

2019

# FERMENTATION

HANDBOOK





# WELCOME

The relentless drive of winemakers to improve—through innovation, reinvention, and other acts of disregard for the stationary, drives us in our own research and product application development. Our pipeline with products, and our continual improvement of operational excellence must keep pace with your own pursuit.

This year we launch our new division, *The Oak Lab™*. Leveraging almost a century's worth of deep winemaking knowledge, we have passionately engaged the oak market to provide something new. Our 25-year veteran Master Cooper broke all the rules and built a unique portfolio of oak solutions. We will continue to develop new oak tools to complement and support your wines with a consistency you can rely on. Our tannin range is now included in The Oak Lab offerings, so look for your favorite tannins in this new section as well.

Innovation at Scott Labs continues with more selection and tools in our fermentation range. This year, two new yeast strains, Tango Malbec™ and Flavia™, a non-*saccharomyces* strain, join the mix. Tango Malbec was isolated in Mendoza and has shown amazing results with Argentinian and Californian Malbecs. Lallemand's R&D into non-*saccharomyces* continues to yield new data about varied species and their unique benefits to wine. For more information on this, please see the article on non-*saccharomyces* on page 27. Beyond yeast, we have a unique new malolactic bacteria strain, Silka™. Isolated in the Rioja region of Spain, Silka is known to elevate structured reds when MLF is performed in barrel. Silka has also been shown to enhance mouthfeel and provide a "silky" tannin profile.

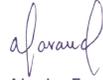
The application of existing products like Stimula Sauvignon Blanc, QA23, Alchemy II, and other Sauvignon Blanc strains, have also developed over the past year as emerging, high-level analysis has provided new tools to benchmark styles, as well as the levers winemakers can use to modify them. Look for new developments and trials in strains and nutrient strategies to maximize aromatic whites.

Lastly, we hope you love this book for its content, beautiful cover, and water-resistant pages, but also remember that [scottlab.com](http://scottlab.com) is now open 24/7 for business. It offers tools, articles and protocols, ordering, tracking, and order history for your convenience.

Wishing you a safe and successful harvest! As always, we look forward to helping you get there.



Adrienne Pitter  
Inside Sales — Healdsburg



Alexha Faraud  
Safety & Compliance Specialist



Annamarie Howard  
Fermentation Technical Sales



Brooke Jennett Koch  
Inside Technical Sales



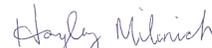
Caitlin Matejcek  
Inside Sales — Central Coast



Carly Lourenzo  
Marketing Coordinator



Carry Perkins  
Inside Sales — Central Coast



Hayley Milunich  
Inside Sales



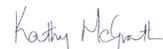
Jessica Just  
Fermentation Dept. GM



Julia Crosby Vazquez  
Inside Technical Sales



Kassy Velasco  
Inside Technical Sales



Kathy McGrath  
Outside Technical Sales



Kim Meglen  
Inside Sales — Healdsburg



Maggie McBride  
Inside Technical Sales



Margaret Karrer  
VP — Special Projects



Maria Peterson  
Wine Market Manager — Cellar Dept.



Michael Jones  
Outside Technical Sales



Monica Royer  
Sales Enablement Manager



Nichola Hall  
Staff Scientist



Rebekka deKramer  
Director of Operations — Enology & Cellar

# TABLE OF CONTENTS

4–5	<b>Suppliers</b>	78–88	<b>Malolactic Bacteria</b>
5	<b>New Products</b>	81	Freeze-Dried Direct Inoculation Cultures
6–39	<b>Yeast</b>	83	Effervescent Direct Inoculation Cultures
6	Premium Yeast Strains	83	Co-Inoculation
8	Easy Steps for Optimal Yeast Rehydration	83	1-Step Cultures
9	Selection Chart: White & Rosé Yeast Strains	84	Standard ML Freeze-Dried Build-Up Cultures
12	Selection Chart: Red Wine Yeast Strains	84	Malolactic Bacteria Nutrition
26	Vi-A-Dry Yeast Strains	87	Recommended Method to Restart a Stuck Malolactic Fermentation
28	Non- <i>Saccharomyces</i> Yeast Strains	89–95	<b>Microbial Control Agents</b>
30	QTL Yeast Strains	91	Lysozyme
31	Encapsulated Yeasts	92	Sulfur Dioxide
33	Recommended Method to Rehydrate ProRestart	93	Bactiless
36	Recommended Method to Restart Stuck Fermentations	93	No Brett Inside
34	Recommended Method to Restart a Stuck Fermentation Using Uvaferm 43 RESTART	94	Velcorin
38	LalVigne	96–98	<b>Cleaning</b>
39	Article: “Sauvignon Blanc—A Tale of Two Styles”	98	Cleaning Agents
40–55	<b>Nutrients</b>	99–104	<b>Stability</b>
43	Article: “Nutrient Notes and Strategy”	103	Spotlight on Canned Wines
44	Fermentation Management: A Focus on Nutrition	104	Article: “Preparing Wine for Bottling”
45	Article: “The Role of Nitrogen Source on Wine Quality”	105	<b>Filtration</b>
46	Yeast Nutrients for Cell Protection and Stimulation	107–116	<b>Fining Agents</b>
46	Yeast Rehydration	117–120	<b>Hybrids and Non-<i>Vinifera</i></b>
47	Yeast Stimulants	121–123	<b>Fruit Wines &amp; Mead</b>
48	Fermentation Nutrients for Yeast Nutrition and Fermentation Security	124–125	<b>Who We Are</b>
52	Natural Yeast Derivative Nutrients	126–127	<b>General Tools</b>
56–67	<b>The Oak Lab™</b>	126	Calculations and Conversions
57	Thermic	127	Product Storage and Stability Guidelines
58	Fire	128	<b>Index</b>
58	Convection	129	<b>How to Order</b>
61	Fermentation Tannins	129	Other Handbooks/Resources
63	Cellaring Tannins		
64	Finishing Tannins		
65	Luxe Tannins		
66	OTT Tannins		
66	Finishing Kits		
68–77	<b>Enzymes</b>		
71	Lallzymes		
72	Rapidase		
73	Scottzymes		

## VENDOR NOTICE

The information in this booklet is, to the best of our knowledge, true and accurate. The data and information, however, are not to be considered as a guarantee, expressed or implied, or as a condition of sale of our products. Furthermore, it is understood by both buyer and vendor that wine is a natural product. Circumstances such as fruit qualities and cellar conditions are infinitely variable. It is the responsibility of the buyer to adapt the use of our products to such circumstances. There is no substitute for good winemaking practices or ongoing vigilance.

## PLEASE NOTE:

Trade of wine between the United States, Canada and other nations and/or trade blocs (such as the European Community) may involve restrictions. In particular these may involve proscription or limitation on the allowable levels of certain ingredients in fermentation aids, fining agents or stabilization products. To the best of our knowledge, all products described in this Handbook when used as directed herein are legal for use in wine made in, and sold, in the United States. Conditions of trade with other nations and trade blocs are subject to ongoing change beyond the control of Scott Laboratories, Inc. It is the responsibility of users of our products to be informed of current restrictions of other countries or trade blocs to which they wish export and to use only products and product levels which conform to those restrictions.

# SUPPLIERS

## Lallemand

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

Beginning in the 1920's, Lallemand supplied fresh baker's yeast for the local market in Quebec, Canada. In 1974, over 50 years later, Lallemand was looking for new opportunities at the same time that Scott Laboratories was looking for a partner to produce dry forms of wine yeast from strains in Scott's library. After some discussion, Lallemand agreed to try. Two strains were produced that first year. This relationship is now in its 46th vintage. Scott currently offers nearly one hundred Lallemand products including yeast, yeast derivatives, bacteria and nutrients.

From this modest introduction in 1974, Lallemand has evolved into a world leader in the development of products for winemakers. Lallemand's focus has always been "value added." Its team of researchers in Toulouse, France emphasize fermentation research. Their solutions to winemaking problems are both cutting edge and practical. The "Fermaid" and "Go-Ferm" product families are illustrations of this. At Lallemand's Montreal facilities the emphasis is on new strain development, production procedures and fundamental research. Scientific papers and ongoing collaborations also link Lallemand with enological institutions on five continents. Taken together, they reflect Lallemand's commitment to the wine industry, here and around the world.

## Anchor

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

Anchor Yeast began in 1923 when Daniel Mills and Sons started the first yeast factory in Cape Town, South Africa. Yeast is now produced in an ISO 9001:2008 certified plant near Durban. They produce wine yeast, baker's yeast, distilling yeast and whiskey yeast sold throughout the world.

The Anchor yeast strains can be divided into natural isolates and hybrid strains. The hybrid strains include isolates hybridized by nature and isolates hybridized by Anchor. Hybridization is a natural process involving the sexual life cycle of *Saccharomyces cerevisiae cerevisiae* and *S. cerevisiae bayanus*. The process is natural and the strains are not genetically modified. The results are yeast hybrids chosen with the best characteristics from both parents. This is a scientific vs. traditional approach that Anchor feels gives the winemaker a competitive edge. Anchor Yeast positions itself as the leading New World wine yeast producer, placing a premium on the ideas and innovation required to make successful New World wines.

## Bioseutica

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

Bioseutica Group's experience with egg-derived proteins extends back to the 1940's and they are now the world's largest producer of egg-derived proteins. In the early 1990's Bioseutica researchers discovered that Lysozyme had potential winemaking uses. It was shown to naturally degrade the cell walls of gram positive bacteria such as *Oenococcus*, *Lactobacillus* and *Pediococcus*.

In 1994, Bioseutica received approval from French and Italian authorities to run industrial trials using lysozyme in winemaking. The next year the BATF (now the TTB) gave preliminary approval in the USA. In the two decades to follow, Bioseutica's lysozyme and Lysovin have become accepted components in American winemakers' tool kits.

## LANXESS

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

LANXESS is a leader in specialty chemicals and operates in all important global markets. Though its components were originally part of the Bayer Group, it is now a wholly independent entity.

Lanxess develops, manufactures and sells a wide range of products including specialty chemicals such as Velcorin®.

In addition, it supports its customers in developing and implementing made-to-measure system solutions. A principal aim is to generate added value for their customers.

Scott Laboratories Inc. began offering Velcorin from Lanxess for United States winemakers beginning in 1988 and for Canadian winemakers in 2013.

## IOC

[www.ioc.eu.com](http://www.ioc.eu.com)

In 2010 we developed a new alliance with the Institut Oenologique de Champagne (IOC) in Epernay, France. This relationship allowed us to expand and improve the range of specialty fining agents in our portfolio.

The origins of the IOC can be traced back to the founding of the Entrepôt Général de la Champagne in 1890. In 1905 a laboratory (which became the IOC) was established to carry out the work of yeast selection and preparation. Over the years their product lines expanded together with the territory covered. Although the IOC has maintained its roots in Champagne (with locations in Epernay, Bar-sur-Seine and Cormontreuil), it also has locations in Chablis, Nuits St. Georges, the Côtes Chalonnaise and in the Côtes du Rhône near Châteauneuf-du-Pape. The IOC offers yeast and a variety of wine processing products for still and sparkling wines.

## Proenol

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

Proenol traces its beginning to 1986 in Vila Nova de Gaia, Portugal, the mother city of Port wine. The objective of Proenol's founders was simple: to use their biotechnological expertise to develop innovative natural solutions.

Since Portugal joined the European Community in 1986, the country's culture has changed. Traditions have been challenged. Proenol prospered in this environment. Collaborative efforts, for example, led to Proenol's selection of two Portuguese yeast strains that are now popular worldwide. They are BA11 and QA23.

Most interestingly, Proenol scientists also perfected a new technology to use encapsulated yeast in winemaking. Using this technology, Proenol has created a variety of innovative products that provide winemakers new options when dealing with issues such as excess malic acid, stuck fermentations and the secondary fermentation of sparkling wine.

## Oenobrand



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

Though Oenobrand is relatively new to the Scott portfolio, it comes with a distinguished pedigree. Supported by its world renowned parent companies (DSM Food Specialties and Anchor BioTechnologies), Oenobrand is commissioned to provide winemakers with innovative and scientifically sound solutions to real life issues.

With a highly qualified team from new and old world wine regions, Oenobrand seeks to take the best from both. Thinking "outside the box" is encouraged. The results are revolutionary products from brands such as DSM, Rapidase and Claristar.



## AiRD Innovations in Chemistry



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

Located in Moss Vale, New South Wales, Australia, AiRD® Innovations in Chemistry grew up near the vineyards. Founded over two decades ago, AiRD specializes in hygiene maintenance for the food and beverage industry. Early on the founder Barry Astley-Turner saw the need to offer customers safer and more effective alternatives to caustics for cleaning stainless steel and other surfaces.

The ingredients in AiRD products combine traceability with high quality assurance. It is our belief that a clean cellar is a key to maintaining wine quality. We are happy to bring you products that accomplish this in a safer, more convenient, and more environmentally sound fashion.

## The Oak Lab



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

Launched as a new division of Scott Laboratories in 2019, The Oak Lab was founded with the vision of changing the perspective of the oak infusion market by developing and embracing new technologies, and re-imagining the process of product trials, selection, and application. Our mission is to deliver solutions for winemaking success and unparalleled customer experiences, all with an eye toward wine quality.

Our line of premium quality oak infusion products is paired with a revolutionary process for bench trials and the ability to create unique, customized blends based on your wines. The Oak Lab leverages centuries worth of North American winemaking expertise, and newly integrated deep oak know-how, to develop an oak infusion product line which harmonizes the entire winemaking process.

## Erbslöh



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

Scott Laboratories is proud to add Erbslöh to our venerable list of suppliers. One of the most trusted names in the industry, with roots in Geisenheim, Germany, this family owned operation has used its strategic position in bentonite to develop a portfolio of yeast, nutrients, enzymes and fining agents for wine, beer, juice and distillate production. A progressive group, in 2003 Erbslöh added the La Littorale brand, which has deep roots in Languedoc's winemaking region.

# NEW

## PREMIUM YEAST

Flavia™	Page 29
Persy™	Page 31
Tango Malbec™	Page 24

## MALOLACTIC BACTERIA

Silka™	Page 82
--------	---------

## THE OAK LAB™

The Oak Lab products	Page 57
----------------------	---------

## FINING AGENTS

FermoBent® PORE-TEC	Page 110
Blancobent UF	Page 110
NaCalit PORE-TEC	Page 110
Granucol BI	Page 111
Granucol FA	Page 111
Granucol GE	Page 111



Yeast is the foundation of our company, and has been since its founding in 1933 as the Berkeley Yeast Laboratory. Our first commercial yeast offerings consisted of strains protected by the University of California, Berkeley, during prohibition and delivered to then graduate student and founder, Julius Fessler. Strains were provided on slant and wet up until the 1960's, when we began to deliver volumes as WADY (Wine Active Dry Yeast). After some years of working with the largest brewer in the U.S. to dry our strains, we eventually found our long-term partner in 1974, Lallemand. They began to not only dry strains for us, but also isolate and develop new strains. Since our partnership with Lallemand, we have seen an explosion in choice, and characterization, as well as strain strength, purity, and reliability. A near century of strain cultivation makes Scott Labs and our yeast partners uniquely positioned to assist winemakers in matching strains to their challenges and opportunities.

## Basics

Each harvest presents new and different variables. Even if grapes are sourced from the same vineyard each year, the fruit will arrive with different sugar, nitrogen and acidity levels.

It is very important to know the status of the must/juice prior to inoculating with yeast. Analyze the fruit for Brix, pH, TA, and nitrogen levels. Before using any yeast strain, consider the factors that are outlined below.

### BRIX

What is the Brix of the juice? The yeast strain chosen should be able to tolerate the alcohol produced from this Brix level. (*See yeast strain selection charts on pages 9–14.*)

### PH AND SO<sub>2</sub>

The effectiveness of SO<sub>2</sub> is directly related to the pH. SO<sub>2</sub> additions should never be standardized. They must ALWAYS be adjusted according to the pH and conditions of the fruit. Additional SO<sub>2</sub> may be necessary if the fruit is overripe, underripe, or compromised.

### YAN

What is the YAN (Yeast Assimilable Nitrogen) of the juice? The correct nutrient additions can be decided once the YAN and Brix have been determined. The nutrient needs of the specific yeast strain being used must be considered.

### TEMPERATURE

What will the fermentation temperature be? Choose a yeast strain that fits within the determined temperature range. Do not stress your yeast by keeping it at the lowest or highest end of its temperature tolerance range.

### YSEO

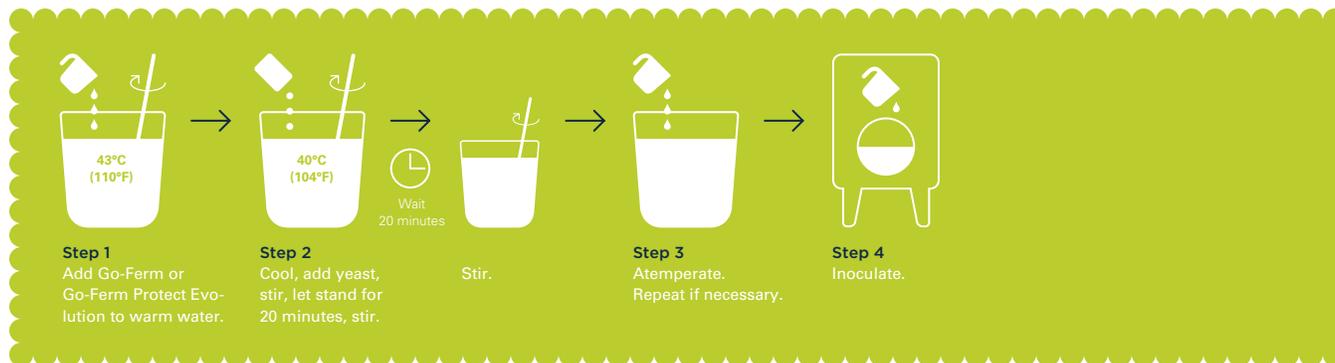
YSEO is a unique and innovative process for yeast developed by Lallemand. The benefits compared with the same strain prepared not using the YSEO process are:

- Reduced lag phase
- Better adaptation to stressful conditions
- Optimized fermentation
- Reduced potential for VA



## PROTOCOL

# Easy Steps for Optimal Yeast Rehydration



Proper yeast rehydration is one of the most important steps to help ensure a strong and healthy fermentation. Normal inoculation for wine active dried yeast is 2 lb/1000 gal (25 g/hL). When added properly, a 2 lb/1000 gal (25 g/hL) addition of wine active dried yeast results in an initial cell concentration of 3–4 million viable cells per milliliter of must/juice. Under favorable conditions, the initial cell population may increase up to 100–150 million viable cells per milliliter of must/juice before growth stops and alcoholic fermentation begins. This biomass increase is critical for healthy fermentations. When harvesting grapes at high maturity levels, increased inoculation rates are recommended. When using higher rates, be sure to maintain a ratio of 1 part yeast to 1.25 parts yeast rehydration nutrient. Careful rehydration, atemperature and inoculation are all important to help prevent sluggish or stuck fermentations.

### USAGE

1. Suspend 2.5 lb/1000 gal (30 g/hL) of Go-Ferm or Go-Ferm Protect Evolution in 20 times its weight of clean, chlorine free, 43°C(110°F) water. (For example: 2.5 lb rehydration nutrient x 20 = 50 ÷ 8.33 lb/gal water = 6 gal water.) The water temperature is important for mixing of the rehydration nutrient. Due to the unique nature of GoFerm and GoFerm Protect Evolution, they will not go into solution completely. This is due to the fatty acid and sterol content. *Please see page 46 for information on yeast rehydration nutrients.*  
**Important: If not using a yeast rehydration nutrient, water temperature should begin at 40°C(104°F) to avoid harming the yeast.**
2. Once the temperature of the yeast rehydration nutrient solution has dropped to 40°C(104°F), add 2 lb/1000 gal (25 g/hL)\* of active dried yeast. Stir gently to break up any clumps. Let suspension stand for 20 minutes, then stir gently again. Live yeast populations decline when allowed to stand for more than 30 minutes.  
**Note: Foaming is not an indicator of yeast viability.**

3. Slowly (over a period of 5 minutes) combine an equal amount of the must/juice to be fermented with the yeast suspension. This will help the yeast adjust to the cooler temperature of the must/juice and will help avoid cold shock caused by a rapid temperature drop exceeding 10°C(18°F). This atemperature step may need repeating for very low temperature must/juice. Each atemperature step should last about 15–20 minutes. For every 10°C(18°F) temperature difference between the must/juice and the yeast slurry, an atemperature step must be performed. For example, for a must/juice temperature of 20°C(68°F) and yeast slurry temperature of 40°C(104°F), two atemperature steps are required.
4. Add the yeast slurry to the bottom of the fermentation vessel just as you begin filling the vessel with must/juice. This is especially important for large tanks with long filling times or when inoculating with strains that are sensitive to the competitive factor (*refer to pages 9–14*). This will allow the yeast a head start over indigenous organisms. For direct inoculation post rehydration, ensure you mix the yeast slurry into the must for the best results.

*Note: Copies of "Easy Steps for Optimal Yeast Rehydration" may be downloaded in Spanish, French and English from our website: [www.scottlab.com](http://www.scottlab.com).*

*\*The yeast dosage can vary depending on the initial Brix, manufacturer's recommendations and the sanitary state of the grapes or winery.*

▶ Visit [www.scottlab.com](http://www.scottlab.com) for a video animation of this protocol.

# White & Rosé Wine Yeast Strains

- Yeast Strain Type
- Highly Recommended
- ◊ Recommended
- M Mouthfeel
- EVC Enhanced Varietal Character
- Mod Moderate
- Ntrl Neutral
- Snstv Sensitive
- Avg Average

	18-2007	43/43 RESTART	58W3	71B	Alchemy I	Alchemy II	Assmanshausen (AMH)	BA11	BC (Bayanus)	Be Fruits	Be Thiols	BM45	BM 4x4	BRG	Cross Evolution	CVW5	CY3079
Page	15	15	15	15	16	16	16	16	17	30	30	17	17	17	18	18	18
<i>S. cerevisiae cerevisiae</i>			○	○			○	○		○	○	○		○			○
<i>S. cerevisiae bayanus</i>	○	○							○								○
Yeast hybrid															○		
Yeast blend					○	○							○				
Albariño						●				●						●	●
Chardonnay	●				●							●	●	●	●	●	●
Chenin Blanc					●	●										●	
Gewürztraminer			●				◊	●			◊				●		
Muscat								◊							●	●	
Pinot Blanc								●							●		●
Pinot Gris			●	●	●											●	
Riesling			●	●	●		●	●			◊				●		
Sauvignon Blanc	◊				●	●		●			●		◊		●		
Viognier	◊		●		◊			●									
Rosé	●			●				●		●	●				●	●	
Rhône Whites			●		●	●		●					◊		●		
Aromatic Whites			●		●			●							●	●	
Late Harvest		●															
Sparkling Base	●							◊	●								●
Restart Stuck		●							●								
Alcohol Tolerance <sup>1</sup>	15%	18%+	14%	14%	15.5%	15.5%	15%	16%	17%	14%	15%	15%	15%	15%	15%	15%	15%
Relative Nitrogen <sup>2</sup>	Low	Low	Med	Low	Med	Med	Low	High	Low	Low	Med	High	High	Med	Low	Low	High
Temp. Range (°F) <sup>3</sup>	50-90	55-95	54-77	59-85	56-61	56-61	68-86	50-77	59-86	54-68	59-64	64-82	64-82	64-88	58-68	57-82	59-80
Fermentation Speed	Fast	Fast	Mod	Mod	Fast	Fast	Slow	Mod	Fast	Med-Fast	Fast	Mod	Mod	Mod	Mod	Fast	Mod
Competitive Factor	Yes	Yes	Yes	Snstv	Yes	Yes	Snstv	Snstv	Snstv	Yes	Yes	Yes	Yes	Ntrl	Yes	Yes	Snstv
Sensory Effect	Ntrl	Ntrl	EVC Esters M	Esters	EVC Esters	EVC Esters	EVC	Esters M	Ntrl	EVC Esters	EVC	EVC M	EVC M	EVC	EVC M	Esters	EVC M
MLF Compatibility	Good	Good	Avg	Very Good	Good	Good	Very Good	Below Avg	Good	Good	Good	Below Avg	Below Avg	Avg	Avg	Avg	Good

# White & Rosé Wine Yeast Strains (continued from page 9)

- Yeast Strain Type
- Highly Recommended
- ◊ Recommended
- M Mouthfeel
- EVC Enhanced Varietal Character
- Mod Moderate
- Ntrl Neutral
- Snstv Sensitive
- Avg Average

	ICV D21	ICV D47	ICV D254	DV10	EC1118	Elixir	Exotics Mosaic	Fermivin 3C	Fermivin 4F9	Fermivin Champion	Fermivin TS28	ICV GRE	K1 (V1116)	M2	M83	NT 116	ICV OKAY
Page	18	19	19	19	19	19	28	20	20	20	20	20	21	21	21	22	30
<i>S. cerevisiae cerevisiae</i>	○	○	○					○			○	○	○	○	○		○
<i>S. cerevisiae bayanus</i>				○	○				○	○							
Yeast hybrid						○	○									○	○
Yeast blend																	
Albariño		◊					●	●			●			●		●	
Chardonnay	●	●	●	●		●	●	●	●					●			◊
Chenin Blanc							●	●	●			●	●				●
Gewürztraminer		◊		●													
Muscat				◊													
Pinot Blanc				●													●
Pinot Gris				●		◊											●
Riesling												●					
Sauvignon Blanc						●			●		●			●			◊
Viognier		◊				●	●	●									◊
Rosé	◊	●	◊			●			●			●		●	●	◊	●
Rhône Whites		●	●			●	●		●			●		●			
Aromatic Whites						●			●		●			●			●
Late Harvest				◊	◊								◊				
Sparkling Base				●	●								◊			●	◊
Restart Stuck				●	◊					●			●				
Alcohol Tolerance <sup>1</sup>	16%	14%	16%	17%	18%	15%	15.5%	14%	15.5%	18%	14.5%	15%	18%	15%	15.5%	15.5%	16%
Relative Nitrogen <sup>2</sup>	Med	Low	Med	Low	Low	Med	Med	Med	Med	Med	Med	High	Low	High	Med	Med	Low
Temp. Range (°F) <sup>3</sup>	61–82	59–68	54–82	50–95	50–86	57–77	64–83	61–72	57–68	59–86	59–72	59–82	50–95	59–86	63–82	54–61	54–86
Fermentation Speed	Mod	Mod	Mod	Fast	Fast	Slow	Mod	Slow	Fast	Mod	Mod	Mod	Fast	Mod	Mod	Fast	Mod
Competitive Factor	Yes	Yes	Ntrl	Yes	Yes	Snstv	Yes	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes	Ntrl	Yes	Yes
Sensory Effect	EVC M	EVC M	EVC M	Ntrl	Ntrl	EVC Esters	EVC M	EVC M	EVC Esters M	Ntrl	EVC M	EVC M	Esters	Esters M	EVC	Esters	Esters
MLF Compatibility	Avg	Good	Very Good	Good	Avg	Avg	Very Good	Good	–	Good	–	Good	Poor	Good	Avg	Good	Very Good

- Yeast Strain Type
- Highly Recommended
- ◊ Recommended
- M Mouthfeel
- EVC Enhanced Varietal Character
- Mod Moderate
- Ntrl Neutral
- Snstv Sensitive
- Avg Average

	ICV Opale 2.0	QA23	R2	Rhône 4600	R-HST	Sensy	Steinberger (DGI 228)	SVG	VIN 13	VIN 2000	W15
Page	30	22	23	23	24	31	24	24	25	25	26
<i>S. cerevisiae cerevisiae</i>	○			○	○		○	○			○
<i>S. cerevisiae bayanus</i>		○	○								
Yeast hybrid						○			○	○	
Yeast blend											
Albariño		●							●	●	
Chardonnay	●	●		●					●	●	
Chenin Blanc									●	●	
Gewürztraminer		●	●		●		●				●
Muscat		●							●		
Pinot Blanc		●				●					
Pinot Gris			◊	◊			●	●			●
Riesling		◊	●		●		●	●			●
Sauvignon Blanc	●	●	●	◊	●	●		●	●	●	
Viognier		◊	◊	●	●					●	
Rosé	●			●	◊	●		◊	●	◊	●
Rhône Whites	●			●	●			●	●	◊	●
Aromatic Whites		●	●		●				●		●
Late Harvest			●		◊				◊		
Sparkling Base		◊							◊		
Restart Stuck									●		
Alcohol Tolerance <sup>1</sup>	14%	16%	16%	15%	15%	14.5%	13%	15%	16.5%	15.5%	16%
Relative Nitrogen <sup>2</sup>	Med	Low	High	Low	Med	Low	Med	Med	Low	Low	High
Temp. Range (°F) <sup>3</sup>	59–86	59–90	41–90	56–72	50–86	54–64	59–77	61–79	54–61	55–61	50–81
Fermentation Speed	Mod	Fast	Mod	Mod	Mod	Mod	Slow	Mod	Fast	Mod	Mod
Competitive Factor	Yes	Yes	Yes	Yes	Yes	Yes	Snstv	Yes	Yes	Yes	Yes
Sensory Effect	EVC Esters	EVC	Esters	Esters	Ntrl M	EVC M	Ntrl	EVC	EVC Esters	EVC Esters	EVC M
MLF Compatibility	Good	Very Good	Good	Good	Avg	Very Good	Avg	Good	Good	Good	Very Good

<sup>1</sup> The alcohol tolerance column indicates performance possibilities in good circumstances and conditions. Alcohol tolerance may vary as circumstances and conditions vary.

<sup>2</sup> Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart. See article on page 45.

<sup>3</sup> 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 ensure 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.

Please see pages 118–119 for more information on yeast choices for hybrid and non-vinifera grapes.

# Red Wine Yeast Strains

- Yeast Strain Type
- Highly Recommended
- ◊ Recommended
- M Mouthfeel
- EVC Enhanced Varietal Character
- Mod Moderate
- Ntrl Neutral
- Snstv Sensitive
- Avg Average

	18-2007	43	43 RESTART	3001	71B	Alchemy III	Alchemy IV	Assmanshausen (AMH)	BC (Bayanus)	BDX	BM45	BM 4X4	BRG	BRL97	CLOS	CSM	CVRP
Page	15	15	15	15	15	16	16	16	17	17	17	17	17	17	17	18	18
<i>S. cerevisiae cerevisiae</i>				○	○			○		○	○		○	○	○	○	○
<i>S. cerevisiae bayanus</i>	○	○	○						○								
Yeast hybrid																	
Yeast blend						○	○					○					
Barbera										◊	◊	◊		●	●		
Cabernet Franc							●				◊			◊		●	●
Cabernet Sauvignon	◊					●				●	●	●		◊		●	●
Grenache					●	●					●	●		◊	●		
Malbec	◊					●								●	●		
Merlot										●	◊	◊		●		●	●
Petite Sirah								●				●			●		●
Pinot Noir	●			●		◊	●	●			◊		●	●			
Petit Verdot						●				●				●	●	●	
Sangiovese		●					●				●	●					
Syrah	●	●					●		●	●		◊		◊	●		
Tempranillo						●					◊				●		●
Zinfandel		●				●		●	●	●	●	●		●	●		
Fruit Forward Reds					●		●										
Structured Reds						●				●	●	●			●		
Restart Stuck		●	●						◊								
Alcohol Tolerance <sup>1</sup>	15%	18%+	18%+	15%	14%	15.5%	15.5%	15%	17%	16%	15%	15%	15%	16%	17%	14%	16%
Relative Nitrogen <sup>2</sup>	Low	Low	Low	Med	Low	Med	Med	Low	Low	Med	High	High	Med	Med	Med	High	Med
Temp. Range (°F) <sup>3</sup>	50-90	55-95	55-95	54-90	59-85	61-82	61-82	68-86	59-86	64-86	64-82	64-82	64-88	62-85	57-90	59-90	64-86
Fermentation Speed	Fast	Fast	Fast	Mod	Mod	Fast	Fast	Slow	Fast	Mod	Mod	Mod	Mod	Mod	Fast	Mod	Mod
Competitive Factor	Yes	Yes	Yes	Yes	Snstv	Yes	Yes	Snstv	Snstv	Snstv	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes
Sensory Effect	Ntrl	Ntrl	Ntrl	EVC	Esters	EVC	EVC	EVC	Ntrl	EVC M	EVC M	EVC M	EVC M	EVC	EVC M	EVC	EVC M
MLF Compatibility	Good	Good	Good	Avg	Very Good	Good	Good	Very Good	Very Good	Avg	Below Avg	Below Avg	Avg	Avg	Very Good	Avg	Very Good

- Yeast Strain Type
- Highly Recommended
- ◊ Recommended
- M Mouthfeel
- EVC Enhanced Varietal Character
- Mod Moderate
- Ntrl Neutral
- Snstv Sensitive
- Avg Average

	ICV D21	ICV D80	ICV D254	Exotics Mosaic	Fermivin A33	Fermivin Champion	Fermivin MT48	Fermivin PF6	ICV GRE	IonYS <sub>W/F</sub>	M2	MT	NT 50	NT 112	NT 116	NT 202	OKAY
Page	18	19	19	28	20	20	20	20	20	21	21	22	22	22	22	22	30
<i>S. cerevisiae cerevisiae</i>	○	○	○		○		○		○	○	○	○					
<i>S. cerevisiae bayanus</i>						○											
Yeast hybrid				○									○	○	○	○	○
Yeast blend																	
Barbera	◊	◊	◊						◊				◊				
Cabernet Franc	◊	◊	◊		●				●			◊	●	●	◊	◊	◊
Cabernet Sauvignon	●	●	●		●				●	●	●	●	●	●	●	●	●
Grenache	◊		◊	●			●		●				●				
Malbec			●		●					●							●
Merlot	●	●	◊	●	●		●		●	●		●	●	●	●	●	●
Petite Sirah		●								●			●	●	●		●
Pinot Noir								●	◊				●				●
Petit Verdot	◊		●	●	●		●			●		●					
Sangiovese	◊		●				●		◊	●			◊				
Syrah	●	●	●	●					●	●	●		●	●	●		●
Tempranillo	◊	◊	◊	●			●		◊	●		◊	◊				
Zinfandel	●	●	●										◊	●			◊
Fruit Forward Reds				●			●	●	●		●		●				
Structured Reds	●	●			●							●					●
Restart Stuck						●											◊
Alcohol Tolerance <sup>1</sup>	16%	16%	16%	15.5%	15.5%	18%	15%	14%	15%	16%	15%	15%	15.5%	16%	15.5%	15%	16%
Relative Nitrogen <sup>2</sup>	Med	High	Med	Med	High	Med	Low	Med	High	High	High	Med	Med	Med	Med	Med	Low
Temp. Range (°F) <sup>3</sup>	61-82	59-82	54-82	64-83	72-86	59-86	68-86	54-75	59-82	77-82	59-86	59-90	57-83	76-83	56-83	68-83	54-86
Fermentation Speed	Mod	Mod	Mod	Mod	Fast	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Fast	Fast	Fast	Fast	Mod
Competitive Factor	Yes	Yes	Ntrl	Yes	Ntrl	Ntrl	Ntrl	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sensory Effect	EVC M	EVC M	EVC M	EVC M	EVC	Ntrl	M	EVC	EVC M	M	Esters M	EVC M	EVC Esters	EVC	EVC	EVC Esters	Esters
MLF Compatibility	Avg	Avg	Very Good	Very Good	Very Good	Good	Good	Good	Good	Good	Good	Avg	Good	Below Avg	Good	Very Good	Very Good

# Red Wine Yeast Strains (continued from page 13)

○ Yeast Strain Type  
 ● Highly Recommended  
 ◐ Recommended  
 M Mouthfeel  
 EVC Enhanced Varietal Character  
 Mod Moderate  
 Ntrl Neutral  
 Snstv Sensitive  
 Avg Average

	Persy	RA17	RBS 133	RC212	Rhône 2056	Rhône 2226	Rhône 4600	RPI15	Syrah	T73	Tango Malbec	VRB	W15
Page	31	23	23	23	23	23	23	24	24	24	24	26	26
<i>S. cerevisiae cerevisiae</i>	○	○	○	○	○	○	○	○	○		○	○	○
<i>S. cerevisiae bayanus</i>										○			
Yeast hybrid													
Yeast blend													
Barbera					●	●						●	
Cabernet Franc				◐		●		●		◐			
Cabernet Sauvignon				●	◐	◐		●					
Grenache		●		●	●	◐	◐		◐			◐	
Malbec			◐					●			●		
Merlot					◐	●		●	●	●	◐		
Petite Sirah	●					●		●	●		◐	●	
Pinot Noir	●	●		●									●
Petit Verdot								●	●				
Sangiovese			●		◐	●			◐	●		●	
Syrah	●				●		●	●	●		●		●
Tempranillo	●				◐					●	●	●	
Zinfandel			●		●	●		●		●		●	
Fruit Forward Reds		●	●		●					●		●	
Structured Reds						●		●	●				
Restart Stuck						◐							
Alcohol Tolerance <sup>1</sup>	16%	15%	16%	16%	16%	17%	15%	17%	16%	16%	15.5%	17%	16%
Relative Nitrogen <sup>2</sup>	Low	High	Med	Med	Med	High	Low	Med	Med	Low	Med	Med	High
Temp. Range (°F) <sup>3</sup>	59-82	61-84	61-82	68-90	59-82	59-82	56-72	68-86	59-90	65-95	59-82	58-80	50-81
Fermentation Speed	Mod	Mod	Mod	Mod	Mod	Fast	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Competitive Factor	Yes	Snstv	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl	Ntrl	Yes
Sensory Effect	EVC M	EVC	EVC	EVC	Esters	EVC M	Esters	EVC	EVC	Esters M	EVC	EVC M	EVC M
MLF Compatibility	Very Good	Below Avg	Good	Good	Good	Below Avg	Good	Avg	Avg	Below Avg	Good	Good	Very Good

<sup>1</sup> The alcohol tolerance column indicates performance possibilities in good circumstances and conditions. Alcohol tolerance may vary as circumstances and conditions vary.

<sup>2</sup> Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart. See *article on page 45*.

<sup>3</sup> 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 ensure 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.

*Please see pages 118-119 for more information on yeast choices for hybrid and non-vinifera grapes.*

## PREMIUM YEAST STRAINS

### 18-2007

*S. cerevisiae* • *bayanus*

Sparkling Base, Chardonnay, Pinot Noir, Sauvignon Blanc, Viognier, Rosé, Cabernet Sauvignon, Malbec, Syrah

Isolated by the Institut Oenologique de Champagne (IOC) in Epernay.

Well adapted to low pH, low temperature and alcohol up to 15% (v/v). Good glycerol producer, low VA, SO<sub>2</sub> and foam producer. Good implantation, complete breakdown of sugars and low nutrient requirements.

It is ideally suited to make sparkling base wines and for secondary fermentations by the Traditional Method and the Charmat Method.

#15900 500 g \$34.00

### 43

*S. cerevisiae* • *bayanus*

Restart Stuck Fermentations, Zinfandel, Sangiovese, Syrah, Late Harvest

Isolated by Lallemand in collaboration with the research center of Inter Rhône in France.

Notable for its powerful ability to restart stuck or sluggish fermentations. Has been known to ferment up to 18% (v/v) and has low relative nitrogen needs.

Uvaferm 43® gives high-quality sensory results in high Brix red fermentations and helps maintain color, red fruit and cherry characteristics.

#15134 500 g \$44.00

#15140 10 kg \$548.00

### 43 RESTART

*S. cerevisiae* • *bayanus*

Restart Stuck Fermentations, Late Harvest

Isolated by Lallemand in collaboration with Inter Rhône in France.

Uvaferm 43 RESTART™ is the result of an innovative preacclimation process developed by Lallemand and approved by the Inter Rhône Laboratory using Uvaferm 43. 43 RESTART's resistance to the stressful conditions of stuck fermentations has been naturally increased.

This process includes the addition of micronutrients, sterols and polyunsaturated fatty acids to strengthen the yeast cell membranes. The yeast cells are more robust, acclimate quicker and have a lower mortality rate after inoculation.

43 RESTART is sensory neutral and has been known to ferment up to 18% (v/v). It is a low SO<sub>2</sub> and H<sub>2</sub>S producer with relatively low nitrogen demand. 43 RESTART is malolactic bacteria compatible.

For best results use the 43 RESTART protocol including Reskue and Fermaid O. Restarts can be done in a few efficient steps. See page 34.

#15223 500 g \$53.00

#15240 10 kg \$658.00

### 58W3

*S. cerevisiae* • *cerevisiae*

Pinot Gris, Gewürztraminer, Riesling, Viognier, Rhone Whites, Aromatic Whites

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

Due to its fermentation kinetics, especially in high potential alcohol juices, a balanced nutrient strategy and good fermentation practices should be followed.

Vitilevure 58W3™ contributes an overall well-balanced mouthfeel 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 \$47.00

#15631 10 kg \$579.00

### 71B

*S. cerevisiae* • *cerevisiae*

Pinot Gris, Riesling, Grenache, Rosé, Fruit Forward Reds

Isolated and selected by the INRA in Narbonne, France.

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

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 in competitive conditions.

#15059 500 g \$31.00

#15078 10 kg \$406.00

### 3001

*S. cerevisiae* • *cerevisiae*

Pinot Noir

Isolated, studied and selected from the prestigious Côte de Nuits terroir in Burgundy during a three-year research project by Laboratory Burgundia Oenologie in Beaune, France. The goal of this selection program was to find a dominant natural yeast strain from a traditional "cold soak" that would elaborate intense, complex and balanced Pinot Noir varietal character. The 3001 strain stood out from other strains. Wines made with 3001 are noted for fruit and varietal characters that are both elegant and complex.

Moderate nitrogen demand. Benefits from proper nutrition and aeration, especially when the potential alcohol exceeds 13% (v/v).

Tolerant to standard SO<sub>2</sub> additions and low temperatures (12°C/54°F) for a steady and reliable alcoholic fermentation following cold soak.

Vitilevure 3001® is recommended for cold soak protocols for intense Pinot Noir wines with aging potential.

#15682 500 g \$47.00

Terpenes in the free form give floral or citrus notes to wine, but they are mainly in a bound, non-odiferous form.

## Alchemy I

*S. cerevisiae* • blend

Sauvignon Blanc, Chardonnay, Chenin Blanc, Riesling, Pinot Gris, Rhône Whites, 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.

Barrel fermentation is not recommended and temperature control is advised.

#15174 1 kg \$101.00

## Alchemy II

*S. cerevisiae* • blend

Albariño, Sauvignon Blanc, Chenin Blanc, Rhône Whites

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

Alchemy II enhances 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 will produce VA.

Fast fermentation kinetics mean temperature management is crucial. It is a low SO<sub>2</sub> producer with medium nitrogen requirements.

#15177 1 kg \$101.00

## Alchemy III

*S. cerevisiae* • blend

Cabernet Sauvignon, Malbec, Zinfandel, Tempranillo, Grenache, Petit Verdot, Structured Reds

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

Alchemy III is a very high producer of 2-phenylethanol (rose), 2-phenylethyl acetate (floral and fruity), β-ionone (raspberry) and acetate esters (fruity and candy). It produces complex wines with good structure and body and is suitable for all red varieties.

Alchemy III has a minimum temperature tolerance of 16°C(61°F) and an alcohol tolerance of up to 15.5% (v/v). It is a strong fermenter with medium nitrogen needs, minimal SO<sub>2</sub> production and glycerol production of 8–11 g/L.

#15230 1 kg \$101.00

## Alchemy IV

*S. cerevisiae* • blend

Pinot Noir, Syrah, Cabernet Franc, Sangiovese, Fruit Forward Reds

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

Formulated for the production of intense red fruit characters such as cherry, red currant, raspberry and pomegranate. High producer of ethyl esters, especially ethyl hexanoate (fruity), which contributes to the longevity of the fruit aromas. This yeast blend has a significant production of total esters and terpenes, while also diminishing the effect of **methoxyppyrazines**. Produces smooth, round wines with heightened aroma intensity.

Alchemy IV has a minimum temperature tolerance of 16°C(61°F) and an alcohol tolerance of up to 15.5% (v/v). It is a strong fermenter with medium nitrogen needs, minimal SO<sub>2</sub> production and glycerol production of 8–11 g/L.

#15231 1 kg \$101.00

Methoxyppyrazines are responsible for vegetative, herbaceous and green characteristics in grapes and wine.

## Assmanshausen (AMH)

*S. cerevisiae* • *kudriavzevii*

Pinot Noir, Zinfandel, Riesling, Petite Sirah, Gewürztraminer

Originated from the Geisenheim Research Institute in Germany.

Enoferm AMH™ has a long lag phase with a slow to medium fermentation rate. A well-managed nutrient program during rehydration and fermentation is essential.

Enhances spicy (clove, nutmeg) and fruit flavors and aromas while adding overall complexity.

Fermentation potential is enhanced with AMH if the culture is allowed to develop in about 10% of the total must volume for eight hours prior to final inoculation.

#15632 500 g \$47.00

#15633 10 kg \$579.00

## BA11

*S. cerevisiae* • *cerevisiae*

Riesling, Viognier, Sauvignon Blanc, Pinot Blanc, Gewürztraminer, Rosé, Muscat, Rhône Whites, Aromatic Whites

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

Promotes clean aromatic characteristics and intensifies mouthfeel 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 \$44.00

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

Restart Stuck Fermentations, Syrah, Zinfandel, Sparkling Base

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

Uvaferm BC™ (Bayanus) has a high sugar and alcohol tolerance. It has been known to ferment up to 17% (v/v) and is therefore a good choice for high Brix fermentations (e.g. late season Zinfandel or Syrah).

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

BC (Bayanus) has low nitrogen requirements and is a low SO<sub>2</sub> and VA producer. It is fructophilic and often used to restart stuck or sluggish fermentations.

#15234	500 g	\$27.00
#15235	10 kg	\$274.00

**BDX** *S. cerevisiae* • *cerevisiae*

Merlot, Cabernet Sauvignon, Zinfandel, Syrah, Petit Verdot, Structured Reds

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

Uvaferm BDX™ is a vigorous fermenter. Alcohol tolerance can be up to 16% (v/v).

Optimizes color and structure with soft tannin extraction and increased mouthfeel.

Does not generate a lot of heat during fermentation.

#15634	500 g	\$47.00
#15635	10 kg	\$579.00

**BM45** *S. cerevisiae* • *cerevisiae*

Sangiovese, Cabernet Sauvignon, Grenache, Zinfandel, Chardonnay, Syrah, Structured Reds

Isolated in the early 1990s in collaboration with the Consorzio del Vino Brunello di Montalcino and the University of Siena in Italy.

Produces high levels of polyphenol reactive polysaccharides, resulting in wines with increased mouthfeel and improved color stability.

Has high nitrogen requirements and can produce H<sub>2</sub>S under poor nutrient conditions.

In Italian red varieties, Lalvin BM45™ has sensory descriptors that include fruit jam, rose and cherry liqueurs, sweet spice, licorice, cedar and earthy elements.

#15064	500 g	\$44.00
#15066	10 kg	\$548.00

**BM 4X4** *S. cerevisiae* • blend

Sangiovese, Cabernet Sauvignon, Grenache, Zinfandel, Chardonnay, Structured Reds

Lalvin BM 4X4® is a blend of BM45 and a complementary strain chosen by Lallemand to provide all the advantages of BM45 with even greater reliability under difficult conditions.

Positive interaction between strains means a more dependable fermentation together with increased aromatic intensity, color intensity and length of finish.

#15176	500 g	\$53.00
#15200	10 kg	\$641.00

**BRG** *S. cerevisiae* • *cerevisiae*

Chardonnay, Pinot Noir

Isolated in Burgundy at the IUVV (Institut Universitaire de la Vigne et du Vin) laboratory in Dijon, France. Reference strain for Burgundian winemakers.

A fast fermenter with a high nutrient requirement. Alcohol tolerance can be up to 15% (v/v).

Levuline BRG™ was isolated for its ability to contribute significant amounts of polysaccharides during fermentation which enhance mouthfeel and body.

Sensory notes include increased minerality in whites such as Chardonnay and spice characters in reds like Pinot Noir.

#15669	500 g	\$44.00
#15670	10 kg	\$478.00

**BRL97** *S. cerevisiae* • *cerevisiae*

Pinot Noir, Zinfandel, Barbera, Merlot, Malbec, Petit Verdot

Isolated at the University of Torino in Italy from a Nebbiolo fermentation.

Fast starter and a moderate speed fermenter, demonstrating good MLF compatibility and high alcohol tolerance.

Helps retain both the color and the varietal character in grapes sensitive to color loss.

Lalvin BRL97™ may be blended with wines fermented with RA17®, RC212® or W15™ to enhance complexity.

#15102	500 g	\$44.00
#15205	10 kg	\$548.00

**CLOS** *S. cerevisiae* • *cerevisiae*

Syrah, Grenache, Tempranillo, Zinfandel, Petite Sirah, Barbera, Petit Verdot, Structured Reds, Malbec

Isolated by the University of Rovira i Virgili in Spain from the Priorat region.

Notable for its high alcohol tolerance (up to 17% v/v) with a very good implantation rate in difficult conditions. Ferments over a wide range of temperatures (14–32°C/58–90°F).

Lalvin CLOS® was selected for its ability to enhance aromatic complexity, structure and mouthfeel. Good compatibility with malolactic bacteria.

#15201	500 g	\$44.00
#15204	10 kg	\$548.00

## Cross Evolution

*S. cerevisiae* • hybrid

Chardonnay, Gewürztraminer, Pinot Blanc, Riesling, Sauvignon Blanc, Rosé, Rhône Whites, Muscat, Albariño, Aromatic Whites

Hybrid yeast from a unique breeding program of the Institute for Wine Biotechnology at the University of Stellenbosch in South Africa.

Ideal for aromatic white and rosé wines with high alcohol potential (15% v/v) and low fermentation temperatures (14°C/58°F). This strain has reasonably low nitrogen requirements.

Cross Evolution® contributes an increased mouthfeel component resulting in a more aromatic and balanced wine.

Chardonnay wines have shown increased fresh fruit and floral aromas.

#15640	500 g	\$47.00
#15641	10 kg	\$579.00

## CSM

*S. cerevisiae* • *cerevisiae*

Cabernet Sauvignon, Cabernet Franc, Merlot, Petit Verdot

Selected by the Institut Français de la Vigne et du Vin (IFV, formerly ITV) Bordeaux in France in cooperation with Conseil Interprofessionnel du Vin de Bordeaux (CIVB-Bordeaux).

Enoferm CSM™ can ferment up to 14% (v/v) and benefits from balanced nutrient additions.

Wines fermented with CSM have shown intense aromatic profiles of berries, spice and licorice.

It has been known to reduce vegetal aromas. CSM adds complexity with a balanced, round mouthfeel and promotes malolactic fermentation.

#15638	500 g	\$47.00
#15639	10 kg	\$579.00

## CVRP

*S. cerevisiae* • *cerevisiae*

Cabernet Franc, Cabernet Sauvignon, Merlot, Petite Sirah, Tempranillo

Selected from the Lallemand yeast collection. CVRP is one of the highest polysaccharide producers in their collection.

CVRP is a moderate rate fermenter with medium nitrogen demands. This strain is tolerant to 16% (v/v) and can ferment from 18–30°C (64–86°F).

Wines made from CVRP are characterized by enhanced mouthfeel, roundness, soft tannins and elevated varietal character. Ideal for big reds.

Good compatibility with malolactic bacteria.

#15207	500 g	\$44.00
#15208	10 kg	\$548.00

## CVW5

*S. cerevisiae* • *bayanus*

Chardonnay, Chenin Blanc, Pinot Gris, Rosé, Sparkling Base, Albariño, Muscat, Aromatic Whites

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

Works well under low temperatures and low turbidity. Very high ester producer and has the lowest nitrogen demand in the Lallemand yeast collection. CVW5 produces low levels of VA and SO<sub>2</sub>.

Strong fermenter even under difficult conditions.

May also be used for making sparkling wine and fruit wines.

#15237	500g	\$44.00
#15210	10 kg	\$548.00

Fruity and floral compounds produced during the fermentation process. Concentration can be influenced by strain choice, solids management, temperature and nutrient regime.

## CY3079

*S. cerevisiae* • *cerevisiae*

Chardonnay, Pinot Blanc

Isolated by the Bureau Interprofessionnel des Vins de Bourgogne (BIVB) in France.

It is a steady, slow fermenter even at cooler temperatures (15°C/59°F). Lalvin Bourgoblanc CY3079® demonstrates good alcohol tolerance and low production of VA and H<sub>2</sub>S when properly fed.

Highly recommended for barrel-fermented and sur lie aged Chardonnay.

Autolyzes quickly at the end of fermentation. It is reported to enhance aromas such as fresh butter, honey, flowers and pineapple.

#15061	500 g	\$44.00
#15082	10 kg	\$548.00

## ICV D21

*S. cerevisiae* • *cerevisiae*

Merlot, Syrah, Zinfandel, Cabernet Sauvignon, Chardonnay, Structured Reds

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	\$44.00
#15163	10 kg	\$548.00

**ICV D47** *S. cerevisiae* • *cerevisiae*

Chardonnay, Rosé, Rhône Whites

Lalvin ICV D47™ is an isolate from Suze-la-Rousse in the Côtes du Rhône in France. It was selected for the production of full-bodied, barrel-fermented Chardonnay and other white varieties.

Fermentations are characterized by a short lag phase followed by a regular fermentation. Will tolerate a fermentation temperature range of 15–20°C (59–68°F).

It is a high polysaccharide producer and wines made with it are known for their accentuated fruit and volume.

Excellent results are obtained for barrel-fermented Chardonnay, especially when blended with wines made with Lalvin ICV D21.

#15642	500 g	\$44.00
#15643	10 kg	\$548.00

**ICV D80** *S. cerevisiae* • *cerevisiae*

Cabernet Sauvignon, Merlot, Syrah, Zinfandel, Petite Sirah, Structured Reds

Isolated by the ICV in 1992 from the Côte Rôtie area of the Rhône Valley in France for its ability to ferment musts high in sugar and polyphenols.

Given proper nutrition, Lalvin ICV D80® is a rapid starter with moderate fermentation rates. It has been known to have an alcohol tolerance of up to 16% (v/v) when the fermentation is aerated and the temperature is maintained below 28°C (82°F).

On the palate it creates high fore-mouth volume, big mid-palate mouthfeel, an intense, fine-grain tannin sensation and a long lasting licorice finish.

Selected for its ability to bring out differentiated varietal aromas by reinforcing the rich concentrated flavors found in varieties such as Zinfandel and Syrah.

#15125	500 g	\$44.00
#15133	10 kg	\$548.00

**ICV D254** *S. cerevisiae* • *cerevisiae*

Cabernet Sauvignon, Syrah, Zinfandel, Sangiovese, Chardonnay, Petit Verdot, Malbec, Rhône Whites

Isolated by the ICV from a Rhône Valley Syrah fermentation.

It has been known to have an alcohol tolerance of up to 16% (v/v) when the fermentation is aerated and the temperature is maintained below 28°C (82°F).

In red wines, Lalvin ICV D254® develops ripe fruit, jam and cedar aromas together with mild spiciness. On the palate it contributes high fore-mouth volume, big mid-palate mouthfeel and intense fruit concentration.

When used for white wines (particularly Chardonnay), sensory descriptors include butterscotch, hazelnut and almond aromas.

#15094	500 g	\$44.00
#15021	10 kg	\$548.00

**DV10** *S. cerevisiae* • *bayanus*

Chardonnay, Sparkling Base, Gewürztraminer, Pinot Gris, Late Harvest, Pinot Blanc, Restart Stuck Fermentations

Selected in Epernay, France.

Strong fermentation kinetics. Recognized for low foaming, low VA production and very low H<sub>2</sub>S and SO<sub>2</sub> 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	\$44.00
#15106	10 kg	\$548.00

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

Sparkling Base

Selected by the 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 SO<sub>2</sub> (up to 50 ppm) and, as a result, may inhibit malolactic fermentation.

#15053	500 g	\$28.00
#15076	10 kg	\$404.00

**Elixir** *S. cerevisiae* • hybrid

Sauvignon Blanc, Chardonnay, Viognier, Rosé, Rhône Whites, Aromatic Whites

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

Good implantation in clarified juice 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 SO<sub>2</sub>, H<sub>2</sub>S 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	\$47.00
--------	-------	---------

## Fermivin 3C

*S. cerevisiae* • *cerevisiae*

Chardonnay, Viognier, Chenin Blanc, Albariño

Fermivin 3C was selected by Oenobrande.

Fermivin 3C is a moderate fermenter, low foaming with optimum fermentation temperatures of 16–22°C (61–71°F), alcohol tolerance up to 14% (v/v), and a low VA and H<sub>2</sub>S producer. Recommended for barrel fermentation and sur lie aging.

Reveals citrus notes from norisoprenoids specific to the Chardonnay varietal. Releases mannoproteins during fermentation and aging.

Known for finesse and aromatic complexity.

#17103 500 g \$44.00

## Fermivin 4F9

*S. cerevisiae* • *bayanus*

Chardonnay, Chenin Blanc, Sauvignon Blanc, Rhône Whites, Aromatic Whites, Rosé

Fermivin 4F9 was selected by the IFV (formerly ITV) in the Loire Valley.

Fermivin 4F9 produces white and rosé wines with intense, exotic fruit (guava, passion fruit) and floral aromas. Releases large quantities of polysaccharides, enhancing body and volume.

A fast fermenter with a moderate nutrient requirement, alcohol tolerance of 15.5% (v/v) and optimum fermentation temperature of 14–20°C (57–68°F). A low SO<sub>2</sub> and H<sub>2</sub>S producer.

#17120 500 g \$44.00

## Fermivin A33

*S. cerevisiae* • *cerevisiae*

Cabernet Franc, Cabernet Sauvignon, Malbec, Merlot, Petit Verdot, Structured Reds

Fermivin A33 was specifically selected for Cabernet Franc by the University of Chile.

Fermivin A33 is a low foaming yeast with a short lag phase, alcohol tolerance up to 15.5% (v/v), a good resistance to SO<sub>2</sub> and a low VA and H<sub>2</sub>S producer.

Known for creating wines with good phenolic structure and aging potential which makes it a good choice for oak aging. Enhances varietal character and aromas of blackcurrant, dark chocolate and fresh tobacco.

#17100 500 g \$44.00

## Fermivin Champion

*S. cerevisiae* • *bayanus*

Restart Stuck Fermentations

Selected in Alsace by INRA of Narbonne, France.

Fermivin Champion has an excellent capacity to metabolize fructose, making it a good choice for restarting stuck fermentations.

High alcohol tolerance to 17% (v/v). As a preventative measure, it can be added towards the end of high initial Brix fermentations.

Does not produce secondary aromas. Fermivin Champion also helps preserve the varietal character of the must/juice when restarting a stuck fermentation.

#17143 500 g \$29.00

#17145 10 kg \$411.00

## Fermivin MT48

*S. cerevisiae* • *cerevisiae*

Merlot, Sangiovese, Grenache, Tempranillo, Petit Verdot, Fruit Forward Reds

Fermivin MT48 was selected in Bordeaux as an ideal yeast strain for Merlot by the IFV (formerly ITV) France in collaboration with CIVB-Bordeaux.

Fermivin MT48 has a short to medium lag phase, rapid and steady kinetics and naturally low volatile acid production. Mouthfeel is enhanced by high glycerol production.

While enhancing aromatic notes of cherry, raspberry, blackberry, plum and spices in Bordeaux varieties, Fermivin MT48 also produces excellent results in Sangiovese, Grenache and Tempranillo.

#17106 500 g \$44.00

## Fermivin PF6

*S. cerevisiae* • *cerevisiae*

Pinot Noir, Fruit Forward Reds

Fermivin PF6 was selected by Oenobrande.

Produces round, elegant wines with bright fruit and spice character. Fermivin PF6 is known to produce balanced wines with enhanced color intensity and lower levels of astringency.

Fermivin PF6 ferments well at low temperatures and is therefore suitable for cold soaks. Optimal fermentation temperature of 12–24°C (54–75°F), moderate nutrient needs and an alcohol tolerance of 14% (v/v).

#17109 500 g \$44.00

## Fermivin TS28

*S. cerevisiae* • *cerevisiae*

Sauvignon Blanc, Albariño, Aromatic Whites

Fermivin TS28 was selected by the IFV (formerly ITV) in the Loire Valley.

The  $\beta$ -lyase activity of Fermivin TS28 optimizes the release of thiol precursors, such as boxwood, gooseberry, and mineral (stone, flint). Produces crisp, aromatic white wines with balanced mouthfeel.

Optimal fermentation temperature of 15–22°C (59–72°F), moderate nutrient needs and an alcohol tolerance of 14.5% (v/v).

#17112 500 g \$44.00

Thiols are released during alcoholic fermentation due to the  $\beta$ -lyase enzyme activity of specific strains of wine yeast.

## ICV GRE

*S. cerevisiae* • *cerevisiae*

Cabernet Franc, Grenache, Cabernet Sauvignon, Merlot, Syrah, Chenin Blanc, Riesling, Rosé, Rhône Whites, Fruit Forward Reds

Selected in the Cornas area of the Rhône Valley in France in 1992.

A rapid starter, it can ferment up to 15% (v/v) alcohol with low volatile acidity.

In reds, it does well with fresh Rhône style wines with up-front fruit. With short skin contact (three to five days), Lalvin ICV GRE™ minimizes the risks of vegetal and undesirable sulfur components.

In fruit-focused whites, such as Chenin Blanc, Riesling and Rhône whites, ICV GRE fermentations result in stable, fresh fruit characteristics such as melon and apricot while improving fore-mouth impact.

#15101 500 g \$44.00

#15142 10 kg \$548.00

**Ionys<sub>WF</sub>** LALLEMAND*S. cerevisiae* • *cerevisiae*

Acid Preservation

Malbec, Petite Sirah, Sangiovese, Syrah, Tempranillo, Cabernet Sauvignon, Merlot, Petit Verdot

IONYS<sub>WF</sub><sup>™</sup> is the result of a multi-year research project between Lallemand and INRA Montpellier.Selected for its ability to significantly retain must/juice acidity during fermentation, IONYS<sub>WF</sub> is recommended for fermenting reds from warmer climates with high pH and high potential alcohol. The acidification 'power' of IONYS<sub>WF</sub> may result in a total acidity difference of 0.4–1.4 g/L tartaric acid and a pH decrease of between 0.04–0.2.Low producer of VA, SO<sub>2</sub> and H<sub>2</sub>S, with an alcohol tolerance of up to 16% (v/v). IONYS<sub>WF</sub> has very high nitrogen requirements and a balanced nutrient protocol is essential. Maintaining a temperature range of 25–28°C (77–82°F) optimizes glycerol production (up to 15 g/L) and may decrease alcohol production between 0.4–0.8% (v/v). IONYS<sub>WF</sub> has a moderate fermentation speed with a long, but steady stationary phase.With proper nutrition and temperature control, wines made with IONYS<sub>WF</sub> are characterized as having fresh fruit and mineral characters and fine-grain tannins.**Storage**

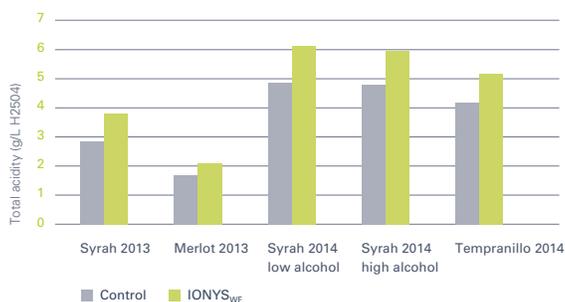
Store at 4°C (39°F). Use immediately once opened.

*Note: IONYS<sub>WF</sub> is an innovative yeast selection and is protected by an International Patent pending; No WO2015/11411. Propagation of IONYS<sub>WF</sub> is an infringement of this Patent.*

#15233 500 g \$53.00

**Why is IONYS<sub>WF</sub> producing more total acidity?**

The IONYS<sub>WF</sub> yeast selection strategy used a form of “adaptive evolution”, which adapts yeast to higher osmotic pressure conditions. The goal was to select a yeast that converts less sugar to ethanol, and more to other by-products such as glycerol, succinic and malic acids. The result is adapted cells that have the ability to naturally internalize potassium and by doing so, lower its content in the must/juice and avoid precipitation with tartaric acid. Higher glycerol and organic acid production (not acetic acid) contribute to wines with higher acidity perception, balance, and overall freshness.

**Acidifying effects of IONYS<sub>WF</sub>****K1 (V1116)** LALLEMAND*S. cerevisiae* • *cerevisiae*

Restart Stuck Fermentations, Sauvignon Blanc, Chenin Blanc, Sparkling Base

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<sup>™</sup> is the most tolerant of difficult fermentation conditions such as extreme temperatures, high alcohol (18% v/v) and low turbidity.

Ferments well under stressed conditions and is useful in restarting stuck fermentations, especially when relative fructose levels remain high.

#15063 500 g \$27.00  
#15077 10 kg \$264.00**Lalvin C** LALLEMAND*S. cerevisiae* • *bayanus*

For use in cool climate wines high in malic acid, cider, fruit wines, restarting stuck fermentations, and secondary fermentation in sparkling wines.

For full product description, please see page 120.

#15689 500 g \$34.00

**M2** LALLEMAND*S. cerevisiae* • *cerevisiae*

Chardonnay, Sauvignon Blanc, Cabernet Sauvignon, Syrah, Rosé, Albariño, Rhône Whites, Fruit Forward Reds, Aromatic Whites

Isolated in Stellenbosch, South Africa.

Enoferm M2<sup>™</sup> is a medium-rate fermenter and needs a high level of balanced nutrients for a strong fermentation. Requires some temperature control for white wine production.

Neutral to low ester-producing strain.

It can be distinguished by its expression of citrus and blossom notes and for accentuating volume in the mouth.

#15648 500 g \$47.00  
#15649 10 kg \$579.00**M83** LALLEMAND*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 SO<sub>2</sub> 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 \$47.00

**MT** *S. cerevisiae* • *cerevisiae*

Merlot, Cabernet Sauvignon, Petit Verdot, Structured Reds

Selected in Saint Emilion, France, by the IFV (formerly ITV) Bordeaux in collaboration with the INRA Montpellier.

Vitilevure MT™ has steady fermentation kinetics and a high alcohol tolerance (15% v/v). It benefits from a balanced nutrient strategy, especially in low nutrient musts with high potential alcohol.

Characterized by aromas of strawberry jam, caramel and spice. Enhances color intensity and tannin structure.

This yeast is particularly recommended for grapes with high maturity and long aging potential.

#15650	500 g	\$47.00
#15651	10 kg	\$579.00

**NT 50** *S. cerevisiae* • hybrid

Shiraz (Syrah), Pinot Noir, Merlot, Cabernet Sauvignon, Cabernet Franc, Grenache, Petit Sirah, Fruit Forward Reds

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

Very robust strain for the production of aromatic red wines. Temperature control (not higher than 28°C/83°F) is advised. Has medium nitrogen requirements.

NT 50 produces well-rounded red wines with structured tannins and good color stability. Useful for New World styles of Syrah and Cabernet Sauvignon.

Enhances berry notes in Pinot Noir and Grenache and floral notes in Syrah and Merlot.

#15184	1 kg	\$91.00
--------	------	---------

**NT 112** *S. cerevisiae* • hybrid

Cabernet Sauvignon, Cabernet Franc, Merlot, Zinfandel, Shiraz (Syrah), Petite Sirah

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

Alcohol tolerant up to 16% (v/v) with a low nitrogen requirement and a short lag phase. Can produce SO<sub>2</sub> under stressed conditions of high alcohol (>14% v/v) or low temperatures (20°C/68°F).

NT 112 is recommended for red wines with a firm tannic structure and enhances blackcurrant, berry and spice flavors.

#15190	1 kg	\$91.00
--------	------	---------

**NT 116** *S. cerevisiae* • hybrid

Shiraz (Syrah), Cabernet Sauvignon, Merlot, Petite Sirah, Pinot Gris, Pinot Blanc, Chenin Blanc, Sparkling Base, Albariño, Aromatic Whites

Product of the yeast hybridization program of Infruitec-Nietvoorbij, 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 has a dual application in winemaking. Its fermentation kinetics make it very suitable for full-bodied, high-maturity red wines destined for oak aging. Its high ability to convert volatile thiols and high ester production at low temperatures makes it similarly suitable for the production of New World style aromatic white and rosé wines. It specifically enhances the zesty (citrus) aromas in whites.

#15185	1 kg	\$91.00
#15226	10 kg	\$658.00

**NT 202** *S. cerevisiae* • hybrid

Cabernet Sauvignon, Pinot Noir, Merlot, Malbec, Structured Reds

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

It is alcohol tolerant up to 15% (v/v) and low foaming. Fermentation temperature should be monitored to control the speed. Not suitable for cold soaking.

NT 202 is an aromatic red wine yeast that promotes blackcurrant, blackberry and plum-like flavors.

This strain has a stimulatory effect on malolactic fermentation and good fructose utilization.

#15191	1 kg	\$91.00
#15227	10 kg	\$658.00

**QA23**  *S. cerevisiae* • *bayanus*

Chardonnay, Sauvignon Blanc, Gewürztraminer, Pinot Blanc, Albariño, Muscat, 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	\$47.00
#15653	10 kg	\$579.00

A significant amount of aroma and flavor compounds are bound up in a non-volatile, flavorless form.  $\beta$ -glucosidases aid in their revelation.

**R2** LALLEMAND*S. cerevisiae* • *bayanus*

Riesling, Sauvignon Blanc, Gewürztraminer, Late Harvest, Aromatic Whites

Isolated in the Sauternes region of Bordeaux, France, by Brian Croser of South Australia.

Has excellent cold temperature properties and has been known to ferment in conditions as low as 5°C(41°F). Tends to produce VA without proper nutrition.

Lalvin R2™ helps produce intense, direct fruit style whites by liberating fruity and floral aromas. In addition, varietal characters are enhanced by the enzymatic release of aroma precursors.

#15071 500 g \$44.00

**RA17** LALLEMAND*S. cerevisiae* • *cerevisiae*

Pinot Noir, Grenache, Fruit Forward Reds

Lalvin RA17® is a BIVB strain that was selected from the Burgundy region of France.

Proper nutrition is recommended to avoid the formation of H<sub>2</sub>S, especially in low nutrient musts.

Enhances cherry and fruit aromas. Wines made with RA17 may be blended with wines fermented with RC212, W15 or BRL97 to give more complexity and fuller structure.

#15056 500 g \$44.00

**RBS 133** LALLEMAND*S. cerevisiae* • *cerevisiae*

Sangiovese, Rosé, Zinfandel, Fruit Forward Reds

Selected in collaboration with the Università degli Studi di Padova in Italy to enhance the quality and uniqueness of the wines from the Raboso del Piave grape variety.

Reduces sensation of acidity and astringency in red wines under difficult conditions such as high acidity.

Wines produced using this yeast are described as having delicate fruity aromas such as cherry, blackberry, plum and ripe fruits. Floral characters such as wild violet, as well as spice and vanilla have also been noted.

Lalvin RBS 133™ has an optimum synergy with malolactic fermentation.

#15687 500 g \$44.00

**RC212** LALLEMAND*S. cerevisiae* • *cerevisiae*

Pinot Noir, Grenache, Cabernet Sauvignon, Rosé

Selected from fermentations in Burgundy, France, by the BIVB.

Timely nutrient additions are recommended to avoid potential H<sub>2</sub>S production, particularly in low nutrient musts.

Known for its ability to generate ripe berry, bright fruit and spicy characteristics and to consistently produce Pinot Noir with good tannin structure.

Lalvin Bourgorouge RC212® wines may be blended with wines fermented with RA17®, AMH™, W15™ or BRL97™ to achieve more complexity.

#15057 500 g \$44.00

#15097 10 kg \$548.00

**Rhône 2056** LALLEMAND YSEC*S. cerevisiae* • *cerevisiae*

Syrah, Grenache, Barbera, Zinfandel, Red French Hybrids, Fruit Forward Reds

Isolated in the northern Côtes du Rhône and selected by the IFV (formerly ITV) from over 1500 strains for its ability to maintain and enhance varietal fruit aromas and flavors.

Low producer of SO<sub>2</sub> and VA over a wide temperature range and can tolerate alcohol up to 16% (v/v). Has relatively high nutrient requirements.

Expresses varietal character, retains good color and is excellent for fruit forward styles.

#15072 500 g \$44.00

#15180 10 kg \$548.00

**Rhône 2226** (formerly L2226) LALLEMAND*S. cerevisiae* • *cerevisiae*

Merlot, Zinfandel, Sangiovese, Barbera, Cabernet Franc, Petite Sirah, Structured Reds

Isolated from a vineyard in the Côtes du Rhône in France.

Lalvin Rhône 2226™ is alcohol tolerant up to 16–17% (v/v) and is recommended for high Brix reds.

Characterized by aromas of black cherry, berry and cherry cola in red wines.

Can be used to restart stuck or sluggish fermentations.

#15644 500 g \$44.00

#15645 10 kg \$548.00

**Rhône 4600** LALLEMAND*S. cerevisiae* • *cerevisiae*

Rosé, Viognier, Chardonnay, Syrah, Rhône Whites

Isolated from the Côtes du Rhône region in France in collaboration with the research center of Inter Rhône.

Lalvin Rhône 4600® has a short lag phase, low nutrient demand and can ferment efficiently at low temperatures (13.5°C/56°F).

Produces high levels of polysaccharides which contribute intense mouthfeel and volume.

Complex aromatic notes and elevated ester production such as tropical (pineapple) and fresh fruit (apple, pear, strawberry) make this strain an ideal choice for rosé wines and Rhône-style whites. Useful for blending.

#15171 500 g \$44.00

Polysaccharides are a macromolecule in wine that can originate from grapes or fungi (*botrytis* and yeast). They can positively impact stability (color, protein and tartrate), body and aroma longevity.

**R-HST** *S. cerevisiae* • *cerevisiae*

Riesling, Gewürztraminer, Sauvignon Blanc, Viognier, Rhône Whites, Aromatic Whites

Selected from Riesling trials conducted in the Heiligenstein region of Austria.

Tolerates fermentation temperatures as low as 10°C(50°F) and alcohol levels up to 15% (v/v). In very cold fermentations, allows the temperature to increase toward the end for a clean finish.

Lalvin R-HST® has a short lag phase and generation time, even at cold temperatures. This allows it to dominate and persist over spoilage yeast such as *Kloeckera apiculata*, where other *S. cerevisiae* might have difficulty.

Retains fresh varietal character while contributing structure and mouthfeel. It can produce crisp, premium white wines suitable for aging.

#15130 500 g \$44.00

**RP15** *S. cerevisiae* • *cerevisiae*

Syrah, Zinfandel, Merlot, Cabernet Sauvignon, Cabernet Franc, Petite Sirah, Malbec, Petit Verdot, Structured Reds

Isolated from spontaneous Rockpile Syrah fermentations in California.

Enoferm RP15™ is a moderate speed fermenter and has been known to be tolerant up to 17% (v/v) alcohol.

Used in concentrated reds for a rich, lush, balanced mouthfeel. Characterized by red fruit and mineral notes.

Has a low to moderate nitrogen demand; benefits from careful rehydration with Go-Ferm or Go-Ferm Protect Evolution.

#15665 500 g \$47.00

#15666 10 kg \$579.00

**Steinberger (DGI 228)** *S. cerevisiae* • *cerevisiae*

Riesling, Pinot Gris, Gewürztraminer

Slow, cool fermenter with low foam production.

Has a reasonable alcohol tolerance (up to 13% v/v) with high SO<sub>2</sub> tolerance.

The beta-glucosidase activity of Steinberger contributes elegant aromas, especially in aromatic white wines.

#15084 500 g \$26.00

#15086 10 kg \$271.00

**SVG** *S. cerevisiae* • *cerevisiae*

Sauvignon Blanc, Pinot Gris, Riesling, Rhône Whites

Selected in the Loire region of France as a result of an IFV (formerly ITV) collaboration with Lallemand.

Notable for its ability to enhance typical Sauvignon Blanc varietal characters (especially from cooler regions) and still maintain good fermentation kinetics.

Wines fermented with SVG are described as having more intensity and a balance of mineral, citrus and spicy notes.

#15144 500 g \$44.00

**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 H<sub>2</sub>S and SO<sub>2</sub>.

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

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

#15657 500 g \$47.00

#15658 10 kg \$579.00

**NEW! Tango Malbec**  *S. cerevisiae* • *cerevisiae*

Malbec, Syrah, Tempranillo, Merlot, Petite Sirah

Lalvin Tango Malbec™ was isolated by the National Institute of Agricultural Technology in La Consulta, Uco Valley, Mendoza, Argentina.

Tango Malbec is a moderate speed fermenter with medium nitrogen requirements and an alcohol tolerance up to 15.5% (v/v). It is a low H<sub>2</sub>S and SO<sub>2</sub> producer and malolactic friendly.

It is known for its respect of varietal character and intense color. Tango Malbec produces full bodied red wines with aromatic complexity including violet, black cherry, blackberry, raspberry, dark plum and anise. Its polyphenolic impact creates wines with good structure and balance.

#15252 500 g \$44.00

**T73** *S. cerevisiae* • *bayanus*

Merlot, Zinfandel, Sangiovese, Tempranillo, Fruit Forward Reds

Isolated by La Universidad de Valencia of Spain in collaboration with Lallemand.

Lalvin T73™ is a moderate speed fermenter with relatively low nitrogen requirements and good alcohol tolerance (up to 16% v/v).

Recognized for its ability to enhance the natural aromas and flavors in red wines produced in hot climates. Its high ester production helps such wines “open up”.

Enhances mouthfeel through the elevated production of glycerol. Useful for blending with wines made with Rhône 2056.

#15091 500 g \$44.00

## Tango Malbec

### The Story of a New Yeast Isolate

LalvinTango Malbec™ was isolated by the National Institute of Agricultural Technology in La Consulta, Uco Valley, Mendoza, Argentina. This strain was chosen from a number of options with the goal of finding a yeast to reveal the best of Malbec's traits.

Malbec is grown all over the world, with plantings totaling over 250,000 acres. Approximately 30% of that is planted in Argentina. Flavor descriptors for Malbec can depend on the growing climate, with the cooler Patagonia region revealing more black cherry and raspberry notes, and the warmer Mendoza area showing predominantly dark and black fruit characters.

When Lallemend embarks upon isolating a new strain of yeast, many criteria are considered. This includes fermentation kinetics, the aroma and flavor profiles, and mouthfeel and structure components. Before a new strain is produced on a commercial scale, it is put through numerous trials and tastings. The strain's ability to withstand the production process is of key importance.

Tango Malbec was trialed at several wineries in the Mendoza region by winemakers in production settings. The trials included comparisons with spontaneous fermentations, as well as known yeast strains. These wines were then tasted by panels consisting of winemakers and researchers alike. In all the tastings, the Tango Malbec was preferred over the control. The overwhelmingly positive results from the trials lead to Tango Malbec's selection for commercial production.

Wines fermented with fruit from cooler climates reveal more black cherry and raspberry notes, with warmer climate fruit tending toward violet, blackberry, black plum and anise nuances. Tango Malbec produces wines with velvety, full structure.



Three vineyards from one Argentine winery reflect the differences in altitude, temperature and yield. Note fruit aromatic intensity always improved and negative characteristics diminished.

## VIN 13

*S. cerevisiae* • hybrid

Sauvignon Blanc, Chenin Blanc, Chardonnay, Rosé, Gewürztraminer, Muscat, Albariño, Rhône Whites, Aromatic Whites, Restart Stuck Fermentations

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. It is a good choice for restarting stuck white fermentations, especially when fructose levels remain high.

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 \$91.00  
#15228 10 kg \$658.00

Thiols in their free form give tropical and/or citrus aromas and flavors to wine, however, they must be revealed by the yeast from their bound non-odiferous form.

## VIN 2000

*S. cerevisiae* • hybrid

Chenin Blanc, Chardonnay, Sauvignon Blanc, Viognier, Albariño

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

Moderate speed fermenter with very low SO<sub>2</sub> production and low foaming. Cold tolerant (12°C/55°F) and alcohol tolerant to 15.5% (v/v).

VIN 2000 is suitable for barrel fermentation.

Recommended for the production of rich and ripe style Chenin Blanc (fresh pineapple and citrus aromas), oaked Chardonnay (citrus aromas) and Sauvignon Blanc (passion fruit, guava and tropical aromas).

#15195 1 kg \$91.00

**VRB**  *S. cerevisiae* • *cerevisiae*

Tempranillo, Barbera, Sangiovese, Zinfandel, Petite Sirah, Fruit Forward Reds

Selected by Centro de Investigaciones Agrarias (CIDA) in Logroño, Spain.

Has a short lag phase and a steady fermentation rate with low VA production. With properly integrated nutrition, Uvaferm VRB® can have an alcohol tolerance of up to 17% (v/v) over a wide temperature range.

This Rioja region selection helps create exceptional flavor complexity while softening tannins and improving mid-palate mouthfeel. Enhances **varietal characteristics** and ester production. Has good compatibility with malolactic fermentation.

Its flavor attributes are often described as ripe fruit, jam, hazelnut and dried plums.

#15173 500 g \$44.00

Recognizable trait of a varietal that shows, regardless of growing region and winemaking techniques.

**W15** *S. cerevisiae* • *cerevisiae*

Gewürztraminer, Riesling, Pinot Gris, Pinot Noir, Syrah, Rosé, Aromatic Whites, Rhône Whites

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 H<sub>2</sub>S 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 both Pinot Noir and cooler climate Syrah.

#15118 500 g \$44.00

#15119 10 kg \$548.00

A by-product of alcoholic fermentation that can give sweetness and/or fullness to wines.

**VI-A-DRY YEAST STRAINS****CEG (Epernay II)** *S. cerevisiae* • *cerevisiae*

White

Isolated by the Geisenheim Research Institute in Germany.

Notable for its ability to deliver slow, steady and clean fermentations. Optimal fermentation temperatures range from 15–25°C (59–77°F).

CEG fermentations often stick under stressed conditions (low temperatures, low nutrient content, etc.), leaving some residual sugar.

This makes CEG advantageous for use in semi-dry white wines.

#15081 500 g \$24.00

#15093 10 kg \$203.00

**Montrachet (Davis 522)** *S. cerevisiae* • *cerevisiae*

White

Selected from the Pasteur Institute strain collection in Paris, France by UC Davis researchers.

With proper nutrition, it has moderate fermentation kinetics at 10–29°C (50–85°F) with low VA and SO<sub>2</sub> formation.

This strain is sensitive to the killer factor, alcohol levels above 13% (v/v) and over-clarified musts (turbidity &lt;50 NTU).

Considered neutral in sensory contribution.

#15060 500 g \$18.00

#15074 10 kg \$190.00

**PM (Prise de Mousse)** *S. cerevisiae* • *bayanus*

White, Sparkling Base, Fruit Wine

PM has good fermentation kinetics at temperatures between 15–25°C (59–77°F).

Moderate producer of VA and a low foam and H<sub>2</sub>S producer.Has high SO<sub>2</sub> and alcohol tolerances.

#15085 500 g \$24.00

#15083 10 kg \$213.00



## INDUSTRY INSIGHT

## Winemaker's Toolbox Working with Selected Non-*Saccharomyces* Yeast Strains

by Gordon Specht

Area Manager, North America, Lallemand

Non-*Saccharomyces*, a colloquial term used in the wine community, refers to roughly 20 other than *Saccharomyces* yeast genera found in the vineyard and cellar. Their unpredictable nature to produce ethyl acetate or other negative off-characters justified their negative reputation as spoilage organisms. However, some of the non-*Saccharomyces* yeast have been looked at more closely for their potential positive contributions during the pre-fermentative and early fermentation stages. Their ability to impact the microbial soup early on as well as their potential to contribute complexity and more positive descriptors such as increased mouthfeel and aromatics has generated a lot of interest in the winemaking community.

Winemakers who would like to utilize the oenological qualities of non-*Saccharomyces* yeasts had to rely on the spontaneous development of wild yeasts, with the inherent risks of unreliable fermentations and uncontrollable sensory deviations. Fortunately, this is no longer the case. Through industry research into the yeast production processes, winemakers can now utilize non-*Saccharomyces* yeasts in the must, which have a survival rate throughout the first phase of fermentation comparable to that commonly obtained with *Saccharomyces* yeasts. The diversity of non-*Saccharomyces* now available to winemakers in commercial active dried form include *Torulaspota delbrueckii*, *Metschnikowia pulcherrima*, *Metschnikowia fructicola*, and *Lachancea thermotolerans*. When inoculated into the right juice matrix, they can help to avoid certain wine faults or reveal the aromatic potential of varietal aromas. All of Lallemand's commercially available non-*Saccharomyces* were isolated and selected from vineyards or winery cellars.

In general, non-*Saccharomyces* yeasts are not strong fermenters and tend to be easily overwhelmed once *Saccharomyces* begin to actively ferment. A sequential inoculation strategy of first adding a non-*Saccharomyces* followed by a selected *Saccharomyces* is the normal practice for some styles of wine. The biological control contribution of the non-*Saccharomyces* yeast in conjunction with the security of the *S. cerevisiae* enables winemakers to impact the sensory qualities and complexity of their wine while ensuring a reliable and complete fermentation. The impact of the non-*Saccharomyces* on the final wine can be great, but it is dependent on respecting several factors. Different non-*Saccharomyces* yeast strains will behave differently making selecting the right strain for the winemaking application very important. In order for the yeast to do its job well, attention must be paid to an individual strain's chemical and biological tolerances to pH, nutritional needs, temperature and SO<sub>2</sub>. Inoculation rate and allowing the proper length of treatment time before the *Saccharomyces* takes over, will also help to get the most out of a selected non-*Saccharomyces* yeast strain. Finally, be aware of special handling instructions for commercial active dried non-*Saccharomyces* as they are not as tolerant to higher storage and rehydration temperatures as the *Saccharomyces* active dried yeast.

After the advent of pure starter cultures, the renewed interest in non-*Saccharomyces* yeasts takes into account the reality of the interactions between microorganisms and their impact on wine quality. Although non-*Saccharomyces* are still relatively under-represented in their commercial availability, there is continued investment in their research and development for different winemaking applications. As we continue to face new winemaking challenges, Lallemand continues to expand the diversity of winemaking tools available to maximize wine quality.



*Metschnikowia pulcherrima*



*Metschnikowia fructicola*



*Saccharomyces cerevisiae*

Electron micrograph of different non-*Saccharomyces* yeast cell wall surfaces may help to explain some of the different impacts these different strains have on a wine.

## NON-SACCHAROMYCES YEAST STRAINS

### Biodiva ALLEMANTO

*Torulasporea delbrueckii*

Chardonnay, Syrah, Pinot Noir, Late Harvest

This *Torulasporea delbrueckii* isolate Biodiva was initially sold in North America in a kit (Level<sup>2</sup>TD) in which it was partnered with a specific *S. cerevisiae* strain. Based upon market feedback, the Biodiva isolate is now available by itself. Winemakers can match it with a compatible *S. cerevisiae* strain of their choosing for both red and white wines. The result is that winemakers can now mimic the best of wild fermentations in a controlled setting. Biodiva is very tolerant to osmotic shock, making it well adapted for fermenting late harvest and icewine.

*S. cerevisiae* strains compatible with Biodiva are 43, BDX, ICV D254, RC212, Rhône 2056, QA23 and VRB.

**Biodiva MUST be used in conjunction with an *S. cerevisiae* strain.**

Following an inoculation of Biodiva (*Torulasporea delbrueckii*) with an inoculation of an appropriate *S. cerevisiae* leads to an increase in ester levels while helping to promote a complete and clean fermentation. Resulting wines commonly have more intense aromas, mouthfeel and complexity.

#### Usage

Before inoculation, make sure molecular SO<sub>2</sub> level is under 0.2 mg/L and turbidity is >80 NTU. Inoculate at 2 lb/1000 gal (25 g/hL). Rehydration of Biodiva is at 30°C(86°F). After 15 minutes, stir gently. Slowly combine an equal amount of juice into rehydration solution to avoid cold shock. Total rehydration time should not exceed 45 minutes. After 1.5–3° Brix drop add selected *S. cerevisiae* with standard yeast rehydration protocol. *Please visit our website for full usage instructions.*

#### Storage

Store for up to 24 months at 4°C(39°F). Use immediately once opened.

*Note: The optimum temperature for Biodiva is >16°C(61°F). If the must/juice is under 16°C(61°F) it could result in a long lag phase, slow growth of the yeast, and other problems.*

#15697 500 g \$107.00

## NEW NAME! Exotics Mosaic

*S. cerevisiae* and *S. paradoxus* hybrid

Chardonnay, Viognier, Chenin Blanc, Syrah, Merlot, Tempranillo, Grenache

Anchor Exotics Mosaic (formerly Anchor Exotics) is a product of the yeast hybridization program of The Institute for Wine Biotechnology at the University of Stellenbosch in South Africa. It is a hybrid between *S. cerevisiae* and *S. paradoxus*. *S. paradoxus* is the closest relative to *S. cerevisiae* and can be found on grapes. This hybrid inherited the aromatic capabilities of both its parents, thereby expanding the aromatic potential and complexity from what *S. cerevisiae* strains have to offer.

White wines produced using this yeast are described as having exotic aromas and flavors, as well as good mouthfeel. It enhances guava, passion fruit, tropical and stone fruit aromas and flavors. Exotics Mosaic is cold sensitive and ferments at a steady rate in barrels. The optimum temperature range for whites is 18–20°C(64–68°F).

Red wines produced using this yeast, particularly Syrah and Merlot, have shown aromas of cherry, floral, cocoa and strawberries. They are also described as full-bodied, well-balanced, complex and intense. Optimum temperature range for reds is 18–28°C(64–83°F).

Exotics Mosaic has been found to produce elevated levels of glycerol (9–13 g/L), which can potentially lead to lower alcohol conversions in high sugar musts. It has an alcohol tolerance up to 15.5% (v/v) with medium nitrogen requirements. It has low VA and SO<sub>2</sub> production. It can also partially degrade malic acid and is known to facilitate and enhance malolactic fermentation. Exotics Mosaic is a hybrid strain and can FULLY ferment through primary fermentation, up to 15.5% (v/v).

**Usage** *See rehydration protocol on page 8 for more information.*

#### Storage

Store in a cool, dry place 5–15°C(41–59°F). Use immediately once opened.

#15220 5 kg \$682.00

#15213 250 g \$38.00



**Andrew Januik,**  
Winemaker  
Januik Winery  
Woodinville, WA

*“I began using Biodiva in 2016 while making wine in South Africa and very quickly was drawn to its effect on fermentations. During the 2016 vintage in Washington, I only used Biodiva on a few experimental lots and was once again very happy with the results. In fact, the few lots of wine on which it was used became some of our favorite from the vintage and almost all ended up in our highest end wines. Over the two vintages since, Biodiva has become an integral part of our fermentation routine being used on a high proportion of our wines. Starting the fermentations with Biodiva gives a beautiful, full mouthfeel that shows elegance that remains with aging. In addition, it seems to bring out very bright and expressive aromatics.”*

**NEW! Flavia** LALLEMAND*Metschnikowia pulcherrima*

Aromatic Whites, Rosé

Flavia™ is a pure culture of *Metschnikowia pulcherrima* selected by the Universidad de Santiago de Chili (USACH) for its ability to produce aroma and flavor revealing enzymes ( $\alpha$ -arabinofuranosidase). This enzymatic action is the first step in the liberation of bound, non-odiferous varietal aroma compounds. These compounds are subsequently revealed due to the  $\beta$ -glucosidase activity of compatible *Saccharomyces cerevisiae* strains. Flavia will enhance the aroma and flavor profiles of wines optimizing varietal characteristics while bringing freshness and volume in the mouth. Using Flavia can optimize the aromatic potential of your grapes.

**Usage**

Prior to inoculation ensure that the  $\text{FSO}_2$  is <15ppm. Flavia is used at a rate of 2 lb/1000 gal (25 g/hL). Add Flavia to ten times its weight of 30°C(86°F), chlorine free water, then stir gently. After 15 minutes, stir gently again. Slowly combine juice with the rehydration slurry to drop the temperature by 10°C(18°F). This is essential so you do not shock the yeast. This step may be repeated until you are within 10°C(18°F) of the inoculation temperature. Total rehydration should not exceed 45 minutes.

Inoculate with a compatible *Saccharomyces cerevisiae* strain 24 hours after adding Flavia, even if there has been no change in °Brix. Suggested compatible strains include those displaying  $\beta$ -glucosidase activity, including QA23™, Elixir™, Cross Evolution®, ICV D47™. For rosé wines, VRB®, RBS 133™, ICV GRE™ or Rhône 4600® good options.

If YAN is low, we recommend using Go-Ferm Protect Evolution® during the rehydration phase.

**Storage**

Store in a cool, dry environment below 11°C(52°F). Use immediately once opened.

#15244 500 g \$105.00

**Gaia** MF98.3 LALLEMAND*Metschnikowia fructicola*

For managing spoilage risks during cold soak of reds

Pre-fermentation cold soaks are used to improve color and aromatics in all red varieties. Vincent Gerbeaux of the Institut Français de la Vigne et du Vin (IFV) in Burgundy selected *Metschnikowia* IFV Gaia<sub>MF98.3</sub> from over 500 non-*Saccharomyces* isolates for use during cold soak applications, in particular on Pinot Noir. This strain is found on grape microflora and is non-fermentative but it does help with the balance of aromas. It has been found to enhance fruity characters and aromatic expression. The presence of Gaia<sub>MF98.3</sub> during cold soak helps limit *Kloeckera apiculata* growth and acetic acid production. *Kloeckera apiculata* (*Hanseniaspora uvarum*) is known to be a high producer of acetic acid and ethyl acetate.

Early inoculation allows for good implantation of Gaia<sub>MF98.3</sub> which can help control undesirable microflora during cold soak. It is able to implant and multiply rapidly helping it to prevail over spoilage microorganisms. **Use of Gaia<sub>MF98.3</sub> needs to be followed by a *S. cerevisiae* strain to complete alcoholic fermentation.** If the temperature of your cold soak is 10°C(50°F) or lower you may cold soak for up to 5 days before adding your *Saccharomyces* yeast. If the temperature of your cold soak is higher than 10°C(50°F), inoculation of your *Saccharomyces* yeast should be done at 2 days. Gaia<sub>MF98.3</sub> is able to grow in low pH and high sugar musts as well as being able to tolerate an initial  $\text{SO}_2$  addition up to 50ppm.

**Usage**

Rehydration of Gaia<sub>MF98.3</sub> is done at 30°C(86°F) and does not require a rehydration nutrient. Inoculate at 2 lb/1000 gal (25 g/hL). After 15 minutes, stir gently. Slowly combine an equal amount of juice into rehydration solution to avoid cold shock. Total rehydration time should not exceed 45 minutes. After cold soak, add selected *Saccharomyces cerevisiae* with standard yeast rehydration protocol to complete alcoholic fermentation.

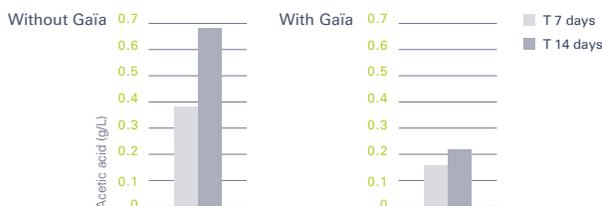
**Storage**

Store for up to 24 months at 4°C(39°F). Use immediately once opened.

#15686 500 g \$105.00

*M. fructicola* (Gaia™): biocontrol of volatile acidity

Production of acetic acid in must inoculated with *Kloeckera apiculata* with or without Gaia™ (sugars 230 g/L, pH 3.2, no  $\text{SO}_2$ , pasteurization)—(SD: 0,05 g/L).



## QTL YEAST STRAINS

### QTL Process

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. QTL has been used to identify properties and attributes 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 known for its fermentation properties. The desired trait is transferred to the chosen strain by natural breeding.

#### Are these yeast GMO?

No. The resulting yeast are all from natural breeding.

#### Do these strains produce H<sub>2</sub>S or SO<sub>2</sub>?

These optimized strains do not produce H<sub>2</sub>S or SO<sub>2</sub> by known pathways, but commonly musts are not sterile and other organisms present may produce these by-products.

#### Do OKAY®, Sensy™, Be Fruits and Be Thiols consume SO<sub>2</sub> during alcoholic fermentation?

SO<sub>2</sub> is usually consumed by *Saccharomyces* yeast through the sulfate pathway metabolism. The specific metabolism of these strains is such that they utilize SO<sub>2</sub> directly to synthesize two essential amino acids containing sulfur, thus avoiding the release of H<sub>2</sub>S.

#### How does the low acetaldehyde production of these yeasts affect your SO<sub>2</sub> additions?

The low acetaldehyde production reduces the consumption of free SO<sub>2</sub>, which may allow for lower total SO<sub>2</sub> additions.

### IOC Be Fruits

*S. cerevisiae* • *cerevisiae*

Albariño, Rosé

Selected by the INRA for very low to no SO<sub>2</sub> or H<sub>2</sub>S 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 (80 NTU ± 20) and fermentation temperatures between 12–15°C (54–59°F).

#15241 500 g \$44.00

### IOC Be Thiols

*S. cerevisiae* • *cerevisiae*

Sauvignon Blanc, Riesling, Gewürztraminer, Rosé

Selected by the INRA for very low to no SO<sub>2</sub> or H<sub>2</sub>S 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 \$44.00

### ICV OKAY

*S. cerevisiae* • hybrid

Petit Syrah, Rosé, Syrah, Viognier

Selected in collaboration with the INRA, SupAgro Montpellier, the ICV and Lallemand for very low to no SO<sub>2</sub> or H<sub>2</sub>S 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 \$29.00

#15222 10 kg \$431.00

### ICV Opale 2.0

*S. cerevisiae* • *cerevisiae*

Chardonnay, Sauvignon Blanc, Rosé, Rhône Whites

ICV Opale 2.0 is a yeast selection from the ICV.

It 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.

ICV Opale 2.0 produces low levels of H<sub>2</sub>S, SO<sub>2</sub> and acetaldehyde.

#15065 500 g \$44.00

**NEW! Persy™***S. cerevisiae* • *cerevisiae*

Rhône reds, Pinot Noir, Tempranillo or other varieties susceptible to hydrogen sulfide production

Selected in collaboration with INRA, SupAgro Montpellier and Lallemend, this QTL strain was developed for use in red wines produced from varieties naturally susceptible to H<sub>2</sub>S.

Using good fermentation practices Lalvin Persy™ is tolerant to 16% v/v ethanol, has low relative nitrogen requirements, a moderate-fast fermentation rate, a preferred temperature range of 59–82°F, low production of negative sensory compounds (H<sub>2</sub>S, VA, acetaldehyde) and is compatible with malolactic bacteria.

Red wines fermented with Persy™ have a balanced mouthfeel with fruit forward persistent aromas and flavors optimizing varietal expression.

#15261	500 g	\$44.00
#15262	10 kg	\$548.00

**Sensy** *S. cerevisiae* • hybrid

Rosé, Sauvignon Blanc, Pinot Blanc

Selected in collaboration with the INRA, SupAgro Montpellier, the ICV and Lallemend for very low to no SO<sub>2</sub> or H<sub>2</sub>S 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	\$44.00
--------	-------	---------

**ENCAPSULATED YEASTS**

Encapsulated yeast are alginate beads (a natural polysaccharide extracted from seaweed) containing yeast cells. Encapsulation allows substrates and metabolites to diffuse easily throughout the beads without releasing yeast cells into the must/juice or wine. Once encapsulated, the beads are partially dehydrated in a fluidized bead column and are stored at 4°C (40°F) until ready for use. The dry beads average 2 mm in diameter. Several encapsulated yeast products are available. Each has a unique winemaking application.

**ProDessert** *S. cerevisiae* • *cerevisiae*

Double encapsulated yeast for premium dessert wine fermentation

The most difficult aspect of dessert wine production is arresting the primary fermentation at the desired residual sugar level. ProDessert® was developed by Proenol (in collaboration with Lallemend) to make this process easier and more effective. When using ProDessert, the alcoholic fermentation is arrested by simply removing the beads from the wine. Precautionary measures (e.g. sulfur dioxide additions, chilling and/or filtration) may still be required to completely stop or remove indigenous yeast, although less overall intervention may be needed. For example, the need for large sulfur dioxide additions or drastic tank chilling may be reduced.

**Recommended Dosage**

100 g/hL 8.0 lb/1000 gal

*Note: Each 1 kilo bag will treat approximately 260 gallons.*

**Due to a short shelf-life, ProDessert is available by special order only. Please allow a 3–4 week lead time.**

**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 at [www.scottlab.com](http://www.scottlab.com).*

#15150	1 kg	\$214.00
#15158	ProMesh barrel	\$2.00
#15159	ProMesh tank bag	\$3.50

## ProElif

*S. cerevisiae* • *cerevisiae*

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.

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

<b>Alcohol</b>	≤ 11.5% (v/v)	<b>Calcium</b>	≤ 80 mg/L
<b>Free SO<sub>2</sub></b>	≤ 15 mg/L	<b>Protein Stability</b>	= stable
<b>pH</b>	≥ 3.0	<b>Tartrate Stability</b>	= stable
<b>YAN</b>	≥ 100 mg/L	<b>Fermentation Temperature</b>	> 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](http://www.scottlab.com).*

#15571 1 kg \$197.00

## ProMalic

*Schizosaccharomyces pombe*

Encapsulated yeast for naturally lowering juice acidity

ProMalic was created by Proenol (in collaboration with Lallemand) as an alternative to malolactic fermentation or chemical deacidification. It metabolizes malic acid into ethanol. It should only be added at the juice stage and removed when desired malic acid level is achieved. If left too long it can create off-characters in the fermentation.

**Due to a short shelf-life, ProMalic is available by special order only. Please contact us to order. All orders MUST be placed by July 12, 2019.**

*For more information on ProMalic, please visit our website at [www.scottlab.com](http://www.scottlab.com).*

## ProMesh Bags

For use with ProDessert, ProRestart and ProMalic

### Barrel Bags

For ProDessert use 2 bags/barrel containing 109 g/bag. One kilogram of beads will treat 260 gallons, or 4 barrels.

For ProRestart use 2 bags/barrel containing 82 g/bag. One kilogram of beads will treat 360 gallons, or 6 barrels.

### Tank Bags

Use up to 5 kg (11 lb. per bag).

#15158	ProMesh barrel	\$2.00
#15159	ProMesh tank bag	\$3.50

## ProRestart

*S. cerevisiae* • *cerevisiae*

Encapsulated yeast to restart sluggish or stuck fermentations

ProRestart® was created by Proenol (in collaboration with Lallemand) for completing sluggish and stuck fermentations effectively.

It has been acclimated to high alcohol and other harsh conditions prior to being encapsulated in the alginate beads. This conditioning allows the yeast cells to work to metabolize residual sugars in sluggish or stuck wine. It can help decrease spoilage risks related to microbiological contamination and consequently helps preserve wine quality.

**ProRestart can be effective when utilized within the following specific wine parameters:**

Potential Alcohol	< 15.5% (v/v)
Free SO <sub>2</sub>	< 20 mg/L
pH	> 3.0
Residual Sugar	May work as low as 10 g/L of sugar
Volatile Acidity	< 0.61 g/L (acetic acid)
Temperature	Optimal 20–22°C(68–72°F) Range 12–25°C(54–77°F)

All of these parameters act in balance with one another. It is critical to manage them together. For example, if you have a red wine with high alcohol and high SO<sub>2</sub>, increase the temperature to 20–25°C(68–77°F). *Note: 25°C(77°F) is a higher temperature than we recommend when using traditional restart protocols.*

If harsh wine conditions exist, a more rigorous rehydration protocol may be required. If conditions fall outside of the recommended wine parameters, a traditional build-up method is necessary.

### Recommended Dosage

75 g/hL 6.0 lb/1000 gal

*Note: Each 1 kilo bag will treat approximately 360 gallons.*

### Usage

First analyze the sluggish or stuck wine for microbial contamination. If necessary, treat the wine prior to adding the ProRestart. *See page 33 for Rehydration Protocol of ProRestart.*

### Storage

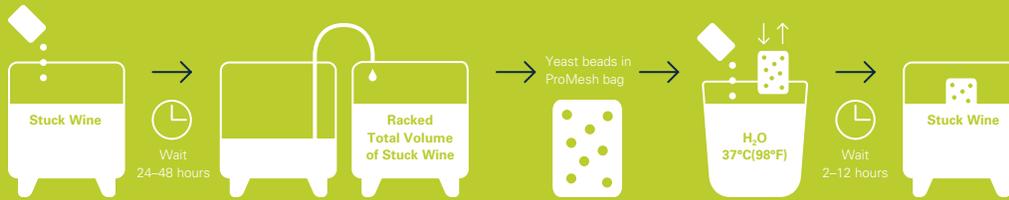
Dated expiration. Store at 4°C(40°F). **Do not freeze.** Once opened use immediately.

#15154	1 kg	\$190.00
#15158	ProMesh barrel	\$2.00
#15159	ProMesh tank bag	\$3.50



## PROTOCOL

# Recommended Method to Rehydrate ProRestart



### Step 1

Add Reskue.

Rack after 24–48 hours.

Let yeast beads adjust to room temperature. Place beads into a ProMesh bag.

### Step 2

Soak beads in sugar solution.

### Step 3

Introduce ProMesh bag into stuck wine. Gently shake bag several times per day. Leave beads in the wine until desired degree of fermentation.

### Step 1

#### Preparation of Stuck Wine and Addition of Beads to ProMesh Nylon Bags

1. Add 40 g/hL (3.3 lb/1000 gal) Reskue™ (see page 50 for Reskue product description) to the stuck wine 24–48 hours prior to bead addition. Rack off of the Reskue, if possible.
2. Remove the encapsulated yeast beads from the recommended 4°C(40°F) storage temperature and allow them to adjust to room temperature. This will avoid thermal shock to the encapsulated yeast.
3. Place the beads in the ProMesh nylon bags before rehydrating. See ProMesh on page 32 for dose per bag.

To ensure good contact with the wine, distribute the beads evenly throughout the ProMesh nylon bags, leaving plenty of space for bead movement.

### Step 2

#### Bead Rehydration

4. Prior to rehydration, add the correct concentration of sugar (see chart) into a volume of clean 37°C(98°F) water 5 times the weight of the beads (or enough sugar solution to completely cover the beads). Once the sugar dissolves, add the ProMesh nylon bag containing the beads.

Potential Alcohol % (v/v)	Sugar Concentration (g/L)	Hours of Soaking Required
13	20	2
13.5	40	4
14	60	6
14.5	80	8
15	100	10
15.5	120	12

Note: The sugar solution does not get added to the wine. It is only necessary to aid in encapsulated yeast activation.

Wait between 2 and 12 hours (see chart above for the recommended rehydration length) before adding the beads to the must/juice.

### Step 3

#### Addition of Beads to Stuck Wine

5. Introduce the ProMesh nylon bags containing the beads into the tank/barrel of stuck wine. The temperature difference between the beads and the wine should be less than 10°C(18°F).
6. If several bags are added to the same tank, they must be placed at different heights for better distribution. A weight (ballast) is to be hung beneath the bags to prevent them from floating.
7. Bags should be gently shaken several times a day to release accumulated CO<sub>2</sub>. The wine must be stirred daily without aeration.
8. Leave the beads in the wine until the desired degree of fermentation is achieved.

#### Regeneration Protocol

The encapsulated yeast beads for ProDessert and ProRestart may need to be “regenerated” if they become clogged with tannins or tartrate crystals. In some reds, high levels of polyphenols may cause ProRestart to slow down. If this occurs, regenerate by rinsing for 1–2 hours in a 40 g/L sugar solution that is 10°C(18°F) higher than the wine temperature (but no more than 35°C/95°F). Then, reintroduce into the stuck wine. We suggest this process is carried out at least once per week.



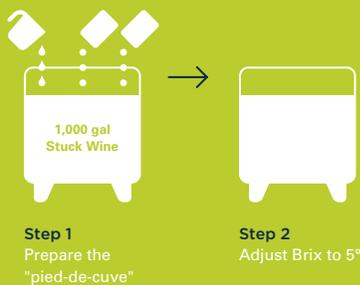
## PROTOCOL

# Recommended Method to Restart a Stuck Fermentation Using Uvaferm 43 RESTART

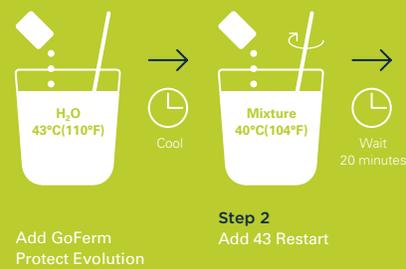
### Prepare the Stuck Wine



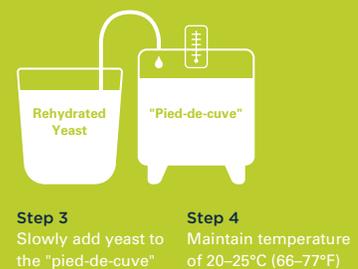
### Prepare the "Pied-de-cuve" (starter)



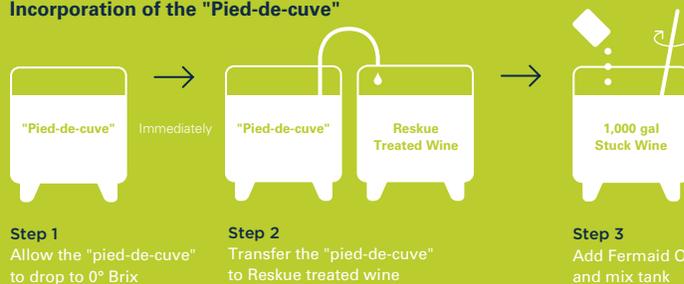
### Yeast Rehydration



### "Pied-de-cuve"



### Incorporation of the "Pied-de-cuve"



## For 1000 gals of stuck wine

### Prepare the Stuck Wine

1. Depending on analysis, address any potential spoilage organisms with SO<sub>2</sub> and/or lysozyme additions
2. Add 1.5kg (3.3lb) Reskue and mix tank.
3. Allow the tank to settle for 48 hours then rack off the settled lees.
4. Adjust the temperature of the Reskue treated wine to 20–25°C(68–77°F).

### Prepare the "Pied-de-cuve" (starter)

1. Prepare the following:
  - 40 gallons water
  - 50 gallons post Reskue treated wine
  - 0.3kg (2/3 lb) Fermaid O
2. Adjust Brix to 5°.

### Yeast Rehydration

1. Add 2kgs (4.4 lbs) of Go-Ferm Protect Evolution in 10 gallons of water at 43°C (110°F).
2. Cool solution to 40°C (104°F) and add 1.5kgs (3.3 lbs) of Uvaferm 43 RESTART.
3. Wait 20 minutes and slowly add rehydrated yeast to the "Pied-de-cuve."
4. Maintain temperature of 20–25°C (68–77°F).

### Incorporation of the "Pied-de-cuve"

1. Allow "Pied-de-cuve" to drop to 0° Brix and transfer immediately to the full volume of Reskue treated wine.
2. Add 1.5kg (3.3lbs) of Fermaid O.
3. Mix tank to homogenize.

## Quick Troubleshooting Guide for Alcoholic Fermentations

There are many factors that can influence the success of a fermentation. If a fermentation becomes sluggish or you suspect it might be stuck, it is wise to assess the complete picture of the wine before jumping into a full restart. Sometimes a simple adjustment can be enough to get a fermentation back on track. If a restart is necessary, having all the details will help you determine the best approach.

### The yeast might need additional nutrients

For a fermentation to be happy and healthy, it is essential that the yeast have enough nutrients. Even when starting with high nutrient levels, additional nutrients are almost always needed by 1/3 of the way through the fermentation. If you're at the tail end of the fermentation with just a small amount of sugar left, an addition of Reskue or Nutrient Vit End can be beneficial.

### There may not be enough healthy yeast to get the job done

If you didn't properly rehydrate your yeast or inoculate at the appropriate dose rate, it is possible that you don't have a good population of healthy yeast. In this case, a re-inoculation might be necessary.

### There might be other microbial populations you need to address

Check your Volatile Acidity (VA). A VA greater than 0.6g/L can be challenging for the yeast and anything higher can become inhibitory to fermentation. A high VA can be a sign of microbial issues that you'll want to address with products like Lysovin (lysozyme) or Bactiless before attempting a restart. If the VA is over 0.8g/L you will need to remove it before attempting a restart.

### The temperature of the wine might be causing trouble

Each yeast strain has an optimal temperature range for fermentation. Anything outside of this range can cause stress for the yeast. If your temperature is too low, try warming the wine. If the temperature is too high, or if it spiked very high at any point it's possible that the yeast are no longer viable and a re-inoculation will be necessary.

### The alcohol may have gotten too high for your selected yeast strain

Certain yeast strains can tolerate more alcohol than others so if you've exceeded the tolerance level of your selected strain, you may need to re-inoculate with something that has a higher tolerance. Based on your starting Brix, you should always select a strain that will be able to handle the potential alcohol level.

### The juice/wine might be too clean

If your juice is really clean, there may not be enough turbidity to keep the yeast in suspension. An addition of Inocel, Nutrient Vit End or Reskue may help in addition to stirring.

### The wine might need a detox

Sometimes there are toxins present that can impede the success of fermentation. Reskue can be extremely beneficial for detoxification. If possible, Reskue should be added and racked after 48 hours. If you are unable to rack, adding Reskue and leaving it in the wine can still be advantageous.

## Restarting Stuck Fermentations

There are now a few different protocols for restarting stuck fermentations. We have included the longer traditional restart, the more rapid protocol with 43 RESTART and the encapsulated yeast procedure. Choosing the correct protocol is dependent on the wine and time constraints. *Contact Scott Labs for more guidance.*

## 🔬 Lab Analysis

### Stuck & Sluggish Fermentation Package

When primary fermentations turn sluggish or stick, there are multiple factors that may be in play. This analysis set will help to identify if any of the basic chemistry parameters are out of balance.

*Volume needed: 375 mL sample*

\$215.00



## PROTOCOL

# Recommended Method to Restart Stuck Fermentations

When restarting a sluggish or stuck fermentation, it is essential to address yeast biomass buildup together with the low nutrient levels. Appropriate yeast rehydration nutrients such as Go-Ferm and Go-Ferm Protect Evolution are useful tools. Both are rich in micronutrients and survival factors.

When stuck wines include high residual sugar levels, an addition of a complex nutrient to the stuck wine is also recommended.

In addition, spoilage organisms like *Lactobacillus* and *Oenococcus* are often present in stuck fermentations. Adding lysozyme to the stuck wine prior to restarting the fermentation may help control such unwanted bacteria and provide an improved environment for the restart to take place (see page 91).

Adding Reskue™ (see page 50 for Reskue product description) to the stuck wine prior to restarting the fermentation may also help reduce accumulated toxins and improve chances for a successful restart.

### For Wines Stuck at >3°Brix

#### Steps 1–8

##### Build-up for Stuck Wine

1. Add 40 g/hL (3.3 lb/1000 gal) of Reskue 24–48 hours prior to restarting.
2. After 24–48 hours, rack off from the Reskue.
3. Add a complex yeast nutrient (Fermaid A, Fermaid K or Fermaid O) directly to the tank of stuck wine at a rate of 0.5–1.0 lb/1000 gal (6–12 g/hL). Many winemakers also add lysozyme at this time to reduce potential bacteria problems (see page 91).
4. In another clean container mix equal volumes of stuck wine and water. Generally this would total 2% of the total wine volume. (Example: For 1000 gal of stuck wine, use 10 gal water + 10 gal wine.) This container will be the “Mother Restart Tank”
5. Calculate the amount of Go-Ferm or Go-Ferm Protect Evolution at the recommended rate. Dissolve this yeast rehydration nutrient in 20 times its weight of clean, chlorine free, 43°C(110°F) water. (Example: 5 lb Go-Ferm x 20 = 100 lb, divided by 8.33 lb/gal water = 12 gal water needed.) Mix the solution and cool to 40°C(104°F).
6. Select a yeast strain that is both alcohol tolerant and a vigorous fermenter such as 43, BC (Bayanus), K1 (V1116), Fermivin Champion or VIN 13. Calculate the amount of yeast required for the total volume of stuck wine at 3–5 lb/1000 gal (36–60 g/hL). When the rehydration nutrient/water solution temperature has cooled to 40°C(104°F), slowly (over 5 minutes) add yeast. Stir gently to mix and avoid clumping. Let this yeast suspension stand for 15–20 minutes.
7. Check the temperature of the yeast suspension. There should not be more than 10°C(18°F) difference between the yeast suspension and the diluted wine in the Mother Restart Tank.

If there is too great a temperature difference, atemperation may be required. Cold temperatures may shock the yeast cells.

8. When the yeast suspension is properly rehydrated and proper consideration has been given to temperature differences, add the yeast to the Mother Restart Tank and wait 20–30 minutes.

#### Steps 9–12

##### Inoculation of Stuck Wine

9. Add 10% of stuck wine to the Mother Restart Tank and wait 20–30 minutes. (Example: For 1000 gal stuck wine, add 100 gal wine.)
10. Add 20% of stuck wine to the Mother Restart Tank and wait 20–30 minutes. (Example: For 1000 gal stuck wine, add 200 gal wine.)
- 11a, 11b, 11c. Repeat step 10.
12. Add any remaining wine to the Mother Restart Tank.

### For Wines Stuck at 1–2°Brix

Follow this restart protocol, except in Step 3 reduce the complex yeast nutrient addition to 0.5 lb/1000 gal (6 g/hL).

### For Wines Stuck at <1°Brix

Follow this restart protocol, except in Step 3 eliminate the addition of a complex yeast nutrient.

## For Wines Stuck at >3°Brix

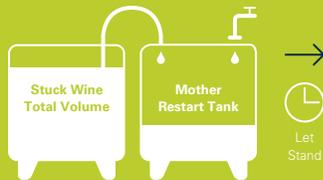
### Build-up for Stuck Wine



**Step 1**  
Add Reskue

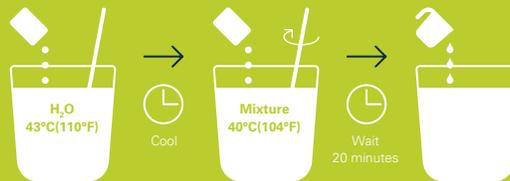
**Step 2**  
Rack off Reskue

**Step 3**  
Add chosen Fermaid  
and lysozyme



**Step 4**  
Mix 1% of stuck wine and  
equal amount of H<sub>2</sub>O

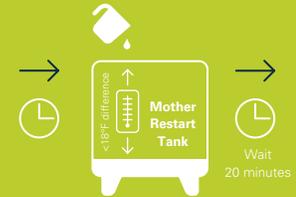
Let stand while immediately preparing the  
nutrient/yeast mixture and proceed to Step 6.



**Step 5**  
Add GoFerm  
Protect Evolution

**Step 6**  
Add yeast  
(slowly), stir

**Step 7**  
Atemperate



**Step 8**  
Add mixture

### Inoculation of Stuck Wine



**Step 9**  
Add 10% of stuck wine to  
starter culture

**Step 10**  
Add 10% of stuck wine to  
starter culture

**Step 11a**  
Add another 20% of the  
stuck wine



**Step 11b**  
Add another 20% of the  
stuck wine

**Step 11c**  
Add another 20% of the  
stuck wine

**Step 12**  
Add any remaining  
stuck wine

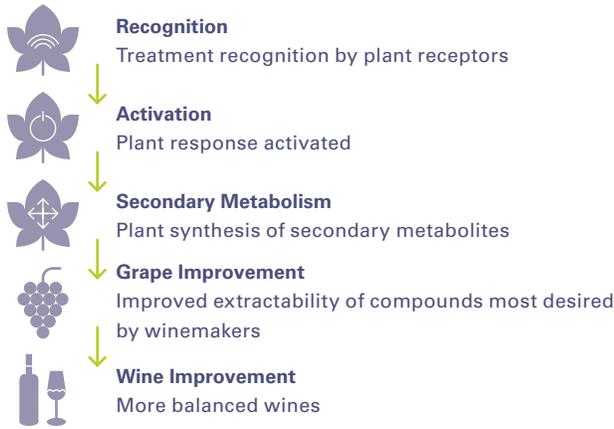
▶ Visit [www.scottlab.com](http://www.scottlab.com) for a video animation of this protocol.



All winegrowers face the challenge of achieving phenolic and enological maturity at the same time. Application of LalVigne® foliar sprays have been observed to result in the concentration of aroma precursors, improved mouthfeel and more mature phenolic characters in the grapes and resulting wines.

LalVigne is a natural inactive yeast derivative foliar spray applied at veraison. The source yeasts used in its production were selected from the Lallemant yeast collection. A single vineyard treatment with a LalVigne spray consists of two applications. The first is done at 5% veraison and the second 10–12 days later.

**Mode of Action**

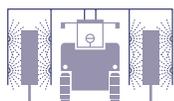
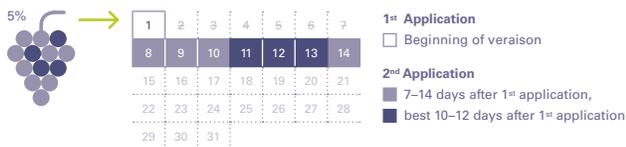


**Dosage**

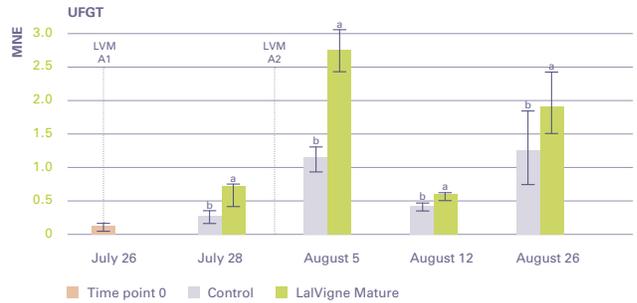
**1 treatment = 2 applications**  
 LalVigne Aroma /LA 1 application = 0.89 lb/acre  
 LalVigne Mature/LM 1 application = 2.7 lb/acre

**Application Recommendation**

% Veraison	1 <sup>st</sup> Application	2 <sup>nd</sup> Application
< 5%	< 5%	+12/14 days after first application
5–30%	5–30%	Recommendation: 7–14 days after the 1 <sup>st</sup> Optimum: +10/+12 days
30–50%	30–50%	7 days after the 1 <sup>st</sup>
50–70%	50–70%	7 days after the 1 <sup>st</sup> if 100% veraison is not reached
70%	Make only 1 <sup>st</sup> application	Do not make 2 <sup>nd</sup> application



**Impact of LalVigne™ MATURE on the expression of genes directly involved with the synthesis of anthocyanins**



Impact of a specific yeast derived foliar spray on gene expression and accumulation of anthocyanin in Sangiovese. *Filipetti et al. 2017.*

This graph shows the expression of the UFGT gene (flavonoid 3 O-glucosyltransferase) during the grape's maturation phase, comparing an untreated control versus the treatment with LalVigne MATURE in two moments of application (LVM A1 and LVM A2). This gene is directly related to the synthesis of phenolic compounds such as anthocyanins.

**LalVigne Aroma**

- Increased Skin Thickness**
- Impact on Botrytis** *Giacosa et al. 2016*
- Aroma Precursors**
- Increased varietal aroma compounds** *Tomasi et al. 2017*

**Grape Characteristics**

Minimal impact on berry weight, Brix, pH, or TA *Télez et al. 2015*

**Glutathione**

Increased concentration of GSH *Šuklje et al. 2016*

**Thiols**

In thiolic varieties: increased 3MH and 3MHA in wines *Šuklje et al. 2016*

**Balance**

Reduced herbaceous and aggressive character *Tomasi et al. 2017*

**Stability**

Higher stability of aroma compounds *Šuklje et al. 2016*

**LalVigne Mature**

**Skin Thickness**  
Improved extractability of anthocyanins *Río Segade et al. 2016*

**Grape Characteristics**

Minimal impact on berry weight, Brix, pH, or TA *González et al. 2016*

**Balance**

Reduced herbaceous and aggressive character *Tomasi et al. 2017*

**Anthocyanins**

Improved concentration of extractable anthocyanins *Villangó et al. 2015*

**Tannin Quality**

Improved skin tannins and polymerization *Lissarrague et al. 2014*

**LalVigne** LALLEMAND

- #17501 3 kg LalVigne Aroma \$107.00
- #17500 3 kg LalVigne LA \$107.00
- #17511 1 kg LalVigne Mature \$92.00
- #17510 1 kg LalVigne LM \$92.00



## ARTICLE

## Sauvignon Blanc—A Tale of Two Styles

Sauvignon Blanc is a versatile variety and can be made in many different styles including mineral, thiol and fruit driven. The drivers of minerality are still under investigation, however, wines made in the tropical/thiolic, or the fruit driven/ester styles, are well-documented. Wines made in the tropical style display characters of tropical fruit, including aromas of passionfruit and guava, citrus notes of grapefruit and green notes reminiscent of gooseberry and boxtree. The more fruit and ester driven wines are characterized by citrus, floral and white and yellow fruits. Processing equipment, viticultural choices and oenological tools help to produce wines in the desired style.

### Tropical/Thiolic Style

Volatile thiols found in the skins of the grape are ultimately responsible for the tropical characteristics. These sulfur based volatile aroma compounds have traditionally been referred to as 4-mercapto-4-methylpentan-2-one (4MMP), 3-mercaptohexan-1-ol (3MH) as well as its ester form of 3-mercaptohexylacetate (3MHA). The volatile thiols are in a non-odoriferous form in the grape and due to the enzymatic action of the yeast in the early stages of fermentation, are released and converted into the volatile forms that we recognize. 4MMP imparts box tree and passion fruit like aromas, and 3MHA and 3MH imparts passion-fruit, grapefruit, gooseberry and guava type aromas to the wine. Depending on viticultural practices, location and climate, the amounts of these compounds will vary.

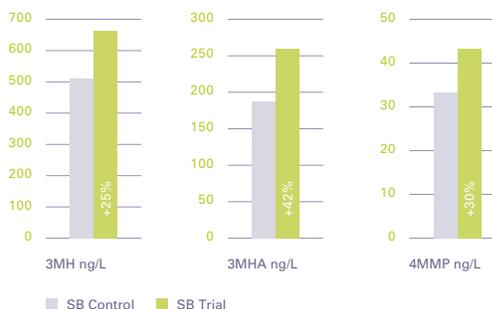
Thiol	Perception Threshold	Aroma	Precursor in Grapes
4MMP	0.8 ng/L	Blackcurrant, Gooseberry, Box tree	cys-4MMP
3MH	60 ng/L	Grapefruit, Passion fruit, Guava	cys-3MH
3MHA	4 ng/L	Passion fruit, Gooseberry, Box tree, Guava	No cys-3MHA found

Research has shown that the amount of the compounds released during fermentation depends on the strain of wine yeast, its enzymatic activity and environmental conditions. Conditions positively impacting volatile thiol revelation include monitoring NTU's, fermentation temperature and nutrient management. It has been shown that ergosterol, vitamins, minerals and key amino acids have positive impacts on thiol production, whereas ammonia (DAP) and exposure to oxygen are detrimental.

Revealing and stabilizing these aromatic compounds is key to maximizing the tropical and thiol fruit aromas and flavors in the resulting wine. Stimula Sauvignon Blanc is an autolyzed yeast nutrient, rich in key vitamins and minerals known to impact volatile aroma compounds. Added at the beginning of the alcoholic fermentation (after 2–3 °Brix drop) this nutrient has significant impact on thiol compounds including 4MMP, 3MH and 3MHA as can be seen in the results of a trial done in 2018 with Alchemy II.

### 2018 Stimula Sauvignon Blanc Trials

Yeast strain: Alchemy II

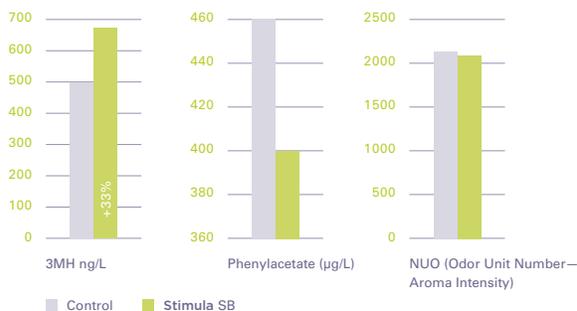


- The impact on 3 thiols of Stimula Sauvignon shows a significant increase in the 3 compounds
- The ratio thiols/esters is 50% higher on the Stimula SB wine
- In terms of profile the control wine has more fermentative aroma and is floral oriented, whereas the Stimula SB wine is more citrus and herbaceous/green thiols oriented

### Fruit Driven/Ester Style

Esters are a class of volatile compounds that are responsible for general “fruity” aromas in wines. Esters are a fermentative aroma, produced throughout the fermentation. Ester production is generally split into two phases with the majority of the compounds produced from 1/3 of the way through fermentation until the end. To optimize ester production, it is necessary to have key amino acids present eg. phenylalalanine. Although having amino acids is essential, choosing a yeast strain with the ability to produce esters, managing lipid levels (turbidity) and temperature are key.

### Stimula Sauvignon Blanc Trials Fumé Blanc



- No 4MMP was found in this wine
- A massive impact of Stimula Sauvignon on 3MH; +33%
- Global aroma intensity is similar but explained by the higher amount of phenylacetate (floral/rose) in the control
- The difference in the Thiols/Esters ratio (28% higher for Stimula treatment)
- There is a difference in terms of sensory profile between the wines: thiolic perception for Stimula treatment, floral for the control



For decades, nitrogen was the main focus when it came to wine yeast nutrition and fermentation security. Nitrogen is required by the cells for many purposes, including cell growth and sugar uptake. Supplementation of nitrogen was traditionally in the form of DAP (inorganic nitrogen source). As research progressed we came to understand that nitrogen in this form, although efficient, was depleted prematurely due to fast accumulation, hot ferments leading to fermentations that began fast but finished slow. This profile was not favorable. Research provided answers in the form of organic nitrogen (autolyzed yeast), and the importance of the quality of nitrogen provided to the yeast.

Although nitrogen remains very important, it is not the only answer. More recently, the focus has shifted toward providing the yeast with what they need, when they need it, and in a non-competitive environment. This holistic approach has ensured the nitrogen needs are taken care of, but also and more importantly, the vitamin, mineral and sterol needs of the cells. By advancing the research and dedicating resources, we now understand not only yeast nutritional needs, but how they are directly linked to fermentation dynamics and the role they play in the yeast's aromatic metabolism. This generation of products can be used to drive wine style while also securing fermentation.

## Basics

Grapes provide nitrogen in the form of proteins, peptides, alpha amino acids and ammonium ions. Yeast assimilable nitrogen (YAN) is composed of alpha amino acids (assimilable organic nitrogen), ammonium ions (inorganic nitrogen), and specific peptides. When determining the YAN in must/juice, it is critical to take all the nitrogen contributions into account. Healthy fermentations contain a balance of yeast assimilable nitrogen from both sources. Low levels of YAN can put undue stress on yeast cells and significantly hinder their performance. In some cases, yeast may create unpleasant flavors and/or aromas or even stop fermenting.

### HOW MUCH YAN IS NEEDED?

The range of YAN in grapes is enormous. It can vary from year to year and from vineyard to vineyard. As a general rule, YAN of 150 to 200mg/L should be considered as the minimum to complete a standard fermentation to 13% ethanol (v/v). If the natural levels are lower than this, the must/juice should be considered to be nitrogen deficient. Addition of a YAN containing nutrient is recommended.

In addition, nutrient management also requires consideration of the following factors:

### INITIAL SUGAR CONTENT

The higher the initial concentration, the more YAN required.

**QUALITY AND QUANTITY** of the nitrogen initially present and supplemented (organic versus inorganic).

### VITAMINS AND MINERALS

These work as essential enzymatic co-factors and growth regulators, preparing the yeast for optimal activity.

### TEMPERATURE

An increase in temperature stimulates the growth of yeast and fermentation rate, thereby requiring increased levels of nitrogen.

### TURBIDITY

When juice is over-clarified, many nutritional factors for yeast are removed, making it necessary to supplement with complete and balanced nutrients.

The yeast strain selected for the fermentation is also a consideration.

### OXYGEN

When adding more oxygen to the must/juice, nitrogen is captured faster and more is needed when compared to fermentations taking place under anaerobic conditions (white wine).

### FRUIT QUALITY

The sanitary status of the grapes, grape chemistry, as well as pre-fermentation winemaking practices also directly influence the YAN.





## ARTICLE

## Nutrient Notes and Strategy

Yeast strains have varying nutritional demands. We have studied the individual strains in our portfolio and have classified them in general terms as low, medium or high nitrogen requiring strains. *These classifications may be found on the charts on pages 9–14.* Further to this point, as the sugar level in any must increases, the nitrogen requirement of the chosen yeast will also rise. Thus when assessing the nitrogen requirement of any fermentations you must consider the general nitrogen requirement of the inoculating yeast and the specific sugar level present in the must.

Factors beyond the yeast strain's genetic needs that should be considered include initial fermentable sugar, temperature of fermentation, pH, pre-fermentation process decisions, grape quality and general hygiene of the facility. These variables will influence how much YAN is required to complete a dry fermentation with minimal sensory deviations. The YAN is influenced in the following ways:

**pH**

At pH 3 only 70% of ammonia can be utilized compared with >90% at pH 4. This can modify the handling of acidic whites or high pH reds.

**Temperature**

The warmer the temperature of the ferment, the more nitrogen is required as the cells are growing and metabolizing faster.

**Oxygen availability**

Yeast available O<sub>2</sub> results in faster nitrogen capture, therefore more YAN is required.

**Nitrogen source**

Nitrogen from amino acids is a more efficient form of nitrogen for cell metabolism and aromatic production than ammonia (DAP) or glutamate.

**Vitamin and mineral deficiency**

Vitamins and minerals can be consumed very quickly (in less than 3 hours) by the native flora, binding of must components (organic acids and polyphenolic compounds) or by the deactivation of thiamin by SO<sub>2</sub> additions in excess of 50ppm. Such deficiencies will negate the benefits of ample YAN and are a critical consideration in nutrition management.

Due to the complex interactions of the yeast, grapes and winemaking parameters (some of which are mentioned above), specific YAN recommendations are not available for each strain. Using the general recommendations in the chart on the following page we can compensate for many of the variables.

Remember to use rehydration nutrients for protection and stimulation of yeast cells and fermentation supplements for cell nourishment. These are also important steps.



## FERMENTATION MANAGEMENT

### A Focus on Nutrition

In order to conduct a healthy and a complete fermentation, yeast require more than just nitrogen. In fact the survival factors, mineral and vitamin co-factors are essential. If limited and/or imbalanced, the yeast will struggle to complete the fermentation and the resulting wine may be slow, sluggish or stuck and the production of negative sensory compounds may be obvious.

**To calculate your additions based on sugar, yeast strain requirements and your fermentation goals follow the outline below.**

- To tailor a fermentation plan to your needs firstly calculate the theoretical nitrogen requirements based on two factors: sugar to be fermented and the yeast strain requirements.

Sugar	Yeast Strain Nitrogen Requirements		
	Low	Medium	High
20	150	180	250
22	165	200	275
24	180	220	300
26	195	240	325
28	210	260	350
30	225	280	375

- Calculate the supplemented nitrogen required:

- Theoretical Nitrogen required (table 1) – Juice/Must YAN = SUPPLEMENTED YAN

- Determine fermentation goal:

- Fermentation security
- Fermentation security and optimization of thiols
- Fermentation security and optimization of ester

- Once YAN supplementation and fermentation goal has been determined then follow one of the three protocols outlined below.

- The nitrogen required to secure the fermentation is supplied by the Fermaid family of complex yeast nutrients, the Go-Ferm Protect evolution is an autolyzed yeast naturally providing the essential survival factors and vitamins to balance the nitrogen uptake and act as fermentation security co-factors. The goal of the Stimula range is to provide nitrogen and naturally occurring vitamins and minerals to assist with the yeasts' aromatic metabolism. To optimize the yeasts' performance all components are required and solely focusing on nitrogen management is no longer appropriate for a healthy fermentation.

YAN Required to Supplement	At Yeast Rehydration Phase	At 2–3 Brix Sugar Drop	At 1/3 Sugar Drop
50 ppm	30 g/hL (2.5 lb/1000 gal) Go-Ferm Protect Evolution	No addition	30 g/hL (2.5 lb/1000 gal) Fermaid O
100 ppm		20 g/hL (1.7 lb/1000 gal) Fermaid O	20 g/hL (1.7 lb/1000 gal) Fermaid O + 12.5 g/hL (1.0 lb/1000 gal) Fermaid K
150 ppm		40 g/hL (3.3 lb/1000 gal) Fermaid O	30 g/hL (2.5 lb/1000 gal) Fermaid A

YAN Required to Supplement	At Yeast Rehydration Phase	At 2–3 Brix Sugar Drop	At 1/3 Sugar Drop
50 ppm	30 g/hL (2.5 lb/1000 gal) Go-Ferm Protect Evolution	40 g/hL (3.3 lb/1000 gal) Stimula Sauvignon Blanc	10 g/hL (0.8 lb/1000 gal) Fermaid O
100 ppm			20 g/hL (1.7 lb/1000 gal) Fermaid O
150 ppm			40 g/hL (3.3 lb/1000 gal) Fermaid O

YAN Required to Supplement	At Yeast Rehydration Phase	At 2–3 Brix Sugar Drop	At 1/3 Sugar Drop
50 ppm	30 g/hL (2.5 lb/1000 gal) Go-Ferm Protect Evolution	No addition	40 g/hL (3.3 lb/1000 gal) Stimula Chardonnay
100 ppm		20 g/hL (1.7 lb/1000 gal) Fermaid O	
150 ppm		40 g/hL (3.3 lb/1000 gal) Fermaid O	



## ARTICLE

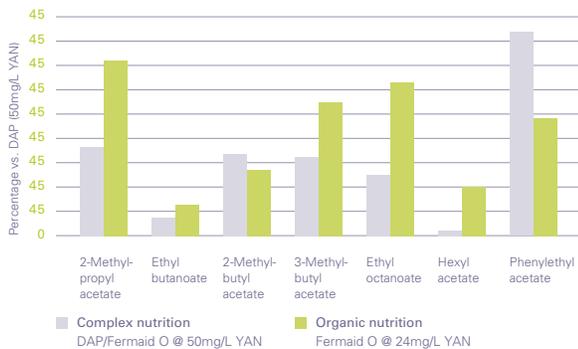
## The Role of Nitrogen Source on Wine Quality

Using nitrogen to stimulate the fermentation rate has been a common practice for a long time. More recently, the quality of nitrogen has been linked with positive aromatic development. Aromatics can be elevated through the use of an organic nitrogen source in the form of amino acids from autolyzed yeast. These amino acids are a complex nitrogen source and are taken up by the yeast in a preferential, sequential, and controlled manner. They undergo a series of enzyme-mediated reactions to ultimately form esters (fruity and floral notes).

When a fermentation is supplemented with ammonia in the form of DAP (diammonium phosphate), it is utilized very quickly leading to accelerated fermentation and heat build-up. When ammonia is present, the yeast prefers the ammonia to the amino acids, thereby leaving behind the aromatic potential. The chart below shows the increase in positive aromatic compounds when using Fermaid O. There is also a decrease in the production of heavy honey-like notes by phenylethyl acetate.

## Ester Formation with Organic Nutrition

*Chardonnay from Yalumba Winery in Australia fermented with two different sources of nitrogen (DAP and Fermaid O).*



The timing of nutrient additions is also an important factor. If nitrogen is added too late in the fermentation, then the cells' ability to assimilate it is reduced. Esters (both acetate and ethyl forms) are produced throughout the fermentation in a biphasic manner. The beginning of the second phase commences when the yeast enters into the stationary phase (this correlates to approximately 1/3 sugar depletion). It is during this second phase that the majority of the esters are produced. The concentration and specific ester produced is highly dependent upon the precursors (amino acids), the enzymatic ability of the yeast (based on its genetic background), as well as winemaking decisions (e.g. temperature of fermentation, management of solids, etc.).

The second group of aromatic compounds that can be positively influenced by nutrition are polyfunctional thiols. Unlike the esters, the thiol potential is determined during the early phases of the fermentation, when the cells are still growing (from 2–3°C drop to 1/3 sugar depletion). However, similar to the esters, the yeast's enzymatic ability plays a role in revealing these compounds – from the non-aromatic, to the tropical and citrus notes.

## Thiol Formation with DAP

*Thiol concentration in Sauvignon Blanc (Gers, France 2004) with DAP addition*



The aromatic potential of the wine can also be manipulated by managing the solids content. In a fairly clarified juice, the esters are greater. With this new information, some newer yeast strains now have a recommended turbidity goal. Aiming for an initial fermentation turbidity of 80 NTUs ( $\pm 20$  NTUs) helps stimulate the yeast, resulting in a more aromatic wine. This pattern seems to be true, regardless of the yeast strain being used.

When a fermentation is supplemented with amino acids from autolyzed yeast and/or ammonia in the form of DAP, we want to ensure that it has the desired effect. Although there are several nutrient strategies that may simply get the job done and ferment a juice to dryness, the quality, and type of nitrogen are key to maximizing the aromatic potential of a wine.

## REHYDRATION NUTRIENTS FOR CELL PROTECTION AND STIMULATION

This is the first stage of your nutrient strategy. Yeast rehydration nutrients provide natural micronutrients (vitamins and minerals) to the yeast during the yeast rehydration phase.

If these micronutrients were added directly to the must/juice, competitive microorganisms would use a significant amount of them and others would be chelated by polyphenols or inactivated by SO<sub>2</sub>. By adding these bioavailable nutrients at the rehydration stage yeast cells benefit most directly. Cell viability and vitality are enhanced, resulting in fermentations that finish stronger, with reduced chances of sensory deviations.

Never use nutrients containing ammonia salts, such as DAP, during yeast rehydration—they are toxic to the yeast.

### Go-Ferm

Yeast rehydration nutrient; OMRI listed

Go-Ferm® is a natural yeast rehydration nutrient containing a balance of vitamins and minerals. It was developed to enhance fermentation kinetics and to help avoid fermentation problems. By suspending Go-Ferm in the rehydration water before adding the selected active dried yeast culture, the yeast soak up the valuable bioavailable micronutrients as they rehydrate. Infusing yeast with these critical nutrients arms them against ethanol toxicity and optimizes nutrient availability, protecting and stimulating the yeast culture.

#### 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.*

#### Usage

1. Mix Go-Ferm in 20 times its weight in clean 43°C(110°F) water. For every 1 kg (2.2 lb) Go-Ferm, 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 (see page 8 for more details).

#### Storage

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

#15149	1 kg	\$37.00
#15135	2.5 kg	\$69.00
#15161	10 kg	\$226.00

### 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 (see page 8 for more details).

#### 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	\$83.00
#15251	10 kg	\$282.00

*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.*

## YEAST STIMULANTS FOR OPTIMIZING AROMATICS

The Stimula range provides you with the most innovative nutrients within the Lallemand portfolio. These yeast autolysates are truly unique. Instead of being used for nourishing the yeast and optimizing cell growth and fermentation rate, they are stimulating the yeast by increasing their ability to produce desirable aromatic compounds. These new 100% yeast autolysates are formulated to supply the optimal levels of specific amino acids and sterols, along with the natural vitamins and minerals. These naturally derived nutrients are involved in the optimization of the aromatic metabolism of the yeast. They are used at specific times in the winemaking process to promote the uptake and revelation of aromatic thiols (Stimula Sauvignon Blanc), or for the production of volatile esters (Stimula Chardonnay).

### 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 is 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 whites and rosé wines.

#### Recommended Dosage

40 g/hL 3.3 lb/1000 gal

#### Usage

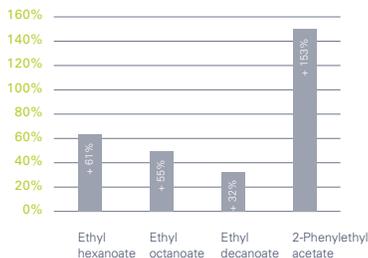
Mix Stimula Chardonnay in 10 times its weight in clean, chlorine free water or juice and add to the fermentation at 1/3 sugar depletion. It is essential that this timing of addition is respected. Stimula Chardonnay is not fully soluble so it will not fully dissolve. Stir to maintain suspension before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

#### Storage

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

#15245 1 kg \$43.00  
#15260 10 kg \$375.00

#### Gain in % with Stimula Chardonnay addition



Comparative trial on a Chardonnay wine 2016 (Languedoc, France) DAP vs. Stimula Chardonnay both added at 40 g/hL at the first 1/3 of alcoholic fermentation. The bars represent the gain in % for each compound using Stimula Chardonnay™ vs. DAP (values are above the perception threshold).

### Stimula Sauvignon Blanc

Stimulates volatile thiol production in aromatic whites and rosés

Stimula Sauvignon Blanc™ is added at the beginning of the fermentation (this equates to approximately 2–3 °Brix drop). This 100% autolyzed yeast product is particularly rich in calcium pantothenate, thiamin, vitamin B6 complexes, folic acid, manganese and zinc in order to optimize the uptake of the 4-MMP and 3-MH precursors and their bioconversion into volatile thiols. Thiols can be found in Sauvignon Blanc, Chardonnay, Riesling, Semillon, as well as Syrah, Grenache and Cabernet Sauvignon amongst others. These desirable compounds are recognized due to their tropical (passionfruit, guava) and citrus (grapefruit) flavors as well as blackcurrant and gooseberry. By using Stimula Sauvignon Blanc you are revealing the aromatic potential of your grapes.

#### Recommended Dosage

40 g/hL 3.3 lb/1000 gal

#### Usage

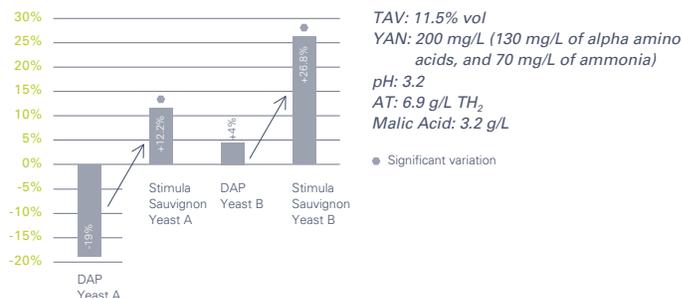
Mix Stimula Sauvignon in 10 times its weight in clean, chlorine free water or juice and add to the fermentation at 2–3 °Brix drop. It is essential that this timing of addition is respected. Stimula Sauvignon is not fully soluble so it will not fully dissolve. Stir to maintain suspension before and during addition.

#### Storage

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

#15246 1 kg \$43.00  
#15255 10 kg \$375.00

#### 4MMP Production Variation vs. Control in %



Comparative trial on a Sauvignon Blanc wine 2016 (Gers, France) DAP vs. Stimula Sauvignon Blanc™ both added at 40 g/hL at the beginning of alcoholic fermentation vs. Control without any addition. Bars represent the variation in % of 4MMP measured in comparison to a control without addition (represented by the x-axis o).



**Fernando Farias Córdova,**  
Winemaker  
**Cava Córdova**  
Ensenada, Baja California,  
México

“ Last harvest I did a trial using Stimula Chardonnay on Valle de Guadalupe (Mexico) Chardonnay.

We had the same juice in two barrels, one with the product and one without, in the same temperature conditions. The fermentation rate went slightly faster in the trial barrel and the aromatics were considerably higher giving it a more floral profile and increasing the fruit aromas.

I highly recommend the usage of Stimula Chardonnay for adding complexity and increasing the aromatic potential of wines. ”

## Esters or Thiols?

### How to select which Stimula product to use

Despite their names, the Stimula products can be used on varieties other than just Chardonnay or Sauvignon Blanc. Which product to use depends on whether you're looking to enhance esters or thiols.

#### Wine Esters

Esters contribute sweet-fruity aromas and flavors in white, rosés and red wines. It is the synergy of esters that contribute to overall complexity of wine aroma. Latest research has shown that ester production is bi-phasic and the majority of esters are produced from  $\frac{1}{3}$  fermentation until the end. These fermentation derived compounds can be split into two major groups: acetate esters and ethyl esters e.g. phenylethyl acetate (rose) and ethyl butanoate (red berry). Although yeast vary in their ability to produce esters (see chart on pages 9–14), the amount produced will be influenced by nutrient composition and fermentation conditions. Ergosterol, vitamins and specific amino acids all support higher ester production and that is why we specifically suggest using Stimula Chardonnay in all varieties where you want to enhance fruity and floral notes.

#### Thiols

Volatile thiols are the sulfur based compounds that contribute tropical notes reminiscent of passionfruit, guava and grapefruit in white wines. Although Sauvignon blanc is the poster child for thiols we know that the bound precursors have been found in the skin of many other white cultivars like Chardonnay, Colombard, Gewurtztraminer, Grenache blanc, Pinot gris, Pinot blanc and Semillon. Interestingly, the blackcurrant bud flavor found in red wines like Cabernet Sauvignon, Merlot and Syrah are also due to the presence of thiols. These compounds are released from their bound form due to yeasts enzymatic activity, and their impact is determined very early in the fermentation process. Both processing and winemaking decisions impact their revelation. Using Stimula Sauvignon blanc is any thiolic varietal early can help to optimize the thiolic potential of that cultivar.

## FERMENTATION NUTRIENTS FOR YEAST NUTRITION AND FERMENTATION SECURITY

Yeast nutrition refers to the utilization of essential food sources for anabolic and catabolic reactions which ultimately ensure the growth and survival of the cell.

Fermentation nutrition is therefore considered a vital part of a controlled fermentation strategy. Nitrogen is an extremely important yeast nutrient. The cells use nitrogen for growth, protein and enzyme synthesis, and sugar transport. Yeast nutrition, however, is more than nitrogen. Yeast cells also require a balanced supply of minerals (magnesium, zinc, etc.), vitamins, lipids and oxygen. Tailor your fermentation regime for optimal yeast reproduction, sugar transport and aromatic expression.

### Anchorferm

Yeast nutrient for Anchor yeast to maximize aromatics

Anchorferm is a yeast nutrient containing specific inactivated yeast and thiamin. When using Anchor yeasts in cool ferments, Anchorferm can maximize aromatic potential. Anchorferm can also help alleviate issues due to *Botrytis*, and high Brix must/juice. The yeast population is kept healthier and the potential for VA and off-sulfur aromas is limited.

Anchorferm is not to be considered a primary nutrient source and should be used in conjunction with other nitrogen sources.

#### Recommended Dosage

20 g/hL 1.6 lb/1000 gal

#### Usage

Anchorferm may be added at any time during fermentation. For best results, add 20 g/hL at  $\frac{1}{3}$  sugar depletion.

To avoid CO<sub>2</sub> release and overflowing of fermentation vessels, Anchorferm should be mixed with water or juice to create a slurry. The amount of water or juice used is not critical. Simply add enough water or juice 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.

\*This product contains thiamin. When dosed at the recommended 20 g/hL dosage, it is under 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. If using Anchorferm, any other nutrient additions cannot contain thiamin, or there is a risk of being over the TTB legal limit for thiamin.

#15147 10 kg \$259.00

### Diammonium Phosphate (DAP)

Inorganic nitrogen source

DAP is an inorganic nitrogen source that should be used in conjunction with complex nutrients to ensure a complete nutritional strategy is followed. DAP is used to supplement in nitrogen deficient environments.

#15805 5 kg \$39.00

## 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 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 or 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 \$185.00

## Fermaid K\*

Complex yeast nutrient

Fermaid® K is a complex yeast nutrient that contains a blend of inactivated yeast, alpha 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 ensure 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 46–54 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](http://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 \$61.00

#15070 10 kg \$158.00

## Fermaid K (Kosher)\*

Kosher certified complex yeast nutrient

Fermaid® K (Kosher) is very similar to Fermaid K except that it is certified as Kosher for Passover.

### Recommended Dosage

25 g/hL 2 lb/1000 gal

*\*Note: The ingredients in Fermaid K Kosher 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 46–54 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](http://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.*

#15070K 10 kg \$267.00

## Fermaid O

Organic yeast nutrient; OMRI listed

Fermaid® O is a blend of highly specific fractions from inactivated yeast that are rich in alpha amino acids (organic nitrogen). Organic nitrogen is known to be a highly effective nutrient source (especially when compared to DAP) 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 ensure 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 \$90.00

#15107 10 kg \$339.00

## USE OF ALL Fermaid PRODUCTS

### Usage

In order to avoid CO<sub>2</sub> 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 9–14).*

## Inocel

Cellulose powder for over-clarified juice

Inocel is purified cellulose powder. Inocel increases the turbidity of white and rosé juice. It may be used alone or in combination with complex nutrients to improve alcoholic and malolactic fermentation kinetics. Add to freshly pressed juice at the beginning of fermentation.

### Recommended Dosage

10–60 g/hL 0.8–5 lb/1000 gal\*

\*Each 10 g/hL of Inocel equals a rough increase of 20 NTU

### Usage

Blend Inocel into 20 times its weight of room temperature water. Once hydrated, add directly to the juice, mixing thoroughly.

### Storage

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

#15804 1 kg \$18.00

## Nutrient Vit End

Inactivated yeast for compromised fruit and/or treating sluggish and stuck fermentations; OMRI listed

Nutrient Vit End™ is a specific inactivated yeast with bio-adsorptive properties for binding short and medium chain fatty acids and fungicides. Saturated fatty acids are produced under stressful conditions resulting in a modification of the yeasts sugar transport capacity. When used during fermentation Nutrient Vit End can bind toxins and help minimize the risk of sluggish or stuck fermentations. It can also be used to detoxify the wine for restarting a sluggish or stuck fermentation.

### Recommended Dosage

**Must/Juice** 30 g/hL 2.5 lb/1000 gal

**Sluggish or Stuck Wine** 40 g/hL 3.3 lb/1000 gal

### Usage

Suspend Nutrient Vit End in water, juice or wine and mix well before adding to must/juice. If using for a stuck or sluggish fermentation, allow to settle and rack off prior to restart.

### Storage

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

#15679 2.5 kg \$62.00

## 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. Add at the start of alcoholic fermentation in low YAN must/juice situations (alongside a complex yeast nutrient) or at 1/3 sugar depletion. Phosphate Titres contains 1% thiamin.

### Recommended Dosage

6 g/hL 0.5 lb/1000 gal

### Usage

Suspend Phosphate Titres in cold water and mix well before adding to must/juice.

### 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 \$21.00

#15888 5 kg \$79.00

## Reskue

Specific inactivated yeast for treating stuck fermentations

Reskue™ is a chosen wine yeast that has been inactivated and treated with a specific autolysis process to create cell wall fractions with very high bio-adsorptive properties for saturated short and medium chain fatty acids. It was formulated for use when restarting stuck fermentations. Saturated fatty acids can be created by yeast during stressful fermentation conditions. These fatty acids can interfere with membrane sugar transport proteins. Use of Reskue™ helps improve these toxic conditions allowing for an easier finish of alcoholic fermentation.

### Recommended Dosage

40 g/hL 3.3 lb/1000 gal

### Usage

Suspend Reskue in 10 times its weight of clean 30–37°C(86–98°F) water and mix. Wait 20 minutes then add to stuck or sluggish fermentation. For stuck fermentations, allow Reskue to settle for 48 hours then rack off and reinoculate with a restart yeast.

### Storage

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

#15224 1 kg \$41.00

#15242 10 kg \$305.00



*Reskue has unique lumps and bumps!  
This increased surface area allows for  
greater adsorption of toxins.*

SEM photo provided by Lallemend.  
Research collaboration with Professor Aude Vernhet  
at SupAgro Montpellier.



## What Differentiates Yeast Derivative Products?

Yeast derivatives are any products derived from yeast biomass. These derivatives include whole inactivated yeast, autolysates, yeast cell walls, yeast extracts and specific yeast fractions. A strain is chosen for particular characteristics and then cultured under specific conditions depending on the desired product.

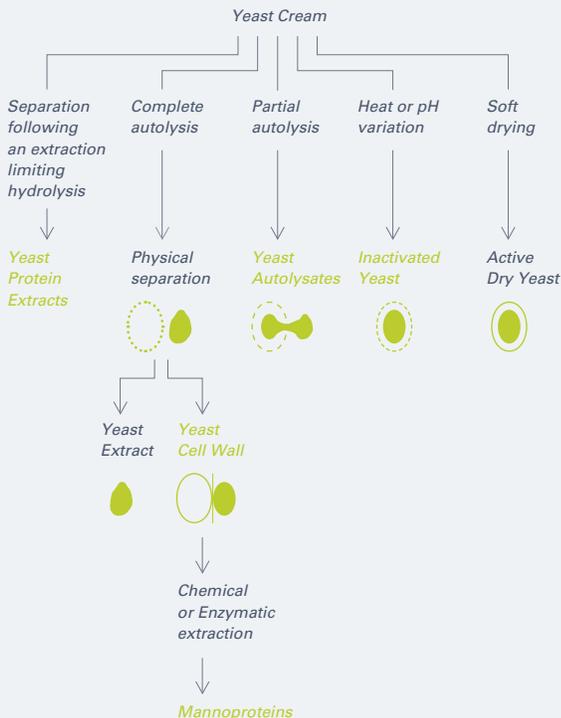
The yeast biomass may be treated in the following ways depending on the required end product:

- Inactivation by the heat of physical-chemical treatment at the end of the growth phase to stop its metabolism and enzyme activity
- Exposure to specific physical-chemical conditions, then centrifuged to separate the soluble yeast extract from the insoluble cell walls
- Treatment by OIV process for production of yeast extract that limits hydrolysis and maintains the intracellular proteins in their high molecular weight form
- Extraction of mannoproteins through specific process used on cell walls prior to purification

### Yeast Derivatives... What Are We Talking About?

General Definition

● Authorized and defined by OIV



## NATURAL YEAST DERIVATIVE NUTRIENTS

Natural yeast derivative nutrients are highly specialized inactivated strains of enological yeast. These yeast strains are grown in a controlled environment and harvested at the end of their growth phase. At this stage the yeast have produced a range of enologically attractive polysaccharides that are more reactive compared to the polysaccharides that are released during the yeast autolysis phase.

Our inactivated yeasts are derived from the biomass of whole yeast cells and have been treated to suppress their fermentative capacity. Each of our natural yeast derivative nutrients can be differentiated by the strains of yeast used, the level of refinement of the yeast cells, their polysaccharide contribution, as well as the presence of specific fractions such as glutathione. These enological tools contribute certain fermentative advantages together with significant wine quality improvement. Used alone, however, they should not be viewed as a substitute for the complete range of fermentation nutrition products listed elsewhere in this Handbook.

### ICV Booster Blanc LALLEMAND

Increases smooth mid-palate intensity and fresh fruit in whites and rosés

ICV Booster Blanc® was developed from an ICV yeast strain specific for whites and rosés. This yeast derivative nutrient is produced by the inactivation of yeast cells and through this process soluble fractions of the cells walls are made readily available.

When added to juice, Booster Blanc participates in the colloidal balance of the wine resulting in smooth mid-palate intensity and increased fresh varietal fruit aromas. Interactions take place that diminish bitterness, vegetal and chemical perceptions. Booster Blanc helps to maintain freshness and aroma stability in wines that go through MLF. If used at the beginning of the primary fermentation, it can be helpful in lowering the production of off-sulfur compounds (notably in botrytised grapes). It can be added toward the end of fermentation to help reveal muted aromatics. To help decrease the perception of woody aromas, add before placing in new barrels. Booster Blanc greatly complements premium whites or rosés that are fermented with ICV D21 and ICV GRE.

#### Recommended Dosage

30 g/hL 2.5 lb/1000 gal

*Note: Dosage should be increased when grapes are affected by more than 15% rot or when there is an absence of oxygen during fermentation.*

#### Usage

Mix Booster Blanc in 10 times its weight in water or juice. Booster Blanc is only 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.

#15179 2.5 kg \$100.00

## ICV Booster Rouge

For greater and smoother tannin structure in reds

ICV Booster Rouge® is a yeast derivative nutrient originating from a specific wine yeast isolated and selected by the ICV. The yeast macromolecules in Booster Rouge interact with red wine polyphenols, resulting in a positive influence on the colloidal balance of the final wine. When used in red must sourced from hot climates, Booster Rouge wines are perceived as having higher fore-mouth volume and smoother mid-palate tannic structure as well as fresher aromatic sensations. Booster Rouge complements short maceration times in premium reds fermented with ICV GRE resulting in mid-palate intensity and fresh varietal aromas. Perceptions of aggressive and drying tannic sensations are minimized due to the high molecular weight polysaccharides that are released. In ultra-premium reds from balanced and mature grapes, Booster Rouge shows good synergy with ICV D254 and ICV D21. Booster Rouge may also be added during the latter part of the alcoholic fermentation to contribute tannin intensity and alcohol integration.

### Recommended Dosage

30 g/hL 2.5 lb/1000 gal

### Usage

Mix Booster Rouge in 10 times its weight in must or water. Booster Rouge is only partially soluble. Booster Rouge can be added directly to the crusher or later during a pump-over. 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.

#15169 2.5 kg \$100.00

## ICV Noblesse

Contributes to balance and softness on the finish; OMRI listed

ICV Noblesse® is a yeast derivative nutrient for use in red and white winemaking which adds a perception of sweetness to balanced wines. The production process used for Noblesse inactivates sulfite-reductase potential, greatly limiting sulfur off-odors. Wines made using Noblesse exhibit a more intense perception of ripe fruit together with an overall roundness and softness on the finish. There is also decreased tannic intensity on the mid-palate. Noblesse can help reduce undesirable aggressive characters or sensations of dryness due to the release of low molecular weight polysaccharides. It can also help reduce the burning sensations common in higher alcohol wines and in wines made from botrytised grapes. Although immediate results are possible, full integration may take three to five months.

### Recommended Dosage

30 g/hL 2.5 lb/1000 gal

### Usage

Mix Noblesse in 10 times its weight in water or must/juice. Add during a pump-over or tank mixing. 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.

#15105 2.5 kg \$100.00

## Opti-MUM Red

For increased roundness in red wines

Opti-MUM Red™ is a part of the newest generation of yeast derived nutrients. Opti-MUM Red is sourced from a specific known wine yeast that is naturally high in polysaccharides. Adding Opti-MUM Red at the beginning of fermentation increases the availability of polysaccharides at a time when polyphenols are being released and diffused. This maximizes the formation of polyphenol-polysaccharide chains. Using Opti-MUM Red results in red wines that are more intense in color, have more rounded mouthfeel, and a decreased perception of astringency.

### Recommended Dosage

20–40 g/hL 1.7–3.4 lb/1000 gal

### Usage

Mix Opti-MUM Red in 10 times its weight in water or juice and mix. If adding later, add during a pump-over or during tank mixings. This product is partially soluble. Stir to maintain suspension before and during addition.

### Storage

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

#15229 1 kg \$55.00

#15250 10 kg \$329.00

## 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 \$55.00

#15202 2.5 kg \$110.00

## Opti-RED

For rounded and smooth tannin reds; OMRI listed

Opti-RED® is a unique inactivated yeast derivative nutrient. It is the product of a specific refining process which results in a high level of polyphenol reactive high molecular weight cell wall polysaccharides. Opti-RED may be used either at the beginning or towards the end of red wine fermentations. Using Opti-RED in the must releases polysaccharides. These polysaccharides are then available to complex with polyphenols as soon as they are released and diffused. This early complexing results in red wines with more intense color and better tannin integration. Using Opti-RED in the latter part of alcoholic fermentation allows the winemaker to shape harsh polyphenolics into smoother, more approachable tannins.

### Recommended Dosage

30 g/hL 2.5 lb/1000 gal

### Usage

Mix Opti-RED in 10 times its weight in must or water. If adding early in fermentation, distribute into the tank as it is filling or during a pump-over. Opti-RED can also be added directly to the crusher. If adding later, add during a pump-over or during tank mixings. This product is partially soluble. Stir to maintain suspension before and during addition.

### Storage

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

#15148	1 kg	\$47.00
#15138	2.5 kg	\$100.00
#15211	10 kg	\$286.00

## Opti-WHITE

Protects fresh aromas; OMRI listed

Opti-WHITE is prepared using a specific production process that results in a yeast derivative rich in polysaccharides and high in antioxidant peptides (glutathione). These glutathione peptides work synergistically with SO<sub>2</sub>, allowing the winemaker to potentially lower their SO<sub>2</sub> dosage whereas the polysaccharides enhance smoothness. 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. When Opti-WHITE is added in the last stages of alcoholic fermentation, it helps 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	\$47.00
#15136	2.5 kg	\$100.00
#15216	10 kg	\$286.00

## REDStyle

Increases extraction of juice and improves structure

REDStyle™ is a unique blend of inactivated yeast derivative nutrients blended with a pectinase enzyme. It is used during the maceration of red grapes to increase the extraction of juice and to improve structure. It can enhance color stability and increase tannin intensity. REDStyle can be used on low maturity or botrytised grapes or musts to shorten maceration times, increase color stability and build structure. It can also help mask unripe (green) characters.

### Recommended Dosage

227 g/ton 0.5 lb/ton

### Usage

Mix REDStyle in 10 times its weight in must or water. Use during maceration. Add into the tank as it is filling or during a pump-over. REDStyle can also be added directly to the crusher. This product is partially soluble. Stir and 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.

#15662	2.5 kg	\$118.00
--------	--------	----------

## FREQUENTLY ASKED QUESTIONS

**My wine is at 8°B and I missed the addition of nutrients at ½ sugar depletion. Should I add Fermaid K at this point?**

The purpose of a nitrogen addition at this point of fermentation is for re-synthesis of the sugar transport system in the yeast cell so that fermentation can continue to completion. Ammonia uptake is inhibited above 10% alcohol. New research has shown that amino acids may be used even at this late stage. A small addition of Fermaid O or Nutrient Vit End will help as long as you add within 48 hours of missing your window. This really is a case-by-case scenario.

**Every harvest I add 2 lb/1000 gal of a complete yeast nutrient ½ of the way through fermentation. Is that what is recommended?**

A 2 lb/1000 gal addition at ½ of the way through fermentation may suffice, however, this depends on the specific conditions of each fermentation. We have added new resources this year (*page 44*) to help you tailor your nutrient program.

**Some suppliers say their nutrients contain a lot more nitrogen than Fermaid K and Go-Ferm. Why?**

Other suppliers may be calculating total nitrogen versus the amount of nitrogen that can be utilized by the yeast. Not all sources of nitrogen are available to the growing yeast cells. That is why Lallemand prefers to list the yeast assimilable nitrogen (YAN) for each product so the winemaker can plan a balanced nutrition strategy.

**Can I use Fermaid K in my yeast rehydration water instead of Go-Ferm?**

No, using nutrients that contain ammonia salts during the rehydration phase can be toxic to the yeast.

**What is the difference between Go-Ferm and Go-Ferm Protect Evolution?**

Go-Ferm Protect Evolution was specifically formulated by Lallemand and the INRA in France after a multi-year study of problem fermentations. In addition to the nutrients that Go-Ferm supplies, Go-Ferm Protect Evolution contains higher levels of unsaturated fatty acids and sterols for improved membrane integrity. In known difficult conditions such as high Brix juices or excessively clarified juice, Go-Ferm Protect Evolution is the best solution. In musts without such difficult conditions, Go-Ferm is a perfect choice.

**Why don't my Go-Ferm and Go-Ferm Protect Evolution go into solution?**

This is a good thing! Due to their high content of sterols and fatty acids, they will not go completely into solution.

**What is the difference between SIY 33 and Fermaid O?**

SIY 33 was originally developed to provide a complex nutrient base from inactivated whole yeast cells. Fermaid O differs as it is comprised of specially selected fractions from enological yeast providing a consistent amino acid base. Fermaid O takes into account the latest research surrounding the efficient use of organic nitrogen by yeast which is based on fermentation security and aromatic optimization.

**I checked my YAN and added DAP accordingly. Why do I still have off-aromas and/or stuck fermentations?**

Both inorganic (DAP) and organic nitrogen occur naturally in grape must. Each type of nitrogen has a distinct role and impact on an optimal fermentation. While yeast may show an affinity for inorganic nitrogen, adding only DAP is not what is best for the yeast. A diet balanced with organic nitrogen, vitamins and minerals can produce healthier fermentations, better aromatics and lower levels of undesirable compounds.

**I am noticing sulfur off-odors during fermentation — what should I do?**

First, assess your nutrient regime. If it is early enough in the fermentation, consider increasing your nutrient additions. Organic nutrients such as Fermaid O and Nutrient Vit End can go a long way in improving aromatics. If you are past the point where additional complex nutrients are recommended, run a bench trial with Noblesse and Reduless.

**As fermentation progresses, I have noticed an increased perception of 'hotness' on the finish of my wine. Are there any products that can help with this?**

Try an addition of Booster Blanc, Noblesse, or Opti-Red, depending on the wine.

**My whites and rosés tend to lose their aromatic freshness quickly. What can I do to preserve the aromatics?**

Inactivated yeast derivative products like OptiMUM White or Opti-WHITE can help retain aromatic intensity and longevity.

**Why do some nutrients not increase my YAN?**

All yeast derived nutrients will have some nitrogen to contribute to a fermentation, but different autolyzed yeast products are used for different reasons. For example, to prepare the cells for fermentation we focus on vitamins, minerals, sterols, and unsaturated fatty acids during the rehydration phase. To promote aromatics (esters and thiols) we stimulate the cells by providing more than nitrogen. The YAN contribution is only mentioned if the goal of the product is fermentation security.



## NEW! THE OAK LAB

The role of oak in winemaking dates back centuries, and can impact the color, texture, and structure of a wine. There are several ways to achieve the desired impact that oak brings. French, American, and European oak barrels are commonly used throughout winemaking to achieve this goal. More recently, there have been advances in using alternative oak products in place of barrels. In addition to the space, cost, and labor savings that alternatives can provide, the wide range of toasts and formats provide winemakers with flexible tools to achieve their goals. Using our oak infusion products alone, or in conjunction with our full range of ScottTan™ tannins, enables wine-makers the freedom to craft wines with a desired goal. *Please visit [theoaklab.com](http://theoaklab.com) for more information.*

Explore The Oak Lab's entire range of products:

- Thermic
- Fire
- Convection
- Tannins

### THERMIC

The Oak Lab™ Thermic range of products undergoes a unique, break-through heating process, resulting in a level of accuracy and consistency different than traditional oak infusion products that are toasted, baked, or electrically radiated. Because the Thermic process is combustion-free, we're able to create a wide spectrum of consistently accurate flavor profiles with extremely high doses of oak flavor compounds, all free of smoke taint.

A touchstone of the entire Thermic line is its impact on the weight, length, and complexity of a wine. The selection of toast profiles offer a nuanced range of flavor and mouthfeel tools. Trials are recommended to discover the best toast profile number, or blend of numbers, for your particular wine and goals.

#### The Toast Profiles

Toast Profile #	Essence	Mouthfeel
1	Clean, bright, sweet	Fresh and light, addition of length
2	Nutty, toasty, toffee	Rounding, boost of mid-palate
3	Vanilla, dark fruits, complexity	Texture, weighty, unctuous
4	Warm, rich, spice	Full, viscous, rich
5	Espresso, smoked meat, complexity	Balanced, rich, round

### Single Rod

Single rods are added to tanks during the aging process. Rods can be used in loose form or stacked in a matrix formation at the base of the tank. Available in toast profiles 1–5.

**Size** 36" x 1" x 7/8"  
**Surface area** 1 sq. ft.  
**Dosage rate** 60–160 per 1000 gallons  
**Contact time** 1–18 months  
**Wood variety** *Quercus alba*

\$5.00

### Fan Pack

Fan packs are added to tanks during the fermentation and aging process. Fan packs are bound by food grade nylon zip ties to allow for easy installation and removal. Available in toast profiles 1–5.

**Size** 20–36" x 1" x 3/8"  
**Surface area** 20 sq. ft.  
**Dosage rate** 3–8 per 1000  
**Contact time** 1–18 months  
**Wood variety** *Quercus alba*

\$90.00

### Cube Bag

Cube bags are added to tanks during the flashing, fermentation and aging process. Cubes are added to tanks in sewn, food grade polyethylene infusion bags. Available in toast profiles 1–5.

**Package Size** 20 lb. bag  
**Cube Size** 1" x 1" x 7/8" ea.  
**Surface area** 34 sq. ft.  
**Dosage rate** 2–8 bags per 1000 gallons  
**Contact time** 1–9 months  
**Wood variety** *Quercus alba*

\$200.00

### Bung Sleeve Insert

Bung sleeves are added during the fermentation and aging process and are added to barrels directly through the bung hole. Each sleeve is made of 20 sections of oak in food grade polyethylene netting and fastened to the barrel bung with a #304 stainless steel eyelet. Available in toast profiles 1–5.

**Size** 20 sections–9" x 1" x 3/8"  
**Surface area** 5.5 sq. ft.  
**Dosage rate** 1 per 60 gallons  
**Contact time** 3–12 months  
**Wood variety** *Quercus alba*

\$80.00

## FIRE

Using natural oak fire, The Oak Lab™ Fire range of artisanal products employs skilled artisan methods to slowly fire toast all oak by hand, closely imitating the impact of a traditional barrel.

### The Toast Profiles

Toast Profile #	Essence	Mouthfeel
Medium	Coconut, vanilla, medium oak Character	Adds strong round tannins, important structure, and volume
Medium Plus	Vanilla, spice, smoke, strong oak character, light butterscotch	Increased volume and length, smooth tannins, balance

### Single Stave

Single staves are added to tanks during the aging process. Staves can be used in loose form or stacked in a matrix formation at the base of the tank.

**Size** 1.5–2.5" x 3/8" x 36"

**Surface area** 1 sq. ft.

**Contact time** 4–18 months

**Wood variety** *Quercus petraea*

\$6.00

### Fan Pack

Fan packs are added to tanks during the fermentation and aging process. Fan packs are bound by food grade nylon zip ties to allow for easy installation and removal. Available in toast profiles Medium and Medium Plus.

**Size** 20–36" x 1" x 3/8"

**Surface area** 20 sq. ft.

**Dosage rate** 3–8 per 1000

**Contact time** 4–18 months

**Wood variety** *Quercus petraea*

\$100.00

### Stave Segment Bag

Segment bags are added to tanks during the flashing, fermentation and aging process. Segments are added to tanks in sewn, food grade polyethylene infusion bags. Available in toast profiles Medium and Medium Plus.

**Package Size** 15 lb. bag

**Cube Size** 2" x 2" x 3/8" ea.

**Dosage rate** 2–8 bags per 1000 gallons

**Contact time** 4–9 months

**Wood variety** *Quercus petraea*

\$200.00

### Bung Sleeve Insert

Bung sleeves are added directly through the barrel bung hole during the fermentation and aging process. Each sleeve is made of 20 sections of oak in food grade polyethylene netting and fastened to the barrel bung with a #304 stainless steel eyelet. Available in toast profiles Medium and Medium Plus.

**Size** 15 sections–9" x 1" x 3/8"

**Surface area** 5.5 sq. ft.

**Dosage rate** 1 per 60 gallons

**Contact time** 4–12 months

**Wood variety** *Quercus petraea*

\$90.00

## CONVECTION

The Oak Lab™ Convection line uses long-cycle convection oven toasting, yielding a uniform toast throughout the oak and resulting in a multitude of aromas and increased mouthfeel.

### The Toast Profiles

Toast Profile #	Essence	Mouthfeel
DR11	Coconut, vanilla, medium oak character	Adds soft tannins, increases volume
MR29	Vanilla, spice, medium oak character, butterscotch, smoke	Increased volume and balance

### Single Stave

Single staves are added to tanks during the aging process. Staves can be used in loose form or stacked in a matrix formation at the base of the tank. Available in toast profiles DR11 and MR29.

**Size** 1.5–2.5" x 3/8" x 36"

**Surface area** 1 sq. ft.

**Contact time** 4–18 months

**Wood variety** *Quercus petraea*

\$5.00

### Fan Pack

Fan packs are added to tanks during the fermentation and aging process. Fan packs are bound by food grade nylon zip ties to allow for easy installation and removal. Available in toast profiles DR11 and MR29.

**Size** 20–36" x 1" x 3/8"

**Surface area** 20 sq. ft.

**Dosage rate** 3–8 per 1000 gallons

**Contact time** 4–18 months

**Wood variety** *Quercus petraea*

\$90.00

### Stave Segment Bag

Segment bags are added to tanks during the flashing, fermentation and aging process. Segments are added to tanks in sewn, food grade polyethylene infusion bags. Available in toast profiles DR11 and MR29.

**Package Size** 15 lb. bag

**Cube Size** 2" x 2" x 3/8" ea.

**Dosage rate** 2–8 bags per 1000 gallons

**Contact time** 4–9 months

**Wood variety** *Quercus petraea*

\$180.00

### Bung Sleeve Insert

Bung sleeves are added directly through the barrel bung hole during the fermentation and aging process. Each sleeve is made of 20 sections of oak in food grade polyethylene netting and fastened to the barrel bung with a #304 stainless steel eyelet. Available in toast profiles DR11 and MR29.

**Size** 15 sections–9" x 1" x 3/8"

**Surface area** 5.5 sq. ft.

**Dosage rate** 1 per 60 gallons

**Contact time** 4–12 months

**Wood variety** *Quercus petraea*

\$80.00

## A Fermentation Tannin Primer

Name	Composition	Properties	Uses
<b>FT Blanc</b>	Gallotannin (Oak gall nut)	<ul style="list-style-type: none"> <li>Reactive with proteins</li> <li>Complexes with oxidizable molecules, preventing browning.</li> </ul>	White, Rosé, cider and fruit wine <ul style="list-style-type: none"> <li>Improve clarification and structure</li> <li>Minimize volatile sulfur compounds</li> <li>Inhibit laccase (botrytised grapes)</li> </ul>
<b>FT Blanc Soft</b>	Gallotannin (Oak gall nut)	<ul style="list-style-type: none"> <li>Reactive with proteins</li> <li>Complexes with oxidizable molecules, preventing browning.</li> <li>Provides softness</li> </ul>	White, Rosé, cider and fruit wine <ul style="list-style-type: none"> <li>Improve clarification and structure</li> <li>Minimize volatile sulfur compounds</li> <li>Inhibit laccase (botrytised grapes)</li> <li>Enhance mouthfeel.</li> </ul>
<b>FT Blanc Citrus</b>	Tannin from citrus wood and gallotannin	<ul style="list-style-type: none"> <li>Protects must and wine from wine oxidation</li> </ul>	White, Rosé, cider Used in combination with yeast strains with $\beta$ -glycosidase activity, will allow for the development of enhanced and intense aromas such as lemon, grapefruit, apple, and white flowers
<b>FT ColorMax</b>	Specially processed catechin tannin	<ul style="list-style-type: none"> <li>Promotes color stability</li> <li>Goes easily into solution</li> </ul>	Red and fruit wine <ul style="list-style-type: none"> <li>Intended for use in tandem with FT Rouge.</li> <li>Helps stabilize color.</li> </ul>
<b>FT Rouge</b>	Proanthocyanidins + Ellagic tannin (oak and chestnut hardwood)	<ul style="list-style-type: none"> <li>Highly reactive with proteins</li> <li>Promotes color stability</li> <li>Enhances structure and aging potential</li> <li>Strong antioxidant</li> </ul>	Red and fruit wine <ul style="list-style-type: none"> <li>Help stabilize color, enhance structure.</li> <li>Inhibit laccase (botrytised grapes) and protect anthocyanins from oxidation.</li> </ul>
<b>FT Rouge Soft</b>	Proanthocyanidins + Ellagic tannin (oak)	<ul style="list-style-type: none"> <li>Reactive with proteins</li> <li>Promotes color stability</li> <li>Enhances structure and aging potential</li> <li>Antioxidant</li> </ul>	Red and fruit wine <ul style="list-style-type: none"> <li>Help stabilize color, enhance structure.</li> <li>Inhibit laccase (botrytised grapes) and protect anthocyanins from oxidation.</li> </ul>
<b>FT Rouge Berry</b>	Tannin from red berry fruit	<ul style="list-style-type: none"> <li>Promotes color stability</li> <li>Prevents oxidation of primary aromas</li> </ul>	Red and Rosé <ul style="list-style-type: none"> <li>Red berry characters</li> </ul>
<b>Uva'Tan</b>	Proanthocyanidins (from grape skins and seeds)	<ul style="list-style-type: none"> <li>Reactive with proteins</li> <li>May compensate for poor tannin structure from grapes</li> <li>Promotes color stability</li> </ul>	Red, White and Rosé wine <ul style="list-style-type: none"> <li>Help stabilize color</li> <li>Enhances structure and aging potential</li> </ul>
<b>Uva'Tan Soft</b>	Proanthocyanidins (solely from white grape skins)	<ul style="list-style-type: none"> <li>Reactive with proteins</li> <li>Promotes color stability</li> <li>Provides softness</li> </ul>	Red, White and Rosé wine <ul style="list-style-type: none"> <li>Help stabilize color</li> <li>Enhances structure while reducing potential astringency</li> </ul>

## Vintage to Vintage Variation

From year to year we all recognize changes both large and small in the vintages. A growing season can feel very similar to previous ones and yet produce conditions and fruit that are very different from prior harvests. Some of these differences are immediately apparent and others sneak up on us. It is important to be mindful of these possibilities and prepare.

What has actually changed may include weather conditions, vineyard care, fruit ripeness, juice chemistry, microbial load, etc. It is important to realize that vintage differences may be seen immediately or reveal themselves as our wine ages. Processing decisions can make significant changes in the final wine.

To help reduce any issues, it is important to test your fruit, make processing decisions based on obtaining the best juice and wine possible in an efficient manner. A good, clean fermentation may require nutrition, particularly in high Brix conditions. Enzymes and tannins can help reduce issues with mold and greenness. Early action is always the best for mitigating problems and possible lingering effects.

## Choosing the Right Tannins

 Highly Recommended  
 Recommended

	Fermentation							Ferm/ Cellaring		Cellaring			Finishing		LUXE			OTT			
	FT Blanc	FT Blanc Soft	FT Blanc Citrus	FT ColorMax	FT Rouge	FT Rouge Soft	FT Rouge Berry	Uva Tan	Uva Tan Soft	Complex	Estate	Refresh	Riche	Riche Extra	Onyx	Radiance	Royal	Bold	Finesse		
Page	61	61	61	61	62	62	62	63	63	63	64	64	64	64	65	65	65	66	66		
Reds																					
Whites and Rosé																					
Fruit, Cider and Mead																					
Promotion of color, body and fruit																					
Protection from oxidation for white wine																					
Mouthfeel enhancement for white wine																					
Grape tannin																					
Enhances structure																					
Enhances mid-palate volume																					
Enhances aromatic potential																					
Stabilizes color																					
Enhances fruit																					
French oak character																					
American oak character																					
Vanillin oak character																					
Protects grapes from rot																					
Enhances aging potential																					
Perception of sweetness																					
Lowers perception of alcohol																					
Rapid integration																					

## FERMENTATION TANNINS

Fermentation tannins are valuable fermentation tools. The goal is to bring out the best that the grapes have to offer, beginning from the moment they enter the winery. Fermentation tannins can be used for very specific reasons, such as *Botrytis* infected grapes, or on fruit where the resulting wines from certain vineyards lack tannins and structure. Fermentation tannins are also used routinely by some wineries to enhance mouthfeel and stabilize color.

### FT Blanc 🍷

Protection from oxidation

White, Rosé, Red, Fruit, Cider

Scott'Tan™ FT Blanc tannin is a white gall nut tannin specifically formulated for use on grapes with mold or rot (e.g. *Botrytis*). It helps protect juice from browning by acting as an antioxidant and inhibiting laccase activity. On sound grapes FT Blanc is an effective antioxidant when used with SO<sub>2</sub>. In protein rich varieties, such as Sauvignon Blanc, FT Blanc can help remove proteins. In some wines it will also contribute notes of minerality.

#15954 1 kg \$50.00  
#15969 5 kg \$220.00

### FT Blanc Soft 🍷

Oxidation protection and mouthfeel enhancement for white wine

White, Rosé, Red, Fruit, Cider, Mead

Scott'Tan™ FT Blanc Soft is similar to FT Blanc in application but wines made with it are also characterized by softness and improved mouthfeel. White and rosé wines made with FT Blanc Soft have enhanced texture with a perception of sweetness on the palate. Even relatively small dosages can contribute to minerality in wines. Similar improvements can be seen in fruit and mead wines.

#15955 1 kg \$72.00  
#15980 5 kg \$324.00

### FT Blanc + FT Blanc Soft

#### Recommended Dosage

##### White/Rosé Juice

50–150 ppm 5–15 g/hL 0.42–1.2 lb/1000 gal

##### Red Wine

50–300 ppm 5–30 g/hL 0.42–2.5 lb/1000 gal

##### Fruit, Cider, Mead

50–200 ppm 5–20 g/hL 0.42–1.6 lb/1000 gal

##### White/Rosé Wine\*

50–300 ppm 5–30 g/hL 0.42–2.5 lb/1000 gal

*\*A small addition of 2.5–5.0 g/hL (0.21–0.42 lb/1000 gal) may help mask the perception of bitterness in a finished wine*

#### Usage

Add FT Blanc or FT Blanc Soft by sprinkling directly on the grapes at the crusher or by adding to the juice or the wine during a tank mixing. Good homogenization is important. If an addition of FT Blanc or FT Blanc Soft is made post-fermentation, we recommend waiting 3–6 weeks after the tannin addition before racking, fining, filtering or bottling.

#### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C (65°F). Once opened, keep tightly sealed and dry.

### FT Blanc Citrus 🍷

White, Rosé, Cider

Scott'Tan™ FT Blanc Citrus is a mixture of condensed tannins extracted from citrus wood and gallic tannins. The use of FT Blanc Citrus during the course of alcoholic fermentation, and in combination with yeast strains with a marked beta-glycosidase activity (such as Alchemy II, 71B, VIN 2000, NT 116, Rhône 4600, VIN 13, QA23 and 58W3), allows for the development of enhanced aromatic potential. The resulting wines may present more intense aromas of lemon, grapefruit, apple and white flowers, which complement varietal aromas and those produced during fermentation. Scott'Tan FT Blanc Citrus also protects the must and wine from oxidation.

#### Recommended Dosage

##### White, Cider

20–150 ppm 2–15 g/hL 0.17–1.2 lb/1000 gal

##### Rosé Must

50–150 ppm 5–15 g/hL 0.42–1.2 lb/1000 gal

#### Usage

To benefit from the sensory aromatic precursors produced from the tannin, FT Blanc Citrus should be added during alcoholic fermentation, within 24–48 hours after yeast inoculation. Dissolve in ten times its weight in water or juice and add during a pump-over.

#### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C (65°F). Once opened, keep tightly sealed and dry.

#15974 1 kg \$115.00  
#15975 5 kg \$495.00

### FT ColorMax 🍷

Promotion of color stability

Red, Fruit

Scott'Tan™ FT ColorMax is a natural catechin product developed for its superior ability to stabilize color. Its special formulation goes into solution more easily than conventional fermentation tannin products. It is intended for use in conjunction with FT Rouge or FT Rouge Soft. Wines made with FT ColorMax tend to have a softer palate than those made with FT Rouge alone.

#### Recommended Dosage

##### Red Must

100–300 ppm 10–30 g/hL 0.8–2.5 lb/1000 gal

#### Usage

Add FT ColorMax at ½ sugar depletion. If a cold soak has been done, add FT ColorMax during the first pump-over.

#### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C (65°F). Once opened, keep tightly sealed and dry.

#15968 1 kg \$64.00

## FT Rouge 🍷

Promotion of color, body and fruit  
Red, Fruit

Scott'Tan™ FT Rouge is a proprietary tannin which is a blend of highly reactive tannins derived from exotic woods and chestnut. The addition of FT Rouge at the beginning of red wine fermentation helps preserve the grapes' natural tannins so they can combine with anthocyanins to create optimal color stability. Mouthfeel is also enhanced. FT Rouge provides antioxidative protection and may inhibit oxidative enzymes (such as laccase) associated with browning.

#15950 1 kg \$40.00  
#15951 5 kg \$159.00

## FT Rouge Soft 🍷

Promotion of color, body and fruit  
Red, Fruit

Scott'Tan™ FT Rouge Soft is a proprietary tannin specifically formulated for its gentle impact. It is particularly suitable for Pinot Noir and early-to-release wines. FT Rouge Soft is reactive with natural grape proteins and thus helps promote optimal color and color stability while enhancing structure. Mouthfeel and roundness are improved while the potential for bitter characters is reduced.

FT Rouge Soft provides antioxidative protection.

#15952 1 kg \$45.00  
#15953 5 kg \$171.00

## FT Rouge + FT Rouge Soft

### Recommended Dosage

#### Red *Vinifera* Must

200–500 ppm 20–50 g/hL 1.6–4.0 lb/1000 gal

#### Red Non-*Vinifera* Must

300–600 ppm 30–60 g/hL 2.5–5.0 lb/1000 gal

#### Fruit

200–500 ppm 20–50 g/hL 1.6–4.0 lb/1000 gal

### Usage

Gradually pour FT Rouge or FT Rouge Soft directly on grapes at the crusher or add to the must during a pump-over to obtain good homogenization. If subsequent additions of FT Rouge or FT Rouge Soft are desired, this can be done in increments of 0.5 lb/1000 gal (~60 ppm) during pump-overs. If an addition of FT Rouge or FT Rouge Soft is made post-fermentation, we recommend waiting 3–6 weeks after the tannin addition before racking, fining, filtering or bottling.

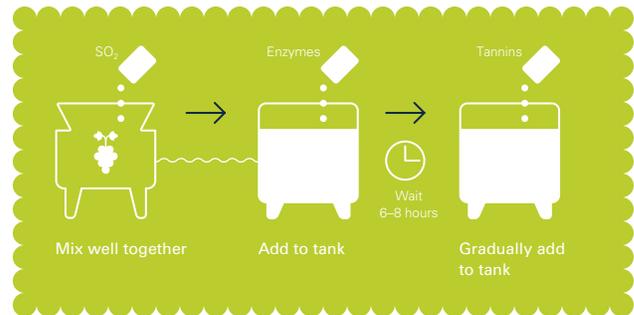
### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.



### PROTOCOL

## Timing of Additions: SO<sub>2</sub>, Enzymes and Tannins



Add SO<sub>2</sub> and mix well prior to adding enzymes. Tannins can be added 6–8 hours later. *Please see FAQs on page 67 for more information.* Yeast derivative nutrients (e.g. Opti-Red) can be added at any point during fermentation.

## FT Rouge Berry 🍷

Promotion of red berry notes  
Rosé, Red, Hybrids

Scott'Tan™ FT Rouge Berry is a mixture of condensed tannins extracted from wood of red berry fruit. The use of FT Rouge Berry in combination with yeast strains with a marked beta-glycosidase activity such as 71B, ICV GRE, NT 116, and Rhône 4600, allows for the development of enhanced red berry characters. The resulting wines may present intense aromas of cherry, strawberry, and blueberry, which complement varietal aromas produced during fermentation.

FT Rouge Berry can also promote the stabilization of color and prevent oxidation of the primary aromas.

### Recommended Dosage

#### Rosé Must

20–150 ppm 2–15 g/hL 0.17–1.2 lbs/1000 gal

#### Red Must

50–200 ppm 5–20 g/hL 0.42–1.6 lbs/1000 gal

### Usage

Add FT Rouge Berry at the first pump-over or punch-down, or 24–48 hours after yeast inoculation. Dissolve in ten times its weight in water before adding.

### Storage

Dated expiration. Unopened, store in a cool, dry, well-ventilated area. Once opened, carefully reseal and use in the same harvest year.

#15972 1 kg \$115.00  
#15973 5 kg \$495.00

## FERMENTATION/CELLARING TANNINS

Natural grape tannins derived from skins and/or seeds can be used either as fermentation or cellaring tannins. When used as a cellaring tannin, bench trials are recommended.

### Uva'Tan 🔥

Grape seed and skin tannin for fermentation and cellaring  
Red Must, White, Rosé, Red

Scott'Tan™ Uva'Tan is composed entirely of grape tannins (seeds and skins). It is high in polyphenols and low in astringency. Uva'Tan can be used both during fermentation and later during cellaring and finishing. For fermentations, Uva'Tan is particularly useful when natural grape tannin levels are deficient. Post-fermentation it can be used to stabilize color, enhance structure and provide antioxidant protection. Used prior to barreling it can improve integration of tannins in wines. It is recommended that Uva'Tan additions be made well in advance of bottling (six weeks at least) for better integration. Additions closer to bottling will still have a beneficial effect but filtration throughput will likely be reduced.

#15964 500 g \$185.00

### Uva'Tan Soft 🔥

White grape skin tannin for fermentation and cellaring  
Red Must, White, Rosé, Red

Scott'Tan™ Uva'Tan Soft is made entirely from white grape skin tannins. They are extracted directly from fresh grapes after pressing to avoid the oxidation of the polyphenols. These highly reactive tannins are characterized by very low astringency. Like Uva'Tan, Uva'Tan Soft can be used in fermentations as well as in cellaring and finishing. During fermentations Uva'Tan Soft can be useful when the grapes' natural tannins are insufficient and softness is a concern. Post-fermentation it can be used to stabilize color, soften structure and provide antioxidant protection. Used prior to barreling it can improve integration of tannins. Additions of Uva'Tan Soft should be made well in advance of bottling (six weeks at least). Additions closer to bottling may still have a beneficial effect but filtration throughput will likely be reduced. At low dosages, Uva'Tan Soft will optimize the aging potential of white and rosé wines.

#15965 500 g \$206.00

### Uva'Tan + Uva'Tan Soft

#### Recommended Dosage

<b>Red Must</b>	50–400 ppm	5–40 g/hL	0.42–3.3 lb/1000 gal
<b>White Wine</b>	50–150 ppm	5–15 g/hL	0.42–1.2 lb/1000 gal
<b>Rosé Wine</b>	50–200 ppm	5–20 g/hL	0.42–1.6 lb/1000 gal
<b>Red Wine</b>	50–300 ppm	5–30 g/hL	0.42–2.5 lb/1000 gal

#### Usage

Pour Uva'Tan or Uva'Tan Soft evenly on the must/juice at the crusher or into the wine during a transfer or racking. Following organoleptic evaluations, two to three further additions can be made subsequent to rackings. Final additions can be made up to three weeks before bottling, though six weeks are recommended for a more complete polymerization, settling and optimal filtration.

#### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

## CELLARING TANNINS

Cellaring tannins are used to enhance mid-palate structure and aging potential. They can also enhance aroma complexity. Bench trials are required to determine the best tannin for a particular wine or style.

### Complex 🔥

Tannin structure enhancement  
Red

Scott'Tan™ Complex is a proprietary cellaring and finishing product. It is a blend of proanthocyanidic (exotic woods) and ellagic (oak) tannins. It enhances structure, aids color stabilization and provides antioxidant protection. It is less reactive and more polymerized than some other tannins, thus it integrates well and provides balance. It is particularly useful in wines with up-front fruit or where smooth tannin structure is lacking.

#### Recommended Dosage

##### Prior to Barrel Aging Red Wine

50–300 ppm    5–30 g/hL    0.42–2.5 lb/1000 gal

##### Prior to Bottling (3–6 weeks)

30–100 ppm    3–10 g/hL    0.25–0.83 lb/1000 gal

*Note: Complex is best used prior to barrel aging. This encourages tannin integration in the wine over time. It may also dramatically improve a red wine when added prior to bottling. At this stage, Complex should be added at least six weeks before bottling to allow reaction and polymerization. Successful additions can be made closer to bottling, but this may result in less throughput during filtration.*

#### Usage

During transfer or racking add Complex into the wine. Mix well to ensure homogeneity. Following organoleptic evaluations, 2–3 further additions can be made subsequent to final rackings. First additions should be made at least 3–6 weeks before bottling to allow for polymerization and settling.

#### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15956 1 kg \$60.00

## Estate

Mid-palate volume  
White, Rosé, Red

Scott'Tan™ Estate can help compensate for lack of tannins in finished wine without the “dryness” associated with barrels. It enhances mid-palate, complexity and balance while providing a measure of antioxidant protection. Fruit characters can be enhanced. Estate is especially recommended when using older, tannin depleted barrels.

### Recommended Dosage

#### Prior to Barrel Aging Red Wine

50–300 ppm    5–30 g/hL    0.42–2.5 lb/1000 gal

#### Prior to Bottling (3–6 weeks) or During Rackings

50–100 ppm    5–10 g/hL    0.42–0.83 lb/1000 gal

*Note: Estate is best used prior to barrel aging. This encourages tannin integration in the wine over time. It may also dramatically improve a red wine when added prior to bottling. At this stage, Estate should be added at least six weeks before bottling to allow reaction and polymerization. Successful additions can be made closer to bottling, but this may result in less throughput during filtration.*

### Usage

During transfer or racking add Estate into the wine. Mix well to ensure homogeneity. Following organoleptic evaluations, 2–3 further additions can be made subsequent to rackings. First additions should be made at least 3–6 weeks before bottling to allow for polymerization and settling.

### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15958    1 kg    \$137.00

## Refresh

French oak character for neutral barrel cellaring  
White, Rosé, Red

Scott'Tan™ Refresh is a proprietary tannin extracted from 100% French oak. It will contribute wood nuance without smoky or toasty characters and is especially useful when old or neutral barrels are used during aging. This finishing/cellaring tannin is a strong antioxidant. It will help preserve color and can increase the complexity of the wine's finish.

### Recommended Dosage

30–200 ppm    3–20 g/hL    0.25–1.6 lb/1000 gal

### Usage

Gradually add Refresh to the wine during a transfer or during racking. After the addition of Refresh, it is recommended to proceed with normal rackings until fining. In young wines kept in tanks, Refresh should be added immediately after malolactic fermentation. If malolactic fermentation is not desired, add at the end of alcoholic fermentation.

### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15960    500 g    \$125.00

## FINISHING TANNINS

Finishing tannins are helpful tools when fine-tuning a wine. They can enhance complexity or provide an influence from oak in wines prior to bottling. Bench trials are required to determine the best tannin for a particular wine or style.

## Riche

French oak character and perception of sweetness  
White, Rosé, Red

Scott'Tan™ Riche is a cellaring and finishing tannin notable for enhancing complexity. Derived from 100% toasted French oak, Riche imparts hints of coconut and vanilla together with a perception of sweetness. It can contribute the final touch to your wine.

### Recommended Dosage

#### White/Rosé Wine

30–70 ppm    3–7 g/hL    0.25–0.58 lb/1000 gal

#### Red Wine

30–150 ppm    3–15 g/hL    0.25–1.25 lb/1000 gal

### Usage

Dissolve Riche in about 10 times its weight of warm water (35–40°C/95–104°F) then add it to the wine and mix well. Final additions should be made at least 3 weeks prior to bottling. After additions, proceed with normal racking.

### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15962    500 g    \$143.00

## Riche Extra

Smooth vanilla American oak qualities  
Red, White

Scott'Tan™ Riche Extra was specifically developed from 100% American oak. This proprietary tannin contributes nuances similar to Riche but with heightened perception of vanillin oak character. It works well in conjunction with low doses of other tannins (e.g. Complex, Estate, FT Blanc). Riche Extra can help smooth a wine's finish.

### Recommended Dosage

#### White Wine

50–100 ppm    5–10 g/hL    0.42–0.83 lb/1000 gal

#### Red Wine

50–200 ppm    5–20 g/hL    0.42–1.6 lb/1000 gal

### Usage

Dissolve Riche Extra in about 10 times its weight of warm water (35–40°C/95–104°F) then add it to the wine and mix well. Good homogenization is important. Final additions should be made at least 3 weeks prior to bottling. After additions, proceed with normal racking.

### Storage

Dated expiration. Unopened, the shelf-life is 5 years at 18°C(65°F). Once opened, keep tightly sealed and dry.

#15963    500 g    \$203.00

## LUXE TANNINS

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.

### 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 rose 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 pump-over. 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 \$142.00

### Radiance

Tannin blend for highlighting fresh fruit  
White, Red, Rosé, Cider

Scott'Tan Radiance is a blend of tannins for use in white, red and rosé wines as well as in ciders. 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 \$142.00

### Royal

American oak for structure and balance  
White, Red

Scott'Tan Royal is derived from American oak. It may be used in red and white wines to add structure, balance and length on the palate. Royal is a good complement for wines aged with American oak. It is known to bring out hints of cocoa, chocolate, coffee and butter-scotch. Royal has also been known to help mitigate the off-aromas and flavors of *Brettanomyces*.

#### Recommended Dosage

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

#### Usage

Dissolve Royal 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.

#15979 250 g \$142.00

### 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 \$16.00



## OTT TANNINS

OTT (Over The Top) Tannins are bold finishing tannins developed to provide a final stylistic touch to wines.

### Bold 🍷

Vanilla oak character and perception of sweetness  
White, Rosé, Red

Scott'Tan™ Bold was developed to provide an amplified final touch to your wine. Wood, caramel and vanilla notes are highlighted on the nose and mouth of wines adjusted with Bold. These wines also exhibit a pronounced oaky aroma. Bold can increase the perception of sweetness, while also altering the tannin profile to reduce the perception of alcohol in reds.

#### Recommended Dosage

##### Red, White and Rosé Wine

30–150 ppm 3–15 g/hL 0.25–1.2 lb/1000 gal

#### Usage

Gradually add Scott'Tan Bold into the wine during a transfer or blending, mixing well to achieve homogeneity. After additions with Bold, we recommend continuing racking as normal. Final additions should be made at least three weeks 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.

#15970 500 g \$244.00

### Finesse 🍷

Adds perception of sweetness while reducing perception of alcohol  
White, Rosé, Red

Scott'Tan™ Finesse was developed as a stylistically New World finishing tannin, but with an eye on organoleptic balance. This proprietary tannin has been shown to lower the perception of alcohol and hotness in reds and as well as perceived biting acidity in whites. Aromatically, it can exhibit tropical notes in Chardonnay and red fruit in Cabernet Sauvignon. Finesse will also heighten the perception of oak and sweetness.

#### Recommended Dosage

##### Red, White and Rosé Wine

30–150 ppm 3–15 g/hL 0.25–1.2 lb/1000 gal

#### Usage

Gradually add Scott'Tan Finesse into the wine during a transfer or blending, mixing well to achieve homogeneity. After additions with Finesse, we recommend continuing racking as normal. Final additions should be made at least three weeks 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.

#15971 500 g \$255.00

## Finishing Kit 🍷

Finishing agents can be valuable tools for perfecting a wine. We now offer finishing kits with liquid tannins and stability agents for ease of trials. These touches can help you achieve specific goals for any given wine.

Please remember that bench trials are a very important step to determine the right fit for any of these products. Finding the correct product to work with the matrix of your wine, as well as the correct dosage, might take several trials.

#### Finishing aids have been found to help with:

- masking pyrazines/greenness
- maximizing fruit
- boosting/increasing mid-palate
- increasing aromatic intensity
- increasing body
- help minimize impact of *Brettanomyces*
- brighten acid
- impart oaky character
- increase perception of sweetness

*Please feel free to contact Scott Laboratories for any additional guidance on conducting bench trials, or for any other product recommendations.*

*Note: Tannin kits are prepared liquids for ease of use in bench trials. All tannins in our portfolio are powder in nature.*

Pipettes sold separately.

#SLQDTAN \$92.00



## Micropipettes FOR BENCH TRIALS

#37101	20–200µL Micropipette	\$135.00
#37102	100–1000µL Micropipette	\$135.00
#37111	5–200µL Micropipette tips (96 tips)	\$11.00
#37112	100–1250µL Micropipette tips (96 tips)	\$13.00

**When is the best time to add fermentation tannins? How do I add them?**

Tannins are best added early in the winemaking process. In red wine, an addition during the fermentation stage integrates tannin into the wine and offers the greatest opportunity for colour stability and increased mid-palate structure. They can be added at the crusher or to the tank during the first pumpover, depending on the grape quality (rotten vs. sound). Additional tannin can be added with each pumpover. If adding to a white wine, add directly to the grapes at the crusher or to the tank during a tank mixing.

**I am using tannin and enzymes. Will SO<sub>2</sub> interfere with my additions?**

Using all three products together is fine, but timing is important! High SO<sub>2</sub> content can inhibit enzyme activity. Do not add SO<sub>2</sub> and enzymes at the same time. It is okay to add enzymes after the SO<sub>2</sub> is adequately dispersed OR to add SO<sub>2</sub> after the enzymes are adequately dispersed. Follow with a tannin addition six to eight hours later. When enzymes are not being used, add SO<sub>2</sub> first, allow to disperse, then follow with the tannin addition.

**Can I use tannins on white juice and wine?**

Yes, a tannin addition in white juice may be beneficial to remove off-aromas, to improve clarification, to inhibit laccase activity from Botrytis or rot, or to serve as an antioxidant. We recommend using either Uva'Tan, Uva'Tan Soft, FT Blanc, FT Blanc Citrus or FT Blanc Soft. Tannins can also be added later to wine to improve mid-palate structure or softness.

**Why should I use tannins on my "premium" red grapes?**

Tannins can be used to protect the colour and phenolic structure of your wines. For the easiest and most efficient integration of tannins, add FT Rouge, FT Rouge Soft, or FT Rouge Berry at the crusher. If needed, an addition of Uva'Tan, Uva'Tan Soft or Estate prior to aging can help reinforce phenolic balance. During long maturation in barrels, Estate will help prevent excessive oxidation that can result in loss of structure and freshness. For improved SO<sub>2</sub> management add small amounts of Estate (5–7.5 g/hL) during each racking.

**Will tannin additions increase colour in low-colour grape varieties?**

Tannins do not add colour to the must of low colour grapes. Recent research indicates that early addition of tannins such as FT Rouge allows them to bind up available proteins. This preserves the grapes' own natural tannins, making them available to bind with the grapes' anthocyanins and thereby providing increased colour stability.

**What if I did not add enough tannin during the primary fermentation?**

If more tannin structure and flavour are desired post-fermentation, make additions with Complex, Estate or Refresh. Addition is best before barrel aging when tannins can be incorporated into the wine and when oxidation and polymerization are slow. Refresh, Riche, Riche Extra, Bold and Finesse are the best tannins to use prior to bottling (3–6 weeks) when a bit of oak influence is desired. Any of these tannins can be used throughout winemaking, depending on the desired effect. Bench trials are required to determine the best tannin for a particular wine or style.

**Will adding tannins inhibit barrel aging?**

Tannins protect wine from oxidation during barrel aging. The wood tannins extracted from a new barrel protect the wine from over-oxidation during the slow process needed for tannin polymerization and wine development. When using old barrels, indigenous tannin may have been completely leached out. A small tannin addition of 5–10 g/hL of Estate or Refresh will act as an antioxidant and help protect the wine. Attaining a good phenolic profile will slow the maturation process and still protect the wine.

**Can tannins help remove undesirable astringency or bitterness?**

Yes. Over-astringency is caused by an imbalance of tannin molecules or by insufficiently bound tannin complexes. By adding a more refined, highly polymerized tannin to the wine, the imbalance can be corrected and the perception of astringency or bitterness reduced. This frequently improves the perception of fruit.

**What if I only want to use pure grape tannin in my wine?**

Uva'Tan (tannins from grape skins and seeds) and Uva'Tan Soft (tannins from white grape skins only) are comprised of 100% grape tannin. All other tannins are sourced from a combination of grapes, exotic woods, oak or chestnut.

**How are the LUXE tannins different from the Cellaring, Finishing and OTT tannins?**

LUXE tannins are unique in that they can be added as late as 48 hours prior to bottling. *See page 65 for more information.*

**LUXE Tannins****How are the LUXE tannins different from Scott'Tan finishing tannins?**

The raw materials used are only from heart wood sourced from the best botanical species and geographical areas, chosen for their desired properties. The processing was specifically designed to create tannins that can be rapidly complexed into your wine.

**Is the extraction process the same for Scott'Tan finishing tannins and the LUXE tannins?**

Both the finishing tannins and LUXE tannins are extracted with water and/or alcohol. The LUXE tannins are extracted at low temperature which makes them easily soluble in a wine matrix. The concentration process is also done at low temperature which lowers the risk of tannin polymerization and oxidation.

**Will LUXE tannins precipitate in my wine?**

The risk of precipitation is extremely low due to the extraction process. The low temperature extraction reduces the concentration of high molecular weight compounds which are less soluble in a wine matrix.

**Will LUXE tannins cause filtration problems?**

These tannins have undergone extensive R&D research under various conditions. No filtration problems were found 48 hours after LUXE tannin addition. It is not recommended to filter less than 48 hours after addition.



Enzymes are natural protein catalysts that facilitate and increase the rate of chemical reactions. Enological enzymes are used to accelerate natural reactions that would otherwise occur slowly in wine. Enzyme use can promote fruit and spice attributes while reducing sulfur off-odors and undesirable herbaceous and mineral characteristics. For most enzymes, the addition to grapes as soon as possible helps with extraction of aroma precursors, reduces maceration time and helps increase juice yield.

## Basics

Enzymes are a useful tool to optimize the potential of your fruit. They perform best when remembering a few basics:

### TIMING

In general, enzymes should be added as early as possible on crushed grapes, juice or must to provide your fermentation with the natural components of the grapes. Enzymes that contain beta-glucosidase (Lallzyme Beta, Scottzyme BG, and Rapidase Revelation Aroma) are inhibited by sugars and should not be used prior to fermentation. Beta, BG, and Revelation Aroma are useful in releasing flavor and aroma compounds. Scottzyme KS is used after pressing to enhance clarification and filterability in wine.

### SO<sub>2</sub>

Enzyme activity is inhibited by SO<sub>2</sub>. In high concentrations (around 200 ppm) SO<sub>2</sub> will denature and inactivate the enzymes. SO<sub>2</sub> can be added after an enzyme addition has been adequately dispersed or vice versa, but do not add SO<sub>2</sub> and enzymes at the same time.

### TANNINS

Wait 6–8 hours after enzyme additions before adding tannins.

### BENTONITE

Bentonite will bind with enzymes and inactivate them, so the timing of additions is important. It is best to use bentonite after the enzyme activity has completed.

If adding enzymes after using bentonite, make sure to rack wine off of the bentonite prior to adding enzymes.

### CONDITIONS

High alcohol, low temperature, high SO<sub>2</sub>, fining agent additions and the amount of movement in a tank can inhibit enzyme action. If conditions are not optimal for the enzymes, extra time may be required for the enzyme activity to be completed before proceeding with other additions.

### LIQUID AND GRANULAR/POWDERED

The enzymes are granular/powdered or liquid. The liquid enzymes are marked with the symbol . The granular/powdered enzymes are marked with the symbol .

### ADDRESSING THE ISSUE OF SMOKE TAIN

With an increase in wildfires over recent years, smoke exposure is a major concern for many winemakers. Smoke is an aerosol of small solid particles and/or liquid droplets which carry organic compounds. The particles derived will vary depending on fuel source. The aromas from the smoke affected grapes may not be obvious in the berries. Over the course of the fermentation and during the subsequent aging process the non-odiferous, non-volatile compounds can be hydrolyzed leaving a negative impact on the sensory profiles of the wine, as well as the mouthfeel. There are still questions as to whether there is varietal sensitivity, an impact on the vine physiology in subsequent years, and how to translate the available analysis. The research is advancing, but there are still many unknowns. Our trials at Scott Laboratories are ongoing, in addition to a continuous collaboration with our partners and researchers in California, Washington and Australia.



## LALLZYME

Lallemand Lallzymes have been an established tool for North American winemakers for two decades. Lallemand has used its worldwide network to develop enzymes for specific winemaking applications. Lallzymes are the result of in-depth analysis and testing at technical institutes and wineries on five continents. All Lallzymes are granular and most are sourced from *Aspergillus niger* fermentations (not sourced from genetically modified organisms). MMX is sourced from a non-GMO *Trichoderma harzianum* fermentation.

### Beta

Aroma enhancement for white and rosé wines

Lallzyme Beta™ is a blend of pectinase and beta-glucosidase for use in white wines with high levels of bound terpenes such as Gewürztraminer, Viognier and Muscat. The sequential actions of side activities cleave aroma precursors and enhance the varietal character of aromatic wines. The larger the reserve of aromatic precursors in the wine the greater the effect of the enzyme treatment. Lallzyme Beta has been formulated so that it will not lead to an over-expression of aromas. The glucosidase activity is inhibited by sugars. The wine should have less than 0.5% residual sugar for full enzyme activity. Bench trials are highly recommended before using.

#### Recommended Dosage

Crushed Grapes	Juice
Not recommended	Not recommended

#### Wine

5–10 g/hL 190–379 g/1000 gal

#### Usage

Dissolve Lallzyme Beta in 10 times its weight in water, gently stir and allow to sit for a few minutes. Then add to wine. For use in wine only since the betagucosidase activity is inhibited by glucose levels in juice.

#### Storage

Dated expiration. Store dry enzyme at 25°C(77°F). Once rehydrated, use within a few hours.

#16200 100 g \$45.00

### Cuvée Blanc

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	Juice	Wine
20 g/ton	Not recommended	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 dry enzyme at 25°C(77°F). Once rehydrated, use within a few hours.

#16203 100 g \$38.00

### EX

Macerating enzyme for light to medium-bodied reds

Lallzyme EX™ is a blend of pectinase and hemicellulase specially formulated to improve color stability and enhance mouthfeel in red wines. Specific side activities contribute to the macerating action on the grape cell wall. This allows the progressive liberation of polyphenols and tannin bound polysaccharides. When using this enzyme, juice extraction from red grape skins is significantly increased and the filterability of the wine is improved. Lallzyme EX has been formulated to provide a gentle maceration, even in low-maturity grapes.

#### Recommended Dosage

Crushed Grapes	Juice	Wine
15–30 g/ton	Not recommended	Not recommended

#### Usage

Dissolve Lallzyme EX in 10 times its weight in water, gently stir and allow to sit for a few minutes. Then add to the crushed grapes at the beginning of maceration or the onset of cold soak.

#### Storage

Dated expiration. Store dry enzyme at 25°C(77°F). Once rehydrated, use within a few hours.

#16204 100 g \$25.00

#16205 250 g \$50.00

### EX-V

Macerating enzyme for medium to full-bodied reds

Lallzyme EX-V™ is a pectinase with cellulase and hemicellulase side activities for red wines intended for aging. It has a specific action on both grape cell walls and cell membranes. This action allows for a rapid release of anthocyanins and a more efficient release of tannins leading to stable anthocyanin-tannin bonding. The end result of this bonding is a more structured wine with deep, stable color. Aromatic profile analysis indicates that Lallzyme EX-V increases the release of aromatic compounds while respecting the varietal characteristics of the grape.

#### Recommended Dosage

Crushed Grapes	Juice	Wine
10–20 g/ton	Not recommended	Not recommended

#### Usage

Dissolve Lallzyme EX-V in 10 times its weight in water, gently stir and allow to sit for a few minutes. Then add to the crushed grapes at the beginning of maceration or the onset of cold soak.

#### Storage

Dated expiration. Store dry enzyme at 25°C(77°F). Once rehydrated, use within a few hours.

#16206 100 g \$38.00

#16208 500 g \$107.00

**MMX** 

Enzyme to improve filterability of *Botrytis* infected wines

Lallzyme MMX™ is a beta-glucanase and pectinase blend. Due to the synergistic activities of the glucanase and pectinase blend, Lallzyme MMX improves the filterability of botrytised wines. This enzyme blend was developed by Lallemand to improve the short maceration of wine on lees.

Lallzyme MMX contains beta-glucanase activities derived from *Trichoderma harzianum*. Enzymes from this source are listed in 27 CFR 24.250.

**Recommended Dosage**

Crushed Grapes	Juice
Not recommended	Not recommended

**Wine**

1–3 g/hL 40–114 g/1000 gal

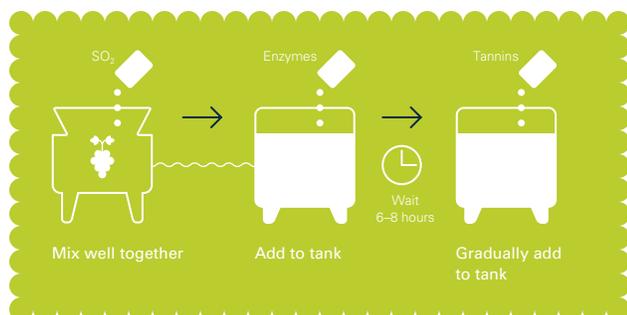
**Usage**

Dissolve Lallzyme MMX in 10 times its weight in water, gently stir, allow to sit for a few minutes and then add to the wine.

**Storage**

Dated expiration. Store dry enzyme at 25°C(77°F). Once rehydrated use within a few hours.

#16207 100 g \$49.00

**PROTOCOL****Timing of Additions: SO<sub>2</sub>, Enzymes and Tannins**

Add SO<sub>2</sub> and mix well prior to adding enzymes. Tannins can be added 6–8 hours later. Yeast derivative nutrients (e.g. Opti-Red) can be added at any point during fermentation.

**RAPIDASE****Clear Extreme** 

Hard to settle Hybrid and American grapes

Hybrid and American grape varieties may be difficult to clarify due to unique grape characteristics and the cool climate conditions for processing. Rapidase Clear Extreme can be used after pressing to help preserve aromatic freshness, reduce viscosity, improve juice clarity, help compact lees and speed up clarification even in difficult conditions (low temperature, low pH, hard to settle varieties). Rapidase Clear Extreme will remain active from 6–50°C(43–122°F).

**Recommended dosage (dependent on temperature):****Crushed Grapes**

Not recommended

**Juice**

6–10°C(43–50°F) 4 g/hL 152 g/1000gal

10–12°C(50–54°F) 2 g/hL 76 g/1000gal

Above 12°C(54°F) 1 g/hL 38 g/1000gal

**Wine**

Not recommended

Settling times less than 6 hours above 10°C (50°F):

3 g/hL 114 g/1000 gal

**Usage**

Dissolve Rapidase Clear Extreme in 10 times its weight in water, stir gently, allow to sit for a few minutes. Then add to the juice right after pressing. Not recommended for use on crushed grapes or wine.

**Storage**

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

#16257 100g \$23.00

**Expression Aroma** 

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	Juice	Wine
20–25 g/ton	Not recommended	Not recommended

**Usage**

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

**Storage**

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

#16260 100g \$24.00

## Extra Press RAPIDASE

Macerating enzyme to improve pressability of white grapes

Rapidase Extra Press is a macerating enzyme for white grapes. It is a liquid pectolytic enzyme with essential side activities that help weaken berry cell walls to facilitate juice release and to reduce viscosity. Use for improving pressability on hard-to-press varieties such as Muscat and Thompson Seedless, as well as on slipskin varieties such as Niagara.

### Recommended Dosage

**Crushed Grapes** 10–50 mL/ton (1–1.2 mL/hL)

**Juice** Best before fermentation

**Wine** Best before fermentation

### Usage

Dilute Rapidase Extra Press in 10 times its weight in must or water prior to addition. Then add to the grapes while filling the press.

### Storage

Dated expiration. Store in the refrigerator at 4–8°C(40–45°F).

#16254 20 kg \$1030.00

## Revelation Aroma RAPIDASE

For extraction of aroma precursors in red and white grapes

Rapidase® Revelation Aroma contains  $\alpha$  and  $\beta$ -glycosidase activities to breakdown glycosylated aroma precursors. It helps release varietal aromatic precursors for intense and complex aromas. It is known for respecting varietal character and has been described as increasing thiols in whites and terpenes in reds.

### Dosage\*

#### Whites

**Crushed Fruit** 15–22 g/ton

**Juice** 1–1.5 g/hL (35–55 g/1000 gal)

**Wine** 1–2 g/hL (35–70 g/1000 gal)

#### Reds

**Crushed Fruit** 20–25 g/ton

**Juice** 2–2.5 g/hL (70–90 g/1000 gal)

**Wine** 2–2.5 g/hL (70–90 g/1000 gal)

*\*Note: Revelation Aroma can be hindered by high sugar. The addition of a small dose after the alcoholic fermentation can give best results. See wine doses above.*

### Usage

Dissolve Rapidase® Revelation Aroma in 10 times its weight in water, stir gently, allow to sit for a few minutes. Pour over crushed fruit or add to the juice before the start of alcoholic fermentation for best results.

### Storage

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

#16266 100g \$50.00

## SCOTTZYME

Scottzymes are the product of natural *Aspergillus niger* fermentations (not sourced from genetically modified organisms). All Scottzymes® except BG are liquids. Scottzymes are offered in 1 kg bottles and 25 kg totes. One kg of Scottzymes equals 890 mL while 25 kg totes are 22.25 liters. To accurately dose liquid Scottzymes, first calculate the dosage then dilute to a 10% solution (v/v). All Scottzymes are non-GMO.

## BG

Aroma releasing enzyme for white, red and fruit wines

Scottzyme® BG is a powdered pectinase with beta-glucosidase side activity for the release of bound terpenes. It is generally used in white wines, but may also be used in red and fruit wines for the release of aroma and flavor compounds. Scottzyme BG should be used only in wine, not must or juice. Scottzyme BG should only be used at the end of fermentation. The glucosidase activity is inhibited by sugars. The wine should have less than 0.5% residual sugar for proper enzyme activity. Bench trials are highly recommended before using.

### Recommended Dosage

**Crushed Grapes**

**Juice**

**Wine**

Not recommended Not recommended 3–5 g/hL (114–190 g/1000 gal)

### Usage

Powdered enzymes tend to scatter across water or wine. It is best to add just enough cool 21–25°C(70–77°F) water to Scottzyme BG to create a paste. Then add more cool water to dissolve the enzyme completely. It is now ready to be added to the wine. Make sure you have gentle motion in the tank to disperse Scottzyme BG. Use only on wine because the glucosidase activity is inhibited by sugar.

### Storage

Store at room temperature for 1–2 years. Once opened, keep tightly sealed and dry. Once hydrated, use within a few hours.

#16176 1 kg \$198.00

## Cinn-Free

Used in white must for release of varietal aromas

Scottzyme® Cinn-Free is a purified pectinase with very low cinnamyl esterase activity which helps reduce the formation of vinyl phenols. It is used in white must for the release of varietal aromas and aromatic precursors. In addition to releasing desirable pectin-trapped aromas, Scottzyme Cinn-Free aids in pressability, yield, settling, clarification and filtration. It is recommended for aromatic varieties like Sauvignon Blanc, Viognier, Pinot Gris, Gewürztraminer, Riesling and Vignoles. It can also be used in varieties like Chardonnay to bring out the full aromatic potential of the grape.

### Recommended Dosage

**Crushed Grapes**

**Juice**

**Wine**

15–30 mL/ton 1.3–1.6 mL/hL Best used before  
50–60 mL/1000 gal fermentation

### Usage

Dilute Scottzyme Cinn-Free to approximately a 10% solution in cool water. Pour over the grapes before pressing or add to juice before the start of alcoholic fermentation. Best used before fermentation.

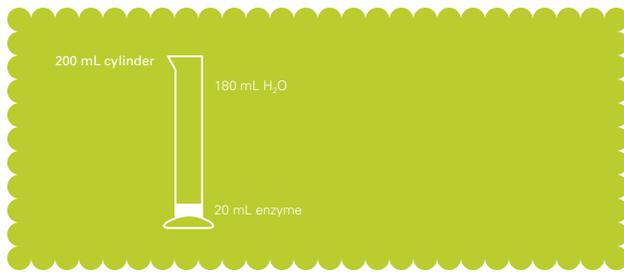
#16175 1 kg (890 mL) \$91.00

#16165 25 kg (22.25 L) \$1288.00



## PROTOCOL

### How to Make a 10% Solution



If using a dose of 20 mL/ton, mix 20 mL of liquid enzyme with approximately 180 mL of water.

## Color Pro

Macerating enzyme for aged and early-to-market reds, whites

Scottzyme® Color Pro is a specialty pectinase with protease side-activities. These side-activities are important for helping break down the cell walls of red grapes to gently extract more anthocyanins, polymeric phenols and tannins. This gentle extraction creates wines that are rounder in mouthfeel and bigger in structure, with improved color stability. Wines made with Color Pro tend to have increased tannins, improved clarity and reduced herbaceous or “veggie” character. Lower doses of Color Pro are recommended for red varieties that are underripe, low in anthocyanins or high in seed tannins. For “big” reds from ripe fruit with mature seeds, higher doses of Color Pro are recommended.

Color Pro is also used in white winemaking for settling and clarifying juice. The improved clarification helps lead to more compact lees, less fining, cleaner fermentation and easier filtration.

### Reds

#### Recommended Dosage

Crushed Grapes	Juice	Wine
60–100 mL/ton	Best used before fermentation	Best used before fermentation

### Usage

Dilute Scottzyme Color Pro to approximately a 10% solution in cool water. Pour the solution over the crushed grapes or add during a pump-over before alcoholic fermentation. If adding to wine, gently mix a 10% solution into the tank for even dispersion. Best used before fermentation.

### Whites

#### Recommended Dosage

Crushed Grapes	Juice	Wine
15–30 mL/ton	2–4 mL/hL	2.6–5.3 mL/hL
	75–150 mL/1000 gal	100–200 mL/1000 gal

### Usage

Pour a 10% solution over crushed grapes or add to juice before the start of alcoholic fermentation.

#16172 1 kg (890 mL) \$78.00

#16162 25 kg (22.25 L) \$996.00

## Color X

Macerating enzyme for heavier, more extracted reds

Scottzyme® Color X is a unique pectinase with cellulase side-activities. These activities help release anthocyanins, polymeric phenols and tannins. In trials we have found the tannic extraction is coarser with Color X than with Color Pro. We therefore recommend using Color X when heavier tannic extraction is desired for longer aging.

The color response of Color X is similar to Color Pro.

### Recommended Dosage

Crushed Grapes	Juice	Wine
60–100 mL/ton	Best used before fermentation	Best used before fermentation

### Usage

Dilute Scottzyme Color X to approximately a 10% solution in cool water. Pour the solution over the crushed grapes or add during a pump-over before alcoholic fermentation. Best used before fermentation.

#16173 1 kg (890 mL) \$78.00

#16163 25 kg (22.25 L) \$996.00

### Choosing Color Pro or Color X?

It is important to know your grapes. Scottzymes will have little effect on overall color if your grapes are deficient in compounds contributing to color (anthocyanins, tannins, cofactors, etc.). Color X and Color Pro both facilitate the extraction and stabilization of compounds already in the grapes. If the grapes lack some of the pieces of this complex puzzle, the color effect due to the Scottzymes may be negligible. Trials, however, have shown changes in mouthfeel and structure even when color change has been minimal.

## HC

Fruit, Concord

Scottzyme® HC is a pectinase and hemicellulase blend designed to increase yield, reduce solids and improve filtration. It is a strong enzyme useful for hard-to-press or slimy grapes (such as Concord) and for pome (apple or pear) or stone (pitted) fruits.

It is best used in conjunction with Scottzyme Pec5L.

### Recommended Dosage

Crushed Fruit	Juice	Wine
60–100 mL/ton	5.3–7.9 mL/hL	6.6–9.2 mL/hL
	200–300 mL/1000 gal	250–350 mL/1000 gal

### Usage

Dilute Scottzyme HC to approximately a 10% solution in cool water. Pour the solution over the crushed fruit or add during a tank mixing before alcoholic fermentation. If adding to wine, gently mix a 10% solution into the tank for even dispersion.

#16171 1 kg (890 mL) \$78.00

#16161 25 kg (22.25 L) \$996.00

## KS

Blend of enzymes for enhanced settling and filtration

Scottzyme® KS is a blend of enzymes developed to create a special formulation for difficult to settle or hard-to-filter juices or wines. Scottzyme KS is most effective when used early in processing. It should not, however, be used before pressing of either red or white grapes. It is never too late to use Scottzyme KS. Customers have reported very favorable results when used to solve “nightmare” filtrations before bottling.

### Reds

#### Recommended Dosage

Crushed Grapes	Juice	Wine
Not recommended	Not recommended	5.3–7.9 mL/hL 200–300 mL/1000 gal

### Usage

Dilute Scottzyme KS to approximately a 10% solution in cool water. Add to the wine after pressing during a tank mixing. Do not use prior to pressing.

### Whites

#### Recommended Dosage

Crushed Grapes	Juice	Wine
Not recommended	2.6–4.0 mL/hL 100–150 mL/1000 gal	5.3–7.9 mL/hL 200–300 mL/1000 gal

### Usage

Dilute Scottzyme KS to approximately a 10% solution in cool water. Add to the juice after pressing or to the wine after alcoholic fermentation during a tank mixing. Do not use prior to pressing.

### Warning

**Never use Scottzyme KS before pressing (e.g. at the crusher for whites, or before or during red fermentation). Scottzyme KS has very aggressive enzymatic activities that will break down skins and create too many fine solids. After pressing, these activities will help with settling and the breakdown of sticky solids (even *Botrytis*). The goal is to make the juice or wine more manageable.**

#16174	1 kg (890 mL)	\$78.00
#16164	25 kg (22.25 L)	\$996.00

## KS Plus

Enzyme blend for enhanced clarification and filtration of difficult lots

Scottzyme KS Plus is a powerful new enzyme created for use in wine that will not clarify. It has higher enzyme activities for the most difficult tasks. Scottzyme KS Plus **should be used on finished wine only** during settling or to help with filtration issues before bottling.

#### Recommended Dosage

Fruit	Juice	Wine
Not recommended	Not recommended	4 mL/hL 150 mL/1000 gal

### Usage

Dilute Scottzyme KS Plus to approximately a 10% solution in cool water. Add to the wine after alcoholic fermentation during a tank mixing.

### Warning

**Never use Scottzyme KS Plus before pressing or on the juice.** It contains our most aggressive enzyme activity and may result in over clarification of juice.

#16178	1 kg (890 mL)	\$234.00
#16168	25 kg (22.25 L)	\$2986.00



Image at left: Scottzyme KS Plus trial shown four days post enzyme addition, settling at room temperature.

From left to right:

- Control: 120 NTU
- Enzyme A: 46.1 NTU
- KS Plus: 20.8 NTU

### EXPERT TIP

## From Our Filtration Specialist

A powerful enzyme such as Scottzyme KS Plus has a great fringe benefit in that it can unclog crossflow and cartridge filters. This is especially useful after filtering colloidal dramatic wines, or specific varietals with naturally higher pectin levels that tend to struggle on filtration day (assuming prefiltration was done properly and within the recommended 24 hour time limit, and a 20 psi differential has not been exceeded). This enzyme treatment is done after filtration but before the alkaline cleaning cycle. The enzyme should always be used before a hot water or steam sanitization so the solids are not baked in. The use of the KS Plus will then enable a more successful cleaning.

## Pec5L

Enzyme for white and fruit for pressability, settling and clarification

Scottzyme® Pec5L is a highly concentrated pectinase blend developed and formulated specifically for winemaking.

It is used on crushed grapes for easier pressing and higher yields and in juice for improved settling, clarification and filtration. It is also useful for berries, pome and stone fruits. When adding to fruit, it is sometimes beneficial to use in conjunction with Scottzyme HC.

### Recommended Dosage

Crushed Grapes	Juice	Wine
10–20 mL/ton	1.0–1.3 mL/hL	1.3–1.6 mL/hL
	40–50 mL/1000 gal	50–60 mL/1000 gal

### Usage

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

#16170	1 kg (890 mL)	\$78.00
#16160	25 kg (22.25 L)	\$877.00

## Performance

Enzyme for clarification of juice

Scottzyme Performance is a concentrated pectinase for the rapid clarification and settling of juice. Performance's high activity allows for quick turnover while improving filterability.

### Recommended Dosage

1–3 g/hL 34–100 mL/1000 gal

### Usage

Dilute Scottzyme Performance to approximately a 10% solution and add to the juice, stir gently. Do NOT use prior to pressing.

#16156	25 kg (22.25 L)	\$910.00
--------	-----------------	----------

## ALL Scottzymes (EXCEPT BG)

### Storage

Store at 4°C(40°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

*Note: The 25 kg totes are Kosher (but not Kosher for Passover). The 1 kg bottles are not Kosher.*

## Rosé: Best Practices

Color loss and oxidation can be especially problematic in rosé winemaking. These concerns can be managed with proper technique and product selection.

- The use of FT Blanc Soft and OptiMUM White as antioxidants can help preserve color and aromas.
- The use of gentle enzymes (Scottzyme Cinn-Free or Color Pro, Lallzyme Cuvée Blanc or Rapidase Expression Aroma) can help speed up the release of color and aroma compounds.
- Gentle pressing is required to avoid astringency and release of bitter phenolics.
- Choose a yeast that is a thiol or ester converter (M83, W15, Cross Evolution, Be Fruits, QA23, NT116, Rhône 4600 or VIN13), depending on the style desired.
- Good nutrition is also critical for a strong, complete fermentation. Using Go-Ferm Protect Evolution and Fermaid O will provide the yeast with organic nutrition and some of the amino acid precursors for fruity, aromatic compounds.
- Temperature during fermentation is best kept between 16°–20°C (60°–68°F), which helps facilitate ester production.
- An ML strain with little diacetyl production can help maximize bright, fruity notes. Co-inoculation of yeast and bacteria also helps preserve color and aromas.

## FREQUENTLY ASKED QUESTIONS

**What is the best way to add liquid enzymes?**

Even distribution is important. First calculate the dosage then dilute Scottzymes to approximately a 10% solution (v/v) in cool water. Pour the solution over the crushed grapes/fruit or during a pump-over before fermentation. If adding to juice or wine, gently mix a 10% solution into the tank for even dispersion.

**How do I add powdered or granular enzymes?**

Granular enzymes need to be dissolved in 10 times their weight in water, gently stirred and allowed to sit for a few minutes. They are then ready to be added to juice or wine. Powdered enzymes tend to scatter across water or wine. It is best to add just enough cool 21–25°C(70–77°F) water to the enzyme to create a paste. Then add more cool water to dissolve the enzyme completely. It is now ready to be added to the tank. Make sure you have gentle motion in the tank to disperse the enzyme or use a dosing pump.

**How long will powdered/granular enzymes remain active after rehydration?**

Rehydrated powdered/granular enzymes should not be kept in liquid form for more than a few hours at room temperature. The liquid solution of these enzymes may be kept a few days at 4°C(39°F) in water acidified with tartaric acid to pH 3.5 with 50 mg/L of SO<sub>2</sub>.

**Are enzymes deactivated by SO<sub>2</sub>?**

Yes, enzymes are inhibited by SO<sub>2</sub>. Deactivation occurs around 200 ppm. Do not add SO<sub>2</sub> and enzymes together. It is okay to add enzymes after the SO<sub>2</sub> is adequately dispersed or to add the SO<sub>2</sub> after the enzymes are adequately dispersed.

**I have already added bentonite. Can I still use enzymes?**

You may still use enzymes but not until the wine has been racked off the bentonite. Bentonite inactivates enzymes. It is best to use bentonite after the enzyme treatment is complete.

**When should I add Scottzyme Color Pro, Scottzyme Color X, Lallzyme EX or Lallzyme EX-V?**

Add at the crusher or the fermenter as soon as possible. Anthocyanins are water-soluble and are released as the grapes are crushed. Most of a red wine's color potential is achieved very early.

**Why should I use Scottzyme Color Pro on whites?**

Scottzyme Color Pro improves settling, fining and filterability of white wines.

**When should I choose Lallzyme EX or Lallzyme EX-V?**

Lallzyme EX is recommended for fruit forward red or rosé wines. Lallzyme EX-V is formulated for premium, aged reds.

**What should I do if the optimal time to add enzymes has passed?**

Low temperatures, alcohol and SO<sub>2</sub> all inhibit enzyme activity, but the enzymes will still work. This is why recommended enzyme dosage levels for wine are higher than for juice. Reaction time will also increase when conditions are not optimal.

**I have problems settling and clarifying my late harvest white wines. When should I treat with Scottzyme KS?**

It is best to add Scottzyme KS after pressing and before fermentation. If added later, you will need a higher dose and a longer reaction time in the wine. If you know you have problems with a specific white wine, add Scottzyme KS to the juice tank. Preventative use is more effective and quicker.

**Warning: Do not use Scottzyme KS before pressing. Never use Scottzyme KS on red grapes or must.****I have enzymes left from last year. Are they still OK to use?**

Leftover liquid Scottzymes should be tightly sealed and stored in a refrigerated environment. Granular enzymes should be kept in a dry, cool environment. If the dry enzymes get moisture in them, they should be thrown out. If kept properly, liquid enzymes should be good for at least one year with only a small activity loss. Granular enzymes will be good for several years.

**I had *Botrytis* on my grapes this harvest and I want to use a beta-glucanase enzyme. Do you carry a beta-glucanase enzyme?**

Yes, Lallzyme MMX is a blend of beta-glucanase and pectinase. It is currently listed in 27 CFR 24.250.

**How long should I leave the enzyme on white grapes before pressing?**

In general, waiting 2–12 hours before pressing should be enough time for the enzyme to work.

**I am using tannin and enzymes. Will SO<sub>2</sub> interfere with my additions?**

Using all three products together is fine, but timing is important! High SO<sub>2</sub> content can inhibit enzyme activity. Do not add SO<sub>2</sub> and enzymes at the same time. It is okay to add enzymes after the SO<sub>2</sub> is adequately dispersed OR to add SO<sub>2</sub> after the enzymes are adequately dispersed. Follow with a tannin addition six to eight hours later. When enzymes are not being used, add SO<sub>2</sub> first, allow to disperse, then follow with the tannin addition.



Malolactic fermentation (MLF) not only converts malic acid to lactic acid, but also has a direct impact on wine quality. Uncontrolled spontaneous malolactic fermentations or wild lactic acid bacteria can result in diminished varietal and fruit flavors, reduced esters, masked aromas and off-characters. The importance of choosing a selected strain has increased due to evolving winemaking preferences (e.g. higher pH levels, lower  $\text{SO}_2$ , higher alcohol, etc.), as well as concerns such as biogenic amines. The use of selected malolactic strains can contribute positively to wines while minimizing risks.

## Basics

It is very important to know the status of the wine prior to inoculating with malolactic bacteria. Analyze the wine for pH,  $\text{SO}_2$ , VA, residual sugar, malic acid and alcohol level. Creating an optimal environment for malolactic bacteria includes:

### TEMPERATURE

Between 20–25°C (68–77°F).

### ALCOHOL LEVEL

Below 13% (v/v).

### PH

Above 3.4.

### $\text{SO}_2$

Free  $\text{SO}_2$  below 10 ppm, total  $\text{SO}_2$  below 25 ppm.

### VOLATILE ACIDITY (VA)

If the pH is high, other bacteria strains may already be growing and causing an elevated VA. The wine should be monitored for unwanted bacteria.

### NUTRITIONAL STATUS

Was a complete yeast nutrient used during primary fermentation? Was a high nutrient demanding yeast strain used for primary fermentation? Good nutrition is important for malolactic bacteria. Malolactic nutrients such as Acti-ML, Opti'Malo Blanc, Opti'Malo Plus, and ML Red Boost will help with the growth and survival of specific malolactic bacteria.

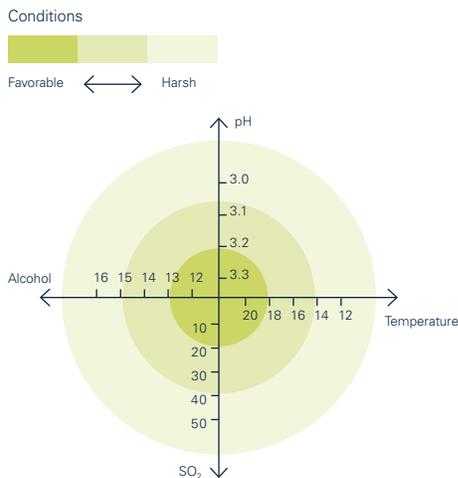
### YEAST STRAIN

Choose a yeast strain which is compatible with the selected malolactic bacteria. See *MLF Compatibility in the yeast charts on pages 9–14*.

### MALIC ACID

Measure malic acid levels. Wine conditions are difficult for bacteria if the malic level is < 0.5 g/L or > 7.0 g/L.

### ML CULTURE GROWTH CONDITIONS



*Note: When selecting a bacteria culture, take note that limiting conditions have a compounding inhibitory effect. For example, if low pH is combined with high  $\text{SO}_2$ , conditions in a wine will be more antagonistic to the bacteria than low pH alone.*

# Choosing the Right Malolactic Bacteria

- 🔹 Highly Recommended
- 🔸 Recommended

*Note: The limits shown are individually stressful. In combination, stresses are increased. Other aspects such as nutrition can also be critical.*

	Freeze-Dried Direct Inoculation (MBR)								Effervescent Direct Inoculation Cultures	Co-Inoculation	1-Step		Nutrients			
	Alpha	Beta	ICV Elios 1	MBR 31	O-MEGA	PN4	Silka	VP41	Malotabs	Beta Co-Inoc	1-Step Alpha	1-Step VP41	Acti-ML	Opti'Malo Plus	Opti'Malo Blanc	ML Red Boost
Page	81	81	81	81	81	82	82	82	83	83	83	83	84	85	85	85
Reds	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹		🔹
Whites and Rosé	🔹	🔹		🔹	🔹	🔸		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔸	
Fruit, Cider and Mead	🔸			🔹		🔹						🔸	🔹	🔹		
Higher alcohol tolerance	🔹		🔹		🔹	🔹	🔹	🔹	🔹		🔹	🔹				
Lower pH tolerance				🔹		🔹		🔹								
Higher SO <sub>2</sub> tolerance		🔹			🔹	🔹	🔹	🔹	🔹	🔹		🔹				
Lower temperature tolerance	🔹			🔹	🔹			🔹	🔹							
Low nutrient demand	🔹				🔹			🔹	🔹		🔹	🔹				
Medium nutrient demand			🔹	🔹		🔹	🔹									
High nutrient demand		🔹								🔹						
Higher diacetyl production	🔸	🔹		🔸		🔹					🔸					
Impact on mouthfeel fullness	🔹		🔸		🔸		🔹	🔹	🔹		🔹	🔹				
Impact on mouthfeel structure	🔸		🔹				🔹	🔸	🔸		🔸	🔸				
Impact on fruitiness		🔹	🔸	🔹	🔹	🔸				🔹						
Restart stuck or sluggish MLF					🔸			🔹			🔸	🔸				🔹
Bacteria rehydration nutrient													🔹			
Nutrient for difficult red MLF's																🔹
Nutrient for difficult white MLF's															🔹	
General ML Nutrient														🔹		
OMRI listed															🔹	🔹
Alcohol (% v/v)	<15.5%	<15.0	<15.5	<14.0	<16.0	<16.0	<16.0	<16.0	<16.0	<15.0	<15.5	<16.0				
pH	>3.2	>3.2	>3.4	>3.1	>3.1	>3.1	>3.3	>3.1	>3.1	>3.2	>3.2	>3.1				
Total SO <sub>2</sub> (mg/L)	<50	<60	<50	<45	<60	<60	<60	<60	<60	<60	<50	<60				
Temperature °C(°F)	>14° (57°)	>14° (57°)	>18° (64°)	>13° (55°)	>14° (57°)	>14° (57°)	>15° (59°)	>16° (61°)	>16° (61°)	>14° (57°)	>14° (57°)	>16° (61°)				
Typical fermentation kinetics	Start	Fast	Slow	Mod	Slow	Fast	Mod	Mod	Mod	Mod	Slow	Fast	Mod			
	Finish	Slow	Fast	Mod	Fast	Fast	Fast	Mod	Mod	Mod	Fast	Slow	Mod			

## 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 Lallemend direct inoculation strains are produced with the MBR® process. The MBR form of malolactic bacteria represents a Lallemend 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.

### Alpha

*O. oeni* adapted to high alcohol; enhances mouthfeel  
White, Red

Enoferm Alpha™ was selected by the IFV (formerly ITV) from a spontaneous fermentation. It shows good fermentation activity and provides a positive sensory contribution.

This strain is pH tolerant to 3.2, total SO<sub>2</sub> to 50 ppm, temperature down to 14°C (57°F) and alcohol to 15.5% (v/v).

Alpha is a dominant strain and shows good resistance to botrycides.

It is often described as enhancing mouthfeel and complexity while reducing perceptions of green and vegetative characters.

#15601	2.5 hL (66 gal) dose	\$23.00
#15602	25 hL (660 gal) dose	\$119.00
#15603	250 hL (6,600 gal) dose	\$626.00

### Beta

*O. oeni* adapted to high SO<sub>2</sub>; positive aroma impact  
White, Red

Enoferm Beta™ was isolated in the Abruzzi wine region of Italy.

This strain is pH tolerant to 3.2, total SO<sub>2</sub> to 60 ppm, temperature down to 14°C (57°F) and alcohol to 15% (v/v).

The name Beta comes from its capacity to increase levels of beta-damascenone and beta-ionone which are compounds that contribute floral notes, particularly in Merlot. In trials, winemakers have found pronounced fruity and berry notes in Cabernet Sauvignon and Merlot, when compared to the control. Beta can also be found to enhance diacetyl in white wines when used in a sequential fermentation.

Beta benefits from the addition of a malolactic nutrient.

#15604	2.5 hL (66 gal) dose	\$23.00
#15605	25 hL (660 gal) dose	\$119.00
#15606	250 hL (6,600 gal) dose	\$626.00

### ICV Elios 1

*O. oeni* adapted to high alcohol; contributes to tannin mouthfeel intensity  
Red

Lalvin MBR ICV Elios 1® was isolated by the Institut Coopératif du Vin (ICV) from a spontaneous malolactic fermentation for use in warm region red wines with high alcohol (15.5% v/v) and high pH.

Performs well when pH is above 3.4, temperatures are 18–25°C (64–77°F) and total SO<sub>2</sub> levels are < 50 ppm.

Contributes to the mouthfeel of the finished wine by enhancing the perception of overall tannin mouthfeel intensity while avoiding green and vegetative characters.

#15108	25 hL (660 gal) dose	\$105.00
#15109	250 hL (6,600 gal) dose	\$545.00

### MBR 31

*O. oeni* adapted to low temperature and low pH; enhances polyphenolic content and fruit character  
White, Red, Fruit, Cider

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 SO<sub>2</sub> 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	\$23.00
#15032	25 hL (660 gal) dose	\$105.00
#15127	250 hL (6,600 gal) dose	\$545.00

### 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	\$119.00
#15616	250hL (6,600 gal) dose	\$626.00

**PN4** LALLEMAND

*O. oeni* adapted to difficult conditions of pH, alcohol and SO<sub>2</sub>  
Red, White

MBR PN4® was isolated from a spontaneous malolactic fermentation in a Pinot Noir by the Institute of San Michele in the Trentino region of Italy.

This strain has been known to perform under difficult conditions such as low pH (3.1) and high alcohol (up to 16% v/v).

Temperature tolerant to 14°C(57°F) and tolerant to total SO<sub>2</sub> levels up to 60 ppm. Known for its fast fermentation kinetics.

For Chardonnay, PN4 is one of the highest diacetyl producers with resulting wines that tend to be creamy and buttery with a full, round mouthfeel. When used in sequential inoculation, more diacetyl is produced. Using PN4 on reds leads to more structured and spicy wines. PN4 can also increase the perception of fruitiness in reds which can mitigate unripe characters.

#15607	25 hL (660 gal) dose	\$119.00
#15608	250 hL (6,600 gal) dose	\$626.00

**NEW! SILKA** LALLEMAND

*O. oeni* adapted to high alcohol; enhances mouthfeel and oak integration  
Red

Lalvin Silka™ was isolated in Rioja, Spain and selected by the ICVV during an extensive research program.

This strain is alcohol tolerant to 16% v/v, pH tolerant down to 3.3 and temperatures down to 15°C(59°F).

Kinetics are regular and nutrient demand is moderate, so Silka would benefit from an addition of ML Red Boost.

Silka is recognized for its positive impact on mouthfeel, softening of astringency and bitterness and well-suited for wines aged in contact with oak.

#15624	25 hL (660 gal) dose	\$131.00
--------	----------------------	----------

**VP41** LALLEMAND

*O. oeni* adapted to high SO<sub>2</sub> and high alcohol; enhances complexity and mouthfeel  
Red, White

Lalvin MBR VP41® was isolated in Italy during an extensive European Union collaboration.

Performs well at a pH above 3.1 and a total SO<sub>2</sub> level of 50–60 ppm. At temperatures below 16°C(61°F) it is a slow starter but can complete fermentation.

Chosen for its strong implantation, steady fermentation, high alcohol tolerance (up to 16% v/v), enhanced mouthfeel and wine structure. An excellent strain for restarting stuck a malolactic fermentation. *See page 87.*

Both red and white wines fermented with VP41 have increased richness and complexity.

#15048	2.5 hL (66 gal) dose	\$23.00
#15042	25 hL (660 gal) dose	\$105.00
#15044	250 hL (6,600 gal) dose	\$545.00

**Storage info for Malolactic Bacteria**

**Short term (<18 months)** @ 4°C(40°F)  
**Long term (>18 months)** @ -18°C(0°F)

**PROTOCOL****Adding Direct Inoculation Cultures to Wine**

Direct inoculation cultures can be added directly to wine. Allow the packet to come to room temperature before use. For enhanced dispersion, rehydrate in 20 times its weight in 20°C(68°F) chlorine-free water for 15 minutes and then add directly to the wine. The 25 hL dose is rehydrated in 500 mL of water.



**Victor Palencia,**  
Owner/Winemaker  
**Palencia Wine Co.**  
Walla Walla, WA

“VP41 has been my favorite ML strain for over 10 years now. Its durable nature and effectiveness on our diverse portfolio of wines have given this strain our in-house ML crown. Effective in both our production and limited high-tier products, we are confident in its ability to deliver consistent and clean malolactic fermentations. It has a strong ability to get the job done, while still being gentle enough to allow the fruit nature, texture and mouthfeel of our wines to show. The relatively low VA production from this strain during the MLF process is always an added bonus.”

## EFFERVESCENT DIRECT INOCULATION CULTURES

### Malotabs LALLEMAND

*O. oeni* in tablet form for barrel addition to fresh and fruit driven wines  
White, Red

Malotabs™ are an easy-to-use form of malolactic bacteria designed by Lallemand for direct addition into barrels. Malotabs™ dissolve immediately and ensure dispersion throughout the barrel. They were designed for sequential inoculations to complement fresh and fruit driven red and white wines.

Malotabs™ are produced from a known strain developed for good implantation, moderate to fast kinetics, low VA and diacetyl production. Malotabs™ are effective in wines with pH above 3.2, high alcohol (up to 16% v/v), total SO<sub>2</sub> below 60 mg/L, temperature down to 16°C(61°F).

Red and white wines fermented with Malotabs™ show increased fruit, mouthfeel, balance and structure.

#### Usage

Malotabs™ come in packages of 5 tablets per box. Once opened, tablets should be used immediately. Unused tablets may be resealed and stored in their original packaging until ready for use. They should be stored under the same conditions as other Lallemand malolactic cultures.

#15049 2.5 hL (66 gal) dose (5/box) \$147.00

## CO-INOCULATION

### Beta Co-Inoc LALLEMAND

*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 SO<sub>2</sub> 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 25 hL (660 gal) dose \$105.00

#15618 250 hL (6600 gal) dose \$545.00

## 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.



**PROTOCOL**

**Adding 1-Step Cultures to Wine**

Activator



20°C(68°F)

Bacteria



20°C(68°F)

Wait  
18–24 hours





20°C(68°F)

**Rehydration**  
Chlorine-free H<sub>2</sub>O, wait 20 minutes, add equal volume of wine

**Inoculation**

*Please see 1-Step procedure in more detail at [www.scottlab.com](http://www.scottlab.com).*

### 1-Step Alpha LALLEMAND

*O. oeni* adapted to high alcohol; enhances mouthfeel  
White, Red

1-Step® Alpha (same strain as Enoferm Alpha) was selected by the IFV in France from a spontaneous malolactic fermentation. It shows good fermentation activity.

The 1-Step Alpha starter kit combines a highly effective malolactic starter culture with an activator to induce malolactic fermentation in an 18–24 hour acclimatization procedure.

Known strain that has proven effective at alcohol levels up to 15.5% (v/v), pH above 3.2, total SO<sub>2</sub> up to 50 ppm, and temperature down to 14°C(57°F).

#15610 100 hL (2,600 gal) dose \$230.00

#15611 500 hL (13,000 gal) dose \$915.00

### 1-Step VP41 LALLEMAND

*O. oeni* adapted to high SO<sub>2</sub> and high alcohol; 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 at high alcohol levels (up to 16% v/v), pH above 3.1, total SO<sub>2</sub> up to 60 ppm, and temperature down to 16°C(61°F).

#15029 100 hL (2,600 gal) dose \$180.00

#15058 500 hL (13,000 gal) dose \$673.00

## 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 Interprofessionnel 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 \$81.00

### 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) \$81.00

## 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, SO<sub>2</sub>, polyphenols, medium chain fatty acids and nutritional levels all affect malolactic bacteria growth and activity. Low temperatures can inhibit malolactic bacteria. High temperatures (25°C/77°F) and high levels of alcohol or SO<sub>2</sub> 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 nutrients help create a better environment in the wine. Used properly, they help 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.).

### 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 Lallemand 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.

#15681 1 kg \$53.00

## ML Red Boost

Malolactic nutrient for difficult Red fermentations; OMRI listed

Specific polyphenolics in red wines from high maturity grapes have an inhibitory effect on malolactic fermentations. To address this challenge Lallemand has formulated ML Red Boost. This malolactic bacteria nutrient is formulated from specific inactivated yeast fractions which enhance the bacteria's resistance to high polyphenol levels. In addition, the availability of certain peptides and polysaccharides in ML Red Boost favor the health of the bacteria and can be effective in reducing the duration of the MLF.

### 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 24 hours before adding the malolactic bacteria.

#15218 1 kg \$53.00

## 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.

#15217 1 kg \$53.00

## Opti'Malo Plus

Complete malolactic nutrient

Opti'Malo Plus™ is a nutrient developed by Lallemand specifically for MLF. It is a blend of inactive yeasts rich in amino acids, mineral cofactors, vitamins, cell wall polysaccharides and cellulose. The cellulose provides surface area to help keep the bacteria in suspension and to help adsorb toxic compounds that may be present at the end of primary fermentation.

### Recommended Dosage

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

### Usage

Suspend in a small amount of water or wine and add directly to the wine just before adding the malolactic bacteria. It should not be added to the rehydration water.

#15141 1 kg \$53.00

## ALL Malolactic Bacteria Nutrition

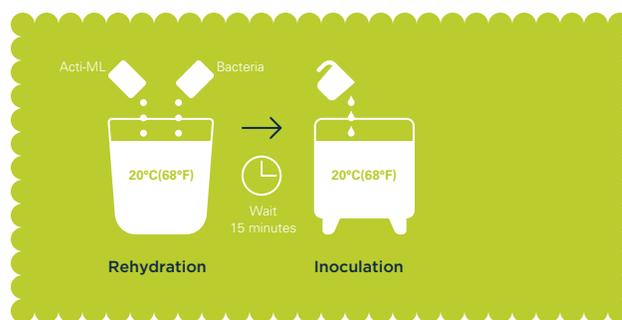
### Storage

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



### PROTOCOL

## Adding Acti-ML to Wine

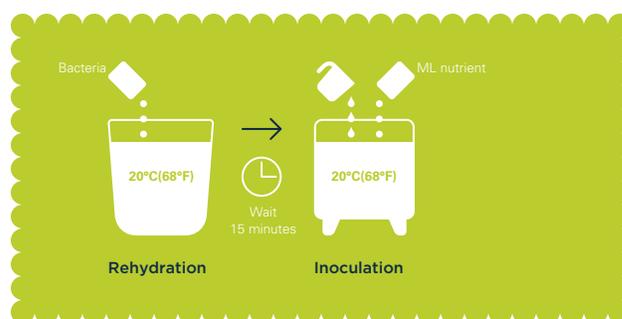


Add Acti-ML to the chlorine-free rehydration water prior to adding the bacteria.



### PROTOCOL

## Adding Opti'Malo Plus, Opti'Malo Blanc, or ML Red Boost to Wine



Add Opti'Malo Plus or Opti'Malo Blanc to the wine just before adding the bacteria. Add ML Red Boost 24 hours prior to adding the bacteria.

## Lab Analysis

### Stuck & Sluggish ML Package

When malolactic fermentations are unexpectedly slowing or have stopped completely, there are many possible inhibiting factors. This analysis set will help to identify if any of the basic chemistry parameters are out of balance. A Quick Malic Assay helps to determine if the wine has the potential to complete malolactic fermentation with specifically selected malolactic bacteria strains.

*Volume needed: 750 mL sample*

\$280.00

## Quick Troubleshooting Guide for Malolactic Fermentations

There are many factors that can influence the success of a malolactic fermentation. Before jumping into a full restart, it's a good idea to assess each of these factors. Sometimes a small adjustment is all that's needed to help a fermentation complete successfully.



### The temperature of the wine might be too low

Try warming the tank or barrels; 20°C (68°F) is optimal. A malolactic fermentation will progress much slower at cooler temperatures.



### The wine might be lacking nutrients

Try adding an ML specific nutrient like Opti'Malo Plus, ML Red Boost or Opti'Malo Blanc (*dosage and usage information on page 85*).



### The wine might need a detox

If you've already done a nutrient addition, the bacteria should have what it needs. Sometimes though, toxins can be present that impede the success of an MLF. Reskue™, a specific inactivated yeast for treating stuck fermentations, can be extremely beneficial for detoxification. Reskue should be added and racked after 48 hours (*dosage and usage information on page 50*).



### The wine chemistry might be challenging or inhibitory to the bacteria

It is essential that you check your pH, alcohol, and free and total SO<sub>2</sub> to see if one of these factors might be inhibiting the fermentation. Winemakers are often surprised by the amount of SO<sub>2</sub> in a wine when they've added little, or even none. SO<sub>2</sub> can come from several sources, including yeast during the alcoholic fermentation, vineyards, old barrels or erroneous cellar additions. Total SO<sub>2</sub> is just as important to check, as bacteria has an affinity for acetaldehyde and can break the bond between the SO<sub>2</sub> and acetaldehyde, liberating free SO<sub>2</sub> and inhibiting the ML fermentation. If any of your chemistry is challenging, make sure you've inoculated with a strain that can handle it. If your wine chemistry pushes the limits of all the strains, consider sending your wine into our lab for a Stuck & Sluggish ML analysis package (*details on page 85*).



### There may not be enough healthy *Oenococcus* to get the job done

If you did not inoculate with *Oenococcus*, there may not be enough of a healthy population present to complete the ML fermentation. Consider inoculating with a known strain that is appropriately suited to handle the chemistry of your wine. If you've already inoculated and the wine is pretty clean (low turbidity), it's possible that the bacteria are struggling to stay in suspension. Try stirring your tanks or barrels more frequently.



### You might just need to give it more time

A malolactic fermentation can be a great test of patience, taking weeks or sometimes months to complete. It's nearly impossible to determine if your ML fermentation is complete through sensory analysis alone. Getting the malic level analyzed gives you an important piece of information (most labs consider a level of 0.1 g/L malic acid to be dry). If you started with high levels of malic acid (>7.0 g/L), conditions can become difficult for bacteria as the subsequent lactic acid increases.

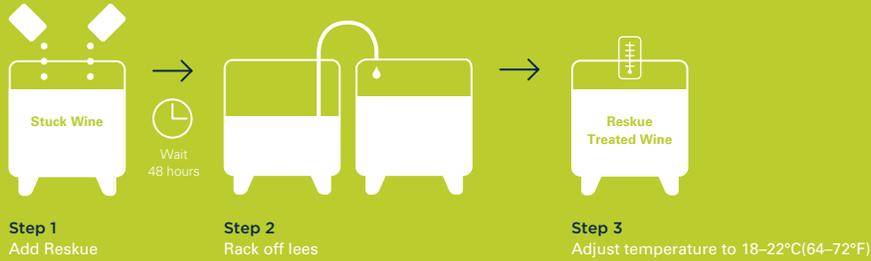
Giving attention to one of these factors can often be all it takes to ensure success, but if the fermentation continues to struggle, sometimes a full restart is necessary. *Our full restart protocol is available on page 87.*



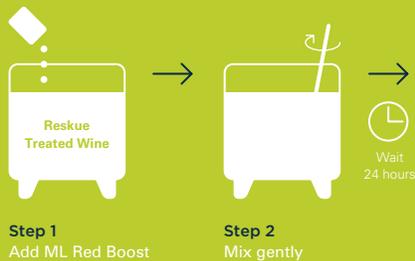
## PROTOCOL

# Recommended Method to Restart a Stuck Malolactic Fermentation

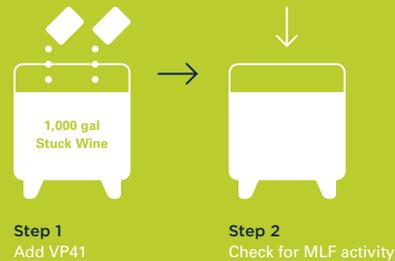
### Prepare the Stuck Wine



### Malolactic Activator Addition



### Malolactic Bacteria Addition



### Prepare the Stuck Wine

1. Add 30 g/hL (2.5 lb/1000 gal) of Reskue™ prior to restarting. Suspend Reskue™ in 10 times its weight in warm water 30–37°C(86–98°F). Wait 20 minutes then add to stuck wine.
2. Allow the tank to settle for 48 hours then rack off the settled lees.
3. Adjust the temperature of the Reskue treated wine to 18–22°C(64–72°F).

### Malolactic Activator Addition

1. Add 20 g/hL (1.7 lb/1000 gal) of ML Red Boost to the Reskue treated wine. When restarting a stuck MLF, ML Red Boost is used for white, red, and rosé wines.
2. Mix gently and wait 24 hours before bacteria addition.

### Malolactic Bacteria Addition

1. Add a double dose of VP41 direct inoculation culture (Example: for 1000 gallons, add 3 x 25hL (660 gal) packets).
2. Check for MLF activity by analyzing L-malic degradation every 2–4 days.

## FREQUENTLY ASKED QUESTIONS

**Can I use half a sachet of bacteria now and save the other half to use later?**

No. Once the sachet of bacteria is opened it must be used immediately. Exposure to oxygen and excess moisture can be detrimental to the survival of the bacteria.

**My bacteria arrived and the ice pack has melted. How can I be confident that my malolactic culture is in good shape?**

We ship bacteria overnight with ice packs. If, despite our best efforts, the ice pack has melted and the container is not cold to the touch when your bacteria arrive, **do not be alarmed**. Lallemand's proprietary manufacturing process means its bacteria is stable. Sealed packets can be delivered and stored for a few weeks at ambient temperature (<25°C/77°F) without significant loss of viability. Place the bacteria in the freezer (-18°C/0°F is preferred but up to 4°C/40°F is acceptable) and store until you need it.

**I would like to have less diacetyl in my white wines. Which strain should I choose?**

High inoculation levels of neutral strains, like O-MEGA® and VP41, will help control excessive diacetyl production. Co-inoculate by adding bacteria one day after yeast addition (if the pH is under 3.5). The diacetyl will be consumed by the yeast and bacteria. Leaving wine on the lees will also reduce diacetyl levels, as does conducting the MLF at warmer temperatures (24°C/75°F compared to 17°C/63°F).

**Can I use citric acid to acidulate my wine for increased diacetyl formation?**

We do not recommend that you use citric acid for acidification before MLF is finished. It can promote acetic acid in addition to diacetyl formation during malolactic fermentation. If increased diacetyl is the goal, choose a bacteria strain that is a known diacetyl producer such as Beta or PN4.

**Why is my malolactic fermentation not finishing?**

Check the wine parameters (free and total SO<sub>2</sub>, alcohol, pH, VA, malic acid and temperature) to determine if there is an obvious reason the fermentation is not completing. Pesticide and fungicide residue, juice concentrates and preservatives in juice or wine can also inhibit malolactic bacteria, as can a lack of essential nutrients. A restart may be necessary.

**Does the yeast strain used for primary fermentation affect the malolactic fermentation?**

Yes. Some yeast strains are harder for malolactic fermentation than others. Yeast strains differ in nutrient demand, production of SO<sub>2</sub> and rate of autolysis which has a resulting effect on the bacteria. *Please refer to the yeast charts on pages 9–14.*

**Does my bacteria need nutrients?**

Unfortunately, there is no easy answer. There are no analytical tools to determine nutrient deficiencies for bacteria. Bacteria need amino acids (not ammonium salts), peptides, vitamins and minerals to complete a successful MLF. Each strain of bacteria, like yeast, has specific requirements. We are happy to help you make a decision that is suitable for your particular wine style.

**How do I choose the correct strain of bacteria for my wine?**

Each strain of bacteria performs best within specific environmental parameters. Consider free and total SO<sub>2</sub> levels, pH, alcohol, temperature constraints as well as malic acid concentration.

**Why does the SO<sub>2</sub> need to be measured when choosing the correct strain of bacteria?**

SO<sub>2</sub> can be bound to acetaldehyde. Bacteria can break that bond and liberate free SO<sub>2</sub>, making their environment more challenging.

**How do I choose the correct nutrient for malolactic fermentations?**

Like alcoholic fermentation options we have rehydration nutrients (Acti-ML) and fermentation/conversion nutrients (Opti'Malo Plus, Opti'Malo Blanc and ML Red Boost). These nutrients can assist with the general nutritional needs of the bacteria (Opti'Malo Plus) or to overcome specific challenges that the bacteria may encounter (Opti'Malo Blanc or ML Red Boost). Opti'Malo Blanc was developed to overcome the nutritional deficiencies and growth difficulties which often present themselves in white wines. ML Red Boost was developed for challenging red wines which were harvested at high maturity levels where the level of polyphenolic compounds can pose challenges for the bacteria.

**I have tried everything to get my wine through MLF but nothing is working. What should I do?**

Sometimes MLF might not be possible in certain wines. Our laboratory can perform a Stuck & Sluggish ML Package to determine whether MLF is even possible on that wine. *Contact our laboratory for more information.*

**What is the difference between direct inoculation, 1-Step and standard build-up cultures?**

Direct inoculation cultures are acclimatized by Lallemand to withstand the rigors of direct inoculation. The 1-Step cultures are an improved version of an old concept. A simple 18–24 hour acclimatization step provides the winemaker with an option when efficiency and cost management are essential. The standard strains are generally used in sparkling winemaking due to the low pH. The procedure for building up the standard cultures is more elaborate than the other types of cultures but offers an alternative when conditions are difficult for MLF.

**I'm thinking of trying co-inoculation. Which bacteria strain should I use?**

Beta Co-Inoc was developed by Lallemand for use in co-inoculation. Due to the slow lag phase, there is less risk of malolactic fermentation finishing before primary. Therefore, there is also less risk of VA production and the result is a timely completion of both fermentations.

**If I am doing a co-inoculation, which bacteria nutrient do I need?****When should I add it, and how much should I add?**

As long as you have a good nutrient strategy and add complex nutrients for your primary fermentation, additional ML nutrients aren't always necessary. If wine conditions are very difficult: low pH (<3.2), high alcohol (>15.5 % v/v), high SO<sub>2</sub> (>45 mg/L total or 5 mg/L free SO<sub>2</sub>), and MLF has not started at the end of alcoholic fermentation (increase in lactic acid <0.2 g/L), ML nutrient additions are recommended: 20 g/hL of ML Red Boost for structured red wines or 20 g/hL Opti'ML Blanc for white wines.

A central graphic featuring a dark blue rounded rectangle with the text "MICROBIAL CONTROL AGENTS" in yellow. The rectangle is flanked by two stylized, semi-circular structures in orange and dark blue, resembling microbial components or control mechanisms. The entire graphic is set against a dark blue background with a scalloped border.

**MICROBIAL  
CONTROL  
AGENTS**

An important part of the process of making wine is controlling microbes to encourage a desirable fermentation. Practices such as adding yeast and ML starter cultures, regular sulfur dioxide additions, acidification, winery hygiene, and filtration are all common ways in which microbial control is applied during winemaking. Though many wine spoilage problems can be prevented with good winemaking practices, there are still circumstances that require extra microbial control. This section describes some of the tools that Scott Laboratories offers to prevent, inhibit or eliminate unwanted microorganisms.

## Basics

### REMOVAL

Microorganisms are physically removed from the wine. Removal strategies include filtration, centrifugation and some types of fining followed by racking.

### INHIBITION

Microbe replication is slowed or stopped, but organisms are not necessarily killed. Microbes may start to grow and multiply once the inhibitory pressure is removed. Inhibition strategies include acidification to lower pH and use of sulfur dioxide at non-lethal concentrations.

### DESTRUCTION

Microorganisms are killed and will not survive to replicate. Destruction strategies include Velcorin® treatment, No Brett Inside® or Bactiless® additions, use of lysozyme (especially at pH >4.0) and addition of alcohol (as in the case of fortified wines).

## Choosing the Right Microbial Control Agent

 Highly Recommended  
 Recommended

	Lysozyme		SO <sub>2</sub>		Chitosan	Chitin-Glucan	DMDC
	Lyso-Easy	Lysovin	Inodose Granules	Inodose Tablets	No Brett Inside	Bactiless	Velcorin
Page	91	91	92	92	93	93	94
Reds	Highly Recommended						
Whites and Rosé	Highly Recommended						
Fruit, Cider and Mead	Highly Recommended						
Protection from indigenous yeast			Highly Recommended	Highly Recommended			
Control gram positive bacteria (LAB)	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended		Highly Recommended	
Control gram negative bacteria ( <i>Acetobacter</i> )			Highly Recommended	Highly Recommended		Highly Recommended	
Inhibit oxidation of grapes and juice			Highly Recommended	Highly Recommended			
Control spoilage yeast ( <i>Brettanomyces</i> )			Highly Recommended	Highly Recommended	Highly Recommended		Highly Recommended
Protection during stuck and sluggish fermentations	Highly Recommended	Highly Recommended	Recommended	Recommended			
Delay MLF	Highly Recommended	Highly Recommended					
Helps prevent refermentation in bottle			Highly Recommended	Highly Recommended			Highly Recommended
Chitosan					Highly Recommended		
Chitin Glucan						Highly Recommended	
Listed in 27 CFR 24.250					Highly Recommended	Highly Recommended	

## LYSOZYME

Lysozyme is a naturally occurring enzyme which can be used in wine to control lactic acid bacteria (LAB) including *Oenococcus spp.*, *Pediococcus spp.* and *Lactobacillus spp.* *Oenococcus oeni* is favorably associated with malolactic fermentation (MLF) but can also produce volatile acidity (VA) under certain conditions. *Pediococcus* and *Lactobacillus* are usually considered spoilage organisms. Lysozyme is a natural product isolated from egg whites and has been used for many years as a biopreservative in the processing and storage of hard cheese.

The enzymatic activity of lysozyme can degrade the cell walls of gram-positive bacteria (including LAB) but not gram-negative bacteria (*Acetobacter*) or yeast. Lysozyme's effectiveness depends on the type of bacteria and the number of cells present.

**It is important to note that lysozyme requires a minimum seven day contact time to allow the enzyme to work.**

## Lyso-Easy CALLERMAN

Lactic acid bacteria inhibitor—ready-to-use lysozyme solution

Lyso-Easy is a ready-to-use solution of 22% lysozyme. One mL of Lyso-Easy contains 0.22 g granular lysozyme.

### Usage

No preparation is needed. Once opened, it should be used immediately.

### Storage

Dated expiration. Store tightly sealed at ambient temperature.

#16406	1 L	\$79.00
#16407	5 L	\$323.00

## Lysovin bioseutica

Lactic acid bacteria inhibitor—granular lysozyme

Lysovin is a powdered lysozyme that needs to be properly rehydrated.

### Usage

Rehydrate Lysovin in 5–10 times its weight in warm water. Stir gently for 1 minute and avoid foaming. Allow to soak for 45 minutes. Repeat until the solution is a clear, colorless liquid.

### Storage

Store in dry form for 5–10 years at 18°C(65°F). Once rehydrated, Lysovin should be used immediately.

#16402	500 g	\$99.00
#16400	1 kg	\$172.00
#16401	5 kg	\$858.00

### Recommended Dosage

Lysozyme Applications		Red	White/ Rosé	Lyso-Easy		Lysovin			Timing of Addition
<b>Inhibit Growth of LAB in Must and Juice</b> To inhibit spoilage characters due to uncontrolled microbial growth. This is especially important in high pH conditions or with grapes containing rot.		●	●	91 mL/hL	3.4 mL/gal	200 ppm	20 g/hL	0.75 g/gal	Add prior to fermentation
<b>Protection During Stuck and Sluggish Fermentations</b> To encourage yeast growth in the absence of SO <sub>2</sub> while reducing the risk of VA production by lactic acid bacteria.		●	●	114–182 mL/hL	4.3–6.8 mL/gal	250–400 ppm	25–40 g/hL	0.94–1.50 g/gal	Add at first signs of a stuck fermentation
<b>Delay MLF/Post-MLF Stabilization</b> To protect wine without the negative effects of SO <sub>2</sub> , to allow for maceration or aging, to allow for implantation of selected bacteria, or to increase efficiency of Phase I micro-oxygenation.	Delay	●	●	46–91 mL/hL	1.7–3.4 mL/gal	100–200 ppm	10–20 g/hL	0.38–0.75 g/gal	Add at juice stage or immediately after alcoholic fermentation
	Stabilize	●	●	114–228 mL/hL	4.3–8.6 mL/gal	250–500 ppm	25–50 g/hL	0.94–1.90 g/gal	Add immediately after MLF completion
Inhibit MLF when Blending Partial and Complete ML Wines		●	●	136–227 mL/hL	5–8.6 mL/gal	300–500 ppm	30–50 g/hL	1.10–1.90 g/gal	Add during blending

1 mL of Lyso-Easy contains 0.22 g granular lysozyme.

Warning: In the case of low color potential grapes such as Pinot Noir, lysozyme products should never be added prior to completion of alcoholic fermentation. If spoilage yeasts such as *Brettanomyces* are suspected, SO<sub>2</sub> addition should not be delayed. Lysozyme is only effective against gram-positive bacteria and has no effect on yeast or gram-negative bacteria.

## SULFUR DIOXIDE

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 SO<sub>2</sub> 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 wine.

### Inodose Granules

Effervescent sulfur dioxide granules

Inodose Granules are small, effervescent granules made of potassium metabisulfite and potassium bicarbonate. As they dissolve into wine or must the granules release a precise dose of SO<sub>2</sub>. Inodose Granules come in pre-measured packs. A pack of Inodose Granules 100, for example, will release 100 grams of pure SO<sub>2</sub>. Inodose Granules are perfect for SO<sub>2</sub> additions to incoming must, juice and to wines prior to clarification and fining. The potassium bicarbonate fraction in these granules has little or no effect on pH.

#### Storage

Store in a dry, well-ventilated environment at temperatures below 25°C(77°F). Use whole packet quickly once opened, as potency will decrease after opening.

#15777	2 g (40/box)	\$20.00
#15778	5 g (25/box)	\$21.00
#15780	100 g	\$10.00
#15781	400 g	\$21.00

*Note: Volume discounts are available. Please contact us for details.*

### Inodose Tablets

Effervescent sulfur dioxide tablets

Inodose Tablets are a blend of potassium metabisulfite and potassium bicarbonate. They are packaged in 2 g and 5 g dosage levels. As they dissolve into must or wine, the tablets release a precise dose of SO<sub>2</sub>. The effervescent action of the bicarbonate provides mixing in barrels or small tanks while reducing time and labor needed for stirring. The easy-to-use tablet form helps prevent overdose problems associated with traditional forms of SO<sub>2</sub> additions. Sealed strip packages keep unused tablets fresh for optimal potency. The potassium bicarbonate fraction in these tablets has little or no effect on pH.

#### Storage

Store in a dry, well-ventilated environment at temperatures below 25°C(77°F). Once the blister pack has been opened, the tablet should be used immediately.

#15775	2 g (48/box)	\$35.00
#15776	5 g (42/box)	\$39.00

*Note: Volume discounts are available. Please contact us for details.*

## Inodose Granules + Tablets

#### 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 SO<sub>2</sub> additions to barrels.

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

SO <sub>2</sub> 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 SO<sub>2</sub> products contribute 2 g or 5 g of pure SO<sub>2</sub> 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 SO<sub>2</sub>.*

### NEW! Potassium Metabisulfite

Potassium metabisulfite can be used throughout the winemaking process from pressing, to must, to finished wine.

#POTMETA1K 1 kg \$5.75

### NEW! Tartaric Acid

Tartaric acid, found naturally in must or wine, is used in a variety of cases:

- Increasing the acidity of must coming from overripe grapes with a lack of natural acidity
- Increasing the total acidity of wines after MLF and increasing aging potential.

#TARTARIC5 5 kg \$95.00

## Bactiless LALLEMAND

Acetic acid and lactic acid bacteria control

Bactiless™ is a 100% natural, non-allergenic source of chitin-glucan from a non-GMO strain of *Aspergillus niger*. Bactiless helps protect wine from acetic acid and lactic acid spoilage bacteria, reducing the production of acetic acid and biogenic amines. Bactiless can be used to drastically reduce bacteria populations and to help prevent bacteria growth in wines, especially after malolactic fermentation. It offers an interesting alternative to lysozyme treatment and/or significant amounts of SO<sub>2</sub>. The effectiveness of Bactiless can be enhanced with SO<sub>2</sub>, but it does not replace the use of SO<sub>2</sub> since it does not have antioxidant or antifungal properties. Bactiless can help inhibit malolactic fermentation when it is not desired. In wines where malolactic fermentation is desired, Bactiless should not be used until after MLF is complete.

Bactiless is shown to be effective against a broad spectrum of wine bacteria, but does not affect yeast populations.

### Recommended Dosage

200–500 ppm 20–50 g/hL 1.67–4.16 lb /1000 gal  
45–113 g/60 gallon barrel

### Usage

Suspend Bactiless in 5–10 times its weight in cool water or wine (Bactiless is insoluble, so it will not go into solution). Bactiless should be mixed to obtain a homogenous addition. Leave Bactiless in contact with the wine for 10 days and then conduct a clean racking. If malolactic fermentation is desired, Bactiless should not be added until after MLF is complete.

To determine the effectiveness, a period of 20–30 days post-racking should be respected before microbial analysis. This is regardless of method used; traditional plating, microscopic observations or RT-PCR.

### Storage

Dated expiration. Store in a dry environment below 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](http://www.TTB.gov).*

#15232 500 g \$82.00

### Bactiless Efficacy Trials as conducted by ETS Laboratories, St. Helena, California.

Trial results are the average of three replicates in cells/mL.

Treatment	Control	Bactiless 20 g/hL
Acetic acid bacteria	2,033,333	54,800
<i>Lactobacillus brevis</i> group	35,733	1,030
<i>Lactobacillus plantarum</i> group	99,333	4,867
<i>Lactobacillus kunkeei</i>	313	73
<i>Oenococcus oeni</i>	1,733,333	46,667
<i>Pediococcus</i> species	100,033	2,700

## No Brett Inside LALLEMAND

*Brettanomyces* spp. control agent

No Brett Inside® is a commercial preparation of Chitosan that was introduced by Lallemand and is distributed exclusively in the North American market by Scott Laboratories.

No Brett Inside specifically targets *Brettanomyces* cells. The active ingredient, Chitosan, works in two ways. The *Brettanomyces* cells are adsorbed onto the chitosan and settle out of the wine. In addition to the physical effect there is a biological effect which results in cell death. This double action of No Brett Inside will help to control contaminating populations helping to preserve wine quality.\* However, it cannot decrease any sensory contribution already produced by *Brettanomyces*.

*\*No Brett Inside should be added post-ML.*

### Recommended Dosage

40–80 ppm 4–8 g/hL 0.33–0.67 lb/1000 gal  
9–18 g/60 gallon barrel

### Usage

Suspend No Brett Inside in 5 times its weight in cool water (No Brett Inside is insoluble, so it will not go into solution). No Brett Inside can be added during a pumpover or tank/barrel mixings to ensure a homogenous addition. Leave the No Brett Inside in contact with the wine for 10 days and then conduct a clean racking.

To determine the effectiveness of your addition, a period of 20–30 days post-racking should be respected before microbial analysis. This is irrespective of the method used; traditional plating, microscopic observations or RT-PCR.

### Storage

Dated expiration. Store in a dry, odor-free environment below 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](http://www.TTB.gov).*

#16410 100 g \$102.00



Before

Scanning Electron Micrograph x 20,000 magnification *Brettanomyces* cells prior to being treated with No Brett Inside.



After

Scanning Electron Micrograph x 20,000 magnification *Brettanomyces* cells treated with 4 g/hL of No Brett Inside. Image shows *Brettanomyces* cells attached to the surface of the Chitosan.

Images courtesy of Biljana Petrova and Dr. Charles G. Edwards, Washington State University, Pullman, WA

## Velcorin LANXESS

Yeast inhibitor; microbial control agent

Velcorin® is the trade name for dimethyldicarbonite (DMDC), a microbial control agent produced by LANXESS. Since 1988, Velcorin has been used in the United States in wine, low-alcohol wine, non-alcoholic wine, and cider, as well as juice, juice sparklers, sports drinks and ready-to-drink teas. Since 2013, Velcorin is also approved for use in wine made in Canada. Velcorin is very effective at low dosages against a broad range of yeast, bacteria and molds. Unlike other chemical preservatives, Velcorin is non-persistent and does not affect wine taste, bouquet or color. In addition, Velcorin can remain active for several hours (depending on hydrolysis rate) thereby helping to eliminate contamination from sources such as bottles, closures and filling equipment.

### Usage

#### To help prevent refermentation in finished wines.

Wines containing residual sugar are susceptible to fermentation in the bottle which can lead to haze, off-odors, off-flavors and effervescence. Adding Velcorin to wine during bottling can help prevent refermentation. Also, Velcorin can be used to replace or decrease the amount of sorbate which is sometimes used in wines containing residual sugar.

#### To control spoilage yeast such as *Brettanomyces* (especially in unfiltered or moderately filtered wines).

*Brettanomyces* is a spoilage yeast that can produce 4-ethylphenol, 4-ethylguaiacol, and other undesirable sensory attributes. *Brettanomyces* has been known to live off of ethanol and/or cellobiose from toasted barrels as its sole carbon source. These factors can make *Brettanomyces* difficult to control in winery environments. In this application, Velcorin can be used either in the cellar or at the time of bottling.

#### To decrease the amount of sulfur dioxide used in wines.

Sulfur dioxide used in combination with Velcorin has been shown to achieve microbial stability at lower overall sulfur dioxide levels. Velcorin does not provide antioxidant protection.

#### To reduce warehouse holding time in early-to-market wines.

Velcorin can be used to decrease the amount of sulfur dioxide and/or decrease the required degree of filtration. These wines undergo speedier sulfur dioxide equilibration and less bottle-shock. They are therefore palatable sooner and can be released earlier.

### Conditions of Use

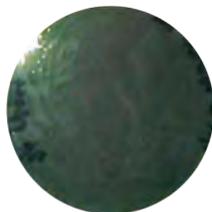
**Velcorin must be used with an approved dosing system.** Scott Laboratories will only sell Velcorin to those using a LANXESS approved dosing machine. Velcorin is a chemical and must be handled with respect. Therefore, all Velcorin handlers must undergo annual safety training (provided at no charge by Scott Laboratories, Inc.). The current cost of a Velcorin dosing machine starts at approximately \$75,000.

#18006 6 kg \$874.00

For more information on Velcorin and dosing machines, please contact Scott Laboratories, Inc.



Before



After

## Lab Analysis

### Velcorin Challenge

A Velcorin Challenge provides information on the suitability of Velcorin, a microbial control agent, as a treatment to stabilize a particular wine. This test requires submission of two 375 mL bottles of each wine to be challenged: one bottle is used as a control and the second bottle is treated with 200 ppm of Velcorin (DMDC). Wine samples should be collected with care, using sterile sampling containers and devices. Sterilize all sample ports prior to pulling samples. Twenty-four hours after Velcorin treatment, both treated and untreated samples are filtered through a 0.45 micron membrane which is then placed on WLN agar. After five days of incubation, colonies are counted and preliminary results are reported. A final report will be issued after 14 days of incubation.

*Volume needed: two 375 mL samples needed per challenge. Includes microbial analysis of both a Velcorin-treated and untreated sample.*

\$250.00 per analysis

## Methanol Testing for Velcorin Addition Quantification

Velcorin, a microbial control agent, breaks down into roughly equal parts of CO<sub>2</sub> and methanol in the presence of water. The increase of methanol due to Velcorin (DMDC) addition can be used to quantify the amount of Velcorin dosed into a particular wine. All wines contain naturally occurring methanol, and background levels may vary. If dosage quantification is desired, methanol testing needs to be performed on wine samples collected before and after Velcorin (DMDC) dosing.

$$\frac{\text{Post Velcorin Methanol} - \text{Pre-Velcorin Methanol}}{0.48} = \text{approximate ppm of Velcorin dosed}$$

*Volume needed: 50 mL needed per sample*

\$140.00 per sample

\$250.00 for Before & After analysis

*Note: Multiple avenues of attack are encouraged with any microbial control strategy, including SO<sub>2</sub> and clean racking.*

## Lysozyme

### How long does it take for lysozyme to work?

The rate of activity depends on many factors including temperature, pH, bacterial load, bacterial resistance and the specific matrix of any given wine. Even though lysozyme starts working immediately, it doesn't necessarily kill all the bacteria immediately. If lysozyme-treated wine samples are plated too quickly after treatment, results may show a false-positive. To ensure accurate results, wait one week before culturing for microbes.

### Is lysozyme effective against all lactic acid bacteria?

No, some lactic strains show resistance to lysozyme. Bench trials MUST be performed to accurately determine the effectiveness and correct addition rate of lysozyme for your wine.

### How soon after a lysozyme addition can I bottle?

Wait at least one week, even if you have diligently completed your lab trials. Lysozyme is a protein and may produce lees (especially in reds) and affect the protein stability in whites. It is not recommended to bottle white wines that contain residual lysozyme.

### Will lysozyme treatment affect the color of red wine?

Lysozyme added to red must can bind with tannins and other polyphenols that otherwise would have stabilized anthocyanins. This tannin loss can result in reduced color. In general, using 100–200 ppm should not cause a decrease in color. Lysozyme added post-MLF for microbial stability during barrel aging may have positive color effects when compared to stabilization with SO<sub>2</sub>. Any decrease in color should occur in the first few days of treatment. For low color potential grapes (e.g. Pinot Noir) lysozyme shouldn't be added before alcoholic fermentation is complete. Bench trials are critical.

## Sulfur Dioxide

### Can I use a partial bag of Inodose granules?

No, use the entire packet for a single dose of SO<sub>2</sub>. The formulation (therefore dosage), can be affected if the granules absorb any moisture.

### Can I break the Inodose tablets in half to deliver a smaller dose?

No, do not break the tablets for smaller dose additions. The combination of potassium metabisulfite and potassium bicarbonate may not be evenly distributed in the tablet. The tablets are available in two sizes to help give dosing choices.

### I added a 5 g granule sachet of SO<sub>2</sub> to my 60 gallon barrel. Does this mean I have 22 ppm of free SO<sub>2</sub>?

You have 22 ppm total SO<sub>2</sub> added. The amount of free depends on pH, residual sugar, solids, etc.

## Bactiless

### Do I have to rack my wine after 10 days?

Yes.

### Can I just add Bactiless to the top of my vessel?

No. A thorough mixing is essential.

### Does Bactiless impact the wines' sensory character?

Bactiless is neutral with regards to its sensory impact, however, it does not have the ability to remove any negative sensory compounds that may have been produced by bacterial contaminants prior to treatment.

### Does Bactiless have an impact on yeast?

Bactiless has no impact on *S. cerevisiae*. It can have a minimal impact on *Brettanomyces*, but it is not as effective as No Brett Inside. It is possible that some yeast can be caught up in the chitin-glucan matrix but this is not the best use of the product and it may not be reproducible.

### Can I induce MLF after a Bactiless addition?

This is still to be determined, however, it is highly advisable to wait until ML is complete before using Bactiless. If you have a lactic acid bacteria issue prior to inducing MLF you may wish to consider the use of Lysozyme.

### Can Bactiless be used if I am exporting?

Bactiless is currently approved by the TTB for use in domestic winemaking (27 CFR 24.250) and cannot be used in wines destined for export (even if it is permitted for use in the country that you are exporting to).

## No Brett Inside

### Do I have to rack off the No Brett Inside lees after 10 days?

Yes. The wine needs to be racked off 10 days after a No Brett Inside addition due to fact that the *Brettanomyces* cells can be adsorbed onto the surface of the Chitosan and then settle into the lees.

### Does No Brett Inside impact the sensory of the wine?

No Brett Inside is insoluble so it should not impact wine sensory. This also means that it will not remove any of the sensory compounds that may already be present due to a *Brettanomyces* infection (4-ethylphenol and 4-ethylguaiacol).

### What is the difference between Bactiless and No Brett Inside?

No Brett Inside is chitosan and Bactiless is chitin-glucan. The source is the same (*Aspergillus niger*), but the formulations are different. They are active in controlling different microbial groups.

## Velcorin

### How does Velcorin work?

Velcorin controls microorganisms by entering the cell and inactivating some of the key enzymes required for cell function.

### Why do I have to use an approved dosing system?

Due to the unique physical properties of Velcorin and to help ensure safe handling, LANXESS Corp. requires the use of an approved dosing machine. There are now several companies that offer a mobile Velcorin-dosing service. Please refer to [www.scottlab.com](http://www.scottlab.com) for a complete list of these companies.

### What factors determine Velcorin effectiveness?

The effectiveness of Velcorin depends on microbial type, microbial load and other factors. At low doses, Velcorin is very effective against yeast. At greater doses Velcorin is also effective against bacteria and certain fungi. Pre-treatment of wine must reduce the microbial load to less than 500 microorganisms/mL. Velcorin is not a substitute for good sanitation practices.

### Do I have to list Velcorin as an ingredient on the label?

No labeling is required in the United States or Canada.

### Is Velcorin-treated wine approved in countries other than the U.S. and Canada?

Velcorin approval is product and country specific. For a current list of countries that allow Velcorin-treated wine, please contact Scott Laboratories.



## Benefits of AiRD Products

- Significant water savings since no citric rinse is required.
- Specially formulated products for the wine industry.
- Innovative *BUILT FORMULA* for more effective cleaning.
- Effective at low doses over wide temperature ranges.
- Non-dusting product.
- No chlorine, other halogens, phosphates, silicates or fillers.
- Does not require hazardous shipping.
- Safer and less environmental impact than bulk chemical cleaners.

## Water Savings with AiRD Products

Classic Method	Water Used*	vs.	AiRD Process	Water Used*
Rinse	100 gallons		Rinse	100 gallons
Caustic	200 gallons		AiRD Product	200 gallons
Long Rinse	200 gallons		Short Rinse	100 gallons
Citric	200 gallons		<b>TOTAL</b>	<b>400 gallons</b>
Rinse	100 gallons			
<b>TOTAL</b>	<b>800 gallons</b>			

Due to its unique formulation, AiRD products can result in up to 50% water savings.\*

*The chart shows a common SOP for a 2,000 gallon tank cleaning.*

*\*Not including potential reuse of AiRD solutions. Actual water savings may be greater.*

## Choosing the Correct Winery Hygiene Product

- ◆ Highly Recommended
- ◊ Recommended

	Cleaning Agents				
	Cleanskin-K	Destainex-LF	Oak Restorer	Oak Restorer-HW	Wineglass
Page	98	98	98	98	98
Dosage	1.0-4.0% w/v	0.5-1.5% w/v	1.0-2.0% w/v	0.5-2.0% w/v	
Water temperature for use	68-140°F 20-60°C	104-140°F 40-60°C	68-89°F 20-30°C	104-140°F 40-60°C	
pH (1% solution)	~11.3	~10.8	~10.65	~9.6	
Removes tartrates	◆	◊	◆	◆	
Removes color	◊	◆	◆	◆	
Microbial neutralizing		◊	◆	◆	
General purpose cleaning	◊	◆			
Barrel cleaning			◆	◆	
Cellar/Tasting Glassware					◆

## CLEANING AGENTS

### Cleanskin-K ∞AIRD

Multi-purpose cleaner and tartrate remover  
Tanks and Equipment

Cleanskin-K is a 100% active, water soluble, multi-purpose potassium-based cleaning product for use in the winery. This carbonate formulation uses the power of oxygen to effectively clean stainless steel and associated materials. Cleanskin-K can be used in tanks, presses, destemmers, juice channels and more to remove tartrate crystals. Secondly, it is effective at removing wine color, protein and organic soils. In addition to the potassium carbonate, Cleanskin-K also contains proprietary percarbonates, chelation and sequestering aids, polysurfactants and a rinse aid, to leave your surfaces bright, clean, neutral and spot free.

#### Recommended Dosage

1.0-4.0% w/v (See chart)

#18500 5 kg \$43.00

### Destainex-LF (Low Foaming) ∞AIRD

Multi-purpose oxidizing cleaner for organic soils and molds  
Bottling systems, winery surfaces, lines, equipment and difficult to rinse systems

Destainex-LF is a proprietary sodium percarbonate based cleaning agents with microbial neutralizing abilities. This highly effective formulation can be used at low levels to remove wine color, protein stains, mold, mildew, and biofilms from wine contact surfaces such as: stainless steel, galvanized metals, concrete, polyethylene (low and high density), polypropylene, plastics, flexible hoses, glass and powder-coated surfaces.

Destainex-LF can be used in both automated (CIP) and manual systems. The sodium percarbonate in Destainex-LF is complemented with proprietary surfactants and chelation agents, water conditioning materials and rinse aids for a bright, clean and spot free neutral surface.

#### Recommended Dosage

0.5–1.5% w/v (See chart)

#18504 5 kg \$41.00

### Oak Restorer ∞AIRD

Oak cleaner and refresher

Oak Restorer products are proprietary cleaners formulated for use on oak surfaces. These products were developed on behalf of winery clients in Australia. These buffered carbonate blends also contain bicarbonates and surfactants to effectively remove tartrate build-up, color, tannin and protein residues, thereby extending the working life of barrels, puncheons, redwood tanks and staves. Oak Restorers are single process cleaning agents requiring only a water rinse. No subsequent neutralization is required. Oak Restorers leave your wooden surfaces refreshed, odorless and pH neutral.

#### Usage

Prepare appropriate volume with correct temperature water.

For Oak Restorer 20–30°C(68–86°F)

For Oak Restorer-HW 40–60°C(104–140°F)

Oak Restorer #18508 5 kg \$38.00

Oak Restorer-HW #18510 5 kg \$38.00

### Wineglass ∞AIRD

Cleaner for cellar and tasting room glassware

Wineglass is a liquid detergent for wine tasting room and cellar glassware with high-quality rinsing properties. Wineglass is safe to use either manually or in a dishwasher.

#18516 5 kg \$48.00

### Cleanskin-K, Destainex-LF + Oak Restorer

#### Recommended Dosage

Consult the chart on page 97 for water temperature requirements of each product. Cleaning is most effective when soft or treated water is used.

Prepare appropriate volume of potable water (typically 10% of vessel volume you are cleaning), accurately measuring the correct weight of the product. Slowly add the powder into the water, mixing until a consistent solution is obtained. Initially the prepared solution will appear milky, but will but clarify. Once the solution has clarified it is ready for use. Products can be used manually or with automated CIP systems. Contact time is based on water temperature and quality, amount of product used and turbulence of contact.

## ALL AiRD Agents

#### Dosage Rates

0.5% w/v	0.5 g/100mL	5 g/L	19 g/gal	0.67 oz/gal
1% w/v	1 g/100mL	10 g/L	38 g/gal	1.34 oz/gal
1.5% w/v	1.5 g/100mL	15 g/L	57 g/gal	2.0 oz/gal
2% w/v	2 g/100mL	20 g/L	76 g/gal	2.68 oz/gal
4% w/v	4 g/100mL	40 g/L	151 g/gal	5.36 oz/gal

#### Storage

Store in a dry, odor-free environment between 10–20°C(50–68°F) away from sunlight.



The goal of stability is to retain clarity and sensory quality in the finished wine. In enology, we can separate stability into three distinct areas:

- Microbiological Stability
- Chemical Stability
- Macromolecular Stability

Assessing stability can sometimes be challenging, however, there are many tools available to help determine and alleviate risk.

In order to obtain microbiological stability, we need to reduce the potential for microbial contamination, microbial growth, and the production of microbial metabolites (e.g. 4-ethyl phenols).

Microbial stability can be achieved by either physical or chemical means. For microbial stability options, please review our Microbial Control, Cleaning and Filtration sections.

Macromolecular (or physical) instabilities can be problematic and unsightly. This type of instability is the result of interactions between grape proteins, grape polysaccharides and polyphenolics, and can lead to hazes in the finished wine.

Chemical instabilities can be caused by metal ions, tartrate, or polyphenolic precipitation. Until recently, we have had limited tools to deal with such issues. In the last several years, however, significant progress has been made with regard to stability products.

We are pleased to now offer a range of options to assist with potassium tartrate stabilization (mannoproteins), and polyphenolic precipitation (gum arabics).

## Choosing the Right Stabilizing Aid

-  Highly Recommended  
 Recommended

	Gum Arabic		Manno-protein	Gum Arabic/ Mannoprotein Blends	
	Flashgum R Liquide	Inogum 300	Claristar	UltiMA Soft	UltiMA Fresh
Page	102	102	101	102	102
Reds	Highly Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended
Whites and Rosé	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Promote stability	Highly Recommended	Highly Recommended	Highly Recommended	Recommended	Recommended
Diminish bitterness	Highly Recommended	Highly Recommended		Highly Recommended	Highly Recommended
Diminish harsh tannins and astringency				Recommended	
Add perception of sweetness and softness	Highly Recommended			Highly Recommended	
Colloidal stability	Highly Recommended	Highly Recommended			
Tartrate (KHT) stability			Highly Recommended		
Aromatic stability			Highly Recommended	Recommended	
Listed as 27 CFR 24.250			Highly Recommended	Highly Recommended	Highly Recommended

## Claristar

Natural liquid mannoprotein preparation for tartrate stabilization  
White, Rosé, Red

Claristar is a specialty liquid mannoprotein product from Oenobrand's to aid in the natural stabilization of wines. It is the result of a patented extraction and separation technique that isolates the fraction of mannoproteins from *S. cerevisiae* with the highest Tartrate Stability Index (TSI). When added to wine, Claristar inhibits the nucleation and growth of potassium tartrate crystals. In addition to improved stability, the sensory balance of red, white and rosé wines are enhanced by the positive effect of the mannoproteins. Users note improved aromatics as well as smoothness on the palate.

Claristar has been available in Europe since 2007. Sold as a liquid, its highly purified mannoproteins are 100% soluble in wine. It can be added directly and homogenizes easily. Thanks to Claristar's enhanced potassium tartrate stabilization properties, wine can be treated immediately prior to bottling.

### Recommended Dosage

Common dosages are 80–100 mL/hL (3–3.8 L/1000 gal) for white and rosé wines and 70–90 mL/hL (2.7–3.46 L/1000 gal) for red wines.

To ensure efficacy of a Claristar addition for stability of any particular wine, bench trials **MUST** be run with laboratory analysis and verification. The amount of Claristar required will be unique to each wine. Its effectiveness is dependent upon a wine's individual characteristics (e.g. protective colloid levels, pH, alcohol, etc.) in addition to a user's chosen stability criteria. The wine submitted for bench trials **MUST** be the final blend. Claristar should be the final addition to any wine prior to filtration and bottling. *Please contact Scott Laboratories, Inc. for more information regarding the bench trial requirement.*

*Note: Claristar is not appropriate for calcium tartrate stabilization problems.*

### Usage

Claristar can be considered for use in white, rosé, and red wines that meet the below criteria:

- Are the final blend
- Have never been pH adjusted with calcium carbonate
- Are confirmed protein stable
- Are under 16% alcohol by volume

Claristar should never be added to a wine prior to cake/DE/Earth/Velo filtration, or cellulose pads. It can be added prior to crossflow and sterile cartridge filtration.

### Storage

Dated expiration. Store in a cool, dry environment at under 10°C(50°F). Once opened, use within 15 days. Can be frozen once.

*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](http://www.TTB.gov).*

#17000 2.5 L \$200.00  
#17001 20 L \$1407.00

## Lab Analysis

### Claristar Screen

This analysis will help determine if your wine meets the Claristar Use Guidelines and thus a good candidate for Claristar use.

*Volume needed: two 750 mL samples*  
\$125.00

## Confirmation of Claristar Dosage

Drops in Temperature Saturation (TSAT) values have traditionally been used as a predictive evaluation for tartrate stability. In the case of Claristar the change in the TSAT curves themselves, between control and treated wines, are compared. While TSAT values may not drop drastically, the reduced variance in curves before and after addition, signals improved stability. This relates to the rate of precipitation of crystals and the corresponding rate of dissolving crystals moving the two toward equilibrium. It is also indicative of colloidal stability in red wines.

### Without Claristar

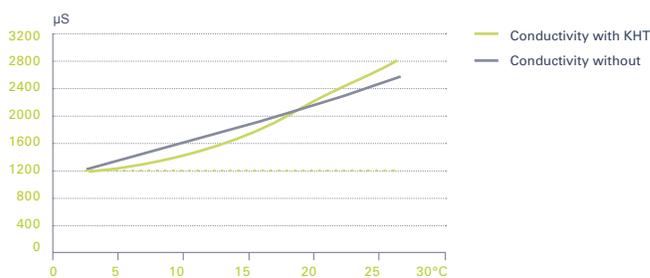
Heavy crystallization in non-treated wine.



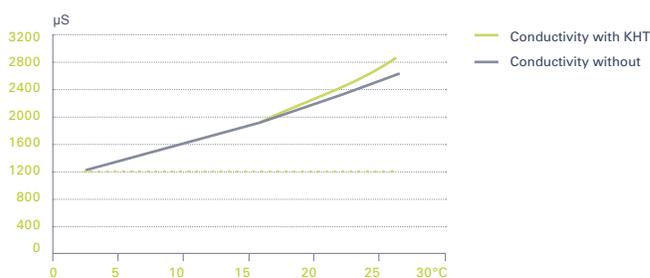
### With Claristar



Analysis of saturation curve on untreated Napa Valley Chardonnay (unstable)



Analysis of saturation curve, with 100 mL/hL Claristar



## Flashgum R Liquide

Gum arabic for colloidal protection  
Red, White, Rosé, Cider, Mead

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.

### Recommended Dosage

400–1200 ppm 40–120 mL/hL 1.5–4.5 L/1000 gal\*

*\*Bench trials recommended*

### Usage

Flashgum R Liquide should be the last commercial product added to the wine. It is best to do inline additions 24–72 hours prior to the final pre-membrane and membrane filtrations. Filterability trials prior to membrane filtration are recommended. If using on wine that is not going to be filtered, add Flashgum R Liquide just prior to bottling.

### Storage

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

#15772	1 L	\$23.00
#15773	5 L	\$76.00
#15769	20 L	\$258.00

## Inogum 300

Gum arabic for colloidal stabilization  
White, Rosé, Red, Fruit, Cider, Mead

Inogum 300 is a clear, 25% solution of purified liquid gum arabic derived from *Acacia verec*. Gum arabic products help reduce the risk of colloidal deposits collecting in the bottle in wines bottled without filtration. Its colloidal protection helps prevent precipitation of unstable color while preserving flavor and structure.

### Recommended Dosage

400–700 ppm 40–70 mL/hL 1.5–2.65 L/1000 gal\*

*\*Bench trials recommended*

### Usage

Inogum 300 should be the last commercial product added to a wine. Ideally it should be added to wine using a dosing pump. If the wine is to be filtered it is recommended that the additions be done 24–72 hours prior to the membrane filtration and that filterability trials be conducted. If the wine is not to be filtered Inogum 300 may be used immediately prior to bottling.

### Storage

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

#15793	1 L	\$22.00
#15794	5 L	\$72.00

## UltiMA Fresh

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

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. If the wine is not to be filtered, it may be used immediately prior to bottling. 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.

#17010 1 kg \$133.00

## UltiMA Soft

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

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. If the wine is not to be filtered, this fully soluble product can be added immediately prior to bottling. 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.

#17012 1 kg \$133.00

## UltiMA Fresh + UltiMA Soft

### Recommended Dosage

150–300 ppm 15–30 g/hL 1.2–2.4 lb/1000 gal\*

*\*Bench trials recommended*

### Usage

Add UltiMA Fresh or UltiMA Soft by mixing with 10 times its weight in water. UltiMA Fresh or UltiMA Soft should be the last commercial product added to the wine. Ideally it should be added to the wine using a dosing pump. If the wine is to be filtered, it is recommended that the addition be done 24–72 hours before the membrane filtration and that filterability trials be conducted prior to filtration.

### Storage

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

*Note: These products contain 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](http://www.TTB.gov).*

## Spotlight on Canned Wines

- The canned wine sector has grown 43% since 2017.
- Though still a small portion of the overall industry sales, canned wine is currently one of the fastest growing segments, accounting for \$45 million in sales.

### Considerations when prepping wine for canning:

- As with any style of wine, controlling dissolved oxygen is important. It becomes even more crucial with canned beverages. As container size decreases, the exposure per unit volume of wine to oxygen increases. Generally, it is recommended that wines be packaged <1 ppm dissolved oxygen. It should be noted that can sizes range, generally, between 187 mL–375 mL. As such, greater care should be taken to limit the uptake of dissolved oxygen.
- Proper yeast choice is also important. Using a strain such as Lalvin ICV OKAY, which produces neither SO<sub>2</sub> nor acetaldehyde, will limit SO<sub>2</sub> binding.
- During aging, the usage of Inodose SO<sub>2</sub> products to adjust Free SO<sub>2</sub> (pH dependant), and proper wine handling can help ensure low levels of dissolved oxygen. Pure-Lees Longevity Plus (@40 g/hL) can absorb up to 1.7 mg/L of dissolved oxygen.
- Using a cellaring tannin such as Scott' Tan Complex can provide structure and antioxidant protection.
- Velcorin™ (DMDC) is a powerful tool to prevent refermentation in wines containing residual sugar, and can be used to make SO<sub>2</sub> additions more effective.

*Contact Scott Laboratories for more information and to learn how our products and services can help achieve your alternate packaging goals.*

## 🔍 Lab Analysis

### Short Tartrate Stability

This analysis will help determine what tartrate stabilization product is compatible with a given wine and at what dosage rate.

*Volume needed: two 750 mL samples*  
\$290.00

### In-Depth Tartrate Stability

This analysis will help determine what tartrate stabilization product is compatible with a given wine, and at what dosage rate. In addition, the in-depth analysis will assist in avoiding any unforeseen filtration issues.

*Volume needed: four 750 mL samples*  
\$460.00



## ARTICLE

## Preparing Wine for Bottling

### Fining

Fining agents can be used on wine to deal with a variety of issues but it is important that treatments are done at the proper time. Fining can help enhance a wine's clarity as well as improve filterability. *See the fining product chart on page 109 for products and applications.* In general, it is recommended that fining take place 6–9 weeks prior to bottling.

### Filtration

The cleaner your wine is before filtration, the more cost effective that filtration will be. Limited contact and settling time for fining agents may result in incomplete effect and higher clogging during filtration. More clogging leads to higher filtration and labor costs.

### Finishing and Fine Tuning Wines

The best time to make final adjustments to a wine is 6–9 weeks prior to bottling. This can include blending as well as tannin additions for fine tuning aroma, fruit or mouthfeel.

### Heat and Cold Stabilization Pre-Bottling

Once a wine is blended, clarified and/or adjusted, it is often protein stabilized with bentonite and tartrate stabilized by one of several methods. It is recommended to heat (protein) stabilize prior to cold (tartrate) stabilization as bentonite additions may alter tartrate stability. It is important to use a bentonite that has good protein removal capacity. Sodium based bentonites have better protein removal capacity than calcium based bentonites, while calcium based bentonites compact lees better. Sometimes a blend of the two can produce the best results. Bench trials for stability and compaction can save time and money.

Bentonite is an effective adsorption tool that is also indiscriminate between desired and undesired proteins. Strategies can be employed to mitigate large bentonite adds. Small additions (2 g/hL) of FT Blanc help form tannin protein complexes (which can reduce instability). Colloidal silica, such as Gelocolle, works on high molecular weight proteins while bentonite works on low molecular weight proteins. Colloidal silica/Gelocolle can be used to reduce total bentonite requirements. Bentonite should be added first, then Gelocolle. Bench trials should be run to determine correct additions.

Performing a rough filtration prior to heat stabilization (whether the wine was fined or not), will help create a clearer product to stabilize. For rough filtration we recommend using a 3–10 micron range depth filter media.

### Stabilization by Removal

Traditional tartrate stabilization involves removal of the unstable crystals and their precursors. The common methods used are cellar chilling, electrodialysis and ion exchange. Cold stabilization chills the wine to near freezing to lower the solubility of tartaric acid. Ideally micro-pulverized KHT (cream of tartar) is added to provide nucleation sites for crystal formation. Once the tartrate crystals have formed, the wine is racked and/or cold filtered. Cold stabilization often results in lower titratable acidity and may alter pH.

Electrodialysis machines pass wine through charged membranes that substitute stable ions for those that could cause instability such as  $K^+$  and  $HT^+$ . This process lowers titratable acidity and may alter pH. Ion exchange machines use resin to substitute more stable ions (usually  $Na^+$ ) for the potassium in the wine. Both of these

processes require special equipment and a great deal of water that results in salty effluent.

### Tartrate Stabilization by Inhibition

Claristar is a mannoprotein derived from wine yeast. It does not change the charge of your wine. It will not remove KHT. It will inhibit nucleation and crystal growth while increasing the solubility of the KHT in your wine. No final blending, acid adjustments or concentration additions should be done after a Claristar addition. It is important to note that adding a mannoprotein to a protein unstable wine may only further exacerbate the protein instability. *For more information on Claristar and the suitability of your wine, see page 101.*

CMC is a well known synthesized chemical for food products. It is a etherified cellulose obtained by alkaline carboxymethylation. It works on crystals by defacing them and restricting further growth. Generally the crystals are flattened. CMC should only be used in white wines. It may precipitate color in red and rosé wines. If a wine is protein unstable, CMC may increase this instability and cause a haze. CMC should never be used in wines that have been treated with lysozyme as it will cause a protein precipitation haze. Bench trials should always be done for color loss and filterability.

Tartrate stabilizers such as Claristar or CMC are utilized just prior to bottling on protein stable wines.

Prior to adding Claristar or CMC the following should be adhered to:

- Confirm protein stability using a hot bath and turbidity meter.
- Claristar or CMC should be added 48 hours prior to bottling so it has enough time to “seat itself” in the wine.
- Before adding Claristar or CMC, wine should be filtered through 1–2 micron depth filter media. The finer this filtration, the more crystal nuclei will be removed.

### Colloidal Stabilization

Gum arabic products act as colloidal stabilizers by using electrical charge attraction and repulsion. Gum arabic is only effective in conditions of very low to no tartrate instability. They are often more effective at color stabilization by complexing with tannins and polyphenols.

When adding gum arabic the following should be considered:

- These products should be added 24–72 hours prior to bottling.
- Always check filterability after adding these products.

Gum arabic should not be added to your wine immediately prior to filtration as it may clog membrane filters. Adding right before a crossflow filtration can also place undue pressure on the elements and cause long term damage.

### Bottled Wine

Stabilizing your wine before bottling reduces the chance of haze or precipitation in the bottle. Wines that drop tartrates are subject to colloidal precipitation and vice versa. This can leave bottled wine prone to oxidation and microbial problems if filtration is not performed. For the final filtration, we recommend a .45 micron membrane filter.





Scott Laboratories' expertise in wine filtration dates back to the 1940s. Though it began with filter sheets, today it extends to virtually every stage in filtration — from juice clarification to membranes for bottling lines.

### FILTER SHEETS

Simple to use and inexpensive, filter sheets are still useful for achieving different levels of retention. Available in a large selection of grades, we offer 20 x 20 cm, 40 x 40 cm, and 60 x 60 cm. Most grades have a cellulose backing along with diatomaceous earth, perlite, or resin substrate. Depending upon the application, the sheets can be utilized to remove light or very heavy solids.

### LENTICULAR MEDIA

With a massive amount of surface area packed into a tight footprint, lenticular media takes the place of filter sheets. Instead of a large plate and frame style assembly, the media is tightly arranged in a vertical format for optimum dirt holding capacity. The media can also be quickly and easily regenerated to cut down on filtration time. A large selection of grades are available in both 12" and 16" diameter.

### CARTRIDGE

Whether you want the highest level of microbial retention, or a selective finish, we offer a wide range of grades. Cartridges can be used for small or large batches depending on the housing they are used with. With the correct grade, water purification can also be achieved.

### CROSSFLOW

Utilizing crossflow filtration offers continual cost savings by reducing wine loss, consumables, and labor. Furthermore, with a DE-free process and no solid waste for the landfill, both environmental and operator safety are improved. We offer several different size crossflow filters to meet the needs of wineries large and small.

Be sure to check out our video series, *Drops of Knowledge*. We are pleased to present detailed videos on set-up and usage for sheet filters, lenticular filter and cartridge filters.

#### FAQ

## FREQUENTLY ASKED QUESTIONS

### What grade filter media should I use?

Filtration is primarily used in winemaking to achieve two goals: to attain an acceptable level of clarity and to improve microbial stability. Consider these goals when selecting your porosity (by micron rating).

The following porosity ranges can be considered a guideline:

> 5  $\mu$  = rough    1–5  $\mu$  = polish    < 1  $\mu$  = sanitizing

If the final goal is to filter through a sterile membrane before bottling, one must consider preparation through a rough, polishing and sanitizing grade filter prior to sterile filtration. Depending on the initial state of the wine clarity (quantity and type of solids in suspension), filtration steps can be added or removed to enhance efficiency. In general, selecting media grades from each category will achieve your primary goals of clarity and improved microbial stability.

### How much wine can I filter through a 0.45 micron membrane cartridge filter before having to replace it?

The membrane will last as long as it continues to let wine through, while also passing regular integrity testing. The point in which membranes will clog is dependent upon the preparation of the wine (pre-filtration or fining), as well as the constituents of the wine (colloids and gums, for example). Regeneration using forward flushes of warm water (120–135°F/49–57°C), as well as chemical regeneration, can help to increase the longevity and throughput of membranes (or any filter media). Filter regeneration is always more effective when performed before filters are entirely clogged.

### What are the effects of fining agents, such as activated carbon and bentonite, on filtration?

Fining agents can be very useful. Some products, however, can also lead to the premature clogging of your depth and surface filter media if they have not been properly settled out and racked off the lees prior to filtration. For example, a relatively small amount of fining lees can immediately clog depth media. Also, products like bentonite and carbon can disable hollow fiber crossflow filters by jamming capillaries. Clean rackings after full settling can help prevent these issues and will help optimize efficiency of filtration.

### My wine filtered easily through my EK filters, but when I started bottling the next week, the wine immediately clogged my membrane. Why?

Depth filtration (sheets, lenticular, DE, etc.) can manage large colloidal proteins much more effectively and help prepare the wine for membrane (surface) filtration. The assistance of depth filtration is optimally effective if done within a 24 hour window of membrane filtration. If not done within this time frame, the colloidal material in the filtrate begins to regroup and can cause surface clogging on your membrane. If you must wait longer than 24 hours, you can alternatively repeat the filtration through the same grade depth filtration media before filtering through the membrane. You may also consider the use of enzymes to mitigate other clogging factors (i.e. pectins and glucans), as well as submitting samples to your laboratory for analysis to help determine strategies to proceed.



**FINING  
AGENTS**

Fining agents can be used on juice or wine to deal with a variety of issues. These include enhancement of stability and clarity, improved filterability and removal of undesirable characters and components. Fining can also unmask hidden flavors and aromas and reduce the risk of microbial spoilage. Some fining agents are single function while others can perform multiple tasks. Sometimes a combination of products is required to resolve a single problem.

Bench trials are always recommended prior to product use. Samples of fining agents for bench trials are available on request. Dosage for all fining agents for whatever purpose should be determined by such trials. Protocols should be carefully observed for bench trials and cellar additions should be prepared and used the same way.

Visit our website at [www.scottlab.com](http://www.scottlab.com) for specific product bench trial data sheets. Remember that the extent of fining can make a difference as to a wine's body, aroma, flavor and color. It can also impact the amount of filtration that will be necessary.

## Basics

### TYPES OF FINING

#### Clarification and Improve Filterability

Fining to clarify and improve filterability may involve the use of reactive substances and/or settling agents to eliminate undesirable substances. It can also be used to complement and potentially reduce the need for mechanical clarification by centrifugation or filtration.

#### Improvement of Aroma and Flavors

Fining to improve aroma and flavors may involve issues like removing bitterness, reducing perceived oxidation and eliminating "moldy" or sulfur off-odors.

#### NOTES:

- Always prepare fining agents in water (not wine or diluted wine).
- Addition by pumping using the Venturi effect is a very efficient way of dispersal. A Mazzei injector is a particularly effective tool for this purpose. Closed circulation after addition is also beneficial. Consult the manufacturer's recommendation prior to use.
- Though most fining agents react rapidly when contact is made, varying tank sizes and addition methods mean that it is always prudent to give products time to work.

Recommended minimum and maximum contact time for some of the most common fining products are shown as below.

Product	Estimated Minimum Contact Time*	Estimated Maximum Contact Time
Bentolact S	7 days	2 weeks
Caséinate de Potassium	2 days	15 days
Colle Perle, Inocolle, Inocolle Extra N1	7 days	3 weeks
Cristalline Plus	2 weeks	4 weeks
Freshprotect	7 days	2 weeks
Polycacel	10 days	3 weeks
Polycel	7 days	2 weeks
Reduless	3 days	5 days
Sparkolloid, Hot and Cold Mix	2-7 days	2 weeks

\*A taller tank requires longer contact time. Above times are estimates only. Contact times may vary depending upon the wine matrix, as well as the size and shape of container being used.



## BENTONITE

### NEW! Blancobent UF

Crossflow bentonite preparation

Blancobent UF is a highly pure and particularly effective powder sodium-calcium bentonite specifically formulated for the stabilization of wine during crossflow filtration. Due to the preparation of the bentonite and the absence of particles > 100 µm, Blancobent UF does not cause excessive abrasion to crossflow membranes. Owing to the defined particle-size distribution, it is capable of direct dosing into hollow fiber membrane crossflow systems. In this way, clarification and stabilization need only one process step. High purity and protein adsorbency reduce the dosage amount necessary relative to conventional bentonites.

#### Recommended Dosage

##### Juice

35–75 g/hL 2.9–6.3 lb/1000 gal

##### Wine

20–200 g/hL 1.6–16.8 lb/1000 gal

#### Usage

Prior to application, check prepared suspension for off-smell (see storage below). Slowly stir Blancobent UF into 8–12 times its weight in water under constant stirring. Allow a rest period of 30–60 minutes, then stir again thoroughly. After that, let the mixture swell for 6–12 hours. Pour off supernatant and add the prepared bentonite mixture to the juice while thoroughly mixing to provide even distribution. The use of warm water facilitates handling.

#15320 25 kg \$115.00

### NEW! FermoBent PORE-TEC

Co-fermentation bentonite for pre-aromatic protein stabilization

FermoBent® PORE-TEC provides early, lasting protein stabilization during alcoholic fermentation. This helps reduce the loss of aromatic compounds formed during fermentation that may subsequently be lost during traditional post-fermentation bentonite additions. FermoBent PORE-TEC also removes fermentation inhibiting substances. Due to its low iron solubility, it can remain in the fermenting vessel allowing improved CO<sub>2</sub> release during fermentation. The utilization of FermoBent PORE-TEC helps reduce the overall amount of bentonite used and can be racked off with the gross lees, helping to save time.

#### Recommended Dosage

##### Must

100–200 g/hL 8.4–16.8 lb/1000 gal

#### Usage

Prior to application, check prepared suspension for off-smell. Mix well. Dilute in 5 times its weight of water and allow to swell. Allow to settle for 4–6 hours. Add to the must and mix thoroughly to provide for even distribution. At end of fermentation a separation of the deposit is unnecessary since the bentonite deposit is separated together with the yeast.

#15321 5 kg \$30.00

### NEW! NaCalit PORE-TEC

Sodium-calcium bentonite specifically formulated for wine

NaCalit PORE-TEC is a granulated Na-Ca bentonite that is specifically formulated for instances where superior flocculation, adsorption and clarification of a wine are required.

#### Recommended Dosage *Bench trials recommended*

50–150 g/hL 4.2–12.6 lb/1000 gal

#### Usage

Prior to application, check prepared suspension for off-smell (see storage below). Stir slowly into an approximately 3–5 times its weight in water under constant stirring. Allow to swell and settle for a minimum of 4–6 hours; for best results wait 12 hours. Pour off supernatant and liquefy the prepared slurry with some of the wine to treat. Add the suspension to the vessel and mix thoroughly to provide even distribution.

#15322 5 kg \$26.00

## ALL Bentonites

#### Storage

Bentonite is highly adsorbent and must be protected from foreign smells and moisture. It is preferred to use rapidly rather than to store an open container due to this adsorbent capacity. Store in a dry, odor-free and well-ventilated environment. Reseal opened packaging immediately.

## ACTIVATED CARBON

### NEW! Granucol BI

Activated carbon pellets for adsorption of undesirable off-characters

Granucol BI is for the reduction of tannins and polyphenols, and the elimination of brownish color.

#### Recommended Dosage

10–50 g/hL 0.8–4.2 lb/1000 gal

#15330 1 kg \$20.00

### NEW! Granucol FA

Activated carbon pellets for adsorption of undesirable off-characters

Granucol FA is for the elimination of reddish off-colors due to browning.

#### Recommended Dosage

10–30 g/hL 0.8–2.5 lb/1000 gal

#15331 1 kg \$20.00

### NEW! Granucol GE

Activated carbon pellets for adsorption of undesirable off-characters

Granucol GE is for the absorption of undesired off-taste and off-aromas.

#### Recommended Dosage

10–60 g/hL 0.8–5 lb/1000 gal

#15332 1 kg \$20.00

## ALL Activated Carbons

#### Usage

Add directly to the must, wine, juice or to other beverages. The pellets immediately disintegrate after addition to the wine. Stir intensively for several minutes. Afterwards, stir again 2-3 times in short intervals. Full absorption will occur within one day. The activated carbon deposit should then be separated as soon as possible. Bench trials are highly recommended to ensure proper dose rates are achieved.

#### Storage

Store in a dry, odor-free and well-ventilated environment. Reseal opened packaging immediately.

## Bentolact S

Casein and bentonite blend for the preventative treatment of must prone to oxidation

White, Rosé, Fruit

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). It helps prevent formation of undesirable off-characters.

#### 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 pump-over or a good mixing. Depending upon the wine, a Bentolact S addition may take up to 7 days to settle. Once hydrated, Bentolact S should not be stored for more than 24 hours.

#15787 1 kg \$26.00

#15788 5 kg \$127.00

#15789 25 kg \$580.00

## Caséinate de Potassium

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

White, Rosé, Fruit, Cider

Caséinate de Potassium is used in both juice and wine for the treatment of oxidized phenolics and bitter compounds.

#### 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. Once hydrated, Caséinate de Potassium will not keep for more than 48 hours.

#15807 1 kg \$45.00

#15808 5 kg \$202.00

## Cold Mix Sparkolloid

For superior clarification of juice  
White, Rosé, Fruit, Cider, Mead

Cold Mix Sparkolloid® was developed by Scott Laboratories to clarify and fine juice. It is a blend of polysaccharides with a carrier and has a strong positive charge. This positive charge neutralizes the repelling charge of particulate matter, allowing aggregation and formation of compact juice lees. Cold Mix Sparkolloid does not remove desirable color constituents and works well with pectolytic enzymes. It is especially useful on hard-to-clarify non-*vinifera* juice.

### Recommended Dosage

#### Juice

125–250 ppm 12–24 g/hL 1.0–2.0 lb/1000 gal

#### Usage

Mix 1–2 gallons of water per pound of Cold Mix Sparkolloid. Slowly stir the Cold Mix Sparkolloid into the water. Agitate the blend with a high-speed mixer until all of the translucent globules of clarifier have been dissolved and the mixture is smooth and creamy. Add the mixture slowly to the juice and thoroughly combine. It will react rapidly but for optimal results we recommend you let it settle one week or more, depending on the volume of juice involved. Afterwards, filter, preferably from the top of the tank.

#15036 25 lb \$194.00

## Colle Perle

Gelatin for treatment of astringent wines  
Red, White, Fruit

Colle Perle is a hydrolyzed gelatin solution at a concentration of 150 g/L.

### Recommended Dosage *Bench trials recommended*

#### Juice, Wine

800–1500 ppm 80–150 mL/hL 3.0–5.7 L/1000 gal

#### Usage

##### Juice

Add at the beginning of cold settling and mix evenly and completely throughout the juice. When used in juice Colle Perle should be used in conjunction with bentonite or Gelocolle to improve settling. Racking should be done after 1 week.

##### Wine in Barrels

Stir vigorously into the wine to ensure thorough distribution. Racking should be done after 1 week. Filtration is possible 48–72 hours after fining with Colle Perle.

##### Wine in Tanks

Add gradually to the wine during a pump-over to ensure even distribution. Alternatively add through a racking valve while using a tank agitator for even distribution. Racking should be done after 1 week. Filtration is possible 48–72 hours after fining with Colle Perle.

*Note: Maximum clarification is achieved after 1 week. This is when filtration is most productive. For wines intended for aging, a second racking 1 week after the first racking will produce the best results. It is not recommended to leave gelatins in wine for more than 30 days.*

#15798 1 L \$22.00  
#15799 5 L \$73.00  
#15800 20 L \$272.00

## Cristalline Plus

Isinglass clarification treatment  
White, Rosé, Fruit

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.

#15770 100 g \$16.00  
#15771 1 kg \$141.00

## Freshprotect

PVPP blend for treatment of oxygen sensitive juice and wine  
White, Rosé, Fruit

Freshprotect is a proprietary IOC blend of polyvinylpyrrolidone (PVPP), bentonite and arabic gum.

### 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. PVPP is intended as a processing aid. Wines made with it must be racked or filtered afterwards.

#15790 1 kg \$35.00  
#15791 5 kg \$146.00  
#15792 20 kg \$479.00

## Gelocolle

Silica gel for improved settling  
Red, White, Rosé, Fruit, Cider

Gelocolle is an aqueous solution of suspended silica commonly used in conjunction with gelatins, isinglass and other organic fining agents. It helps compact lees and reduces the risk of overfining. It is also useful for hard-to-filter wines where it helps chelate proteins and other compounds.

### Recommended Dosage *Bench trials recommended*

200–1000 ppm 20–100 mL/hL 0.75–3.8 L/1000 gal

*Note: Use 1.0 mL of Gelocolle to 1.0 mL of gelatin.*

#### Usage

Gelocolle should be added directly into the wine 1 hour after fining with organic fining agents. Mix thoroughly.

*Note: Gelocolle solidifies at temperatures of less than 0°C (32°F). This process is irreversible.*

#15782 1 L \$18.00  
#15783 5 L \$67.00

## Hot Mix Sparkolloid

For superior clarification of wine  
White, Red, Rosé, Fruit, Cider, Mead

Hot Mix Sparkolloid® is specially formulated to clarify wine without impacting aroma, body or flavor. It can be used after bentonite or carbon fining to help compact lees. Hot Mix Sparkolloid can be helpful in removing haze left by other fining agents and enhances filterability.

**Recommended Dosage** *Bench trials recommended*

### Wine

125–500 ppm 12–48 g/hL 1.0–4.0 lb/1000 gal

### Usage

Heat water to boiling [1–2 gallons of water per pound Hot Mix Sparkolloid (8–15 L/kg)]. Slowly stir in the Hot Mix Sparkolloid. Maintain temperature above 82°C (180°F) while agitating the mixture constantly until all of the translucent globules of clarifier have been dissolved and the mixture is smooth and creamy (approximately 20–30 minutes). While still hot, slowly add the mixture to the wine. This is easily accomplished by adding to a tank being mixed by a tank agitator or by introducing the hot mixture into the line during a tank circulation. Let the wine settle 1 week or more, depending somewhat on the volume of wine involved. Then filter, preferably from the top of the tank.

#15035 25 lb \$179.00

## Inocolle

Gelatin to enhance the bouquet of finished wines or for the treatment of moldy must  
White, Rosé, Red, Fruit, Cider

Inocolle is a partially hydrolyzed gelatin solution at a concentration of 100 g/L. It softens wine while improving aromas and flavors. It can help clarify wine by removing both colloidal and unstable materials.

**Recommended Dosage** *Bench trials recommended*

### White Wines, Rosé, Ciders or Light Colored Fruit Wines

300–600 ppm 30–60 mL/hL 1.1–2.2 L/1000 gal

### Red Wines

500–1000 ppm 50–100 mL/hL 1.9–3.8 L/1000 gal

### When used with Gelocolle

250–500 ppm 25–50 mL/hL 0.95–1.9 L/1000 gal

### Usage

#### Juice

Introduce into juice gradually while mixing vigorously to ensure even treatment. Racking should be done after 1 week. Do not adjust juice acidity with either tartaric or citric acid prior to treatment with Inocolle.

#### Whites/Rosés

For enhanced settling and gentler fining introduce into wine 1 hour before adding Gelocolle. Mix vigorously to ensure even treatment. Racking should be done after 1 week. Filtration is possible 48–72 hours after treating with Inocolle.

#### Reds

Introduce gradually while mixing vigorously to ensure even treatment. Racking should be done after 1 week. Filtration is possible 48–72 hours after treating with Inocolle.

*Note: Maximum clarification is achieved after 1 week. This is when filtration is most productive. For wines intended for aging, a second racking 1 week after the first racking will produce the best results. It is not recommended to leave gelatins in wine for more than 30 days.*

#15795 1 L \$25.00

#15796 5 L \$86.00

#15797 20 L \$262.00

## Inocolle Extra N1

Gelatin for gentle fining of structured red wines  
Red

Inocolle Extra N1 is a powdered proprietary formulation of high molecular weight gelatin protein. It can rapidly reduce turbidity, removing colloids which otherwise might precipitate later in the wine.

**Recommended Dosage** *Bench trials recommended*

### Wine

50–100 ppm 5–10 g/hL 0.4–0.84 lb/1000 gal

### Usage

Mix Inocolle Extra N1 in 5 times its weight in warm water (35–40°C/95–104°F). Mix thoroughly. Introduce gradually into the wine making sure the temperature of the solution is maintained throughout the transfer. Mix vigorously to ensure even treatment. Racking should be done after 1 week.

*Note: Maximum clarification is achieved after 1 week. This is when filtration is most productive. For wines to be aged, a second racking 1 week after the first racking will produce the best results. It is not recommended to leave gelatins in wine for more than 30 days.*

#15801 1 kg \$30.00

## Polycacel

PVPP and casein for treatment of oxidized must or wine or for preventative treatment of browning and pinking  
White, Rosé, Fruit

Polycacel is an IOC blend of polyvinylpyrrolidone (PVPP), micro-pulverized cellulose and casein for use on problem phenols associated with browning and pinking.

**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.

#15785 1 kg \$87.00

#15786 5 kg \$260.00

## 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.

**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.

#15784    1 kg    \$76.00

## Pure-Lees Longevity Plus

Inactivated yeast blend for a very gentle fining and oxidation protection  
White, Rosé, Cider

Pure-Lees Longevity Plus™ is a proprietary blend of inactivated yeast for use immediately after alcoholic fermentation on wines susceptible to oxidation. Pure-Lees Longevity Plus is the result of work done in collaboration with INRA with different inactivated yeast fractions to evaluate the impact on oxidation. The result is a product with high dissolved oxygen uptake capacity. Oxidation can be responsible for the loss of fruit character. Use of Pure-Lees Longevity Plus helps protect color and aromas. It was more efficient than SO<sub>2</sub> at preserving color and thiols during 5-month aging trials.

### Recommended Dosage

200–400 ppm    20–40 g/hL    1.7–3.4 lb/1000 gal

### Usage

Suspend Pure-Lees Longevity Plus in 10 times its weight in water, gently mix then add to wine. Mix thoroughly. Contact time depends on aging time (1–9 months).

#15249    1 kg    \$38.00

## Reduless

Reduces sulfur off-aromas  
Red, White, Rosé, Cider

Reduless is a proprietary fining product from Lallemand for the reduction of sulfur off aromas such as H<sub>2</sub>S 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.

### 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.

#15116    1 kg    \$76.00

#15115    2.5 kg    \$146.00

## ALL Fining Agents

### Storage

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

## Lab Analysis

### Wine Enhancement Trials

Enhancement and/or fining trials to determine which product(s) and the optimal dose rates needed to achieve the desired effect.

*Volume needed: minimum of two 750 mL samples*

\$90.00/product

## FAQ

## FREQUENTLY ASKED QUESTIONS

**Do I need to run bench trials before I use a fining agent?**

Yes, bench trials are essential to determine proper dosing and efficiency. Each fining product works under a different mechanism and will react to each wine differently. Bench trials and cellar additions should be prepared and used the same way (same temperature, same mixing style, etc.). If bench trials are not performed, the winemaker may risk under or over fining and could harm the wine. Take the time to find the right dose; your wine will thank you.

**What are the main factors that influence how well fining works?**

Fining can be a delicate operation. Product preparation and addition, product concentration, temperature, product age, pH, metal content and previous fining treatments are all factors that can influence the effectiveness of fining. It is important to follow the manufacturer's instructions and maintain accuracy when using fining products.

**Which fining agents react with lysozyme?**

Carbon, silica sol, oak chips and tannin will bind and precipitate lysozyme with a resulting decrease in activity. Bentonite will bind with and inactivate lysozyme.

**Which fining agents do not react with lysozyme?**

Gelatin, potassium caseinate and pectinase do not affect lysozyme activity. In fact, pectinase treatment will help maintain lysozyme activity by breaking down phenolic compounds that can bind lysozyme.

**What is the best way to add fining agents?**

There are several ways to add fining agents. Add the fining agent to the tank while mixing with a Guth agitator, dosing into a recirculation pump setup with a stand-alone dosing machine or with a Mazzei injector.

**Non-Allergenic Fining Agents**

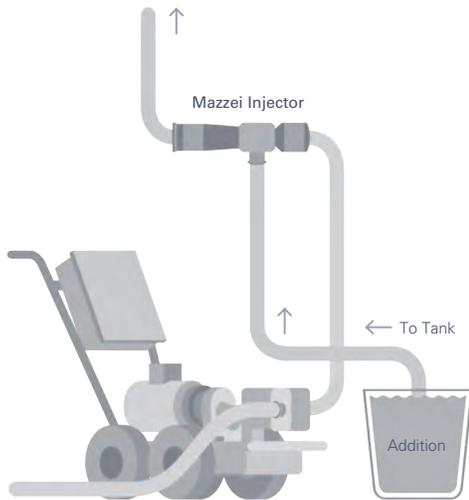
Global wine markets continue to seek ways to remove animal-derived and potentially allergenic enological products from their production process. Scott Labs is in the process of introducing a new generation of highly effective, "label friendly" fining agents. Two of these are available to trial or purchase for harvest 2019. Both products contain a blend of chitosan and chitin-glucan and at the time of this publication are listed under 27 CFR 24.250. They are awaiting a change in status from the TTB.

**Qi No [Ox]**

For removal of oxidized phenolics. Can be used as an alternative to casein.

**Qi' Up**

A flotation aid. Can be used as an alternative to gelatin.



### Mazzei Injector

The Mazzei injector is a simple venturi device which makes it easy to aerate fermenting musts and can also be used for liquid injection.

#### Usage

To energize a red fermentation with a healthy dose of oxygen, connect the Mazzei injector on the discharge side of your pump which is set to pump-over a red fermenter. The injector will draw large amounts of air and mix it well during the process.

To add liquids to a process, connect the Mazzei injector on the discharge side of your pump which is set to recirculate a tank (as you would for a pump-over). Then drop a short suction hose connected to the suction port of the Mazzei into the vessel containing your mixed addition (fining agent, carbon, tannin, anything liquid).

▶ Please visit [www.scottlab.com](http://www.scottlab.com) for a video of the Mazzei injector in action.



### Inoxpa RVN Helicoidal Pump

The Inoxpa RVN Helicoidal Pump features a unique helicoidal impeller design which provides exceptionally gentle must transfers. Due to its unique shape and flow, the Inoxpa RVN Helicoidal Pump is best-in-class for pump-over applications by providing gentle handling of solid particles without any damage, and without clogging.

RVN pumps are widely used in wineries for the pump-over process where the high capacity and minimum destruction of the solid parts (seeds, skins, etc.) is required. The design of the pump contributes to a better extraction of tannins, and reduction of lees formation, therefore achieving higher quality wines. The RVN is the standard for automated tank pump-overs. It works very well in conjunction with the Mazzei Injector.

▶ Please visit [www.scottlab.com](http://www.scottlab.com) for more information and pricing.



**David Akiyoshi,**  
Winemaker  
LangeTwins Wine Estates  
Acampo, CA

“The unique helicoidal pumphead on the Inoxpa pump is a true mainstay at LangeTwins. The gentle, low shear screw impeller is ideal for red pump-overs and operates without any worry of clogging with skins, seeds or excess solids generation. During the off-season, we use the Inoxpa for tank mixing and wine additions. Our repair rate for replacing pump seals is around 4-6% per annum and most importantly, the repair can easily be done by our cellar crew. Versatile as well as reliable, we will continue to grow our processing pump needs with Inoxpa.”



**HYBRIDS +  
NON-VINIFERA**

## Hybrid White Yeast Strains

- Yeast Strain Type
- Highly Recommended
- ◊ Recommended

	58W3	71B	Alchemy I	CWV5	CY3079	ICV Opale 2.0	Elxir	Exotics Mosaic	Lalvin C	Q.A23	Steinberger	SVG	VIN 13	VIN 2000
Page	15	15	16	18	18	30	19	28	120	22	24	24	25	25
<i>S. cerevisiae cerevisiae</i>	○	○			○	○					○	○		
<i>S. cerevisiae bayanus</i>				○					○	○				
A hybrid yeast strain							○	○					○	○
A blend of yeast strains			○											
Aromella	●		◊				◊			●			◊	
Blanc du Bois				●			◊			●			●	●
Chardonnay			●	●	●	●				●			●	●
Frontenac Blanc			●				●			●		●	●	◊
Frontenac Gris	◊	●		●		●		●	●	●				
Itasca		●		●						●			●	◊
La Crescent	●	●	●				●	●	●	●	◊	●	●	
Muscadine	◊			●					●	●			●	
Rosé		●		●		●	◊	●					●	●
Seyval Blanc			●				●			●		●		◊
Traminette	●		●				◊	●		◊	●		●	
Vidal Blanc			●	●		◊	◊							●
Vignoles	●		●			◊	●			●		●	●	
Enhances grapefruit and/or tropical aromas, aromatic thiol converter			●				●	●		●		●	●	
Vigorous; temperature control is advised			●										●	
Barrel fermentation	●			◊	●				●					●
Sur lie aging					●									
Accentuates citrus aromas						●	●							
Enhances mouthfeel					●	●		●						
Reduces malic content		●				●		●	●			●		
Brings out floral notes	●										●	●	●	
Enhances aromas in high-terpene varieties	●						●			●	●			
High ester producer	●		●	●									●	●
Enhances varietal character								●	●					●
MLF Compatibility	Average	Very Good	Good	Average	Good	Poor	Average	Very Good	Very Good	Very Good	Average	Good	Good	Good

# Hybrid Red Yeast Strains

- Yeast Strain Type
- Highly Recommended
- ◐ Recommended

	3001	71B	Alchemy III	Alchemy IV	BM 4X4	BRL 97	CLOS	CSM	ICV D254	Exotics Mosaic	Lalvin C	NT 202	RBS 133	RC212
Page	15	15	16	16	17	17	17	18	19	28	120	22	23	23
<i>S. cerevisiae cerevisiae</i>	○	○				○	○	○	○				○	○
<i>S. cerevisiae bayanus</i>											○			
A hybrid yeast strain										○		○		
A blend of yeast strains			○	○	○									
Black Spanish					●		●						●	
Chambourcin	●			●	●	◐	●	●	●			●	◐	●
Crimson Pearl			◐	●					●				◐	●
Frontenac		●		●	●			●		●	●	●	●	●
Maréchal Foch	●		●			●				●		◐		●
Marquette	●		●		●		●	●	●	●				◐
Noiret			●	◐		●	●			◐		●	◐	
Norton	◐		●	◐		●	●		●	●	●	●	●	
Petite Pearl		●	◐	●			◐		●			◐	◐	●
St. Croix			●				◐	◐				●	●	
Enhances berry fruit	●	●		●			●	●	●	●				●
Diminishes vegetal characters		●		●	●			●					●	
Increases mid-palate balance					●	◐			●					
Enhances complexity	●		●				●					●		
Enhances mouthfeel		●			●	◐		●	●			●		
High producer of polysaccharides					●				●					
Promotes color stability					●	●								
Reduces malic acid content		●								●	●			
MLF Compatibility	Average	Very Good	Good	Good	Below Average	Average	Very Good	Average	Very Good	Very Good	Very Good	Very Good	Good	Good

Due to challenging weather conditions and, to a lesser extent, disease pressure, much of North America east of the Rockies is planted with either French-American hybrids (e.g. Maréchal Foch, Chambourcin, Seyval, Traminette) or native American varieties (e.g. Norton, Muscadine, Niagara).

With one or two exceptions, native American varieties tend to have very strong fruit flavors and aromas compared to European cultivars. This is especially true of Muscadine and Labrusca varieties. The combination of the strong fruit and high acid in many varieties creates wines that are often balanced by residual sugar. Of the native varieties, Norton is the most successful in producing a dry wine with flavors and aromas which come close to those of *Vitis vinifera*.

French-American hybrid varieties are crosses between *Vitis vinifera* and one or more American varieties. As breeding hybrid grapes involves multiple generations of these crosses, it is possible to create cultivars that have aromas and flavors that are more or less reminiscent of their European ancestors, and the overt fruitiness from the American side can be muted to a greater or lesser degree. Cultural methods in the vineyard can affect this fruit expression, as can the degree of ripeness at harvest. The expression of fruit characteristics can also be influenced by the strain of yeast used to ferment the wine. Yeast can enhance or mute flavors and aromas. Some yeast strains contain genes that can convert flavorless precursors into aromatic elements, while others produce enzymes that cleave glycosidic bonds and release aromatic terpenes into the wine. Yeast can also produce high levels of polysaccharides which can increase mouthfeel, balance harshness and acidity (within reason) and add to the colloidal stability of the wine.

In the last few years, new strains of yeast have shown promise with hybrids and native American varieties. Some of these are listed on the following charts.

## HYBRID AND NON-VINIFERA PRODUCTS

### Clear Extreme RAPIDASE

Enzyme for hard to settle Hybrid and American grapes

Hybrid and American grape varieties may be difficult to clarify due to unique grape characteristics and the cool climate conditions for processing. Rapidase Clear Extreme can be used after pressing to help preserve aroma freshness, reduce viscosity, improve juice clarity, help compact lees and speed up clarification even in difficult conditions (low temperature, low pH, hard to settle varieties). Rapidase Clear Extreme will remain active from 6–50°C(43–122°F).

#### Recommended dosage (dependent on temperature):

6–10°C(43–50°F)	4 g/hL	152 g/1000gal
10–12°C(50–54°F)	2 g/hL	76 g/1000gal
Above 12°C(54°F)	1 g/hL	38 g/1000gal

Settling time less than 6 hours

Above 10°C(50°F) 3 g/hL 114 g/1000gal

#### Usage

Dissolve Rapidase Clear Extreme in 10 times its weight in water, stir gently, allow to sit for a few minutes. Then add to the juice right after pressing.

#### Storage

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

#16257 100 g \$23.00

### 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 harvest 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	Juice	Wine
20–25 g/ton	Not recommended	Not recommended

#### Usage

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

#### Storage

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

#16260 100 g \$24.00

### Lalvin C LALLEMAND

*S. cerevisiae* • *bayanus*

Yeast for use in cool climate wines high in malic acid, cider, fruit wines, restarting stuck fermentations, 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.

#### Technical Information

Fermentation temperature	15–30°C(59–86°F) ideal [may go down to 12–14°C(54–63°F)]
Lag phase	Very short
Nitrogen needs	Low
SO <sub>2</sub> production	Low
Fermentation speed	Moderate
Vigor	High
Alcohol tolerance	17% (v/v)
Volatile acidity	Very low
Competitive factor	Sensitive
Sensory contribution	Neutral

#15689 500 g \$34.00

### LalVigne LALLEMAND

LalVigne is an organic yeast derivative foliar spray applied at veraison. For a full product description, please see page 38.

#17501	3 kg LalVigne Aroma	\$107.00
#17500	3 kg LalVigne LA	\$107.00
#17511	1 kg LalVigne Mature	\$92.00
#17510	1 kg LalVigne LM	\$92.00

### Scottzyme KS + KS Plus

Enzyme blends for enhanced settling and filtration.

See descriptions and pricing on page 75.



**FRUIT WINES  
+ MEAD**

Making wine from sources other than grapes can be quite different and can pose many challenges. Numerous tools used in grape fermentation can also be utilized in fruit or mead fermentation.

These tools can help the winemaker create a better product and ultimately enhance product longevity. The following information has been compiled to highlight our recommendations.

## Basics

### YEAST

Using a selected yeast strain can maximize the positive attributes that come with a “known” strain (e.g. mouthfeel, complexity, flavor profile, fermentation kinetics), while avoiding off-flavors, bad aromas and poor fermentation characteristics that may come with a “wild”, unknown strain. The key to strain choice is matching the right strain to the chosen wine style and fermentation conditions. Proper rehydration of the selected yeast strain is essential.

### NUTRIENTS

Fruit wines and mead are notorious for having low nutrient content. Proper nutrition for both yeast and malolactic bacteria is essential to ensure good flavor and aroma profiles. It can also help to avoid stuck or prolonged fermentations and H<sub>2</sub>S and VA problems.

### MALOLACTIC BACTERIA

Malolactic fermentation can help soften wines made from fruit with high malic acid content. Using a “known” strain can again maximize chosen attributes. If the winemaker’s goal is to reduce acid without adding flavor/aroma characteristics, then a neutral strain should be used. If flavor enhancement and complexity are desired, then the choice might be MBR 31. Many fruit wines have unbalanced acid profiles and can lean toward a low pH. Be sure to choose a strain that falls within the parameters of your wine.

### ENZYMES

All fresh fruits contain pectin in varying amounts. Pectin can hold small particles in suspension and create a cloudy wine if the excess pectin is not removed. Pectolytic enzymes (Scottzyme Pec5L) can break up the large pectin molecules into smaller, less troublesome ones. Some enological enzymes can also help improve fruit yield, filterability, pressability and settling in wine. Try Scottzyme Pec5L alone or in conjunction with Scottzyme HC on berries, stone and pome fruits to enhance pressability and to improve clarity and settling. Scottzyme HC provides hemicellulase activity to help increase yield, reduce solids and improve filtration. If you are experiencing a nightmare filtration or have compromised fruit, consider using Scottzyme KS or Scottzyme KS Plus. Use Scottzyme KS or Scottzyme KS Plus only after pressing. Try Scottzyme BG or Lallzyme Beta to release bound terpenes. Use them only after the residual sugar level is below 0.5%. Bench trials are essential to determine the correct dosage. Two weeks after enzyme addition, it is acceptable to ameliorate the wine to the desired sugar level.

### TANNINS

Tannins give wine its characteristic structure and can contribute to its longevity. Some types of fruit contain very little natural tannin, which can make producing a well-balanced wine difficult. Enological tannins can be added to enhance flavor, aroma characteristics and complexity. They may also reduce the risk of oxidation and to help stabilize wine color. Try FT Blanc Soft to give a perception of sweetness without adding sugar. Add FT Rouge or FT Rouge Soft to help enhance complexity and stabilize wine color. Addition of FT Rouge Berry will allow for the development of enhanced red berry characters. FT Blanc Citrus will allow for the development of enhanced aromatic characters. The use of Radiance will help promote balance and mouthfeel, while maintaining acidity. It is also known for revealing fresh fruit, vanilla, coconut and caramel.

### FINING AGENTS

Typically, fining agents are used to enhance clarity in fruit wine and mead. Fining agents can also help with settling, stability and oxidation. Before adding any fining agent to your wine, be sure to run a laboratory bench trial to determine the correct dosage. To remove excess astringency or to enhance wine bouquet, try the gelatins Colle Perle or Inocolle. Bentolact S can remove excess protein, improve stability and reduce bitterness. Try Hot Mix Sparkolloid NF to gently clarify and brighten the wine. Add Cristalline Plus (isinglass) to brighten and clarify both red and white wine. Caséinate de Potassium (casein) can treat oxidation and help prevent further browning. Redules is naturally rich in copper and may help decrease sulfur and phenol related defects.

### SULFUR DIOXIDE

Sulfur dioxide is used to inhibit the growth of microorganisms and to help reduce the risk of oxidation. Inodose SO<sub>2</sub> Granules and Tablets are easy to use and are already measured into specific doses for your convenience.

### YEAST DERIVATIVE NUTRIENTS

Opti-WHITE, OptiMUM White and Booster Blanc are natural yeast derivatives. Use them at the onset of fermentation to increase mouthfeel, help avoid browning and protect natural fresh aromas during aging. Add near the end of fermentation to simulate extended lees aging. Opti-RED, Opti-MUM Red and Booster Rouge are natural yeast derivatives high in polyphenol reactive polysaccharides. Add at the onset of fermentation to enhance mouthfeel and to help stabilize color. Noblesse can be used to improve the perception of fruit and roundness and softness in the finish. It may be added at the onset of fermentation or near the end of fermentation.

## Choosing the Right Product for Fruit Wines and Mead

🔹 Highly Recommended

🔸 Recommended

Yeast	Fruit	Mead	Page
71B	🔹		15
ICV D47	🔹		19
DV10	🔹	🔹	19
EC1118	🔹	🔹	19
K1 (V1116)	🔹	🔹	21
Lalvin C	🔹		120
M2	🔹		21
OKAY	🔹		30
QA23	🔹	🔹	22
R2	🔹		23
Sensy	🔹		31
VIN 13	🔹	🔹	25
W15	🔹	🔹	26

### Nutrients

	Fruit	Mead	Page
Fermaid A	🔹	🔹	49
Fermaid K	🔹	🔹	49
Fermaid O	🔹	🔹	49
Anchorferm	🔹	🔹	48
Go-Ferm	🔹	🔹	46
Go-Ferm Protect Evolution	🔹	🔹	46

### Malolactic Bacteria

	Fruit	Mead	Page
Alpha	🔹		81
IB (Inobacter)	🔹		84
MBR 31	🔹		81
PN4	🔹		82

### Enzymes

	Fruit	Mead	Page
Beta	🔹		71
BG	🔹		73
HC	🔹		74
KS	🔹		75
KS Plus	🔹		75
Pec5L	🔹		76

Tannins	Fruit	Mead	Page
FT Blanc	🔹		61
FT Blanc Citrus	🔹		61
FT Blanc Soft	🔹	🔹	61
FT Rouge	🔹		62
FT Rouge Berry	🔹		62
FT Rouge Soft	🔹		62
Radiance	🔹		65

### Fining Agents/Stability

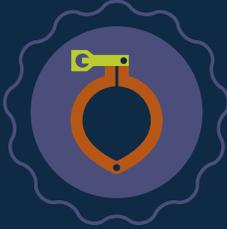
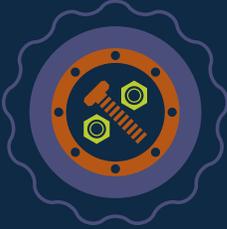
	Fruit	Mead	Page
Bentolact S	🔹		111
Caséinate de potassium	🔹		111
Colle Perle	🔹		112
Cristalline Plus	🔹		112
Freshprotect	🔹	🔸	112
Flashgum R Liquide	🔹	🔹	102
Gelocolle	🔹		112
Hot Mix Sparkolloid NF	🔹	🔹	113
Inocolle	🔹		113
Inogum 300	🔹	🔹	102
Polycacel	🔹		113
Reduless	🔹	🔹	114

### Yeast Derivative Nutrients

	Fruit	Mead	Page
Booster Blanc	🔹	🔹	52
Booster Rouge	🔹		53
ICV Noblesse	🔹	🔹	53
OptiMUM White	🔹	🔹	53
Opti-MUM Red	🔹		53
Opti-Red	🔹		54
Opti-WHITE	🔹	🔹	54

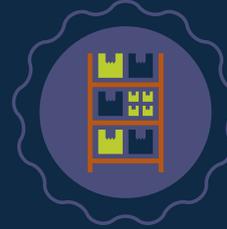
# WHO WE ARE

## Equipment, Parts & Service



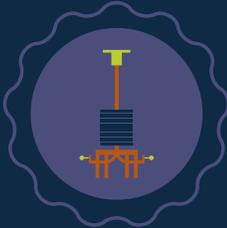
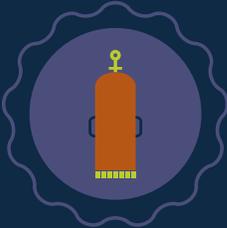
We offer a wide range of crushpad and filtration equipment, all focused on improving wine quality and efficiency. Our seasoned Parts & Service teams are available to provide support, guidance and service for all of our offerings.

## Shipping



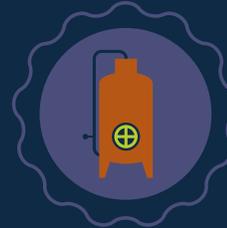
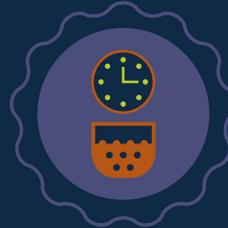
Our seasoned staff works efficiently to ensure all products are well packaged in a timely and cost-effective manner. We provide a wide range of shipping methods to fulfill customer requirements.

## Filtration



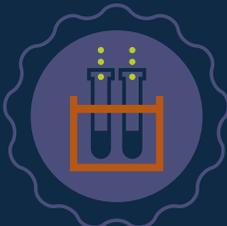
We have filtration specialists on-staff available to support filtration strategies and challenges, with attention to quality and production.

## Fermentation



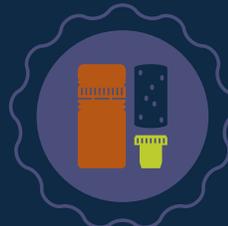
Our experienced Inside Sales and Technical team has 318 years of combined experience in the wine industry.

## Laboratory



Our laboratory does year-round R&D, trials, and support for our portfolio of products.

## Cork & Packaging



The average tenure of a cork operator at Scott Laboratories is over 17 years, with many of them having been with the company for close to 30 years.

## Communications



Launched last harvest, the new Scott Labs' website was designed to enable customers the opportunity to conveniently obtain technical information, place orders at anytime, and have visibility of their complete order history.

## Outside Resources



Our outside team of 15 is spread out across six different states, covering the entire U.S. and Mexico. Their regional expertise helps customers find solutions specific to their unique winemaking needs.

# GENERAL TOOLS

## Calculations and Conversions

### Volume Conversions

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](http://www.onlineconversion.com)  
[www.wineadds.com](http://www.wineadds.com)  
[www.winebusiness.com/tools](http://www.winebusiness.com/tools)

### Temperature Conversions

<b>F° = Degree Fahrenheit</b> C° to F° = (C° x 9/5) + 32	<b>F°</b>	0	32	40	50	60	70	80	90	100	110	120
<b>C° = Degree Celsius</b> F° to C° = (F° - 32) x (5/9)	<b>C°</b>	-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
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.

## Product Storage and Stability Guidelines

Product	Recommended Storage (once opened)	Optimal Storage Temperature
Active Dried Yeast	Use immediately	20°C(68°F)
Bactiless	Dry, odor-free environment	Below 25°C(77°F)
Bentolact S	Dry: Tightly sealed; dry Rehydrated: should not be stored more than 24 hours.	25°C(77°F)
Biodiva	Use immediately	4°C(39°F)
Caséinate de Potassium	Dry: Tightly sealed; dry Rehydrated: should not be stored more than 48 hours.	25°C(77°F)
Claristar	Use immediately	10°C(50°F)
Cleaning Products (AIRD)	Dry, odor-free environment away from sunlight.	10–20°C(50–68°F)
Colle Perle	Tightly sealed	25°C(77°F)
Cristalline Plus	Tightly sealed; dry	25°C(77°F)
Exotics Mosaic	Use immediately	5–15°C(41–59°F)
Freshprotect	Tightly sealed; dry	25°C(77°F)
Gaia	Use immediately	4°C(39°F)
Gelocolle	Use immediately	10–20°C(50–68°F)
Gum Arabics	Tightly sealed	25°C(77°F)
Inocolle	Tightly sealed	25°C(77°F)
Inocolle Extra N1	Tightly sealed; dry	25°C(77°F)
Inodose Granules & Tablets	Use immediately	25°C(77°F)
Ionys <sub>WF</sub>	Use immediately	4°C(39°F)
Lallzymes	Dry: General Storage Rehydrated: Use within a few hours	25°C(77°F)
Lyso-Easy	Use immediately	18°C(65°F)
Lysovin	Dry: General Storage Once opened, use immediately.	Dry: 5–10 years @ 18°C(65°F) Rehydrated: use immediately.
Malolactic Bacteria	Use immediately	Short term: @ 4°C(39°F) Long term: @ –18°C(0°F)
Mannoproteins	Tightly sealed	25°C(77°F)
No Brett Inside	Dry, odor-free environment	Below 25°C(77°F)
Polycacel	Tightly sealed; dry	25°C(77°F)
Polycel	Tightly sealed; dry	25°C(77°F)
ProDessert	Use immediately	4°C(39°F)
ProElif	Use immediately	4°C(39°F)
ProRestart	Use immediately	4°C(39°F)
Pure-Lees Longevity Plus	Tightly sealed; dry	Below 25°C(77°F)
Rapidase Enzymes	Tightly sealed; refrigerate.	4–8°C(39–45°F)
Scottzymes	Liquid: Tightly sealed; refrigerate Dry: Tightly sealed; dry environment	1–2 years: Store liquid forms: @ 4°C(39°F) Store dry forms: @ 18–24°C(60–77°F)
Sparkoloid NF (Hot & Cold Mix)	Tightly sealed; dry	4 years @ 18°C(65°F)
Tannins	Tightly sealed; dry	18°C(65°F)
Velcorin	Not recommended	20–30°C(68–86°F)
Yeast Nutrients, Yeast Derivative Nutrients, ML Nutrients	Tightly sealed; dry	18°C(65°F)

Note: Most products have an expiration date on the package. Please check the product and then use storage guidelines above.

## INDEX

18-2007	15	EC1118	19	Noblesse (ICV)	53	UltiMA Fresh	102
43	15	Elios 1 (ICV)	81	NT 50	22	UltiMA Soft	102
43 RESTART	15	Elixir	19	NT 112	22		
3001	15	Exotics Mosaic	28	NT 116	22	Velcorin	94
58W3	15	Enzymes	68–77	NT 202	22	VIN 13	25
71B	15	Epernay II	26	No Brett Inside	93	VIN 2000	25
		(see CEG)		Nutrient Vit End	50	VP41	82
Acti-ML	84	EX (Lallzyme)	71			VRB	26
Alchemy I	16	EX-V (Lallzyme)	71	OKAY (ICV)	30		
Alchemy II	16			Oak Restorer-CW	98	W15	26
Alchemy III	16	Fermaid 2133	51	Oak Restorer-HW	98	Wineglass	98
Alchemy IV	16	(see SIY 33)		O-MEGA	72		
Alpha (Enoferm)	81	Fermaid A	49	Opale 2.0 (ICV)	30		
Anchorferm	48	Fermaid K	49	Opti-MUM Red	53		
Assmanshausen (AMH)	16	Fermaid K (Kosher)	49	OptiMUM White	53		
		Fermaid O	49	Opti'Malo Plus	85		
BA11	16	Fermivin Champion	20	Opti'Malo Blanc	85		
Bactiless	93	Fermivin 3C	20	Opti-RED	54		
BC (Bayanus)	17	Fermivin A33	20	Opti-WHITE	54		
BDX	17	Fermivin 4F9	20				
Be Fruits	30	Fermivin MT48	20	Pec5L (Scottzyme)	76		
Bentolact S	111	Finishing Kit	66	Performance (Scottzyme)	76		
Bentonite	110	Flashgum R Liquide	102	Persy	31		
Beta (Enoferm) bacteria	81	Flavia	29	Phosphate Titres	50		
Beta (Lallzyme) Enzyme	71	Freshprotect	112	PM (Prise de Mousse)	26		
Beta Co-Inoc	83	Fruit wines	121–123	PN4	82		
BG (Scottzyme)	73			Polycacel	113		
Biodiva	28	Gaia	29	Polycel	114		
BM45	17	Gelocolle	112	Potassium metabisulfite	92		
BM 4x4	17	Go-Ferm	46	ProDessert	31		
Booster Blanc	52	Go-Ferm Protect Evolution	46	ProElif	32		
Booster Rouge	53	GRE (ICV)	20	ProMalic	32		
BRG	17			ProRestart	32		
BRL97	17	HC (Scottzyme)	74	Pure-Lees Longevity Plus	114		
		Hot Mix (Sparkolloid NF)	113				
Activated Carbon	111			QA23	22		
Caséinate de Potassium	111	IB (Inobacter)	84				
CEG	26	Inocel	50	R2	23		
(see Epernay II)		Inocolle	113	RA17	23		
Chitosan	93	Inocolle Extra N1	113	RBS 133	23		
(see No Brett Inside)		Inodose SO <sub>2</sub> Granules	92	RC212	23		
Chitin-Glucan	93	Inodose SO <sub>2</sub> Tablets	92	Rapidase Clear Extreme	72		
(see Bactiless)		Inogum 300	102	Rapidase Expression Aroma	72		
Cinn-Free (Scottzyme)	73	Ionys	21	Rapidase Extra Press	73		
Claristar	101			Rapidase Revelation Aroma	73		
Cleaners (AiRD)	96–98	K1 (V1116)	21	REDStyle	54		
Clos	17	KS (Scottzyme)	75	Reduless	114		
Cold Mix (Sparkolloid NF)	112			Reskue	50		
Colle Perle	112	LalVigne	38	Rhône 2056	23		
Color Pro (Scottzyme)	74	Lalvin C	120	Rhône 2226	23		
Color X (Scottzyme)	74	LUXE Tannin Kit	65	Rhône 4600	23		
Cristalline Plus	112	Lyso-Easy	91	R-HST	24		
Cross Evolution	18	Lysovin	91	RP15	24		
CSM	18						
Cuvée Blanc (Lallzyme)	71	M2	21	Sensy	31		
CVRP	18	M83	21	SIY 33 (Fermaid 2133)	51		
CVW5	18	Malotabs	93	SIY Cell Hulls	51		
CY3079	18	Mannoproteins	102	Silka	82		
		MBR 31	81	Steinberger (DGI 228)	24		
D21 (ICV)	18	Mead	121–123	SVG	24		
D47 (ICV)	19	ML Red Boost	85	Syrah	24		
D80 (ICV)	19	MMX	72				
D254 (ICV)	19	Montrachet (Davis 522)	26	T73	24		
Davis 522 (Montrachet)	26	MT	22	Tango Malbec	24		
Diammonium Phosphate	48	MT01	84	Tartaric Acid	92		
(DAP)				The Oak Lab	57		
DV10	19						

## HOW TO ORDER

### www.scottlab.com

Our easy-to-use website makes planning and submitting your harvest orders easier than ever. Try one, or all, of these convenient features this season:



#### Quick-Order Shopping Cart

Our website's shopping cart allows you to quickly enter orders without navigating to every item page. Simply open the site directly to [scottlab.com/shop/basket](https://www.scottlab.com/shop/basket) and start entering search terms or item numbers.



#### PDF Order Planner

Order Planner at [scottlab.com/order-planner](https://www.scottlab.com/order-planner) to easily plan and organize your full harvest season list in one place.



#### Order Upload

Do you love spreadsheets as much as our web team? Assemble your order in a spreadsheet and you can load a CSV file directly as a shopping cart. Head to [scottlab.com/upload-cart](https://www.scottlab.com/upload-cart) to learn more and download the CSV template.



#### Reorder

Head to the **My Account** section ([scottlab.com/profile](https://www.scottlab.com/profile)) of the site and you can search back through your past **Invoices** and **Shipments**. If you have an order that you want to re-create, click the handy "**Reorder**" button to load the items from that invoice or shipment into your shopping cart.



#### Order Templates

If you have groups of items that you order regularly or want to save for quick re-ordering, nothing beats our **Order Templates** feature. Just assemble a shopping cart by browsing the site or using any of the handy tools listed above, and from the **Shopping Cart** page choose "Save as Order Template." Next time you want to start an order from this list of items you can load it from either your "My Account" section of the site, or directly from the **Shopping Cart** page. Great for filter media and other recurring purchases.

## CIDER + SPARKLING BOOKS

Scott Laboratories is proud to provide trusted resources for all of your fermentation endeavors. For a copy of our Sparkling or Cider Handbook, please contact us.



# Notes

A series of horizontal dotted lines for writing notes.







**SCOTT LABORATORIES, INC.**

1480 CADER LANE, PETALUMA, CA 94954

TEL 707 765 6666, FAX 707 765 6674

[WWW.SCOTTLAB.COM](http://WWW.SCOTTLAB.COM), [INFO@SCOTTLAB.COM](mailto:INFO@SCOTTLAB.COM)