



SCOTT LABORATORIES
2017 FERMENTATION HANDBOOK



WELCOME

Last year's Handbook highlighted some exciting changes that were going on in the company, and this year will follow suit. In November of 2016, we packed up and said goodbye to the building we'd called home for the last three decades. Moving just a few streets away, we completed construction on a brand-new building in just less than ten months. With the goal of increased capacity and customer service, the new building houses 60 employees, expanded warehouse space and greater shipping capabilities.

As with all years, we had notable changes to our Scott family. After 30 years of running our Equipment department, Bruce Edwards retired to enjoy life outside of the world of stainless steel. We also welcomed several new employees into our fold – fabulous additions that continue to be a mirror of wine industry growth.

As in any industry, with growth comes the desire to experiment and try new things. Our goal is to provide tools for these new directions. This year, we broke Specialty Yeast off into its own section, as we continue to add more unique strains to this area of our portfolio. We now offer a full range of non H₂S or SO₂ producing strains, as well as numerous innovative non-Saccharomyces strains and multi-yeast blends. We have also introduced a new yeast derivative nutrient, Opti-MUM Red™, which can help increase color and mouthfeel and reduce astringency. In our Microbial Control section, you will find a new product, Bactiless™. Bactiless is a new, natural product for the control of Acetobacter and lactic acid bacteria (LAB). It offers an interesting one-two punch against gram positive and negative bacteria.

Finally, we are excited to offer winemakers a chance to craft their wines on the lab bench using our Finishing and Tannin Kits. We custom designed these kits with easy-to-dose liquid product for simple, fast trials. We hope these tools continue to expand your options for crafting the best wines possible.

Wishing you a safe and successful harvest!



Adrienne Hoffman
Inside Sales — Healdsburg



Annamarie Howard
Fermentation Technical Sales — Central Coast



Brandy LaVoy
Inside Technical Sales



Brooke Jennett Koch
Inside Technical Sales



Caitlin Matejcek
Inside Sales — Central Coast



Carly Shepherd
Marketing Coordinator



Cheryl Donovan
Inside Sales — Central Coast



Hayley Milunich
Inside Sales



Kassy Velasco
Inside Sales



Kathy McGrath
Outside Technical Sales



Maggie McBride
Tannin/Stability Specialist



Margaret Karrer
Inside Technical Sales



Maria Peterson
Filtration Specialist



Michael Jones
Outside Technical Sales



Monica Royer
Sales & Marketing Strategist



Nichola Hall
Outside Technical Sales



Rebekka deKramer
Inside Technical Sales

TABLE OF CONTENTS

4-5	Suppliers	67-74	Malolactic Bacteria
5	New Products	69	Freeze-Dried Direct Inoculation Cultures
6-35	Yeast	70	Effervescent Direct Inoculation Cultures
6	Premium Yeast Strains	71	Co-Inoculation
7	Easy Steps for Optimal Yeast Rehydration	71	1-Step Cultures
8	Selection Chart: White, Rosé and Sparkling Wine Yeast Strains	72	Standard ML Freeze-Dried Build-Up Cultures
10	Selection Chart: Red Wine Yeast Strains	72	Malolactic Bacteria Nutrients
22	Vi-A-Dry Yeast Strains	75-81	Microbial Control Agents
23	Article: "Tips and Tools for Rosé Winemaking"	77	Lysozyme
24-29	Specialty Yeast	78	Sulfur Dioxide
26	Yeast Blends	79	Bactiless
27	Non-Saccharomyces Yeast Strains	79	No Brett Inside
28	Non-H ₂ S or SO ₂ Producing Strains	80	Velcorin
29	Encapsulated Yeasts	82-86	Cleaning
30	Method to Restart Stuck Fermentations	83	Cleaning Agents
32	Method to Restart Stuck Fermentations using 43 Restart	85	Article: "Considerations for Selecting and Evaluating a Cleaning Agent"
33	Method to Rehydrate ProRestart	87-91	Stability
34	Article: "LaVigne Foliar Spray"	91	Article: "Preparing Wine for Bottling"
36-48	Nutrients	92	Filtration
38	Article: "Optimizing Alcoholic Fermentations"	93-100	Fining Agents
39	Article: "Nutrient Notes and Strategy"	101-103	Sparkling Wine
40	Rehydration Nutrients	103	Article: "Foam Stability in Sparkling Wines"
41	Fermentation Nutrients	104-107	Hybrids & Non-Vinifera
44	Yeast Derivative Nutrients	108-109	Specialty Wines
49-58	Tannins	110-111	Who We Are
52	Fermentation Tannins	112-113	General Tools
54	Cellaring Tannins	112	Calculations and Conversions
55	Finishing Tannins	113	Product Storage and Stability Guidelines
56	Luxe Tannins	114	Index
57	OTT Tannins	115-122	Scott Laboratories Order Form
59-66	Enzymes		
61	Lallzyme		
62	Scottzyme		
65	Rapidase		

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.lallemmandwine.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 44th 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 upon 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

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

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

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 speciality 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

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 to 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

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.

OENOBRANDS

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

Located outside Adelaide in South 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.

NEW PRODUCTS

PREMIUM YEAST

Ionys_{WF} Page 17

SPECIALTY YEAST

Alchemy III Page 26

Alchemy IV Page 26

Be Fruits Page 28

NUTRIENTS

Opti-MUM Red™ Page 46

TANNINS

Finishing Kit Page 56

Luxe Tannin Kit Page 57

ENZYMES

Scottzyme Performance Page 64

MICROBIAL CONTROL

Bactiless™ Page 79

PREMIUM YEAST

Yeast has been an important part of our portfolio ever since our predecessor company (Berkeley Yeast Laboratory) was founded in 1933. Our first commercial yeast offerings consisted of strains given to us from the collection of the University of California College of Agriculture at Berkeley. The college had safeguarded them throughout the dark years of Prohibition. In each of the 84 subsequent harvests, we have learned and evolved. We are uniquely positioned to assist winemakers in meeting new 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 8–11, 25.)

pH and SO₂

The effectiveness of SO₂ is directly related to the pH. SO₂ additions should never be standardized. They must ALWAYS be adjusted according to the pH and conditions of the fruit. Additional SO₂ 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

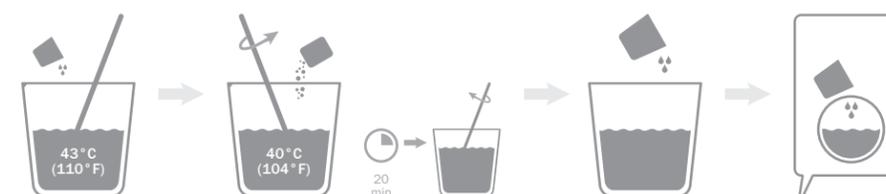
What will the fermentation temperature be? Choose a yeast strain that fits within the determined temperature range. Do not stress your yeast by keeping it at the lowest or highest end of its temperature tolerance range.

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



Step 1

Add Go-Ferm or Go-Ferm Protect Evolution to warm water.

Step 2

Cool, add yeast, stir, let stand for 20 minutes, stir.

Stir

Step 3

Atemperate. Repeat if necessary.

Step 4

Inoculate.

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, atemperament 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 40 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 atemperament step may need repeating for very low temperature must/juice. Each atemperament step should last about 15–20 minutes. For every 10°C(18°F) temperature difference between the must/juice and the yeast slurry, an atemperament 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 atemperament 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 8–11, 25). 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.

**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 for a video animation of this protocol.

WHITE, ROSÉ & SPARKLING WINE YEAST STRAINS

	43	43 Restart	58W3	71B	Assmanshausen (AMH)	BA11	BC (Bayanus)	BM45	BM 4x4	BRG	Cross Evolution	CW5	CY3079	ICV D21	ICV D47	ICV D254	DV10	EC1118
Page	12	12	12	12	12	13	13	13	13	13	14	14	14	15	15	15	15	15
<i>S. cerevisiae cerevisiae</i>			○	○	○	○		○		○			○	○	○	○		
<i>S. cerevisiae bayanus</i>	○	○					○					○					○	○
Yeast hybrid											○							
Yeast blend									○									
Chardonnay								●	●	●	●	●	●	●	●	●	●	●
Chenin Blanc												●						
Gewürztraminer			●		○	●					●				○		●	
Pinot Blanc						●					●						●	
Pinot Gris			●	●		●					●						●	
Riesling			●	●	●	●					●							
Sauvignon Blanc						●					●							
Sémillon			●								●					●		
Viognier			●			●									○			
Dry Whites			●	○	○	●		○	○	●	●	●	●	○	●	●	●	●
Rosé				●		●					●	●	○	●	○			
Late Harvest	●	●															○	○
Icewine	●	●															○	○
Sparkling Base						○	●				●						●	●
Restart Stuck	●	●					●										●	○
Secondary Ferm							○										●	●
Alcohol Tolerance ¹	18%+	18%+	14%	14%	15%	16%	17%	15%	15%	15%	15%	15%	15%	16%	14%	16%	17%	18%
Relative Nitrogen Needs ²	Low	Low	Med	Low	Low	High	Low	High	High	Med	Low	Low	High	Med	Low	Med	Low	Low
Temp. Range (°F) ³	55-95	55-95	54-77	59-85	68-86	50-77	59-86	64-82	64-82	64-88	58-68	57-82	59-80	61-82	59-68	54-82	50-95	50-86
Fermentation Speed	Fast	Fast	Mod	Mod	Slow	Mod	Fast	Mod	Mod	Mod	Mod	Fast	Mod	Mod	Mod	Mod	Fast	Fast
Competitive Factor	Yes	Yes	Yes	Snstv	Snstv	Snstv	Snstv	Yes	Yes	Ntrl	Yes	Yes	Snstv	Yes	Yes	Ntrl	Yes	Yes
Sensory Effect	Ntrl	Ntrl	EVC Esters M	Esters	EVC	Esters M	Ntrl	EVC M	EVC M	EVC	EVC M	Esters	EVC M	EVC M	EVC M	EVC M	Ntrl	Ntrl
MLF Compatibility	Good	Good	Avg	Very Good	Very Good	Below Avg	Good	Below Avg	Below Avg	Avg	Avg	Avg	Good	Avg	Good	Very Good	Good	Avg

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

² Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart. See article on page 39.

³ The temperature column indicates general performance possibilities. It is not a substitute for sound winemaking. Yeast may be stressed or die if temperatures are sustained at extremes of their tolerance. Keep in mind that a yeast's ability to ferment within the given range also depends on alcohol and other antagonistic conditions.

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

	Elixir	Ferminvin Champion	Ferminvin 3C	ICV GRE	K1 (V1116)	M2	MB3	NT 116	ICV OKAY	ICV Opale	QA23	R2	Rhône 4600	R-HST	Steinberger (DGI 228)	SVG	VIN 13	VIN 2000	W15
Page	16	16	16	16	17	17	17	18	28	18	19	19	20	20	20	20	21	21	21
<i>S. cerevisiae cerevisiae</i>			○	○	○	○	○		○	○			○	○	○	○			○
<i>S. cerevisiae bayanus</i>		○									○	○							
Yeast hybrid	○							○									○	○	
Yeast blend																			
Chardonnay	●	●	●			●		○		●	●		●				●	●	
Chenin Blanc			●	●	●			●									●	●	
Gewürztraminer											●	●		●	●		○		●
Pinot Blanc									●		●								
Pinot Gris	○							●				○	○		●	●	○		●
Riesling				●							○	●		●	●	●	●	●	●
Sauvignon Blanc	●					●		○		●	●	●	○	●	●	●	●	●	●
Sémillon				●	●			●		●	●								
Viognier	○		●					○	●		○	○	●	●			●	●	
Dry Whites				●	●	●	●	●	●	●	●	●	○	●	●	●	●	●	●
Rosé	○			●		●	●	○	●	●	●		●	○		○	●	○	●
Late Harvest								○					●		○		○		
Icewine								○				●	●				○		
Sparkling Base								○		○	○						○		
Restart Stuck		●						●									●		
Secondary Ferm											●								
Alcohol Tolerance ¹	15%	18%	14%	15%	18%	15%	15.5%	15.5%	16%	14%	16%	16%	15%	15%	13%	15%	16.5%	15.5%	16%
Relative Nitrogen Needs ²	Med	Med	Med	High	Low	High	Med	Med	Low	Med	Low	High	Low	Med	Med	Med	Low	Low	High
Temp. Range (°F) ³	57-77	59-86	61-72	59-82	50-95	59-86	63-82	54-61	54-86	59-86	59-90	41-90	56-72	50-86	59-77	61-79	54-61	55-61	50-81
Fermentation Speed	Slow	Mod	Slow	Mod	Fast	Mod	Mod	Fast	Mod	Mod	Fast	Mod	Mod	Mod	Slow	Mod	Fast	Mod	Mod
Competitive Factor	Snstv	Ntrl	Yes	Yes	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Snstv	Yes	Yes	Yes	Yes
Sensory Effect	EVC Esters	Ntrl	EVC M	EVC M	Esters	Esters M	EVC	Esters	Esters	EVC Esters	EVC	Esters	Esters	Ntrl M	Ntrl	EVC	EVC Esters	EVC Esters	EVC M
MLF Compatibility	—	Good	Good	Good	Poor	Good	Avg	Good	Very Good	Poor	Very Good	Good	Good	Avg	Avg	Good	Good	Good	Very Good

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 page 105 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

	43	43 Restart	3001	71B	Assmanshausen (AMH)	BC (Bayanus)	BDX	BM45	BM 4X4	BRG	BRL97	CLOS	CSM	CVRP	ICV D21	ICV D80	ICV D254	Fermivin A33	Fermivin Champion	Fermivin MT48
Page	12	12	12	12	12	13	13	13	13	13	13	14	14	14	15	15	15	16	16	16
<i>S. cerevisiae cerevisiae</i>			○	○	○		○	○		○	○	○	○	○	○	○	○	○		○
<i>S. cerevisiae bayanus</i>	○	○				○													○	
Yeast hybrid																				
Yeast blend									○											
Barbera							◊	◊	◊		●	●			◊	◊	◊			
Cabernet Franc								◊			◊		●	●	◊	◊	◊	●		
Cabernet Sauvignon							●	●	●		◊		●	●	●	●	●	●		
Carignane				◊			●					●								
Grenache				●				●	●		◊	●			◊		◊			
Malbec											●	●					●	●		●
Merlot							●	◊	◊		●		●	●	●	●	◊	●		
Mourvedre											●		●		●					●
Nebbiolo								●	●		●	●			◊	◊	◊			
Petite Sirah					●			●			●			●						
Pinot Noir			●		●			◊		●	●									
Sangiovese	●							●	●						◊		●			
Syrah	●					●	●		◊		◊	●			●	●	●			●
Tempranillo								◊				●		●	◊	◊	◊			
Zinfandel	●				●	●	●	●	●		●	●			●	●	●			●
Young Reds				●	◊		●				●		●	●	◊	◊	●			
Aged Reds	◊				●	◊	◊	●	●		●	●	◊		●	●	●			
Restart Stuck	●	●				◊													●	
Alcohol Tolerance ¹	18%+	18%+	15%	14%	15%	17%	16%	15%	15%	15%	16%	17%	14%	16%	16%	16%	16%	15.5%	18%	15%
Relative Nitrogen Needs ²	Low	Low	Med	Low	Low	Low	Med	High	High	Med	Med	Med	High	Med	Med	High	Med	High	Med	Low
Temp. Range (°F) ³	55-95	55-95	54-90	59-85	68-86	59-86	64-86	64-82	64-82	64-88	62-85	57-90	59-90	64-86	61-82	59-82	54-82	72-86	59-86	68-86
Fermentation Speed	Fast	Fast	Mod	Mod	Slow	Fast	Mod	Mod	Mod	Mod	Mod	Fast	Mod	Mod	Mod	Mod	Mod	Fast	Mod	Mod
Competitive Factor	Yes	Yes	Yes	Snstv	Snstv	Snstv	Snstv	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl	Ntrl	Ntrl	Ntrl
Sensory Effect	Ntrl	Ntrl	EVC	Esters	EVC	Ntrl	EVC M	EVC M	EVC M	EVC M	EVC	EVC M	EVC	EVC M	EVC M	EVC M	EVC M	EVC	Ntrl	M
MLF Compatibility	Good	Good	Avg	Very Good	Very Good	Very Good	Avg	Below Avg	Below Avg	Avg	Avg	Very Good	Avg	Very Good	Avg	Avg	Very Good	Good	Good	Good

¹ The alcohol tolerance column indicates performance possibilities in good circumstances and conditions. Alcohol tolerance may vary as circumstances and conditions vary.
² Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart. See article on page 39.

³ The temperature column indicates general performance possibilities. It is not a substitute for sound winemaking. Yeast may be stressed or die if temperatures are sustained at extremes of their tolerance. Keep in mind that a yeast's ability to ferment within the given range also depends on alcohol and other antagonistic conditions.

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

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

	ICV GRE	Iony ⁵ Vir	M2	MT	NT 50	NT 112	NT 116	NT 202	RA17	RBS 133	RC212	Rhône 2056	Rhône 2226	Rhône 4600	RP15	Syrah	T73	VRB	W15
Page	16	17	17	18	18	18	18	18	19	19	19	19	20	20	20	20	21	21	21
<i>S. cerevisiae cerevisiae</i>	○	○	○	○					○	○	○	○	○	○	○	○		○	○
<i>S. cerevisiae bayanus</i>																	○		
Yeast hybrid					○	○	○	○											
Yeast blend																			
Barbera	◊				◊							●	●						●
Cabernet Franc	●			◊	●	●	◊	◊			◊		●		●			◊	
Cabernet Sauvignon	●	●	●	●	●	●	●	●			●	◊	◊		●				
Carignane			●	●	●	●	●									●			
Grenache	●				●				●		●	●	◊	◊		◊			◊
Malbec		●						●		◊					●				
Merlot	●	●			●	●	●	●				◊	●		●	●	●	●	
Mourvedre	●					●	●									●		●	
Nebbiolo	◊			◊	◊							◊					●	◊	
Petite Sirah		●			●										●	●	●	●	
Pinot Noir	◊							●	●		●			●	●				●
Sangiovese	◊	●						◊		●		◊	●				◊	●	●
Syrah	●	●	●		●	●	●					●		●	●	●	●		●
Tempranillo	◊	●		◊	◊							◊						●	●
Zinfandel	◊				◊	●	●			●		●	●		●		●	●	
Nouveau	●		●	◊	●				●		◊	◊	◊	◊		◊	◊		◊
Young Reds	●		●	●	●				◊	●	●		●	●	●	●	●	●	●
Aged Reds			●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●
Restart Stuck			◊									◊							
Alcohol Tolerance ¹	15%	16%	15%	15%	15.5%	16%	15.5%	16%	15.5%	15%	15%	16%	17%	15%	17%	16%	16%	17%	16%
Relative Nitrogen Needs ²	High	High	High	Med	Med	Med	Med	Med	High	Med	Med	Med	High	Low	Med	Med	Low	Med	High
Temp. Range (°F) ³	59-82	77-82	59-86	59-90	57-83	76-83	56-83	68-83	61-84	61-82	68-90	59-82	59-82	56-72	68-86	59-90	65-95	58-80	50-81
Fermentation Speed	Mod	Mod	Mod	Mod	Fast	Fast	Fast	Fast	Mod	Mod	Mod	Mod	Fast	Mod	Mod	Mod	Mod	Mod	Mod
Competitive Factor	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Snstv	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl	Yes
Sensory Effect	EVC M	M	Esters M	EVC M	EVC Esters	EVC	EVC	EVC Esters	EVC	EVC	EVC	Esters	EVC M	Esters	EVC	EVC	Esters M	EVC M	EVC M
MLF Compatibility	Good	Good	Good	Avg	Good	Below Avg	Good	Very Good	Below Avg	Good	Good	Good	Below Avg	Good	Avg	Avg	Below Avg	Good	Very Good

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 page 105 for more information on yeast choices for hybrid and non-vinifera grapes.

PREMIUM YEAST STRAINS

43

S. cerevisiae • *bayanus*

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

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
#15140	10 kg

43 RESTART

S. cerevisiae • *bayanus*

Restart stuck fermentations

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 Rhone 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 more quickly 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 SO₂ and H₂S 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 32](#).

#15223	500g
#15240	10kg

3001

S. cerevisiae • *cerevisiae*

Pinot Noir, Chambourcin

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 SO₂ 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
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58W3

S. cerevisiae • *cerevisiae*

Pinot Gris, Gewürztraminer, Riesling, Viognier, Sémillon

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
#15631	10 kg

71B

S. cerevisiae • *cerevisiae*

Pinot Gris, Riesling, Grenache, Rosé, Red French Hybrids, American Cultivars, Fruit Wines

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
#15078	10 kg

ALCHEMY STRAINS

Alchemy I and II, for use in whites.

NEW! Alchemy III and IV, for use in reds.

For more information about the Alchemy strains, please see the new Specialty Yeast section on page 24.

ASSMANSHAUSEN (AMH)

S. cerevisiae • *kudriavzevii*

Pinot Noir, Zinfandel, Riesling, Petite Sirah

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
#15633	10 kg

BA11

S. cerevisiae • *cerevisiae*

Riesling, Viognier, Sauvignon Blanc, Pinot Blanc, Pinot Gris, Gewürztraminer, Sparkling Base, Rosé

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
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BC (BAYANUS)

S. cerevisiae • *bayanus*

Restart Stuck Fermentations, Secondary Fermentations, Syrah, Zinfandel

Selected from the collection of the Pasteur Institut 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 SO₂ and VA producer. It is fructophilic and often used to restart stuck or sluggish fermentations.

#15234	500 g
#15235	10 kg

BDX

S. cerevisiae • *cerevisiae*

Merlot, Cabernet Sauvignon, Zinfandel, Syrah, Carignane

Selected from the Pasteur Institut 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
#15635	10 kg

BM45

S. cerevisiae • *cerevisiae*

Sangiovese, Cabernet Sauvignon, Grenache, Zinfandel, Nebbiolo, Chardonnay, Syrah, Aged 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 H₂S 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
#15066	10 kg

BM 4X4

S. cerevisiae • blend

Sangiovese, Cabernet Sauvignon, Grenache, Zinfandel, Nebbiolo, Chardonnay

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
#15200	10 kg

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
#15670	10 kg

BRL97

S. cerevisiae • *cerevisiae*

Pinot Noir, Zinfandel, Barbera, Merlot, Nebbiolo, Malbec, Mourvedre, Norton

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
#15205	10 kg

CLOS

S. cerevisiae • *cerevisiae*

Syrah, Grenache, Carignane, Tempranillo, Zinfandel, Petite Sirah, Barbera, Norton

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
#15204	10 kg

CROSS EVOLUTION

S. cerevisiae • hybrid

Chardonnay, Gewürztraminer, Pinot Blanc, Marsanne, Rousanne, Riesling, Sauvignon Blanc, Rosé

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
#15641	10 kg

CSM

S. cerevisiae • *cerevisiae*

Cabernet Sauvignon, Cabernet Franc, Merlot, Mourvedre

Selected by the 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
#15639	10 kg

CVRP

S. cerevisiae • *cerevisiae*

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

Selected from the Lallemand yeast collection. CVRP is the highest polysaccharide producer in the collection.

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

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

Good compatibility with malolactic bacteria.

#15208	10 kg
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CVW5

S. cerevisiae • *bayanus*

Chardonnay, Chenin Blanc, French Colombard, Pinot Gris, Sémillon

Selected from the Lallemand yeast collection, CVW5 is a daughter strain of the 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 SO₂.

Strong fermenter even under difficult conditions.

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

#15237	500g	
#15210	10 kg	NEW SIZE!

CY3079

S. cerevisiae • *cerevisiae*

Chardonnay, Pinot Blanc, Chardone1

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 H₂S when properly fed.

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

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

#15061	500 g
#15082	10 kg

ICV D21

S. cerevisiae • *cerevisiae*

Merlot, Syrah, Zinfandel, Cabernet Sauvignon, Chardonnay, Mourvedre

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

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

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

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

#15143	500 g
#15163	10 kg

ICV D47

S. cerevisiae • *cerevisiae*

Chardonnay, Sémillon, Pinot Blanc

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
#15643	10 kg

ICV D80

S. cerevisiae • *cerevisiae*

Cabernet Sauvignon, Merlot, Syrah, Zinfandel, Petite Sirah

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
#15133	10 kg

ICV D254

S. cerevisiae • *cerevisiae*

Cabernet Sauvignon, Syrah, Zinfandel, Sangiovese, Chardonnay, Norton

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 foremouth 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
#15021	10 kg

DV10

S. cerevisiae • *bayanus*

Chardonnay, Sparkling Base, Gewürztraminer, Pinot Gris, Late Harvest, Fruit Wine, Pinot Blanc, Secondary Fermentations

Selected in Epernay, France.

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

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

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

#15062	500 g
#15106	10 kg

EC118 (PRISE DE MOUSSE)

S. cerevisiae • *bayanus*

Sparkling Base, Late Harvest, Icewine, Fruit Wine, Secondary Fermentations

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

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 EC118™ can produce high amounts of SO₂ (up to 50 ppm) and, as a result, may inhibit malolactic fermentation.

#15053	500 g
#15076	10 kg

ELIXIR

S. cerevisiae • hybrid
Sauvignon Blanc, Chardonnay, Viognier, Rosé

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

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

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

Recommended for aromatic whites and rosés to enhance floral and fruity aromas with greater complexity.

#15214 500 g

FERMIVIN 3C

S. cerevisiae • *cerevisiae*
Chardonnay, Viognier, Chenin Blanc, Chardonef

Fermivin 3C was selected by Oenobrand.

Fermivin 3C is a moderate fermenter, low foaming with optimum fermentation temperature of 16–22°C (61–71°F), alcohol tolerance (up to 14% v/v), and a low VA and H₂S 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

FERMIVIN A33

S. cerevisiae • *cerevisiae*
Cabernet Franc, Cabernet Sauvignon

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 SO₂ (up to 50ppm free) and a low VA and H₂S producer.

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

#17100 500 g

FERMIVIN CHAMPION (formerly Fermichamp)

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

#17145 10 kg

FERMIVIN MT48 (formerly Cepage Merlot)

S. cerevisiae • *cerevisiae*
Merlot, Sangiovese, Grenache, Tempranillo

Fermivin MT48 was selected in Bordeaux as an ideal yeast strain for Merlot by the ITV (Institut Technique du Vin) 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. Mouth-feel 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 on Sangiovese, Grenache and Tempranillo.

#17106 500 g

ICV GRE

S. cerevisiae • *cerevisiae*
Cabernet Franc, Grenache, Cabernet Sauvignon, Merlot, Syrah, Chenin Blanc, Riesling, Rosé, Marsanne, Roussanne

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

#15142 10 kg

NEW! IONYS_{WF}

S. cerevisiae • *cerevisiae*
Malbec, Petit Sirah, Sangiovese, Syrah, Tempranillo, Cabernet Sauvignon, Merlot

IONYS_{WF}™ 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_{WF} is recommended for fermenting reds from warmer climates with high pH and high potential alcohol. The acidification ‘power’ of IONYS_{WF} 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, SO₂ and H₂S, with an alcohol tolerance of up to 16% (v/v). IONYS_{WF} 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%. IONYS_{WF} has a moderate fermentation speed with a long, but steady stationary phase.

With proper nutrition and temperature control, wines made with IONYS_{WF} are characterized as having fresh fruit and mineral characters and fine-grain tannins.

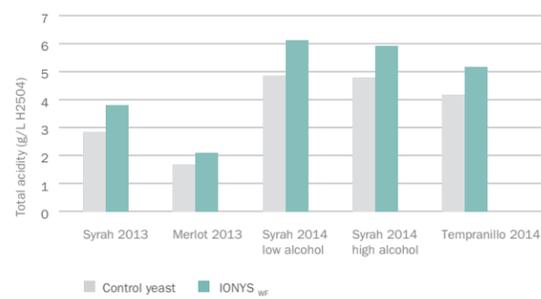
Note: IONYS_{WF} is an innovative yeast selection and is protected by an International Patent pending; No WO2015/11411. Propagation of IONYS_{WF} is an infringement of this Patent.

#15233 500 g

Why is IONYS_{WF} producing more total acidity?

The IONYS_{WF} yeast selection strategy used “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_{WF}



K1 (V1116)

S. cerevisiae • *cerevisiae*
Restart Stuck Fermentations, Sauvignon Blanc, Sémillon, Chenin Blanc, White French Hybrids, American Cultivars, Sparkling Base, Fruit Wine

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

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

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

#15077 10 kg

LALVIN C

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 107.

#15689 500 g

M2

S. cerevisiae • *cerevisiae*
Chardonnay, Sauvignon Blanc, Cabernet Sauvignon, Syrah, Carignane

Isolated in Stellenbosch, South Africa.

Enoferm M2™ 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

#15649 10 kg

NEW! M83

S. cerevisiae • *cerevisiae*
Rosé

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

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

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

#15674 500 g

MT 

S. cerevisiae • *cerevisiae*
Merlot, Cabernet Sauvignon, Carignane

Selected in Saint Emilion, France, by the 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
#15651	10 kg

NT 50 

S. cerevisiae • hybrid
Shiraz (Syrah), Pinot Noir, Merlot, Cabernet Sauvignon, Cabernet Franc, Grenache

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
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NT 112 

S. cerevisiae • hybrid
Cabernet Sauvignon, Cabernet Franc, Merlot, Zinfandel, Shiraz (Syrah), Mourvedre, 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 SO₂ 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
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NT 116 

S. cerevisiae • hybrid
Shiraz (Syrah), Cabernet Sauvignon, Merlot, Petite Sirah, Pinot Gris, Pinot Blanc, Sémillon, Chenin Blanc

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
#15226	10 kg

NT 202 

S. cerevisiae • hybrid
Cabernet Sauvignon, Pinot Noir, Merlot, Malbec, Chambourcin, Norton

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
#15227	10 kg

ICV OPALE  

S. cerevisiae • *cerevisiae*
Chardonnay, Sauvignon Blanc, Rosé

ICV Opale is a yeast selection from the ICV.

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

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

Can produce significant amount of SO₂ and, as a result, may inhibit malolactic fermentation.

#15068	500 g
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QA23  

S. cerevisiae • *bayanus*
Chardonnay, Sauvignon Blanc, Sémillon, Chardonef, Gewürztraminer, Pinot Blanc, Seyval Blanc

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

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

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

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

#15652	500 g
#15653	10 kg

R2 

S. cerevisiae • *bayanus*
Riesling, Sauvignon Blanc, Gewürztraminer, Icewine, White French Hybrids, Fruit Wine

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 bound aroma precursors.

#15071	500 g
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RA17 

S. cerevisiae • *cerevisiae*
Pinot Noir, Gamay Noir, Grenache, Rosé

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

Proper nutrition is recommended to avoid the formation of H₂S, especially in low nutrient musts.

Enhances cherry and fruit aromas in varietals such as Pinot Noir and Gamay Noir.

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
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RBS 133 

S. cerevisiae • *cerevisiae*
Sangiovese, Hybrids, Rosé, Zinfandel

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 with 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
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RC212 

S. cerevisiae • *cerevisiae*
Pinot Noir, Grenache, Cabernet Sauvignon, Chambourcin, Rosé

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

Timely nutrient additions are recommended to avoid potential H₂S 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
#15097	10 kg

RHÔNE 2056  

S. cerevisiae • *cerevisiae*
Syrah, Grenache, Barbera, Zinfandel, Red French Hybrids, Mourvedre

Isolated and selected in the northern Côtes du Rhône by the University of Nantes (ITV) in France in collaboration with the research center of Inter Rhône.

Low producer of SO₂ 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.

Wines made with Lalvin Rhône 2056 have been shown to be interesting and complex when blended post-fermentation with wines made with T73 or ICV D254.

#15072	500 g
#15180	10 kg

RHÔNE 2226 (formerly L2226)

S. cerevisiae • *cerevisiae*

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

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 highly 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
#15645 10 kg

RHÔNE 4600

S. cerevisiae • *cerevisiae*

Rosé, Viognier, Marsanne, Roussanne, Chardonnay, Syrah

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

R-HST

S. cerevisiae • *cerevisiae*

Riesling, Gewürztraminer, Sauvignon Blanc, Viognier, White French Hybrids, Icewine

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, allow 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 mouth-feel. It can produce crisp, premium white wines suitable for aging.

#15130 500 g

RP15

S. cerevisiae • *cerevisiae*

Syrah, Zinfandel, Merlot, Cabernet Sauvignon, Cabernet Franc, Petite Sirah

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
#15666 10 kg

STEINBERGER (DGI 228)

S. cerevisiae • *cerevisiae*

Riesling, Pinot Gris, Gewürztraminer, Traminette

Slow, cool fermenter with low foam production.

Has a reasonable alcohol tolerance (up to 13% v/v) with high SO₂ tolerance.

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

#15084 500 g
#15086 10 kg

SVG

S. cerevisiae • *cerevisiae*

Sauvignon Blanc, Pinot Gris, Riesling, Hybrids

Selected in the Loire region of France as a result of an 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

SYRAH

S. cerevisiae • *cerevisiae*

Syrah, Merlot, Carignane, Mourvedre, Petite Sirah

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

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

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

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

#15657 500 g
#15658 10 kg

T73

S. cerevisiae • *bayanus*

Sangiovese, Nebbiolo, Tempranillo, Zinfandel, Merlot

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

VIN 13

S. cerevisiae • hybrid

Restart stuck fermentations, Sauvignon Blanc, Chenin Blanc, Riesling, Viognier, Chardonnay, Rosé, Gewürztraminer

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

Aromatic as well as cold tolerant (10–15°C/50–59°F), VIN 13 also has high alcohol tolerance (16.5% v/v) and low nitrogen requirements (qualities obtained by hybridizing *S. bayanus* and *S. cerevisiae* strains). 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
#15228 10 kg

TESTIMONIAL



“VIN 13 is one of my favorite yeast strains to work with. For over 20 years it has consistently helped me showcase the true essence of each varietal. Its ability to produce fruit forward esters at cool fermentation temperatures is unmatched. Particularly with white cultivars, where you are looking for a tropical profile with great thiol development and floral notes, VIN 13 is a huge benefit. I will not go a harvest season without it!”

Coenraad Stassen

Brys Estates Vineyard & Winery

Traverse City, MI

VIN 2000

S. cerevisiae • hybrid

Chenin Blanc, Chardonnay, Sauvignon Blanc, Viognier, Chardonel

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 SO₂ 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

VRB

S. cerevisiae • *cerevisiae*

Tempranillo, Barbera, Sangiovese, Zinfandel, Petite Sirah, Mourvedre

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 mouth-feel. 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

W15

S. cerevisiae • *cerevisiae*

Gewürztraminer, Riesling, Pinot Gris, Pinot Noir, Syrah, Rosé, French Hybrids, Fruit Wine

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

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

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

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

#15118 500 g
#15119 10 kg

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
#15093 10 kg

MONTRACHET (DAVIS 522)

S. cerevisiae • *cerevisiae*

White

Selected from the Pasteur Institut 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 SO₂ formation.

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

Considered neutral in sensory contribution.

#15060 500 g
#15074 10 kg

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 H₂S producer.

Has high SO₂ and alcohol tolerances.

#15085 500 g
#15083 10 kg

PLEASE NOTE

Some of your favorite yeasts may have moved to our new Specialty Yeast Section on page 24.

ARTICLE

TIPS AND TOOLS FOR ROSÉ WINEMAKING

Rosé wines are lightly colored and generally made from juice that has had minimal contact time with dark skins. Although no legal definition for the color of rosé exists, it is generally accepted that the color may range from light salmon to copper, vibrant pink, or even a pale crimson. The color is determined by the grape variety as well as the length and temperature of maceration. Winemaking decisions made during this maceration period have an important impact on not just the color, but on the mouthfeel and aromas of the final wine. In general, grapes pressed directly with minimal skin contact will yield the lightest colored wines, with aromas leaning toward floral, citrus and stone fruits.

In the U.S., the majority of rosés are produced by holding the juice in contact with the skins, before or during fermentation, until the desired color is achieved or by *saignée*, the bleeding of a small percentage of juice from red must. The light juice that is bled off is then fermented as rosé. When undergoing longer pre-fermentation maceration, the use of the non-fermentative yeast **Gaia**, can help in preventing the development of off-characters from spoilage yeasts. The *saignée* method generally yields darker colored rosé, and wines with more berry fruit aroma. Rosé can also be produced by blending a small amount of red wine with white. Most rosé from Champagne is traditionally made in this manner.

Rosés are made to be consumed young and fresh with bright fruit flavors and aromas and the balance of a crisp white wine. As such, during winemaking they must be protected from oxidation. In order to protect these delicate aromas during fermentation, the judicious use of an oxygen-scavenging tannin such as **FT Blanc Soft**, a "white" gall nut tannin that will not darken rosé, will help prevent oxidation. One can also use the yeast derivative **OptiMUM White** which naturally contains high levels of the antioxidant glutathione and can help preserve and promote delicate aromas. Research from the Centre du Rosé in Provence has shown that glutathione is especially important in preserving thiols in varieties naturally rich in these aromas such as Cabernet Sauvignon.

Enzymes may be used during crush to speed up color extraction and the breakdown of pectin for more complete release of the juice and aroma compounds bound in the grapes' flesh. The enzymes should be gentle to avoid extraction of astringent and/or bitter phenolics. Recommended enzymes are **Scottzyme Cinn Free** or **Color Pro**, **Lallzyme Cuvée Blanc**, **Rapidase Expression Aroma** or **Extra Press**. Care should be taken when using enzymes on highly colored varieties, particularly if the weather has been hot and the color has started to bleed from the skin into the flesh of the grapes.

The yeast strain can have a major impact on the flavor profile. Strains with a proven track record for producing excellent rosés are **M83**, **W15**, **Rhone 4600**, **Cross Evolution** and **Be Fruits**. Aromatic white wine strains, such as **Elixir** and **QA23**, can bring out terpenes and aromatic thiols if the grape varietal contains the precursors. **VIN13** and **NT116** are extremely strong fermenters, thiol converters and ester producers. **OKAY** and **Sensy** produce delicate, aromatic rosés without danger of yeast derived H₂S or SO₂.

To fulfill the aromatic potential of the fruit, the yeast have certain nutritional requirements. Rosés are quite often deficient in nitrogen and lipids (survival factors). Rehydrating the yeast with

Go-Ferm Protect Evolution front-loads the yeast with survival factors, keeping the cell membrane's integrity through the end of fermentation. The YAN (Yeast Available Nitrogen) needed for a healthy fermentation may range from 150 ppm to 250 ppm depending on the yeast strain chosen, the form of nitrogen (organic or inorganic) and possible stress factors. Stress factors may include potential alcohol, clarity and microbial competition. When correcting YAN for rosé, a complete nutrient derived from autolyzed yeast is preferable to DAP (diammonium phosphate). Organic nitrogen (amino acids) is preferable to inorganic nitrogen (ammonia). **Fermaid O**, a natural source of vitamins and minerals, contains only organic nitrogen, which is 4–5 times more efficient than ammonia nitrogen. Many of the amino acids in **Fermaid O** are also precursors to fruity aromatic compounds.

Yeast lipid metabolism is strongly affected by the temperature of fermentation, thus the temperature of fermentation will impact a wine's aromatic potential. Ideally the fermentation temperature should be between 60–68°F (16–20°C). Although it was traditionally thought that fermenting at lower temperatures increased the potential for esters, we now know that this is not the case. Our current understanding is that ester production is strongly linked with organic yeast nutrition. At slightly warmer fermentation temperatures between 60–68°F (16–20°C), there is more ester production. Although more of these esters will volatilize at the higher temperature, the end result will still be greater than if the fermentation temperature had been colder. Higher temperatures post-fermentation can result in the loss of delicate aromatics, as important varietal aromas like terpenes are preserved by holding wine at colder temperatures. Temperature management and control throughout the production process are key.

Although malic acid is a key contributor to freshness in rosé wine, malolactic fermentation can be used to lower the acidity of an unbalanced wine and make it more microbially stable. However, sequential inoculation can alter the flavors and aromas by causing the loss of bright red fruit characteristics due to diacetyl formation. This can be avoided by using **Lalvin VP41**, a low diacetyl producing bacteria strain, and by co-inoculating the yeast and bacteria. When co-inoculating, the initial SO₂ addition should be kept below 30 ppm and the bacteria should be added 24 hours after the yeast. Any diacetyl produced by the bacteria is soon consumed by the active yeast, preserving the fresh fruit characters.

Stabilization is perhaps the trickiest part of rosé winemaking. Tartrate and protein stabilization are as important as in white winemaking. For tartrates, traditional chilling and tartrate precipitation may be used. In combination with chilling, **Claristar** (a mannoprotein) can be used to inhibit nucleation and growth of tartrate crystals. For protein stabilization, bentonite remains the only answer.

Color stabilization frequently causes the biggest problems. The color of rosés often turns orange or brown. First and foremost, dissolved oxygen must be controlled to prevent phenolic oxidation and browning. **Flashgum R** or **Inogum 300** (gum arabics) can then be added just before bottling. This will have a protective colloidal effect and help maintain the original bright color of the wine. If the wine shows browning before bottling, fining with **Polycel** (PVPP) or **Caséinate de Potassium** (casein) can possibly remove the oxidized phenolic compounds. Bench trials are necessary before either addition.

SPECIALTY YEAST

As research progresses and winemaking trends evolve, so do our yeast offerings. Our goal is to provide the widest range of options to ensure successful fermentations in all conditions, as well as options to enhance wine complexity.

Though *saccharomyces cerevisiae* is the standard for wine fermentations, our non-*saccharomyces* strains and yeast blends offer an exciting selection for enhancing wine complexity and security. You will find these options here in this new section.

As the result of an innovative quantitative genetics process, we are now pleased to offer several non-H₂S or SO₂ producing strains. These strains can help winemakers achieve greater aromatic expression and an increase in wine quality, even in more challenging conditions.

In addition, encapsulated yeasts can be used for a variety of winemaking applications, including dessert wine production, restarting stuck fermentations, and secondary fermentation for sparkling wine production. Encapsulations allows substrates and metabolites to diffuse throughout the beads without releasing yeast cells into the wine environment.

These state-of-the-art products give winemakers a variety of unique tools for their winemaking toolbox.

SPECIALTY YEAST

- Yeast Strain Type
- ◆ Highly Recommended
- M Mouthfeel
- EVC Enhanced Varietal Character
- Mod Moderate
- Avg Average

	Alchemy I	Alchemy II	Alchemy III	Alchemy IV	Be Fruits	Biodiva*	BM 4x4	Exotics SPH	Gaia*	ICV Okay	ProElif*	ProRestart*	ProMalic*	ProDessert*	Sensy
Page	26	26	26	26	28	27	13	27	27	28	29	29	29	29	28
<i>S. cerevisiae</i>					○					○	○	○		○	○
Non- <i>Saccharomyces</i>						○		○	○				○		
Yeast Blend	○	○	○	○			○								
Encapsulated											○	○	○	○	
White	◆	◆				◆	◆	◆		◆			◆		◆
Rosé					◆	◆				◆			◆		◆
Red			◆	◆		◆	◆	◆	◆	◆					
Sweet/Dessert White						◆								◆	
Secondary Fermentation											◆				
Restart Stuck												◆			
Low or no H ₂ S production					◆					◆					◆
Low or no SO ₂ production					◆					◆					◆
Low acetaldehyde production					◆					◆					◆
Requires <i>S. cerevisiae</i> addition						◆			◆				◆		
Bio-protectant for cold soaks									◆						
Maximizes aromatic profile	◆	◆	◆	◆	◆			◆							◆
Alcohol Tolerance	15.5%	15.5%	15.5%	15.5%	14%	—	15%	15.5%	—	16%	—	—	—	—	14.5%
Relative Nitrogen Needs	Med	Med	Med	Med	Low	—	High	Med	—	Low	—	—	—	—	Low
Temperature Range (°F)	56–61	56–61	61–82	61–82	54–68	—	64–82	64–83	—	54–86	—	—	—	—	54–64
Fermentation Speed	Fast	Fast	Fast	Fast	Med-Fast	—	Mod	Mod	—	Mod	—	—	—	—	Mod
Competitive Factor	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	—	Yes	—	—	—	—	Yes
Sensory Effect	EVC Esters	EVC Esters	EVC	EVC	EVC Esters	—	EVC M	EVC M	—	Esters	—	—	—	—	EVC M
MLF Compatibility	Good	Good	Good	Good	Good	—	Below Avg	Very Good	—	Poor	—	—	—	—	Very Good

*Please see full item descriptions on the following pages for more information on these products and their parameters for use.

YEAST BLENDS

ALCHEMY

The Alchemy range is a scientifically formulated blend of wine yeast strains developed in collaboration with the Australian Wine Research Institute (AWRI). These yeast blends have been developed specifically for the production of New World style aromatic white and red wines. Anchor was the first yeast brand to commercialize yeast blends which are based on the synergistic effect between individual yeasts in specific ratios. These yeast blends enhance wine aroma based on the metabolic interaction between specific strains present in the blend, rather than the cumulative effect of the individual strains. They have been formulated to provide optimum aromatic profiles.

Alchemy I and II were formulated for use in white wines. The ratio of the blends in Alchemy I have been formulated to enhance fruity, floral esters and volatile thiols in Chardonnay, Sauvignon Blanc, Riesling, Pinot Gris and Seyval Blanc.

Alchemy II was formulated to enhance volatile thiols. It is highly recommended for cool tank fermentations of Sauvignon Blanc in the new world (South Africa, Chile or New Zealand) style.

Alchemy III and IV were developed specifically to enhance the red fruit aroma profiles of all red varieties. Common to both Alchemy blends is their very high contribution to fruit aromas due to higher total esters and ethyl hexanoate production. This is further enhanced by the production of β – damascenone (violets) and a decrease in methoxypyrazines which can mask fruit characters. Alchemy III is a blend specifically developed for complex red wines. It is a high producer of fruity and floral aromas. Alchemy IV has been blended for the production of very intense red fruit characters. It is a high producer of ethyl esters.

ALCHEMY I

S. cerevisiae · blend

Sauvignon Blanc, Chardonnay, Chenin Blanc, Riesling, Pinot Gris, Seyval Blanc

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

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.

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).

#15174 1 kg

ALCHEMY II

S. cerevisiae · blend

Sauvignon Blanc, French Colombard, Chenin Blanc

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

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

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

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

#15177 1 kg

NEW! ALCHEMY III

S. cerevisiae · blend

Cabernet Sauvignon, Malbec, Zinfandel, Tempranillo, Pinot Noir, Grenache

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 SO₂ production and glycerol production of 8–11g/L.

#15230 1 kg

NEW! ALCHEMY IV

S. cerevisiae · blend

Pinot Noir, Syrah, Merlot, Cabernet Franc, Gamay, Nebbiolo, Sangiovese

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 methoxypyrazines. 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 SO₂ production and glycerol production of 8–11g/L.

#15231 1 kg

BM 4X4

S. cerevisiae · blend

Sangiovese, Cabernet Sauvignon, Grenache, Zinfandel, Nebbiolo, Chardonnay

Please see page 13 for product description.

#15176 500 g

#15200 10 kg

NON-SACCHAROMYCES YEAST STRAINS

BIODIVA

Torulaspora delbrueckii

Chardonnay, Sémillon, Syrah, Pinot Noir, Late Harvest, Icewine

The *Torulaspora delbrueckii* isolate Biodiva was initially sold in North American in a kit (Level²TD) 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 (*Torulaspora 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 SO₂ level is under 0.2 mg/L and turbidity is >80 NTU. Inoculate at 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 instruction.*

Storage

Store for 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.

#15685 125 g

EXOTICS SPH

S. cerevisiae and *S. paradoxus* hybrid

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

Anchor Exotics SPH 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 SPH 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 SPH 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 SO₂ production. It can also partially degrade malic acid and is known to facilitate and enhance malolactic fermentation. **Exotics SPH is a hybrid strain and can FULLY ferment through primary fermentation, up to 15.5% (v/v).**

Usage *See rehydration protocol on page 7 for more information.*

Storage

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

#15213 250 g

#15220 5 kg

GAIA ^{MF98.3}

Metschnikowia fruticola

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 L’Institut Francais de la Vigne (IFV) in Burgundy selected *Metschnikowia* IFV Gaia ^{MF98.3} 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 ^{MF98.3} 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 ^{MF98.3} which can help control undesirable flora during cold soak. It is able to implant and multiply rapidly helping it to prevail over spoilage microorganisms. Use of Gaia ^{MF98.3} 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 ^{MF98.3} is able to grow in low pH and high sugar musts as well as being able to tolerate an initial SO₂ addition up to 50ppm.

Usage

Rehydration of Gaia ^{MF98.3} is done at 30°C(86°F) and does not require a rehydration nutrient. Inoculate at 25g/hL (2lb/1000gal). 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. **Use of Gaia needs to be followed by a S. cerevisiae strain to complete alcoholic fermentation.**

#15686 500 g

M. fruticola (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 SO₂, pasteurization)—(SD: 0,05 g/L).



NON H₂S OR SO₂ PRODUCING 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, on a molecular level, 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 between the strains.

Are these yeast GMO?

No. The resulting yeast are all from natural breeding.

Do these strains produce H₂S or SO₂?

These optimized strains do not produce H₂S or SO₂, but commonly musts are not sterile and other organisms present may produce these byproducts.

Do OKAY®, Sensy™ and Be Fruits consume consume SO₂ during alcoholic fermentation?

SO₂ is usually consumed by *Saccharomyces* yeast through the sulfate pathway metabolism. The specific metabolisms of OKAY® and Sensy™ utilize SO₂ directly to synthesize two essential amino acids containing sulfur, thus avoiding the release of H₂S.

How does the low acetaldehyde production of these yeasts affect your SO₂ additions?

The low acetaldehyde production reduces the consumption of free SO₂, which may allow for lower total SO₂ additions.

NEW! IOC BE FRUITS

S. cerevisiae · *cerevisiae*

White, Rosé

Selected by the INRA for no SO₂ or H₂S production.

Reveals fruity esters (strawberry, pineapple, citrus notes) in white and rosé wines. The pure expression of the fruit is emphasized by the ability of the yeast to reduce the acetaldehyde formation, while limiting sulfite production.

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

#15241 500 g

ICV OKAY

S. cerevisiae · hybrid

White, Rosé, Red

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

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

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

#15221 500 g

#15222 10 kg

SENSY

S. cerevisiae · hybrid

White, Rosé

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

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

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

#15225 500 g

ENCAPSULATED YEASTS

Encapsulated yeast are alginate beads (a natural polysaccharide extracted from seaweed) containing *Saccharomyces* 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 Lallemand) 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.*

#15150 1 kg

#15158 ProMesh barrel

#15159 ProMesh tank bag

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.

Please see page 103 for product description.

#15571 1 kg

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 SO₂ < 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 SO₂, 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

#15158 ProMesh barrel

#15159 ProMesh tank bag

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 14, 2017.

For more information on ProMalic, please visit our website at 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

#15159 ProMesh tank bag

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 added to the rehydration water these factors promote increased biomass of the selected yeast strain. Consequently the selected yeast can acclimate more easily to the often hostile environments (including high alcohol and low temperature) associated with stuck fermentations.

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. These microorganisms can compete for nutrients and release metabolites that inhibit yeast metabolism. 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 77).

Adding Reskue™ (see page 43 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.

Visit www.scottlab.com for a video animation of this protocol.

HEROES OF RESTART

When faced with the challenge of restarting a stuck fermentation, it's important to turn to a yeast strain that's up for the task. Selecting a strong, vigorous fermenter with good alcohol tolerance is of key importance. When it comes to a successful restart, strains like 43, 43 Restart, Fermivin Champion, K1 (V1116), Vin 13, BC and DV10 can truly save the day!

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 77).
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, atemperature 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.

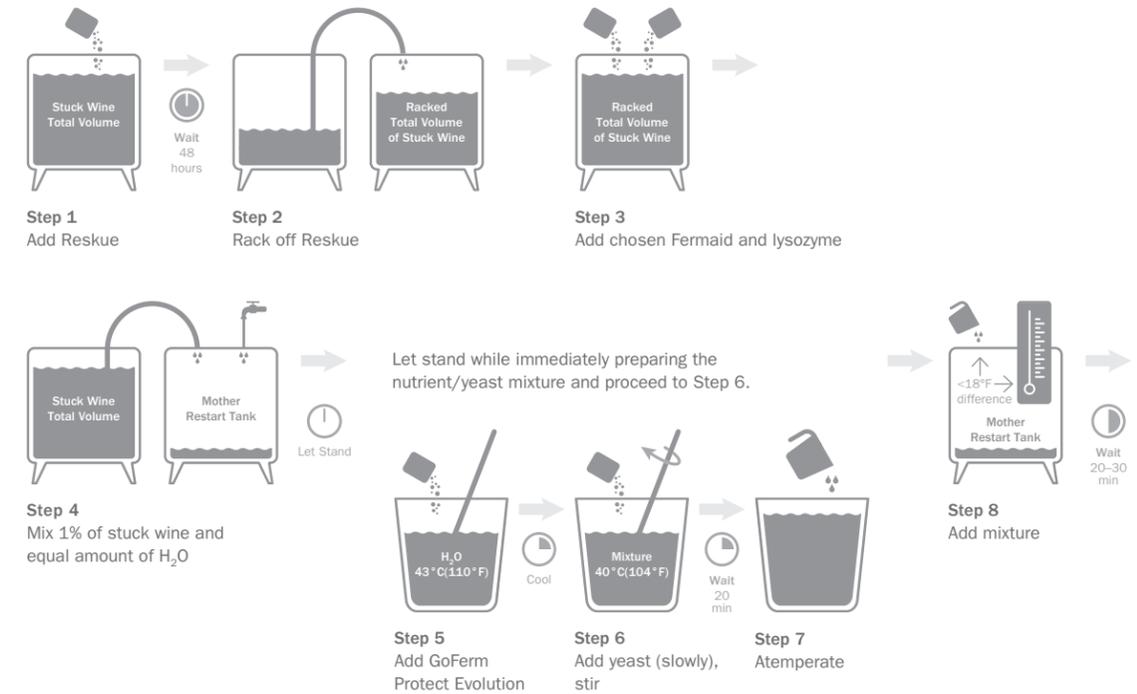
For Wines Stuck at 1–2° Brix

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

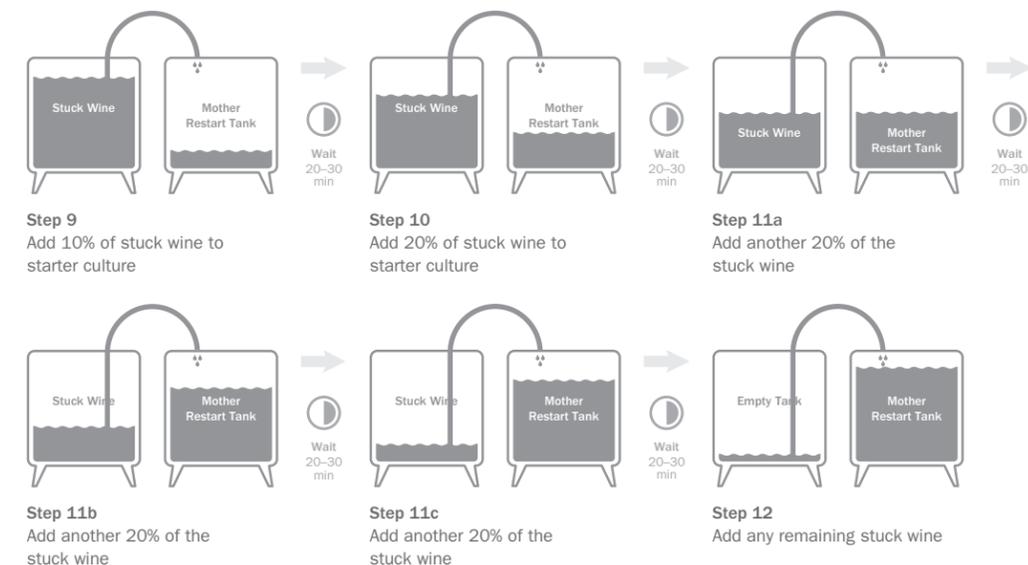
For Wines Stuck at <1° Brix

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



Inoculation of Stuck Wine



LAB ANALYSIS

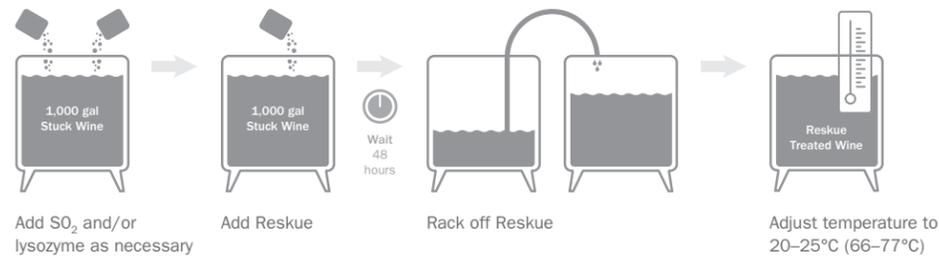
STUCK & SLUGGISH FERMENTATION PACKAGE

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.

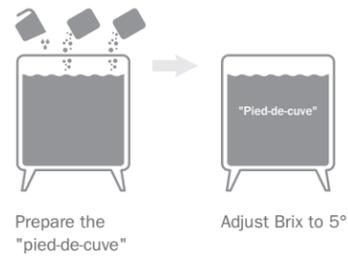
Volume needed: 375 mL sample

PROTOCOL RECOMMENDED METHOD TO RESTART A STUCK FERMENTATION USING UVAFERM 43 RESTART

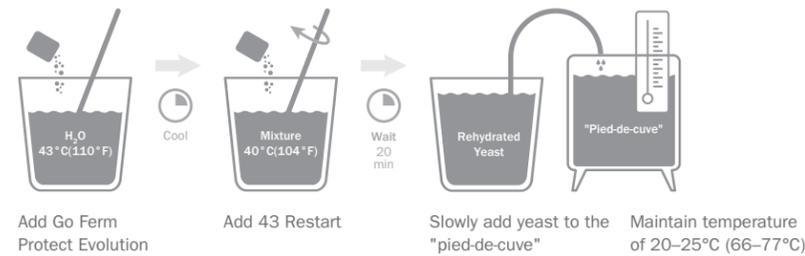
Prepare the Stuck Wine



Prepare the “Pied-de-cuve” (starter)



Yeast Rehydration



Incorporation of the “Pied-de-cuve”



For 1000 gals of stuck wine

Prepare the Stuck Wine

- Depending on analysis, address any potential spoilage organisms with SO₂ and/or lysozyme additions
- Add 1.5kg (3.3lb) Reskue and mix tank.
- Allow the tank to settle for 48 hours then rack off the settled lees.
- Adjust the temperature of the Reskue treated wine to 20–25°C (68–77°F).

Prepare the “Pied-de-cuve” (starter)

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

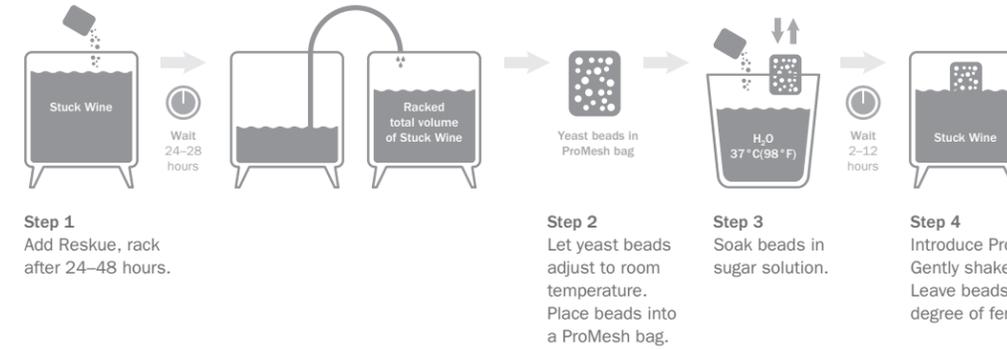
Yeast Rehydration

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

Incorporation of the “Pied-de-cuve”

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

PROTOCOL RECOMMENDED METHOD TO REHYDRATE PRORESTART



Step 1

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

- Add 40 g/hL (3.3 lb/1000 gal) Reskue™ (see page 43 for Reskue product description) to the stuck wine 24–48 hours prior to bead addition. Rack off of the Reskue, if possible.
- 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.
- Place the beads in the ProMesh nylon bags before rehydrating. See ProMesh bags 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

- 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 Pro-Mesh 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

- 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).
- 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.
- Bags should be gently shaken several times a day to release accumulated CO₂. The wine must be stirred daily without aeration.
- 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.

ARTICLE



MAKE YOUR WINE IN THE VINEYARD. FOLIAR VINEYARD SPRAYS FOR VARIETAL EXPRESSION.

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 Lallemend 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.

HOW LALVIGNE WORKS

The plant receptors in the vine recognize the Lalvigne treatment and induce a genetic response by the genes involved in the synthesis of the secondary metabolism. Due to the phenotypic variety of the vine clone and the differences of the source yeast in the Lalvigne products, the responses will be expressed differently. This diversity of response is not unlike the synergistic expression between grape varieties and active yeast in fermentation.

LALVIGNE MATURE AND LALVIGNE LM

LALVIGNE MATURE AND LALVIGNE LM OBSERVATIONS

Uniformity in ripening

In vineyards in Virginia, Oregon and in the Central Valley of California, it was observed that after the LalVigne application, the vineyard seemed to color more uniformly. Below is an example of ripening uniformity with the application of Lalvigne Mature/LM. A camera positioned in a vineyard in Spain during the 2016 harvest captured the control and treated in real time.



Control



Lalvigne Mature/LM

Cool Region Applications—Timing of Harvest

Protection against weather and other late season forces

A 2014 trial in Washington and a 2016 trial in Virginia involved treating Merlot vineyards with LalVigne Mature. In both trials, the winemakers picked the treated vineyard six days earlier than the control block. Picking was done based upon the winemaker's decisions on flavor and perceived phenolic maturity of the grapes. Wines made from the treated and control blocks demonstrated strong similarities, despite the difference in harvest dates. The opportunity for the winemaker to achieve their harvest goals a week earlier greatly reduces the risk of quality and tonnage loss due to weather, bird, insect, mold or other forces that increase as the harvest wears on.

Warm Region Applications

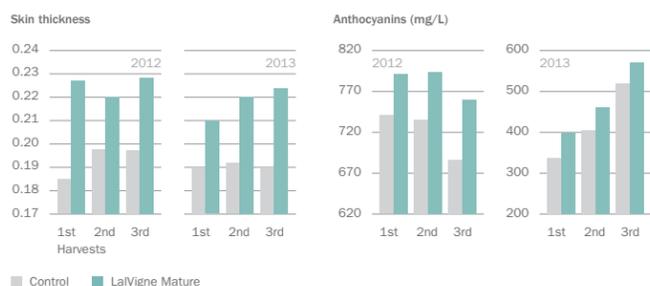
With the application of Lalvigne, research has shown that there is no increase in sugar (Brix), berry weight, or change in TA and pH. In areas where brix levels reach their maximum before the berries have reached phenolic maturity, the application of Lalvigne can bring balance to the berry. Earlier ripeness avoids high sugars, phenolic imbalance and loss of yield due to raisining and dehydration.

Skin Thickness and Extractable Anthocyanins

Berry skins have a large number of the phenolic compounds important to winemaking. Phenolic compounds are very responsive to outside environmental stresses. The cell wall composition of the berry skin changes as it ripens, and these changes influence extractability. With the application of LalVigne, there is an effect on the berry skin thickness, and on the ratio of certain phenolic compounds, including a higher concentration of extractable anthocyanins and skin tannins.

Recent findings in a trial done by Sz. Villangó1,5*, Gy. Pásti 1,M. Kállay1 on Syrah grapes in Hungary and recently published in the S. Afr. J. Enol. Vitic., Vol. 36, No. 3, 2015, showed among other things, that the application of LalVigne Mature foliar spray may result in a significant increase in berry skin thickness (Spsk). The thicker skins combined with the higher extractability of these compounds resulted in wines with increased anthocyanins.

Syrah (Hungary)



Anthocyanin extraction in a simulated maceration Nebbiolo



The treatment in this trial demonstrated a significant difference in both the total and extractable content of anthocyanin

Plant Protection

Thicker skins may also be important in plant protection and lessen the probability of the berries being susceptible to rot and/or Botrytis.

Botrytis incidence

Cabernet Sauvignon, 2013		Control	LalVigne Mature
Frequency in % on bunches	B1	62.28	42.31
	B2	56.07	45.59
	B3	75.58	38.81
	B4	63.41	70.88
Average frequency bunches		64.34	49.40
Intensity on bunches	B1	12.24	5.21
	B2	10.69	4.87
	B3	15.55	5.36
	B4	12.36	12.57
Average intensity bunches		12.71	7.00

Reduction of green flavor compound—IBMP

It has been shown in trials from 2014–2017 that differences in methoxypyrazine levels seem to be consistently lower in the treated blocks compared to the control blocks.

LALVIGNE AROMA AND LALVIGNE LA

LALVIGNE AROMA AND LALVIGNE LA OBSERVATIONS

Reduced Glutathione (GSH)

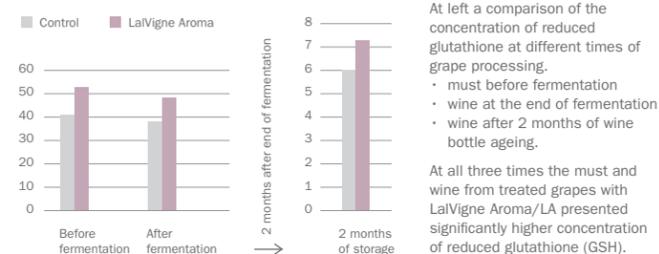
Having high levels of GSH is important for the preservation of aroma and color. The level of glutathione can vary in must/juice based on grape varieties, viticulture and winemaking practices. For glutathione to be active and effective, it must be in its reduced form.

GSH is an important antioxidant whose additions to juice and wine have been reported to prevent browning and increase production of some volatile thiols during fermentation. It provides a proposed protective role against the loss of certain terpenes, esters and thiols in wine during aging (Andújar-Ortiz et al., 2013; Kritzinger et al., 2012; Makhotkina et al., 2014).

Higher levels of reduced glutathione (GHS) over time.

In a recent study published by K. Šuklje et al. in Food Chemistry 197 (2016) 1073–1084, they investigated “the potential to improve wine aroma by applying two inactive dry yeast products at the onset of ripening on Sauvignon Blanc grapes.” Results show that the applications led to “increased reduced glutathione concentrations in the grape juice and corresponding wines.”

Reduced glutathione (GSH; mg/L)



At left a comparison of the concentration of reduced glutathione at different times of grape processing.
 • must before fermentation
 • wine at the end of fermentation
 • wine after 2 months of wine bottle ageing.

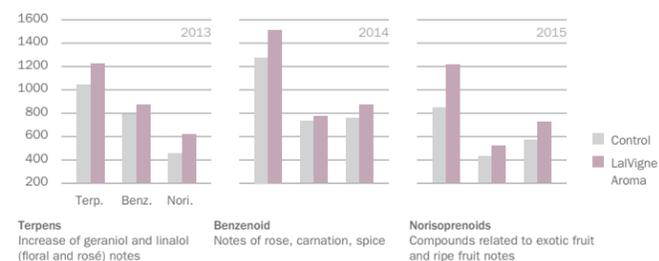
At all three times the must and wine from treated grapes with LalVigne Aroma/LA presented significantly higher concentration of reduced glutathione (GSH).

Aromatics

In trials run in Italy, France and the U.S., results show consistent increases in varietal aromatic compounds (higher Varietal Aroma Potential Index).

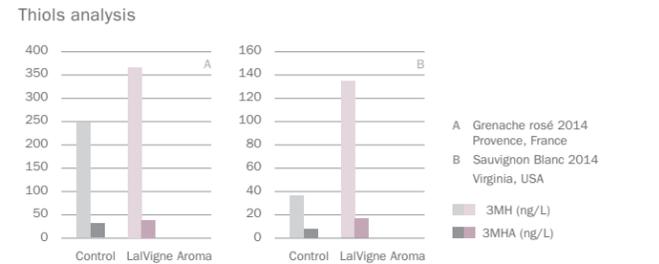
Increases varietal aroma compounds

Glera (Prosecco DOC) Analysis of glycosides aroma precursors in grapes



In thiolic varieties such as Sauvignon Blanc there have been higher levels of 3MH and 3MHA (passion fruit, grapefruit, guava) in wines.

Increases 3MH and 3MHA in wines



Skin Thickness

Protecting from pests and microbial problems

	LalVigne Aroma/LA	LalVigne Mature/LM
Advances and increases aroma precursors	+++++	++
Advances and increases phenolic maturity	++	+++++
Natural/Non GMO	100%	100%
Dosage	2 x 2.89lbs/acre	2 x 0.9lbs/acre
Timing	Beginning of veraison and 10–12 days later	Beginning of veraison and 10–12 days later

Map of USA with registration



LALVIGNE LALLEMEND

- #17501 3 kg LalVigne Aroma
- #17500 3 kg LalVigne LA
- #17511 1 kg LalVigne Mature
- #17510 1 kg LalVigne LM

Growing organic grapes? Contact us if you're interested in using LalVigne on your vineyards. It may be approved but must be certified in advance by your certifying body.

NUTRIENTS

Classic wine yeast strains of *Saccharomyces cerevisiae* perform best when their specific needs are considered. In addition to issues like temperature and turbidity, nutritional factors are critical. If requirements are met, yeast can thrive and perform at their peak while converting must/juice into wine.

Nitrogen is an important part of yeast nutrition and has a significant impact on the fermentation outcome. YAN (yeast assimilable nitrogen) content in must/juice directly influences fermentation speed. It impacts the yeast biomass at the beginning of fermentation, as well as the sugar transport kinetics during fermentation.

Of note, it is normal for must/juice to be nitrogen depleted at the end of the yeast growth phase even though the majority of the sugar remains to be fermented. This results in a decrease in both protein synthesis and sugar transport activity. An addition of YAN at the end of the growth phase reactivates protein synthesis and the sugar transport speed which corresponds to an increased fermentation rate.

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.

YEAST NUTRIENT YAN CONTRIBUTION

Nutrient	Dose 20 g/hL (1.7 lb/1000 gal)	Dose 25 g/hL (2 lb /1000 gal)	Dose 30 g/hL (2.5 lb /1000 gal)	YAN Source
Anchorferm	2 mgN/L	2.5 mgN/L	Not recommended	Organic nitrogen from autolyzed yeast
DAP		50 mgN/L	63 mgN/L	Inorganic nitrogen
Fermaid A		30 mgN/L	36 mgN/L	Inorganic nitrogen (from DAP) and organic nitrogen from autolyzed yeast
Fermaid K		25 mgN/L	30 mgN/L	Inorganic nitrogen (from DAP) and organic nitrogen from autolyzed yeast
Fermaid O		10 mgN/L	12 mgN/L	Organic nitrogen from autolyzed yeast
Go-Ferm		7.5 mgN/L	10 mgN/L	Organic nitrogen from autolyzed yeast
Go-Ferm Protect Evolution		7.5 mgN/L	10 mgN/L	Organic nitrogen from autolyzed yeast
Nutrient Vit End		7 mgN/L	8.5 mgN/L	Organic nitrogen from autolyzed yeast
Phosphate Titres		50 mgN/L*	63 mgN/L*	Inorganic nitrogen
SIY 33 (Fermaid 2133)		8 mgN/L	10 mgN/L	Organic nitrogen from autolyzed yeast

*This dosage exceeds the legal limit of thiamin.

CHOOSING THE CORRECT YEAST NUTRIENT

👉 Highly Recommended

Note: With the exceptions of Fermaid K and Fermaid K (Kosher), all ingredients of the products shown in the nutrient section of this handbook are listed by the TTB as acceptable in good commercial winemaking practice listed in 27 CFR 24.246. The ingredients in Fermaid K and Fermaid K (Kosher) are listed as acceptable in good commercial winemaking practice in either 27 CFR 24.250 or 27 CFR 24.246. For more information please visit www.TTB.gov.

	Anchorferm	DAP	Fermaid A	Fermaid K	Fermaid K (Kosher)	Fermaid O	Go-Ferm	Go-Ferm Protect Evolution	Inocel	Nutrient Vit End	Phosphate Titres	Reskue	SIY 33 (Fermaid 2133)	SIY Cell Hulls
Page	41	41	41	41	42	42	40	40	42	42	43	43	43	43
OMRI Listed						👉	👉	👉		👉				
Contains organic nitrogen	👉		👉	👉	👉	👉	👉	👉		👉		👉	👉	👉
Contains DAP		👉	👉	👉	👉						👉			
Contains supplemented thiamin	👉			👉	👉						👉			
Yeast nutrient without DAP	👉					👉	👉	👉	👉	👉		👉	👉	👉
Yeast rehydration nutrient							👉	👉						
Yeast rehydration nutrient for difficult conditions								👉						
Complex yeast nutrient			👉	👉	👉									
Contains added vitamins and/or minerals				👉	👉						👉			
Contains higher levels of sterols and fatty acids								👉						
Inactivated yeast for challenging conditions										👉		👉		👉
Yeast nutrient certified Kosher for Passover					👉									
Contains cellulose									👉					
Approved under TTB 24.246	👉	👉	👉			👉	👉	👉	👉	👉	👉	👉	👉	👉
Approved under TTB 24.250				👉	👉									

ARTICLE

OPTIMIZING ALCOHOLIC FERMENTATIONS

Working with a natural product requires an awareness of its variable and dynamic attributes. No two sets of fruit or circumstances are exactly the same. It is crucial to understand the many factors that can negatively impact a fermentation. This understanding allows the winemaker to be proactive and address potential issues before they occur. This is critical as we strive to produce the best possible wines from the raw materials that nature has given us.

What are the major parameters that influence fermentation performance?

Yeast Strain Selection and Handling

The *Saccharomyces cerevisiae* strains available for winemakers are diverse and robust. In addition to converting sugars to ethanol, they have varying secondary capabilities such as polysaccharide production, β -glucosidase activity and the creation or enhancement of aroma potentials.

S. cerevisiae strains chosen for fermentations need to tolerate and grow in circumstances of high physiological stress. Environmental challenges include high sugar, SO_2 , and antagonistic microorganisms. The yeast need to thrive while making, accumulating and tolerating increasing levels of ethanol. Choose a yeast strain suited for the task. Take into consideration the ethanol and temperature tolerances of the strain, as well as their nutritional needs.

See yeast reference chart on page 8–11, 25 for guidance.

Cell Numbers and Health

In order to assure that your selected yeast strain dominates during fermentation, inoculation should be done at a rate of no less than 25 g/hL (2 lb/1000 gallons). This converts to an initial inoculation of approximately 4×10^6 cells/mL. If yeast inoculations are at recommended levels, they should then be able to suppress indigenous microorganisms which otherwise might be competitive. This suppression results in a shorter lag (cell acclimatization) phase and reduced likelihood that volatile acidity problems will develop. Further, if the 25 g/hL rate is respected, the yeast will be stronger, grow more rapidly, and the fermentations will finish faster.

Note:

- If the initial sugar level is between 25–30°Brix, we recommend increasing the yeast inoculation level to 35 g/hL (2.9 lb/1000 gallons).
- If the initial sugar level exceeds 30°Brix, we recommend increasing the yeast inoculation level to 40 g/hL (3.3 lb/1000 gallons). For icewine, we recommend 50 g/hL (4.25 lb/1000 gallons).

If Go-Ferm or Go-Ferm Protect Evolution are used, any increase in yeast inoculation should be matched by an increase in these nutrients. Respect a ratio of 1 part yeast to 1.25 parts Go-Ferm or Go-Ferm Protect Evolution.

Nutritional Requirements

The nutritional needs of yeast are complex and diverse. Yeast require more than nitrogen to succeed. Macronutrients (e.g. oxygen), micronutrients (e.g. minerals: magnesium, calcium, zinc, manganese; vitamins: thiamin, biotin, calcium pantothenate) and microprotectors (e.g. polyunsaturated fatty acids and sterols) each have a role. Together they impact the vitality of the yeast. Vitamins have a role in cell growth, fermentation activity and nitrogen metabolism. Minerals impact the correct functioning of the yeast and can have a direct correlation to the sensory properties of the wine. Sterols and polyunsaturated fatty acids help the yeast resist stress factors. Each is necessary to a successful fermentation.

Interestingly, some factors are more critical at the fermentation's onset (vitamins and minerals), some at mid-point (nitrogen and oxygen) and some later on (polyunsaturated fatty acids and sterols). To achieve optimal fermentation results we recommend that these factors be anticipated with a multi-stage nutrition program including both rehydration and fermentation nutrients. Any program should be tailored to the individual needs of the particular yeast you have chosen, the condition of the must/juice, the chemistry, the pre-fermentation processes and initial nitrogen levels. Notably, if nitrogen is deficient, then we can also assume that other essential nutrients are lacking as well.

Temperature

Temperature control during fermentation is critical! Temperature stress can permanently inactivate yeast cells. Temperature stress can be viewed as over-cooling (whites and rosés), excessive heat (most notably in reds) and rapid temperature swings (commonly from hot to very cool). Temperature management is important throughout the entire winemaking process.

We strongly recommend that the maximum temperature for red wine fermentations does not exceed 24–26°C(75–78°F) **as measured under the cap**. For white and rosé fermentations the peak temperature should be 20°C(68°F).

For temperature minimums please consult individual strain recommendations. **Remember, fermentations should never be initiated at the lower limits of a strain's tolerance.** This will only introduce an unnecessary stress variable.

Toxins and Competitive Factors

Toxins can originate from both grapes and stressed yeast cells. Examples of such toxins are short to medium chain fatty acids, SO_2 and ethanol. Antagonistic microorganisms and residual agrochemicals can also be problematic. Natural yeast derivatives are very useful in detoxifying the environment for the fermenting yeast.

Final point: keep your yeast in suspension

It is important to keep the yeast moving and to have some level of solids in fermenting must/juice. As fermentations progress, yeast cells can settle to the bottom of the vessel or get trapped under the cap. As yeast settle they are compacted in the lees and this contributes additional stress. This may result in elevated volatile acidity and sulfide production. If the juice is too clear you can increase the level of solids by adding fermentation nutrients, Reskue™ or Inocel.

Since successful winemaking depends on alcoholic fermentation management, it is important to have a keen understanding of factors listed above and how they interrelate. Awareness and proactive winemaking increase the chances for successful fermentations. This can result in wines with more positive aromatics and focused structure.

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 8–11, 25.* Further to the 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.

Given a must/juice at 250g/L (25°Brix) initial sugar, a low nitrogen requiring yeast would need 150ppm, a medium 200ppm and a high 250ppm of nitrogen to consume this level of fermentable sugar.

To calculate the actual needs of your chosen strain, the following calculation can be applied:

For Low N requiring strains Sugar (g/L) x 0.75
For Medium N requiring strains Sugar (g/L) x 0.90
For High N requiring strains Sugar (g/L) x 1.25

Note: Remember to consider other essential nutritional needs of the yeast when doing additions.

Conversion Note: 1° Brix \approx 10 g/L sugar.

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_2 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_2 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 wine-making parameters (some of which are mentioned above), specific YAN recommendations are not available for each strain. Using the general recommendations in the chart below 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.

YEAST PROTECTION AND NUTRITION

RECOMMENDED ADDITION RATES

Must/Juice YAN	Step 1 Yeast Rehydration*	Step 2 Fermentation Nutrition	
		Start of Alcoholic Fermentation	% AF Completion
>200 mg/L	Go-Ferm 30 g/hL (2.5 lb/1000 gal)*	Fermaid O 10–20 g/hL (0.8–1.7 lb/1000 gal)	Fermaid O 10–20 g/hL (0.8–1.7 lb/1000 gal) or Fermaid K 25 g/hL (2 lb/1000gal)
125–200 mg/L	Go-Ferm 30 g/hL (2.5 lb/1000 gal)*	Fermaid O 10–20 g/hL (0.8–1.7 lb/1000 gal)	Fermaid A 10–30 g/hL (0.8–2.5 lb/1000 gal) or Fermaid K 10–25 g/hL (0.8–2 lb/1000 gal)
<125 mg/L	Go-Ferm Protect Evolution 30 g/hL (2.5 lb/1000 gal)*	Fermaid A 10–30 g/hL (0.8–2.5 lb/1000 gal) or Fermaid K 10–25 g/hL (0.8–2 lb/1000 gal)	Fermaid A 10–30 g/hL (0.8–2.5 lb/1000 gal)** or Fermaid K 10–25 g/hL (0.8–2 lb/1000 gal)**

Note: Knowing the initial YAN in the must/juice is only one piece of the puzzle. Other factors are critical as well. Do not forget to consider the balance and availability of nitrogen, micronutrients and microprotectors, relative nitrogen needs of the selected yeast strain, SO_2 , temperature, fruit condition, oxygen, and the variety of other factors which can impact yeast health and a successful fermentation.

* Quantity may change based on yeast dose.

** DAP may be required to further adjust the YAN

REHYDRATION NUTRIENTS FOR YEAST 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 SO₂. By adding these bio-available 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 bio-available 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

- 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.
- Let the mixture cool to 40°C(104°F) then add the selected active dried yeast.
- Let stand for 20 minutes.
- 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. Atemperate as necessary (*see page 7 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
#15135 2.5 kg
#15161 10 kg

GO-FERM PROTECT EVOLUTION



Next generation yeast rehydration nutrient for challenging conditions; OMRI listed

Go-Ferm Protect Evolution® is the next generation of natural yeast rehydration nutrient 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).

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 ⅓ 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

- 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.
- Let the mixture cool to 40°C(104°F) then add the selected active dried yeast.
- Let stand for 20 minutes.
- 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. Atemperate as necessary (*see page 7 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

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.

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 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 ⅓ sugar depletion.

To avoid CO₂ release and overflowing of fermentation vessels, Anchorferm should be mixed with water or juice to create a slurry. 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.

*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

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

FERMAID A

Complex yeast nutrient

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

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

Recommended Dosage

10–30 g/hL 0.8–2.4 lb/1000 gal

#15070A 10 kg

FERMAID K *

Complex yeast nutrient

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

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

Recommended Dosage

25 g/hL 2 lb/1000 gal

**Note: The ingredients in Fermaid K are listed by the TTB as acceptable in good commercial winemaking practice in CFR 24.250 together with CFR 24.246. The ingredients in all other products shown on pages 40–47 are listed by the TTB as acceptable in good commercial winemaking practice in CFR 24.246. For more information please visit www.TTB.gov. This product contains thiamin. The TTB Maximum Legal Dose for thiamin hydrochloride = 0.60 mg/L (0.005 lb/1000 gal) of wine or juice. 21 CFR 184.1875.*

#15073 2.5 kg

#15070 10 kg

FERMAID 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 CFR 24.250 together with CFR 24.246. The ingredients in all other products shown on pages 40–47 are listed by the TTB as acceptable in good commercial winemaking practice in CFR 24.246. For more information please visit www.TTB.gov. This product contains thiamin. The TTB Maximum Legal Dose for thiamin hydrochloride = 0.60 mg/L (0.005 lb/1000 gal) of wine or juice. 21 CFR 184.1875.*

#15070K 10 kg

FERMAID O

Organic yeast nutrient; OMRI listed

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

Recommended Dosage

40 g/hL 3.3 lb/1000 gal

#15067 2.5 kg
#15107 10 kg

USE OF ALL FERMAID PRODUCTS

Usage

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

Storage

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

Note: Due to high nutrient requirements, some yeast strains may benefit from additional nutrient supplementation (see yeast reference chart on pages 8–11, 25).

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

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

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 ⅓ 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 hydro-chloride = 0.60 mg/L (0.005 lb/1000 gal) of wine or juice. 21 CFR 184.1875.*

#15887 1 kg
#15888 5 kg

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 and fungicide residues. It was designed for use when restarting stuck fermentations. Saturated fatty acids can be created by yeast during stressful fermentation conditions. These fatty acids and fungicide residues 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
#15242 10 kg

SIY 33 (FERMAID 2133)

Autolyzed yeast

SIY 33™ (Fermaid 2133) is a pure, autolyzed, spray dried yeast. It provides natural alpha amino nitrogen, B vitamins and yeast hulls. SIY 33 (Fermaid 2133) will help supplement the alpha amino nitrogen component of YAN. Add at ⅓ sugar depletion when inorganic nitrogen is NOT desired. Unlike Fermaid A and K, SIY 33 (Fermaid 2133) does not contain added ammonia salts (DAP) or supplemented micronutrients.

Recommended Dosage

25 g/hL 2 lb/1000 gal

Usage

In order to avoid CO₂ release and overflowing of fermentation vessels, SIY 33 (Fermaid 2133) 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.

#15100 12.5 kg

SIY CELL HULLS

Yeast hulls for difficult fermentation conditions

SIY Cell Hulls™ (yeast ghosts or skeletons) are a preparation of the insoluble fraction of whole yeast cells (i.e. cell walls). Yeast hulls are highly beneficial in oxygen deficient juice and wine as they contribute sterols and unsaturated fatty acids. For severe conditions, such as botrytised musts, high sugar musts, over-fined musts or warm cellar conditions, Nutrient Vit End and Reskue are recommended. Racking will remove yeast hulls and may necessitate a second addition.

Recommended Dosage

25 g/hL 2 lb/1000 gal

Usage

In order to avoid CO₂ release and overflowing of fermentation vessels, SIY Cell Hulls 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.

#15069 per lb
 44 lb box

CHOOSING THE RIGHT NATURAL YEAST DERIVATIVE NUTRIENT

 Highly Recommended
 Recommended

	ICV Booster Blanc	ICV Booster Rouge	ICV Noblesse	OptiMUM Red	OptiMUM White	Opti-Red	Opti-White	REDstyle
Page	45	45	45	46	46	46	47	47
OMRI Listed								
Increases aromatic freshness in whites and rosés								
Develops mid-palate intensity in whites and rosés								
Increases mid-palate intensity in reds								
Color and tannin stabilization								
Increases aromatic structure & complexity								
Decreases alcohol perception								
Facilitates wood integration								
Develops aromatic/spicy notes								
Increase overall balance								
Avoids off-aromas and oxidation								
Reduces bitterness or green character								
Reduced production of sulfur off-odors during fermentation								
Reduces sulfur defects								
Contains enzyme								

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

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

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. Licorice aromas and mid-palate intensity are also enhanced. 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

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

NEW! 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

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 bio-availability and the level of available polysaccharides. Glutathione is a natural antioxidant that has been shown to protect against browning, enhance the fruity nature of aromatic wines and minimize undesirable aroma compounds. OptiMUM White should be added early in the fermentation process (after settling). This helps protect juice from oxidation. When used at this point it also has a positive impact on volatile thiol preservation. This natural yeast derivative nutrient favors aromatic intensity, stabilization and longevity in whites and rosés. In order to achieve the maximum antioxidant protection OptiMUM White should be used with a complete nutritional program.

Recommended Dosage

20–40 g/hL 1.7–3.4 lb/1000 gal

Usage

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

Storage

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

#15198 1 kg
#15202 2.5 kg

OPTI-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
#15138 2.5 kg
#15211 10 kg

OPTI-WHITE  

Protects fresh aromas; OMRI listed

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

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

Recommended Dosage

25–50 g/hL 2–4 lb/1000 gal

**Use 50 g/hL for maximum anti-oxidative properties*

Usage

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

Storage

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

#15165 1 kg
#15136 2.5 kg
#15216 10 kg

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

FREQUENTLY ASKED QUESTIONS

My wine is at 8°B and I missed the addition of nutrients at 1/3 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. Nitrogen uptake is inhibited above 10% alcohol. Depending on the initial juice chemistry this may not cause issues. If you are in low nitrogen situations, a small addition of organic nutrient (Fermaid O or Nutrient Vit End) may be beneficial. This really is a case-by-case scenario.

Every harvest I add 2 lb/1000 gal of a complete yeast nutrient 1/3 of the way through fermentation. Is that what is recommended?

Nitrogen supplementation during fermentation must be carefully managed. Each fermentation the initial YAN of the juice should be checked. The yeast strain, temperature of the fermentation, the initial grape sugar, as well as other contributing factors should all be considered prior to nutrient additions. Latest research has shown that timely nutrient additions are important to a successful fermentation. The first addition should be at the onset of fermentation (drop of 2–3°B) followed by a second addition at 1/3 of the way through fermentation.

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 Lallemant 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 Lallemant 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 Redules.

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.



TANNINS

Winemaking tannins come from a variety of sources. These include oak (both American and European, toasted and untoasted), chestnut, grapes (both skins and seeds), exotic woods (such as tara and quebracho) and gall nuts. Though all tannins provide some degree of anti-oxidative protection, each is also quite distinctive. The selection, processing and blending are all critical when developing commercial tannins for use in wine. The descriptors often used to characterize tannin types are inadequate to the task. Words such as ellagic (meaning oak or chestnut wood) or proanthocyanidins (meaning from grapes and some exotic woods) are very broad. The producer of winemaking tannins needs to understand and quantify the potential of specific raw materials and then apply this knowledge. Tools such as GC/MS (gas chromatography/mass spectrometry), reverse phase HPLC (high performance liquid chromatography) and TLC (thin layer chromatography) analysis are common in this process.

Raw materials need to be tasted in different concentrations in different wines. Even if laboratory tools are useful for understanding products, tasting remains the key. There is no substitute if we wish to understand issues such as mouthfeel, relative astringency and increasing roundness. In particular, the way the polysaccharides linked with tannins contribute to the overall impact on the palate.

These are the elements that went into the development of the Scott' Tan™ product range. It was an elaborate program. We believe you will appreciate the results.

BASICS

Fermentation Tannins

Tannins are used in wines from all winemaking areas. Fermentation tannins can be used for very specific reasons, such as on *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.

Cellaring and Finishing Tannins

Cellaring and finishing tannins are helpful tools when fine-tuning a wine. Some winemakers are looking for more mid-palate structure and aging potential while others are looking for an influence from oak. Bench trials are a valuable tool when deciding which tannin works best.

OTT Tannins

OTT (Over The Top) Tannins are bold finishing tannins developed to provide a final, stylistic touch to wines.

LUXE Tannins

The LUXE tannins are ultra-premium finishing tannins designed to bring out elegance, complexity and balance in premier wines.

A FERMENTATION TANNIN PRIMER

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

VINTAGE TO VINTAGE VARIATION

The changes from vintage to vintage may often seem negligible. The vineyard has been cared for in the same way, fruit appears to be similar upon arrival, but then during processing, problems can arise. What has happened? There are a number of possible culprits.

The weather during the growing season may have been different, fruit may or may not have the same nutrient levels, microbial load, Brix, pH, phenolics level, greenness, etc. It is important to take

these factors into account when deciding how best to process your fruit. Extra nutrition may be needed if grapes are extremely high Brix. The use of fermentation tannins might be called upon to mitigate greenness, and enzymes might be required to tackle mold issues. It is important to always test your fruit so decisions can be made early that help minimize any problems and present the best wine possible.

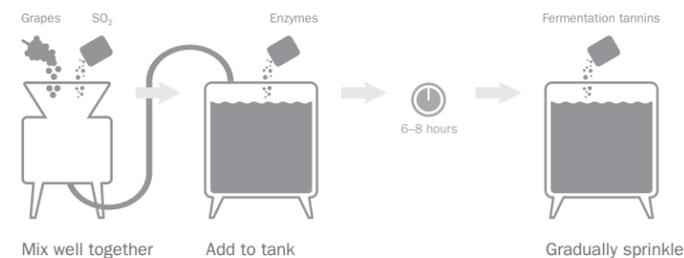
CHOOSING THE RIGHT TANNINS

🔹 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	52	52	52	52	53	53	53	54	54	54	55	55	55	55	56	56	57	57	57
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															🔹	🔹	🔹		

PROTOCOL

TIMING OF ADDITIONS: SO₂, ENZYMES AND TANNINS



Add SO₂ and mix well prior to adding enzymes. Tannins can be added 6–8 hours later. Please see FAQs on page 58 for more information. Yeast derivative nutrients (e.g. Opti-Red) can be added at any point during fermentation.

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.

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 SO₂. 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
#15969	5 kg

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
#15980	5 kg

FT BLANC + FT BLANC SOFT

Recommended Dosage

White/Rosé Juice

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

50–300 ppm	5–30 g/hL	0.42–2.5 lb/1000 gal
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Fruit, Cider, Mead

50–200 ppm	5–20 g/hL	0.42–1.6 lb/1000 gal
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White/Rosé Wine*

50–300 ppm	5–30 g/hL	0.42–2.5 lb/1000 gal
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**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	0.17–1.25 lb/1000 gal
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Rosé Must

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

In order to benefit from the effect of 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 must and add during a punch-down or pump-over.

Storage

Dated expiration. Unopened: store the product in a dry, cool and well-ventilated place. Opened package: carefully reseal and store for use in the same harvest year.

#15974	1 kg
#15975	5 kg

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. 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
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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
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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 anti-oxidative protection and may inhibit oxidative enzymes (such as laccase) associated with browning.

#15950	1 kg
#15951	5 kg

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 anti-oxidative protection.

#15952	1 kg
#15953	5 kg

FT ROUGE + FT ROUGE SOFT

Recommended Dosage

Red *Vinifera* Must

200–500 ppm	20–50 g/hL	1.6–4.0 lb/1000 gal
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Red Non-*Vinifera* Must

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

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

Gradually sprinkle 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 (63 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.

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
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Red Must

50–200 ppm	5–20 g/hL	0.42–1.6 lbs/1000 gal
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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
#15973	5 kg

TESTIMONIAL



"Harvest 2016 rainfall was more than any winemaker likes to see. I was looking for a fermentation tannin to pump up the aromatics in some of our red varietals as well as to stabilize the color pigments that were present. FT Rouge Berry was exactly what we needed! With the same fruit source, we fermented one batch with FT Rouge Berry and one without, and there is a significant difference in final wine quality. The punch of cherry and raspberry notes enhanced the wine and the color intensity was significantly greater—this product will now be a staple in our winery!"

Nancie Oxley

St. Julian Winery

Paw Paw, MI

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
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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) for a more complete polymerization. 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
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UVA'TAN + UVA'TAN SOFT

Recommended Dosage

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

Usage

Sprinkle 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
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Prior to Bottling (3–6 weeks)

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

#15956	1 kg
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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
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Prior to Bottling (3–6 weeks) or During Rackings

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

Finishing tannins can enhance complexity 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
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Red Wine

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

Smooth vanillin 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
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Red Wine

50–200 ppm	5–20 g/hL	0.42–1.6 lb/1000 gal
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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
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NEW! FINISHING KIT

Finishing agents can be valuable tools for perfecting a wine. We now offer finishing kits with liquid product for ease of addition. 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



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

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

Usage

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

Storage

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

#15977 250 g

RADIANCE

Tannin blend for highlighting fresh fruit
White, Red, Rosé, Cider

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

Recommended Dosage

10–100ppm 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

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 butterscotch. Royal has also been known to help mitigate the off-aromas and flavors of *Brettanomyces*.

Recommended Dosage

10–100ppm 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

NEW! 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



MICROPIPETTES FOR BENCH TRIALS

#37101	20–200µL Micropipette
#37102	100–1000µL Micropipette
#37111	5–200µL Micropipette tips (96 tips)
#37112	100–1250µL Micropipette tips (96 tips)

OTT TANNINS

OTT (Over The Top) Tannins are bold finishing tannins developed to provide a final stylistic touch to wines.

BOLD

Vanillin 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 in the 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

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

FREQUENTLY ASKED QUESTIONS

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 color 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 SO₂ interfere with my additions?

Using all three products together is fine, but timing is important! High SO₂ content can inhibit enzyme activity. Do not add SO₂ and enzymes at the same time. It is okay to add enzymes after the SO₂ is adequately dispersed OR to add SO₂ after the enzymes are adequately dispersed. Follow with a tannin addition six to eight hours later. When enzymes are not being used, add SO₂ 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 Ctirus 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 color 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 SO₂ management add small amounts of Estate (5–7.5 g/hL) during each racking.

Will tannin additions increase color in low-color grape varieties?

Tannins do not add color to the must of low color 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 color stability.

Why not add oak chips? Aren't they a source of accessible tannin?

Oak chips are a source of ellagic (wood) tannin. The level of tannin available will differ depending upon the wood source and the treatment regime. When using oak based products, macromolecules (lignin, cellulose, hemicellulose, etc.) other than oak will be extracted. The oak based addition may help mask flavors, provide some oxidative protection and leave an oak finish, but they will NOT improve mid-palate structure. By contrast, the combination of wood and proanthocyanidic tannins in FT Rouge or FT Rouge Soft will help improve structure and color stability. Tannins have the ability to integrate quicker than oak chips.

What if I did not add enough tannin during the primary fermentation?

If more tannin structure and flavor 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 56 for more information.

LUXE TANNINS

How are the LUXE tannins different than 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

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. (D. Delteil, 2003, Personal Communication). 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 and Scottzyme BG) are inhibited by sugars and should not be used prior to fermentation. Beta and BG are useful in releasing flavor and aroma compounds. Scottzyme KS is used after pressing to enhance clarification and filterability in wine.

SO₂

Enzyme activity is inhibited by SO₂. In high concentrations (around 200 ppm) SO₂ will denature and inactivate the enzymes. SO₂ can be added after an enzyme addition has been adequately dispersed or vice versa, but do not add SO₂ 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 SO₂, 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 .

CHOOSING THE RIGHT ENZYMES

- Highly Recommended
- Recommended

*Note: The ingredients in MMX are listed by the TTB as acceptable in good commercial winemaking practice in CFR 24.250. For more information, please visit www.TTB.gov. All other enzymes are listed in CFR 24.246.

	Lallzymes					Scottzymes								Rapidase			
	Beta	Cuvée Blanc	EX	EX-V	MMX	BG	Cinn-Free	Color Pro	Color X	HC	KS	Pec5L	Performance	Clear Extreme	Extra Press	Expression Aroma	Revelation Aroma
Page	61	61	61	61	62	62	62	63	63	63	64	64	64	65	65	65	65
Reds			Highly Recommended	Highly Recommended	Highly Recommended	Recommended		Highly Recommended	Highly Recommended		Recommended						Recommended
Whites and Rosé	Highly Recommended	Highly Recommended			Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended		Recommended	Highly Recommended	Highly Recommended	Highly Recommended		Highly Recommended	Highly Recommended	Highly Recommended
Fruit, Cider and Mead					Highly Recommended	Highly Recommended	Highly Recommended			Highly Recommended	Highly Recommended	Highly Recommended					
Hybrids and non-vinifera										Recommended	Recommended	Highly Recommended		Highly Recommended			
Aroma enhancement for aromatic white wines	Highly Recommended	Recommended			Recommended	Highly Recommended	Recommended									Highly Recommended	Highly Recommended
Macerating enzyme for fruit forward reds			Highly Recommended					Highly Recommended									
Macerating enzyme for premium reds				Highly Recommended				Highly Recommended	Highly Recommended								
Release of varietal aromas in whites	Highly Recommended	Highly Recommended			Recommended	Highly Recommended	Highly Recommended									Highly Recommended	Highly Recommended
Hard-to-press grapes (e.g. Concord, Muscat, Thompsons), fruit										Highly Recommended		Highly Recommended			Highly Recommended		
Gentle extraction		Highly Recommended	Highly Recommended				Highly Recommended	Highly Recommended									Highly Recommended
Improved pressability		Highly Recommended					Highly Recommended	Recommended				Highly Recommended			Highly Recommended		
Never use BEFORE pressing											Highly Recommended		Highly Recommended	Highly Recommended			
Enhanced settling							Highly Recommended	Highly Recommended			Highly Recommended						
Improved clarification		Highly Recommended			Recommended		Highly Recommended	Highly Recommended			Highly Recommended		Recommended				
Increased yield		Recommended					Highly Recommended	Recommended		Highly Recommended		Highly Recommended			Highly Recommended		Recommended
Reduced solids							Highly Recommended	Highly Recommended		Highly Recommended	Highly Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended		
Improved filterability		Highly Recommended	Highly Recommended		Highly Recommended		Highly Recommended	Highly Recommended		Highly Recommended							
Improved flowrate in crossflow											Recommended						
Use on botrytised wines					Highly Recommended						Recommended						
Contains beta-glucanase					Highly Recommended												
Listed in CFR 24.250.					Highly Recommended												

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 betaglucosidase 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
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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 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
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EX

Macerating enzyme for early-to-release 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
#16205	250 g

EX-V

Macerating enzyme for premium 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
#16208	500 g

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 CFR 24.250.

Recommended Dosage

Crushed Grapes	Juice
Not recommended	Not recommended

Wine

1–3 g/hL	40–114 g/1000 gal
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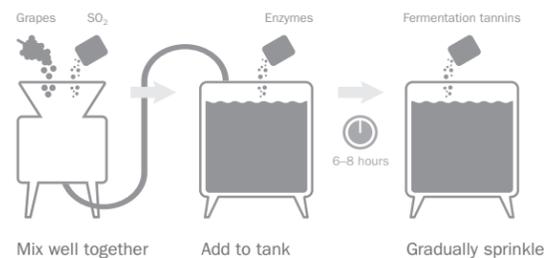
Usage

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.

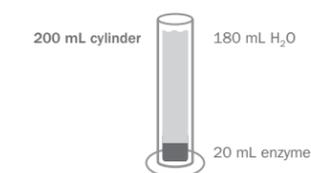
Storage

Dated expiration. Store dry enzyme at 25°C(77°F). Once rehydrated use within a few hours.

#16207	100 g
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PROTOCOL**TIMING OF ADDITIONS: SO₂, ENZYMES AND TANNINS**

Add SO₂ and mix well prior to adding enzymes. Tannins can be added 6–8 hours later. Please see FAQs on page 66 for more information. Yeast derivative nutrients (e.g. Opti-Red) can be added at any point during fermentation.

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.

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. The 25 kg totes are Kosher (but not Kosher for Passover). The 1 kg bottles are not Kosher. 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 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
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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 fermentation
	50–60 mL/1000 gal	

Usage

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

#16175	1 kg (890 mL)
#16165	25 kg (22.25 L)

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. Sprinkle 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

Sprinkle a 10% solution over crushed grapes or add to juice before the start of alcoholic fermentation.

#16172	1 kg (890 mL)
#16162	25 kg (22.25 L)

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. Sprinkle the solution over the crushed grapes or add during a pump-over before alcoholic fermentation. Best used before fermentation.

#16173	1 kg (890 mL)
#16163	25 kg (22.25 L)

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. Sprinkle 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)
#16161	25 kg (22.25 L)

KS

Blend of enzymes for enhanced settling and filtration

Scottzyme® KS is a blend of enzymes designed 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)
#16164	25 kg (22.25 L)

PEC5L

Enzyme for white and fruit for pressability, settling and clarification

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

It is used on crushed grapes for easier pressing and higher yields and in juice for improved settling, clarification and filtration. 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 40–50 mL/1000 gal	1.3–1.6 mL/hL 50–60 mL/1000 gal

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

#16170	1 kg (890 mL)
#16160	25 kg (22.25 L)

NEW! SCOTTZYME 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)
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ALL SCOTTZYMES (EXCEPT BG)

Storage
Store at 4°C(40°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

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
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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 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. Sprinkle over crushed fruit or add in the press.

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

#16260	100g
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EXTRA PRESS

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
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REVELATION AROMA

For extraction of aroma precursors in red and white grapes

Rapidase® Revelation Aroma contains α and β-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. Sprinkle 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
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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. Sprinkle 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 SO₂.

Are enzymes deactivated by SO₂?

Yes, enzymes are inhibited by SO₂. Deactivation occurs around 200 ppm. Do not add SO₂ and enzymes together. It is okay to add enzymes after the SO₂ is adequately dispersed or to add the SO₂ 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 SO₂ 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 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 SO₂ interfere with my additions?

Using all three products together is fine, but timing is important! High SO₂ content can inhibit enzyme activity. Do not add SO₂ and enzymes at the same time. It is okay to add enzymes after the SO₂ is adequately dispersed OR to add SO₂ after the enzymes are adequately dispersed. Follow with a tannin addition six to eight hours later. When enzymes are not being used, add SO₂ first, allow to disperse, then follow with the tannin addition.

MALOLACTIC BACTERIA

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 wine-making preferences (e.g. higher pH levels, lower SO₂, 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, SO₂, 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.

SO₂

Free SO₂ below 10 ppm, total SO₂ 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.

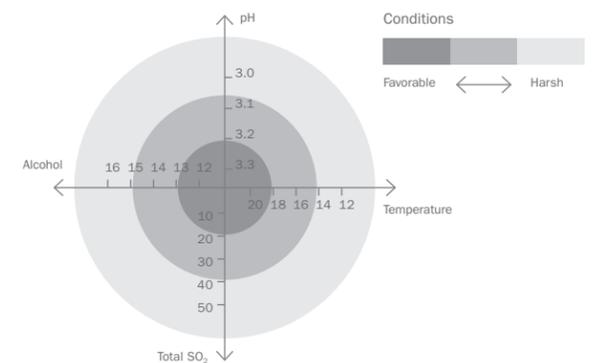
Yeast Strain

Choose a yeast strain which is compatible with the selected malolactic bacteria. See *MLF Compatibility in the yeast charts* on pages 8–11, 25.

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 SO₂, 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.

Page	Freeze-Dried Direct Inoculation (MBR)							Effervescent Direct Inoculation Cultures	Co-Inoculation	1-Step		Nutrients			
	Alpha	Beta	ICV Elios 1	MBR 31	O-MEGA	PN4	VP41			MALOTABS	Beta Co-Inoc	1-Step Alpha	1-Step VP41	Act-ML	Opti'Malo Plus
69	69	69	69	69	69	70	70	70	71	71	71	72	73	73	73
Reds	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Whites and Rosé	Highly Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Fruit, Cider and Mead	Recommended	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Higher alcohol tolerance	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Lower pH tolerance	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Higher SO ₂ tolerance	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Lower temperature tolerance	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Low nutrient demand	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Medium nutrient demand	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
High nutrient demand	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Higher diacetyl production	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Impact on mouthfeel fullness	Highly Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Impact on mouthfeel structure	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Impact on fruitiness	Highly Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Restart stuck or sluggish MLF	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Bacteria rehydration nutrient	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Nutrient for difficult red MLF's	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Nutrient for difficult white MLF's	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
General ML Nutrient	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
Alcohol (% v/v)	<15.5%	<15.0	<15.5	<14.0	<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	>3.1	>3.1	>3.2	>3.2	>3.1				
Total SO ₂ (mg/L)	<50	<60	<50	<45	<60	<60	<60	<60	<60	<50	<60				
Temperature °C(°F)	>14° (57°)	>14° (57°)	>18° (64°)	>13° (55°)	>14° (57°)	>14° (57°)	>16° (61°)	>16° (61°)	>14° (57°)	>14° (57°)	>16° (61°)				
Typical fermentation kinetics	Start	Fast	Slow	Mod	Slow	Fast	Mod	Mod	Mod	Slow	Fast	Mod			
	Finish	Slow	Fast	Mod	Fast	Fast	Fast	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 Institut Technique du Vin (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 SO₂ 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
- #15602 25 hL (660 gal) dose
- #15603 250 hL (6,600 gal) dose

BETA

O. oeni adapted to high SO₂; 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 SO₂ 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.

Benefits from the addition of a malolactic nutrient.

- #15604 2.5 hL (66 gal) dose
- #15605 25 hL (660 gal) dose
- #15606 250 hL (6,600 gal) dose

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 SO₂ 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
- #15109 250 hL (6,600 gal) dose

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 ITV for use in red and white wines.

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

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

It is sometimes slow to start, but finishes quickly.

- #15022 2.5 hL (66 gal) dose
- #15032 25 hL (660 gal) dose
- #15127 250 hL (6,600 gal) dose

O-MEGA

O. oeni adapted to high alcohol and cooler cellar temperatures
White, Red

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

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

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

- #15615 25hL (660 gal) dose
- #15616 250hL (6,600 gal) dose

PN4 LALLEMAND

O. oeni adapted to difficult conditions of pH, alcohol and SO₂
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 SO₂ 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
#15608 250 hL (6,600 gal) dose

VP41 LALLEMAND

O. oeni adapted to high SO₂ 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 SO₂ 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.

Both red and white wines fermented with VP41 have increased richness and complexity.

#15048 2.5 hL (66 gal) dose
#15042 25 hL (660 gal) dose
#15044 250 hL (6,600 gal) dose

Storage info for Malolactic Bacteria

Short term (<18 months) @ 4°C(40°F)

Long term (>18 months) @ -18°C(0°F)

EFFERVESCENT DIRECT INOCULATION CULTURES**MALOTABS** LALLEMAND

O. oeni in tablet form for barrel addition to fresh and fruit driven wines

White, Red

Malotabs™ are a new easy-to-use form of malolactic bacteria designed by Lallemmand 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.

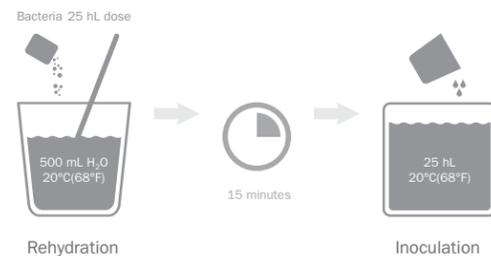
Malotabs™ are produced from a known strain developed for good implantation, moderate to fast kinetics, low VA and diacetyl production. Malotabs™ are effective in wines with pH above 3.2, high alcohol (up to 16% v/v), total SO₂ below 60 mg/L, temperature down to 16°C(61°F).

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 Lallemmand malolactic cultures.

#15049 2.5 hL (66 gal) dose (5/box)

PROTOCOL**ADDING DIRECT INOCULATION CULTURES TO WINE**

If using a direct inoculation culture, allow packet to come to room temperature. Open the packet, 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.

CO-INOCULATION**BETA CO-INOC** LALLEMAND

O. oeni for use in co-inoculation
White, Red

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

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

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

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

#15617 25hL (660 gal) dose
#15618 250 hL (6600 gal) dose

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.

Please see our website (www.scottlab.com) for the protocol.

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 ITV 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 SO₂ up to 50 ppm, and temperature down to 14°C(57°F).

#15609 25 hL (660 gal) dose
#15610 100 hL (2,600 gal) dose
#15611 500 hL (13,000 gal) dose
#15612 1,000 hL (26,000 gal) dose

1-STEP VP41 LALLEMAND

O. oeni adapted to high SO₂ 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 SO₂ up to 60 ppm, and temperature down to 16°C(61°F).

#15029 100 hL (2,600 gal) dose
#15058 500 hL (13,000 gal) dose
#15054 1,000 hL (26,000 gal) dose

PROTOCOL**ADDING 1-STEP CULTURES TO WINE**

Rehydration
Chlorine-free H₂O, wait 20 minutes, add equal volume of wine

Please see 1-Step procedure in more detail at www.scottlab.com.

STANDARD ML FREEZE DRIED BUILD-UP CULTURES

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

Please contact us for more information when using these products.

IB (INOBACTER)

O. oeni adapted for sparkling wines; neutral sensory effect
Sparkling, White, Red

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

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

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

#15024 25–50 hL (660–1,320 gal) dose

MT01

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

Sparkling, White, Red

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

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

#15027 25–35 hL (660–925 gal)

MALOLACTIC BACTERIA NUTRITION

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

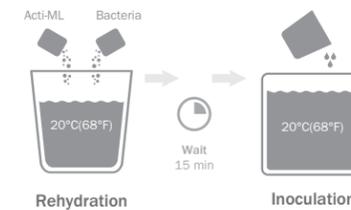
Storage

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

#15681 1 kg

PROTOCOL

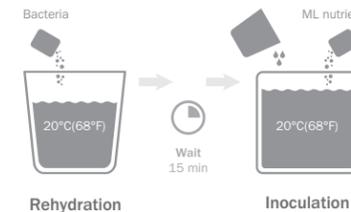
ADDING ACTI-ML TO WINE



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.

OPTI'MALO BLANC

Malolactic nutrient for difficult White and Rosé fermentations

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

Recommended Dosage

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

Usage

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

Storage

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

#15217 1 kg

OPTI'MALO PLUS

Complete malolactic nutrient

Opti'Malo Plus™ is a natural 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.

Storage

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

#15141 1 kg

ML RED BOOST

Malolactic nutrient for difficult Red fermentations

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.

Storage

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

#15218 1 kg

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: 375 mL sample

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. Provided that any warming period is moderate (e.g. 30°C/86°F for less than 48 hours) viability should be excellent. 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 SO₂, 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. A restart protocol for stuck or sluggish malolactic fermentations is on our website (www.scottlab.com).

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 SO₂ and rate of autolysis which has a resulting effect on the bacteria. *Please refer to the yeast charts on pages 8–11, 25.*

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 SO₂ levels, pH, alcohol, temperature constraints as well as malic acid concentration.

Why does the SO₂ need to be measured when choosing the correct strain of bacteria?

SO₂ can be bound to acetaldehyde. Bacteria can break that bond and liberate free SO₂, 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 SO₂ (>45 mg/L total or 5 mg/L free SO₂), 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.

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 when followed by racking.

Inhibition

Microbe replication is stopped or slowed, 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

	Lysozyme		SO ₂		Chitosan	Chitin Glucan	DMDC
	Lyso-Easy	Lysovin	Inodose Granules	Inodose Tablets	No Brett Inside	Bactiless	Velcorin
Page	77	77	78	78	79	79	80
Reds	◆	◆	◆	◆	◆	◆	◆
Whites and Rosé	◆	◆	◆	◆	◆	◆	◆
Fruit, Cider and Mead	◆	◆	◆	◆	◆	◆	◆
Protection from indigenous yeast			◆	◆			
Control gram positive bacteria (LAB)	◆	◆	◆	◆		◆	
Control gram negative bacteria (<i>Acetobacter</i>)			◆	◆		◆	
Inhibit oxidation of grapes and juice			◆	◆			
Control spoilage yeast (<i>Brettanomyces</i>)			◆	◆	◆		◆
Protection during stuck and sluggish fermentations	◆	◆					
Delay MLF	◆	◆					
Helps prevent refermentation in bottle			◆	◆			◆
Chitosan					◆	◆	
Chitin Glucan						◆	
Listed in CFR 24.250					◆	◆	

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

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.

- #16405 250 mL
- #16406 1 L
- #16407 5 L

LYSOVIN

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
- #16400 1 kg
- #16401 5 kg

LYSO-EASY + LYSOVIN

Recommended Dosage

Lysozyme Applications	Red	White	Lyso-Easy		Lysovin			Timing of Addition
Inhibit Growth of LAB in Must and Juice 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
Protection During Stuck and Sluggish Fermentations To encourage yeast growth in the absence of SO ₂ 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
Delay MLF/Post-MLF Stabilization To protect wine without the negative effects of SO ₂ , 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, SO₂ addition should not be delayed. Lysozyme is only effective against gram-positive bacteria and has no effect on yeast or gram-negative bacteria such as *Acetobacter*.

SULFUR DIOXIDE

Wine quality can be preserved with sulfur dioxide. Sulfur dioxide is used in wine for its antioxidant and anti-microbial properties. The effectiveness of sulfur dioxide as an anti-microbial agent is dependent upon pH, as well as the presence of other SO₂ binding compounds. As pH increases, the portion of sulfur dioxide that is active against microorganisms decreases. Therefore, increases in pH require the addition of more sulfur dioxide to maintain adequate anti-microbial 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 SO₂. Inodose Granules come in pre-measured packs. A pack of Inodose Granules 100, for example, will release 100 grams of pure SO₂. Inodose Granules are perfect for SO₂ 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)
#15778	5 g (25/box)
#15780	100 g
#15781	400 g

Note: Volume discounts are available. See order form on pages 116–122 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 SO₂. 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 SO₂ 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)
#15776	5 g (48/box)

Note: Volume discounts are available. See order form on pages 116–122 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 sulfite additions to barrels.

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

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

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

NEW! BACTILESS

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 SO₂. The effectiveness of Bactiless can be enhanced with SO₂, but it does not replace the use of SO₂ 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 0.70–1.76 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).

#15232	500g
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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

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.*
*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

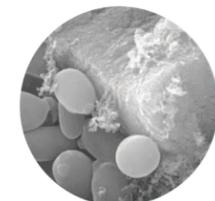
Dated expiration. Store in a dry, odor-free environment below 25°C(77°F).

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

#16410 100g



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 dimethyldicarbonate (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 splatters, 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

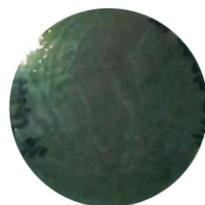
Velcorin must be used with an approved dosing system. Scott Laboratories will only sell Velcorin to those using a LANXESS approved dosing machine. Velcorin is a chemical and must be handled with respect. Therefore, all Velcorin handlers must undergo annual safety training (provided at no charge by Scott Laboratories, Inc.). The current cost of a Velcorin dosing machine starts at approximately U.S. \$74,000.

#18000 3 kg

For more information on Velcorin and dosing machines, please contact Rebekka deKramer at 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 results are reported.

Volume needed: two 375 mL samples needed per challenge. Includes microbial analysis of both a Velcorin-treated and untreated sample.

METHANOL TESTING FOR VELCORIN ADDITION QUANTIFICATION

Velcorin, a microbial control agent, breaks down into roughly equal parts of CO₂ 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 SO₂ and clean racking.

FREQUENTLY ASKED QUESTIONS

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 SO₂. 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.

Is lysozyme approved for use in Canada?

Winemakers in Canada do not yet have approval to use lysozyme in their wine.

SULFUR DIOXIDE

Can I use a partial bag of Inodose granules?

No, use the entire packet for a single dose of SO₂. 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 SO₂ to my 60 gallon barrel.

Does this mean I have 22 ppm of free SO₂?

You have 22 ppm total SO₂ 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 (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 assure 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 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. Pretreatment 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.*

CLEANING

“Cleanliness is the basic condition for quality.”

Emile Peynaud. *Knowing and making wine.*

A clean cellar is one of the basic keys to producing and maintaining quality wines. AiRD products achieve hygiene goals while saving time, water and energy.

Our mantra is “Work smarter, not harder”!

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.

CHOOSING THE CORRECT WINERY HYGIENE PRODUCT

	Cleaning Agents					
	Cleanskin-K	Destainex	Destainex-LF	Oak Restorer-CW	Oak Restorer-HW	Wineglass
Page	83	83	83	84	84	84
Dosage	0.5–4% w/v	0.5–1.5% w/v	0.5–1.5% w/v	0.5–2.0% w/v	0.5–2.0% w/v	
Water temperature for use	68–140°F 20–60°C	104–140°F 40–60°C	104–140°F 40–60°C	68–89°F 20–30°C	104–140°F 40–60°C	
pH (1% solution)	~11.3	~10.5–10.9	~10.8	~10.65	~9.6	
Removes tartrates	Highly Recommended	Recommended	Recommended	Highly Recommended	Highly Recommended	
Removes color	Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	
Microbial neutralizing		Recommended	Recommended	Highly Recommended	Highly Recommended	
General purpose cleaning	Recommended	Highly Recommended	Highly Recommended			
Barrel cleaning				Highly Recommended	Highly Recommended	
Cellar/Tasting Glassware						Recommended

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

1–4% w/v (See chart)

Usage

Cleaning is most effective when soft or treated/potable warm water is used.

Prepare appropriate volume of 20–60°C (68–140°F) potable water (typically 10% volume of the vessel volume you are cleaning), accurately measuring the correct weight of the Cleanskin-K. Slowly add the powder into the water, mixing until a consistent solution is obtained. Initially the prepared solution will appear milky, but will soon clarify. Once the solution has clarified it is ready for use. Cleanskin-K can be used manually, or with automated CIP systems.

Contact time is based on water temperature and quality, amount of Cleanskin-K used and turbulence of contact. Average contact time is 20 minutes.

Storage

Store in a dry, odor free environment between 10–20°C (50–68°F) away from sunlight.

#18500 5 kg

DESTAINEX ∞AIRD

Multi-purpose oxidizing cleaner for organic soils and molds
Winery Surfaces, Tanks, Lines, Equipment

#18502 5 kg

DESTAINEX-LF (LOW FOAMING) ∞AIRD

Low Foaming version of Destainex

Bottling systems, winery surfaces, lines, equipment and difficult to rinse systems

Destainex products are proprietary sodium percarbonate based cleaning agents with microbial neutralizing abilities. These highly effective formulations 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 products can be used in both automated (CIP) and manual systems. The sodium percarbonate in Destainex products are complemented with proprietary surfactants and chelation agents, water conditioning materials and rinse aids for a bright, clean and spot free neutral surface.

#18504 5 kg

DESTAINEX + DESTAINEX-LF

Recommended Dosage
0.5–1.5% w/v (See chart)

Usage
Cleaning is most effective when soft or treated warm water is used.

Choose Destainex-LF rather than Destainex if used in an application where low foam is desired.

Prepare appropriate volume of potable hot water 40–60°C (104–140°F) and accurately measure the correct weight of your Destainex product. Slowly add the powder into the water mixing until a consistent solution is obtained. Initially the prepared solution will appear milky, but will soon clarify. Once the solution has clarified it is ready for use. Destainex products can be used manually, or with an automated CIP system.

Contact time is based on water temperature and quality, amount of Destainex product used and turbulence of contact. Conduct trials to determine contact time. Average contact time is 20 minutes.

Storage
Store in a dry, odor free environment between 10–20°C (50–68°F) away from sunlight.



Before After
Before and after photos of the inside of a pressure leaf filter dosing tank, cleaned using Destainex-LF.



Before After
Before and after photos of pressure leaf filter horizontal screens, cleaned using Destainex-LF.

ALL CLEANING 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

OAK RESTORER

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.

OAK RESTORER-COLD WATER (CW)

Oak cleaner and refresher

Recommended Dosage
0.5–2% w/v (See chart)

Usage
Prepare appropriate volume in correct temperature water: 20–30°C(68–86°F)

Storage
Store in a dry, odor free environment between 10–20°C (50–68°F) away from sunlight.

#18508 5 kg

OAK RESTORER-HOT WATER (HW)

Oak cleaner and refresher

Recommended Dosage
0.5–2% w/v (See chart)

Usage
Prepare appropriate volume in correct temperature water: 40–60°C(104–140°F)

Storage
Store in a dry, odor free environment between 10–20°C (50–68°F) away from sunlight.

#18510 5 kg

WINEGLASS

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.

Storage
Store in a dry, odor free environment between 10–20°C (50–68°F) away from sunlight.

#18516 5 kg

ARTICLE

CONSIDERATIONS FOR SELECTING AND EVALUATING A CLEANING AGENT

The standard bulk chemicals used in our industry for cleaning are caustic soda (either sodium or potassium hydroxide based) and citric acid. Although common, this combination is limited in effectiveness, and can involve worker-safety issues as well as cause long-term damage to winery equipment and surfaces.

Caustic soda solutions, if maintained above pH 10, are highly effective at dissolving tartrates and heavy deposits. When used as a multi-purpose cleaner, however, some negative side-effects can result. A caustic solution can be effective at decolorizing and dissolving organic soil, but it also denatures and chars these soils at the same time. This is due to the pH differential between the caustic solution and wine (pH 14 to 3.5 respectively). De-natured and charred organic soils are seen on wine surfaces as brown/black deposits. The use of caustic can therefore actually create new stains, which in turn provide opportunities for the development of biofilms. In addition to the points above, if a caustic is sodium based, it is potentially environmentally degrading (high sodium effluent can cause sodic soils).

After caustic use, it has become common practice to rinse with a low dose aqueous citric acid solution to neutralize any residual salts (Na or K) and reduce Ca/Mg scale. This process will not, however, remove the charred stains and biofilm left behind by the caustic treatment. This cleaning combination using bulk chemicals may be ubiquitous and may seem inexpensive, but it can be potentially ineffective and creates new winery headaches.

An Alternative

Built formulations are a blend of synergistic compounds that allow for optimized cleaning, while respecting your equipment, cellar staff and water savings. In addition to the actual cleaning solution, these complex formulations include surfactants, chelating agents, water conditioners and rinse aids. The chelating agents assist with the removal of minerals that can be associated with the water. The surfactants (surface active agents) reduce the surface tension of the water and help to keep the debris in solution. This allows for the effective removal of dirt and/or soil from the area. AiRD products also have a built in rinse aid that leaves the system clean, spot free and neutral. Instead of bulk caustic, we would recommend using a formulated carbonate based system.

Percarbonates (either potassium or sodium based) are effective at dissolving wine soils at a lower pH than caustic solutions. Due to the built formulations of AiRD products, the soils are removed from the wine contact surface, retained in the water solution and rinsed freely from the system. The formulation itself is fully biodegradable within 30 days.

Once the cleaning solution has been drained, it is important to rinse the cleaning solution from the system. This clean water rinse is the next stage. It is important that this water rinse respects the system and does not redeposit contaminants from the water. This stage is also important as residual alkali cleaner is incompatible with many of the acid based sanitizers. When using AiRD cleaning products, a citric rinse is not required. Eliminating this step saves time, energy, chemicals and water. The final stage is the actual sanitation phase. Sanitation is only effective if cleaning has effectively removed all residues — organic, inorganic, color, tannins, and microbial materials.

An optimized program follows the W.A.T.C.H. rule (water, action, temperature, concentration and heat), while also considering; soil type (organic, inorganic or combination) and presence (light, moderate or heavy load), soiled material (stainless steel, hoses, concrete), and water condition in addition to the activity of the cleaning agent itself. By understanding these factors you can minimize the amount of cleaning and sanitation agents used, as well as conserving water and energy.

The validation of your program can be determined by traditional and advanced microbiological techniques, which range from plating, DNA analysis and ATP bioluminescence. Essentially, once you are finished the area should look, smell and feel clean!

Documentation and Safety Considerations

It is essential that you maintain records on your regime and incorporate cleaning and sanitation protocols into every stage of your quality assurance program, insuring that the cleaning and sanitation agents selected are appropriate.

All products used in the sanitation program must be approved for use, including the concentration that you intend to use it at. Do not decant into unlabelled containers and do not deviate from the prescribed use. Proper Personal Protective Equipment (PPE) should be respected. For details on PPE, please refer to the specific SDS which can be found on our website at www.scottlab.com.

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			
Rinse	100 gallons			
TOTAL	800 gallons		TOTAL	400 gallons

Due to its unique formulation, AiRD products can result in up to 50% water savings.*

*The chart at left shows a common SOP for a 2,000 gallon tank cleaning. *Not including potential reuse of AiRD solutions. Actual water savings may be greater.*

FREQUENTLY ASKED QUESTIONS

Why is water quality important?

Water comprises 96–99% of cleaning and sanitation solutions. The chemical and microbiological impurities in water can drastically alter the effectiveness of a cleaner or a sanitizer, and the outcome of your process.

Why is water hardness important?

Hard water (water that has a high mineral content) can leave mineral deposits on the surface of equipment which can cause filming and staining and provide a surface for biofilm development. Hard water also interferes with the ability of a cleaning agent to do its job. The minerals react with bulk caustic and carbonate cleaners to produce the film which leaves less chemical available for cleaning. This is one of the reasons that you should use built formulations.

What if I do not have demineralized water for the final rinse stage?

It is important that the final water rinse does not recontaminate your sanitized equipment. Use of a 0.2 micron cartridge filter should be used for the final rinse of previously sanitized equipment.

What is a built formulation?

A built formulation is a synergistic blend of compounds that allow the cleaner to clean the surface while solubilizing the soil and removing it from the system.

What are the main types of soils in the winery?

Soil is the presence of a material in the wrong area. It can be visible or invisible. Winery soils can be generally categorized as organic, inorganic or combination. Winery soils can be grape based and include sugars, acids, salts, color pigments, tannins, and proteins, or they can be process based. Process based soils can originate from wine additions, microbial activity, water quality or residual cleaning agents.

How do I determine the type of soil that I have?

Initial rinsing with warm water will tell you if the soil is generally water soluble (examples are sugars and tartrate crystals). If the soil does not rinse freely with warm water, likely candidates are proteins, tannins, polyphenolics or baked on residues that could have been removed with warm water when fresh. In general, these soils are acid-based. This is why an alkaline-based agents is used for cleaning.

How do I prepare the equipment for cleaning?

It depends on the equipment. Generally, a warm water rinse <math><40^{\circ}\text{C}</math> (104°F) as soon as the equipment has been emptied will stop stains from drying onto the surface, which can make removal much more difficult.

What if I cannot get the water to the recommended temperature?

Follow the W.A.T.C.H. formula and compensate for lack of temperature or time by increasing the other parameters (water, action, time, concentration and heat).

How much water do I need to use?

You would generally use approximately 10% of the equipment volume when cleaning manually. Depending on the stage of the process this water can be re-used (final rinse water can be used as the initial rinse water in a neighboring piece of equipment).

What happens if I add more than the recommended dosage?

More chemical does not always equal more effective cleaning. If more than the recommended is used you can leave chemical residues behind and have to use more water to rinse out the excess. Depending on the cleaning agent, handling may be more difficult due to the physical properties (e.g. foaming, heat generation, neutralization, etc.).

Do I need to sanitize after cleaning with AiRD products?

After a thorough cleaning the equipment is ready for the sanitation phase. All cleaners have differing antimicrobial abilities but sanitation is not their primary function. After cleaning, all equipment should be process ready, whether a sanitation step is required is process dependent. If unsure always conduct a sanitation step after cleaning.

Why use a specialty cleaner for glassware?

AiRD Wineglass is much safer than using quaternary ammonium. It is free-rinsing, does not leave residue, and is highly effective at removing wine soils and lipstick.

How do AiRD cleaning products impact the environment?

AiRD formulations are biodegradable in 30 days.

STABILITY

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	89	89	88	90	90
Reds	◆	◆	◊	◆	◆
Whites and Rosé	◆	◆	◆	◆	◆
Promote stability	◆	◆	◆	◊	◊
Diminish bitterness	◆	◆		◆	◆
Diminish harsh tannins and astringency				◊	
Add perception of sweetness and softness	◆			◆	
Colloidal stability	◆	◆			
Tartrate (KHT) stability			◆		
Aromatic stability			◆	◊	

CLARISTAR

Natural liquid mannoprotein preparation for tartrate stabilization
White, Rosé, Red

Claristar is a specialty liquid mannoprotein product from Oeno-brands 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 CFR 24.250. For more information please visit www.TTB.gov.

#17000 2.5 L
#17001 20 L

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: four 750 mL samples

\$115.00

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

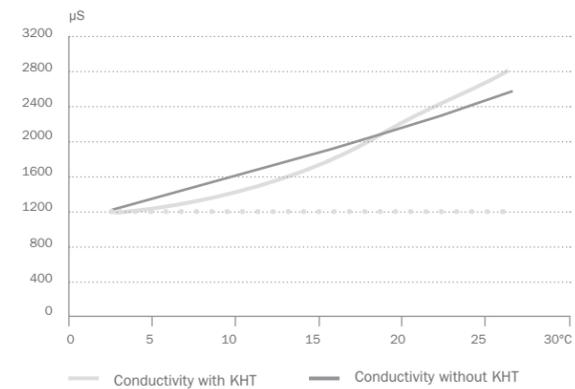
Heavy crystallization in non-treated wine.



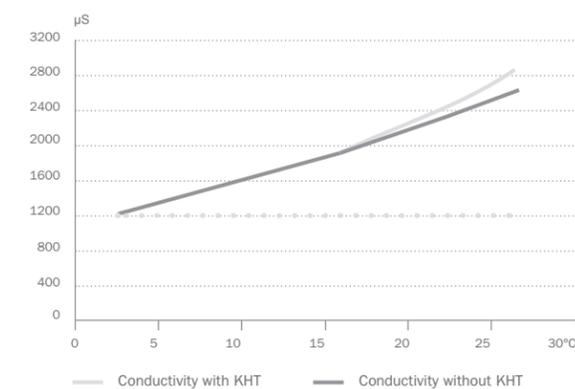
With Claristar



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
#15773 5 L
#15769 20 L

INOGLUM 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 verek. 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
#15794 5 L

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.

Recommended Dosage *Bench trials recommended
150–300 ppm 15–30 g/hL 1.2–2.4 lb/1000 gal*

Usage

Add UltiMA Fresh by mixing with 10 times its weight in water. UltiMA Fresh can 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: This product contains ingredient(s) currently listed by the TTB as acceptable in good commercial winemaking practices in CFR 24.250. For more information please visit www.TTB.gov.

#17010 1 kg

ULTIMA SOFT

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

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.

Recommended Dosage *Bench trials recommended
150–300 ppm 15–30 g/hL 1.2–2.4 lb/1000 gal*

Usage

Add UltiMA Soft by mixing with 10 times its weight in water. UltiMA Soft can 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 at temperatures of less than 25°C(77°F).

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

#17012 1 kg

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: four 750 mL samples

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 unforseen filtration issues.

Volume needed: four 750 mL samples

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 94 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 cold stabilization, electrodialysis and ion exchange. Cold stabilization chills the wine to near freezing to lower the solubility of tartaric. 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 may be added after Claristar has been added. 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 89.*

CMC is a well known synthesized chemical for food products. It is a etherfied 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.

FILTRATION

Scott Laboratories' expertise of 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.



Visit www.scottlab.com for videos on several filtration use protocols.

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:
> 5µ = rough 1 µ–5 µ = polish < 1 µ = 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.

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.

Visit www.scottlab.com and click on the *Forms & Videos* section.

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. Refer to page 112 to calculate formulas.

Visit our website at 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 (see page 100 for more information). 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
Bentostab	7 days	3 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.

CHOOSING THE RIGHT FINING AGENT

- ◆ Highly Recommended
- ◊ Recommended
- *Hot Mix is for wine only.
- Cold Mix is for juice only.

	Casein and/or Bentonite Formulations					Isinglass	Gelatin			PVPP			Silica Gel		Sparkolloid NF*	
	Bentolact S	Bentostab	Caséinate de potassium	Polycacel	Redules		Cristalline Plus	Colle Perle	Inocolle	Inocolle Extra N1	Freshprotect	Polycacel	Polycel	Gelocolle	Cold Mix	Hot Mix
Page	95	95	95	98	98	96	96	97	97	96	98	98	96	95	97	
Reds					◆		◆	◆	◆				◆		◊	
Whites and Rosé	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆		◆	
Fruit, Cider and Mead	◆	◆	◆	◆	◆	◆	◊	◊		◆	◆	◊	◆		◆	
Treat moldy juice (<i>Botrytis</i>)	◆		◊	◆				◆		◆	◆	◊				
Remove bitterness or off-flavors	◆		◆	◊			◊	◊		◆	◊	◊				
Treat oxidized juice	◆		◆	◆						◆	◆	◆				
Treat oxidized wines			◆	◆							◆	◆				
Promote protein stability	◆	◆														
Wine clarification	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆		◆	
Diminish bitterness	◆		◆	◆		◊	◊			◆	◆	◆				
Diminish harsh tannins and astringency							◆									
Diminish greenness					◊		◆	◊		◆						
Soften hard-pressed wine							◆									
Help reduce microbial populations via settling							◆	◆								
Enhance aromatics				◊	◆			◆			◊					
Promote a uniform gentle tannin fining prior to aging								◊	◆							
Help unmask hidden aromatics				◊	◆		◊	◆			◊					
Improve wine filterability						◆				◆		◆			◆	
Inhibit browning or pinking	◊		◆	◆						◊	◆	◆				
Help compact lees	◊	◊					◊						◊		◆	
Remove haze left by other fining agents													◊		◆	
Reduces sulfur defects					◆											
Preserve wine color				◊							◊	◊				
Juices (<i>Vinifera</i> , <i>Labrusca</i> , unfermented cider and mead)														◆		

BENTOLACT S

Formulated for the preventative treatment of must prone to oxidation; helps prevent formation of undesirable off-characters
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). Bentolact S can help reduce bitterness associated with heavy press fractions or moldy grapes. The negative charge of bentonite attracts and precipitates positively charged colloidal and proteinaceous materials which can contribute to off-odors and haze. At the same time the casein will help remove phenolic compounds associated with bitterness and oxidation. Higher dosages may be used for poor quality juice. Bentolact S is supplied in dry form which is soluble in water. For best results, it should be mixed in the juice or wine during a pumpover or tank mixing.

Recommended Dosage *Bench trials recommended*

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

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

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

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

- #15787 1 kg
- #15788 5 kg
- #15789 25 kg

BENTOSTAB

Deproteinizing bentonite for clarification
White, Rosé

Bentostab is a bentonite for clarification and protein precipitation. Montmorillonite particles allow for good colloidal adsorption.

Recommended Dosage

Juice
300–1000 ppm 30–100 g/hL 2.5–8.3 lbs/1000 gal

Wine
100–700 ppm 10–70 g/hL 0.83–5.8 lbs/1000 gal

Usage
Dissolve Bentostab in approximately 20 times its volume of 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 good mixing. Depending upon the wine, a Bentostab addition may take up to 7 days to settle.

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

- #15766 5 kg

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. In juice it can be used preventatively, while in wine it can diminish and remove off-compounds. Further, Caséinate de potassium can help remove yellow color from oxidized wines.

Recommended Dosage *Bench trials recommended*

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

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

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

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

- #15807 1 kg
- #15808 5 kg

COLD MIX SPARKOLLOID NF

For superior clarification of juice
White, Rosé, Fruit, Cider, Mead

Cold Mix Sparkolloid® NF 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 NF 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 NF. Slowly stir the Cold Mix Sparkolloid NF 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. Juice generally separates and forms a clear supernatant within 48 hours. Once mixed and chilled (if the juice has been heated), juice should be left undisturbed without further mixing if natural settling is going to be the only separation method.

Storage
Keep tightly sealed and dry. Shelf-life is 4 years at 18°C(65°F).

- #15036 25 lb

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. Primary uses are clarification and the removal of bitter tannins and phenolics. Colle Perle flocculates and settles well. Desirable aromas and flavors are retained while harsh characters are removed. It is particularly useful to optimize potential of hard pressed product. In white wines it can be used in conjunction with bentonite to compact lees.

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.

Storage

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

#15798	1 L
#15799	5 L
#15800	20 L

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.

Storage

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

#15770	100 g
#15771	1 kg

FRESHPROTECT

PVPP blend for treatment of oxygen sensitive juice and wine
White, Rosé, Fruit

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

Recommended Dosage *Bench trials recommended*

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

Usage

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

Storage

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

#15790	1 kg
#15791	5 kg
#15792	20 kg

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.

Storage

Dated expiration. Store in a dry well-ventilated environment between 10–20°C(50–68°F). Gelocolle solidifies at temperatures of less than 0°C(32°F). This process is irreversible. Once opened, use immediately.

#15782	1 L
#15783	5 L

HOT MIX SPARKOLLOID NF

For superior clarification of wine

White, Red, Rosé, Fruit, Cider, Mead

Hot Mix Sparkolloid® NF 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 NF 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 NF (8–15 L/kg)]. Slowly stir in the Hot Mix Sparkolloid NF. 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 Guth agitator (*see page 100 for more info on Guth*) 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.

Storage

Keep tightly sealed and dry. Shelf-life is 4 years at 18°C(65°F).

#15035	25 lb
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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. Can be used for flotation. Moldy must may be improved by the addition of Inocolle.

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 assure 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 assure 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 assure 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.

Storage

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

#15795	1 L
#15796	5 L
#15797	20 L

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. Inocolle Extra N1 has an affinity for polyphenols and will enhance the aging potential of wine. Wines are polished while mature phenolic compounds associated with balance and structure are preserved.

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.

Storage

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

#15801	1 kg
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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 polyvinylpolypyrrolidone (PVPP), micropulverized cellulose and casein for use on problem phenols associated with browning and pinking. Its proprietary formulation helps avoid the over-stripping sometimes associated with high doses of caseinates and PVPP. It can be used either preventatively in juice or in wine destined for prolonged tank storage. Wine flavors and aromas are enhanced while color is improved.

Recommended Dosage *Bench trials recommended*

For Oxidized Juice

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

For Protection of Wine

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

Usage

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

Storage

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

#15785 1 kg
#15786 5 kg

POLYCEL

PVPP for treatment of pinking or browning
White, Rosé

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

Recommended Dosage *Bench trials recommended*

For Oxidized Juice

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

For Preventative Treatment of Wine

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

For Curative Treatment of Wine

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

Usage

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

Storage

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

#15784 1 kg

REDULESS

Reduces sulfur off-aromas
Red, White, Rosé, Cider

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

Recommended Dosage

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

Usage

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

Storage

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

#15116 1 kg
#15115 2.5 kg

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

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 2017. Both products contain a blend of chitosan and chitin-glucan and at the time of this publication are listed under CFR 24.250.

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.

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.

My wine is astringent. What fining agent should I use to reduce the astringency?

Gelatins are a good choice for the reduction of astringency. Gelatins can target harsh tannins and phenolics. Another way to reduce astringency is to add polymerized aging tannins. Bench trials are highly recommended for gelatins and aging tannins prior to use.

I detect bitterness in the finish of my wine. What can I use to remove it?

Often a bentonite and casein blend (Bentolact S) is a fast and easy way to reduce bitterness. If you have already protein stabilized with bentonite, try adding a small amount (25 ppm) of the Scott™Tan FT Blanc Soft to eliminate the bitterness. The Bentolact S will precipitate the bitter molecules while the tannin will mask bitterness. Bench trials are recommended.

My wine has "off" sulfur aromas. What can be done to correct this?

Reduless is a good option. Its formulation is rich in copper and useful for in reducing H₂S, dimethyl sulfide and other sulfur compounds. Phenolic defects can also be diminished.

What can I do for a wine that is oxidized?

Depending on the degree of oxidation, it may be necessary to use more than one product. Run bench trials with Caséinate de potassium, Polycacel, Polycel or Freshprotect. Oxidation is easier to prevent than treat. To protect organoleptic soundness, prevent oxidation by adding Bentolact S or Scott™Tan FT Blanc on white grapes together with adequate SO₂.

My wine is cloudy, what can I use to try to fix it?

First, check for microbial contamination. If there is a microbial problem, consider SO₂, No Brett Inside and lysozyme additions (as appropriate) plus filtration. If microbes are not found, run bench trials with Hot Mix Sparkolloid NF, Cristalline Plus (isinglass) or gelatin. Sometimes the use of enzymes can eliminate wine cloudiness. Bench trials with Scottzyme KS or Scottzyme Pec5L may also prove useful.

I want to compact the lees. Which product is best?

Run bench trials with Hot Mix Sparkolloid NF, Cristalline Plus and gelatin. To encourage faster sedimentation, colloidal silica (Gelocolle) can be used after gelatin fining.

What is Sparkolloid NF?

Both types of Sparkolloid (Hot Mix NF and Cold Mix NF) are proprietary blends of polysaccharides in neutral carriers. Both exhibit a strong positive charge that neutralizes and complexes with clouding particles. Developed in-house, Cold Mix is for juice and Hot Mix is for wine. Both are powerful fining agents available at a minimal cost.

What is isinglass? When should I use it?

Isinglass (Cristalline Plus) is used especially for applications with white and rosé wines. Made from the swim bladders of fish, this fining agent is proven to enhance clarity and brilliance even in wines made from botrytised grapes.

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?

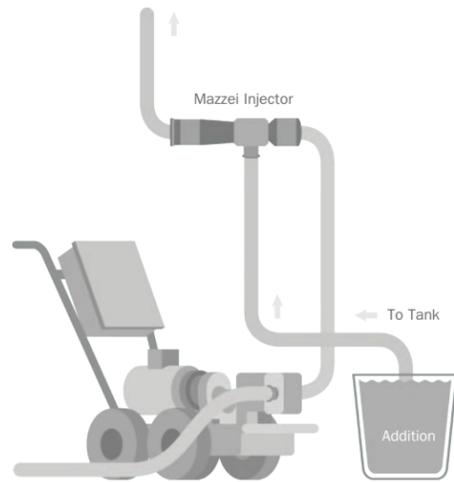
There are several ways to add fining agents. Add the fining agent to the tank while mixing with a Guth agitator, dosing into a recirculation pump setup with a stand-alone dosing machine or with a Mazzei injector.

Are all gelatin products the same?

No, today’s gelatin products offer a wide range of options. The gelatins we offer are derived from porcine by-products. They are refined, purified and then separated into specific fractions by capillary electrophoresis. Positively charged and colloidal in nature, gelatins require tannins for agglomeration and precipitation. Gelatins can be used to change wine structure or to enhance aroma and flavor. Timing of gelatin additions is critical to achieve the best results. Removing immature tannins and anthocyanins too early can upset the future balance and structure of the wine.

What are some of the other benefits of fining with gelatin?

Fining with gelatin has been shown to significantly lower yeast and bacterial populations such as *Brettanomyces* and *Acetobacter* (Murat and Dumeau, 2003). Clarifying can also help increase the filterability of wines.



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). When the pump is running the venturi will draw from that vessel at a rate you determine with a throttling valve. No need for a stand-alone dosing machine. No hauling buckets up to the top of the tank. Additions can be made safely from the cellar floor.

Please contact Scott Laboratories for pricing.

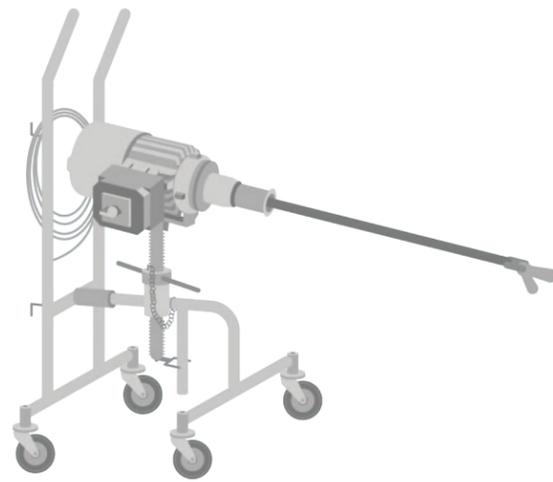
Please visit www.scottlab.com for a video of the Mazzei injector in action.



2" stainless steel model



1.5" plastic model



GUTH TANK AGITATORS

Since 1974, Guth tank agitators have been a North American wine industry standard with thousands sold. Fitted with a 2" TC on the nose cone, these mixers have hollow rotors which allow a center shaft to be inserted and retracted from full tanks without product loss. They are lightweight and portable, ideal for tasks as varied as fining additions, cold stabilization and mixing blends. Guths are available in two sizes (the RA 45 and RA 110). When properly inserted, these agitators can mix tanks up to 8,000 and 16,000 gallons respectively. Give us your tank drawing and we will advise the optimal placement of the mixer. Options include gassing flanges, variable frequency drives, and mobile support carriages (recommended).

Please contact Scott Laboratories for pricing.

TRADITIONAL METHOD PRIMARY FERMENTATION

YEAST

18-2007, DV10, EC1118, BA11, LALVIN C, NT 116, QA23, VIN 13

Your primary fermentation yeast should be chosen for its ability to ferment rapidly and to completion. Juice used for the base wine should be pressed gently and fermented at lower temperatures 17–18°C (62–64°F).

18-2007, DV10 and EC1118 are traditional sparkling base wine strains. BA11, Lalvin C, NT 116, QA23 and VIN 13 are strains that have also been used for base wines.

18-2007

S. cerevisiae, bayanus

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

#15900 500g

For other yeast descriptions and pricing, see pages 12–29.

NUTRITION

It is important to have a clean quick primary fermentation. Good nutrition is essential. GoFerm Protect Evolution is recommended for the rehydration nutrient, followed by a complete yeast nutrient such as Fermaid A, K or O. A problematic primary fermentation can lead to off-aromas and flavors, VA, H₂S and SO₂ production, reduced characters and possibly a stuck or sluggish fermentation. These factors can all contribute to a difficult secondary fermentation and sensory characteristics that may stay in the wine through the secondary fermentation.

For nutrient descriptions and pricing, see pages 40–47.

MALOLACTIC BACTERIA

Standard ML freeze dried build-up cultures

IB (INOBACTER)

O. oeni adapted for sparkling wines; neutral sensory effect. See description and pricing on page 72.

MT01

O. oeni with low volatile acidity and diacetyl production, neutral sensory effect. See description and pricing on page 72.

CLARIFICATION OF BASE WINE

INOBENT

Inobent is a refined bentonite. Its fine particles help remove protein and colloids, facilitating sedimentation and minimizing lump formation. Inobent has low deproteinization qualities and helps retain the necessary elements for secondary fermentation.

Recommended Dosage *Bench trials recommended*
Must

20–100 g/hL 1.7–8.3 lbs/1000 gal

Wine

10–50 g/hL 0.8–4.2 lbs/1000 gal

#15865 1 kg

OPTIMUM WHITE

For protection against browning and aroma protection. See description and pricing on page 46.

POLYCEL

To help remove bitterness or browning. See description and pricing on page 98.

REDULESS

For reduction of sulfur off-aromas and flavors. See description and pricing on page 98.

SECONDARY FERMENTATION

YEAST

18-2007, DV10, EC1118, LALVIN C AND QA23

18-2007, DV10, EC1118 are the traditional yeasts used for secondary fermentation. It is important to choose a strain that is reliable and will finish rapidly.

NUTRITION

GoFerm Protect Evolution is an important part of secondary fermentation nutrition. The use of GoFerm during rehydration helps prepare the yeast for more difficult conditions in the base wine (low pH, alcohol, low nutrient levels). The base wine should also have more complete nutrient added such as Fermaid O or Phosphates Titres.

Go FERM and Fermaid O descriptions and pricing are on pages 40, 42.

PHOSPHATE TITRES

DAP and thiamine blend.

See description and pricing on page 43.

CLARIFICATION/RIDDLING

CLARIFIANT S

Liquid preparation of Sodium Bentonite specially selected for riddling

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

Recommended Dosage

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

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

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

Usage

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

Storage

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

#15870 10 L

CLARIFIANT XL

Liquid preparation of bentonite and silicate for riddling

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

Recommended Dosage

Whites

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

Red or Rosé

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

Usage

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

Storage

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

#15873 1L
#15871 10L

PHOSPHATES MAZURE

Co-adjuvant for riddling assistance

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

Recommended Dosage

200 ppm 20 mL/hL 757 mL/1000 gal

Usage

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

Storage

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

#15885 10L

LIQUEUR (DOSAGE)

FLASHGUM R

Gum arabic for stability and perceived sweetness and softness on the palate.

ULTIMA FRESH

Mannoproteins/gum arabic for stability and perceived volume.

ULTIMA SOFT

Mannoproteins/gum arabic for stability and perceived softness and volume.

See descriptions and pricing of the above products on pages 89–90.

NON-TRADITIONAL METHOD

PROELIF

Double encapsulated yeast for secondary fermentation in sparkling wine production

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

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

Alcohol	≤ 11.5% (v/v)	Calcium	≤ 80 mg/L
Free SO₂	≤ 15 mg/L	Protein Stability	= stable
pH	≥ 3.0	Tartrate Stability	= stable
Free Assimilable Nitrogen	≥ 100 mg/L	Fermentation Temperature	> 12°C(54°F)

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

Recommended Dosage

133–200 g/hL 1.0–1.5 g/750 mL bottle

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

Usage

Please contact us for full usage instructions.

Storage

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

#15571 1 kg

For more information on Sparkling wine production and specific products, please visit our website at www.scottlab.com.

PACKAGING

We offer a full range of champagne corks and wirehoods for sparkling wine. *Please contact us for more information.*

ASK THE EXPERT

FOAM STABILITY IN SPARKLING WINES

Dr. Belinda Kemp

Senior Scientist in Oenology, Cool Climate Oenology and Viticulture Institute (CCOVI), Brock University, Ontario, Canada.

Pouring a glass of sparkling wine only to find the wine turns quickly into still wine is a big disappointment. Aside from glass type and serving temperature, every decision made at each step of sparkling wine production can influence foam stability. Since 2013, CCOVI has focused on studying sparkling wine production and how the final sparkling wine foam and flavor can be affected by winemaking decisions. It is important to remember that foam height refers to the wine’s ability to form stable foam, whereas foam stability time is the time the bubbles take to completely dissipate. It is well documented in published studies that the main tensioactive compounds involved in foam stability are grape and yeast proteins. Techniques that reduce or remove these compounds can decrease or increase foam stability depending on the treatment.

It is important to consider foam stability from the moment the grapes are harvested and throughout sparkling wine production. Ideally, the aim is to achieve a steady stream of foam and sustained collar for the duration of the time the wine is in the glass.

A common mistake winemakers make when they first start a sparkling wine program is to make the base wine as they would a still wine. Our current research shows that the chemical composition of different grape varieties affects foam stability, particularly the amount of tartaric acid, which has a positive effect on foaming and stability. Our press fraction study revealed that the first press fraction (without free run juice) had far superior foam height and stability than the other fractions. Base wine destined for sparkling should not undergo bentonite fining before the secondary fermentation to prevent grape protein removal. Grape proteins are an important factor in foam stability. The use of sodium bentonite in sparkling winemaking has been well documented. Our trials found that when juice was fined with sodium bentonite prior to the first fermentation and used as a riddling agent at bottling, the resultant sparkling wines had far less foam height and stability than wines without any bentonite. A balance must be considered between possible bentonite use and foam response. Low turbidity of the base wine can be achieved by appropriate settling of the juice, accurate racking of the juice/base wine and the correct filtration. Phenolic compounds can have a negative effect on foam stability. Higher alcohol levels have also been found to have a negative effect on foam.

The temperature of the secondary fermentation and cellar storage impact the type of yeast lees and the ease of riddling. It is much easier to riddle wines that have had long lees aging and were fermented and stored at 12°C(54°F) with a tiny amount of riddling agent than at 16°C(61°F). A detrimental effect on sparkling wine foam occurs if too much of a riddling agent is added at bottling, it reduces foamability by removing tensioactive compounds. Similarly, too much sugar added to the base wine at bottling increases the likelihood of wine loss and gushing at disgorging due to the high pressure in the final bottles. This can also cause bottle variation. The type of wine used in the dosage has an impact on foam. Our dosage study revealed that sparkling wines with a dosage made from the oldest sparkling wines in the cellar had increased foam stability and flavour complexity. These wines showed better than those produced from oaked still wines.

For more information, see the complete paper by Belinda Kemp., Hervé Alexandre., Bertrand Robillard and Richard Marchal (2015) Review: Effect of Production Phase on Bottle-Fermented Sparkling Wine Quality. Journal of Agriculture and Food Chemistry. 63, 1, 19–38.

HYBRIDS AND NON-VINIFERA

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 WHITE YEAST STRAINS

- Yeast Strain Type
- ◆ Highly Recommended
- ◊ Recommended

	58W3	71B	Alchemy I	CY3079	ICV Opale	Exotics SPH	LaWin C	QA23	Steinberger	SVG	VIN 13	VIN 2000
Page	12	12	26	14	18	27	107	19	20	20	21	21
<i>S. cerevisiae cerevisiae</i>	○	○		○	○				○	○		
<i>S. cerevisiae bayanus</i>							○	○				
A hybrid yeast strain						○					○	○
A blend of yeast strains			○									
Chardone1			◆	◆	◆			◆			◆	◆
Frontenac Gris	◊	◆			◆	◆	◆	◆				
La Crescent	◆	◆	◆			◆	◆	◆	◊	◆	◆	
Muscadine	◊						◆	◆			◆	
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	Good	Poor	Very Good	Very Good	Very Good	Average	Good	Good	Good

HYBRID RED YEAST STRAINS

- Yeast Strain Type
- ▲ Highly Recommended
- ◊ Recommended

	3001	71B	BM 4X4	BRL 97	CLOS	CSM	ICV D254	Exotics SPH	Lalvin C	NT 202	RBS 133	RC212
Page	12	12	13	13	14	14	15	27	107	18	19	19
<i>S. cerevisiae cerevisiae</i>	○	○		○	○	○	○				○	○
<i>S. cerevisiae bayanus</i>									○			
A hybrid yeast strain								○		○		
A blend of yeast strains			○									
Chambourcin	▲		▲	◊	▲	▲				▲	◊	▲
Frontenac		▲	▲			▲		▲	▲	▲	▲	▲
Maréchal Foch	▲			▲								
Marquette		▲	▲		▲	▲	▲	▲	▲			◊
Noiret				▲	▲					▲		
Norton	◊			▲	▲		▲	▲	▲	▲	▲	
St. Croix					◊					▲		
Mitigates underdeveloped phenolic ripeness			▲			▲					▲	
Enhances berry fruit	▲	▲			▲	▲	▲	▲				▲
Diminishes vegetal characters		▲				▲						
Increases mid-palate balance			▲	◊			▲					
Enhances complexity	▲				▲					▲		
Enhances mouthfeel		▲	▲	◊		▲	▲			▲		
High producer of polysaccharides			▲				▲					
Promotes color stability			▲	▲								
Promotes bright fruit and berry characteristics	▲				▲			▲				▲
Reduces malic acid content		▲						▲	▲			
MLF Compatibility	Average	Very Good	Below Average	Average	Very Good	Average	Very Good	Very Good	Very Good	Very Good	Good	Good

HYBRID AND NON-VINIFERA PRODUCTS

CLEAR EXTREME 

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 100g

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 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. Sprinkle over crushed fruit or add in the press.

Storage

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

#16260 100g

LALVIN C 

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

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 ₂ 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

LALVIGNE 

LalVigne is an organic yeast derivative foliar spray applied at veraison. *For a full product description, please see pages 34–35.*

#17501 3 kg LalVigne Aroma
 #17500 3 kg LalVigne LA
 #17511 1 kg LalVigne Mature
 #17510 1 kg LalVigne LM

TESTIMONIAL



"We used LalVigne on the bottom rows of our Chambourcin block. In these six rows, we have continually struggled with getting decent fruit that matures evenly, so historically have not harvested them. We applied LalVigne in 2016 to see if we could get the fruit to ripen properly and am very happy report that the product did exactly as described. We actually harvested these six rows for the first time ever!

I plan to use it again in 2017 and may even try it on our Concorde's."

Shriti Plimpton

Fence Stile Vineyards & Winery
 Kansas City, MO



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. See pages 8–11, 25 for specific strain attributes. Proper rehydration of the selected yeast strain is essential. See page 7 for details.

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 H₂S 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. Use Scottzyme KS only after pressing. Use Scottzyme KS 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 Crystalline Plus (isinglass) to brighten and clarify both red and white wine. Caséinate de potassium (casein) can treat oxidation and help prevent further browning. Reduless 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 SO₂ Granules and Tablets are easy to use and are already measured into specific doses for your convenience. See page 78 for dosing information.

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. See pages 44–47 for more information.

Please contact us for a copy of our Cider Handbook for a complete offering of products and protocols useful in cidermaking.

CHOOSING THE RIGHT PRODUCT FOR SPECIALTY WINES

🔹 Highly Recommended

🔸 Recommended

Yeast	Fruit	Mead	Page
71B	🔹		12
ICV D47	🔹		15
DV10	🔹	🔹	15
EC1118	🔹	🔹	15
K1 (V1116)	🔹	🔹	17
Lalvin C	🔹		107
M2	🔹		17
OKAY	🔹		28
QA23	🔹	🔹	19
R2	🔹		19
Sensy	🔹		28
VIN 13	🔹	🔹	21
W15	🔹	🔹	21

Nutrients

Fermaid A	🔹	🔹	41
Fermaid K	🔹	🔹	41
Fermaid O	🔹	🔹	42
Anchorferm	🔹	🔹	41
Go-Ferm	🔹	🔹	40
Go-Ferm Protect Evolution	🔹	🔹	40

Malolactic Bacteria

Alpha	🔹		69
IB (Inobacter)	🔹		72
MBR 31	🔹		69
PN4	🔹		70

Enzymes

Beta	🔹		61
BG	🔹		62
HC	🔹		63
KS	🔹		64
Pec5L	🔹		64

Tannins	Fruit	Mead	Page
FT Blanc	🔹		52
FT Blanc Citrus	🔹		52
FT Blanc Soft	🔹	🔹	53
FT Rouge	🔹		53
FT Rouge Berry	🔹		53
FT Rouge Soft	🔹		53

Fining Agents/Stability

Bentolact S	🔹		95
Caséinate de potassium	🔹		95
Colle Perle	🔹		96
Cristalline Plus	🔹		96
Freshprotect	🔹	🔸	96
Flashgum R Liquide	🔹	🔹	89
Gelocolle	🔹		96
Hot Mix Sparkolloid NF	🔹	🔹	97
Inocolle	🔹		97
Inogum 300	🔹	🔹	89
Polycacel	🔹		98
Reduless	🔹	🔹	98

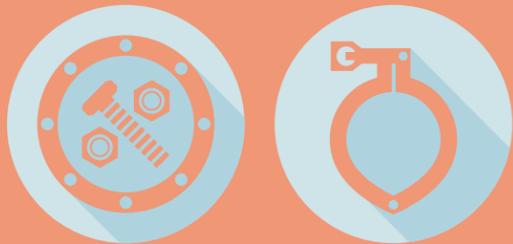
Yeast Derivative Nutrients

Booster Blanc	🔹	🔹	45
Booster Rouge	🔹		45
ICV Noblesse	🔹	🔹	45
OptiMUM White	🔹	🔹	46
Opti-MUM Red	🔹		46
Opti-Red	🔹		46
Opti-White	🔹	🔹	47

WHO WE ARE

EQUIPMENT, PARTS & SERVICE

We help customers design and implement entire crush pad solutions, from concept through installation, service, and on-going maintenance.



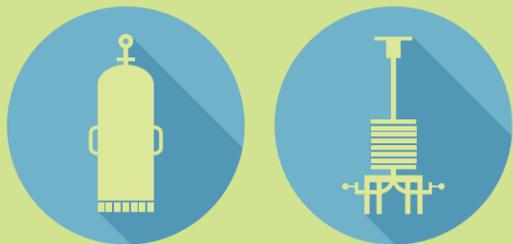
SHIPPING

September is the busiest month of the year for our Shipping department, with over 3,000 shipments leaving the warehouse.



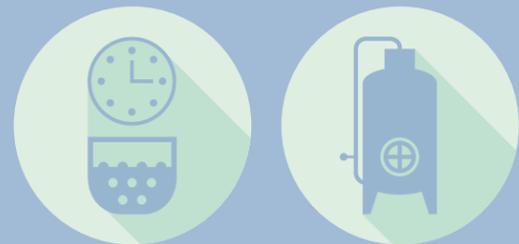
FILTRATION

We have filtration specialists on-staff available to visit, provide consultation, and customize filtration solutions for wineries of all sizes.



FERMENTATION

Over the past year, our experienced technical team has assisted in troubleshooting over 7 million gallons worth of stuck fermentations!



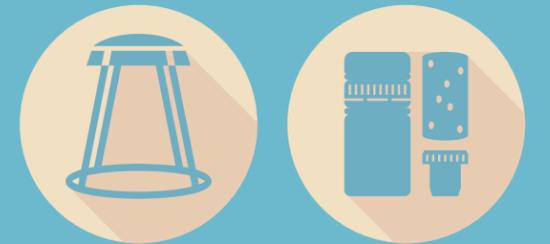
LABORATORY

In addition to customer analysis, our lab also 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 over 25 years.



MARKETING

Our Marketing department facilitates over 40 wine industry tradeshows all over the country each year, where we connect with and support local customers and industry organizations.



OUTSIDE SALES

Our outside sales staff of 15 is spread out across six different states, covering the entire U.S. 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

www.wineadds.com

www.winebusiness.com/tools

Temperature Conversions

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

Other Conversions

1 lb/1000 gal = 454 g/1000 gal = 0.454 kg/1000 gal = 120 mg/L = 27.2 g/barrel* = 0.120 g/l

1 kg/hL = 1000 g/hL = 10,000 mg/L = 2.271 kg/barrel* = 10 g/L

1 ppm = 1 mg/L *barrel = 60 gal = 227.1 L

1°Brix = 1% sugar (wt/vol)

1 g/100 mL = 1%

1 g/L = 0.1%

Bench Trial Calculator

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

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

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.)

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

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:

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 SPH	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)
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)
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)
Sparkolloid 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 101
 1-Step Malolactic Cultures 71
 43 12
 43 Restart 12
 3001 12
 58W3 12
 71B 12
- Acti-ML 72
 Alchemy I 26
 Alchemy II 26
 Alchemy III 26
 Alchemy IV 26
 Alpha (Eoferm) 69
 Anchorferm 41
 Assmanshausen (AMH) 12
- BA11 13
 Bacteria 67–74
 Bactiless 79
 BC (Bayanus) 13
 BDX 13
 Be Fruits 28
 Bentolact S 95
 Bentostab 95
 Beta (Eoferm) bacteria 69
 Beta (Lallzyme) Enzyme 61
 Beta Co-Inoc 71
 BG (Scottzyme) 62
 Biodiva 27
 BM45 13
 BM 4x4 13
 Booster Blanc 45
 Booster Rouge 45
 BRG 13
 BRL97 13
- Caséinate de potassium 95
 CEG 22
(see Epernay II)
 Cellaring Tannins 54–55
 Chitosan 79
(see No Brett Inside)
 Chitin-Glucan 79
(see Bactiless)
 Cider 108
 Cinn-Free (Scottzyme) 62
 Clarifiant S 102
 Clarifiant XL 102
 Claristar 88
 Cleaners (AiRD) 82–86
 Cleanskin-K 83
 Clos 14
 Cold Mix (Sparkolloid NF) 95
 Colle Perle 96
 Color Pro (Scottzyme) 63
 Color X (Scottzyme) 63
 Crystalline Plus 96
 Cross Evolution 14
 CSM 14
 Cuvée Blanc (Lallzyme) 61
 CVRP 14
 CVW5 14
 CY3079 14
- D21 (ICV) 15
 D47 (ICV) 15
 D80 (ICV) 15
 D254 (ICV) 15
 Davis 522 (Montrachet) 22
 Destainex 83
 Destainex-LF 83
 Diammonium Phosphate (DAP) 41
 DV10 15
- EC1118 15
 Elios 1 (ICV) 69
 Elixir 16
 Exotics SPH 27
 Encapsulated Yeast Enzymes 59–66
 Epernay II 22
(see CEG)
 EX (Lallzyme) 61
 EX-V (Lallzyme) 61
- Fermaid 2133 43
(see SIY 33)
 Fermaid A 41
 Fermaid K 41
 Fermaid K (Kosher) 42
 Fermaid O 42
 Fermentation Tannins 52–54
 Fermivin Champion 16
 Fermivin 3C 16
 Fermivin A33 16
 Fermivin MT48 16
 Fining Agents 93–100
 Finishing Kit 56
 Finishing Tannins 55
 Flashgum R Liquide 89
 Freshprotect 96
 Fruit wines 108–109
- Gaia 27
 Gelatins 96–97
 Gelocolle 96
 Go-Ferm 40
 Go-Ferm Protect Evolution 40
 Grape tannins 54
 GRE (ICV) 16
 Gum Arabics 89
- HC (Scottzyme) 63
 Hot Mix (Sparkolloid NF) 97
 Hybrid grape varieties 104–107
- IB (Inobacter) 72
 Inobent 101
 Inocel 42
 Inocolle 97
 Inocolle Extra N1 97
 Inodose SO₂ Granules 78
 Inodose SO₂ Tablets 78
 Inogum 300 89
 Ionys_{WF} 17
 Isinglass 96
(see Crystalline Plus)
- K1 (V1116) 17
 KS (Scottzyme) 64
 Kosher products
(see all yeast, Fermaid K (Kosher), lysozyme and enzymes)
 Kosher for Passover products
(call for information)
- Lallzymes 61–62
 LalVigne 34–35
 Lalvin C 107
 Level 2 Solutions 27
(see Biodiva)
 LUXE Tannin Kit 57
 LUXE Tannins 56
 Lyso-Easy 77
 Lysovin 77
 Lysozyme products 77
- M2 17
 M83 17
 Malotabs 70
 Malolactic bacteria 67–74
 Malolactic fermentation 67
 Malolactic nutrients 72
 Mannoproteins 87–90
 MBR 31 69
 Mead 108–109
 Microbial Control Agents 75–81
 ML Red Boost 73
 MMX 62
 Montrachet (Davis 522) 22
 MSDS sheets
(see www.scottlab.com)
 MT 18
 MT01 72
- Noblesse (ICV) 45
 NT 50 18
 NT 112 18
 NT 116 18
 NT 202 18
 No Brett Inside 79
 Nutrient Vit End 42
 Nutrients (fermentation) 41
 Nutrients (malolactic) 72
 Nutrients (rehydration) 40
- OKAY (ICV) 28
 Oak Restorer-CW 84
 Oak Restorer-HW 84
 O-MEGA 69
 OMRI certified products
(see Fermaid O, Go Ferm, Noblesse, Nutrient Vit End, Opti-RED, Opti-WHITE, OptiMUM White)
- Opale (ICV) 18
 Opti-MUM Red 46
 OptiMUM White 46
 Opti'Malo Plus 73
 Opti'Malo Blanc 73
 Opti-RED 46
 Opti-WHITE 47
 OTT Tannins 57
- Pec5L (Scottzyme) 64
 Pectinase 61–65
 Performance (Scottzyme) 64
 Phosphates Mazure 102
 Phosphate Titres 43
 PM (Prise de Mousse) 22
 PN4 70
 Polycacel 98
 Polycel 98
 Potassium metabisulfite
(see Inodose SO₂ products)
 ProDessert 29
 ProElif 29
 ProMalic 29
 ProRestart 29
- QA23 19
 R2 19
 RA17 19
 RBS 133 19
 RC212 19
 Rapidase Clear Extreme 65
 Rapidase Expression Aroma 65
 Rapidase Extra Press 65
 Rapidase Revelation Aroma 65
 REDStyle 47
 Reduless 98
 Reskue 43
 Restart Protocols 30–31, 32
 Rhône 2056 19
 Rhône 2226 20
 Rhône 4600 20
 R-HST 20
 RP15 20
- Scott'Tan 52–57
 Scottzymes 62–64
 Sensy 28
 Silica Gel 96
(see Gelocolle)
 SIY 33 (Fermaid 2133) 43
 SIY Cell Hulls 43
 Sluggish Fermentation 30–31, 32
 SO₂ 78
 Sparkling Wine 101–103
 Sparkolloid NF
(see Cold Mix & Hot Mix)
 Stability 87–91
 Steinberger (DGI 228) 20
 Storage guidelines 113
 Stuck fermentation 30–31, 32
 SVG 20
 Syrah 20
- T73 21
 Tannins 49–58
(see Scott'Tan)
 Thiamin-containing product
(see Anchorferm, Phosphate Titres & Fermaid K)
- UltiMA Fresh 90
 UltiMA Soft 90
- Velcorin 80
 VIN 13 21
 VIN 2000 21
 VP41 70
 VRB 21
- W15 21
 Wineglass 84
- YAN 6, 36–37, 39
 Yeast 6–35
 Yeast derivative nutrients 45–47
 Yeast rehydration protocol 7
 Yeast hulls 43
(see SIY Cell Hulls)

ORDER FORM 2017

Please Print Clearly

Please Note

- All pricing for sale within United States is FOB Petaluma.
- For large orders, please call for a price quotation and order early to ensure product availability.
- Maximum credit card order is \$3000.
- We accept Visa, Mastercard and American Express.
- Credit application available online at www.scottlab.com.

Number of Pages Faxed _____

Company Name _____

Customer Number _____

Contact Name _____

Customer Signature _____

Bill to Address _____

Ship to Address _____

Telephone Number _____

E-Mail Address _____

Purchase Order Number _____

Credit Card Number _____

Expiration Date (mm/yy) _____ / _____

Name on Card _____

Signature _____

Ship Via

- UPS FedEx
 1 Day 2 Day Saver Most Economical

Please mark preferred carrier and shipping method.

Malolactic bacteria, encapsulated yeast, Biodiva, Gaia and Claristar all have greater temperature sensitivity and will be processed with expedited shipping.

To Submit Orders to Scott Laboratories Inc.

Call Scott Laboratories Inc. at 707-765-6666

Fax Scott Laboratories Inc. at 707-765-6674

Mail to Scott Laboratories Inc. at P.O. Box 4559, Petaluma, California 94955-4559

E-Mail to fermentation@scottlab.com

Editable PDF now available on our website www.scottlab.com

Return Policy

Return Policy for Fermentation and Filtration Products

We offer credits if products are returned within 15 days of shipment. **Please call Scott Laboratories prior to return for authorization.**

Once we receive your returned items we will issue a credit to your account. Please note that we are not responsible for perishable items that have not been stored properly by the customer. If you are returning items for any reason, the following conditions apply:

- Sealed units must be unopened and undamaged upon return.
- **Goods that have been marked or labeled will not be accepted and no credit will be issued.**
- Damage claims must be reported within 5 working days of receipt of your order.
- Original packing must be retained for shipping company inspection of shipping damage claims.
- Sorry, but we do not accept returns on malolactic bacteria.
- A 20% restocking fee will be applied to all returns.
- Customer to pay return freight costs.

Note: To avoid problems, all packages should be opened immediately upon receipt and contents should be checked against the packing slip.

Scott Laboratories should be informed immediately of any discrepancies.

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
Premium Yeast						
12	15134	43	500 g			
12	15140	43	10 kg			
12	15223	43 Restart	500 g			
12	15240	43 Restart	10 kg			
12	15682	3001	500 g			
12	15630	58W3	500 g			
12	15631	58W3	10 kg			
12	15059	71B	500 g			
12	15078	71B	10 kg			
12	15632	Assmanshausen (AMH)	500 g			
12	15633	Assmanshausen (AMH)	10 kg			
13	15117	BA11	500 g			
13	15234	BC (Bayanus)	500 g			
13	15235	BC (Bayanus)	10 kg			
13	15634	BDX	500 g			
13	15635	BDX	10 kg			
13	15064	BM45	500 g			
13	15066	BM45	10 kg			
13	15176	BM4X4	500 g			
13	15200	BM4X4	10 kg			
13	15669	BRG	500 g			
13	15670	BRG	10 kg			
13	15102	BRL97	500 g			
13	15205	BRL97	10 kg			
14	15201	CLOS	500 g			
14	15204	CLOS	10 kg			
14	15640	Cross Evolution	500 g			
14	15641	Cross Evolution	10 kg			
14	15638	CSM	500 g			
14	15639	CSM	10 kg			
14	15208	CVRP	10 kg			
14	15237	CVW5	500 g			
14	15210	CVW5	10 kg			
14	15061	CY3079	500 g			
14	15082	CY3079	10 kg			
15	15143	D21 (ICV)	500 g			
15	15163	D21 (ICV)	10 kg			
15	15642	D47 (ICV)	500 g			
15	15643	D47 (ICV)	10 kg			
15	15125	D80 (ICV)	500 g			
15	15133	D80 (ICV)	10 kg			
15	15094	D254 (ICV)	500 g			
15	15021	D254 (ICV)	10 kg			
15	15062	DV10	500 g			
15	15106	DV10	10 kg			
15	15053	EC1118 (Prise de Mousse)	500 g			
15	15076	EC1118 (Prise de Mousse)	10 kg			
16	15214	Elixir	500 g			

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
16	17103	Fermivin 3C	500 g			
16	17100	Fermivin A33	500 g			
16	17143	Fermivin Champion	500 g			
16	17145	Fermivin Champion	10 kg			
16	17106	Fermivin MT48	500 g			
16	15101	GRE (ICV)	500 g			
16	15142	GRE (ICV)	10 kg			
17	15233	Ionys _{WF}	500 g			
17	15063	K1 (V1116)	500 g			
17	15077	K1 (V1116)	10 kg			
107	15689	Lalvin C	500 g			
17	15648	M2	500 g			
17	15649	M2	10 kg			
18	15674	M83	500 g			
18	15650	MT	500 g			
18	15651	MT	10 kg			
18	15184	NT 50	1000 g			
18	15190	NT 112	1000 g			
18	15185	NT 116	1000 g			
18	15226	NT 116	10 kg			
18	15191	NT 202	1000 g			
18	15227	NT 202	10 kg			
18	15068	Opale (ICV)	500 g			
19	15652	QA23	500 g			
19	15653	QA23	10 kg			
19	15071	R2	500 g			
19	15056	RA17	500 g			
19	15687	RBS 133	500 g			
19	15057	RC212	500 g			
19	15097	RC212	10 kg			
19	15072	Rhône 2056	500 g			
19	15180	Rhône 2056	10 kg			
20	15644	Rhône 2226	500 g			
20	15645	Rhône 2226	10 kg			
20	15171	Rhône 4600	500 g			
20	15130	R-HST	500 g			
20	15665	RP15	500 g			
20	15666	RP15	10 kg			
20	15084	Steinberger (DGI 228)	500 g			
20	15086	Steinberger (DGI 228)	10 kg			
20	15144	SVG	500 g			
20	15657	Syrah	500 g			
20	15658	Syrah	10 kg			
21	15091	T73	500 g			
21	15183	VIN 13	1000 g			
21	15228	VIN 13	10 kg			
21	15195	VIN 2000	1000 g			
21	15173	VRB	500 g			
21	15118	W15	500 g			
21	15119	W15	10 kg			

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
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Vi-A-Dry Yeast

22	15081	CEG (Epernay II)	500 g			
22	15093	CEG (Epernay II)	10 kg			
22	15060	Montrachet (Davis 522)	500 g			
22	15074	Montrachet (Davis 522)	10 kg			
22	15085	PM (Prise de Mousse)	500 g			
22	15083	PM (Prise de Mousse)	10 kg			

Specialty Yeast Strains

26	15174	Alchemy I	1 kg			
26	15177	Alchemy II	1 kg			
26	15230	Alchemy III	1 kg			
26	15231	Alchemy IV	1 kg			
26	15241	Be Fruits	500 g			
27	15685	Biodiva	125 g			
27	15213	Exotics SPH	250 g			
27	15220	Exotics SPH	5 kg			
27	15686	Gaia	500 g			
28	15221	OKAY (ICV)	500 g			
28	15222	OKAY (ICV)	10 kg			
29	15150	ProDessert	1 kg			
29	15154	ProRestart	1 kg			
29	15158	ProMesh Barrel Bag	—			
29	15159	ProMesh Tank Bag	—			
28	15225	Sensy	500 g			

Foliar Spray

35	17501	LalVigne Aroma	3 kg			
35	17500	LalVigne LA	3 kg			
35	17511	LalVigne Mature	1 kg			
35	17510	LalVigne LM	1 kg			

Yeast nutrients; natural yeast derivative nutrients

41	15147	Anchorferm	10 kg			
45	15179	Booster Blanc	2.5 kg			
45	15169	Booster Rouge	2.5 kg			
41	15805	DAP	5 kg			
41	15070A	Fermaid A	10 kg			
41	15073	Fermaid K	2.5 kg			
41	15070	Fermaid K	10 kg			
42	15070K	Fermaid K (Kosher)	10 kg			
42	15067	Fermaid O	2.5 kg			
42	15107	Fermaid O	10 kg			
40	15149	Go-Ferm	1 kg			
40	15135	Go-Ferm	2.5 kg			
40	15161	Go-Ferm	10 kg			
40	15103	Go-Ferm Protect Evolution	2.5 kg			
42	15804	Inocel	1 kg			
45	15105	Noblesse (ICV)	2.5 kg			
42	15679	Nutrient Vit End	2.5 kg			

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
46	15229	Opti-MUM Red	1 kg			
46	15198	OptiMUM White	1 kg			
46	15202	OptiMUM White	2.5 kg			
46	15148	Opti-Red	1 kg			
46	15138	Opti-Red	2.5 kg			
46	15211	Opti-Red	10 kg			
47	15165	Opti-White	1 kg			
47	15136	Opti-White	2.5 kg			
47	15216	Opti-White	10 kg			
43	15887	Phosphate Titres	1 kg			
43	15888	Phosphate Titres	5 kg			
47	15662	Redstyle	2.5 kg			
43	15224	Reskue	1 kg			
43	15242	Reskue	10 kg			
43	15100	SIY 33 (Fermaid 2133)	12.5 kg			
43	15069	SIY Cell Hulls (Yeast Hulls)	1 lb			
43	15069	SIY Cell Hulls (Yeast Hulls)	44 lb bag			

Scott'Tan Tannins

57	15970	Bold	500 g			
54	15956	Complex	1 kg			
55	15958	Estate	1 kg			
57	15971	Finesse	500 g			
52	15954	FT Blanc	1 kg			
52	15969	FT Blanc	5 kg			
52	15974	FT Blanc Citrus	1 kg			
52	15975	FT Blanc Citrus	5 kg			
52	15955	FT Blanc Soft	1 kg			
52	15980	FT Blanc Soft	5 kg			
52	15968	FT ColorMax	1 kg			
53	15950	FT Rouge	1 kg			
53	15951	FT Rouge	5 kg			
53	15972	FT Rouge Berry	1 kg			
53	15973	FT Rouge Berry	5 kg			
53	15952	FT Rouge Soft	1 kg			
53	15953	FT Rouge Soft	5 kg			
56	15977	Onyx	250 g			
56	15978	Radiance	250 g			
55	15960	Refresh	500 g			
55	15962	Riche	500 g			
55	15963	Riche Extra	500 g			
57	15979	Royal	250 g			
54	15964	Uva'Tan	500 g			
54	15965	Uva'Tan Soft	500 g			
56	SLQDTAN	Finishing Kit				
57	SLQDLUX	LUXE Tannin Kit				
57	37101	Micropipette	20–200 µl			
57	37102	Micropipette	100–1000 µl			
57	37111	Micropipette tips	5–200 µl			
57	37112	Micropipette tips	100–1250 µl			

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
Enzymes						
61	16200	Lallzyme Beta	100 g			
61	16203	Lallzyme Cuvée Blanc	100 g			
61	16204	Lallzyme EX	100 g			
61	16205	Lallzyme EX	250 g			
61	16206	Lallzyme EX-V	100 g			
61	16208	Lallzyme EX-V	500 g			
62	16207	Lallzyme MMX	100 g			
65	16257	Rapidase Clear Extreme	100 g			
65	16260	Rapidase Expression Aroma	100 g			
65	16254	Rapidase Extra Press	20 kg			
65	16266	Rapidase Revelation Aroma	100 g			
62	16176	Scottzyme BG	1 kg			
62	16175	Scottzyme Cinn-Free	1 kg			
62	16165	Scottzyme Cinn-Free	25 kg			
63	16172	Scottzyme Color Pro	1 kg			
63	16162	Scottzyme Color Pro	25 kg			
63	16173	Scottzyme Color X	1 kg			
63	16163	Scottzyme Color X	25 kg			
63	16171	Scottzyme HC	1 kg			
63	16161	Scottzyme HC	25 kg			
64	16174	Scottzyme KS	1 kg			
64	16164	Scottzyme KS	25 kg			
64	16170	Scottzyme Pec5L	1 kg			
64	16160	Scottzyme Pec5L	25 kg			
64	16156	Scottzyme Performance	25 kg			

One liquid kilo of Scottzyme enzymes is approximately 890 mL.

Malolactic Bacteria

71	15609	1-Step Alpha	25 hL			
71	15610	1-Step Alpha	100 hL			
71	15611	1-Step Alpha	500 hL			
71	15612	1-Step Alpha	1000 hL			
71	15029	1-Step VP41	100 hL			
71	15058	1-Step VP41	500 hL			
71	15054	1-Step VP41	1000 hL			
69	15601	Alpha	2.5 hL			
69	15602	Alpha	25 hL			
69	15603	Alpha	250 hL			
69	15604	Beta	2.5 hL			
69	15605	Beta	25 hL			
69	15606	Beta	250 hL			
71	15617	Beta Co-Inoc	25 hL			
71	15618	Beta Co-Inoc	250 hL			
69	15108	Elios 1 (ICV)	25 hL			
69	15109	Elios 1 (ICV)	250 hL			
72	15024	IB (Inobacter)	25 hL			
70	15049	Malotabs	2.5 hL (5/box)			
69	15022	MBR 31	2.5 hL			
69	15032	MBR 31	25 hL			

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
69	15127	MBR 31	250 hL			
72	15027	MT01	25 hL			
69	15615	O-MEGA	25 hL			
69	15616	O-MEGA	250 hL			
70	15607	PN4	25 hL			
70	15608	PN4	250 hL			
70	15048	VP41	2.5 hL			
70	15042	VP41	25 hL			
70	15044	VP41	250 hL			

ML Nutrients

72	15681	Acti-ML	1 kg			
73	15218	ML Red Boost	1 kg			
73	15217	Opti'Malo Blanc	1 kg			
73	15141	Opti'Malo Plus	1 kg			

Microbial Controls

79	15232	Bactiless	500 g			
77	16405	Lyso-Easy	250 mL			
77	16406	Lyso-Easy	1 L			
77	16407	Lyso-Easy	5 L			
77	16402	Lysovin	500 g			
77	16400	Lysovin	1 kg			
77	16401	Lysovin	5 kg			
79	16410	No Brett Inside	100 g			
78	15777	2 g SO ₂ Inodose Granules	(40/box)	1-4		
78	15777	2 g SO ₂ Inodose Granules	(40/box)	5-19		
78	15777	2 g SO ₂ Inodose Granules	(40/box)	20+		
78	15778	5 g SO ₂ Inodose Granules	(25/box)	1-4		
78	15778	5 g SO ₂ Inodose Granules	(25/box)	5-19		
78	15778	5 g SO ₂ Inodose Granules	(25/box)	20+		
78	15780	100 g SO ₂ Inodose Granules		1-19		
78	15780	100 g SO ₂ Inodose Granules		20-59		
78	15780	100 g SO ₂ Inodose Granules		60+		
78	15781	400 g SO ₂ Inodose Granules		1-14		
78	15781	400 g SO ₂ Inodose Granules		15+		
78	15775	2 g SO ₂ Inodose Tablets	(48/box)	1-4		
78	15775	2 g SO ₂ Inodose Tablets	(48/box)	5-19		
78	15775	2 g SO ₂ Inodose Tablets	(48/box)	20+		
78	15776	5 g SO ₂ Inodose Tablets	(48/box)	1-4		
78	15776	5 g SO ₂ Inodose Tablets	(48/box)	5-19		
78	15776	5 g SO ₂ Inodose Tablets	(48/box)	20+		

Cleaning Agents

83	18500	Cleanskin-K	5 kg			
83	18502	Destainex	5 kg			
83	18504	Destainex-LF	5 kg			
84	18508	Oak Restorer-CW	5 kg			
84	18510	Oak Restorer-HW	5 kg			
84	18516	Wineglass	5 kg			

Page	Product #	Product	Size	Quantity	Price (\$)	Ship Date
Fining, Clarifying and Stability Products						
95	15787	Bentolact S	1 kg			
95	15788	Bentolact S	5 kg			
95	15789	Bentolact S	25 kg			
95	15766	Bentostab	5 kg			
95	15807	Caséinate de potassium	1 kg			
95	15808	Caséinate de potassium	5 kg			
88	17000	Claristar	2.5 L			
88	17001	Claristar	20 L			
96	15798	Colle Perle	1 L			
96	15799	Colle Perle	5 L			
96	15800	Colle Perle	20 L			
96	15770	Cristalline Plus	100 g			
96	15771	Cristalline Plus	1 kg			
89	15772	Flashgum R Liquide	1 L			
89	15773	Flashgum R Liquide	5 L			
89	15769	Flashgum R Liquide	20 L			
96	15790	Freshprotect	1 kg			
96	15791	Freshprotect	5 kg			
96	15792	Freshprotect	20 kg			
96	15782	Gelocolle	1 L			
96	15783	Gelocolle	5 L			
97	15795	Inocolle	1 L			
97	15796	Inocolle	5 L			
97	15797	Inocolle	20 L			
97	15801	Inocolle Extra N1	1 kg			
89	15793	Inogum 300	1 L			
89	15794	Inogum 300	5 L			
98	15785	Polycacel	1 kg			
98	15786	Polycacel	5 kg			
98	15784	Polycel	1 kg			
98	15116	Reduless	1 kg			
98	15115	Reduless	2.5 kg			
95	15036	Sparkolloid Cold Mix NF	25 lb/box			
97	15035	Sparkolloid Hot Mix NF	25 lb/box			
90	17010	Ultima Fresh	1 kg			
90	17012	Ultima Soft	1 kg			

Sparkling

101	15900	18-2007	500 g			
101	15865	Inobent	1 kg			
102	15870	Clarifiant S	10 L			
102	15873	Clarifiant XL	1 L			
102	15871	Clarifiant XL	10 L			
102	15885	Phosphates Mazure	10 L			
103	15571	ProElif	1 kg			





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