by R&D BIOLAFFORT®) 100% Verek gum arabic solution that has undergone an innovative purification process

- High stabilisation power against unstable colouring matter
- Very good filterability, can be added before microfiltration



IVIC = Clogging index of the wine treated with gum arabic / Clogging index of the control wine

STABIMAX™ has a low impact on wine filterability.

↓

Importance of the selection and purification of the gum arabic.

5 L / 20 L	70 - 100 mL/hL

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).
- Very low clogging index

1 L / 5 L / 20 L	100 - 150 mL/hL

OENOGOM™ INSTANT

LOW SO_2

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

- Stabilisation of the colouring matter of red wines

2.5 kg / 25 kg	20 - 30 g/hL (200 - 300 ppm)

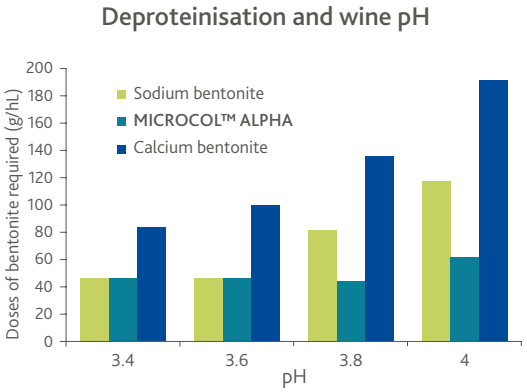
STABIVIN™	STABIFIX™	OENOGOM™ BIO
100% Verek gum arabic solution with a high protective index for stabilising unstable colour compounds in red wines	**Solution of selected and purified gum arabic**	**Pure gum arabic in rapid dissolving micro-granular form (100% Verek)** LOW SO_2
• Hydrophilic colloid that prevents colloidal haze and deposits, helping wines maintain maximum clarity • Stabilises unstable colouring matter • Increases protection against metallic or protein hazes	• Stabilises otherwise unstable colouring matter • Increases protection against metallic hazes	• Stabilisation of the colouring matter of red wines • Increases protection against metallic hazes
Dose: 70 - 100 mL/hL	Dose: 70 - 100 mL/hL	Dose: 20 - 30 g/hL (200 - 300 ppm)
Packaging: 1 L / 5 L / 20 L	Packaging: 20 L	Packaging: 2.5 kg

PROTEIN STABILISATION

MICROCOL™ ALPHA

Natural sodium bentonite, micro-granular

- Stabilising properties with regard to heat-sensitive proteins over a **large pH range**
- Wide stabilising action spectrum
- High clarifying capacity and compact lees
- Aromatic preservation
- Helps colour stabilisation
- Improves wine brightness



MICROCOL™ ALPHA provides a stabilising action with respect to proteins, even when the wine pH is high.

1 kg / 5 kg / 25 kg	10 - 80 g/hL (100 - 800 ppm)

MICROCOL™ FT

CROSS-FLOW FILTRATION

Natural sodium-calcium bentonite compatible with cross-flow filtration

- Due to its high purity, **MICROCOL™ FT** contains very little crystalline silica, which is responsible for the abrasion of membranes.
- The particle size is controlled, preventing filter clogging or leaving micro-particle residues after filtration.

15 kg	30 - 80 g/hL (300 - 800 ppm)

MICROCOL™ CL G

CLARIFICATION

Natural calcium bentonite

- Very good lees compaction
- Aids clarification of musts and wines (in combination with a protein-based fining agent)
- Good deproteinising ability

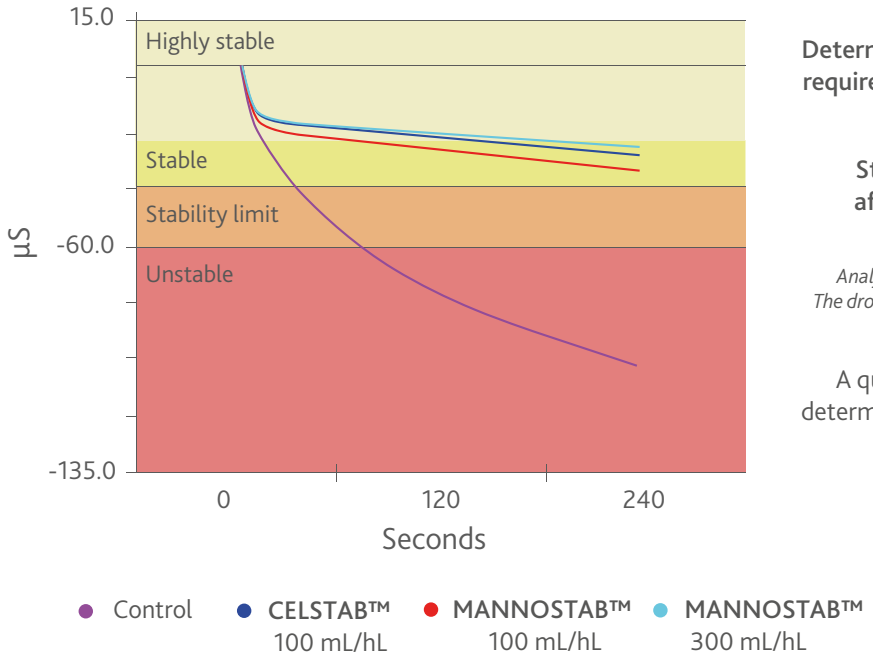
15 kg	20 - 100 g/hL (200 - 1000 ppm)

Find Out More

See our **MICROCOL™ ALPHA** video in the **LAFFORT & YOU** section.

TARTARIC STABILISATION

PRACTICAL APPROACH TO TARTARIC STABILISATION



Determination of tartrate instability and the required dose using the MINI CONTACT test

Stabilisation check of a white wine after treatment with CELSTAB™ or MANNOSTAB™

Analysis by MINI CONTACT (CHECK STAB method)
The drop in conductivity indicates that the treated wine is considered "stable".

A quick and efficient test can be used to determine the treatment dose and to check its effectiveness.

LAFFORT® offers a solution adapted to each quality and category of wine to optimise treatment.

DIT VALUE (%)	> 20	> 20	< 20
Category of wine	Quick to market	Quick to market	Premium - ageworthy wines (six months minimum)
Calcium (mg/L)	< 60	< 60	< 60
Recommended treatment	POLYTARTRYL™	CELSTAB™	MANNOSTAB™ LIQUIDE 200
Treatment dose	10 g/hL (100 ppm)	100 - 200 mL/hL	50 - 150 mL/hL
White and rosé wines	Direct treatment	Direct treatment	Natural stabilisation
Red wines	Direct treatment	-	Natural stabilisation

DEGREE OF TARTARIC INSTABILITY: DIT (%) *- Stability threshold (white, red, rosé wines): < 5% (under measurement conditions in our laboratory).*

TARTARIC STABILISATION

CELSTAB™

Solution of cellulose gum (100 g/L), a highly purified polymer of vegetable origin (from wood) with a lower degree of polymerisation and low viscosity

- The composition of **CELSTAB™** is highly purified and uniform (only one peak - HPLC).
- **CELSTAB™** is recommended for the stabilisation of wine against potassium bitartrate crystallisation.
- It inhibits microcrystal nucleation and growth by disrupting surfaces responsible for the formation of crystals.
- **CELSTAB™** has a very high inhibitory power (by optimal degree of substitution) and allows for the stabilisation of highly tartaric-unstable wines.

1 L / 5 L / 20 L

100 - 200 mL/hL

MANNOSTAB™ LIQUIDE 200

Mannoprotein for potassium tartrate stabilisation

Contains the only mannoprotein naturally present in wines with the ability for potassium tartrate stabilisation: MP40 is enzymatically extracted from the yeast cell wall according to a patented process (Patent 2726284), which preserves and ensures the tartaric stabilisation capacity of MP40.

MANOSTAB™ LIQUIDE 200:

- Inhibits crystallisation of potassium bitartrate salts.
- Has a neutral sensory impact on wines.
- Is a natural compound already present in wines.
- Stabilises white, rosé and red wines; still and sparkling wines; filtered and unfiltered wines.
- Generates no waste and requires no water or energy consumption.

*Microscopic observation of potassium bitartrate crystals evolution at -4°C (25°F) in solutions with and without **MANNOSTAB™ LIQUIDE 200***

Available in powder form on request, for the production of wines without sulphites

1 L / 10 L

50 - 150 mL/hL

POLYTARTRYL™

Metatartaric acid under vacuum

- Crystallisation inhibitor of potassium bitartrate salts

POLYTARTRYL™: index 40

SUPER POLYTARTRYL™: index 40/42 - The strongest index of esterification

Incorporate **POLYTARTRYL™ / SUPER POLYTARTRYL™** 48 hours before the final filtration and bottling.

1 kg / 5 kg

10 g/hL (100 ppm)

CA^{2+}STAB™

Preparation of racemic tartaric acid (50/50 mixture of the D and L forms)

- Stabilisation of calcium tartrate salts by selective precipitation of excess calcium

The amount of **CA^{2+}STAB™** to be added is determined after measurement of the calcium content.

It is recommended that the treatment be carried out as early as possible (ideally during alcoholic fermentation). Use on must is recommended.

For use on wines during ageing, a six-week interval before preparation for bottling must be strictly adhered to.
See the product data sheet for instructions on how to use it.

2.5 kg

MICROBIOLOGICAL STABILISATION

OENOBRETT™

Chitosan (of fungal origin) and enzyme-based preparation for the control of *Brettanomyces* spoilage

- Chitosan disrupts *Brettanomyces* cell membrane, leading to cell lysis.
- The synergistic effect of the pectinase/glucanase enzymes accelerates the settling of the lysed cells. The decrease of the *Brettanomyces* population is significant and thus prevents spoilage.
- The antimicrobial action of **OENOBRETT™** is an essential tool within an SO_2 reduction strategy.

23 g *(barrel dose)* / 250 g / 2.5 kg	10 g/hL (100 ppm)

OENOBRETT™ ORG

Preparation based on chitosan of fungal origin to combat *Brettanomyces* spoilage

- Chitosan disrupts the cell membrane, leading to cell lysis.
- The antimicrobial action of **OENOBRETT™ ORG** is an essential tool within an SO_2 reduction strategy.

100 g	4 - 10 g/hL (40 - 100 ppm)

MICROCONTROL™

Formulation based on fungal-origin chitosan and inactivated yeasts, designed to reduce microbial load and protect wines against certain spoilage microorganisms

BIOControl product

- **Reduces overall microbial populations** (non-*Saccharomyces cerevisiae* yeasts, yeasts*, bacteria*)
- Suitable for winemaking approaches with reduced or no added SO_2
- Clarifies wine through sedimentation

**Reduction of populations through the fining effect*

250 g	5 g/hL (50 ppm)

FLORACONTROL™

Formulation of chitosan and inactivated yeasts for the protection of wines against certain spoilage microorganisms

BIOControl product

- Reduction of the overall microbial load (yeasts & bacteria)
- Tool for winemaking and ageing with reduced SO_2 or without sulphites
- Contributes to wine clarification

The inactivated yeast fraction provides a natural reducing component that helps protect wines against oxidation during ageing.

1 kg	20 - 30 g/hL (200 - 300 ppm)

CaFINISH™ NEW

Micronised calcium tartrate for stabilising calcium tartrate salts

- Selected for its high chemical purity, sensory neutrality, and fine microgranular structure
- Acts as a crystallisation initiator for tartrate salts in wine
- Promotes the specific precipitation of excess calcium as calcium tartrate crystals

5 kg / 25 kg	50 - 100 g/hL (500 - 1000 ppm)

FUMARIC^{trl}™

Pure fumaric acid for controlling the growth and activity of the lactic acid bacteria responsible for malolactic fermentation in wine

- Prevents the onset of MLF
- Can stop MLF while in progress
- Preservation of malic acid in wines
- Tool for making wines with reduced SO_2 or with no sulphite added

2.5 kg / 25 kg	30 - 60 g/hL (300 - 600 ppm)

SPECIFIC TREATMENTS

Oenological carbon may be used during winemaking to correct defects caused by fungal contamination and to adjust the colour of oxidised or pinked musts and wines.

Sourced from plant material and selected for their high adsorption capacity, **LAFFORT®** offers a complete range of oenological carbons in powder, granulated, and liquid form to simplify use in the cellar.

Wine quality is intimately linked to the redox balance. **SUPRAROM™** and **SULFIREDOX™** are two tools at your disposal to ensure optimal ageing and preserve the sensory characteristics of your wine.

SPECIFIC TREATMENTS

ACTIVE CARBON

The usage of active carbon is regulated. Please check the current regulations. All treatments must be recorded in a handling register and a holding register.

CHARBON ACTIF LIQUIDE HP

FERMENTATION / AGEING

Activated carbon in a stabilised aqueous solution

- High colour correction and decolourisation capacity

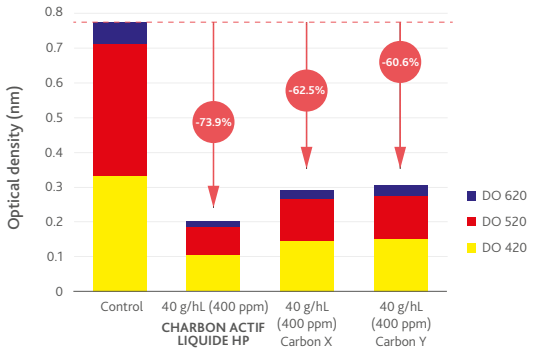
Practical Advice

OPTIMISED DECOLOURISATION

Consider the combined use of **OENOFINE™ NATURE** and **CHARBON ACTIF LIQUIDE HP** in alcoholic fermentation.

- Combination compatible with European regulations for organic winemaking, Regulation (EC) 889/2008
- Colour stabilisation and removal of oxidised compounds
- Selective adsorption of unstable proteins from wine to initiate protein stabilisation

Colour correction and decolourising power (%) of CHARBON ACTIF PLUS GR



Treatment at 40 g/hL (400 ppm) (eq. 600 mL/hL) for the production of a Clairet. Two hours of contact before optical density measurements

10 L 100 - 600 mL/hL

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
CHARBON ACTIF SUPRA 4 FERMENTATION / AGEING	Powdered activated carbon **Colour correction and decolourisation**	20 - 100 g/hL (200 - 1000 ppm)	15 kg
CHARBON ACTIF PLUS GR FERMENTATION / AGEING	Granulated activated carbon **Colour correction and decolourisation**	20 - 100 g/hL (200 - 1000 ppm)	5 kg
GEOSORB™ GR FERMENTATION	Granulated activated carbon Decontaminant for fermenting juice and new wines **Reduction in geosmin and octenone content**	Action on geosmin: 15 - 25 g/hL (150 - 250 ppm) Action on octenone: 35 - 45 g/hL (350 - 450 ppm)	5 kg 15 kg

OTHERS

PRODUCT	DESCRIPTION / APPLICATION	DOSE	PACKAGING
SUPRAROM™ FERMENTATION	Preparation containing condensed tannins, potassium metabisulphite and ascorbic acid Preventive and curative treatment for must oxidation	10 - 25 g/100 kg grapes	1 kg
SULFIREDOX™ AGEING	Copper sulphate solution dissolved in water at 25 g/L **For the elimination of reductive character in wines**	2 - 10 mL/hL	1 L 5 L

PRESERVATIVES

In oenology, sulphur dioxide is widely used for its antioxidant, antimicrobial and stabilising properties.

LAFFORT® offers a range of sulphur formulas in liquid, powder or effervescent tablet form to facilitate their use.

PRESERVATIVES

REFER TO LOCAL LEGISLATION FOR THE MAXIMUM SULPHUR DIOXIDE LEVEL IN THE WINE.

PRODUCT	DESCRIPTION	DOSE	PACKAGING
BISULFITE 15	Aqueous solution of potassium bisulphite	10 mL releases 1.5 g of SO_2.	1 L 5 L 20 L
BISULFITE 18	Potassium bisulphite and sulphur dioxide in aqueous solution	10 mL releases 1.8 g of SO_2.	5 L 20 L
BISULFITE NH_4 150*	Aqueous solution of ammonium bisulphite	10 mL releases 1.5 g of SO_2 and 0.4 g of diammonium.	20 L
BISULFITE NH_4 200*	Aqueous solution of ammonium bisulphite	10 mL releases 2 g of SO_2 and 0.5 g of diammonium.	10 L
BISULFITE NH_4 400*	Aqueous solution of ammonium bisulphite	10 mL releases 4 g of SO_2 and 1.07 g of diammonium.	20 L
SOLUTION 6	Pure sulphur dioxide dissolved in water	10 mL releases 0.6 g of SO_2.	10 L 20 L
SOLUTION 10	Pure sulphur dioxide dissolved in water	10 mL releases 1 g of SO_2.	5 L 10 L 20 L
POTASSIUM METABISULFITE	Neutralised aqueous solution of sulphur dioxide	1 g of potassium metabisulphite releases 0.5 g of SO_2.	1 kg - 25 kg
OENOSTERYL™ 2	Effervescent tablets of potassium bisulphite	Each tablet releases 2 g of SO_2.	Box of 48 tablets
OENOSTERYL™ 5	Effervescent tablets of potassium bisulphite	Each tablet releases 5 g of SO_2.	Box of 42 tablets
SULPHUR DISCS** 2.5 g - 5 g - 10 g	Burnable sulphur tablets	Preservation of empty barrels: burn between 2 - 4 g/hL (20 - 40 ppm) of sulphur (repeat the operation regularly according to the storage conditions). Sulphuring after barrel cleaning: burn between 1 - 3 g/hL (10 - 30 ppm) once the barrels are drained.	Box of 1 kg

**Product is authorised on musts and wines still in fermentation at a maximum dose of 20 g/hL (200 ppm).*
***The production of SO_2 can vary depending on how damp the barrels are.*

Find Out More
Watch our **OENOSTERYL™** video on our website, in the **LAFFORT & YOU** section.

FILTRATION

A crucial step in the winemaking process, filtration is intended to eliminate particles in suspension, microorganisms and other impurities to obtain a clear wine.

LAFFORT® offers a wide range of diatomaceous earths (Kieselguhr), perlites and filter sheets to adapt filtration to the intended purpose and ensure the quality of the finished product.

PRE-COATS & DIATOMACEOUS EARTHS

PRE-COATS

DIATOMYL™ R & DIATOMYL™ B

Filtration aids specifically formulated to improve filtration yields in food-grade liquids
DIATOMYL™ B and **DIATOMYL™ R** are completely chemically inert towards musts and wines and provide improved stability of the precoat throughout the filtration cycle. They help maintain the integrity of the precoat by preventing degradation caused by pressure fluctuations.

REFERENCE	COLOUR	PERMEABILITY	PACKAGING
DIATOMYL™ R	Pink	0.25	15 kg
DIATOMYL™ B	White	0.85	15 kg

RECOMMENDATIONS FOR PRE-COATS:

DIATOMYL™ R is an effective option to optimise the clarification of wines in preparation for bottling.

OPTION 1	PRE-COATS	FILTER COAT
DIATOMYL™ P2	500 - 600 g/m²	√
DIATOMYL™ R	800 g/m²	
DIATOMYL™ P2	500 - 600 g/m²	

OPTION 2*	PRE-COATS	FILTER COAT
DIATOMYL™ P2	500 - 600 g/m²	
DIATOMYL™ R	1 000 g/m²	√

** Specifically intended for white, rosé and dessert wines to meet strict microbiological requirements.*

DIATOMACEOUS EARTHS (KIESELGUHR)

Filtration aid from fossilised algae (diatoms), for improving wine clarification and filter efficiency
DIATOMYL™ products are widely used in the food industry (beer, edible oils, ciders, fruit juice).

REFERENCE	COLOUR	WET DENSITY (g/L)	APPLICATIONS
DIATOMYL™ P00	White	478	New wines, press wines. Filtration of musts, solids or lees on rotary drum vacuum or press filter. Can be used as a pre-coat.
DIATOMYL™ P0	White	440	
DIATOMYL™ P2	White	440	Clarifying filtration of wines. Can be used as a pre-coat as a mechanical protection of the media.
DIATOMYL™ P5	Rosé	314	Clarifying final filtration. Prepares low-microbial wines for sterile filtration.

PERLITES AND FILTER SHEETS

PERLITES

Volcanic rocks of the rhyolite group

PERL products are used in the food industry (wines, ciders, fruit juice, brines, etc.).

REFERENCE	PERMEABILITY (DARCY)	APPLICATIONS
PERL 10	2.5 - 3	Musts, solids and lees on rotary drum vacuum or press filter
PERL 8	1.2 - 1.8	Enzyme-treated musts, new wines on earth or press filters For optimal results, a cellulose-based pre-coat (**DIATOMYL™ B**) is recommended.
PERL 6	0.5 - 0.8	Fine clarifying filtration of wines on earth or press filters For optimal results, a cellulose-based pre-coat (**DIATOMYL™ B**) is recommended.

L SERIES FILTER SHEETS

Sheet filters made of pure cellulose, diatomaceous earth or perlite, intended for wine filtration

L series filter sheets are suited to various technical objectives:

REFERENCE	RETENTION THRESHOLD (µm)	OBJECTIVE
L 60	0.35	Filtration for "sterile" bottling of at-risk wines (high pH, residual sugar) To limit bacterial risks Filtration before membrane (0.45 - 0.65 µm)
L 40	0.45	Sterile filtration Filtration before membrane (0.45 - 0.65 µm)
L 15	0.60	Yeast sterile filtration Filtration before membrane (0.65 µm)
L 12	1	Fine filtration with significant reduction of microbes (yeasts)
L 7	1.5	Clarifying filtration
L 5	2	Refining filtration
L 3	2 - 3	Filtration with strong haze retention power

CLEANING PRODUCTS

Wine is a food product that must comply with strict hygiene rules. It provides an environment that can support the growth of numerous microorganisms, which, although not dangerous to health, can affect the quality of the wine.

The surfaces of containers in contact with must and wine must be completely free of spoilage microorganisms and their substrates (tartrate crystals, etc...).

LAFFORT® offers a complete range of hygiene products for cleaning and disinfecting all types of equipment (stainless steel and concrete tanks, pumps, hoses, filters, bottling lines, etc.) and the cellar (floors, walls...).

HYGIENE AND OENOLOGY

A FULL RANGE OF HYGIENE PRODUCTS FOR THE WINE SECTOR

PRODUCT	ACTIVE INGREDIENT	ACTIONS	PACKAGING
DECATARTRE LIQUIDE	LIQUID ALKALI	DETERGENT AND TARTRATE REMOVAL	20 L
DECAPOL™ CHLORÉ	CHLORINATED ALKALI	DETERGENT AND DECONTAMINANT	20 L
DECAPOL™ ACTIF	HYDROGEN PEROXIDE	DECONTAMINANT, DETERGENT ACTIVATOR	20 L
DECAPOXY™ 5	PERACETIC ACID	DISINFECTANT	20 L
P3 VINO MFC	LIQUID ALKALI	DETERGENT FOR MEMBRANE SYSTEMS	20 L

For instructions on the dose and how to use it, consult the product datasheet.

REGENERATION AND UNCLOGGING OF FILTER MEMBRANE UNITS

Aiming to support our partners during all steps of winemaking, **LAFFORT®** offers a new range of cleaning products specially developed to regenerate and unclog the filter membrane units. Based on enzymatic technology, it allows for more efficient cleaning of crossflow filters and filter cartridges.

DECAPOL™ EXTRA*Life*

Enzymatic detergent created to decompose organic residues in filtering systems (crossflow filters and filter cartridges)

- Free of phosphate and surfactants (can be directly applied to filter cartridges)
- Strong oxidiser
- Suitable for everyday use or for unclogging programs
- Used in a closed circuit or CIP

For instructions on the dose and how to use it, consult the product packaging.

5 kg

DECAPOL™ DEEP*Clean*

Enzymatic detergent created to decompose organic residues in filtering systems (crossflow filters)

- Moderate oxidiser
- Suitable for everyday use or for unclogging programs
- Specific for cleaning crossflow filters
- Used in a closed circuit or CIP

For instructions on the dose and how to use it, consult the product packaging.

5 kg

NOBILE®

L'œnologie du bois

NOBILE®

The oenology of wood

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

MATERIAL SELECTED

Carefully selected for their oenological 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 to limit natural variability and ensure reproducibility.

The oak is seasoned 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 oenological potential of each product.

PRECISION TECHNOLOGY

As a producer of wood for use in oenology, 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 other specific methods for reproducing heated gradients comparable to barrel toasting. Experience and control of toasting techniques govern the release of volatile compounds from the wood and ensure aromatic and tannic reproducibility for elaborate flavour profiles.

DOSAGE & CONTACT TIME

The dosage or quantity, depending on the wood alternative used, must be considered and will be based on the characteristics of the wine's style. Contact time is defined by tasting throughout ageing. For more usage tips, consult the **NOBILE®** team, who specialise in the oenology of wood.

REGULATIONS

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

NOBILE®

L'œnologie du bois

THE NOBILE® TOASTING PROCESSES

HOMOGENEOUS TOASTING
The toasting program is dedicated to reproducing complex aromatic expressions.

HOMOGENEOUS TOASTING

GRADIENT TOASTING
A surface heating process 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, resulting in an aromatic complexity similar to barrel ageing.

DOUBLE TOASTING

SOFT OAK
Exclusive to the NOBILE® range, the "Soft Oak" method is used to optimise the softness of the tannins during toasting.This program contributes to the creation of unique sensory expressions.

SOFT OAK PROCESS

DISCOVER OUR WEBSITE, WHICH IS ENTIRELY DEDICATED TO OAK FOR WINEMAKING

A complete website to find all the products we offer and our decision-making tools to help you create the best oak-wine balance.

With our calculator, easily estimate your need in Staves (and its equivalent in Blocks) depending on the volume of wine to be treated and the required level of oaking and complexity.

JOIN US ON INSTAGRAM
@nobile_oenologie

CHIPS & GRANULARS

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

COMPLEX PROFILE

NOBILE® SWEET VANILLA
Chips

Lush vanilla & marshmallow flavours

NOBILE® CHERRY SPICE
Chips

Sweet entry, black fruits & spicy

NOBILE® DARK ALMOND
Chips

Roasted complexity & dark chocolate

TRADITIONAL PROFILE

NOBILE® SWEET
Chips & Granulars

Vanilla & toasted

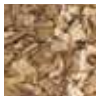
NOBILE® INTENSE
Chips

Volume & coffee

NOBILE® AMERICAN BLEND
Chips & Granulars

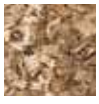
Caramel & smoky

UNTOASTED OAK - VINIFICATION



NOBILE® FRESH GRANULAR 24M
Granulars

Antioxidant & structure



NOBILE® AMERICAN FRESH GRANULAR
Granulars

Fruit & lactones

CHIPS VARIETAL PROFILE

Preserves varietal character without notes of oak

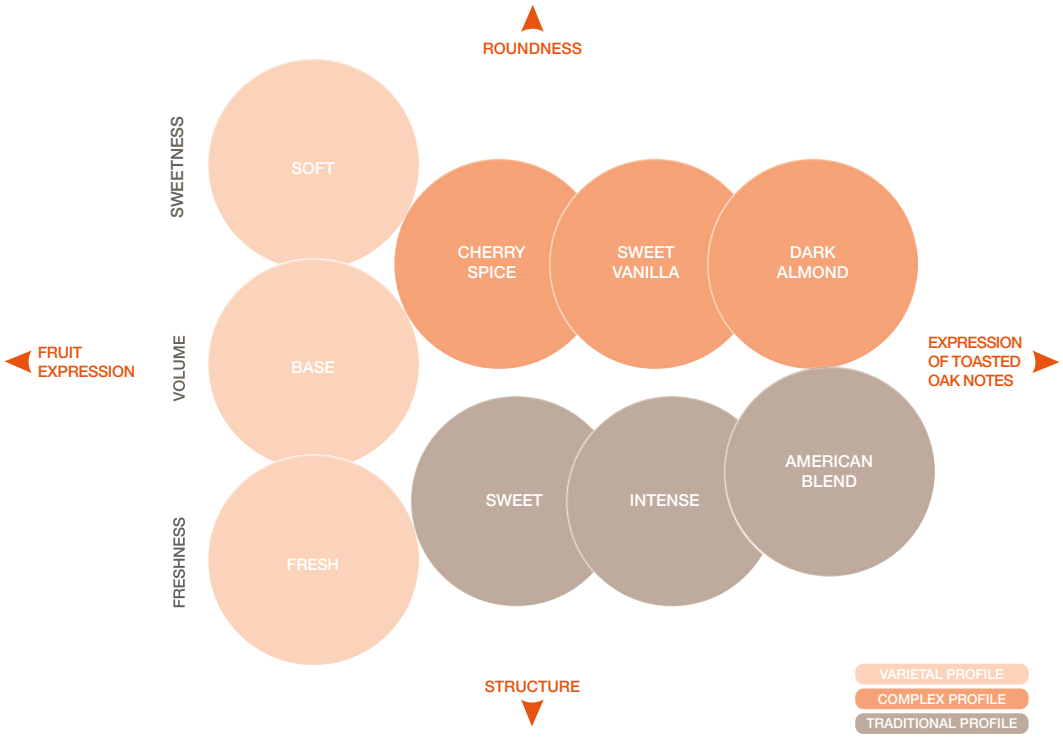
VARIETAL PROFILE

NOBILE® SOFT Chips ▶ Sweetness & length

NOBILE® BASE Chips ▶ Volume & roundness

NOBILE® FRESH THERMO TREATED Chips & Granulars ▶ Freshness, fruit & structure

CHIPS POSITIONING



STAVES, BLOCKS & BARREL REFRESH

Character and complexity whilst respecting the fruit

STAVES 18 MM

HOMOGENEOUS TOASTING

18 - XBASE

Intensity and palate weight
Fruity, without overt oak characters

18 - XTREME

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

GRADIENT TOASTING

18 - DIVINE

Enhanced texture
Extension of the fruit to a complex finish (such as the elegance of Burgundian barrels)

STAVES 12 MM

DOUBLE TOASTING

ELITE

Toasted nuances and volume
Similar to traditional barrel ageing (Bordeaux style)

HOMOGENEOUS TOASTING

DULCE

Roundness & sweetness
Dulce de leche & caramel

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, spice bread & lactone

AGEING OBJECTIVES

		STAVES 7 MM	STAVES 12 MM	STAVES 18 MM
	RESPECTS THE FRUIT WITHOUT TOASTED NOTES	**FRESH** Structure & fruit		**18 - XBASE** Volume & sweetness
	AROMATIC	**SENSATION** Vanilla & toasted notes **INTENSE** Chocolate & roasted notes	**DULCE** Sweet, Dulce de leche & caramel	**18 - XTREME** Roasted coffee & mocha
	COMPLEXITY SIMILAR TO BARREL AGEING	**RÉVÉLATION** Structure & fruit	**ELITE** Complex & traditional	**18 - DIVINE** Burgundy barrel style

OENOLOGICAL +

- Slow and gradual extraction.
- Aromatic expression with respect for the fruit.
- Character and complexity comparable to barrel ageing.

BARREL REFRESH

Give a second life to your barrels.

Patented attachment system (FR 1752945) for ultra-easy implementation.

CUSTOM MADE

BARREL REFRESH SPECIAL — A custom blend of 7 & 12 mm profiles can be made to specification to achieve particular characteristics and styles.

BARREL REFRESH SPECIAL 18 — A custom blend of 7, 12 & 18 mm profiles can be made to specification to achieve particular characteristics and styles.

NOBISPARK

Aromatic persistence and smooth effervescence

CONCEPT

The search for the finest balance between the natural compounds of oak and sparkling wines during alcoholic fermentation has led us to develop NOBISPARK. This oenological bidule is the result of a project aimed at developing the use of oak during the second fermentation.

Used in the same way as a classic bidule, NOBISPARK does not require any specific equipment when it is inserted after filling the bottle.

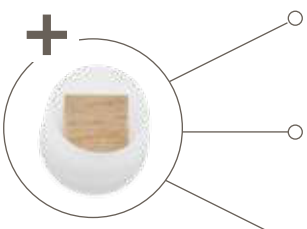
NOBISPARK RANGE

Improves the aromatic persistence of wines on the palate and reinforces the smoothness of the effervescence.

NOBISPARK FRESH ▶ Brings a sensation of sweetness and volume while preserving the integrity, freshness and fruit of the initial blend - no toast flavours.

NOBISPARK SENSATION ▶ Brings complexity and toast flavours, perfectly integrated by the second fermentation, while keeping the fruit intact.

OENOLOGICAL +



- **Sensory differentiation of sparkling wines** from the same initial blend.
- **Improved aromatic clarity** by eliminating any notes of reduction in young wines.
- **Antioxidant protection** considerably improves the ageing potential of sparkling wines.

SPIRIT RANGE

A full range of high-quality chips developed specifically for spirits

HOMOGENEOUS TOASTING

NOBILE®
FRUIT SHINE

- Sensation of freshness on the palate
- Slightly enhanced structure

Aromatic expression:

- **Enhanced fruit**
- Delicate oaky complexity

FRENCH OAK

NOBILE®
BOURBON CASK

- **Volume & roundness**
- Warm balance on the palate

Aromatic expression:

- Lush: crème brûlée, brown sugar
- Complex: Madagascar vanilla, bourbon, orange peel, caramel

AMERICAN OAK

SOFT OAK PROCESS

NOBILE®
OLD RESERVE

- Delicate texture
- **Supple and silky tannins**

Aromatic expression:

- Lush: biscuit, vanilla
- Complex: dried fruit, spices, floral
- Lengthy and sophisticated oaky complexity

AMERICAN OAK

LAFFORT®

THE ORGANIC COMMITMENT

Organic certifications and wine

The products and product ranges usable in organic winemaking are defined by EU Regulation 889/2018 and the USDA's (United States Department of Agriculture) National Organic Program (NOP).

Certifications

The list of **LAFFORT®** products authorised within the framework of the European Organic legislation and/or NOP is available on our website (direct access is available by scanning the QR code below).

We have chosen to entrust certification to the external inspection body Ecocert. Three of our products are certified in accordance with Regulation (EU) 2018/848.

LAFFORT
l'œnologie par nature

Our certificates & listed products:

ZYMAFLORE™ 011 BIO
OENOCELL™ BIO
OENOGOM™ BIO

BiO

More than 153 products or ranges are listed on the website www.intrants.bio as authorised within the framework of the European Organic legislation.

Where can I find LAFFORT® certificates?

Go to www.laffort.com, «Downloads» section, «Certificates» category.

www.laffort.com/downloads/certificates

ROSÉ

At **LAFFORT®**, we are well aware of the technical skills and know-how required to make rosés. In this type of winemaking, success is based on control of the hue combined with aromatic complexity. Thanks to our R&D department, our team of oenologists, and close collaboration with our partners in the field, we have developed recognised expertise in this area, which is reflected in our range of targeted products specifically developed to make the best rosés.

Christophe ROSSI
Rosé Brand Manager

ROSÉ VINIFICATION

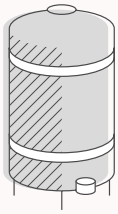
BIOPROTECTION

BIOProtection using the non-*Saccharomyces* yeasts **ZYMAFLORE™ ÉGIDE**^{TDMP} and/or **ZYMAFLORE™ KHIO**^{MP} aims to preserve the quality of the grapes or freshly pressed must by protecting it against oxidation and the development of spoilage microorganisms, as part of a strategy to reduce the use of sulphites.

ZYMAFLORE™ KHIO^{MP}

DIRECT INOCULATION

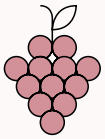
BIOProtection in the liquid phase, suitable for low-temperature conditions (stabulation). Strong capacity to consume oxygen in musts.

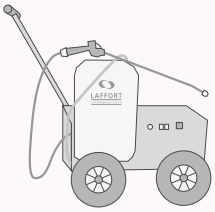


ZYMAFLORE™ ÉGIDE^{TDMP}

DIRECT INOCULATION

BIOProtection on grapes and harvest reception equipment (by spraying).





ENZYMES

The use of enzymes in rosé wine-making plays an essential role at the following stages:

- **Pressing:** The rapid release of high-quality juice through the use of specific press enzymes allows for better management of uncontrolled maceration to obtain better aromas and ensure precise colour management.
- **Clarification:** Full and clean depectinisation enables better solids management, whether from flotation, natural settling or stabulation.
- **Aromatic optimisation:** The secondary activity of some of our specific enzymes contributes to enhanced aromatic expression (thiols, terpenes).

PROCESS OPTIMISATION		AROMATIC OPTIMISATION	
Pressing	Clarification	Aromatic thiols revelation	Terpene aroma revelation
LAFAZYM™ PRESS*	LAFAZYM™ CL*	LAFAZYM™ THIOLS[+] (must and wines in fermentation)	LAFAZYM™ AROM (end of AF and finished wines)
LAFASE™ XL PRESS* *(liquid)*	LAFAZYM™ 600 XL^{ICE}* *(liquid)*		
	LAFASE™ XL CLARIF *(liquid)*		

* Purified enzymes

ROSÉ VINIFICATION

FERMENTATION

Our selection of yeasts for rosé winemaking

ZYMAFLORE™ ROSÉ

ZYMAFLORE™ XAROM

ZYMAFLORE™ X16

ZYMAFLORE™ X5

ZYMAFLORE™ XORIGIN

YEAST NUTRITION

Appropriate nutrition is essential for successful fermentation, both in terms of its kinetics and from a sensory perspective.

YEAST PREPARATION ADDITIVE	NUTRIENT	PROTECTION
SUPERSTART™ *Blanc* & *Rosé* To be used when rehydrating the yeast. Yeast rehydration product with a high sterols, vitamin and mineral content for optimising yeast metabolism throughout fermentation.	**NUTRISTART™ AROM** Complete nutrition - mixed, to correct nitrogen deficiencies in musts.	**FRESHAROM™** To be used $^{1}/_{3}$ of the way through AF. Formulation rich in reductive metabolites promoting the assimilation of glutathione precursors for the aromatic preservation of wines.

Effectively protects the wine's aromatic potential and significantly delays the appearance of oxidation-related notes and colours, resulting in more aromatic wines with better ageing potential.

Decision Making Tool

Discover our **YEAST NUTRITION TOOL** on our website, at the **LAFFORT & YOU** section.

ROSÉ VINIFICATION

FINING – MUST OR WINE

Early fining, on the must or during alcoholic fermentation, helps act on the phenolic compounds that trap aromas, and allows the wine's colour to develop and its structure to be modified. Appropriate fining will help produce high-quality rosé wines.

The colour chart below represents the hue and intensity of the rosé must or wine to be treated. Next to it, you will find the recommended product(s) to be used to achieve your goal.

Refine wines and
control colour intensity.

ORGANIC USABLE UE 2018/848

Natural origin

VEGEMUST™

Vegetable proteins (patatins, pea).
Effective clarification. Reduction of the phenolic content.

OENOFINE™ NATURE

Inactivated yeast, vegetable proteins (patatin, pea), calcium bentonite.
Elimination of oxidisable and oxidised phenolic compounds.

OENOFINE™ PiNK

Inactivated yeast, vegetable protein (patatin), activated carbon, sodium bentonite.
Reduction in hue, elimination of phenolic compounds.

Synergistic formulations

POLYMUST™ ROSÉ

PVPP, vegetable protein (patatin).
Stabilises hue, reduces phenolic acids.

POLYLACT™

PVPP, potassium caseinate.
Elimination of browning.

Controlling oxidation

IN ADDITION TO OTHER FINING PRODUCTS

CHARBON ACTIF LIQUIDE HP

HUE MANAGEMENT

Activated carbon in stabilised aqueous solution.

- Optimal hue management.
- High decolourisation capacity.

The use of activated carbon is regulated; check the current laws.

ROSÉ VINIFICATION

PREVENTING OXIDATION

POWERLEES™ LIFE

A formulation of inactivated yeasts rich in reducing compounds including reduced glutathione

POWERLEES™ LIFE was selected during a research program to study alternatives to sulphites for the protection of wines during ageing. The specific inactivated yeasts that go into the composition make it possible to act as:

➔ **A preventive measure** (after fermentation):

- Significantly slowing down oxygen consumption by oxidisable compounds in the wine.
- Stabilising the colour of rosés by avoiding browning due to oxidation.
- Preserving the aromatic profile from the end of fermentation until the bottle is opened.

➔ A corrective measure:

- Refreshing the aromatic profile of already oxidised wines.
- Fixing acetaldehyde and limiting its volatility.

STABILISATION

At the end of the process, certain choices can alter the aromatic profile or colour of wines; stabilisation options are available that respect the quality and style of the wine.

PROTEIN STABILISATION	CALCIUM STABILISATION*
MICROCOL™ ALPHA Natural sodium bentonite that respects colour and aromas while also having good protein removal capacity.	**CA^{2+}STAB™** Stabilisation of calcium tartrate salts by selective precipitation of excess calcium.

TARTARIC STABILISATION		
CELSTAB™ CMC for tartaric stabilisation of potassium bitartrate salts. To be used after a laboratory trial.	**POLYTARTRYL™** Metatartaric acid - Inhibits crystallisation of potassium bitartrate.	**MANNOSTAB™ LIQUIDE 200** Natural mannoprotein for tartaric stabilisation of potassium bitartrate salts. Can be used in organic winemaking.

*It is recommended that the treatment be carried out as early as possible (ideally during alcoholic fermentation). Use on must is recommended. When used on wine during ageing, a period of six weeks must be strictly observed before preparation for bottling. Seek advice from your oenologist. Refer to the product data sheet for conditions of use.

LAFFORT® QUALITY COMMITMENT

As part of our global quality management policy, we continuously strive to meet your needs to the best of our ability. Certificates are available on the **LAFFORT®** website, confirming the quality of **LAFFORT®** products regarding the following points:

- FSSC 22000 certificate - Category K and FII.
- Ecocert certificate for certified organic products according to European Regulation (EU) 848/2018.
- List of **LAFFORT®** products available for use in organic winemaking and/or the US National Organic Program's (NOP) winemaking regulations.
- Certificates for our Kosher passover products.
- General attestation.
- List of allergenic products.
- Statement on animal welfare.
- Packaging: suitability for contact with foodstuffs and environmental.
- Vegan certificates.
- Recommendations for labelling oenological products in wine.

SPARK

The production of quality sparkling wine follows a sequence of stages that must be optimised to achieve the desired final product. For each stage, **LAFFORT®** has gathered under the **SPARK** range the products best suited not only for producing ***traditional sparkling wines***, but also for enabling the production of ***sparkling wines using the Charmat method***.

François Botton
Spark Range Manager

LAFFORT® SPARK
BASE WINE PRODUCTION

The quality of sparkling wines depends to a large extent on the meticulous preparation of the base wine. This fundamental step, often overlooked, plays a decisive role in the complexity, balance and elegance of the sparkling wine. Here are a few key factors that can contribute to the success of your base wine.

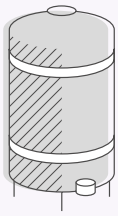
BIOPROTECTION, SO_2 REDUCTION AND O_2 CONSUMPTION

BIOProtection using the non-*Saccharomyces* yeasts **ZYMAFLORE™ ÉGIDE**^{TDMP} and/or **ZYMAFLORE™ KHIO**^{MP} aims to preserve the quality of the grapes or freshly pressed must by protecting it against oxidation and the development of spoilage microorganisms, as part of a strategy to reduce the use of sulphites.

ZYMAFLORE™ KHIO^{MP}

DIRECT INOCULATION

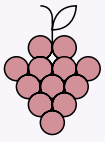
BIOProtection in the liquid phase, suitable for low-temperature conditions (stabulation). Strong capacity to consume oxygen in musts.

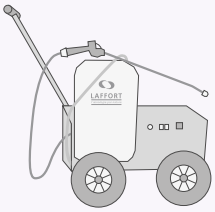


ZYMAFLORE™ ÉGIDE^{TDMP}

DIRECT INOCULATION

BIOProtection on grapes and harvest reception equipment (by spraying).





JUICE CLARIFICATION

Depectinisation of the juice after pressing is essential for rapid clarification. Low pH is often a limiting factor for musts intended for base wines. The use of **LAFAZYM™ 600 XL**^{ICE} helps break down the pectins responsible for turbidity, resulting in effective sedimentation within just a few hours and facilitating the fining of the different must fractions.

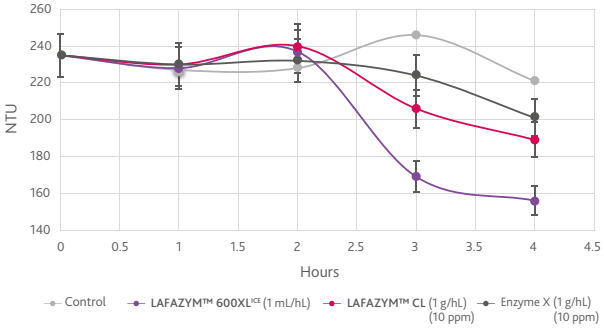
LAFAZYM™ 600 XL^{ICE}

EXTREME pH

Fast and effective must clarification over a wide pH range (2.9 - 4.0) and temperature range.

- Preparation of pectolytic enzymes.
- **Provides rapid depectinisation even at low temperatures (effective from 5°C / 41°F).**
- Reduces settling time and improves lees compaction.

Test on Pinot Noir must (Champagne)



Turbidity after static settling.

pH	Total acidity g/L (tartaric acid)	Total acidity meq/L	Density at 20°C - g/mL (°Brix)	Estimated sugar g/L	Potential Alcohol (16.83 g/L = 1% vol)
3.06	12.47	166.3	1068 (16.2)	156	9.25

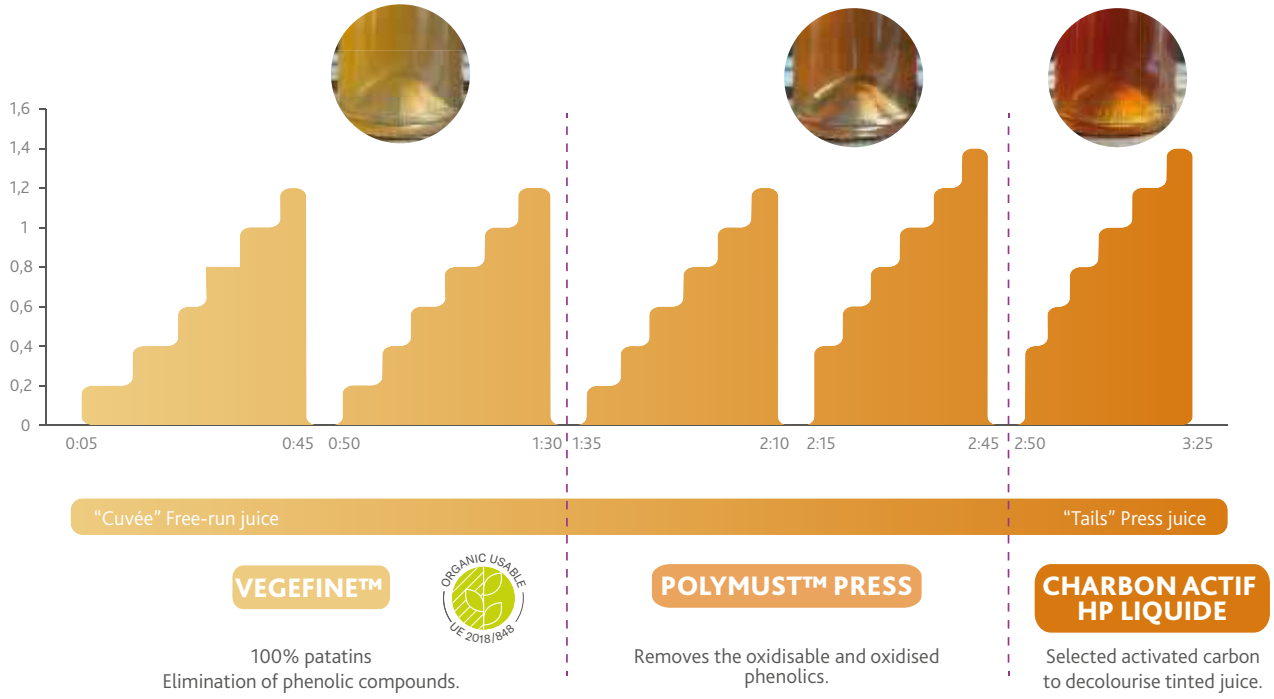
LAFFORT® SPARK
BASE WINE PRODUCTION

MUST FRACTIONING AND FINING

Must fractioning involves separating the juice into several fractions at different points in the press cycle. While this approach is strictly regulated in Champagne, it is advisable to fractionate as a function of the press cycle, as described below. This approach makes it possible to separate the more delicate "free-run" juice from the press juice or "tails", which contain potentially bitter or astringent compounds.

This strategy has several advantages:

- Aromatic quality: Fractioning makes it possible to preserve delicate aromas and varietal characteristics without spoilage due to over-extraction.
- Unwanted compounds are removed through precise, almost surgical, fining of the fractions that need it most. It is thus possible to precisely eliminate phenolic compounds and colouring matter from each of the fractions according to the grape variety.



FINING WITH OENOFINE™

OENOFINE™ is a range of products based on BIOSourced ingredients. The synergy between their raw materials makes them **good alternatives to PVPP** and its various applications.

OENOFINE™ NATURE

Inactivated yeast, vegetable proteins (patatin and pea), calcium bentonite

- Oxidation management

OENOFINE™ PINK

Inactivated yeast, vegetable protein (patatin), activated carbon, sodium bentonite

- To be used on **Blanc de Noirs in the pre-fermentation** phase for better management of oxidation and hue.

Non-fined control

OENOFINE™ NATURE

LAFFORT® SPARK
BASE WINE PRODUCTION

PRODUCTION OF BASE WINES: A QUESTION OF STYLE...

Meticulous control of alcoholic fermentation is essential in the production of sparkling base wine. This complex process is greatly influenced by the judicious choice of yeast strains and their corresponding nutritional requirements.

CLASSIC

ZYMAFLORE™ SPARK

Strain isolated in Champagne, tested, validated and recommended by the microbiology laboratory of the CIVC technical centre. Its presence during fermentation helps to preserve delicate aromas and authentic expressions of the terroir.

ZYMAFLORE™ 011 BIO

Strain isolated in Champagne. Selected for its remarkable fermentation performance (Certified Organic).

COMPLEXITY AND FRESHNESS

ZYMAFLORE™ CX9

Expresses notes of lemon zest, toasted almond and fresh hazelnut. Particularly recommended to reinforce the richness of wines in the event of a non-MLF strategy. It imparts a structure and aromatic complexity typical of wines that have undergone malolactic fermentation (MLF) while preserving the natural freshness of wines made without MLF.

ZYMAFLORE™ KLIMA

Ability to preserve and even synthesise malic acid during fermentation: reinforces the acidity and freshness of wines to give balanced, expressive "cuvées".

MODERN AND FRUITY

ZYMAFLORE™ CGN24

NEW

Strong production of elegant fermentative aromas such as **green apple** and **fresh pear**.

Reliable and robust, it allows the production of precise, fresh, **Prosecco-style wines**.

GIOVANNI PAGOTTO
OENOLOGIST, CONEGLIANO REGION

«**ZYMAFLORE™ CGN24** provides a typical and original signature: a fresh, juicy, light wine that is perfectly balanced - and above all, less sweet.»

Practical advice

For yeast nutrition, consider **SUPERSTART™ SPARK**, a yeast preparation additive specifically designed for the difficult conditions found with sparkling wines and when restarting fermentation (Patent FR 2736651).

MALOLACTIC FERMENTATION STRATEGY

The decision to opt for MLF in the production of sparkling base wines depends on the winemaker's specific objectives in terms of style, aromatic complexity and taste balance. Choosing to initiate or block MLF requires an in-depth understanding of the required characteristics of the final product. If the decision is taken to opt for MLF, **LAFFORT®** offers a strain of bacteria selected in Champagne specifically for base wines with a low pH.

LACTOENOS™ B16 *Standard*

***Oenococcus oeni* strain selected for low pH base wines.**

- A very resistant strain, particularly adapted to low pH levels found in base wines. Pre-acclimatisation is achieved in the cellar through a step-by-step protocol (see technical tools).

Find out more

Discover our **LACTOENOS™ B16 *Standard* reactivation protocol** on our website in the **LAFFORT & YOU** area.

LAFFORT® SPARK
BASE WINE PRODUCTION

PROTEIN STABILISATION

Ensuring the protein stability of the base wine is a crucial step in the sparkling winemaking process. Meticulous and systematic verification of protein stability is essential to guarantee the clarity and quality of the final product. The usual method for achieving protein stability is the use of natural sodium bentonite.

MICROCOL™ ALPHA

Micro-granulated natural sodium bentonite with strong protein-removal capacity for stabilising and clarifying wines over a wide pH range.

- Strong capacity to remove heat-sensitive proteins over a wide pH range.
- The charge remains stable over time.
- Very good lees settling (strong clarification capacity).
- Preserves aromatic intensity.
- Contributes to the stabilisation of colouring matter.
- Helps improve the brightness of wines.

TARTARIC STABILISATION

Once the base wines are protein-stable, proceed with tartaric stabilisation to prevent the formation of tartrate crystals in bottle, ensuring the wine's clarity and avoiding any undesirable deposits during storage.

MANNOSTAB™ LIQUIDE 200

Liquid formulation of a specific mannoprotein (MP40 - Patent No. 2726284), naturally present in wine, with the property of inhibiting crystallisation of potassium bitartrate.

- Inhibits the crystallisation of potassium bitartrate salts.
- Stabilises white, red and rosé sparkling wines, filtered or unfiltered.

With the traditional method, addition is made before bottling to prevent tartrate precipitation during ageing on lees. It is also possible to make an addition on disgorging.

CELSTAB™

The solution of cellulose gum (100 g/L), CELSTAB™, is a highly purified cellulose polymer of vegetable origin with a low degree of polymerisation and viscosity.

- The liquid (10% solution) formula makes it easy to incorporate into the base wine.

In the traditional method, the addition is made before bottling.

INNOVATION NOBILE®

NOBISPARK

The search for the finest balance between the natural compounds of oak and sparkling wines during alcoholic fermentation has led us to develop NOBISPARK. This oenological bidule enables the second fermentation under oak, resulting in more complex and elegant Traditional Method wines.

Improves the aromatic persistence of wines on the palate and reinforces the smoothness of the effervescence.

NOBISPARK FRESH ▶ Brings a sensation of sweetness and volume while preserving the integrity, freshness and fruit of the initial blend - no toast flavours.

NOBISPARK SENSATION ▶ Brings complexity and toast flavours, perfectly integrated by the second fermentation and keeping the fruit intact.

LAFFORT® SPARK
BASE WINE PRODUCTION

PRESERVATION OF BASE WINES

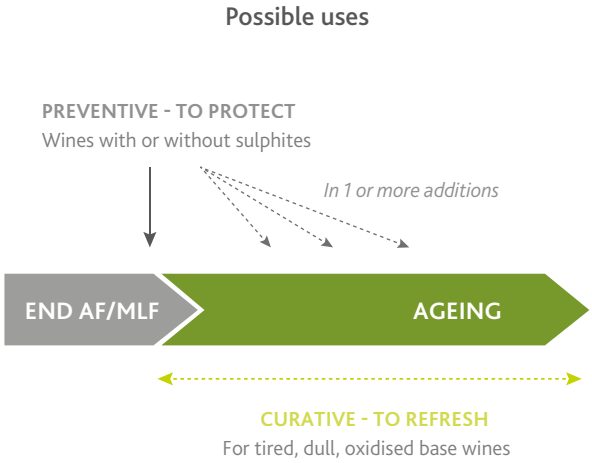
Preserving base wines in optimum conditions, in terms of temperature and exposure to oxygen, is essential to maintain the freshness and specific characteristics of each cuvée. By nature, base wines have low sulphite additions, and care must be taken to ensure that there is no spoilage before bottling. With this in mind, our R&D department has developed **POWERLEES™ LIFE.**

POWERLEES™ LIFE

A formulation of inactivated yeasts rich in reducing compounds, notably reduced glutathione, to preserve and refresh wines during ageing.

POWERLEES™ LIFE offers several significant advantages:

- Protects wines from premature oxidation during ageing, whether or not they contain added sulphites.
- Significantly slows down oxygen consumption by oxidisable compounds in the wine.
- Preserves wine colour.
- **Refreshes the aromatic profile of already oxidised wines, notably reserve wines.**



POWERLEES™ LIFE can be added once or several times from the end of fermentation and throughout the ageing period. It offers a complementary solution to sulphur dioxide (SO_2) as part of a strategy to reduce sulphite additions while ensuring effective protection of the wines. This innovative product is thus part of an approach to preserving quality while addressing the challenges associated with moderate sulphite use.

AURÉLIE POULAIN
CONSULTANT OENOLOGIST IN CHAMPAGNE

"I recommend **POWERLEES™ LIFE** for firming up wines with limited ageing potential. Its antioxidant action makes it possible to limit SO_2 additions and is part of a sulphite reduction strategy.
On very tired reserve wines, with oxidative or even aldehydic character, a dose of 20 g/hL (200 ppm) of **POWERLEES™ LIFE** helps to restore tension, freshness and aromatic clarity, removing the oxidative aspect."

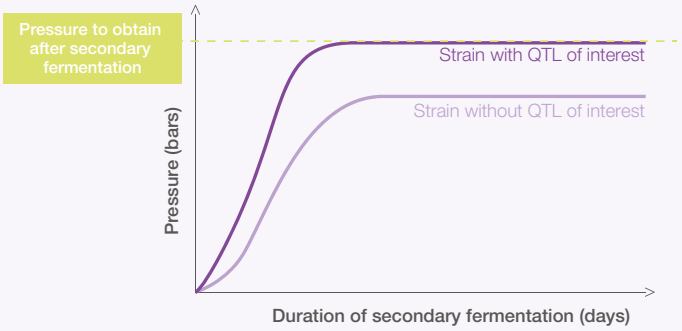
In conclusion, preparing base wines is a delicate process that requires expertise and a deep respect for the terroir. It is the very essence of creating exceptional sparkling wines, underlining the importance of each step in achieving excellence in the glass.

LAFFORT® SPARK
SECONDARY FERMENTATION

The fermentation takes place in a closed container, resulting in a significant increase in pressure due to the release of carbon dioxide (CO_2), which can reach concentrations of up to 12 g/L. The secondary fermentation takes approximately 45 days, with distinct phases linked to the increasing pressure.

Yeasts selected for their ability to complete the secondary fermentation

The robustness of certain yeasts to "prise de mousse" used to be based on empirical criteria. However, this is now explained by the presence of several genetic markers (QTL) that determine their resistance to low pH (< 2.8) and high pressures (Marti-Raga, 2017).



LAFFORT® takes these genetic criteria into consideration when recommending yeasts suitable for the secondary fermentation.

TRADITIONAL METHOD

CHARMAT METHOD

SUPERSTART™ SPARK

Yeast rehydration preparation adapted to sparkling wine conditions (Patent FR 2736651).
A combination of survival (lipid) and growth factors to ensure a complete "prise de mousse".

ZYMAFLORE™ SPARK

Yeast recommended for fine, elegant and full sparkling wines.
Develops tertiary aromas for fine, complex and elegant sparkling wines.

Tested and validated by the microbiology laboratory of the CIVC technical centre (Comité Interprofessionel du Vin de Champagne).

CLEANSPARK

Riddling adjuvant (bentonite/alginate).
Quick and complete removal of particles and sediments in bottles after ageing "sur lattes" (on lees).

TANSPARK

A combination of gallic and ellagic tannins in liquid form.
Rebalances redox potential of the base wine, reinforces its structure and confers shininess to the finished sparkling wine.

ZYMAFLORE™ X16

Yeast for aromatic and modern sparkling wines.
High production of secondary aromas (white peach, white flowers, yellow fruits).

FRESHAROM™

Specific preparation of inactivated yeast with high protective power (5.3%).

Allows for increased aromatics, as well as better ageing potential in sparkling wines.

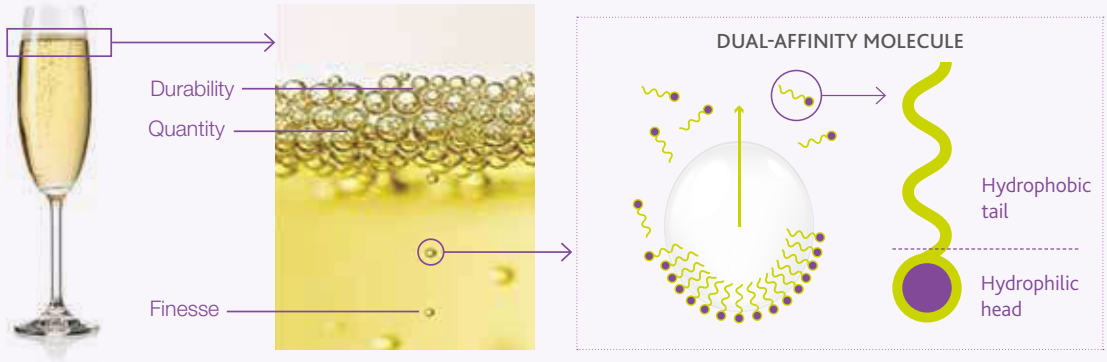
Actively contributes to bead fineness and mousse retention before adding the starter culture for secondary fermentation.

LAFFORT® SPARK
QUALITY OF BUBBLES

ROLE OF MANNOPROTEINS IN BUBBLE AESTHETICS

The ideal aesthetic of effervescence in sparkling wine is for tasters to observe **fine, elegant and persistent** bubbles in the glass, regularly supplying a generous and stable cordon (rim or collar) to form a **harmonious** foam. The research program (**SPUM**) on the aesthetics of effervescence, launched by **LAFFORT®** in 2014 in collaboration with Prof. Gérard Liger-Belair's team at the University of Reims Champagne Ardenne, allowed us to study the effect of the different mannoprotein fractions of yeast, then to demonstrate their impact on the quality and stability of the wine foam. **MANNOSPARK™** is a specific formulation resulting from this study.

Mechanism and interactions in the bubble-forming process



Sparkling wines contain greater or lesser quantities of surfactant macromolecules from grapes and yeasts. They play a fundamental role in the lifespan and quality of the bubbles in a glass. From birth, the bubble is charged with CO_2, its growth directly linked to the concentration of dissolved CO_2 in the wine. It then detaches from its nucleation site and rises to the surface. During its journey, it captures the surfactant molecules in the wine, including mannoproteins. When the bubbles reach the wine's surface, the surfactant macromolecules play their **protective role** by prolonging the bubbles' lifespan and thus promoting the formation of the collar.

MANNOSPARK™

TIRAGE | DISGORGING

Specific yeast cell wall mannoproteins (Patent 2726284).

- Reinforces tartaric and colloidal stabilisation.
- Restores the foaming properties of wines.
- Refines the size of bubbles to ensure their elegance.
- Promotes persistence of foam at the surface of the glass.
- Allows the formation of a more generous rim of foam that is more stable over time.

*Comparison of bubble collar and size under standardised serving conditions for a Crémant rosé , with or without **MANNOSPARK™** (100 ml/hL added at bottling before secondary fermentation - bottle fermented, 12 months on lees).*

MANAGEMENT OF AGEING ON LEES AND SWEETNESS

OENOLEES™

TIRAGE

Specific preparation of yeast cell wall extract. (Patent EP 1850682).

- Accelerates the development of "ageing on lees" characters.
- Optimises foam finesse and persistence.

OENOLEES™ MP

DISGORGING

Specific preparation of yeast cell wall extract (mannoproteins), rich in sapid peptide content and polysaccharides (Patent EP 1850682).

- Significantly reduces the quantity of liqueur.
- Allows the winemaker to delicately balance both acidity and bitterness.
- Actively helps restore the foaming properties of the sparkling wines.

ALCOHOLIC FERMENTATION RESTART PROTOCOL

For 100 hL of wine in stuck alcoholic fermentation (AF)

PRELIMINARY OPERATION ON STUCK WINE

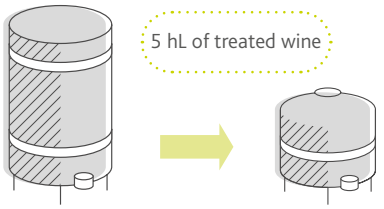
- Rack avoiding air.
- Adjust wine temperature to 20°C (68°F).
- Adjust SO_2 at 1 - 2 g/hL (10 - 20 ppm).
- Add: → For white wines: **BI-ACTIV™:** 40 g/hL (400 ppm).
  → For red wines: **OENOCELL™:** 40 g/hL (400 ppm).
- Mix wine anaerobically every 12 hours for a minimum of 24 hours.
- Move on to step 2.

Stuck fermented wine

PREPARATION OF THE YEAST INOCULUM

2.1. Preparation of the wine for the yeast inoculum

- Take 5 hL of the volume of the treated stuck wine from step 1.
- Adjust the alcohol to 8%, the sugar content to 20 g/L and the temperature to 20°C (68°F).
- Add **THIAZOTE™ PH:** 20 g/hL (200 ppm) to this volume of wine and mix thoroughly.



Wine in stuck AF prepared in step 1

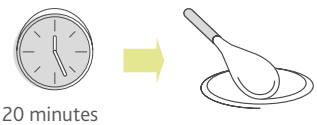
Wine for 5 hL starter

2.2. Yeast preparation

- Prepare 60 L of water at 40°C (104°F).
- Add the yeast rehydration nutrient **SUPERSTART™ SPARK** or **SUPERSTART™ ROUGE**: 30 g/hL (300 ppm) of the volume of wine to be treated, then homogenise.
- Add **ZYMAFLORE™ BO213**: 30 g/hL (300 ppm) of the volume of wine to be treated, then homogenise.

Water (40°C / 104°F) + SUPERSTART™ SPARK/ ROUGE + ZYMAFLORE™ BO213

- Wait 20 minutes, then homogenise.

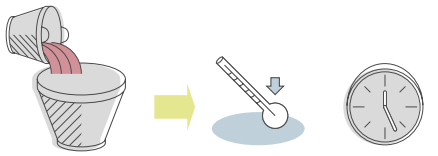


20 minutes

ALCOHOLIC FERMENTATION RESTART PROTOCOL

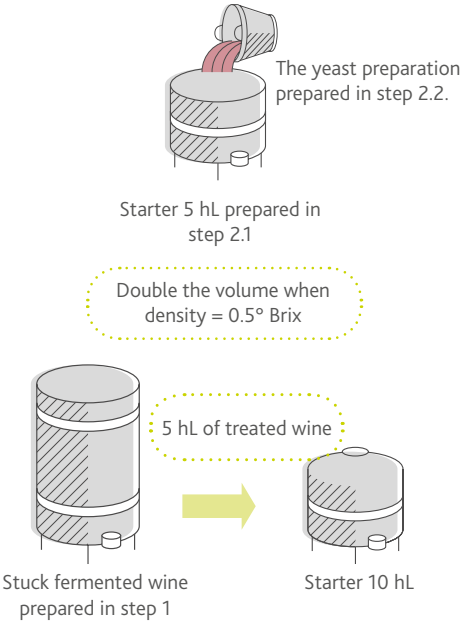
- Add immediately the 20 L of treated wine from step 2-1.
- Wait 10 minutes for the temperature to drop; it should not fall below **20 - 25°C (68 - 77°F).**
- The total time of the yeast rehydration must not exceed 45 minutes.

**Check with a thermometer.*



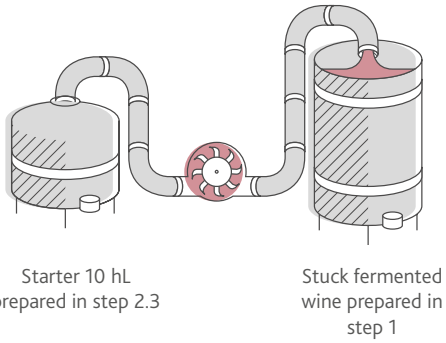
2.3. Acclimatisation of the yeast preparation

- Add the yeast preparation (Step 2.2) to the prepared wine for the yeast inoculum (step 2.1).
- Measure the Brix and maintain the inoculum at 20°C (68°F) with aeration until 0.5°Brix (avoid the total exhaustion of sugars in the inoculum and a fall in the yeast activity). Aerate as soon as AF starts.
- Double the volume with treated wine (step 1), maintain temperature at 20°C (68°F).
- Measure the Brix and maintain the inoculum at 20°C (68°F) until 0.5°Brix. Aerate again when fermentation becomes active.



INCORPORATION OF YEAST INOCULUM IN THE TANK

- Add the yeast innoculum to the treated wine (step 1) and maintain at 20°C (68°F).
- Add 30 g/hL (300 ppm) of **NUTRISTART™ ORG** to the total volume of the tank to the treated wine (Step 1).



Decision Making Tool

Discover our **RESTARTING FERMENTATION (AF) DMT** on our website, in the **LAFFORT & YOU** section.

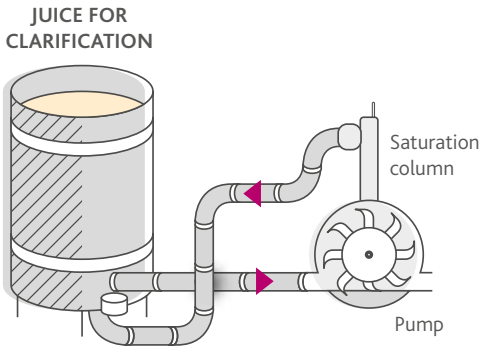
FLOTATION PROTOCOL WITH VEGEFLOT™

Many factors influence the flotation process and, hence, its success. The parameters of the protocol have been specially adapted for easy flotation. Do not hesitate to contact **LAFFORT®**'s team before your flotation trials in order to explore the potentially inhibiting parameters and find the appropriate solutions.

PREPARING THE JUICE

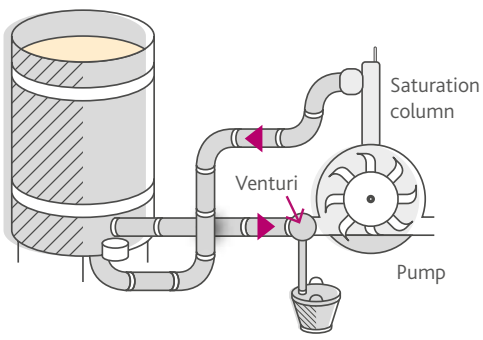
- Clarification by flotation involves migration of the particles of the must to the surface of the tank. This migration is prevented in the presence of pectins. The addition of pectolytic enzyme directly after grape pressing is necessary to accelerate the process.
  - → **LAFASE™ XL FLOT**: 1 - 4 mL/hL.
  - → **LAFAZYM™ 600XL^{ICE} (allows complete depectinisation at low temperatures)**: 1 - 2 mL/hL.
- Check the completion of the depectinisation before starting the flotation. Use our easy and fast **PECTIN TEST**.

CONNECTING THE FLOTATION PUMP



- For easy flotation, the tank fill level should not exceed 85 to 90% of the total volume.
- The temperature of the must should be between 15 - 18°C (59 - 64°F). **The colder the must, the higher the viscosity and the more difficult the flotation process.**
- Connect the pump inflow to the lees valve and the pump outflow to the racking valve.
- For the best results, pipes should not exceed 3 m (inflow and outflow).
- Make sure all the air is out of the saturation column before closing the tap.

ADDING THE VEGEFLOT™

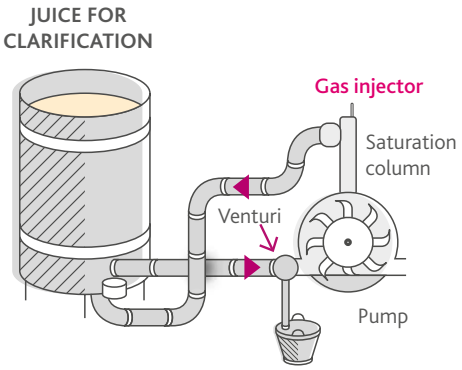


- Start the pump without gas injection.
- Check that the saturation pressure is between 2 and 3 bar (the size of the tank does not matter).
- Prepare **VEGEFLOT™** in a clean, inert container **following LAFFORT® recommendations.**
- The recommended dose of **VEGEFLOT™** is usually 15 g/hL (150 ppm) (The dose can be adjusted according to the characteristics of the must).
- Place the pipe dedicated to the venturi suction provided on the flotation system into the **VEGEFLOT®** preparation.
- **Inject VEGEFLOT™ as slowly as possible.**
- Mix the tank for 20 to 25 minutes at a saturation pressure of 2 to 3 bar without adding gas.

FLOTATION PROTOCOL WITH VEGEFLOT™

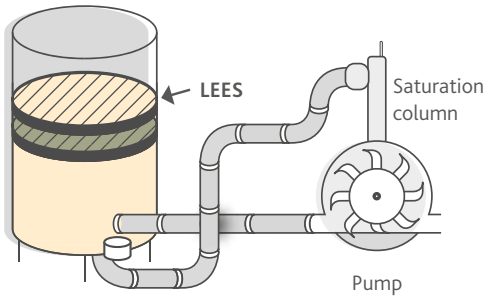
STARTING THE FLOTATION PROCESS

- Once the tank is homogenised, open the gas injection valve.
- The nitrogen inlet pressure should be between 5 and 7 bar.
- The gas flow rate must be between 25 and 60 L/min (depending on flotation setup). The saturation pressure must be adjusted to 5 bar.
- Check the quality of the flotation. To do this, take a sample at the tap of the saturation column.
- Remember to readjust the saturation pressure between 5 and 7 bar after sampling.
- The circulation time for flotation is between 60 and 150 min, depending on the volume of the tank.
- Pump the equivalent of 1 to 2 volumes of the tank - 1.5 times is usually enough.



COMPLETION OF FLOTATION PROCESS AND WAITING TIME

- Once the flotation process is complete, stop the pump.
- Close the gas.
- Close all the valves in the tank.
- Leave the tank for 60 to 120 minutes so that lees can rise to the surface.
- **Do not leave the tank longer than 240 minutes. Gravitational force can cause the separation and resuspension of the lees if the waiting time is too long.**
- Check the turbidity of the clarified batch.



Find Out More

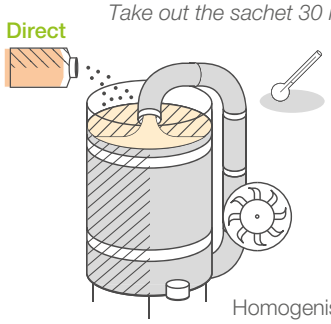
Discover our **FLOTATION** video on our website, at **LAFFORT & YOU** section.

LACTOENOS™ RANGE INOCULATION

LACTOENOS™ DIRECT

DIRECT INOCULATION

Take out the sachet 30 minutes before inoculation.



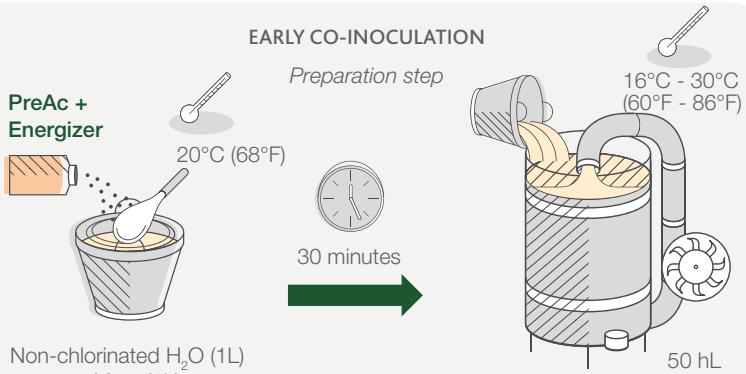
- Early co-inoculation
  24 - 48 h after start of AF.
  (16 - 30°C/ 60 - 86°F)
- Late co-inoculation
  1.010 density/2.5° Brix
  (<26°C / < 78°F).
- Sequential inoculation
  After AF, at racking
  (20°C - 22°C / 68 - 71°F).
- Curative inoculation
  (20°C - 22°C / 68 - 71°F).

LACTOENOS™ PREAC

INOCULATION WITH ACCLIMATISATION - FOR 50 hL

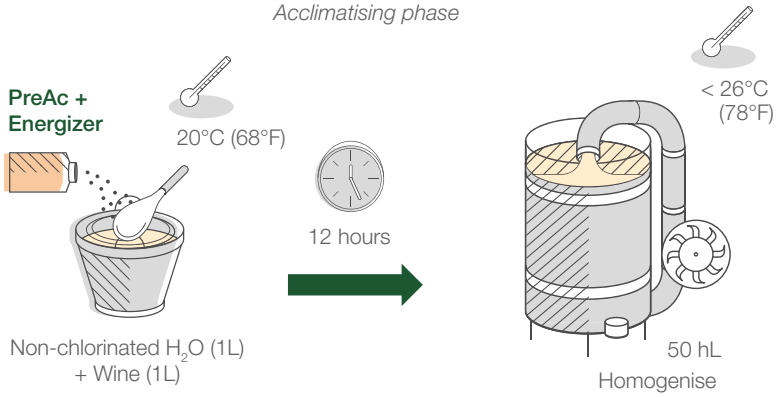
EARLY CO-INOCULATION

Preparation step



LATE CO-INOCULATION or SEQUENTIAL INOCULATION

Acclimatising phase



Find Out More

Discover our **RESTARTING MALOLACTIC FERMENTATION (MLF) protocol** on our website, at **LAFFORT & YOU** section.

TOOLS FOR ACIDIFICATION IN MUSTS AND WINES

Three acids are authorised 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.

For organoleptic purposes, additions can consist of a mix of different acids.

The intended addition must be trialled first. This is because the outcome of additions is influenced by the specific ionic strength and buffering capacity of a wine in addition to the initial pH and TA. This means that two wines with the same initial pH and TA and the same addition can have different outcomes.

REGULATORY STANDPOINT

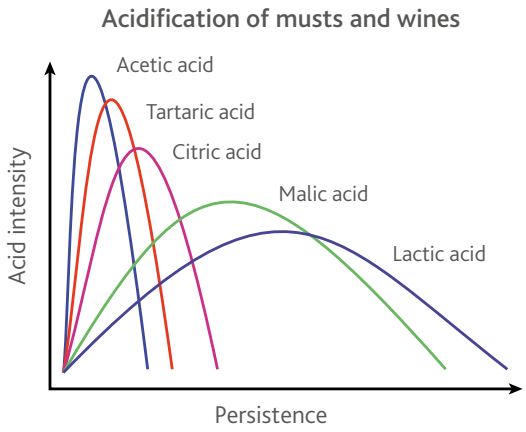
Annex VIII Part I Section C of Regulation (EU) 1308/2013, supplemented by Regulation (EU) 2019/934, allows the use of tartaric acid, malic acid and lactic acid for the acidification of musts and wines.

Acidification of fresh grapes, grape must, partially fermented grape must, new wine still in fermentation, and wine.

- Maximum dose of 4 g/L expressed as tartaric acid, i.e. 53.3 meq/L.

All treatments will be entered into a handling register and a custody register.

Acidification and enrichment (or chaptalisation) of one and the same product are mutually exclusive processes (for example a must or new wine still in fermentation can be enriched or chaptalised and the wine from the fermentation can be acidified), except by way of derogation (Appendix V, section C, point 7).



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

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TOOLS FOR ACIDIFICATION IN MUSTS AND WINES

SUMMARY OF THE COMMERCIAL PRODUCTS AVAILABLE AND THEIR PRINCIPAL OENOLOGICAL CHARACTERISTICS.

	TARTARIC ACID	MALIC ACID	LACTIC ACID	COMMENTS
Chemical formula	$C_4H_6O_6$ L	$C_4H_6O_5$ DL/L	$C_3H_6O_3$ 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.
Note on label	Acidity regulator E334	Acidity regulator E296	Acidity regulator E270	
pKa	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.
Correspondence 1 Eq	75 g	67 g	90 g	
Recommended targets	Red - Rosé - White	Rosé - White	Red - Rosé - White	
Treatment of must (at 53.3 meq/L*)	4 g/L	3.57 g/L	4.80 g/L	
Effect on pH	+++	++	++	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.
Effect on total acidity	++	+++	+++	
Chemical stability	- Precipitation of K bitartrate, neutral calcium tartrate	+++	+++	Potassium or calcium salts from malic and lactic acids are significantly more soluble than tartaric acid salts, the risk of precipitation is thus lower.
Microbiological stability	+ 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 acid bacteria.	+++	Malic and lactic acids interact with bacterial metabolisms. However, the increasingly frequent control of MLF (use of selected starters) and compliance with hygiene rules mean that the risk of such spoilage is very low.
Organoleptic impact	Lively, immediate, dryness, hardness	Freshness, greenness	Soft and tart acidity	
Formulation	Powder	Powder	Liquid	Lactic acid is in liquid form, powder formulations contain unauthorised lactates. Powders can be directly dissolved into the wine.

** Maximum dose - Consult the **LAFFORT®** technical department for more information on the dose to use.*

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