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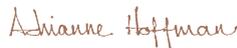
Innovation is not a common word used for ideas that originated with cloistered monks, yet the ideas currently percolating in our industry on sparkling wine are a new take on an age-old tradition. Over the last several decades, a clutch of quality and dedicated sparkling houses have created the foundation for American sparkling wine excellence. In recent years, the development of custom and mobile sparkling options has also helped open up this capital and technologically-intensive product line for all producers. This book is a representation of the new wave of sparkling wine entrants, arriving to a bellwether of excellent market conditions, access to production, and a consumer thirst for bubbly.

So, with all the celebratory emotion that bubbles conjure up, we are excited to share our first ever Sparkling Handbook with you. Once again, we have witnessed tremendous growth in a sector that has historically been dominated by imports. An increasing number of our winery partners are making sparkling wine, either in-house, using mobile services, or at a custom facility. Being a wine style marked by the term “Method”, sparkling wine is, at its core, a technological challenge. We hope this book provides winemakers steeped in experience, and well as newcomers, with a resource. As with all of our Handbooks, you will find detailed product information, as well as articles, industry perspectives, and protocols.

We owe a very special thank you to our assisting Technical Editor, Jerome Barret, a sparkling wine consultant. A native practitioner in Champagne, Jerome notably has consulted on all six fruit-bearing continents for countless styles and base wines. We are grateful for his vast experience and knowledge and its reflection in this book. Also, thank you to our guest contributors who shared their own best practices and insights — we all benefit and improve from this shared knowledge.

As with all of our Handbooks, we truly hope you find this to be a valuable resource. Please feel free to contact us anytime for more product information or technical guidance.

Cheers!



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TABLE OF CONTENTS

6-8	Traditional Method Process
9-11	Charmat Method Process
12-15	Harvest & Pre-Fermentation
13	Foliar Spray
14	Pressing
14	Voices from the Industry: Recommended Base Wine Parameters
15	Enzymes
16-33	Primary Fermentation
16-17	Selection Chart: Primary Fermentation Yeast Strains
18-22	Primary Yeast Strains
23-25	Nutrients
25-28	Malolactic Fermentation
25-26	Freeze-Dried Direct Inoculation Cultures
26	Co-Inoculation
26	Standard ML Freeze-Dried Build-Up Cultures
27	1-Step Cultures
27-28	Malolactic Bacteria Nutrition
28	Best Practices: MLF in Sparkling Wine
29	Sulfur Dioxide
30-32	Fining Agents
33	Tartrate Stability
33	Article: Tartrate Stability
33	Carboxymethylcellulose (CMC)
34-40	Secondary Fermentation
35	Selection Chart: Secondary Fermentation Yeast Strains
36	Secondary Yeast Strains
37	Encapsulated Yeast
38	Nutrition
40	Article: Common Issues with Pied de Cuve
41-44	Traditional Method Tirage & Riddling
41-42	Adjuvants & Riddling Aids
43-44	Crown Caps & Bidules
43	Article: Crown Caps as Winemaking Tools
45	Charmat Method Filtration
46	Disgorging
46	Disgorging FAQ
46	Article: Gushing in Sparkling Wine
47	Dosage
47	Finishing Tools
48	Stabilization
49	Rectified Grape Must
50-51	Bottling & Packaging
50	Corks
50	Article: Relvas Champagne-style corks
51	Wirehoods
51	Foil
53	General Tools
53	Calculations and Conversions
54	Glossary
55	Index

Disclaimer: Absolute caution should be taken with pressurized vessels. Gas or liquid pressure above the pressure vessel's rating should never be used. Regulators should always be used on gas supply if using gas.

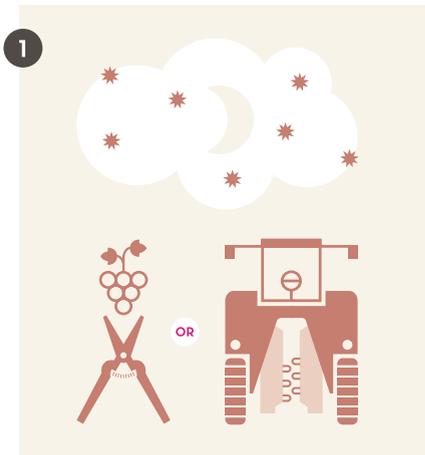
We are grateful for the contributions from many of our colleagues that are featured in this book as "Voices of the Industry". The views and best practices shared are those of the contributor, and not necessarily those of Scott Laboratories.

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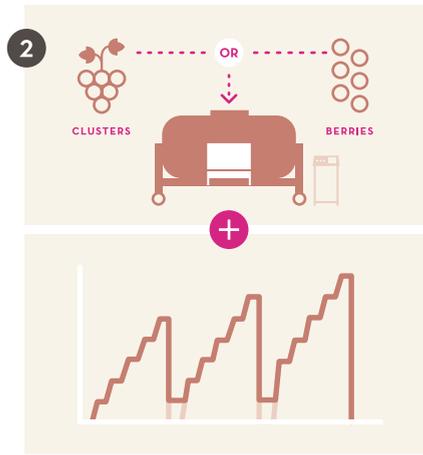
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Traditional Method BOTTLE FERMENTED



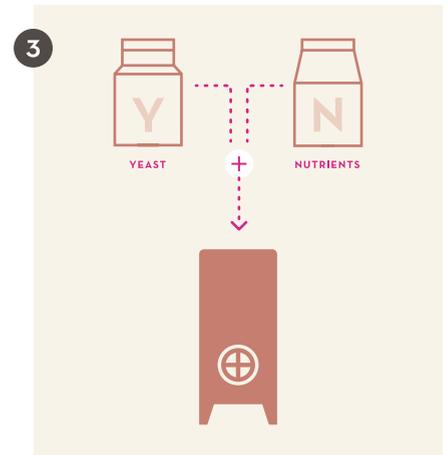
HARVEST

Grapes destined for sparkling wine are harvested at a low brix level (17–21°) to keep the acidity and flavors bright (see “Recommended Sparkling Base Wine Parameters” on page 14). It is optimal to pick in the early morning or at night while the temperature is cool. Grapes may be hand harvested or machine harvested. When filling bins, it is recommended that smaller bins be used and they should not be filled all the way to the top, as the weight of the fruit will start to extract juice and oxidation will readily occur.



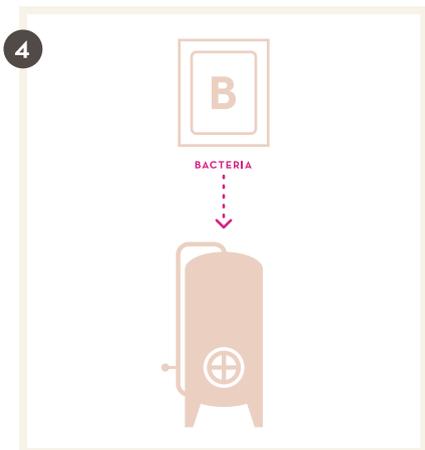
PRESSING

Pressing is a crucial step in the sparkling process. In order to ensure the quality of the juice, it is recommended to press whole cluster grapes. This produces must that has a low level of phenolic extraction. A gentle, gradual increase in pressure is recommended. Many industrial presses have programs specifically for crémant or sparkling wine already installed.



PRIMARY FERMENTATION

In order to start the primary alcoholic fermentation, a combination of yeast and nutrients are added to the must. Primary fermentation can be done in a stainless steel tank, neutral wooden barrel or plastic bin.



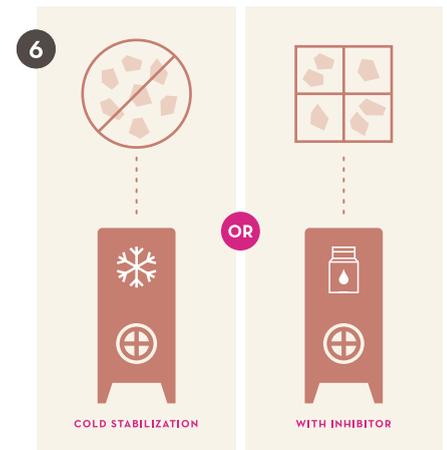
MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) is dependent upon winemaker preference. Conducting MLF on the base wine helps to soften high-acid wines and reduces the malic acid for better microbial stability. It is common to put a portion of the base wine through MLF and then blend it with wine that has not undergone MLF in order to achieve a balance of acidity, freshness, rounded mouthfeel and fruity aromas.



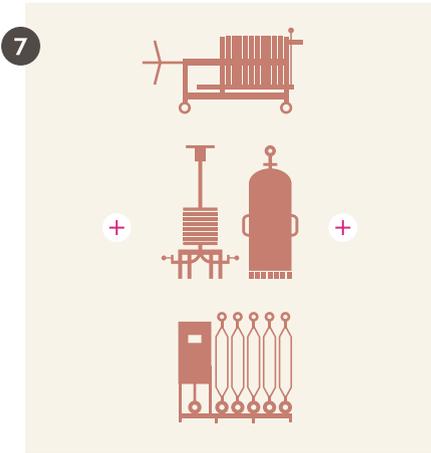
BLENDING

Blending is not necessary, but it is considered by some to be the most important step to achieve a finished wine that is well balanced. By blending wines with different sensory attributes, the winemaker can create a finished sparkling wine with more complex aromas and flavors.



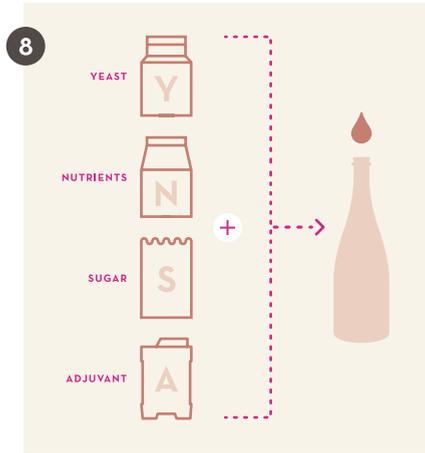
TARTRATE STABILIZATION

The formation of potassium or calcium tartrate crystals can be detrimental, as they are unsightly and can cause gushing (loss) of the finished wine. Tartrate stabilization can be achieved by cold stabilization or by the use of inhibitory products such as carboxymethylcellulose (CMC), which inhibit crystal formation.



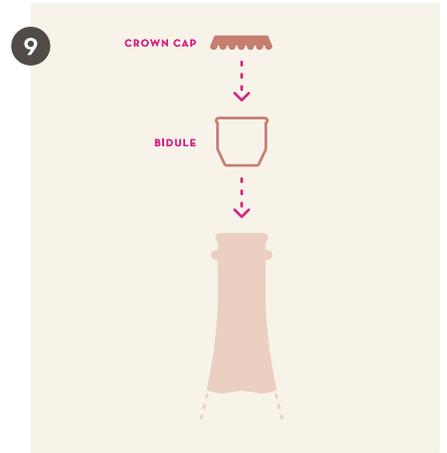
CLARIFICATION

The base wine may be clarified in a number of ways. Depending on the volume of wine and equipment available, filtration is the most common approach to clarification (the use of depth media in a plate and frame filter or a lenticular filter housing). Crossflow filtration is also an option for clarifying the base wine.



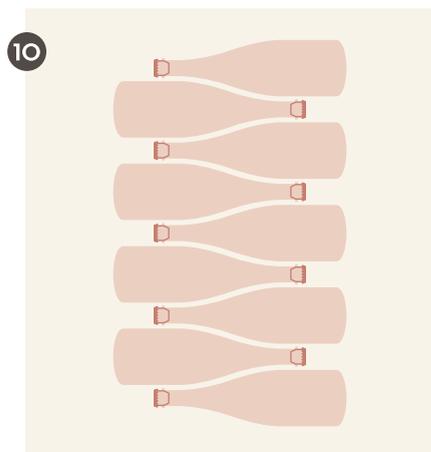
TIRAGE

The tirage addition is a mixture of yeast, sugar, nutrients, and an adjuvant/riddling aid that is added to the base wine and kept in suspension by mixing, then added to each bottle for the secondary fermentation. The yeast create alcohol, and more importantly, CO₂ gas, necessary for creating bubbles and pressure in the bottle. The adjuvant/riddling aid is added to help compact the yeast and allow it to smoothly move into the bottle neck to prepare for disgorging.



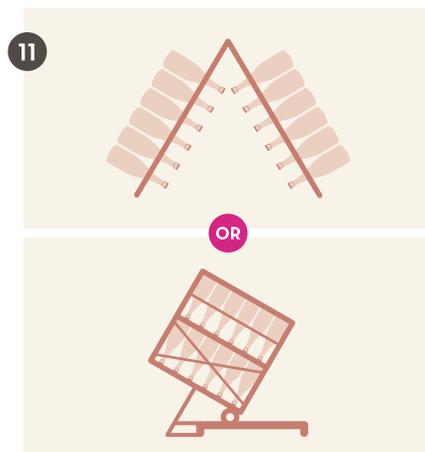
BIDULING + CROWN CAPPING

After tirage, each bottle is fitted with a bidule stopper and a crown cap closure. The bidule aids in collecting the lees at the end of riddling and makes for an easier, cleaner disgorgement when the “yeast plug” (the accumulation of dead yeast) is removed from the neck of the bottle. The crown cap acts as a temporary closure (in most cases) and allows the ingress of oxygen into the bottle during aging to affect the final sensory qualities of the finished wine. Oxygen ingress can be controlled via different crown cap liners (see page 43) depending on the style of wine desired.



SECONDARY FERMENTATION

The secondary fermentation is carried out in the bottle. The bottles are left to rest on their side, allowing the secondary fermentation to complete. It can take anywhere from weeks to months for the secondary fermentation to finish. It is up to the discretion of the winemaker to decide the length of time the wine will age on the lees, depending on the style of wine desired.



RIDDLING

Riddling is the act of gradually tipping and shifting the bottles on point over a period of time to slowly move the lees down into the neck of the bottle. Riddling can be done manually by hand or mechanically with a gyropalette. Riddling is initiated after the secondary fermentation is complete and usually takes several weeks.



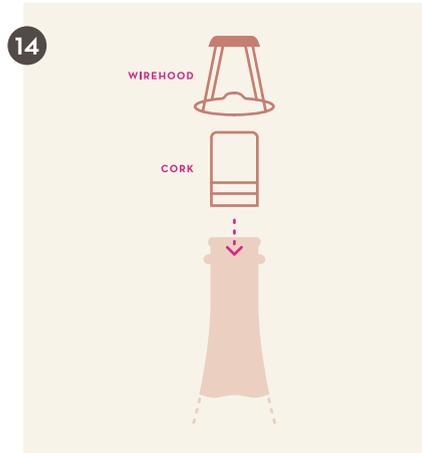
DISGORGING

After the wine has gone through secondary fermentation, aging, and riddling, the bidule stopper, which now holds the yeast plug in the neck of the bottle, is removed. Prior to removing the crown cap the bottles, on point, are cooled (4-10°C/ 0-50°F) and the top inch or so of the neck is frozen in a glycol solution (-15°C/5°F). This allows the crown cap to be removed and the bidule containing the yeast plug to be expelled with minimal loss of wine or CO₂ pressure. This process may take place manually or by machine.



DOSAGE

The dosage (*dosage liqueur*) is the winemaker's final opportunity to add a unique touch to the wine. The dosage may include a mixture of sugars, wines, distilled spirits, etc. It is the special recipe that helps define many wines. It also helps determine the sugar level in the finished wine which relates to the dosage classification. The dosage solution should be final filtered before addition to the bottles.



CORKING + WIREHOODING

After dosage, the wine is then closed with a cork and wirehood. The wirehood (also referred to as *muselet*) is used specifically to secure the cork and prevents it from releasing due to the pressure in the bottle. The use of corks and wirehoods are also a chance to decorate or brand a bottle of sparkling wine with the producer's logo, colors, etc. See pages 50–51 for information on custom corks and wirehoods.



PACKAGING

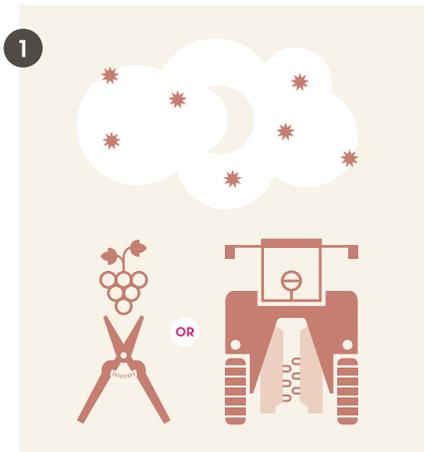
The addition of a foil capsule over the cork and wirehood is an optional step. Many commercial producers of sparkling wine add a foil capsule to highlight the final packaging of the bottle. The wine label is also added during this step.



ENJOYING

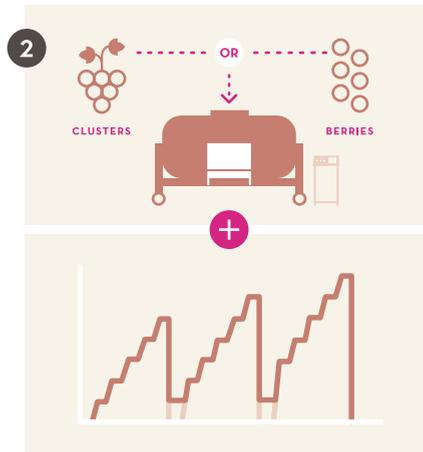
This is the easiest and most favorable step of the entire process. Pop the cork, pour into glasses to share, and enjoy!

Charmat Method TANK FERMENTED



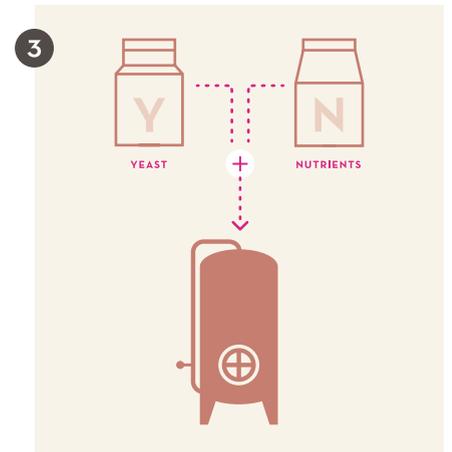
HARVEST

Grapes destined for sparkling wine are harvested at a low brix level (17–21°) to keep the acidity and flavors bright (see “Recommended Sparkling Base Wine Parameters” on page 14). It is optimal to pick in the early morning or at night while the temperature is cool. Grapes may be hand harvested or machine harvested. When filling bins, it is recommended that smaller bins be used and they should not be filled all the way to the top, as the weight of the fruit will start to extract juice and oxidation will readily occur.



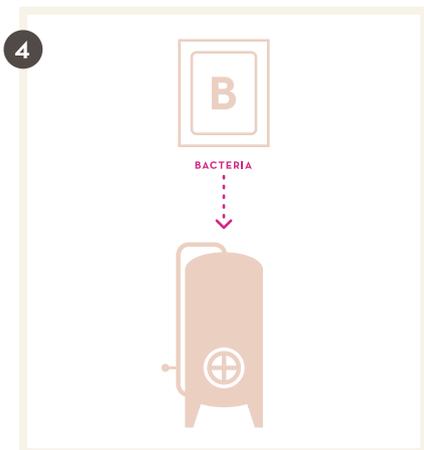
PRESSING

Pressing is a crucial step in the sparkling process. In order to ensure the quality of the juice, it is recommended to press whole cluster grapes. This produces must that has a low level of phenolic extraction. A gentle, gradual increase in pressure is recommended. Many industrial presses have programs specifically for crémant or sparkling wine already installed.



PRIMARY FERMENTATION

In order to start the primary alcoholic fermentation, a combination of yeast and nutrients are added to the must. Primary fermentation is typically always done in a stainless steel tank.



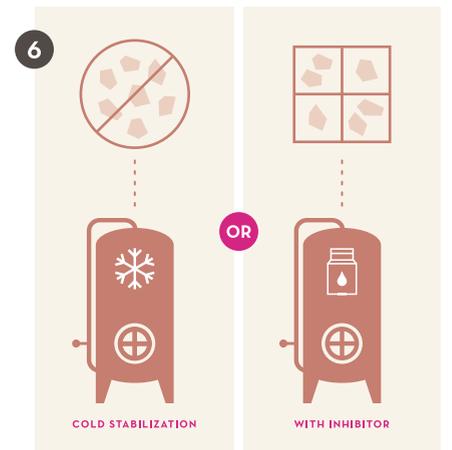
MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) is dependent upon winemaker preference. Conducting MLF on the base wine helps to soften high-acid wines and reduces the malic acid for better microbial stability. It is common to put a portion of the base wine through MLF and then blend it with wine that has not undergone MLF in order to achieve a balance of acidity, freshness, rounded mouthfeel and fruity aromas.



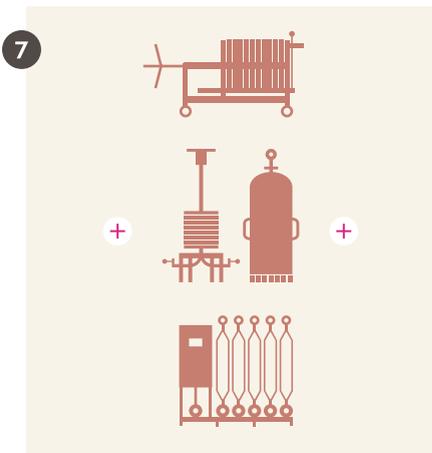
BLENDING

Blending is not necessary, but it is considered by some to be the most important step to achieve a finished wine that is well balanced. By blending wines with different sensory attributes, the winemaker can create a finished sparkling wine with more complex aromas and flavors.



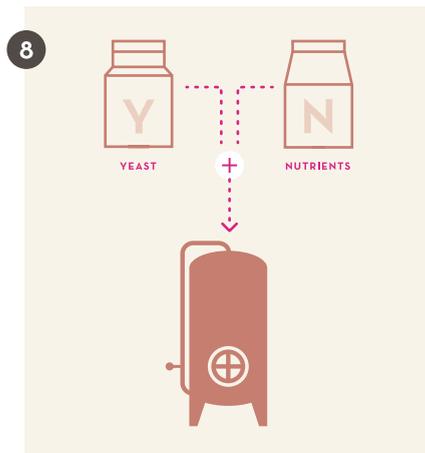
TARTRATE STABILIZATION

The formation of potassium or calcium tartrate crystals can be detrimental, as they are unsightly and can cause gushing (loss) of the finished wine. Tartrate stabilization can be achieved by cold stabilization or by the use of inhibitory products such as carboxymethylcellulose (CMC), which inhibit crystal formation.



CLARIFICATION

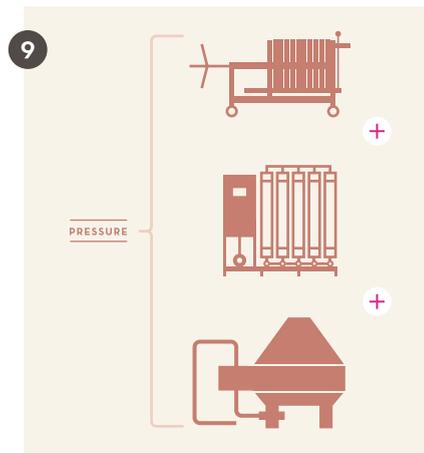
The base wine may be clarified in a number of ways. Depending on the volume of wine and equipment available, filtration is the most common approach to clarification (the use of depth media in a plate and frame filter or a lenticular filter housing). Crossflow filtration is also an option for clarifying the base wine.



SECONDARY FERMENTATION

The secondary fermentation is carried out in a closed pressure rated tank. It can take weeks for the secondary fermentation to finish. It is up to the discretion of the winemaker to decide the length of time the wine will stay on the yeast lees.

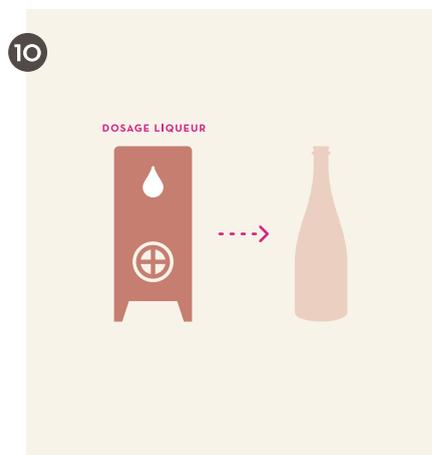
Disclaimer: Ensure all vessels are gas and liquid pressure rated for safe use.



ISOBARIC FILTRATION

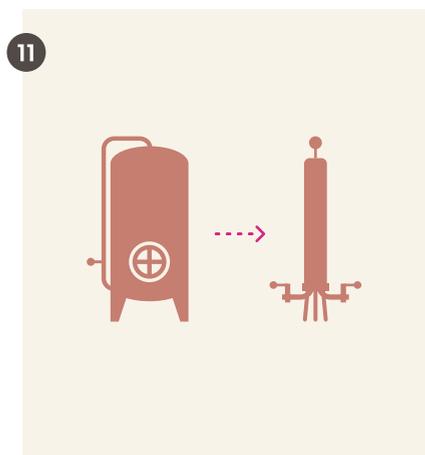
Filtration of the now sparkling wine, in preparation for dosage and bottling, must be done under isobaric conditions to the pressurized bottling tank. Tanks and equipment including pumps and hoses need to be pressure rated for safe use. The wine should also be final filtered in preparation for bottling.

Disclaimer: Ensure all vessels are gas and liquid pressure rated for safe use.



DOSAGE

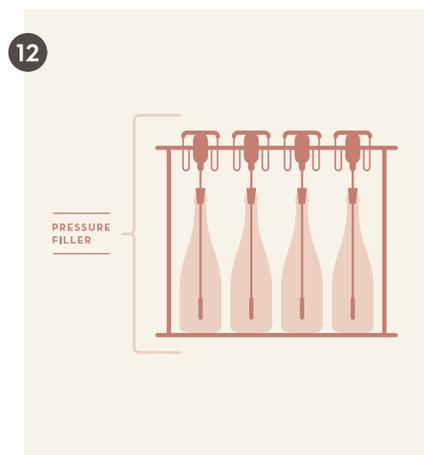
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FINAL FILTRATION

Prior to filling, the wine goes through a membrane filtration to achieve microbial stability.

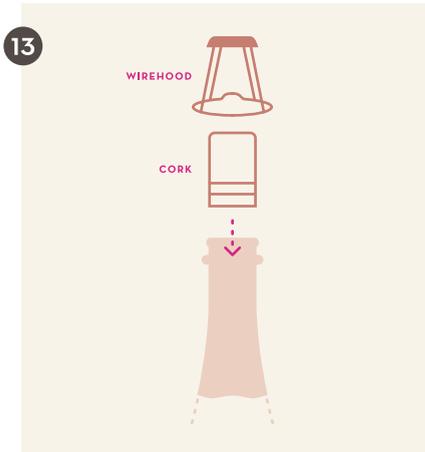
Disclaimer: Ensure all vessels are gas and liquid pressure rated for safe use.



FILLING

The filtered dosage is first added to the pressurized bottling tank, followed by the filtered sparkling wine. The wine is then ready to be bottled with a back pressure filler.

Disclaimer: Ensure all vessels are gas and liquid pressure rated for safe use.



CORKING + WIREHOODING

At filling, the wine is closed with a cork and wirehood. The wirehood (also referred to as *muselet*) is used specifically to secure the cork and prevents it from releasing due to the pressure in the bottle. The use of corks and wirehoods is also a chance to decorate or brand a bottle of sparkling wine with the producer's logo, colors, etc. See pages 50–51 for information on custom corks and wirehoods.



PACKAGING

The addition of a foil capsule over the cork and wirehood is an optional step. Many commercial producers of sparkling wine add a foil capsule to highlight the final packaging of the bottle. The wine label is also added during this step.



ENJOYING

This is the easiest and most favorable step of the entire process. Pop the cork, pour into glasses to share, and enjoy!

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Harvest & Pre-Fermentation

FOLIAR SPRAY

LalVigne Aroma/LA

Organic yeast derivative foliar spray for increased color and aroma precursors

LalVigne Aroma/LA is a natural, yeast derivative foliar spray applied at veraison. The yeasts used in its production were sourced from the Lallemand wine yeast collection. Application of LalVigne Aroma/LA foliar spray has been observed to result in the concentration of color and aroma precursors by increasing the levels of glutathione (GSH). GSH is an important antioxidant whose additions to juice and base wine have been reported to prevent browning and increase production of some volatile thiols during primary fermentation.

A single vineyard treatment with LalVigne Aroma/LA spray consists of two applications. The first is done at 5% veraison and the second 10-12 days later.

Note: When ordering, please check the LalVigne registration map status by state.

- #17501 3 kg LalVigne Aroma
- #17500 3 kg LalVigne LA

LalVigne Mature/LM

Organic yeast derivative foliar spray for phenolic maturity

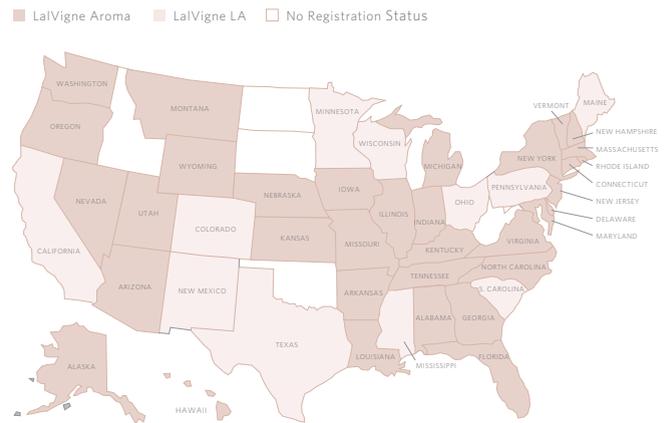
LalVigne Mature/LM is a natural, yeast derivative foliar spray applied at veraison. The yeasts used in its production were sourced from the Lallemand wine yeast collection. The application of LalVigne Mature/LM has been observed to advance and increase phenolic maturity in reds, reducing the risk of having to pick underripe fruit. It has been shown to increase ripening uniformity and reduce levels of methoxypyrazines (green, herbaceous flavors), allowing for increased aromatics, mouthfeel, and structure in finished wines.

A single vineyard treatment with LalVigne Mature/LM spray consists of two applications. The first is done at 5% veraison and the second 10-12 days later.

Note: When ordering, please check the LalVigne registration map status by state.

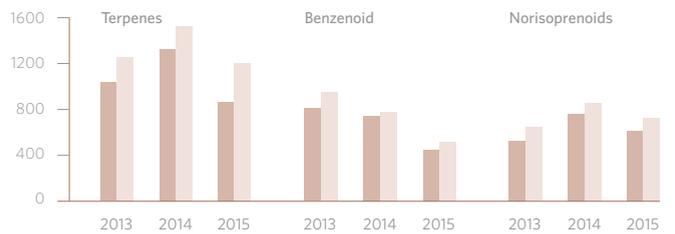
- #17511 1 kg LalVigne Mature
- #17510 1 kg LalVigne LM

Map of USA with registration



LalVigne Aroma/LA Increases Aroma Precursors

Glera (Prosecco DOC) Sparkling wine
Analysis of glycoside aroma precursors in grapes



Terpenes

Increase of geraniol and linalool (floral and rose notes), hydroxy geraniol, hydroxy linalool and geranic acids.

Benzenoid

Benzyl alcohol, beta-phenyl-ethanol, and homovanillic acid, which together give aromatic complexity (notes of rose, carnation, spicy).

Norisoprenoids

The vomifolliol and 3-oxo- α -ionol were increased with treatment (compounds related to exotic fruit and ripe fruit notes).



Joe Wright, Winemaker
Left Coast Cellars
Rickreall, OR

“ We use LalVigne Mature on our sparkling grapes, specifically for our Blanc de Noir and Brut Rosé. Though it has not affected our picking decisions, it has certainly promoted more olfactory ripeness with equal chemistry as prior picks. I’m very happy with it; it works really well for the program. ”

PRESSING

After the decision of when to pick your grapes, pressing is the most crucial step for ensuring the quality of the juice. When pressing for sparkling wine, the pressing program is often split into what is referred to as press fractions. Each press fraction represents a gradual increase in pressure on the fruit.

Traditionally, the press fractions are broken down as follows:

- **Cuvée:** this is the first, most gentle pressing that consists of the free run juice and up to 0.8 bar
- **Taille:** the next pressing in the cycle that goes up to 1.2 bar
- **Rebêche/Hard Pressing:** this is the final pressing that delivers the most pressure, and therefore extracts more phenolics and tannins from the fruit

Other Helpful Tips

- It is ideal to press whole-cluster grapes instead of destemmed.
- Most winery presses have programs for crémant or sparkling.
- A very gentle increase in pressure should be respected to break the berry without pressing hard on the skins. The inside flesh of the berry is the richest in sugar and acids and contains less phenolics.
- Analysis of pH, TA, Brix and SO₂ during pressing is imperative for juice quality.

Voices from the Industry Recommended Sparkling Base Wine Parameters



Penny Gadd-Coster, Executive Director of Winemaking at Rack & Riddle in Healdsburg, CA, shares her recommended base wine parameters and best practices.

Technical Information

Vineyard/Grapes	Optimal Ranges
Brix	17°–21° brix
pH	2.9–3.2
TA	8–12 g/L
Grape Processing	Parameters
Pressing	
Cuvée	Free-run and press up to 0.8 bar
Taille	0.8–1.2 bar cycles
Hard pressing	Hard press 1.2 to end of cycle
Pre-Fermentation	
Settle cold 24–48 hours and rack	
Fermentation	
Use robust yeast and nutrients. While typical base wine chemistry is not challenging, the goal is to achieve a clean and healthy fermentation. Organic nitrogen sources are preferred.	
TA	If TA is too low, adjust prior to ferment (0.8–1.2mg/100mL)
pH	Common juice pH 2.9–3.2
Temperature: depending on style	Colder ferments held at -13°C(55°F) will produce fruitier results, while warmer ferments -15°C(60°F) will feature less fruity aromatics.
Blending	
Single Vineyard	Blending may not always be necessary, especially if juice is from a single vineyard source. Building complexity can be important in these cases. I often put some of the wine in barrel or stir the lees to help add depth.
Multi-Varietal Blends	Generally, I do trials with multiple varieties to achieve the balance and style I'm looking for. Fruit profile, terroir enhancement, elegant, big — whatever I'm trying to do, blending is the time to make it happen. I often look at tannins for complexity and mouthfeel, especially if I want a finished wine with little aging. They can also help with keeping color and flavors fresh during extended aging on yeast in the bottle.

ENZYMES

Enzyme choice is dependent on the desired final wine style. When developing your press fractions, keep in mind that the amount of juice from the grapes depends on the pressure used during the press and the readiness of the juice to release from the fruit. Enzymes aid in gently extracting the juice from the grapes.

🍷 Granular/Powdered Enzymes

🍷 Liquid Enzyme

Cuvée Blanc LALLEMAND 🍷

Macerating enzyme for white grapes

Lallzyme Cuvée Blanc™ was developed by Lallemand for use on white grapes during skin contact prior to pressing. It is a very specific blend of pectinases with glycosidase side activity.

Lallzyme Cuvée Blanc is used to enhance aromatic complexity, provide gentle juice extraction and fast clarification after pressing.

Recommended Dosage

Crushed Grapes

20 g/ton

Juice, Wine

Not recommended

Usage

Dissolve Lallzyme Cuvée Blanc in 10 times its weight in water, gently stir and allow to sit for a few minutes. Then add to the grapes.

Storage

Dated expiration. Store in a cool, dry place. Once rehydrated, use within a few hours.

#16203 100 g

Expression Aroma RAPIDASE 🍷

For extraction of aroma precursors in white grapes

Rapidase® Expression Aroma is designed for early extraction of aroma precursors such as thiols from white grapes. It is particularly useful for thick skin or early harvested grapes. Rapidase® Expression Aroma helps extract aroma precursors from the grape skins, optimizing the aromatic compounds and complexity of the final wine.

Dosage

Crushed Fruit

20–25 g/ton

Juice, Wine

Not recommended

Usage

Dissolve Rapidase® Expression Aroma in 10 times its weight in water, stir gently, allow to sit for a few minutes. Sprinkle over crushed fruit or add in the press.

Storage

Dated expiration. Store refrigerated at 4–8°C(40–45°F).

#16260 100 g

Pec5L 🔥 🍷

Enzyme for white pressability, settling and clarification

Scottzyme® Pec5L is a highly concentrated pectinase blend designed specifically for winemaking.

It is used on crushed grapes for easier pressing and higher yields and in juice for improved settling, clarification and filtration.

Recommended Dosage

Crushed Grapes

10–20 mL/ton

Juice

1.0–1.3 mL/hL 40–50 mL/1000 gal

Usage

Dilute Scottzyme Pec5L to approximately a 10% solution in cool water. Sprinkle over the grapes before pressing or add to the juice before the start of alcoholic fermentation.

Storage

Dated expiration. Store refrigerated at 4–8°C(40–45°F).

#16170 1 kg (890 mL)

#16160 25 kg (22.25 L)

FOR JUICE FINING, PLEASE SEE PAGE 30.

FOR CURRENT PRICING OR TO PLACE AN ORDER, PLEASE VISIT
WWW.SCOTTLAB.COM OR CALL (707) 765-6666.

Primary Fermentation

YEAST STRAINS

- Highly Recommended
- Recommended

Strains	Page	Base Varietals							Base Wine Style							
		Chardonnay	Pinot Blanc	Pinot Gris	Pinot Meunier	Pinot Noir	Sauvignon Blanc	Syrah	Rosé	Classical Fermenter	Enhances Mouthfeel	Enhances Structure	Fruit Forward	Neutral Whites	Aromatic Whites	Red Base
58W3	18			●								●			●	
71B	18			●				●							●	
18-2007	18	●			●	●			●						●	
Alchemy I	18	●		●												●
Alchemy II	18											●			●	
BA11	18		●					●			●					●
BC (Bayanus)	19									●					●	
Be Fruits	20							●							●	●
Be Thiols	20							●							●	
CVW5	19	●		●				●							●	●
DV10	19	●	●	●						●					●	
ICV D21	19	●										●	●	●		●
EC1118	19									●						
Elixir	19	●		○	●	●	●	●				●				●
Fermivin Champion	20														●	
K1 (V1116)	20			○												●
Lalvin C	20									●					●	
M83	20							●				●	●			
NT 116	21	○	●	●				○				●	●		●	
OKAY	21							●					●			●
ICV Opale 2.0	21	●						●					●			
QA23	21	●	●													●
Quartz	21															●
Sensy	21		●					●		●	●					●
Syrah	22								●		●	●	●			●
VIN 13	22	●						●					●		●	
W15	22			●		●	●	●		●	●	●				

Strains	Relative Nitrogen Needs ¹	Temperature Range (°F) ²	Fermentation Speed	Sensory Effect	MLF Compatibility
58W3	Medium	54-77	Moderate	Enhanced Varietal Character, Esters, Mouthfeel	Average
71B	Low	59-85	Moderate	Esters	Very Good
18-2007	Low	50-90	Fast	Enhanced Varietal Character, Mouthfeel	Good
Alchemy I	Medium	56-61	Fast	Enhanced Varietal Character, Esters	Good
Alchemy II	Medium	56-61	Fast	Enhanced Varietal Character, Esters	Good
BA11	High	50-77	Moderate	Esters, Mouthfeel	Below Average
BC (Bayanus)	Low	59-86	Fast	Neutral	Good
Be Fruits	Low	54-68	Medium-Fast	Enhanced Varietal Character, Esters	Good
Be Thiols	Medium	59-64	Fast	Enhanced Varietal Character	Good
CVW5	Low	57-82	Fast	Esters	Average
DV10	Low	50-95	Fast	Neutral	Good
ICV D21	Medium	61-82	Moderate	Enhanced Varietal Character, Mouthfeel	Average
EC1118	Low	50-86	Fast	Neutral	Average
Elixir	Medium	57-77	Slow	Enhanced Varietal Character, Esters	Average
Fermivin Champion	Medium	59-86	Moderate	Neutral	Good
K1 (V1116)	Low	50-95	Fast	Esters	Poor
Lalvin C	Low	59-86	Moderate	Neutral	Good
M83	Medium	63-82	Moderate	Enhanced Varietal Character	Average
NT 116	Medium	54-61	Fast	Esters	Good
OKAY	Low	54-86	Moderate	Esters	Very Good
ICV Opale 2.0	Medium	59-86	Moderate	Enhanced Varietal Character, Esters	Poor
QA23	Low	59-90	Fast	Enhanced Varietal Character	Very Good
Quartz	Low	50-90	Moderate	Enhanced Varietal Character	Good
Sensy	Low	54-64	Moderate	Enhanced Varietal Character, Mouthfeel, Esters	Very Good
Syrah	Medium	59-90	Moderate	Enhanced Varietal Character	Average
VIN 13	Low	54-61	Fast	Enhanced Varietal Character, Esters	Good
W15	Low	50-81	Moderate	Enhanced Varietal Character, Mouthfeel	Very Good

¹ Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart.

² The temperature column indicates general performance possibilities. It is not a substitute for sound winemaking. Yeast may be stressed or die if temperatures are sustained at extremes of their tolerance. Keep in mind that a yeast's ability to ferment within the given range also depends on alcohol and other antagonistic conditions.

Temperature should be measured directly under the cap in red must/wine. When working with high sugar fermentations, lower temperatures are recommended. Good cap management is required to assure homogenous temperatures in red wine fermentations. Increasing dosage of yeast may help prevent a sluggish or stuck fermentation.

Important Notes

This chart is only useful as a quick reference guide. For more information on selected yeast strains, please refer to the yeast section of this handbook.

- A Aromatic Strain
- B Body Builder Strain
- C Classical Fermenter
- R For Red Sparkling Wines

58W3 A

S. cerevisiae • *cerevisiae*

Pinot Gris, Aromatic Whites

Isolated during a five-year study by the INRA (National Agricultural Research Institute) in Alsace, France.

Due to its fermentation kinetics, 58W3 is a balanced nutrient strategy and good fermentation practices should be followed.

Vitilevure 58W3™ contributes an overall well-balanced mouth-feel with floral and fruity aromas.

Allows for the release of bound terpenes in aromatic varieties due to the beta-glucosidase activity. This enhances classic varietal characteristics.

#15630 500 g

#15631 10 kg

18-2007 C

S. cerevisiae • *bayanus*

Chardonnay, Pinot Meunier, Pinot Noir, Neutral Whites

Isolated by the Institut Oenologique de Champagne in Epernay. Well adapted to low pH, low temperature and alcohol up to 15% (v/v). Good glycerol producer, low VA, SO₂ and foam producer. Good implantation, complete breakdown of sugars and low nutrient requirements. It is ideally suited to making wines by the Traditional Method and Charmat Method.

#15900 500 g

71B A B

S. cerevisiae • *cerevisiae*

Pinot Gris, Rosé, Fruit Forward Whites

Isolated and selected by the INRA in Narbonne, France.

Known for fermenting fruity rosé wines and whites because it produces long-lived aromas that result from the synthesis of relatively stable esters.

Softens high acid musts by partially metabolizing malic acid.

Sensitive to competitive factors and may have difficulty competing with wild microflora. Careful rehydration with Go-Ferm or Go-Ferm Protect Evolution and early inoculation will help Lalvin 71B dominate.

#15059 500 g

#15078 10 kg

Alchemy I A

S. cerevisiae • blend

Chardonnay, Pinot Gris, Sauvignon Blanc, Aromatic Whites

Scientifically formulated blend of wine yeast strains developed in collaboration with the Australian Wine Research Institute (AWRI) in South Australia.

The ratio of the yeast in the blend has been formulated to provide an optimal aromatic profile. Alchemy I enhances esters (fruity, floral) and volatile thiols (boxwood, passion fruit, grapefruit and guava aromas).

Alchemy I is a strong aroma producer with fast fermentation kinetics. It is low foaming and has low to medium nitrogen requirements.

Temperature control is advised.

#15174 1 kg

Alchemy II A

S. cerevisiae • blend

Sauvignon Blanc

Scientifically formulated blend of wine yeast strains developed in collaboration with the AWRI in South Australia for optimal aromatic profile.

Alchemy II enhances mostly volatile thiols such as: boxwood, passion fruit, grapefruit, kiwi fruit and guava aromas. It is highly recommended for cool tank fermentations of Sauvignon Blanc (New Zealand, South African or Chilean style).

Under difficult conditions (pH<3.2, turbidity under 80 NTU, low YAN, temperatures below 15°C(59°F), Alchemy II can be stressed and produce VA.

Fast fermentation kinetics mean temperature management is crucial. It is a low SO₂ producer with medium nitrogen requirements.

#15177 1 kg

BA11 A B

S. cerevisiae • *cerevisiae*

Pinot Blanc, Sauvignon Blanc, Rosé, Aromatic Whites

Selected in 1997 near the Estação Vitivinícola de Barraida in Portugal.

Promotes clean aromatic characteristics and intensifies mouth-feel and lingering flavors in white or sparkling base wines.

Lalvin BA11™ can encourage the fresh aromas of tropical fruit, cream, vanilla and spice in relatively neutral white grape varieties.

#15117 500 g

BC (Bayanus)  *S. cerevisiae* • *bayanus*

Neutral Whites

Selected from the collection of the Pasteur Institut in Paris, France.

Ferments cleanly with excellent fermentation kinetics. It is often chosen for sparkling base wines.

BC (Bayanus) has low nitrogen requirements and is a low SO₂ and VA producer. It is fructophilic.

#15234 500 g

#15235 10 kg

CVW5   *S. cerevisiae* • *bayanus*

Chardonnay, Pinot Gris, Rosé, Aromatic Whites

Selected from the Lallemand yeast collection, CVW5 is a daughter strain of Lalvin EC1118.

Works well under low temperature and low turbidity conditions. Very high ester producer and has the lowest nitrogen demand in the Lallemand yeast collection. CVW5 produces low levels of VA and SO₂.

Strong fermenter even under difficult conditions.

#15237 500 g

#15210 10 kg

ICV D21   *S. cerevisiae* • *cerevisiae*

Chardonnay, Syrah

Isolated from one of the best Languedoc terroirs during a special regional program run by the Institut Coopératif du Vin's (ICV) Natural Micro-Flora Observatory and Conservatory in France.

Noted for its good fermentation performance. Produces very few sulfide compounds during fermentation.

Selected for fermenting red wines with stable color, intense fore-mouth volume, mid-palate tannin structure and fresh aftertaste.

Lalvin ICV D21® can also be used with very ripe white grapes that are barrel fermented to develop fresh fruit aromas, volume and perceived acidity. In highly clarified juices, maintain fermentation temperatures greater than 16°C(61°F) and supplement with proper nutrition.

#15143 500 g

#15163 10 kg

DV10  *S. cerevisiae* • *bayanus*

Chardonnay, Pinot Blanc, Pinot Gris, Neutral Whites

Selected in Epernay, France.

Strong fermentation kinetics. Recognized for low foaming, low VA production and very low H₂S and SO₂ production.

Lalvin DV10™ is well known for clean fermentations that respect varietal character while avoiding bitter sensory contributions associated with other more one-dimensional 'workhorse' strains such as PM.

#15062 500 g

#15106 10 kg

EC1118 (Prise De Mousse)  *S. cerevisiae* • *bayanus*

Sparkling Base

Selected by the Institut Oenologique de Champagne (IOC) in Epernay, France. Reference strain for sparkling wine.

It is the original, steady low foamer, and is popular for barrel fermentations. It is an excellent choice for secondary fermentations of sparkling wine.

Ferments well at low temperatures and flocculates with compact lees.

Under low nutrient conditions Lalvin EC1118™ can produce high amounts of SO₂ (up to 50 ppm) and, as a result, may inhibit malolactic fermentation.

#15053 500 g

#15076 10 kg

Elixir   *S. cerevisiae* • hybrid

Chardonnay, Pinot Gris, Pinot Meunier, Pinot Noir, Syrah

Product of the yeast hybridization program of the Institute for Wine Biotechnology at the University of Stellenbosch in South Africa.

Good implantation in clarified juices and requires good nutrition and proper temperature control. Elixir has moderate nitrogen requirements and should ferment between 14–25°C(57–77°F) for a slow and steady fermentation. It is a low SO₂, H₂S and VA producer with alcohol tolerance to 15% (v/v).

Vitilevure Elixir™ expresses terpenes, norisoprenoids and thiols (e.g. in Sauvignon Blanc) adding complexity to aromatic varieties.

#15214 500 g

Fermivin Champion

S. cerevisiae • *bayanus*

Neutral Whites

Selected in Alsace by INRA of Narbonne, France.

Fermivin Champion has an excellent capacity to metabolize fructose and a high alcohol tolerance.

Does not produce secondary aromas. Fermivin Champion helps preserve the varietal character.

#17143 500 g

#17145 10 kg

IOC Be Fruits

S. cerevisiae • *cerevisiae*

Rosé

Selected by the INRA for very low to no SO₂ or H₂S production.

Produces ethyl and acetate fruity esters (strawberry, pineapple, citrus notes) in white and rosé wines without spoiling varietal aromas. The pure expression of the fruit is emphasized by the yeast's ability to reduce acetaldehyde formation, while limiting sulfite production. Fermaid O is recommended for nutrition.

IOC Be Fruits™ has a short lag phase, low nutrient requirements, an alcohol tolerance of 14% (v/v) and low VA production. Optimal conditions for fruity ester expression are must/juice that is clarified (20–80 NTU) and fermentation temperatures between 12–15°C (54–59°F).

#15241 500 g

IOC Be Thiols

S. cerevisiae • *cerevisiae*

Sauvignon Blanc, Riesling, Gewürztraminer, Rosé

Selected by the INRA for very low to no SO₂ or H₂S production.

Reveals fruity thiols (citrus and exotic fruits) in white and rosé wines. Enhances 3-MH potential (grapefruit, passion fruit) without excessive plant-based notes. The purity of the fruity expression is heightened by this strain's inability to produce negative sulfur compounds that can mask aromas. Fermaid O is recommended for nutrition.

IOC Be Thiols™ is a fast fermenter with a short lag phase, moderate nitrogen requirements, and an alcohol tolerance of 15% (v/v). Optimal conditions for expressing fruity thiols are must/juice that is clarified (80 NTU ± 20), pH > 3.2, and fermentation temperatures between 15–18°C (59–64°F).

#15247 500 g

K1 (V1116)

S. cerevisiae • *cerevisiae*

Pinot Gris, Sauvignon Blanc, Aromatic Whites

Selected by the ICV in Montpellier, France, among numerous killer strains isolated and studied by Pierre Barre at INRA.

When fermented at low temperatures (16°C/61°F) with proper nutrition, it is a strong floral ester producer, especially in neutral or high-yield varieties.

Among the high ester production strains, Lalvin V1116™ is the most tolerant of difficult fermentation conditions such as extreme temperatures, and low turbidity.

Ferments well under stressed conditions, especially when relative fructose levels remain high.

#15063 500 g

#15077 10 kg

Lalvin C

S. cerevisiae • *bayanus*

American hybrid varieties

Yeast for use in cool climate wines high in malic acid, hybrid and high acid grapes, and secondary fermentation in sparkling wines. Lalvin C has the ability to partially degrade malic acid (up to 45%).

A strain selected from the collection of the Pasteur Institute, Paris. Originally isolated from a French wine region, Lalvin C has been used in winemaking since the early 1960's.

#15689 500 g

M83

S. cerevisiae • *cerevisiae*

Rosé

Selected by the Laboratoire Aubanelle in the Bandol appellation of Provence.

Vitilevure M83 is particularly well-adapted for rosé winemaking in warmer regions. It has good implantation capacity, strong fermentation kinetics, moderate nutrient demands and an alcohol tolerance up to 15.5% (v/v). It is a low producer of VA and SO₂ during fermentation.

Produces round and balanced rosés with enhanced fresh fruit aromas. M83 increases color stability in rosé as a result of its polysaccharide production.

#15674 500 g

NT 116   

S. cerevisiae • hybrid

Chardonnay, Pinot Blanc, Pinot Gris, Rosé, Sauvignon Blanc, Sparkling Base, Aromatic Whites

Product of the yeast hybridization program of Infruitec-Niet-voorbij, the wine and vine institute of the Agricultural Research Council in Stellenbosch, South Africa.

It is alcohol tolerant up to 15.5% (v/v), cold tolerant (12°C/54°F) and has a medium nitrogen requirement.

NT 116 is suitable for full-bodied, high-maturity red wines for production of aromatic white and rosé wines. It's ability to convert volatile thiols and high ester production at low temperature enhances aroma and complexity in both red and white wines.

#15185 1 kg
#15226 10 kg

OKAY   

S. cerevisiae • hybrid

Rosé, Aromatic Whites

Selected in collaboration with the INRA, SupAgro Montpellier, the ICV and Lallemand for very low to no SO₂ or H₂S production.

Lalvin ICV OKAY® has a very short lag phase, low nutrient requirements with steady fermentation kinetics and an alcohol tolerance up to 16% (v/v). It is a low foamer with very low acetaldehyde production.

Recommended for fresh aromatic wines with fruit intensity. Very good compatibility with malolactic fermentation.

#15221 500 g
#15222 10 kg

ICV Opale 2.0   

S. cerevisiae • *cerevisiae*

Chardonnay, Sauvignon Blanc, Rosé

Opale 2.0™ is a yeast selection from the ICV.

Has been shown to enhance varietal character and aromatics in warm weather and/or high Brix grapes that might otherwise produce neutral wines. Particular benefits have been seen in Chardonnay.

Lalvin ICV Opale 2.0 has excellent fermentation qualities with a short lag phase and medium nitrogen requirements.

#15065 500 g

QA23   

S. cerevisiae • *bayanus*

Chardonnay, Pinot Blanc, Sauvignon Blanc, Aromatic Whites

Selected in Portugal by the University of Trás-os-Montes and Alto Douro (UTAD) in cooperation with the Viticultural Commission of the Vinho Verde region.

Lalvin QA23™ has low nutrient and oxygen requirements. It has been known to ferment juice at low temperatures (15°C/59°F) to dryness.

Excellent thiol converter making it a complementary yeast for developing varietal Sauvignon Blanc passion fruit character.

Produces large amounts of the enzyme beta-glucosidase during growth which allows for the release of bound terpenes in aromatic varieties.

#15652 500 g
#15653 10 kg

Quartz  

S. cerevisiae

Aromatic Whites

Formulated specifically for sparkling wines, providing aromatic finesse and fermentation security under difficult conditions. Vitilevure® Quartz is a great selection for tank-fermented Sauvignon Blanc or whites fermented in neutral barrels. It is known for creating aromatic and balanced wines. It is particularly adapted for foam formation in base wines.

#15671 500g

Sensy    

S. cerevisiae • hybrid

Pinot Blanc, Sauvignon Blanc, Rosé

Selected in collaboration with the INRA, SupAgro Montpellier, the ICV and Lallemand for very low to no SO₂ or H₂S production.

Lalvin Sensy™ has a short lag phase, low nutrient demand with a moderate fermentation rate, alcohol tolerance up to 14.5% (v/v) and a temperature tolerance of 12-18°C(54-64°F).

In aromatic white wines, Sensy is known for promoting intense aromatic esters with balanced mouthfeel and freshness. It is malolactic bacteria friendly.

#15225 500 g

Syrah

S. cerevisiae • *cerevisiae*

Syrah, Merlot, Mourvedre, Petite Sirah, Petit Verdot, Structured Reds

Enoferm Syrah™ is a Côtes du Rhône isolate from France.

Best sensory results are achieved when a proper nutrition strategy is followed. Alcohol tolerant up to 16% (v/v) with low production of H₂S and SO₂.

High glycerol producer and offers good mouthfeel and stable color extraction.

Typical aromas include violets, raspberries, cassis, strawberries and black pepper.

#15657 500 g

#15658 10 kg

VIN 13

S. cerevisiae • hybrid

Chardonnay, Sauvignon Blanc, Rosé, Aromatic Whites

Product of the yeast hybridization program of the Institute for Wine Biotechnology at the University of Stellenbosch in South Africa.

Aromatic as well as cold tolerant (10–15°C/50–59°F), VIN 13 also has high alcohol tolerance (16.5% v/v) and low nitrogen requirements (qualities obtained by hybridizing *S. bayanus* and *S. cerevisiae* strains).

VIN 13 is a very good thiol releaser (guava, passion fruit and grapefruit) and outstanding ester producer. On tank-fermented Chardonnay it promotes pineapple and banana flavors, while on Riesling, Gewürztraminer and Viognier it accentuates floral notes.

The combination of fermentation kinetics and sensory contributions make this strain very suitable for cold-fermented aromatic whites that are fermented to dryness. Do not over inoculate.

#15183 1 kg

#15228 10 kg

W15

S. cerevisiae • *cerevisiae*

Pinot Gris, Sauvignon Blanc, Rosé

Isolated in 1991 at the Swiss Federal Research Station in Wädenswil, Switzerland.

Its low heat generation during fermentation helps winemakers minimize the potential for temperature spikes and possible H₂S problems.

Produces higher levels of glycerol and succinic acid, especially when fermented between 15–20°C (59–68°F), which helps add complexity to the mid-palate.

In white wines, Lalvin W15™ helps retain bright fruit characters while optimizing mouthfeel and balance. It also performs well with Pinot Noir and cooler climate Syrah.

#15118 500 g

#15119 10 kg

QTL Strains/Low to No H₂S/SO₂ Producing Strains

The Quantitative Trait Loci (QTL) technique is a quantitative genetics process used to identify genes by their character traits and location on an organism's genome. This technique has been used to identify characteristics for individual enological yeast strains. When a desired trait is identified on a strain's genome, that strain can then be naturally crossed with a chosen enological strain. This desired trait is transferred to the chosen strain through natural breeding (non-GMO).

The QTL strains have been optimized to not produce H₂S or SO₂. SO₂ is usually consumed by *Saccharomyces* yeast through the sulfate metabolism pathway. The SO₂ metabolism of the QTL strains utilizes SO₂ directly to synthesize two essential amino acids containing sulfur, avoiding the release of H₂S.

QTL strains include Be Fruits, Be Thiols, OKAY, Opale 2.0 and Sensy.

NUTRIENTS

The conversion of sugar to alcohol in sparkling base wines can be difficult due to the challenging acid chemistry. Focus your nutrient program to ensure that the yeast have all of the essential vitamins, minerals, sterols, and nitrogen that are needed. Start by protecting and stimulating the yeast by using Go-Ferm Protect Evolution® during the rehydration phase. Follow up with a complete nutrient during the fermentation by using one or more of the Fermaid® family of complex nutrients. This will nourish the yeast and encourage the fermentation in the low pH environment. Yeast nutrition and protection will help minimize stress factors and help reduce any off flavors or aromas that may be caused by stress.

Fermaid A

Complex yeast nutrient

Fermaid® A is a complex yeast nutrient blend of inactivated yeast supplying organic nitrogen (alpha amino nitrogen) and diammonium phosphate (DAP). There are no supplemented vitamins or minerals.

The nitrogen blend in Fermaid A is aimed at encouraging a balanced rate of fermentation. An addition elevates the yeast's intracellular amino reserve, reducing the chances of a stuck or sluggish fermentation. The available YAN in the fruit directly impacts the fermentation rate and the formation of flavor active volatile compounds. For best results, Fermaid A should be used in conjunction with an appropriate yeast rehydration nutrient (Go-Ferm Protect Evolution). This will ensure proper nutrition of the selected yeast from rehydration through completed fermentation.

Recommended Dosage

10–30 g/hL 0.8–2.4 lb/1000 gal

#15070A 10 kg

Fermaid K*

Complex yeast nutrient

Fermaid® K is a complex yeast nutrient that contains a blend of inactivated yeast, free amino acids (organic nitrogen derived from inactivated yeast), sterols, unsaturated fatty acids, key nutrients (magnesium sulfate, thiamin, folic acid, niacin, calcium pantothenate) and ammonium salts (DAP). The unsaturated fatty acids and sterols that Fermaid K provides are important survival factors needed to maintain alcohol resistance and permease (sugar uptake) activity.

The nitrogen from the alpha amino acids contained in Fermaid K is utilized much more efficiently than from the ammonia salts. The cell wall fractions in Fermaid K absorb short and medium chain fatty acids that are toxic to the yeast. They also provide nucleation sites to help keep the yeast in suspension. For best results, Fermaid K should be used in conjunction with an appropriate yeast rehydration nutrient (such as Go-Ferm or Go-Ferm Protect Evolution) to assure proper nutrition of selected yeast from rehydration through completed fermentation.

Recommended Dosage

25 g/hL 2 lb/1000 gal

Note: The ingredients in Fermaid K are listed by the TTB as acceptable in good commercial winemaking practice in 27 CFR 24.250 together with 27 CFR 24.246. The ingredients in all other products shown on pages 23–25, 38 are listed by the TTB as acceptable in good commercial winemaking practice in 27 CFR 24.246. For more information please visit www.TTB.gov. This product contains thiamin. The TTB Maximum Legal Dose for thiamin hydrochloride = 0.60 mg/L (0.005 lb/1000 gal) of wine or juice. 21 CFR 184.1875.

#15073 2.5 kg

#15070 10 kg

Fermaid O

Organic yeast nutrient; OMRI listed

Fermaid® O is a blend of highly specific fractions from inactivated yeast that are rich in assimilable amino acids (organic nitrogen). Organic nitrogen is known to be a highly effective nutrient source (especially when compared to inorganic nitrogen) consistently resulting in lower peak fermentation temperatures, lower levels of negative sulfur compounds and cleaner fermentation kinetics. Organic nitrogen use has been correlated with positive aromatic expression (thiols and esters). Fermaid O does not contain any DAP or supplemented micronutrients. For optimal results, Fermaid O should be used in conjunction with an appropriate yeast rehydration nutrient (Go-Ferm or Go-Ferm Protect Evolution) to assure proper micronutrient nutrition of selected yeast from rehydration through completed fermentation.

Recommended Dosage

40 g/hL 3.3 lb/1000 gal

#15067 2.5 kg

#15107 10 kg

ALL Fermaid PRODUCTS

Usage

In order to avoid CO₂ release and overflowing of fermentation vessels, all Fermaid products should be mixed with room temperature water before adding to an active fermentation. The amount of water used is not critical. Simply add enough water to make a slurry.

Storage

Dated expiration. Store in a cool and dry environment at 18°C(65°F). Once opened, keep tightly sealed and dry.

Note: Due to high nutrient requirements, some yeast strains may benefit from additional nutrient supplementation (see yeast reference chart on pages 16–17).

Go-Ferm Protect Evolution

Yeast rehydration nutrient; OMRI listed

Go-Ferm Protect Evolution® is the latest generation of natural yeast rehydration nutrients with improved sterol content (quality and quantity) together with micronutrients which help to increase yeast cell viability and vitality. This third generation formulation improves yeast stress tolerance and enhances fermentation security (especially in difficult conditions) and helps with aromatics.

Difficult conditions may include overripe fruit, marginal fruit quality (poorly developed fruit, *Botrytis*, molds, high bacteria count), insecticide or fungicide residue, low nutrient levels, or over-clarified juice. It is especially useful in white and rosé fermentations when oxygen additions are difficult. The enhanced sterol content can replace the second oxygen addition recommended at 1/3 sugar depletion.

Go-Ferm Protect Evolution provides a combination of protective and nutritive benefits for optimal fermentation and sensory results.

Recommended Dosage

30 g/hL 2.5 lb/1000 gal

Note: This recommendation is based on a yeast inoculum of 2 lb/1000 gallons (25 g/hL). If using more or less yeast, respect the ratio of 1 part yeast to 1.25 Go-Ferm Protect Evolution.

Usage

1. Mix Go-Ferm Protect Evolution in 20 times its weight in clean 43°C(110°F) water. For every 1kg (2.2 lb) Go-Ferm Protect Evolution, use approximately 5 gallons (20 L) of water.
2. Let the mixture cool to 40°C(104°F) then add the selected active dried yeast.
3. Let stand for 20 minutes.
4. Slowly (over 5 minutes) add equal amounts of must/juice to be fermented to the yeast slurry. Do not allow more than 10°C(18°F) difference. Atempérate as necessary (*Our protocol on optimal yeast rehydration can be found at www.scottlab.com*).

Storage

Dated expiration. Store in a cool and dry environment at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15103 2.5 kg

#15251 10 kg

Note: Due to the unique nature of Go-Ferm Protect Evolution, it will not go into solution completely. This is due to the fatty acid and sterol content and is to be expected.

OptiMUM White

For optimizing aromatic intensity and longevity; OMRI listed

OptiMUM White® is a yeast derivative nutrient which is produced using a new process that increases the glutathione bioavailability and the level of available polysaccharides. Glutathione is a natural antioxidant that has been shown to protect against browning, enhance the fruity nature of aromatic wines and minimize undesirable aroma compounds. OptiMUM White should be added early in the fermentation process (after settling). This helps protect juice from oxidation. When used at this point it also

has a positive impact on volatile thiol preservation. This natural yeast derivative nutrient favors aromatic intensity, stabilization and longevity in whites and rosés. In order to achieve the maximum antioxidant protection OptiMUM White should be used with a complete nutritional program.

Recommended Dosage

20–40 g/hL 1.7–3.4 lb/1000 gal

Usage

Mix OptiMUM White in 10 times its weight in water or juice. Add to the juice after settling or directly to the tank at the onset of fermentation. This product is partially soluble. Stir to maintain suspension before and during addition.

Storage

Dated expiration. Store in a cool and dry environment at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15198 1 kg

#15202 2.5 kg

Opti-WHITE

Protects fresh aromas; OMRI listed

Lallemand introduced this natural yeast derivative nutrient for use in white and rosé wine production after an extensive research program.

Opti-WHITE is prepared using a specific production process that results in a yeast derivative rich in polysaccharides and high in anti-oxidant peptides (glutathione). These glutathione peptides work synergistically with SO₂, allowing the winemaker to potentially lower their SO₂ dosage. When added to the juice at the onset of fermentation, Opti-WHITE enhances smoothness, helps avoid browning from oxidation and protects fresh aromas during aging. Opti-WHITE may also be added in the last stages of alcoholic fermentation to help bring out flavor profiles often associated with lees aging.

Recommended Dosage

25–50 g/hL 2–4 lb/1000 gal

*Use 50 g/hL for maximum antioxidative properties

Usage

Mix Opti-WHITE in 10 times its weight in juice or water. Add to the juice after settling or directly to the barrel or tank prior to the onset of fermentation. If adding during the later stages of alcoholic fermentation, add during a tank mixing for proper homogenization. This product is partially soluble. Stir to maintain suspension before and during addition.

Storage

Dated expiration. Store in a cool and dry environment at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15165 1 kg

#15136 2.5 kg

#15216 10 kg

YEAST STIMULANTS FOR OPTIMIZING AROMATICS

Stimula Chardonnay provides you the most innovative nutrients within the Lallemand portfolio. This yeast autolysate is truly unique. Instead of being used for nourishing the yeast and optimizing cell growth and fermentation rate, it stimulates the yeast by increasing their ability to produce desirable aromatic compounds. This new 100% yeast autolysate is formulated to supply the optimal levels of specific amino acids and sterols, along with the natural vitamins and minerals.

Stimula Chardonnay

Stimulates volatile ester production in aromatic whites and rosés

Stimula Chardonnay™ is added at the end of the yeast growth phase (this equates to approximately 1/3 sugar depletion). At this time the yeast are not utilizing the amino acids as a nitrogen source for growth, but they are using them along with the naturally occurring riboflavin, biotin, vitamin B6 complexes, sterols, manganese and zinc to produce esters. These desirable compounds are recognized as being fruity and floral in nature. By using Stimula Chardonnay you are optimizing the aromatic potential of your white and rosé wines.

Recommended Dosage

40 g/hL 3.3 lb/1000 gal

Usage

Mix Stimula Chardonnay in 10 times its weight in clean, chlorine free water or juice and add to the fermentation at 1/3 sugar depletion. It is essential that this timing of addition is respected. Stimula Chardonnay is not fully soluble so it will not fully dissolve. Stir to maintain suspension before and during addition.

Storage

Dated expiration. Store in a dry environment at 18°C(65°F). Once opened, use immediately.

#15245 1 kg

MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) is dependent upon winemaker preference. Conducting MLF on the base wine can help to soften high-acid wines and reduces the malic acid for better microbial stability.

FREEZE-DRIED DIRECT INOCULATION CULTURES

Since wine environments can be hostile, direct inoculation starter cultures must be conditioned to this environment during their production. The direct inoculation process was developed to prepare the cell membrane in advance for these difficult conditions. The result is highly active cultures which are ready for easy and quick inoculation of wine. Proper nutrition can help enhance performance, especially in a harsh environment. All Lallemand direct inoculation strains are produced with the MBR® process. The MBR form of malolactic bacteria represents a Lallemand acclimation process that stresses the bacteria, enabling it to withstand the rigors of direct inoculation. The conditioned MBR bacteria can conduct a more reliable MLF.

None of our commercial ML strains contain the decarboxylase enzymes known to produce biogenic amines.

Visit www.scottlab.com for a protocol on how to add Direct Inoculation Cultures to wine.

MBR 31

O. oeni adapted to low temperature and low pH; enhances polyphenolic content and fruit character

White, Red

Lalvin MBR 31® was selected by the IFV for use in red and white wines.

Performs well even under stressful conditions such as low pH (3.1) and low temperature, though not below 13°C(55°F). It is alcohol tolerant to 14.0% (v/v) and total SO₂ to 45 ppm.

Known for its positive sensory characteristics. In reds, it may increase berry fruit flavors and mouthfeel. In whites, it is known for light buttery flavor, respect for fruit, increased body and length of finish.

It is sometimes slow to start, but finishes quickly.

#15022 2.5 hL (66 gal) dose

#15032 25 hL (660 gal) dose

#15127 250 hL (6,600 gal) dose

O-MEGA

O. oeni adapted to high alcohol and cooler cellar temperatures

White, Red

Selected in the south of France by the Institut Français de la Vigne et du Vin (IFV) in Burgundy for its ability to complete MLF in a wide range of applications.

O-MEGA® can perform in cool temperatures (down to 14°C/57°F) and higher alcohols (up to 16% v/v) with very low VA production.

Due to its late degradation of citric acid, only very low levels of diacetyl are produced. This makes it suitable for fruit forward wines. Using this bacteria in reds helps stabilize color because of the slow degradation of acetaldehyde. Also noted to do well in cold climate Pinot Noirs.

#15615 25hL (660 gal) dose

#15616 250hL (6,600 gal) dose

STANDARD ML FREEZE-DRIED BUILD-UP CULTURES

When using these standard cultures, strict adherence to the 7-10 day build-up protocol must be followed.

Please contact us for more information when using these products.

IB (Inobacter)

O. oeni adapted for sparkling wines; neutral sensory effect

Sparkling, White, Red

The IOC IB™ malolactic strain was isolated by the Comité Inter-professionnel du Vin de Champagne (CIVC) in France.

Strain of choice for many sparkling wine producers when malolactic fermentation is desired.

Contributes a neutral sensory effect, especially in lower pH wines.

#15024 25-50 hL (660-1,320 gal) dose

MT01

O. oeni with low volatile acidity and diacetyl production; neutral sensory effect

Sparkling, White, Red

Lalvin MT01™ was isolated and selected in Epernay, France.

Characterized by very low VA and diacetyl production resulting from a lack of citrate permease activity.

#15027 25-35 hL (660-925 gal)

CO-INOCULATION

Beta Co-Inoc

O. oeni for use in co-inoculation

White, Red

Specifically selected by Lallemand for reliable performance in co-inoculation of wines with pH > 3.2. Not recommended for use in a sequential MLF.

Beta Co-Inoc is added to the juice/must 24-48 hours after yeast inoculation and before alcohol reaches 5% (v/v). Recommended temperature at inoculation is between 18-25°C(64-77°F) and recommended ongoing temperatures are between 15-28°C(59-82°F). Total SO₂ at crusher should not exceed 80 ppm.

Wines that are co-inoculated result in more fruit forward wines as diacetyl is consumed by the yeast and bacteria.

Note: In co-inoculation, the health and success of the primary fermentation are keys to success. Factors such as pH, turbidity, temperature and nutrition must be considered. If the primary fermentation is sluggish or stuck, it may be necessary to add lysozyme. This is especially important if the pH is over 3.5. Beta Co-Inoc is not recommended for wines with alcohol potential >15% (v/v).

#15617 25hL (660 gal) dose

#15618 250 hL (6600 gal) dose



David Munksgard, Winemaker
Iron Horse Vineyards
Sebastopol, CA

“I started working with Scott Labs right out of college in 1980. It's not just their truly fine products, their high level of customer support, or their constant innovation and evolution. It's all these things and more. I consider Scott Labs to be a partner in my winemaking. Beta Co-Inoc has changed my feelings about ML with sparkling base wines. I want acid reduction and fruit preservation and Beta Co-Inoc does the trick, often finishing within a few days of completion of primary.”

1-STEP CULTURES

1-Step® cultures are improved versions of an old concept. The purpose is to provide winemakers with a product that combines the economy and activity of standard strains with a degree of the convenience associated with the direct inoculation strains.

In lieu of direct inoculation or prolonged build-up, a simple 18–24 hour acclimatization step is required using a culture of *Oenococcus oeni* and an activator (included in the kits). 1-Step cultures are a good choice when efficiency and cost management are essential.

The 1-Step cultures can also be used to restart a stuck or sluggish MLF. None of our commercial ML strains contain the decarboxylase enzymes known to produce biogenic amines.

Visit www.scottlab.com for a protocol on how to add 1-Step Cultures to wine.

1-Step VP41

O. oeni; enhances complexity and mouthfeel

Red, White

The 1-Step® VP41 (same strain as Lalvin MBR VP41) starter kit combines a highly effective malolactic starter culture with an activator to induce malolactic fermentation in an 18–24 hour build-up procedure.

Known strain that has proven effective in many different environments.

#15029 100 hL (2,600 gal) dose

#15058 500 hL (13,000 gal) dose

MALOLACTIC BACTERIA NUTRITION

Even under ideal conditions, *Oenococcus oeni* malolactic bacteria grow slowly. The nutrient needs of the yeast chosen for primary fermentation affect nutrients available for malolactic bacteria. Highly mature grapes tend to have lower nutrient levels. Indigenous microflora utilize the same nutrients. Highly clarified wines are often stripped of nutrients. All of these factors contribute to the need for sufficient nutrition for *O. oeni*. A small yeast population with little autolysis or a yeast strain that does not fully autolyze may not provide the needed nutrient release. *O. oeni* have complex nutrient needs and wine is often a poor source of these nutrients. Malolactic bacteria require sugar (fructose, glucose), organic acids (malic, citric, pyruvic), organic nitrogen (amino acids, peptides), vitamins (B group, pantothenic acid) and trace minerals (Mn, Mg, K, Na). The unfavorable conditions of wine can make malolactic fermentation very difficult. Temperature, pH, alcohol, SO₂, polyphenols, medium chain fatty acids and nutritional levels all affect malolactic bacteria growth and activity. Low temperatures can inhibit malolactic bacteria. High temperatures (above 77°F) and high levels of alcohol or SO₂ can kill malolactic bacteria. Stuck or sluggish malolactic fermentations may be caused by difficult conditions in the wine or by the malolactic bacteria not being able to multiply and reach the minimum population required for malolactic fermentation. Malolactic bacteria helps the selected bacteria get a faster start, increase survival rates and lower the risk of problems from undesirable bacteria (biogenic amines, VA, off-flavors and aromas, etc.).

Visit www.scottlab.com for a protocol on how to add Acti-ML to wine.

Acti-ML

Bacteria rehydration nutrient

Acti-ML® is a bacteria nutrient used during rehydration of the direct addition and standard malolactic bacteria strains. It was developed by the Lallemmand bacteria R&D team led by Dr. Sibylle Krieger-Weber. Acti-ML is a specific blend of inactive yeasts rich in amino acids, mineral cofactors and vitamins. These inactive yeasts are mixed with cellulose to provide more surface area to help keep bacteria in suspension. Acti-ML can help strengthen the development of bacteria growth under difficult conditions.

Recommended Dosage

20 g/hL 50 g/60 gal 1.7 lb/1000 gal

Usage

Mix Acti-ML into 5 times its weight in 20°C(68°F) chlorine free water. Add bacteria, then wait 15 minutes before adding the suspension to the wine.

Storage

Dated expiration. Store at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15681 1 kg

Opti'Malo Blanc

Malolactic nutrient for difficult White and Rosé fermentations; OMRI listed

Malolactic fermentation in Chardonnay wines can often be the last to finish. Lallemand researched this issue by looking at different peptide formulations, which resulted in the development of Opti'Malo Blanc™. Opti'Malo Blanc is a unique malolactic nutrient specifically formulated for white and rosé wines. Formulated from a blend of selected inactivated yeasts, Opti'Malo Blanc helps compensate for amino nitrogen and peptide deficiencies. The bioavailability of certain peptides stimulates the growth of selected bacteria and shortens the duration of MLF, especially under difficult white winemaking conditions.

Recommended Dosage

20 g/hL 50 g/60 gal 1.7 lb/1000 gal

Usage

Suspend in small amount of water or wine and then add directly to the wine just before adding the malolactic bacteria.

Storage

Dated expiration. Store at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15217 1 kg

Best Practices

Malolactic Fermentation in Sparkling Wine

Malolactic fermentation (MLF) on a base wine for sparkling wine is often done to soften the acidity on high acid wines and reduce the malic acid for microbial stability. Stylistically, some winemakers prefer not to have the base wine go through MLF to maintain the freshness and fruity aromas in the wine.

Malolactic bacteria can be added either at the end of alcoholic fermentation, or it can be co-inoculated (24 hours after the yeast inoculation). If MLF is desired, co-inoculation is generally recommended. The low pH and alcohol of a base wine can be inhibitory to MLF. With co-inoculation, not only does the heat of the primary fermentation help the ML finish faster, but the live yeast will metabolize the diacetyl (butter flavor) and diminish or eliminate it completely.

Recommended ML bacteria strains are VP41, MBR31 and O-MEGA. All of these function well down to a pH of 3.1. All are low diacetyl producers. If the pH is lower than 3.1, a standard 7-10 day build-up culture is recommended using strains IB (Inobacter) or MT01.

SULFUR DIOXIDE

Base wine quality can be preserved with sulfur dioxide. Sulfur dioxide is used in wine for its antioxidant and antimicrobial properties. The effectiveness of sulfur dioxide as an antimicrobial agent is dependent upon pH, as well as the presence of other SO₂ binding compounds. As pH increases, the portion of sulfur dioxide that is active against microorganisms decreases. Therefore, increases in pH require the addition of more sulfur dioxide to maintain adequate antimicrobial activity. Inodose Granules and Tablets are an easy and effective way to add sulfur dioxide to grapes, juice or base wine.

Inodose Granules

Effervescent sulfur dioxide granules

Inodose granules are small, effervescent granules made of potassium metabisulfite and potassium bicarbonate. Excellent for incoming fruit or must. Available in pre-measured packs of 2 g, 5 g, 100 g and 400 g.

#15777	2 g (40/box)
#15778	5 g (25/box)
#15780	100 g
#15781	400 g

Inodose Tablets

Effervescent sulfur dioxide tablets

Inodose tablets are a blend of potassium metabisulfite and potassium bicarbonate. Available in 2 g and 5 g tablets.

#15775	2 g (48/box)
#15776	5 g (48/box)

Inodose Granules + Inodose Tablets

Inodose granules and tablets dissolve into wine or must releasing a precise dose of SO₂. They help reduce overdosing problems associated with traditional SO₂ additions. They may be used for additions to must, juice and to wines prior to clarification and fining. The potassium carbonate fraction of the granules and tablets has little or no effect on pH.

Usage

Various applications include:

- In gondolas or picking bins to inhibit oxidation of grapes and juice, especially from *Botrytis* or mold.
- During transport of must or juice.
- To inhibit indigenous yeast and bacteria.
- In tanks before fermentation and directly into barrels after malolactic fermentation.
- To make sulfite additions to barrels.

Storage

Store in a dry, well-ventilated environment at temperatures below 25°C(77°F). Once opened, Inodose Granules and Tablets should be used immediately.

Inodose Granules and Tablets Conversion Chart—PPM of Total Sulfur Dioxide

SO ₂ Dose	1 Liter	1 Gallon	60 Gallons	100 Gallons	1000 Gallons
2 g	2,000	529	9	5	0.5
5 g	5,000	1,321	22	13	1.3
100 g	100,000	26,420	440	264	26.4
400 g	400,000	105,680	1,761	1,057	106

Note: The SO₂ products contribute 2 g or 5 g of pure SO₂ when added to the wine. Because they are blends of KMBS and potassium bicarbonate, the tablets and granules actually weigh more than what they contribute in SO₂.

Note: When using granulated, powdered, or tablet products at the time of dosage, it is important to note that the solution should be free of any solids or gushing can occur.

Sulfivin K150

Potassium bisulfite solution

Sulfivin K150 contains 150 g/L of potassium bisulfite. It can be used throughout the winemaking process from pressing to finished wine. Sulfivin K150 acts as an antiseptic against yeast and bacteria and has a role in increasing the solubility of polyphenols. It also contributes antioxidant activity.

Sulfivin K150 is an easy way to add a 100% liquid solution (no particles) of known strength.

Storage

Dated expiration. Store in a dry, well-ventilated environment at a temperature between 5–25°C(41–77°F). Once opened, use immediately.

#15890 12 kg

FINING AGENTS

J Juice Fining

W Wine Fining

F Flotation

Bentolact S

Formulated for the preventative treatment of must prone to oxidation; helps prevent formation of undesirable off-characters

White, Rosé

Bentolact S is a proprietary IOC blend of soluble casein and bentonite. It is most effective when used early (e.g. during cold settling of juice). Bentolact S can help reduce bitterness associated with heavy press fractions or moldy grapes. The negative charge of bentonite attracts and precipitates positively charged colloidal and proteinaceous materials which can contribute to off-odors and haze. At the same time the casein will help remove phenolic compounds associated with bitterness and oxidation. Higher dosages may be used for poor quality juice. Bentolact S is supplied in dry form which is soluble in water. For best results, it should be mixed in the juice or wine during a pumpover or tank mixing.

Recommended Dosage Bench trials recommended

Juice

200-1000 ppm 20-100 g/hL 1.7-8.4 lb/1000 gal

Wine

1000-2000 ppm 100-200 g/hL 8.4-16.7 lb/1000 gal

Usage

Dissolve in 10 times its weight in cold water and mix vigorously to avoid any lumps. Allow the mixture to stand for 3 hours. Add to the juice or wine during a pumpover or a good mixing. Depending upon the wine, a Bentolact S addition may take up to 7 days to settle.

Storage

Dated expiration. Store in a dry, well-ventilated environment at a temperature below 25°C(77°F). Once hydrated, Bentolact S should not be stored for more than 24 hours.

#15787 1 kg

#15788 5 kg

#15789 25 kg

Caséinate de Potassium

To help prevent oxidation and for the removal of oxidized wine components

White, Rosé

Caséinate de Potassium is used in both juice and wine for the treatment of oxidized phenolics and bitter compounds. In juice it can be used preventatively, while in wine it can diminish and remove off-compounds. Further, Caséinate de Potassium can help remove yellow color from oxidized wines.

Recommended Dosage Bench trials recommended

Juice

500-1000 ppm 50-100 g/hL 4.2-8.4 lb/1000 gal

Wine

200-1000 ppm 20-100 g/hL 1.7-8.4 lb/1000 gal

Usage

Mix the Caséinate de Potassium in approximately 10 times its weight of cold water. Allow the solution to stand for about 4 hours. Stir to remove any lumps. For juice, add the Caséinate de Potassium solution before settling or at the start of alcoholic fermentation. For wine, add the Caséinate de Potassium solution gradually during pumping over or via fining connection. Mix vigorously after adding the Caséinate de Potassium solution. Minimum contact time is 2 days, maximum is 15 days.

Storage

Dated expiration. Store in a dry, odor-free environment below 25°C (77°F). Once hydrated, Caséinate de Potassium will not keep for more than 48 hours.

#15807 1 kg

#15808 5 kg

Cristalline Plus

Isinglass clarification treatment

White, Rosé

Cristalline Plus is a blend of isinglass and citric acid stabilized with potassium metabisulfite. It has a high positive charge and can improve clarity and filterability even in very difficult wines (such as wines made with botrytised grapes). Cristalline Plus is not sensitive to cold temperatures and may be slow to complete settling.

Recommended Dosage Bench trials recommended

15–30 ppm 1.5–3 g/hL 0.12–0.25 lb/1000 gal

Usage

Dissolve Cristalline Plus in 150–200 times its weight in water, 15–20°C (59–68°F). Allow to swell for 3 hours. Add additional water if solution is too viscous. Add homogenized solution to wine, taking care to mix well. Rack once lees are well settled.

Storage

Dated expiration. Store in a dry, odor-free environment below 25°C (77°F).

#15770 100 g

#15771 1 kg

Freshprotect

PVPP blend for treatment of oxygen sensitive juice and wine

Freshprotect is a proprietary IOC blend of polyvinylpyrrolidone (PVPP), bentonite and arabic gum. It was specifically formulated to help minimize problems associated with the oxidation of polyphenols including color, bitterness and herbaceousness in oxygen sensitive juice. These characteristics are significantly mitigated with the use of Freshprotect. PVPP is intended as a processing aid. Wines made with it must be racked or filtered afterwards. Freshprotect has also been known to help correct sensory off-aromas.

Recommended Dosage Bench trials recommended

Juice

200–1000 ppm 20–100 g/hL 1.7–8.3 lb/1000 gal

Usage

Mix Freshprotect into 10 times its weight in cool water (do not mix in juice or wine). Allow to soak for 1 hour. Then add the mixture into the tank slowly; making sure the solution is thoroughly blended into the juice.

Storage

Dated expiration. Store in a dry, odor-free environment below 25°C (77°F).

#15790 1 kg

#15791 5 kg

#15792 20 kg

Inobent

Refined bentonite that helps remove protein and colloids

Inobent is a refined bentonite used for classic sparkling build up. It has fine particles that help remove protein and colloids, facilitating sedimentation and minimizing lump formation. Inobent has low deproteinization qualities and helps retain necessary elements for secondary fermentation.

Recommended Dosage Bench trials recommended

Must

20–100 g/hL 1.7–8.3 lbs/1000 gal

Wine

10–50 g/hL 0.8–4.2 lbs/1000 gal

Usage

Dissolve Inobent in approximately 20 times its volume of cold water and mix vigorously to avoid any lumps. Allow the mixture to swell for 6 to 12 hours. Add to the juice or wine during a good mixing. Depending upon the wine, an Inobent addition may take up to 7 days to settle.

Storage

Dated expiration. Store in a dry, well ventilated environment at a temperature between 5–25°C (41–77°F). Once hydrated, Inobent should not be stored for more than 24 hours.

#15865 1 kg

Polycacel

PVPP and casein for treatment of oxidized must or wine or for preventative treatment of browning and pinking

White, Rosé

Polycacel is an IOC blend of polyvinylpyrrolidone (PVPP), micropulverized cellulose and casein for use on problem phenols associated with browning and pinking. Its proprietary formulation helps avoid the over-stripping sometimes associated with high doses of caseinates and PVPP. It can be used either preventative-ly in juice or in wine destined for prolonged tank storage. Wine flavors and aromas are enhanced while color is improved.

Recommended Dosage Bench trials recommended

For Oxidized Juice

300–700 ppm 30–70 g/hL 2.5–5.8 lb/1000 gal

For Protection of Wine

150–300 ppm 15–30 g/hL 1.25–2.5 lb/1000 gal

Usage

Several hours prior to use mix Polycacel into 20 times its weight in cool water (do not mix in juice or wine). Mix well and allow to sit for 2 hours. Add the mixture into the tank slowly; making sure the addition is thoroughly blended into the juice or wine being treated.

Storage

Dated expiration. Store in a dry, odor-free environment below 25°C (77°F).

#15785 1 kg

#15786 5 kg

Polycel   

PVPP for treatment of pinking or browning

White, Rosé

Polycel is formulated to help prevent and/or treat compounds which cause pinking and browning. Polycel is polyvinylpyrrolidone (PVPP) and it complexes with polyphenols like catechins as well as other compounds associated with pinking and browning. Polycel may also help reduce problems with atypical aging. As it is insoluble in water and alcohol it precipitates out and leaves no residue. It can be used together with bentonite and/or casein.

Recommended Dosage Bench trials recommended

For Oxidized Juice

400-800 ppm 40-80 g/hL 3.3-6.7 lb/1000 gal

For Preventative Treatment of Wine

150-300 ppm 15-30 g/hL 1.25-2.5 lb/1000 gal

For Curative Treatment of Wine

300-500 ppm 30-50 g/hL 2.5-4.2 lb/1000 gal

Usage

Mix Polycel into 20 times its weight in cool water (do not use wine or juice). Mix well and allow to sit for 1 hour. Add the mixture to the tank slowly, making sure the addition is thoroughly blended into the juice or wine being treated. Depending upon the wine, Polycel may take up to a week to settle out. PVPP is intended as a processing aid. Wines made with it must be racked or filtered afterwards.

Storage

Dated expiration. Store in a dry, odor-free environment below 25°C(77°F).

#15784 1 kg

Reduless  

Reduces sulfur off-aromas

Red, White, Rosé

Reduless is a proprietary fining product from Lallemand for the reduction of sulfur off aromas such as H₂S and dimethyl sulfide. Its formulation includes bentonite together with other natural elements which are rich in copper. Reduless can naturally enhance roundness while treating sulfur problems. It has also been shown to reduce phenol related defects. It is particularly useful with sulfur prone varieties (e.g. Syrah, Sauvignon Blanc, Carignane, Pinot Noir, Chardonnay).

Recommended Dosage

100-150 ppm 10-15 g/hL 0.8-1.2 lb/1000 gal

Usage

Mix Reduless in 10 times its weight in water. Add immediately to the tank. If prepared in advance, re-suspend the product prior to its addition to the tank. Gently mix and rack off or filter after 72 hours. The maximum potential copper contribution when used according to the recommendation is 0.02 ppm.

Storage

Store at room temperature, away from direct sunlight and strong odors. It can be stored for up to 4 years from production date.

#15116 1 kg

#15115 2.5 kg

**On the Horizon
Non-Allergenic Fining Agents**

Global wine markets continue to seek ways to remove animal-derived and potentially allergenic enological products from their production process. Scott Labs is in the process of introducing a new generation of highly effective, "label friendly" fining agents. These products contain either a blend of chitosan and chitin-glucan or pea protein, and at the time of this publication are listed under 27 CFR 24.250. They are awaiting a change in status from the TTB.

Inofine V   

Allergen-free pea protein that clarifies and combats oxidation of must.

Qi No [Ox]   

For removal of oxidized phenolics. Can be used as an alternative to casein. Provides more freshness and fruitiness, resulting in a "new world" or fruit forward style sparkling wine.

Qi-Up XC  

An allergen-free flotation aid that is made of chitin derivatives. Qi-Up XC can be used as an alternative to gelatin.

TARTRATE STABILITY

Tartrate stability is vital in sparkling wine. In still wine, tartrate stability is an aesthetic and marketing decision. In sparkling wines, however, tartrate crystals will serve as nucleation points for the CO₂. They will cause the wine to gush and go flat faster. Two forms of tartrate crystals may form. The most common in the U.S. are potassium bitartrate crystals (KHT). These are the most predictable and easiest to deal with. Calcium tartrate crystals (CaT) may also form. These are less predictable and may precipitate after tirage. In this case they may be riddled and disgorged. Some producers in Champagne think that the tartrates may actually help riddling.

Tartrate stability can be achieved several ways. The most common way is by chilling the wine after adding 4 grams/liter of finely ground cream of tartar (KHT). The cream of tartar will act as nucleation points for the crystals and will speed formation and sedimentation. This will not work with CaT. However, for areas where CaT is a problem, the IOC in Champagne has recently developed DUOSTAB, a mixture of finely ground KHT and CaT which will cause the precipitation when chilled of both crystal-line formations. When cold stabilizing the base wine of sparkling wine, keep in mind that the second fermentation raises the alcohol. This lowers the solubility of the tartrates even further.

Electrodialysis is an effective, albeit expensive, method of tartrate stabilization. With charged cationic or anionic membranes it is possible to remove K⁺, Ca⁺⁺, HT⁻, and/or T⁻. This method is effective on both KHT and CaT. Other than expense, other negatives are the need for large quantities of water and the disposal of the salty effluent.

A more economical version of ion removal is the use of ion exchange resin. The wine passes over a charged resin (usually in a cylinder) and the unstable ions are exchanged for more stable ones. One of the most common resins exchanges H⁺ for K⁺ ions. This method can be used for both KHT and CaT. One of the negatives is that it may remove vitamins and other factors that the yeast need for a second fermentation.

An alternative approach to removing the excess tartrates is to stabilize them with CMC (carboxymethylcellulose), a man-made cellulose-based polysaccharide. CMC prevents crystal growth by altering the crystal face. If used, it should be added at tirage. The wine should be tested first to make sure that the CMC will work and to determine the level of addition. Wines with high tartrate levels may need to be partially cold stabilized prior to using CMC.

CARBOXYMETHYLCELLOSE (CMC)

Inostab MES

Highly purified Cellulose gum (carboxymethylcellulose) solution for tartaric stability

Inostab MES is a highly purified cellulose gum that has been put into solution at 5% in water to ensure a better solubility.

This product inhibits the formation of tartaric salts (both potassium and calcium) in wine; the principle is to stop the crystals growth by modifying their surface. Inostab MES is most effective against potassium tartrate formation. Its use is not a guarantee. Results should be confirmed by lab analysis. In the case of secondary fermentation in bottle, Inostab MES should be incorporated before bottling to reduce the risk of gushing at disgorgement.

#17020 1 L

#17022 10 L

Disclaimer: In addition to using CMC, to minimize the risk of crystal formation, a partial cold stabilization is also recommended.

Lab Analysis

Short Tartrate Stability

This analysis will help determine if Inostab MES is compatible with a given wine and the optimal dosage rate.

Volume needed: two 750 mL samples

In-Depth Tartrate Stability

This analysis will help determine if Inostab MES is compatible with a given wine and the optimal dosage rate. In addition, the filterability of the dosed wine will be evaluated.

Volume needed: six 750 mL samples

Secondary Fermentation

YEAST STRAINS

Strains	Page	Relative Nitrogen Needs ¹	Temperature Range (°F) ²	Fermentation Speed	Sensory Effect	Yeast Format
18-2007	36	Low	50-90	Fast	Neutral, Mouthfeel	Free
DV10	36	Low	50-95	Fast	Neutral	Free
EC1118	36	Low	50-86	Fast	Neutral	Free
ProElif	37	>100 mg/L	>54	Moderate	Enhanced Varietal Character	Encapsulated
QA23	36	Low	59-90	Fast	Enhanced Varietal Character	Free
Quartz	36	Low	50-90	Moderate	Enhanced Varietal Character	Free

¹ Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart.

² The temperature column indicates general performance possibilities. It is not a substitute for sound winemaking. Yeast may be stressed or die if temperatures are sustained at extremes of their tolerance. Keep in mind that a yeast's ability to ferment within the given range also depends on alcohol and other antagonistic conditions.

Important Notes

This chart is only useful as a quick reference guide. For more information on selected yeast strains, please refer to the yeast section of this handbook.

18-2007 *S. cerevisiae* • *bayanus*

Isolated by the Institut Oenologique de Champagne in Epernay. Well adapted to low pH, low temperature and alcohol up to 15% (v/v). Good glycerol producer, low VA, SO₂ and foam producer. Good implantation, complete breakdown of sugars and low nutrient requirements. It is ideally suited to making wines by the Traditional Method and Charmat Method.

#15900 500 g

DV10 *S. cerevisiae* • *bayanus*

Selected in Epernay, France.

Strong fermentation kinetics. Recognized for low foaming, low VA production and very low H₂S and SO₂ production.

Lalvin DV10™ is well known for clean fermentations that respect varietal character while avoiding bitter sensory contributions associated with other more one dimensional 'workhorse' strains such as PM.

Can be used to restart stuck fermentations and has been known to ferment up to 17% (v/v) alcohol.

#15062 500 g

#15106 10 kg

EC1118 (Prise De Mousse) *S. cerevisiae* • *bayanus*

Selected by the Institut Oenologique de Champagne (IOC) in Epernay, France. Reference strain for sparkling wine.

It is the original, steady low foamer, and is popular for barrel fermentations. It is an excellent choice for secondary fermentations of sparkling wine.

Ferments well at low temperatures and flocculates with compact lees.

Under low nutrient conditions Lalvin EC1118™ can produce high amounts of SO₂ (up to 50 ppm) and, as a result, may inhibit malolactic fermentation.

#15053 500 g

#15076 10 kg

QA23  *S. cerevisiae* • *bayanus*

Selected in Portugal by the University of Trás-os-Montes and Alto Douro (UTAD) in cooperation with the Viticultural Commission of the Vinho Verde region.

Lalvin QA23™ has low nutrient and oxygen requirements. It has been known to ferment juice at low temperatures (15°C/59°F) to dryness.

Excellent thiol converter making it a complementary yeast for developing varietal Sauvignon Blanc passion fruit character.

Produces large amounts of the enzyme beta-glucosidase during growth which allows for the release of bound terpenes in aromatic varieties.

#15652 500 g

#15653 10 kg

Quartz *S. cerevisiae*

Formulated specifically for sparkling wines, providing aromatic finesse and fermentation security under difficult conditions.

Vitilevure® Quartz is a great selection for tank-fermented Sauvignon blanc or whites fermented in neutral barrels. It is known for creating aromatic and balanced wines.

It is particularly adapted for foam formation in base wines.

#15671 500 g

ENCAPSULATED YEAST

ProElif

Double encapsulated yeast for secondary fermentation in sparkling wine production

ProElif® is an encapsulated yeast product developed by Proenol for secondary fermentations. The yeast cells are double encapsulated in an alginate bead. The beads can be directly inoculated into the bottle (eliminating the need to prepare a starter culture). This helps ensure control of the number of cells per bottle. Upon fermentation completion, the beads have a greater density than the wine and will quickly drop to the neck of the bottle when inverted. The beads accumulate more tightly than traditional riddling, therefore less wine is lost during disgorging. Traditional freezing and disgorging methods are used to finish the process. The use of ProElif results in a fresh sparkling wine. If greater yeast character is desired, you may make changes to the base wine with this in mind. For example, ProElif has been used with Opti-WHITE treated base wine with good results.

ProElif is a good choice for test batches or just starting out. It offers quick production without yeast build up or riddling as well as fast attenuation and easy disgorging.

For ProElif to be successful, the base wine should fall within these parameters:

Alcohol	≤ 11.5% (v/v)	Calcium	≤ 80 mg/L
Free SO ₂	≤ 15 mg/L	Protein Stability	= stable
pH	≥ 3.0	Tartrate Stability	= stable
Free Assimilable Nitrogen	≥ 100 mg/L	Fermentation Temperature	> 12°C(54°F)

The base wine must be stable to avoid agglomeration of the beads which could cause subsequent difficulty during disgorging. All of these parameters act in synergy with one another. It is critical to manage them together. If one parameter is over the limit, try to compensate with the others or ferment at a higher temperature.

Recommended Dosage

133–200 g/hL 1.0–1.5 g/750 mL bottle

Note: 1 g of ProElif beads = 4–6 million active cells/mL.

Usage

Please contact us for full usage instructions.

Storage

Dated expiration. Store at 4°C(40°F). Do not freeze. Once opened use immediately. For more detailed information, technical data sheets are available on our website www.scottlab.com.

#15571 1 kg

Advantages of Encapsulated Yeast

- Reduces costs associated with production and labor
- Direct inoculation which eliminates need to build yeast culture
- Economic footprint for cellar or production facility due to elimination of riddling and lab equipment
- Elimination of riddling step satisfies fast-to-market needs

ProElif

Although the parameters for the base wine are stricter with ProElif, it is more than made up for by the time it saves the small sparkling winemaker. ProElif eliminates the need to spend 3–5 days building up a yeast culture (pied de cuve). It is already pre-conditioned to the stressful conditions of the base wine. It also makes unnecessary the 7–21 day riddling cycle. The bottles are simply turned upside down and in three seconds the beads are in the neck of the bottle, ready to be disgorged.

NUTRITION

Due to the depletion of nutrients during the primary fermentation, this must be addressed for the secondary fermentation to minimize the risk of a stuck fermentation. Due to the adverse conditions (low temperature, low pH and alcohol) providing sterols via Go-Ferm Protect Evolution is essential during the yeast acclimatization and tirage stage. During the fermentation process, the yeast should, at a minimum, be supplied with ammonia salts and thiamin (Phosphate Titres). A complex nutrient would be preferred, however, there are concerns over the introduction of non-soluble components that may give challenges during the disgorging process.

Go-Ferm Protect Evolution

Yeast rehydration nutrient for challenging conditions; OMRI listed

Go-Ferm Protect Evolution® is the latest generation of natural yeast rehydration nutrients with improved sterol content (quality and quantity) together with micronutrients which help to increase yeast cell viability and vitality. This third generation formulation improves yeast stress tolerance and enhances fermentation security (especially in difficult conditions) and helps with aromatics.

Difficult conditions may include overripe fruit, marginal fruit quality (poorly developed fruit, *Botrytis*, molds, high bacteria count), insecticide or fungicide residue, low nutrient levels, or over-clarified juice. It is especially useful in white and rosé fermentations when oxygen additions are difficult. The enhanced sterol content can replace the second oxygen addition recommended at 1/3 sugar depletion.

Go-Ferm Protect Evolution provides a combination of protective and nutritive benefits for optimal fermentation and sensory results.

Recommended Dosage

30 g/hL 2.5 lb/1000 gal

Note: This recommendation is based on a yeast inoculum of 2 lb/1000 gallons (25 g/hL). If using more or less yeast, respect the ratio of 1 part yeast to 1.25 Go-Ferm Protect Evolution.

Usage

1. Mix Go-Ferm Protect Evolution in 20 times its weight in clean 43°C(110°F) water. For every 1 kg (2.2 lb) Go-Ferm Protect Evolution, use approximately 5 gallons (20 L) of water.
2. Let the mixture cool to 40°C(104°F) then add the selected active dried yeast.
3. Let stand for 20 minutes.
4. Slowly (over 5 minutes) add equal amounts of must/juice to be fermented to the yeast slurry. Do not allow more than 10°C(18°F) difference. Atempérate as necessary ([visit www.scottlab.com](http://www.scottlab.com) for a video protocol on yeast rehydration).

Storage

Dated expiration. Store in a cool and dry environment at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15103 2.5 kg

#15251 10 kg

Note: Due to the unique nature of Go-Ferm and Go-Ferm Protect Evolution, they will not go into solution completely. This is due to the fatty acid and sterol content and is to be expected.

Phosphate Titres

DAP and thiamin blend for optimized fermentations

Phosphate Titres is a blend of diammonium phosphate (DAP) and thiamin (vitamin B1) for nutrient supplementation of deficient must/juice. Wine yeast requires a supply of thiamin for cell growth. Phosphate Titres can help ensure regular yeast multiplication and sugar utilization. For secondary fermentation, add Phosphate Titres to the wine being used for the starter culture.

Recommended Dosage

6 g/hL 0.5 lb/1000 gal

Usage

Suspend Phosphate Titres in cold water and mix well before adding to starter culture wine.

Storage

Dated expiration. Store in a cool and dry environment below 25°C(77°F). Once opened, keep tightly sealed and dry.

*This product contains thiamin. The TTB Maximum Legal Dose for thiamin hydrochloride = 0.60 mg/L (0.005 lb/1000 gal) of wine or juice. 21 CFR 184.1875.

#15887 1 kg

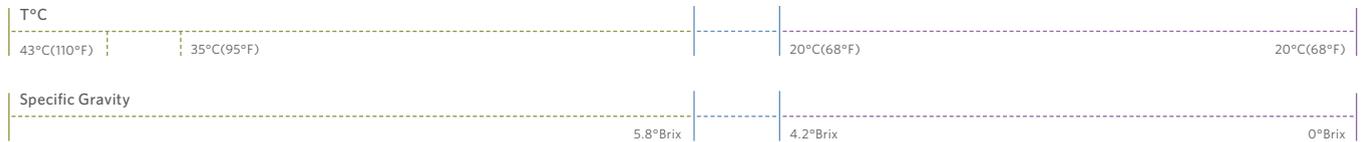
#15888 5 kg

The Importance of Thiamin (Vitamin B1)

- Essential growth factor for *S. cerevisiae*
- Enhances cell viability and vitality
- Activates fermentation
- Inactivated by >50ppm SO₂
- When deficient, higher levels of pyruvate, acetaldehyde (major SO₂ binding compounds) may result

PREPARATION OF A YEAST STARTER CULTURE

500 L of yeast culture for 10,000 L of Tirage



REHYDRATION

🕒 15-20 MINUTES + 15 MINUTES

- Mix 1.25 kg Go-Ferm Protect Evolution® in 10 L of water at 43°C(110°F).
- Allow to stand for 15-20 min. When temperature has dropped to 35°C(95°F), add in 1 kg of selected yeast.

It is essential to follow the recommended temperatures carefully. Sprinkle yeast slowly and evenly onto the surface of the Go-Ferm Protect Evolution-water mix, while stirring gently. Ensure all clumps are dispersed.

- Allow the suspension to stand for 15 minutes then stir gently prior to addition to the Starter.

STARTER

🕒 6-18 HOURS

10 L Rehydrated Yeast
 10 L Base Wine
 10 L Liqueur at 500 g/L (= 5 kg of sugar in 6.8 L of water)
 30 g Phosphates Titrés

 30 L Starter

- Carefully stir the mix and measure density. This will be the initial reference point (around 5.8°Brix). This will help to check the starter activity.
- Maintain the temperature of the Starter mixture at 20°C(68°F). Stir and regularly check the density, at least twice a day. Once the density is below 4.2°Brix, then proceed to the next stage.

FIRST MULTIPLICATION

🕒 2-4 DAYS

30 L Starter
 330 L Base Wine
 70 L Water
 70 L Wine Liqueur at 500 g/L
 (= 35 kg of sugar in 48 L of base wine)
 100 g Phosphates Titrés

 500 L

- Maintain temperature at 20°C(68°F).
- Stir with splashing at morning and evening and check the density once a day
- Drop of density, in full activity, should be around 10 to 12 units per day (2.5-3°Brix/day).
- Starter culture is ready when density is around 0°Brix.
- If bottling is delayed, it is important to maintain the starter culture slightly above 0°Brix. Add sugar if necessary to keep the yeast culture active.
- Make a microscopic check before Tirage to check the yeast activity (cells in division), as well as cell count.

Yeast cell numbers must be between 50 and 70 million cells/mL. (i.e. $5-7 \cdot 10^7$ cells/mL)

Common Issues with Pied de Cuve

The population in the pied de cuve is too low.

This is a result of not enough oxygenation at the multiplication phase, and not enough addition of nitrogen.

The alcohol level in the pied de cuve is too high.

This is a result of too much sugar being added to the wine/sugar/water mix.

The pied de cuve has too much sugar when ready to be used.

In this case, delay the bottling date for a short time. Increase the temperature for a faster consumption of sugar, and calculate the increase of sugar coming from the yeast culture in the final mix.

The pied de cuve is dry (no sugar), and it's unclear how long this has been the case.

Check yeast viability, as they are at risk to start dying. Make a complementary addition of sugar and postpone bottling.

The temperature of the pied de cuve is too high compared to the wine/sugar/water mix on bottling day.

Reduce the temperature of the yeast culture to be close to the wine and sugar mix temperature and postpone the bottling date.

There are not enough live yeast at the moment of inoculation.

This is a risky situation. Restart a yeast culture and reschedule the bottling.

The base wine is nutrient deficient.

Always add the proper dosage of nitrogen recommended for the yeast culture you are using. It is also advised to add some nitrogen to the base wine prior to bottling.

The yeast used for the pied de cuve is producing SO₂.

The yeast used is not appropriate for sparkling wine. It is likely now at risk for a stuck fermentation in the bottle.

TIRAGE

Tirage is the addition of yeast to the bottle for secondary fermentation. Care must be taken to have a clarified base wine ready and a healthy yeast starter culture. The yeast is added to the bottle, usually with a mixture of sugar, nutrients, and an adjuvant/riddling aid. The bottle is then closed with a bidule and crown cap.

RIDDLING

Riddling is the movement of the bottles after the secondary fermentation. The bottles are gently moved to an inverted (on point) position over a period of time either manually or by machine. This brings the yeast into the bottle necks making them ready for disgorging.

Traditional Method Tirage & Riddling

ADJUVANTS & RIDDLING AIDS

Clarifiant BK

Blend of bentonites that facilitates the sedimentation of yeast

Clarifiant BK is a powdered blend of bentonites that was formulated specifically for sparkling wine. It facilitates the sedimentation of yeast into a compact deposit for ease of disgorgement. Clarifiant BK has a low deproteinization quality and gentle mode of action which is important for the quality of the foam.

Recommended Dosage

Wine

80 mL/hL of prepared solution 3.0 L/1000 gal

Usage

Dissolve little by little 600 g of powder into 10 L of cold water and mix vigorously for 1 hour. Leave to swell for 6-12 hours mixing occasionally. Add the mixture to the wine immediately before bottling and ensure the resulting mix is continually homogenous. Can successfully be used in conjunction with Solution ST.

Storage

Please see next page.

#15872 1 kg

Clarifiant S

Liquid preparation of sodium bentonite specially selected for riddling

Clarifiant S is a liquid preparation of sodium bentonite that can be used for both manual and automatic riddling. Clarifiant S helps create a compact sediment in the bottle that can move easily down into the neck during the riddling process. Clarifiant S has a gentle mode of action resulting in brilliantly clear wines. The efficiency of Clarifiant S is improved when used in conjunction with Phosphates Mazure.

Recommended Dosage

700-800 ppm 70-80 mL/hL 2.6-3.0 L/1000 gal

If Clarifiant S and Phosphates Mazure are used together, the following dose rate is recommended.

600-800 ppm 60-80 mL/hL 2.3-3.0 L/1000 gal

Usage

Shake the bottle well before use. No additional product preparation is required. Clarifiant S can be added directly to the wine after the yeast and sugar have been added. The tank must be continually mixed during the bottling operation in order to remain homogenous. If using in conjunction with Phosphates Mazure (20 mL/hL), add the Clarifiant S first.

Storage

Please see next page.

#15870 10 L

Clarifiant XL

Liquid preparation of bentonite and silicate for riddling

Clarifiant XL is a liquid adjuvant consisting of a pure bentonite (selected for its uniformity) and a silicate that can be used for both manual and automatic riddling. The combination of these components gives a high degree of clarification and sedimentation. No other additives are required for riddling operations. Clarifiant XL provides compact deposits that are non-adherent and easy to remove.

Recommended Dosage

Sparkling Whites

600-800 ppm 60-80 mL/hL 2.6-3.0 L/1000 gal

Sparkling Reds or Rosés

800-1000 ppm 80-100 mL/hL 3.0-3.8 L/1000 gal

Usage

Shake the bottle well before use. No additional product preparation is required. Clarifiant XL can be added just directly to the wine after the yeast and sugar have been added. The tank must be continually mixed during the bottling operation in order to remain homogenous.

Storage

Please see next page.

#15873 1 L

#15871 10 L

Inoclair 2

Combination of bentonite and alginate for mechanical riddling

Inoclair 2 reduces the riddling time necessary for both traditional and agglomerating yeast. The alginate in Inoclair 2 ensures that the yeast/bentonite sediment remains intact and also speeds up the riddling process. The bentonite component has a high protein removal capacity. Inoclair 2 should only be used for wines undergoing mechanical riddling.

Recommended Dosage

350 mL/hL of prepared solution

Usage

For Tirage

Add 100 g of Inoclair 2 to 10 L of cold water, mix well to avoid lumps. Let swell for 6 to 12 hours and remix. It is preferable to add to the yeast culture, add to tank. Keep the tank homogenous.

Inoclair 2 should never be added directly to the wine before being put into solution.

For Riddling

Important: do not to shake the bottles at the point of riddling.

Storage

Please see next page.

#15867 1 kg

Phosphates Mazure

Co-adjutant for riddling assistance

Phosphates Mazure is a bentonite based liquid co-adjutant. It is used in conjunction with Clarifiant S. The Phosphates Mazure adds “weight” to the Clarifiant S allowing an intact sediment to be formed in the neck of the bottle making classical and manual riddling easier.

Recommended Dosage

200 ppm 20 mL/hL 757 mL/1000 gal

Usage

Shake the bottle well before use. No additional product preparation is required. Phosphates Mazure can be added directly to the wine after the yeast, sugar and Clarifiant S. The tank must be continually mixed during the bottling operation in order to remain homogenous.

Storage

Please see below.

#15885 10 L

Solution ST

Liquid preparation of tara tannins and copper sulfate for prevention of off-odors and clarification during riddling

Solution ST enables the preservation of the sensory qualities in wines destined for bottle fermentation. It also improves a wine’s potential for aging and makes riddling easier. Solution ST also helps to prevent oxidation and acts as a preventative and curative treatment for reductive odors.

Recommended Dosage

Wine

20-40 mL/hL

Usage

Add directly to the wine at the same time as riddling agents. Ensure thorough mixing.

Storage

Please see below.

#15896 10 L

ALL Adjuvants & Riddling Aids

Dosage

Riddling adjuvant dose rates are calculated based on a yeast population between 1.2- 1.8 million cells per ml of wine to ferment.

A yeast cell count should be performed on bottling day to confirm. Populations in excess may result in poor riddling results.

Storage

Dated expiration. Store in a dark, dry environment at a temperature between 5-25°C(41-77°F). Once opened, use immediately.

Pressure in Sparkling Wine

Confusion exists when describing CO₂ pressure in sparkling wine. Terms such as bars, atmospheres, psi and volumes/volume are commonly used but are not necessarily accurate. These measurements are only accurate at standard temperature and pressure (0°C/32°F at 1atm/14.7psi). The most accurate measurement of CO₂ pressure in sparkling wine is by weight which is not affected by temperature or pressure. By definition in the U.S., sparkling wine must contain at least 3.92 grams CO₂/liter created by a fermentation.

At low temperature or high atmospheric pressure the solubility of CO₂ increases, lowering the pressure in a bottle of sparkling wine. At high temperature or low atmospheric pressure the solubility of CO₂ decreases and the pressure in the bottle increases.

The solubility of CO₂ is also diminished by ethanol and sugar. A sparkling wine with residual sugar will contain more pressure than a wine with lower sugar and/or alcohol, even if the amount of CO₂ is the same.

Care should be taken to minimize dissolved gas in the base wine prior to the second fermentation. Too much CO₂ in solution may be inhibitory to the yeast. Also, nitrogen and oxygen in solution will add to the pressure and may cause gushing.

The secondary fermentation in Traditional Method sparkling winemaking is usually created by the addition of 24 grams sugar/liter to the base wine along with yeast. The sugar may be added as crystalline sugar or as RCGM (Rectified Concentrated Grape Must), a 65% grape sugar solution. Depending on the base wine and yeast strain, this should result in the formation of 11-12 grams of CO₂/liter (approximately 7-8 atmospheres at 20°C). Some pressure will be lost during disgorging, bringing the CO₂ level down to 8.5-9.5 grams/liter. For early-to-market sparkling wines, producers may lower their sugar addition to 20-22 grams/liter. The result will be a lower CO₂ level with a somewhat creamier texture.

Adjuvants

Riddling agents are adjuvants used to help move the yeast and sediment from the secondary fermentation smoothly into the neck of the bottle without sticking to the glass. Riddling agents are made up of bentonite or alginate and bentonite blends. The positively charged yeast are attracted to the negatively charged bentonite. This helps settle and compact the yeast into the bottle neck.

The choice of riddling agent is made by the processing available in the winery. Pure bentonite (or mix with Kaolin) may be used for hand or automatic riddling. Alginate and bentonite blends are used for automatic riddling.

CROWN CAPS & BIDULES

Crown Caps as Winemaking Tools

In the Traditional Method, the temporary crown cap can be used as a winemaking tool to subtly change the flavor and aroma of the sparkling wine. In other winemaking, the closure is used simply to protect the winemaking that has come before it. However, in sparkling winemaking, the use of the crown cap occurs mid-process. The moulded liner inside the cap allows for the gas exchange that leads to the slow ingress of air. As the sparkling wine ages on the yeast after the second fermentation, autolysis releases breakdown products of the yeast into the wine. The oxidation of these products creates the “brioche” character that has typically been associated with French Champagne.

By altering the oxygen permeability of the crown cap liner, the oxidation of the yeast byproducts can be sped up or slowed down. For early-to-market sparkling wines, a cap with greater permeability (PE.DI Top+3) creates some of the same complexity usually associated with fine champagnes. A cap with moderate permeability (PE.DI Top+) allows for slower oxidation and greater complexity in wines that will be aged on the yeast from 2-4 years. For prestige cuvées aged up to 5 years or more on the yeast, the cap with the lowest O₂ ingress (PE.DI Top Z) should be used.

Aside from the three levels of permeability, PE.DI has also developed a crown cap with a liner comprising polymer mixed with sulfites, called OXYSORB. The oxygen passing through the liner is trapped by the sulfites up to the point that all active sites are bound to the oxygen (approx. 340 days). At that point, the permeability of the OXYSORB liner will be that of the Top+.

PE.DI Crown Caps



PE.DI has over 35 years of experience in the production of high quality crown caps designed specifically for the secondary fermentation of traditional method wines.

Materials

High quality metals and innovative liners translate into an assortment of products that meets packaging regulations for the food and beverage industry.

Aluminum

Aluminum crown caps are non-magnetic, lightweight, rust resilient, gentle on equipment, and allow an optimal surface for printing.

Stainless Steel

Stainless steel is the preferred selection for crown caps used in final packaging. It is also an ideal choice for aging wines long-term.

Standard Steel

Standard steel crown caps are economical and versatile, but can be susceptible to rust in certain cellar conditions.

Liners

All liners are made of injected PVC-free polyethylene.

Top+3

Top+3 is the ideal liner for early to market sparkling wines. It allows greater permeability for wines aging up to 36 months.

Top+

Top+ is the most common liner used in sparkling production. It is ideal for aging up to 48 months.

TopZ

TopZ is ideal for warmer, riper vintages. It has a tighter permeability for long term aging up to 60 months and longer.

OXYSORB

OXYSORB is the first ‘active’ liner used for secondary bottle fermentation (see page 44 for more information).

Options & Features (for Aluminum, Stainless Steel & Standard Steel)

Diameter* 26 mm

29 mm

*36mm available upon request

Liners Top+3 (available for samples upon request)

Top+

TopZ

OXYSORB (available for samples upon request)

Annual vintage color also available. Minimum order 100,000 pieces.

Other Features

Aluminum	Stainless Steel	Standard Steel
Lightweight	Magnetic	Economic
Recyclable	Recyclable	Magnetic
Rust-free	Rust-free	Recyclable

Bidules



PE.DI bidule stoppers are made of pure, PVC-free polyethylene and fit perfectly into the bottle neck for easy disgorging. The bidule stopper works in combination with the crown cap to guarantee mechanical sealing against pressure and to facilitate disgorgement. Available in 26 mm and 29 mm sizes. 100% recyclable after use.

OXYSORB **NEW!**

OXYSORB is the first 'active' liner used for secondary bottle fermentation.

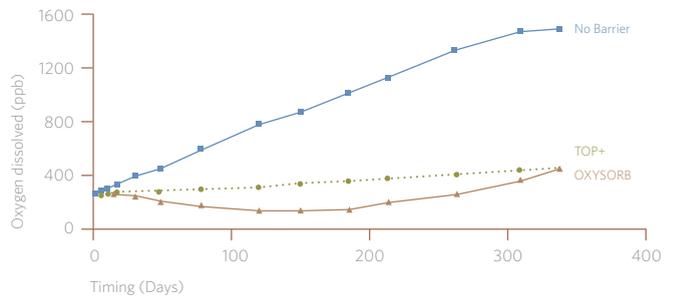
How It Works

- OXYSORB is a heat-molded liner made of pure, PVC-free polyethylene.
- OXYSORB contains a sulfite-based compound included in the liner that combines with oxygen, preventing it from entering the bottle and reducing the effects of oxidation on the wine.
- Once the liner's active effect, i.e. its ability to absorb oxygen, is depleted, its permeability becomes identical to that of the TOP+ liner.
- The sulfites remain within the liner, as proven during migration testing.

Recommendations

- The ideal solution for wines that are particularly vulnerable to oxygen, such as rosé wines.
- Recommended for organic and sulfite free wines.
- A perfect alternative for 375 ml bottles, which due to their lower volume, have double the exposure to oxygen in comparison with 750 ml bottles.

Difference in dissolved oxygen on bottles capped with crowns with no O₂ barrier versus Top+ liner and OXYSORB liner.



The graph shows that after around 340 days, the two lines for TOP+ and OXYSORB meet. From that point, the "active" effect of the liner comes to an end and the permeability becomes identical to that of TOP+.

Charmat Method Filtration

HIGH-PRESSURE (ISOBARIC) CROSSFLOW FILTRATION

Pall OenoFlow XL-HP

The Pall OenoFlow™ XL-HP is an economic and efficient system for clarifying filtration of sparkling wine by means of the tangential flow principle. The OenoFlow XL-HP system was designed for the preparation of sparkling wines under isobaric manufacturing conditions, for example, wines under the same pressure as the sparkling wine storage tank. The OenoFlow XL-HP system may also be used for the preparation of base wines before refermentation. This allows the use of only one system for all the necessary treatments in the production of sparkling wines.

HIGH-PRESSURE LENTICULAR FILTRATION

Pall WSFZ Lenticular Housings



The Pall WSFZ lenticular housings provide flexibility in production as they can be used for filtering both still and sparkling wines. Due to an enclosed design, product and gas loss is minimal and there is no exposure to environmental contaminants. WSFZ housings can be used with SUPRAdisc™ II modules which provide higher throughputs and have the ability to be back-flushed, forward-flushed, and reused several times. The WSFZ housings are designed for use under safe pressure ratings for both gas and liquid pressure.

Disclaimer: Ensure all vessels are gas and liquid pressure rated for safe use.

Disgorging

Frequently Asked Questions

Liqueur preparation

What type of sugar can be used for the disgorging liqueur?

Cane sugar or beet root sugar, but the legal aspect is important. Cane sugar is most commonly used for its purity, but it still needs to be mixed and filtered. Beet root sugar can be used if the purity is good.

What other options are there for sweetening?

The use of rectified concentrated must can also be used. It is a popular choice for its convenience.

Can wine be used for the disgorging liqueur?

Yes, the use of wine (base or bottled) is a useful tool. It is important to choose a wine that will match the quality and style of the final product.

Does my disgorging liqueur need to be filtered prior to use?

Yes, it is very important to have a clean dosage liqueur for microbial stability and particle removal. Care should be taken to choose the right filter and speed of filtration due to the high viscosity of the liqueur.

What additives can be used in the disgorging liqueur?

- SO₂ (possibly in addition to citric or ascorbic acid)
- Tannins
- CMC
- Metatartaric acid
- Anti-reductive products (copper sulfate or specific yeast extract)
- Yeast extracts
- Gum Arabic
- Mannoproteins

Avoid any product that might unbalance the chemistry of the wine and always respect recommended dosage rates.

Wine Preparation

When should I schedule my disgorgement date?

Calculate the targeted aging date, and then taste as often as you can in order to achieve the balance and taste you are looking for.

How long should I keep my wines before shipment?

It is best to keep wine at least one month prior to shipment, in order to allow the liqueur to dissolve completely into the wine.

Gushing in Sparkling Wine

Gushing can be caused by a number of factors. The most common root cause is insoluble particles in the base wine that do not clear through riddling and disgorging. Common residual impurities include bentonite, silica gel, diatomaceous earth, cellulose fibers, yeast, bacteria and calcium or potassium tartrates. It is vital that clean, quality bottles free of interior imperfections be used. Imperfections in the glass will be points of emanation for bubbles.

Insoluble particles are not always the culprit. Excess sugar at tirage will result in too much CO₂, which can cause gushing. For early-to-market sparkling wines, gushing may be reduced by lowering the second fermentation sugar from 24 g/L (standard) to 20–22 g/L. Time in the bottle and cap permeability result in different levels of CO₂ over the tirage period.

Wine too warm or agitated will more readily release CO₂ gas from solution. Prior to disgorging, the wine should rest without movement for 3–5 days. Ideally, it should be chilled to 2°C (35°F). One technique to mitigate gushing is tapping the crown cap with a small “hammer” prior to disgorging. Different mechanisms are available for a hammer depending on the automation of the disgorging line.

Gushing may occur during the addition of the dosage after disgorging. Make sure there are no undissolved solids in the syrup, such as sugar crystals, KMBS, powder or dust. The temperature of the dosage should be the same as the wine.

When managing gushing issues make sure to document the occurrence and the frequency. This will help get to the root cause analysis of the problem.

Tools & Equipment

Sparkling winemaking equipment can be challenging to source.

Visit www.crush2cellar.com for a wide array of useful items for sparkling wine production.

Dosage

FINISHING TOOLS

The dosage (*dosage liqueur*) provides a final opportunity to define wine style. It may include a mixture of sugar, wine, distilled spirits, tannins, and stability aids. Finishing tools such as tannins, gum arabic and mannoproteins may be used to help refine aroma, color, mouthfeel, body and volume. They can also help reduce the perception of bitterness and acidity.

Flashgum R Liquide

Gum arabic for colloidal protection

Flashgum R Liquide is a 25% gum arabic derived from Acacia seyal. This preparation offers both colloidal protection and the perception of sweet and soft characters on the palate. Gum arabic products can help reduce the risk of colloidal deposits in the bottle in wines bottled without filtration. Natural polysaccharides reduce astringency and increase feelings of volume and fullness in the mouth. Flashgum R Liquide can provide color protection in rosé and fruit wines.

Storage

Dated expiration. Store in a dry, odor-free environment at or below 25°C(77°F).

#15772 1 L
#15773 5 L
#15769 20 L

Onyx

French oak for adding complexity and integrating flavors

Red, Rosé

Scott'Tan Onyx is derived from French oak. It was designed for use in red and rosé wines to bring out the berry and sweet red fruit notes. Onyx is known for maintaining varietal characteristics while adding complexity and minimizing greenness. It helps soften and integrate flavors.

Recommended Dosage

10-100 ppm 1-10 g/hL 0.08-0.83 lb/1000 gal

Usage

Dissolve Onyx in about 10 times its weight of warm water 35-40°C(95-104°F) until fully dissolved. Add to wine gradually during a transfer or pumpover. Good homogenization is important. Additions should be made at least 48 hours prior to bottling.

Storage

Dated expiration. Unopened the shelf-life is 4 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15977 250 g

Radiance

Tannin blend for highlighting fresh fruit

White, Red, Rosé

Scott'Tan Radiance is a blend of tannins for use in white, red and rosé wines. It will help unmask and refine the aromas and flavors of your fresh fruit. Radiance will help promote balance and mouthfeel while maintaining acidity. It is known for revealing fresh fruit, vanilla, coconut and caramel.

Recommended Dosage

10-100 ppm 1-10 g/hL 0.08-0.83 lb/1000 gal

Usage

Dissolve Radiance in about 10 times its weight of warm water 35-40°C(95-104°F) until fully dissolved. Add to wine gradually during a transfer or pumpover. Good homogenization is important. Additions should be made at least 48 hours prior to bottling.

Storage

Dated expiration. Unopened the shelf-life is 4 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15978 250 g

LUXE Tannin Kit

The LUXE tannins are ultra-premium finishing tannins designed to bring out elegance, complexity and balance in premier wines. They have been highly refined and carefully extracted so additions may be made as late as 48 hours prior to bottling.

Our LUXE liquid tannin kits include samples of each tannin in the range: Radiance, Onyx, and Royal. These kits are a great tool to make final touches to your wine. Pipette sold separately.

#SLQDLUX

UltiMA Fresh

Mannoprotein/gum arabic with positive impact on stability and perceived volume

UltiMA Fresh is a proprietary blend of specific mannoproteins together with gum arabics. It has been shown to have a volume enhancing effect on red and white wines, while also reducing perceptions of bitterness and acidity. Bench trials are highly recommended and allow the winemaker to fine tune use of UltiMA Fresh for optimal results. It is a fully soluble product. Gum arabic and mannoproteins both have some stabilizing effects on wine, though the addition of this product is not a replacement for good winemaking practice and thorough analysis.

Storage

Dated expiration. Store in a dry, well-ventilated environment with temperatures less than 25°C(77°F).

Note: This product contains ingredient(s) currently listed by the TTB as acceptable in good commercial winemaking practices in 27 CFR 24.250. For more information please visit www.TTB.gov.

#17010 1 kg

UltiMA Soft

Mannoprotein/gum arabic with positive impact on stability and perceived softness and volume

UltiMA Soft is a unique blend of mannoproteins and gum arabic. On white wines UltiMA Soft can soften, enhance body, add to length, and lower astringency. On red wines, it helps maintain fruity aromas while helping to round out the mid-palate. Bench trials are recommended. Gum arabic and mannoproteins both have some stabilizing effects on wine, though the addition of this product is not a replacement for good winemaking practice and thorough analysis.

Storage

Dated expiration. Store in a dry, well-ventilated environment with temperatures less than 25°C(77°F).

Note: This product contains ingredient(s) currently listed by the TTB as acceptable in good commercial winemaking practices in 27 CFR 24.250. For more information please visit www.TTB.gov.

#17012 1 kg

STABILIZATION

Sulfivin K150

Potassium bisulfite solution

Sulfivin K150 contains 150 g/L of potassium bisulfite. It can be used throughout the winemaking process from pressing to finished wine. Sulfivin K150 acts as an antiseptic against yeast and bacteria and has a role in increasing the solubility of polyphenols. It also contributes antioxidant activity.

Sulfivin K150 is an easy way to add a 100% liquid solution (no particles) of known strength.

Storage

Dated expiration. Store in a dry, well-ventilated environment at a temperature between 5–25°C(41–77°F). Once opened, use immediately.

#15890 12 kg

Note: When using granulated, powdered, or tablet products at the time of dosage, it is important to note that the solution should be free of any solids or gushing can occur.

Residual Sugar Classifications

	Champagne*	Prosecco**	Cava DO***
Doux/Dulce	> 50 g/L RS		> 50 g/L RS
Semiseco	32–50 g/L RS	32–50 g/L RS	32–50 g/L RS
Seco	17–32 g/L RS	17–32 g/L RS	17–32 g/L RS
Extra Seco	12–17 g/L RS	12–17 g/L RS	12–17 g/L RS
Brut	< 12 g/L RS	< 12 g/L RS	< 12 g/L RS
Extra Brut	0–6 g/L RS		< 6 g/L RS
Brut Nature	0–3 g/L RS		< 3 g/L RS

* Set by the Comité Interprofessionnel du vin de Champagne (CIVC)

** Set by the Consorzio Tutela Prosecco DOC

*** Set by the Cava Regulatory Council

RECTIFIED GRAPE MUST

Sucraisin MCR Liqueur

Sucraisin MCR Liqueur is a concentrated rectified grape must. It comes from grape juice in which all of the “non-sugar” components have been extracted making it sensory neutral.

The use of Sucraisin enables the mixture (sugar + wine + starter + adjuvants) to be prepared quickly and in a uniform manner. MCR, made up solely of fructose and glucose, can be used rapidly by the yeast.

Dosage Rate

Style	Dose Rate	RCGM volume 63° Brix (mL/750 mL btl)
Brut	15 g/L	4.5-13.0
Extra dry	12-20 g/L	10.5-17.5
Dry	17-35 g/L	15.0-31.0
Semi-dry	33-50 g/L	29.5-44.5
Sweet	> 50 g/L	> 44.5

Storage

Store in a dark, dry environment at a temperature between 10-15°C(50-59°F). Once opened, use within a year.

#15874 10 L

Bottling & Packaging

CORKS

Sparkling Wine Corks



Stock

- Relvas champagne-style corks: agglomerated body with two natural cork discs
- 30 x 47 mm
- Two grades available
- Minimum order is 1,000 pieces
- Lead time is 5 days

Custom

- Relvas champagne-style corks: agglomerated body with two natural cork discs
- Sized per customer specification
- Side and end fire-branding available at no charge
- Minimum order is 1,000 pieces
- Lead time is 12-14 weeks
- * *Laser branding available for orders less than 10,000 pieces. Lead time is 2 weeks.*

Micro-Agglomerated Corks



Micro-agglomerated corks are made of fine granulate to neutralize any off-aromas or trichloroanisole (TCA).

Stock

- Agglomerated body with micro-agglomerated disc champagne-style corks
- 30.5 x 48 mm
- Two grades available
- Minimum order is 1,000 pieces
- Lead time is 5 days

Custom

- Agglomerated body with micro-agglomerated disc champagne-style corks
- 30.5 x 48 mm
- Two grades available
- Side and end fire-branding available
- Minimum order is 6,000 pieces
- Lead time is 12-14 weeks
- * *Laser branding available for orders less than 10,000 pieces. Lead time is 2 weeks.*

Relvas Champagne-Style Corks

Started in 1926, Relvas Portugal began as a company manufacturing cork oak stoppers for table wines and champagne. Due to the popularity of their champagne stoppers, in 1946, the company switched to producing only champagne corks. By the late 1960's, Relvas began producing champagne corks with an agglomerate body and two discs of natural cork oak, the first company ever to do this. Today, their commitment to quality and consistency remains unwavering.

Sourcing is a critical step. With wine, it takes great grapes to produce great wine. It is the same with cork - the quality of the raw product is crucial. Traceability, control, careful storage, and utilization of cork are critical steps to ensure that sparkling wine corks are made in the best conditions. Relvas sources directly from the producers and inspects both the area and the raw material. Storage is done in-house at their own facilities and a state-of-the-art boiling system is performed. Consistency is also an important factor. Standardized and lean processes allow for consistency, even with a natural product. State-of-the-art optical sorting allows for rigorous analysis, to ensure only the highest quality for every lot.

Technical performance is attainable only with the highest quality standards. Natural disc champagne corks are the most adapted corks for closing traditional method sparkling wines. These are highly-pressurized wines that require a physical barrier to pressure given by the natural discs. Sensory quality is also ensured, as the discs protect the wine from background off-flavors.

Customers are our best asset and the only true indicator of consistent quality. Relvas is proud to have the best sparkling wine and champagne customers from around the world. Customers include Krug, Dom Perignon, Louis Roederer, Veuve Clicquot, Iron Horse, and Domaine Carneros, just to name a few.

WIREHOODS

Stock



- Standard 38mm CL for sparkling wine
- Available with gold disc/gold wire, black disc/black wire, silver disc/silver wire, black disc/gold wire
- For additional color options, please see “custom wirehoods” below
- Packed 2,700 pieces per box
- Minimum order is one box
- Lead time is 5 days

Custom



- Unlimited disc color options
- Lithograph printed per customer artwork
- 13 wire color choices
- Minimum order is 10,000 pieces
- Digital disc printing available on orders less than 10,000 pieces
- Lead time is 3-4 weeks

For more information, please contact Scott Labs’ Packaging Department at (707) 765-6666.

“ We have been using wirehoods from Scott Labs for well over a decade. We have never once had a problem with the quality or performance. Shipping and customs are now both an afterthought, as we know our order will arrive when we need it, and will run flawlessly on our line. I wouldn’t hesitate to recommend Scott Labs wirehoods to anybody that is looking for a quality, dedicated supplier.”

Zak Miller
 Domaine Carneros
 Napa CA
 Photograph by Avis Mandel



FOIL

Stock



- Three colors available in stock: black, gold, silver
- 34 x 115 mm, 1:8T
- Two grades available
- Packed 3,780 pieces per box
- Minimum order is one box
- Lead time is 5 days

Custom

Custom champagne foils are available upon request. Minimum order quantity is 100,000 pieces.

Voices from the Industry

New Access to Mobile Sparkling Production Gives Winemakers Options



Keith Hock, Owner of Méthode Mobile Sparkling Wine Bottling in Napa, CA, shares why he felt it was important to start a mobile sparkling wine bottling business.

I established Méthode Mobile Sparkling Wine Bottling in 2015 as the first mobile sparkling wine bottling business in the US to provide new producers a Méthode Traditional solution for tirage bottling, riddling, disgorging, and labeling. Immediately my clients were capable of producing estate sparkling wines. Sparkling wine production requires specialized and expensive equipment that typically only dedicated sparkling producers can capitalize. With mobile services, capital and equipment is no longer a barrier.

Brand new and modern equipment was assembled to provide assurance to my clients that their wines will be bottled with quality. I worked with specialized sparkling wine machine manufacturers in France to design machines that would offer the flexibility of different bottle shapes and sizes, speed, efficiency and, most importantly, durability for movement of the equipment from winery to winery.

Méthode is an extension of my consulting winemaking business, Hock Wine, and through the two, I provide both the technical and physical support. My ultimate goal is to support the winemakers and wineries I work with in the sparkling process with the hope of creating a new and exciting wine category in their brand that will be enjoyed for many years.

The business continues to evolve and the interest in domestic grower-producer sparkling wines continues to expand. The best thing about the business is that Méthode Mobile Sparkling Wine Bottling has enabled me to work with some of my peers and with great vineyards to craft some deliciously beautiful wines that may not have been previously possible.

For more information, visit www.hockwine.com.

Méthode Mobile Sparkling Wine Bottling

Contact: Keith Hock

707 812 0944

keith@hockwine.com

Custom & Mobile Sparkling Providers

To see a complete list of custom and mobile sparkling wine providers, please visit www.scottlab.com.

General Tools

CALCULATIONS AND CONVERSIONS

Volume

mL = milliliter
 fl oz = fluid ounce
 gal = gallon
 L = liter
 hL = hectoliter

1 mL = 0.035 fl oz
 1 fl oz = 30 mL
 1 L = 1000 mL
 1 L = 0.2642 gal
 1 gal = 3785 mL
 1 gal = 3.785 L
 1 hL = 100 L
 1 hL = 26.4 gal

Mass Conversions

mg = milligram
 g = gram
 kg = kilogram
 lb = pound

1 kg = 1000 g
 1 kg = 2.205 lb
 1 g = 1000 mg
 1 lb = 453.6 g
 1 lb = 0.4536 kg
 1 metric ton = 1000 kg
 1 metric ton = 2205 lb
 1 US ton = 2000 lb
 1 US ton = 907 kg

Internet Conversion Tools

www.onlineconversion.com
www.wineadds.com
www.winebusiness.com/tools

Temperature Conversions

F° = Degree Fahrenheit C° to F° = (C° x 9/5) + 32	F°	0	32	40	50	60	70	80	90	100	110	120
C° = Degree Celsius F° to C° = (F° - 32) x (5/9)	C°	-18	0	4	10	16	21	27	32	38	44	49

Other Conversions

1 lb/1000 gal = 454 g/1000 gal = 0.454 kg/1000 gal = 120 mg/L = 27.2 g/barrel* = 0.120 g/L
 1 kg/hL = 1000 g/hL = 10,000 mg/L = 2.271 kg/barrel* = 10 g/L
 1 ppm = 1 mg/L *barrel = 60 gal = 227.1 L
 1°Brix = 1% sugar (wt/vol)
 1 g/100 mL = 1%
 1 g/L = 0.1%

Bench Trial Calculator

We recommend performing bench trials with many of our products including lysozyme, tannins, enzymes and fining agents. This calculator will help determine the amount of any given stock solution to achieve a range of concentrations in various-sized sample bottles.

For Powdered Products (Lysovin, Tannins, Fining Agents, etc.)

$$\text{mLs of stock solution to add per sample bottle} = \frac{(\text{sample size in mLs}) \times (\text{desired concentration in ppm}) \times (0.0001)}{\% \text{ concentration (w/v) of stock solution}}$$

For Liquid Products (Scottzymes, Gelatins, etc.)

$$\text{mLs of stock solution to add per sample bottle} = \frac{(\text{sample size in mLs}) \times (\text{desired concentration in mLs/1000 gal}) \times (0.000026)}{\% \text{ concentration (w/v) of stock solution}}$$

For example: If you have a 10% stock solution of Color Pro and wish to create a 150 mL/1000 gal dose in a 375 mL sample bottle you would calculate:

$$\text{mLs of stock solution to add per sample bottle} = \frac{(375) \times (150) \times (0.000026)}{10} = 0.146 \text{ mL}$$

Therefore, you would need to add 0.146 mL of a 10% Color Pro stock solution to a 375 mL bottle to represent a concentration of 150 mL/1000 gal.

SPARKLING WINE GLOSSARY

Assemblage

The act of assembling the blend of the base wine for sparkling wine.

Atmosphere (see “Bar”)

This is a unit of pressure that is considered to be standard atmospheric pressure at sea level. It is approximately 14.7 psi (pounds per square inch), or 1.013 bar.

Bar (see “Atmosphere”)

This is a unit of pressure and is defined as 100 kPa (kilopascals). It is roughly the equivalent of an atmosphere (atm). It is approximately 0.987 atm, or 14.5 psi (pounds per square inch).

Bead

The fine string of bubbles rising up through a glass of sparkling wine.

Blanc de Blancs (white from white)

Sparkling wine made from white grapes.

Blanc de Noirs (white from black)

Sparkling wine made from red grapes.

Charmat Method (Tank Method)

Charmat Method is a name for a sparkling wine making process. Unlike the ‘Traditional Method’, where the second fermentation happens in bottle, in Charmat Method, it takes place in a large closed pressure tank.

Crémant

An appellation in France.

Cuvée

The first “free run” juice extracted from the grapes.

Cuvée (blend)

The finished blend for a specific sparkling wine.

Disgorging (dégorgement)

The removal of the yeast sediment following the secondary fermentation and riddling, usually by freezing the neck and expelling the frozen plug.

Disgorging à la Volée (disgorging on the fly)

Removal of the sediment from the bottle without freezing the neck.

Dosage (dosage liqueur)

A sweet liqueur added to the wine following disgorging.

Dosage Classifications

Classification	Sugar Level
Brut Nature	0–3 g/L
Extra Brut	0–6 g/L
Brut	0–15 g/L
Extra Dry	12–20 g/L
Sec (Dry)	17–35 g/L
Demi-Sec	33–50 g/L

Gushing

An abundance of wine overflowing out of the bottle resulting in a significant loss.

Late Disgorged (dégorgement tardif)

Longer than usual time spent aging on the yeast following the secondary fermentation.

Liqueur de Expedition

Same as “dosage” and quite often made with a base of brandy or reserve wine.

Liqueur de Tirage

The mixture of sugar added to the cuvée at bottling for the secondary fermentation.

Mousse

The effervescence of sparkling wine. A “fine” mousse is one with tiny, persistent bubbles.

Pied de Cuve

In the production of sparkling wine, the *pied de cuve* (literally “foot of vat”) is the high population yeast culture used to inoculate the base wine/sugar mixture for the second fermentation. The creation of a *pied de cuve* involves several days of building up the yeast population with sugar additions while gradually acclimating them to the alcoholic environment of the base wine.

Prise de Mousse

The second fermentation which traps the bubbles.

Reserve Wine

Some of the base wine held in reserve to use in non-vintage blends or as a component in the dosage.

Riddling Racks (pupitres)

A-framed rack with holes designed to hold the bottles during the riddling process.

Riddling (remuage)

The turning of the bottles while moving them from horizontal to the upside-down position, thus moving the yeast sediment into the neck of the bottle.

Riddler (remueur)

The person who riddles the bottles.

Sur Lattes

Storing the bottles horizontally during the aging process following the secondary fermentation.

Sur Pointes

The upside-down position of the bottles following riddling.

Tailles

Press fractions extracted after the free run. Usually separated as “premiere taille” (first cut) and “deuxieme taille” (second cut).

Tirage

The bottling of the base wine with sugar and yeast for the second fermentation.

Traditional Method (Méthode Champenoise)

Traditional Method is a name for a sparkling wine making process. During Traditional Method, the secondary alcoholic fermentation takes place in the bottle (except for oversized or very small bottles, where the wine is transferred after disgorging).

Vendange

The harvest.

INDEX

- 18-2007 18, 36
 1-Step Malolactic Cultures 27
 1-Step VP41 27
 58W3 18
 71B 18
- A**
 Acti-ML 27
 Adjuvants 41
 Alchemy I 18
 Alchemy II 18
- B**
 BA11 18
 Bacteria 25–28
 Base Wine Parameters 14
 BC (Bayanus) 19
 Be Fruits 20
 Be Thiols 20
 Bentolact S 30
 Beta Co-Inoc 26
 Bidules 44
 Build-Up Malolactic Cultures 26
- C**
 Carboxymethylcellulose (CMC) 33
 Caséinate de Potassium 30
 Chitosan 32
 Chitin-Glucan 32
 Clarifiant BK 41
 Clarifiant XL 41
 Clarifiant S 41
 Cristalline Plus 31
 Crown Caps 43
 Cuvée Blanc (Lallzyme) 15
 CVW5 19
- D**
 D21 (ICV) 19
 DV10 19, 36
- E**
 EC1118 19, 36
 Elixir 19
 Encapsulated Yeast (ProElif) 37
 Enzymes 15
 Expression Aroma (Rapidase) 15
- F**
 Fermaid A 23
 Fermaid K 23
 Fermaid O 23
 Fermivin Champion 20
 Fining Agents 30–32
 Finishing Tools 47
 Flashgum R Liquide 47
 Foliar Spray 13
 Freshprotect 31
 Direct Inoculation
 Malolactic Cultures 25
- G**
 Glossary 54
 Go-Ferm Protect Evolution 24, 38
 Gum Arabics 47–48
- H**
 Harvest 13
- I**
 IB (Inobacter) 26
 Inocclair 2 41
 Inodose SO₂ Granules 29
 Inodose SO₂ Tablets 29
 Inofine V 32
 Isinglass 31
 (see *Cristalline Plus*)
- J-K**
 K1 (V1116) 20
- L**
 Lallzymes 15
 LalVigne 13
 Lalvin C 20
- M**
 M83 20
 Malolactic Bacteria 25–28
 Malolactic Fermentation 25
 Malolactic Nutrients 27
 Mannoproteins 48
 MBR 31 25
 Microbial Control Agents 29
 (see SO₂)
 MT01 26
- N**
 NT 116 21
 Nutrients
 Primary Fermentation 23–25
 Secondary Fermentation 38–40
 Nutrients (Yeast Stimulants) 25
- O**
 OKAY (ICV) 21
 O-MEGA 26
 OMRI certified products
 (see *Fermaid O, Go-Ferm
 Protect Evolution, OptiMUM
 White, Opti'Malo Blanc,
 Opti-WHITE*)
 Opale 2.0 (ICV) 21
 OptiMUM White 24
 Opti'Malo Blanc 28
 Opti-WHITE 24
 Oxysorb (Liner) 44
- P-Q**
 Pec5L (Scottzyme) 15
 Pectinase 15
 Phosphates Mazure 42
 Phosphate Titres 38
 Polycacel 31
 Polycel 32
 Potassium metabisulfite
 (see *Inodose SO₂ products*)
 Pre-Fermentation 113
 Pressing 14
 Primary Fermentation 16–33
 ProElif 37
 QA23 21, 36
 Qi No [Ox] 32
 Qi-Up XC 32
 Quartz 21, 36
- R**
 Rapidase Expression Aroma 15
 Reduless 32
 Riddling Aids 41–42
- S**
 Scottzymes 15
 (see *Pec5L*)
 SDS Sheets
 (see www.scottlab.com)
 Secondary Fermentation 35–40
 Sensy 21
 SO₂ 29
 Solution ST 42
 Stability 47–48
 (see *Finishing Tools*)
 Stimula Chardonnay 25
 Syrah 22
- T**
 Tartrate Stability 33
 Thiamin-containing product
 (see *Fermaid K & Phosphate
 Titres*)
 Tirage 40–42
- U-V**
 UltiMA Fresh 48
 UltiMA Soft 48
 VIN 13 22
- W-Z**
 W15 22
 Yeast Strains
 Primary Fermentation 16–22
 Secondary Fermentation 35–37
 Yeast Derivative Nutrients
 (see *OptiMUM White &
 Opti-WHITE*)
 Yeast Starter Culture
 Preparation 39

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