

www.lallemandwine.com

Lallemand has been producing yeast since the 1920s when it started supplying fresh bakers yeast in Quebec, Canada. In 1974, over 50 years later, Lallemand found a new partner with Scott Laboratories who was looking to produce dry wine yeast from their culture collection. Two strains were produced that first year — the first ever active dry wine yeast brought to North America!

The Lallemand/Scott Laboratories relationship, now in its 46th year, has brought North American winemakers nearly one hundred Lallemand products including yeast, yeast-based products, bacteria and enzymes. These products have changed the way North America makes wine and have changed winemakers' understanding of winemaking.

Lallemand is the leader in knowledge, education, applications and product development for winemakers worldwide. With 150 research scientists, 11 research labs, over 70 publications, eight patents, and collaboration with enological institutions on five continents, Lallemand is committed to the ongoing success of the global wine industry. Their solutions to winemaking problems are both cutting edge and practical.



www.ioc.eu.com

The origins of the Institut Oenologique de Champagne (IOC) headquartered in Epernay, France can to be traced back to the founding of the Entrepôt Général de la Champagne in 1890. Since 2010, Scott Laboratories has supplied their products to North America.

In the early days, the IOC was known for post-fermentation products. Today they offer not only fining agents and stabilizers, but yeast and other wine processing products for still and sparkling wines.

ANCHOR ②



www. anchoroenology.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 and are sold throughout the world.

The wine yeast strains from Anchor Oenology can be divided into natural isolates and hybrid strains which combine the best characteristics from both parents. Anchor Oenology is the leading New World wine yeast producer.

THE OAK LAB & öaklab.

www.theoaklab.com

The Oak Lab is a portfolio of oak infusion products that was launched in 2019 and is the newest division of Scott Laboratories. The Oak Lab's mission is to deliver oak infusion products that are unique and exceedingly high-quality.

The Oak Lab's flagship Thermic line of products are produced using a revolutionry process. The Thermic products are consistent in their flavor and aroma profiles and reliably scale up from bench trials to production volumes with remarkable fidelity.

OENOBRANDS



www.oenobrands.com

Oenobrands comes to the Scott Laboratories portfolio with a distinguished pedigree. Supported by its world renowned parent companies, DSM Food Specialties and Anchor Oenology, Oenobrands provides winemakers with innovative and scientifically sound solutions. This results in revolutionary products from brands such as DSM, Rapidase and Claristar.

www.erbsloeh.com

Scott Labs is proud to add Erbslöh to our list of suppliers. Erbslöh is one of the most trusted names in the industry. Based in Geisenheim, Germany, this family owned company brings

the Scott Labs portfolio premium bentonites and granulated carbons.

OO AIRD AIRD INNOVATIONS IN CHEMISTRY

www.airdchemistry.com

AiRD® Innovations in Chemistry specializes in environmentally conscious cleaning products for the wine industry. Founded over two decades ago in New South Wales, Australia, AiRD grew up near the vineyards with the goal of providing sustainable, non-hazardous alternatives to caustic for cleaning stainless steel and other surfaces.

COOPERAGES 1912 COOPERAGES

www.cooperage1912.com

Since 1912 the Boswell family has been a fixture in the oak industry. Cooperages 1912 represents their premium oak barrel division in North America, offering American, French and Eastern European oak options. Their portfolio of barrels

within their TW Boswell and World Cooperage programs is extremely diverse, offering something for every wine, and every winemaker.

2B FERM



2B Ferm offers winemakers a portfolio of yeast, nutrients and fining agents that are all organic certified. The organic production process is a fundamental belief of this independent producer from Southwestern Germany. Represented in Canada by Scott Labs since 2012, 2B Ferm products can now be found in all major global winemaking regions.

AROBOIS



www.arobois.com

Located in the southwestern corner of France, Arobois was a pioneer in the oak chips industry. With a portfolio of chips differing in size and toast levels, arobois chips have earned the

trust of many Canadian winemakers. Arobois is a HAACP and ISO recognized company.

GARBELLOTTO



www.garbellotto.com

A family owned cooperage operating in the Northern Italian town of Conegliano, Garbellotto has crafted a reputation for superior craftsmanship in larger format vats and casks. Their recent developments, including the Botticella, Experience and

N.I.R stave analysis program illustrates the family has found a balance between the demands of todays winemakers, and the famous Garbellotto craftsmanship that has been the foundation of their success since 1775.

Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

Enzymes

Filtration

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Yeast

Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

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Fruit Wines & Mead

General Tools





NON-SACCHAROMYCES YEAST

INITIA™

Oxygen-scavenging yeast to protect aroma and color



INITIA™ is a pure culture of *Metschnikowia pulcherrima* that quickly consumes oxygen. When added to freshly pressed white or rosé juice INITIA can prevent browning and other damaging oxidative effects. INITIA-treated wines have fresher aromatics and brighter color. INITIA consumes oxygen faster than SO₂, making INITIA ideal for low chemical input winemaking.

Find INITIA on page 42



YEAST

LALVIN ICV



Complex, elegant rosés with red fruity notes

LALVIN ICV SUNROSE™ is a pure strain of *Saccharomyces cerevisiae* from the Institut Coopératif du Vin (ICV) that is used in rosé wine production. Wines are elegant with complex red fruit aromas. This strain is especially suitable for rosé winemaking with grapes from warm climates.

Find ICV SUNROSE on page 28

SCOTT LABORATORIES



YEAST NUTRIENT

Stimula Cabernet[™]

Stimulates fruity aroma compounds in red wines

STIMULA CABERNET™ is a yeast nutrient optimized to stimulate the yeast's production of fruity esters in red wines. When STIMULA CABERNET is added at ⅓ sugar depletion it triggers specific yeast metabolic pathways resulting in red and black fruit aromas. Wines made with STIMULA CABERNET are noted for their increased complexity and diminished vegetal/herbaceous notes. This 100% autolyzed yeast-based nutrient is rich in specific amino acids, small peptides, vitamins and minerals.

LALLEMAND

YEAST NUTRIENT

Stimula Syrah[™]

Stimulates floral and spicy aromas in red wines

STIMULA SYRAH™ optimizes the yeast's ability to reveal and enhance varietal compounds originating in certain red grapes maximizing fruity, floral and spicy aromas. Adding STIMULA SYRAH at the beginning of active fermentation stimulates yeast to liberate varietal thiols, terpenes and nor-isoprenoids. Due to its unique formulation, wines made using STIMULA SYRAH have less sulfur off-flavors like hydrogen sulfide.

Find STIMULA SYRAH on page 55

LALLEMAND

Find STIMULA CABERNET on page 53

FINING

PURE-LEES **DELICACY**TM

Gentle fining and oxygen scavenging Compatible with no/low SO₂ winemaking

PURE-LEES DELICACY improves red wine quality by smoothing the texture without modifying the wine structure. This new range of specific inactivated yeast can be used as recommended alternative to lees during a long-period of contact during weeks/months of ageing but thanks to the high interaction with wine matrix, a quick effect is observed even after several days of contact.

Find PURE-LEES DELICACY on page 121

Malolactic

Oak & Tannins

Enzymes

Fining & Stability

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Fruit Wines & Mead

Canaral Too



Since our founding in 1933 as the Berkeley Yeast Laboratory, yeast has been at the heart of our portfolio. Our first commercial yeasts were provided on slants and came from the yeast collection housed at the University of California, Berkeley during prohibition. Growing yeast from slants poses microbial challenges for winemakers so we started providing yeast in an active dried form. For many years we produced and dried our strains at a large brewery, but in 1974 we partnered with Lallemand who began to produce our wine strains in addition to their baking strains. This partnership launched Lallemand into

wine yeast production. Lallemand Oenology continues to isolate and bring new wine yeast strains to winemakers worldwide and they remain the most respected wine yeast producer in the world.

Today's wine yeast strains are well characterized, and improvements have been made in their strength, purity and reliability. A near century of wine yeast cultivation makes Scott Laboratories and our yeast partners uniquely positioned to assist winemakers with yeast to meet the demands of today's winemaking.

SELECTING YEAST FOR SUCCESS

Harvested grape lots can differ from vintage to vintage and from block to block even within the same vineyard. There is no such thing as "standard" fruit chemistry and you can improve your yeast selection success by knowing the fermentable sugar, yeast assimilable nitrogen (YAN), and physical condition for every lot of fruit. Knowing the pH, titratable acidity (TA), malic acid and potassium concentration for each lot is also helpful for your entire winemaking plan.

We suggest selecting yeast based first on its technical compatibility with grape and winery conditions and secondly on its sensory contribution and compatibility with the desired wine style. For assistance see yeast strain selection charts on pgs 12-17.

As a reminder:

FERMENTABLE SUGAR

Yeast strains vary in their ability to tolerate ethanol levels. The initial sugar content will help determine the final ethanol content. Initial sugar content may be determined by gravity (usually reported as °Brix) or by direct measurements of sugar.

YAN

Yeast strains vary in their need for yeast assimilable nitrogen (YAN). Our strains are classified as low, medium or high nitrogen-demanding strains. The amount of nitrogen a yeast will need is dependent upon its individual needs, the initial sugar level and the temperature of the fermentation.

TEMPERATURE

Yeast strains vary in their temperature tolerance. Do not stress the yeast by fermenting at the upper or lower end of the recommended range. Temperature management is a key factor of yeast health, fermentation rate and security. Temperature should be measured directly under the cap in red must/wine and good cap management is required to ensure homogeneous temperatures. When working with high sugar fermentations, lower temperatures are recommended.

SENSORY IMPACT

Yeast contribute to wine aroma, flavor and mouthfeel. Some strains enhance varietal characters increasing fruity, tropical, spicy and floral notes. Other strains can produce esters increasing fruity and floral aromas. Certain strains produce polysaccharides and other compounds increasing mouthfeel. Lastly, some strains have a neutral sensory impact thereby preserving inherent grape qualities.

WHY SHOULD YOU ADD 25 g/hL* OF YEAST?

Lower potential for osmotic shock

Shorter lag phase

Fast onset of fermentation

Shorter fermentation length

Lower final VA

Lower final residual sugar

Healthier cell population

^{*} If sugar is greater than 25°Brix you should increase your inoculation rate to at least 30g/hL (2.5 lb/1000 gal). Increasing dosage of yeast may help prevent a sluggish or stuck fermentation.

HOW TO MAKE GOOD YEAST BETTER

QTL PROCESS: BREEDING YEAST THAT DO NOT PRODUCE SULFIDES OR SULFUR DIOXIDE

Selective breeding is used to improve the traits of enological strains of *Saccharomyces cerevisiae*. At the genetic level, traits may be controlled by a single/small group of genes or by a large group of genes.

Yeast traits that are controlled by a single or small group of genes have been the traditional target of selective breeding. When two yeast strains, each with different traits controlled by one or a few genes, are bred together, daughter yeast are easily screened to find the correct combination of traits.

Some yeast traits are genetically complex and traditional selective breeding and screening methods are an ineffective tool to target these traits. For example, if we breed two strains of wine yeast, one that produces low levels of ${\rm H_2S}$ and another that produces low levels of ${\rm SO_2}$, it is very difficult to identify

the daughter yeast that is both a low $\rm H_2S$ and low $\rm SO_2$ producer. This is because these traits are controlled and influenced by a large group of genes.

Quantitative Trait Loci (QTL) is a new technique that allows us to pinpoint the location of all genes involved in complex yeast traits. Now when we selectively breed yeast we can quickly screen daughter strains for the desired trait. Combining QTL mapping with selective breeding has allowed Lallemand Oenology to produce a line of **no to very low H₂S, SO₂, and acetaldehyde producing strains**. This is a non-GMO technique and all QTL process strains are naturally bred. Look for the QTL logo in the yeast descriptions.





YSEO PROCESS: YEAST PREPARATION IMPROVES PERFORMANCE AND SENSORY QUALITY

Did you know that the way in which a yeast is produced can have a major impact on fermentation outcome and wine quality?

In the early 2000s, Lallemand Oenology began developing a new yeast preparation technique. The Yeast Security and Sensory Optimization process (YSEO) optimizes nutrient additions during cell growth and the results are impressive.

The chart shows that yeast produced using the YSEO process produce less volatile acidity (VA) in a variety of wine types. In each fermentation the same yeast strain was used in identical conditions. The only difference was that one was fermented with yeast produced with the YSEO process and the other with the

traditional yeast production process.

Other trials have shown that the YSEO process can enhance strain performance in other ways including reduced lag phase, faster fermentation times, decreased H₂S production, better adaption to stressful conditions and reduced malolactic fermentation antagonism.

YSEO makes a good yeast even better.

YSEO IS A UNIQUE AND INNOVATIVE PRODUCTION PROCESS FOR YEAST DEVELOPED BY LALLEMAND.

The benefits of the YSEO process are:

Reduced lag phase	Better adaption to stressful conditions	Optimized fermentation	Reduced potential for VA
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Production of Volatile Acidity in Yeast Produced with and without the YSEO Process

	Yeast without YSEO (g/L acetic acid)	Yeast with YSEO (g/L acetic acid)
Italy (Montepulciano)	0.29	0.18
INRA (Sauvignon)	0.51	0.42
INRA (Sauvignon)	0.31	0.13
WSU (Riesling)	0.44	0.31
WSU (Syrah)	0.23	0.21
WSU (Cabernet Sauvignon)	0.58	0.38

Adapted from the article, Evaluation of the YSEO Process to Prepare Dried Winemaking Yeast by Sibylle Krieger¹, Anne Ortiz-Julien¹, Francoise Raginel¹, Ann Dumont¹, Forbes Wardrop¹, Charles G. Edwards²



¹ Lallemand, 1620, rue Prefontaine, Montreal, QC Canada

² Department of Food Science and Human Nutrition, Washington State University, Pullman, WA, U.S.A.



Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

Fining & Stability

Cleaning

Basics

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General Tools

YEAST STRAINS FOR WHITE & ROSÉ WINE

O Yeast Strain Type	18–2007	43/43 RESTART	58W3	718	ALCHEMY I	ALCHEMY II	ASSMANSHAUSEN (AMH)	BA11	BM 4X4	BM45	BRG	CEG (EPERNAY II)	CROSS EVOLUTION	CVW5	CY3079	DV10 {	EC1118	ELIXIR	EXOTICS MOSAIC	EXOTICS NOVELLO
Page#	18	18	18	19	19	19	20	20	21	21	21	22	22	23	23	23	24	24	24	25
S. cerevisiae cerevisiae			0	0				0		0	0	0			0					
S. cerevisiae bayanus	0	0												0		0	0			
Yeast hybrid/other							0						0					0	0	0
Yeast blend					0	0			0											
Alcohol Tolerance ¹	15%	17%	14%	14%	15.5%	15.5%	15%	16%	16%	15%	15%	13.5%	15%	15%	15%	17%	18%	15%	15.5%	15.5%
Relative Nitrogen ²	Low	Low	Med	Low	Med	Med	Med	High	High	High	High	Med	Low	Low	High	Low	Low	Med	Med	Med
Temp. Range (°C) ³	10-32	13-35	12-25	15-29	13-16	13-16	20-30	15-25	18-28	18-28	18-31	15-25	14-20	14-28	15-25	10-35	10-30	14-25	18-28	16-28
Fermentation Speed	Fast	Fast	Mod	Mod	Fast	Fast	Slow	Mod	Mod	Mod	Fast	Slow	Mod	Fast	Mod	Fast	Fast	Slow	Mod	Mod
Competitive Factor	Yes	Yes	Ntrl	Snstv	Yes	Yes	Snstv	Snstv	Yes	Yes	Ntrl	Snstv	Yes	Yes	Snstv	Yes	Yes	Snstv	Yes	Yes
Sensory Effect	Ntrl	Ntrl	EVC Esters M	Esters	EVC Esters	EVC Esters	EVC	Esters M	EVC M	EVC M	EVC	Esters	EVC M	Esters	EVC M	Ntrl	Ntrl	EVC Esters	EVC M	EVC M
MLF Compatibility	Good	Good	Avg	Very Good	Good	Good	Very Good	Below Avg	Below Avg	Below Avg	Avg	Not Known	Avg	Avg	Good	Good	Avg	Avg	Very Good	Good
Albariño						٥							٨	٨					٨	٨
Chardonnay	٨				٠				٥	٠	٠		٥	٥	٥	٥		٨	٠	
Chenin blanc					٠	٥								٠					٠	
Gewürztraminer			٨				٥	٨					٥			٥				
Muscat								٥				٠	٨	٨		٥				٨
Pinot blanc								۵					٨		٨	۵				
Pinot gris			٨	٥	٥									٨		۵		٥		
Riesling			٨	٨	٠		٨	٨					٠							
Sauvignon blanc					٠	٨		٨	٥				٠					٨		
Viognier			٨		٥			٨										٨	٠	
Rosé	٠			٠				٨				٠	٨	٨				٠		
Rhône Whites			٨		۵	٥		٨	٥				٠					٨	٥	
Aromatic Whites			٥		٥			٨					•	٠				٨		٠
Late Harvest		۵														٥	٥			
Sparkling Base	٠							٥						٠		۵	٠			
Restart Stuck		•														٠	٥			

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 51.

YEAST STRAINS FOR WHITE & ROSÉ WINE

~~~	~~~	~~~	~~~	~~~	~~	~~	~~~	~~~	~~~	~~~	~~	~~	~~~	~~~	~~~	~~~	~~~	~~~	$\sim$	
O Yeast Strain Type	FERMIVIN 3C	FERMIVIN 4F9	FERMIVIN TS28	ICV D21	ICV D47	ICV D254	ICV GRE	ICV OKAY	ICV OPALE 2.0	ICV SUNROSE	IOC BE FRUITS	IOC BE THIOLS	K1 (V1116)	M83	MSB	NT 116	OENOFERM BOUQUET	OENOFERM FREDDO	OENOFERM INTERDRY	OENOFERM PINOTYPE
Page#	25	25	26	26	27	27	27	28	28	28	28	29	29	29	30	31	31	31	NA	32
S. cerevisiae cerevisiae	0		0	0	0	0	0			0			0	0			0		0	0
S. cerevisiae bayanus		0													0			0		
Yeast hybrid/other								0	0		0	0				0				
Yeast blend																				
Alcohol Tolerance ¹	14%	15.5%	14.5%	16%	15%	16%	15%	16%	14%	16%	14%	15%	18%	15%	14.5%	16%	15%	15%	13%	14%
Relative Nitrogen ²	Med	Med	Med	Med	Low	Med	Med	Low	Low	Med	Low	Med	Med	Med	Med	Med	High	Low	Med	High
Temp. Range (°C) ³	16-22	14-20	15-22	16-30	15-28	12-28	15-28	12-30	15-30	14-20	12-24	15-25	10-35	17-28	14-20	12-16	16-20	13-17	18-22	18-28
Fermentation Speed	Slow	Fast	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Fast	Fast	Mod	Mod	Fast	Mod	Mod	Slow	Mod
Competitive Factor	Yes	Yes	Yes	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl	Yes	Yes	Ntrl	Yes	Ntrl	Ntrl
Sensory Effect	EVC M	EVC M Esters	EVC M	EVC M	EVC M	EVC M	EVC M	Esters	EVC Esters	E	EVC Esters	EVC	Esters	EVC	EVC M	EVC E	Esters	Esters	EVC	Esters, Hi-glyc
MLF Compatibility	Good	-	-	Avg	Good	Very Good	Very Good	Very Good	Good	Good	Good	Good	Poor	Avg	Not Known	Good	Avg	Below Avg	Avg	Very Good
Albariño	٠		٠		٥	COOU	0000	0000			٠				Kilowii			7118		0000
Chardonnay	٠	٠		•	•	٠			٠									٠		٨
Chenin blanc	٨	٨					٨						٨		٠	٨		٨		
Gewürztraminer					٥							٥					٠		٥	
Muscat																	٠		٥	
Pinot blanc																		٨		٨
Pinot gris																•		٨		٨
Riesling							٨					٥					٠	٨	٥	
Sauvignon blanc		٨	•						٨			٨			٠	•		٨		
Viognier	٠				٥			٨									٥			
Rosé		•		٥	•	٥	٠	٨	٠	٠	٠	•		•				٠		
Rhône Whites		٨			٨	٨	٨		٨											
Aromatic Whites		٨	•													•				
Late Harvest													٥						٥	
Sparkling Base								٥					٥							
Restart Stuck													•					٥		

^{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.

#### **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.



Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

Enzymes

Fining & Stability

Cleaning

Basics

Filtration

Closure

Fruit Wines

General Tools

## YEAST STRAINS FOR WHITE & ROSÉ WINE (CONTINUED)

~~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	$\sim$	
O Yeast Strain Type	OENOFERM RIESLING	OENOFERM X-THIOL	OENOFERM X-TREME	QA23	R2	RHÔNE 4600	R-HST	SAUVY	SENSY	SVG	VIN 13	VIN 2000	VITIFERM ALBA FRIA	VITIFERM ESPRIT	VITIFERM PINOT ALBA	VITIFERM SAUVAGE	W15
Page#	32	32	32	33	33	34	35	35	36	36	37	37	38	38	38	39	39
S. cerevisiae cerevisiae	0					0	0	0		0			0	0	0		0
S. cerevisiae bayanus				0	0												
Yeast hybrid/other		0	0						0		0	0					
Yeast blend																	
Wild yeast																0	
Alcohol Tolerance ¹	13%	15%	17%	16%	16%	15%	15%	14%	15%	15%	17%	15.5%	15%	15%	15%	15%	16%
Relative Nitrogen ²	High	Low	Low	Low	High	Low	Med	Med	Low	Med	Low	Low	Low	Low	Low	Low	High
Temp. Range (°C) ³	17-22	13-22	10-17	15-32	10-30	13-22	10-30	14-20	12-18	16-28	12-16	13-16	16-18	16-18	18-20	18-20	10-27
Fermentation Speed	Mod	Fast	Fast	Fast	Mod	Mod	Mod	Mod	Mod	Mod	Fast	Mod	Mod	Mod	Mod	Mod	Mod
Competitive Factor	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Snstv	Yes	Yes
Sensory Effect	Esters	Thiols Esters	Esters	EVC	Esters	Esters	EVC M	EVC	EVC M	EVC	EVC Esters	EVC Esters	EVC	EVC	М	EVC	EVC M
MLF Compatibility	Avg	Avg	Below Avg	Very Good	Good	Good	Avg	Not Known	Very Good	Good	Good	Good	Very Good	Avg	Very Good	Very Good	Very Good
Albariño				٨							٠	٨					
Chardonnay			٠	٨		۵					٠	٨			٨	٠	
Chenin blanc			٠								٠	٨		٥	٨	٥	
Gewürztraminer				٨	٠		٨							٥		٥	٠
Muscat				٨							٥			٥		٥	
Pinot blanc			٥	٠					٨						٥	٥	
Pinot gris			٥		٥	٥				٨					٥	٨	٠
Riesling	٨	٠	٥	٥	٨		٨			٨				۵	٨	٥	٠
Sauvignon blanc		٨	٥	٠	٨	٥	٨	٨	٨	٠	٥	٠	٠			٥	
Viognier			٥	٥	٥	٥	٨					٨	٥			٥	
Rosé		٨				٠	٥		٨	٥	٥	٥					۵
Rhône Whites						٨	٨			٠	٠	٥					٨
Aromatic Whites				٨	٨		٨	٨			٠						٨
Late Harvest					٨		٥				٥			٠			
Sparkling Base			٥	٥							٥			٠			
Restart Stuck			•								•			•			

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 51.

YEAST STRAINS FOR RED WINE

			\sim	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~					
O Yeast Strain Type	43	43 RESTART	3001	718	ALCHEMY III	ALCHEMY IV	ASSMANSHAUSEN (AMH)	BDX	BM 4X4	BM45	BRG	BRL97	5010	CSM	CVRP	EXOTICS MOSAIC	EXOTICS NOVELLO	FERMIVIN A33
Page#	18	18	19	19	20	20	20	21	21	21	21	22	22	22	23	24	25	25
S. cerevisiae cerevisiae			0	0				0		0	0	0	0	0	0			0
S. cerevisiae bayanus	0	0																
Yeast hybrid/other							0									0	0	
Yeast blend					0	0			0									
Alcohol Tolerance ¹	17%	17%	15%	14%	15.5%	15.5%	15%	16%	16%	15%	15%	16%	17%	14%	16%	15.5%	15.5%	15.5%
Relative Nitrogen ²	Low	Low	Med	Low	Med	Med	Med	Med	High	High	High	Med	Med	Med	Med	Med	Med	High
Temp. Range (°C) ³	13-35	13-35	12-32	15-29	16-28	16-28	20-30	18-30	18-28	18-28	18-31	16-29	14-32	15-32	18-30	18-28	16-28	22-30
Fermentation Speed	Fast	Fast	Mod	Mod	Fast	Fast	Slow	Mod	Mod	Mod	Fast	Mod	Fast	Mod	Mod	Mod	Mod	Fast
Competitive Factor	Yes	Yes	Yes	Snstv	Yes	Yes	Snstv	Snstv	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl
Sensory Effect	Ntrl	Ntrl	EVC	Esters	EVC	EVC	EVC	EVC M	EVC M	EVC M	EVC M	EVC	EVC M	EVC	EVC M	EVC M	EVC M	EVC
MLF Compatibility	Good	Good	Avg	Very Good	Good	Good	Very Good	Avg	Below Avg	Below Avg	Avg	Avg	Very Good	Avg	Very Good	Very Good	Good	Very Good
Barbera								٥	٥	٥		٨	٥					
Cabernet Franc						٨				٥		٥		٨	٨			•
Cabernet Sauvignon					٨			٠	٨	٠		٥		٨	٨			•
Grenache				٠	٨				٨	٠		٥	٠			٨		
Malbec					٨							٨	٥					•
Merlot								٨	٥	٥		٨		٨	٥	٨		•
Petite Sirah							٨		٨				٥		٥			
Pinot noir			٨		٥	٨	٠			٥	٠	٨						
Petit Verdot					٨			٨				٨	٨	٨		٨		•
Sangiovese	٨					٨			٨	۵								
Syrah	٨					٨		٨	٥			٥	٨			۵		
Tempranillo					٨					٥			٨		٨	٨		
Zinfandel	٠				٨		٨	٨	٨	٨		٨	٨					
Fruit Forward Reds				٠		•										•	٨	
Structured Reds					٥			•	•	٠			•					•
Restart Stuck	٠	٨																

^{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.

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.



Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

Enzymes S

YEAST STRAINS FOR RED WINE (CONTINUED)

The property of the propert		$\sim\sim$	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	\sim			
S. cerevisiae cerevisiae S. cerevisiae bayanus S. cerevis bayanus S. cerevis bayanus S.	Recommended M Mouthfeel EVC Enhanced Varietal Character Mod Moderate Ntrl Neutral Snstv Sensitive	FERMIVIN MT48	ICV D21	ICV D80	ICV D254	ICV GRE	ICV OKAY	IONYS _{WF}	MT	NT50	NT 116	NT 202	PERSY	PINOTYPE	RA17		RHONE 2056	RHÔNE 2226	RP15
Secretified							28			30	31	31	33						
Yeast hybridiother Image: Company of the		0	0	0	0	0		0	0					0	0	0	0	0	0
Veast blend Image: Company of the company	<u> </u>																		
Alcohol Tolerance* 15% 16% 16% 16% 15% 16% 16% 16% 15% 16% 16% 15% 16% 16% 16% 16% 16% 16% 16% 16% 16% 16	- 						0			0	0	0	0						
Relative Nitrogen?																			
Tempe, Range (°C)³ 20-30 16-30 15-28 12-28 15-28 15-30 25-28 15-32 14-28 24-28 15-28 15-28 16-29 15-30 15-28 15-32 20-30 Fermentation Speed Mod Mod Mod Mod Mod Mod Mod Mod Mod Fast Fast Fast Mod Mod Mod Mod Mod Fast Fast Fast Fast Fast Mod Mod Mod Mod Mod Fast Fast Fast Fast Fast Fast Fast Mod Mod Mod Mod Mod Fast Fast Fast Fast Fast Fast Fast Fast	Alcohol Tolerance ¹	15%	16%	16%	16%	15%	16%	16%	15%	15.5%	16%	16%	16%	14%	15%	16%	16%	18%	17%
Fermentation Speed Mod Fast Fast Fast Fast Mod M	Relative Nitrogen ²	Low	Med	High	Med	Med	Low	High	Med	Med	Med	Med	Low	High	High	Med	Med	Med	Med
Competitive Factor Ntrl Yes	Temp. Range (°C) ³	20-30	16-30	15-28	12-28	15-28	12-30	25-28	15-32	14-28	24-28	15-28	15-28	18-28	16-29	15-30	15-28	15-28	20-30
Sensory Effect M EVC M/M EVC M/M EVC M/M EVC M/M EVC M/M EVC Esters EVC M/M M/M EVC M/M M/M EVC Esters EVC Esters EVC M/M M/M EVC Esters ESTERS A A	Fermentation Speed	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Fast	Fast	Fast	Mod	Mod	Mod	Mod	Mod	Fast	Mod
MIF Compatibility	Competitive Factor	Ntrl	Yes	Yes	Ntrl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl	Snstv	Ntrl	Yes	Yes	Yes
Barbera	Sensory Effect	М		EVC M		EVC M	Esters	М	EVC M	EVC Esters	EVC	EVC Esters	EVC M	Esters M	EVC	EVC	Esters	EVC M	EVC
Cabernet Franc 0	MLF Compatibility	Good	Avg	Avg	Very Good	Very Good	Very Good	Good	Avg	Good	Good	Very Good	Very Good	Very Good	Below Avg	Good	Good		Avg
Cabernet Sauvignon Image: Ca	Barbera		٥	٥	٥	٥				٥							٠	٨	
Grenache ♦	Cabernet Franc		٥	٥	٥	٠			٥	٠		٥				٥		٨	•
Malbec Image: Control of the control of t	Cabernet Sauvignon		٠	٨	٨	٠		٨	٨	٠	٠	٨				٨		٥	•
Merlot Image: Control of the control of t	Grenache	۵	٥		٥	٨				٠					٥	•	•	٥	
Petite Sirah Image: Control of the contro	Malbec				٨			٨				٨							•
Pinot noir Image: Control of the control	Merlot	٨	٨	٥	٥	٥		٨	٠	٥		٨					٥	٥	•
Petit Verdot ♠ <	Petite Sirah			٥			•	٨		٥			•					٥	•
Sangiovese ♠ <td< td=""><td>Pinot noir</td><td></td><td></td><td></td><td></td><td>٥</td><td></td><td></td><td></td><td>٨</td><td></td><td>٨</td><td>٥</td><td>٨</td><td>٥</td><td>٥</td><td></td><td></td><td></td></td<>	Pinot noir					٥				٨		٨	٥	٨	٥	٥			
Syrah	Petit Verdot	٥	٥		٨			٨	٨		٠								•
Tempranillo • <td< td=""><td>Sangiovese</td><td>۵</td><td>٥</td><td></td><td>٨</td><td>٥</td><td></td><td>٨</td><td></td><td>٥</td><td></td><td></td><td></td><td></td><td></td><td></td><td>٥</td><td>٨</td><td></td></td<>	Sangiovese	۵	٥		٨	٥		٨		٥							٥	٨	
Zinfandel	Syrah		۵	۵	٥	۵	•	٥		۵			•				•		•
Zinfandel	Tempranillo	٨	٥	٥	٥	٥		٨	٥	٥			•				٥		
Structured Reds	Zinfandel		٨	٨	٨					٥		٥					٠	٨	•
	Fruit Forward Reds	٨				٨				٨					٠		•		
Restart Stuck	Structured Reds		٨	٨					٨			٨						٨	•
	Restart Stuck											٥						٥	

O Yeast Strain Type	SYRAH	173	TANGO MALBEC	VITIFERM RUBINO EXTRA	VRB	W15
Page#	36	NA	36	39	37	37
S. cerevisiae cerevisiae	0		0	0	0	0
S. cerevisiae bayanus		0				
Yeast hybrid/other						
Yeast blend						
Alcohol Tolerance ¹	16%	16%	16%	17%+	17%	16%
Relative Nitrogen ²	Med	Low	Med	Low	Med	High
Temp. Range (°C) ³	15-32	18-32	15-28	16-32	15-28	10-27
Fermentation Speed	Mod	Mod	Mod	Fast	Mod	Mod
Competitive Factor	Yes	Yes	Ntrl	Yes	Ntrl	Yes
Sensory Effect	EVC	Esters M	EVC	EVC	EVC M	EVC M
MLF Compatibility	Avg	Below Avg	Good	Very Good	Good	Very Good
Barbera				٥	٠	
Cabernet Franc		٥		٥		
Cabernet Sauvignon				٥		
Grenache	٥			٥	٥	
Malbec			٥	٠		
Merlot	٥	٨	٥	٥		
Petite Sirah	٥		٥		٨	
Pinot noir				٥		٠
Petit Verdot	٨					
Sangiovese	٥	٠			٨	
Syrah	٨		٨	٥		٨
Tempranillo		٠	٨	•	٨	
Zinfandel		٨		٥	٨	
Fruit Forward Reds		٨			٨	
Structured Reds	٨					
Restart Stuck						

Yeast

Yeast Nutrient

Malolactic Fermentation

Oak & Tannins

St:

₹ %

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Basics

Filtratic

Closui

Fruit Win

YEAST STRAINS FOR AMERICAN & HYBRID WHITE CULTIVARS

~~~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~	
<ul> <li>✓ Yeast Strain Type</li> <li>♦ Highly Recommended</li> <li>✓ Recommended</li> <li>M Mouthfeel</li> <li>EVC Enhanced Varietal Character</li> <li>Mod Moderate</li> <li>Ntrl Neutral</li> <li>Snstv Sensitive</li> <li>Avg Average</li> </ul>	58W3	718	ALCHEMY I	CVW5	CY3079	ELIXIR	EXOTICS MOSAIC	ICV OPALE 2.0	LALVIN C	QA23	SAUVY	STEINBERGER	9AS	VIN 13	VIN 2000
Page#	18	19	19	23	23	24	24	28	29	33	35	36	36	37	37
S. cerevisiae cerevisiae	0	0			0						0	0	0		
S. cerevisiae bayanus				0					0	0					
Yeast hybrid/other						0	0	0						0	0
Yeast blend			0												
Alcohol Tolerance ¹	14%	14%	15.5%	15%	15%	15%	15.5%	14%	16%	16%	14%	13%	15%	17%	15.5%
Relative Nitrogen ²	Med	Low	Med	Low	High	Med	Med	Low	Low	Low	Med	Med	Med	Low	Low
Temp. Range (°C) ³	12-25	15-29	13-16	14-28	15-25	14-25	18-28	15-30	15-30	15-32	14-20	15-25	16-28	12-16	13-16
Fermentation Speed	Mod	Mod	Fast	Fast	Mod	Slow	Mod	Mod	Fast	Fast	Mod	Slow	Mod	Fast	Mod
Competitive Factor	Ntrl	Snstv	Yes	Yes	Snstv	Snstv	Yes	Yes	Snstv	Yes	Yes	Snstv	Yes	Yes	Yes
Sensory Effect	EVC Esters M	Esters	EVC Esters	Esters	EVC M	EVC Esters	EVC M	EVC Esters	Esters	EVC	EVC	Ntrl	EVC	EVC Esters	EVC Esters
MLF Compatibility	Average	Very Good	Good	Average	Good	Average	Very Good	Good	Very Good	Very Good	Not Known	Avg	Good	Good	Good
Reduces malic acid content		٨					٨	٠	٨						
Aromella	٠		٥			٥				٨				٥	
Blanc du Bois				٠		٥				•	٥			٥	٥
Chardonel			٠	٠	٠			٠		•				٠	٠
Frontenac blanc			٠			٥				•			۵	٠	٥
Frontenac gris	٥	٨		٠			٨	٠	٥	•	٠				
ltasca		٨		•						•				٠	٥
La Crescent	•	٨	٨			•	٨		٨	•	•	٥	٠	٠	
Muscadine	٥			•					٨	•				٠	
Rosé		٨		•		٥	٨	•						٠	٠
Seyval blanc			٨			•				•	•		٠		٥
Traminette	•		٥			٥	۵			٥	٥	٠		٠	
Vidal blanc			٨	٠		٥		٥							٠
Vignoles	•		٠			•		٥		•			٠	٠	

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

#### HYBRID AND NON-VINIFERA WINES

Most native American grape cultivars tend to have strong fruit flavors and aromas as compared to European cultivars. This is especially true of *Vitis rotundifolia* (Muscadine) and *V. labrusca* varieties. The combination of strong fruit and high acid is often balanced by creating wines with residual sugar. French-American hybrid varieties are crosses between *Vitis* 

vinifera and one or more American varieties. As a result of the breeding, it is possible to create cultivars that have aromas and flavors that are reminiscent of their European ancestors. In addition to viticultural practices, wine style can be influenced by the yeast strain. Yeast can enhance flavors and aromas, mouthfeel and varietal expression. If the yeast can convert

^{2.} Relative nitrogen needs refer to how much nitrogen one strain requires relative to the other strains on this chart. See article on page 51.

## Yeast

east Nutrients

Malolactic Fermentation

#### YEAST STRAINS FOR AMERICAN & HYBRID RED CULTIVARS

~~~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~~~	~	
O Yeast Strain Type ♦ Highly Recommended O Recommended M Mouthfeel EVC Enhanced Varietal Character Mod Moderate Ntrl Neutral Snstv Sensitive Avg Average	3001	718	ALCHEMY III	ALCHEMY IV	BM 4X4	BRL 97	\$010	CSM	EXOTICS MOSAIC	ICV D254	LALVIN C	PERSY	NT 202	RC212
Page#	19	19	20	20	21	22	22	22	24	27	29	33	31	34
S. cerevisiae cerevisiae	0	0				0	0	0		0				0
S. cerevisiae bayanus											0			
Yeast hybrid/other									0			0	0	
Yeast blend			0	0	0									
Alcohol Tolerance ¹	15%	14%	15.5%	15.5%	16%	16%	17%	14%	16%	15.5%	16%	16%	16%	16%
Relative Nitrogen ²	Med	Low	Med	Med	High	Med	Med	Med	Med	Med	Low	Med	Low	Med
Temp. Range (°C) ³	12-32	15-29	16-28	16-28	18-28	16-29	14-32	15-32	12-28	18-28	15-30	15-28	15-28	15-30
Fermentation Speed	Mod	Mod	Fast	Fast	Mod	Mod	Fast	Mod	Mod	Mod	Fast	Fast	Mod	Mod
Competitive Factor	Yes	Snstv	Yes	Yes	Yes	Yes	Yes	Yes	Ntrl	Yes	Snstv	Yes	Yes	Ntrl
Sensory Effect	EVC	Esters	EVC	EVC	EVC M	EVC	EVC M	EVC	EVC M	EVC M	Esters	EVC Esters	EVC M	EVC
MLF Compatibility	Average	Very Good	Good	Good	Below Average	Average	Very Good	Average	Very Good	Very Good	Very Good	Very Good	Very Good	Good
Diminishes vegetal characters		•		٠	•			•				•		
Promotes color stability					•	٠								
Reduces malic acid content		•							٠		٠			
Black Spanish					•		•							
Chambourcin	•			•	٨	٥	•	•		•		•	٠	•
Crimson Pearl			٥	•						•				•
Frontenac		•		•	٨			٠	٨		٠	٠	٠	•
Maréchal Foch	٠		٨			٨			۵			٠	٥	٠
Marquette	٠		٠		٨		•	٠	٨	•		٠		٥
Noiret			٨	٥		٠	•		٥			٠	٠	
Norton	٥		٨	٥		٠	•		٠	•	٠		٨	
Petite Pearl		•	٥	٠			٥			•			٥	٠
St. Croix			٨				٥	٥					٨	

^{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.

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.

HYBRID AND NON-VINIFERA WINES (CONTINUED)

flavorless thiol precursors into aromatic elements or produce enzymes that cleave glycosidic bonds and release aromatic terpenes into the wine, then varietal characteristics are enhanced. 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. These strains are listed in the chart above.

YEAST STRAIN DESCRIPTIONS

18-2007 **₩**IOC

Robust fermenter for sparkling wines

Sparkling base, Chardonnay, Pinot noir

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

Well adapted to low pH, low temperature and alcohol up to

Good glycerol producer, low VA, SO, and foam producer. Good

#38-12527

500 g

\$48.00

implantation, complete breakdown of sugars and low nutrient requirements.

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

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 10-32°C		
•••••••••••••••••••••••••••••••••••••••		······	~~~~~~	
Trustophilis years for high sugar formentations	#33-15083	500 g	\$49.80	
Fructophilic yeast for high sugar fermentations Zinfandel, Sangiovese, Syrah, Late Harvest	#33-15083B	10 kg	\$745.00	

UVAFERM 43[™] is a *Saccharomyces cerevisiae bayanus* strain that gives high-quality sensory results in high Brix red fermentations and helps maintain color, red fruit, and cherry characteristics.

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

Alcohol Tolerance: 17%	Nitrogen Needs: LOW	Temp. Range: 13-35°C		Sensory: NEUTRAL	
~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~~~~~	·····	·····
43 RESTART CALLEMAND	******	#3	33-15083R	500 g	\$64.50

Preacclimated fructophilic yeast for restarting stuck fermentations Restart Stuck Fermentations, Late Harvest

UVAFERM 43 RESTART™ is a preacclimated yeast adapted to

quickly restart a stuck fermentation. This yeast is the result of an innovative process developed by Lallemand Oenology using UVAFERM 43™, a strain isolated by Lallemand Oenology in collaboration with Inter-Rhône in France.

43 RESTART's resistance to stressful conditions of stuck fermentations has been naturally enhanced. Acclimation includes addition of micronutrients, sterols, and polyunsaturated fatty acids to strengthen 43 RESTART cell membranes. Yeast cells are more robust, acclimate quicker and have a lower mortality rate after inoculation.

43 RESTART is sensory neutral and very malolactic bacteria compatible.

For best results use the 43 RESTART protocol for stuck wines. See pg 47 for protocol which includes RESKUE™ and FERMAID O[™] and best practices.

Alcohol Tolerance: 17%	Nitrogen Needs: LOW	Temp. Range: 13-35°C		Sensory: NEUTRAL	
~~~~~~~	~~~~~~	~~~~~~	~~~~~		·····
58W3 (ALLEMAND YSEO	ulaita a coine a a	#	÷33-15108	500 g	\$67.00
Spicy and fruity aromatic v Pinot gris, Gewürztraminer		Whites, #3	33-15108B	10 kg	\$852.00

VITILEVURE 58W3[™] contributes an overall well-balanced mouthfeel with spicy, floral and fruity aromas.

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

Due to 58W3's fermentation kinetics, especially in high sugar juices, a balanced nutrient strategy and good fermentation practices should be followed.

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

Alcohol Tolerance: 14% Nitrogen Needs: MEDIUM Temp. Range: 12-25°	Sensory: ENHANCED VARIETAL CHARACTERISTICS, ESTERS, MOUTHFEEL
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Aromatic Whites

\$110.00

\$110.00

71B LALLEMAND YSEO

Softens high malic acid grapes

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

LALVIN 71B[™] is known for fermenting fruity rosé wines and semi-sweet whites. It synthesizes relatively stable esters and higher alcohols resulting in long-lived aromas. Respects rosé wine color.

Softens high acid musts by partially metabolizing malic acid.

#33-15054	500 g	\$38.20
#33-15054B	10 kg	\$570.00

Sensitive to competitive factors and may have difficulty competing with wild microflora. Careful rehydration with GO-FERM PROTECT EVOLUTION™ and early inoculation will help 71B dominate in competitive conditions.

This strain was isolated and selected by the INRA (National Agricultural Research Institute) in Narbonne, France.

Alcohol Tolerance: 14%	Nitrogen Needs: LOW	Temp. Range: 15-29°C		Sensory: ESTERS	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~		~~~~~		~~~~~~
3001 VALLEMAND YSEO Enhanced varietal expressi	ion in Pinot noir	#	33-15033	500 g	\$67.00

Pinot noir

VITILEVURE 3001™ enhances the varietal characteristics, intensity and balance of Pinot noir.

Wines made with 3001 are noted for their fruit and varietal characteristics that are complex and elegant with good aging potential.

This strain was isolated, studied and selected from the prestigious Côte de Nuits terroir in Burgundy and is particularly suitable for inoculation into musts that have undergone pre-fermentation cold maceration (cold soak).

3001 is tolerant to standard cold soak SO, additions and can withstand lower inoculation temperatures.

Alcohol Tolerance: 15%	Nitrogen Needs: MEDIUM	Temp. Range: 12-32°C	Sensory: ENHANCE VARIETAL CHARACTERISTICS (EVC)
~~~~~	~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

#33-16071

#33-16072

ALCHEMY I Blend of yeast strains for fruity and floral esters

Sauvignon blanc, Chardonnay, Chenin blanc, Riesling, Pinot gris, Rhône Whites, Aromatic Whites

ALCHEMY I produces fruity and floral esters and reveals volatile thiols (boxwood, passion fruit, guava and grapefruit aromas).

ALCHEMY I is both a strong aroma producer and a fast fermenter with low foam production.

Temperature control is advised, and barrel fermentations should be avoided.

1 kg

ALCHEMY I is a specific blend of S. cerevisiae wine yeast strains developed in collaboration with the Australian Wine Research Institute (AWRI) in South Australia.

Alcohol Tolerance: 15.5%	Nitrogen Needs: MEDIUM	Temp. Range: 13-16°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, ESTERS
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#### ALCHEMY II Blend of yeast strains for expressing volatile thiols

Albariño, Sauvignon blanc, Chenin blanc, Rhône Whites

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

ALCHEMY II is a low SO₂ producer with fast fermentation kinetics. Temperature management is crucial.

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

1 kg

ALCHEMY II is a blend of Saccharomyces cerevisiae wine yeast strains developed in collaboration with the AWRI in South Australia for optimal aromatic profile.

Alcohol Tolerance: 15.5%	Nitrogen Needs: MEDIUM	Temp. Range: 13-16°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS	
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#### ALCHEMY III

#### Blend of yeast strains for complex structured reds

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

ALCHEMY III is a very high producer of 2-phenylethanol (rose), 2-phenylethyl acetate (floral and fruity), ß-ionone (raspberry) and acetate esters (fruity and candy).

It produces complex wines with good structure and body and is suitable for all red varietals.

\$110.00 #33-16073 1 kg

ALCHEMY III is a strong fermenter, produces minimal SO, and high levels of glycerol (8-11 g/L).

ALCHEMY III is a specific blend of Saccharomyces cerevisiae wine yeast strains developed in collaboration with the AWRI in South Australia.

Alcohol Tolerance: 15.5%	Nitrogen Needs: MEDIUM	Temp. Range: 16-27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS
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#33-16074

#33-15067

ALCHEMY IV

Blend of yeast strains for intensely fruity reds

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

ALCHEMY IV was formulated for the production of intense red fruit characters such as cherry, red currant, raspberry and pomegranate. The high production of ethyl esters, especially ethyl hexanoate (fruity) contributes to the longevity of the fruit aromas.

ALCHEMY IV can diminish herbaceous, vegetal, and unripe flavors and elevate terpenes while producing smooth,

1 kg

\$110.00

\$67.00

easy-drinking, round wines with heightened aroma intensity. ALCHEMY IV is a strong fermenter, produces minimal SO₂, and high levels of glycerol (8–11 g/L).

ALCHEMY IV is a specific blend of Saccharomyces cerevisiae wine yeast strains developed in collaboration with the AWRI in South Australia.

Alcohol Tolerance: 15.5%	Nitrogen Needs: MEDIUM	Temp. Range: 16–29°C	Sensory: ESTERS, MOUTHFEEL
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#### ASSMANSHAUSEN (AMH)



Pinot noir, Zinfandel, Riesling, Petite Sirah, Gewürztraminer

ENOFERM AMH[™] is a color friendly strain that enhances spicy (clove, nutmeg) and fruit flavors and aromas while adding overall complexity.

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

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.

500 g

AMH is a Saccharomyces kudriavzevii strain originating from the Geisenheim Research Institute in Germany.

Alcohol Tolerance: 15%	Nitrogen Needs: MEDIUM	Temp. Range: 20-30°C	Sensor	y: ENHANCED VARIETAL CH	ARACTERISTICS
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BA11 (ALLEMAND YSEO	15 1 16 1	#	33-15088	500 g	\$50.50

Strong fermenter for white wine mouthfeel

Riesling, Viognier, Pinot blanc, Gewürztraminer, Rosé, Muscat, Rhône Whites, Aromatic Whites

LALVIN BA11[™] promotes clean aromatic characteristics with subtle notes of spice, orange blossom, pineapple and apricot. Lees stirring releases polysaccharides for a full mouthfeel.

This S. cerevisiae cerevisiae strain was selected in 1997 near the Estação Vitivinicola de Barraida in Portugal and is suitable for grapes from cool regions as well as relatively neutral varietals.

Alcohol Tolerance: 16%	Nitrogen Needs: HIGH	Temp. Range: 15-25°C	Sensory: ESTERS, MOUTHFEEL
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BDX LALLEMAND YSEO

Steady fermenter for Bordeaux varietals

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

UVAFERM BDX[™] is a reliable fermenter that enhances varietal characteristics in Bordeaux varietals, emphasizing spicy and jammy notes.

Wines have good phenolic structure with increased mouthfeel

#33-15096

#33-15100

500 g

\$50.50

\$59.60

and color.

BDX is a reliable fermenter that does not generate a lot of heat. Selected from the Institut Pasteur strain collection in Paris, France.

500 g

Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 18-30°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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**BM 4X4** 

Aromatic complexity and mouthfeel in reds and whites

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

Wines made using LALVIN BM 4X4[™] have sensory descriptors which include jam, floral and cherry liqueurs, sweet spice, licorice, cedar and earthy.

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

In white wines, BM 4X4 produces high levels of esters and poly-

saccharides resulting in fruity aromas and round mouthfeel.

Lalvin BM 4X4[™] is a blend of Lalvin BM45[™] (see scottlab.com for more information) and another yeast known for fermentation reliability. The BM 4X4 blend was formulated to provide the aromatic complexity of BM45 while providing greater reliability under difficult fermentation conditions.

Below average malolactic fermentation compatibility.

Alcohol Tolerance: 16%  Nitrogen Needs: HIGH  Temp. Range: 18–27°C  ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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#### BM 45

For increased mouthfeel and improved colour stability

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

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

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

#33-15037	500 g	\$50.50
#33-15037B	10 kg	\$745.00

Has high nitrogen requirements and can produce H₂S under poor nutrient conditions.

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

	Alcohol Tolerance: 15%	Nitrogen Needs: HIGH	Temp. Ro	ange: 18-28°C	
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	RG LALLEMAND YSEO	#33-15112	500 g	\$59.60	

#### Classic strain for Burgundy varietals

Chardonnay, Pinot noir

LEVULINE BRG[™] is the reference strain for Burgundian winemakers. Increases minerality in whites such as Chardonnay and spice characters in reds like Pinot noir.

BRG is a fast fermenter. Produces significant amounts of poly-

saccharides during fermentation leading to enhanced mouthfeel and body.

This strain was isolated in Burgundy at the IUVV (Institut Universitaire de la Vigne et du Vin) laboratory in Dijon, France.

Alcohol Tolerance: 15%	Nitrogen Needs: HIGH	Temp. Range: 18-31°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS. MOUTHFEEL	
Alcohol Tolerunce: 15%	Nitrogen Needs: HIGH	Temp. Runge: 18-51-C	ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL	



#### BRL97 Enhanced color stability and structure in color sensitive varietals

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

LALVIN BRL97™ respects varietal characteristics and helps retain color in grapes sensitive to color loss.

Fast starter and a moderate speed fermenter. Demonstrates good malolactic fermentation compatibility and high alcohol tolerance. This strain was isolated at the University of Torino in Italy from a Nebbiolo fermentation.

500 g

\$50.50

\$66.90

\$848.00

\$67.00

To enhance complexity, BRL97 fermented wine may be blended with wines fermented with LALVIN RC212  $^{\text{\tiny TM}}$  or W15  $^{\text{\tiny TM}}$ .

	Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 17-29°C	EN	Sensory: HANCED VARIETAL CHARAC	CTERISTICS
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CEG (EPERNAY II) Sweet and semi-sweet wine production		#	±33-15047	500 g	\$29.80	
	White, Rosé	e production		±33-15053	10 kg	\$366.00

#33-15072

UVAFERM® CEG often slows or stops under stressed conditions making it ideal for semi-dry white or rosé wine production.

Under normal fermentation conditions CEG is noted for its

ability to deliver slow, steady and clean fermentations. Isolated by the Geisenheim Research Institute in Germany.

Alcohol Tolerance: 13.5%	Nitrogen Needs: MEDIUM	Temp. Range: 15-25°C		Sensory: ESTERS	
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CLOS (ALLEMAND YSEO) Aromatic complexity and	d mouthfeel in big reds	#	±33-15120	500 g	\$59.60

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

LALVIN CLOS™ was selected for its ability to enhance aromatic complexity, structure and mouthfeel.

Notable for its high alcohol tolerance (up to 17% v/v) and good implantation in difficult conditions. Good compatibility with malolactic bacteria.

This strain was isolated by the University of Rovira i Virgili in Spain from the Priorat region.

Alcohol Tolerance: 17%	Nitrogen Needs: MEDIUM	Temp. Range: 14-32°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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#33-15115

#33-15115B

#33-15090

CROSS EVOLUTION

Natural yeast hybrid to enhance aromatics and mouthfeel

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

CROSS EVOLUTION™ increases fresh fruit and floral aromas in white and rosé wines.

This strain complements increased mouthfeel resulting in aromatic wines that are well-balanced.

CROSS EVOLUTION is a strong fermenter and ideal for aromatic white and rosé wines that have a high alcohol potential.

500 g

10 kg

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

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 13-20°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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#### CSM

Minimizes herbaceous characters in under-ripe fruit Cabernet Sauvignon, Cabernet Franc, Merlot, Petit Verdot

Wines fermented with ENOFERM CSM[™] have shown intense aromas of berries, spice and licorice.

CSM has been known to reduce vegetal aromas and add complexity with a balanced, round mouthfeel.

#33-15090B		10 kg		\$844.0	00
CSM is malolactic	friendly	and was	selected	by the	Institu

500 g

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

Alcohol Tolerance: 14% Nitrogen Needs: MEDIUM	Temp. Range: 15-32°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS	
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\$598.00

CVRP (ALLEMAND

Rich, round reds

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

 $CVRP^{\text{\tiny TM}}$  is ideal for full-bodied reds where varietal definition, smooth mouthfeel and sweet tannin expression is desired.

This yeast overproduces polysaccharides resulting in round, full wines with decreased astringency and bitterness, stable color and complex, ripe fruit flavors.

CVRP has a moderate and steady fermentation rate, good malolactic compatibility and is one of the highest polysaccharide producing strains within the Lallemand Oenologies yeast portfolio.

10 kg

Nitrogen Needs: MEDIUM

Temp. Range: 18-32°C

Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL

#### CVW5 4

#### Production of stable esters in whites

Chardonnay, Chenin blanc, Pinot gris, Rosé, Albariño, Muscat, Aromatic Whites, Fruit Wine

 $CVW5^{TM}$  is a high producer of fruity aromas (esters) and low producer of volatile acidity and  $SO_3$ .

CVW5 has the lowest nitrogen demand of the Lallemand Oenology yeast strains. Strong fermenter even under difficult conditions, including low turbidity.

#33-15210A	500g	\$41.70
#33-15210	10 kg	\$598.00

This *S. cerevisiae bayanus* strain was selected from the Lallemand Oenology yeast strain collection and is a daughter strain of LALVIN EC1118TM (see pg 24)

**Storage**: 4-11°C(39-52°F)

#33-15208

Alcohol Tolerance: 15% Nitrogen Needs: LOW Temp. Range: 14–27°C Sensory: ESTERS
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#### CY3079 (BOURGOBLANC)



Classic strain for barrel-fermented whites

Chardonnay, Pinot blanc

LALVIN CY3079 (Bourgoblanc) $^{\text{TM}}$  enhances aromas of fresh butter, almond, honey, flowers and pineapple.

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

Autolyzes quickly at the end of fermentation resulting in round wines.

#33-15061	500 g	\$50.00
#33-15078	10 kg	\$745.00

CY3079 is a steady, average fermenter even at cooler temperatures (15°C/59°F). This strain demonstrates good alcohol tolerance and low production of volatile acidity and  $\rm H_2S$  when nutrient requirements are met.

This strain was isolated for its ability to complement typical white Burgundys by the Bureau Interprofessional des Vins de Bourgogne (BIVB) in France.

Alcohol Tolerance: 15% Nitrogen Needs: HIGH Temp. Range: 15–25°C Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL	Alcohol Tolerance: 15%
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#### DV10 (ALLEMAN

#### Strong fermenter for crisp, clean wines

Chardonnay, Sparkling Base, Gewürztraminer, Pinot gris, Late Harvest, Pinot blanc

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 Prise de Mousse.

#33-15041	500 g	\$50.00
#33-15076	10 kg	\$745.00

Strong fermentation kinetics. Recognized for low foaming, low VA production and very low  $\rm H_2S$  and  $\rm SO_2$  production. Saccharomyces cerevisiae bayanus strain from Epernay, France.





Malolactic Fermentation

s Enzyme









#### EC1118 (PRISE DE MOUSSE)



Original sparkling wine strain

Sparkling Base Wines

LALVIN EC1118 $^{\text{\tiny TM}}$  is the original, steady, low-foamer yeast strain.

Ferments well at low temperatures and flocculates with compact lees.

Under standard winemaking conditions EC1118 has good compatibility with malolactic bacteria. Under low nutrient

#33-15062	500 g	\$38.20
#33-15063	10 kg	\$570.00

conditions EC1118 can produce high amounts of  ${\rm SO_2}$  (up to 50 ppm) and, as a result, may inhibit malolactic fermentation.

This *Saccharomyces cerevisiae bayanus* strain was selected by the IOC in Epernay, France and is the reference strain for sparkling base wine. It is an excellent choice for secondary fermentations of sparkling wine.

Alcohol Tolerance: 17%	Nitrogen Needs: LOW	Temp. Range: 10-30°C		Sensory: Neutral	
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ELIXIR VALLEMAND VSEO		#	33-15079	500 g	\$67.00

Varietal optimization in whites and rosés

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

VITILEVURE ELIXIR $^{\text{m}}$ has enzymatic abilities which allows for the expression of terpenes and thiols revealing floral and fruity varietal aromas and stable esters.

Wines are aromatically complex, flavors persistent and mouth-feel is well-balanced.

Suitable for use in highly clarified juice.

Strain requires good nutrition and proper temperature control. It is a low SO₂, H₂S and volatile acidity producer.

ELIXIR is a hybrid yeast resulting from the yeast hybridization program at the Institute for Wine Biotechnology at the University of Stellenbosch in South Africa.

Alcohol Tole	rance: 15%	Nitrogen Needs: MEDIUM	Temp. Range: 14-25°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, ESTERS

EXOTICS MOSAIC



All-purpose hybrid yeast for fruity wines with mouthfeel

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

EXOTICS MOSAIC produces white wines with guava, passion fruit, tropical and stone fruit aromas and flavors as well as good mouthfeel. Red wines have cherry, floral, cocoa and strawberry aromas. Reds are full-bodied, well-balanced, complex and intense.

Wines fermented with EXOTICS MOSAIC take time to mature therefore this yeast is an excellent choice for wines destined for aging.

Steady fermenter but sensitive to cold temperatures. Can pro-

duce elevated levels of glycerol (9–13 g/L) which potentially leads to lower alcohol. Low volatile acidity and SO₂ production.

250 g

\$42.00

Strain can partially degrade malic acid and is known to facilitate and enhance malolactic fermentation.

EXOTICS MOSAIC is a hybrid of *Saccharomyces cerevisiae* and *S. paradoxus* developed at the Institute for Wine Biotechnology at the University of Stellenbosch in South Africa.

Storage: 5-15°C(41-59°F)

#33-16085

Alcohol Tolerance: 15.5% Nitrogen Needs: MEDIUM Temp. Range: 18–28°C ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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EXOTICS NOVELLO

All purpose hybrid yeast for aromatic expression and mouthfeel

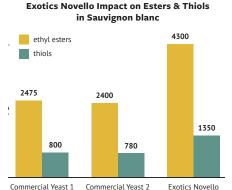
Sauvignon blanc, Viognier, Aromatic Whites, Merlot, Syrah, Fruity Reds

EXOTICS NOVELLO is known for enhancing mouthfeel, softness and aromas in white and red wines.

Fresh fruity thiols and floral esters are revealed in whites while astringency and bitterness is decreased. In red wines red and black fruits and spice are increased while green and vegetal characters are diminished.

EXOTICS NOVELLO produces low levels of VA and H₃S and has some pectinase activity. Developed by Anchor Oenology in collaboration with the Australian Wine Research Institute (AWRI), EXOTICS NOVELLO is a Saccharomyces hybrid having the sensory characteristics of S. cariocanus and the fermentation security of S. cerevisiae.

Storage: $5-15^{\circ}C(41-59^{\circ}F)$



\$42.00

Alcohol Tolerance: 15.5%	Nitrogen Needs: MEDIUM	Temp. Range: 17-27°C	ENHANCED VA	Sensory: RIETAL CHARACTERISTICS,	, ESTERS, MOUTHFEEL
For round and fruity white	*0 \$01071088	#	±33-17015	500 g	\$46.00

Chardonnay, Viognier, Chenin blanc, Chardonel

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

Reveals citrus notes from norisoprenoids specific to the Chardonnay varietal. Releases mannoproteins during fermentation and aging. Known for finesse and aromatic complexity.

250g

#33-16086

Alcohol Tolerance: 14%		Nitrogen Needs: MEDIUM	Temp. Range: 16-22°C	
	FERMIVIN 4F9 Senobrands Aromatic white and rosé wines with a long finish	#33-17033	500 g \$46.00	<u> </u>

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

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

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

A fast fermenter with a moderate nutrient requirement, alcohol tolerance of 15.5% (v/v) and optimum fermentation temperature of 14-20°C (57-68°F). A low SO, and H₂S producer.

Alcohol Tolerance: 15.5%		Nitrogen Needs: MEDIUM	Temp. Range: 14	-20°C
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FERMIVIN A33	OENOBRANDS	#33-17030	500 g	\$46.00

Structured red wines

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

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

Fermivin A33 is a low foaming yeast with a short lag phase, alcohol tolerance up to 15.5% (v/v), a good resistance to SO, 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 oak aging. Enhances varietal character and aromas of blackcurrant, dark chocolate and fresh tobacco.

Alcohol Tolerance: 15.5%	Nitrogen Needs: HIGH	Temp. Range: 22-30°C
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Malolactic Fermentation

Structured Reds

#### FERMIVIN MT48



500 g

\$46.00

Fruity and spicy reds

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

FERMIVIN® MT48 enhances aromatic notes of cherry, raspberry, blackberry, plum and spices in Bordeaux varieties. Produces excellent results in Sangiovese, Grenache and Tempranillo.

FERMIVIN MT48 has a short to medium lag phase, rapid and

steady kinetics and low volatile acidity production.

High glycerol production.

#33-17004

FERMIVIN MT48 was selected in Bordeaux by the IFV (formerly ITV) France in collaboration with CIVB-Bordeaux.

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 20-30°C	ENHANCE	Sensory: D VARIETAL CHARACTERIS	TICS, MOUTHFEEL
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Fruity and elegant red wir	OBRANDS	#	‡33-17025	500 g	\$46.00

Pinot noir, Fruit Forward Reds

Fermivin® PF6 produces round, elegant wines with bright fruit and spice character.

Fermivin PF6 is known to produce balanced wines with enhanced color intensity and lower levels of astringency.

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

Alcohol Tolerance: 14%	Nitrogen Needs: MEDIUM	Temp. Range: 12-24°C	
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FERMIVIN TS28  OENOBRANDS  Aromatic and crisp Sauvianon blanc type wines	#33-17036	500 g \$46.00	

Sauvignon blanc, Albarino, Aromatic Whites

a more stable aromatic profile in the mouth.

Fermivin® TS28 was selected by the IFV (formerly ITV) in the

The  $\beta$ -lyase activity of Fermivin TS28 optimizes the release of thiol precursors, such as boxwood, gooseberry, and mineral

(stone, flint). Produces crisp, aromatic white wines with balanced mouthfeel.

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

F						
Alcohol Tolerance: 14.5% Nitrogen		eeds: MEDIUM	Temp. Ro	unge: 15-22°C		
	~~~~~	~~~~~	~~~~~~	·····		
Freshness and mouthfeel for mature and concentrated reds and whites Merlot, Syrah, Zinfandel, Cabernet Sauvignon, Chardonnay,		#33-15086	500 g	\$50.00		
		#33-15086B	10 kg	\$745.00		

LALVIN ICV D21[™] was selected for fermenting red wines with stable color, intense fore-mouth volume, mid-palate tannin structure and fresh aftertaste. Contributes both higher acidity perception and positive polyphenol-reactive polysaccharides leading to

ICV D21 can be used with ripe white grapes to develop fresh fruit aromas, volume and perceived acidity. Suitable for barrel fermentation.

Noted for its good fermentation performance and low sulfide production. In highly clarified juices, maintain fermentation temperatures above 16°C(61°F) and supplement with proper nutrition.

ICV D21 was 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.

Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 16-27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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\$745.00

\$50.00

ICV D47

Complex whites with citrus and floral expression

Chardonnay, Rosé, Rhône Whites

LALVIN ICV D47[™] is known for the production of full-bodied, complex white wines with fruity and floral notes.

ICV D47 is a high polysaccharide and ester producing strain suitable for both tank and barrel-fermented white and rosé wines.

This yeast has a short lag phase and regular fermentation rate. Can tolerate a fermentation temperature range of 15-28°C(60-

#33-15056	500 g	\$50.00
#33-15056B	10 kg	\$745.00

82°F), however a temperature of 17-20°C (63-68°F) is preferred, especially at the end of fermentation.

The freshness from wines made using LALVIN ICV D21[™] make for an ideal post-fermentation blending component.

This yeast was isolated from Suze-la-Rousse in the Côte du Rhone region of France.

l	Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 16-27°C	ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL	
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ı	ICV DQO TALEMAND				

Enhances tannin structure in reds

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

LALVIN ICV D80[™] complements big tannin volume, ripe fruit, and licorice style reds.

Selected for its ability to bring out varietal aromas and reinforcing the rich concentrated flavors found in varieties such as Zinfandel and Syrah where wines have a high fore-mouth volume, big mid-palate mouthfeel and intense fine-grain tannins.

\$50.00 500 g #33-15081 #33-15081B 10 kg \$745.00

ICV D80 is a rapid starter with a moderate fermentation rate. Excellent for blending with wines fermented with LALVIN ICV D254TM.

This strain was isolated by the Institut Coopératif du Vin (ICV) in 1992 from the Côte Rôtie area of the Rhône Valley

Sensory:

Alcohol Tolerance: 16%	Nitrogen Needs: HIGH	Temp. Range: 15-27°C	ENHANCE	D VARIETAL CHARACTERIS	TICS, MOUTHFEEL	
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ICV D254 ALLEMAND YSEG		#	33-15036	500 g	\$50.00	

#33-15075

#33-15085

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

In red wines, LALVIN ICV D254[™] develops ripe fruit, jam and cedar aromas together with mild spiciness.

On the palate it contributes high fore-mouth volume, big mid-palate mouthfeel and intense fruit concentration.

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

10 kg

This strain was isolated by the Institut Coopératif du Vin (ICV) from a Rhône Valley Syrah fermentation.

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Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 12-27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL

#### ICV GRE LALLEMAND YSEO

#### Fruit forward reds and whites

Chenin blanc, Riesling, Rosé, Rhône Whites, Rhône Reds, Fruit Forward Reds

In fruit-focused whites, such as Chenin blanc, Riesling and Rhône whites, LALVIN ICV GRE™ fermentations result in stable, fresh fruit characteristics such as melon and apricot with improved fore-mouth volume.

In reds, ICV GRE complements up-front fruit for easy-todrink Rhône-style wines. With short skin contact (three to

10 kg \$745.00 #33-15085B five days), ICV GRE reduces vegetal and undesirable sulfur

500 g

components in varieties like Merlot, Cabernet Sauvignon, Grenache and Syrah.

ICV GRE is a rapid starter, with good alcohol tolerance and low SO₂, volatile acidity and foam production.

Alcohol Tolerance: 15% Nitrogen Needs: MEDIUM Temp.	ange: 15–27°C Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUT	FEEL
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#### **ICV OKAY**



500 g

\$50.00

Strong fermenter for sulfur management and fruity esters Petit Sirah, Rosé, Syrah, Viognier

LALVIN ICV OKAY[™] is recommended for fresh and aromatic red, white or rosé wines with good fruit intensity.

Very short lag phase with steady fermentation kinetics and good fermentation security. Low foam production.

ICV OKAY has very good synergy with malolactic bacteria.

This S. cerevisiae hybrid was selected in collaboration with the INRA, SupAgro Montpellier, the ICV and Lallemand Oenology for very low to no SO₂, H₂S, and acetaldehyde production.

	Alcohol Tolerance: 16%	Nitrogen Needs: LOW	Temp. Range: 12–30°C		Sensory: ESTERS	
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Su	ICV OPALE 2.0	TALLEMAND YSEO  ment in aromatic wines	#	33-15114	500 g	\$51.40

Chardonnay, Sauvignon blanc, Rosé, Rhône Whites

LALVIN ICV OPALE 2.0[™] respects varietal characteristics while producing intense and complex fruit aromas in white and rosé wines.

Wines fermented with ICV OPALE 2.0 gives the initial impression of volume and softness, followed by a round intense mid-palate and balanced finish.

#33-15125

ICV OPALE 2.0 has excellent fermentation qualities with a short lag phase, even in high-maturity/high Brix grapes, with no to very low SO₂, H₂S and acetaldehyde production.

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Alcohol Tolerance: 14%	Nitrogen Needs: LOW	Temp. Range: 15-30°C	ENHANCED	Sensory: VARIETAL CHARACTERIS	TICS, MOUTHFEEL
NEW					
ICV SUNROSE (ALLEM	AND	±	±33-15140	500 g	\$67.00
Complex and elegant rosé wines			33 131 10	200 8	φον.σο

Rosés

LALVIN ICV SUNROSE™ is recommended for rosé wines that are red fruit and blackcurrant focused.

ICV SUNROSE produces elegant and complex wines with a balanced, round mouthfeel.

This strain has excellent implantation rates and low volatile acidity production even in high Brix grapes.

This strain from the Institut Coopératif du Vin (ICV) is especially suitable for rosé wines from warm climates.

	Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 14–20°C		Sensory: ESTERS, MOUTH	HFEEL
LOW U.S an	1501			~~~~~		~~~~~~
Sul	IOC BE FRUITS  fur management and fr	wity esters for whites and	rosés #	38-12542	500 g	\$49.00

Albariño, Rosé

IOC BE FRUITS[™] produces fruity esters (strawberry, pineapple, citrus notes) in white and rosé wines without masking varietal aromas. Fruit expression is emphasized due to the yeast's very low to no sulfite and acetaldehyde production.

Optimal conditions for fruity ester production are achieved

when must/juice is clarified (80 NTU  $\pm$  20) and fermentation temperatures are between 12-15°C(54-59°F).

BE FRUITS™ has a short lag phase and low volatile acidity production. This hybrid yeast strain was selected by INRA for very low to no SO₂ or H₂S production.

Alcohol Tolerance: 14%	Nitrogen Needs: LOW	Temp. Range: 12-23°C	Sensory: ESTERS
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Sulfur management and thiol revelation

Sauvignon blanc, Riesling, Gewürztraminer, Rosé

IOC BE THIOLS[™] reveals fruity thiols (citrus and exotic fruits) in white and rosé wines. It enhances 3MH potential (grapefruit, passion fruit) without excessive green flavors. The purity of the fruity expression is heightened by this strain's inability to produce negative sulfur compounds that can mask aromas.

Optimal conditions for expressing fruity thiols occur when

500 g \$49.00 #38-12545

must/juice is clarified (80 NTU ± 20), pH >3.2, and fermentation temperatures are between 15-20°C(59-68°F).

BE THIOLS is a fast fermenter with a short lag phase. This hybrid yeast strain was selected by INRA for very low to no SO, or H₂S production.

Alcohol Tolerance: 15% Nitrogen Needs: MEDIUM	Temp. Range: 15-25°C	EN	Sensory: HANCED VARIETAL CHARAC	CTERISTICS	
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K1 (V1116) CALLEMAND	#	#33-15059	500 g	\$30.40	
trong fermenter for ester production and challenging conditions		<i>‡</i> 33-15060	10 kg	\$359.00	

Fruity whites, Chenin blanc

LALVIN K1 (V1116)[™] is one of the highest ester producing strains in our portfolio. When fermented at low temperatures (16°C/61°F) with proper nutrition, it is a strong floral ester producer, especially in neutral or high-yielding varieties.

K1 (V1116) performs well in difficult conditions such as extreme temperatures, high alcohol (18% v/v) and low turbidity.

Alcohol Tolerance: 18%	Nitrogen Needs: LOW	Temp. Range: 10–35°C		Sensory: ESTERS	
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LALVIN C Softens high malic acid gra	ipes	#	±33-15119	500 g	\$50.00

Frontenac, La Crescent, Muscadine

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

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

Alcohol Tolerance: 17%	Nitrogen Needs: LOW	Temp. R	ange: 15-30°C
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M2 Distinctive citrus and blossom notes	#33-15109	500 g	\$61.20

Chardonnay, Sauvignon blanc, Cabernet Sauvignon, Syrah, Rosé, Albarino, Rhône Whites, Fruit Forward Reds, Aromatic Whites

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.

Alcohol Tolerance: 15%	Nitrogen Needs: HIGH	Temp. Rang	ge: 15-30°C
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M83 CALLEMAND Provence style rosés	#33-15121	500 g	\$60.50

Rosé

VITILEVURE M83™ produces round and balanced rosés with enhanced fresh fruit aromas.

Increases color stability as a result of its polysaccharide production. M83 is particularly well adapted for rosé winemaking in warmer regions. It has good implantation, strong fermentation kinetics, and low volatile acidity and SO, production.

This strain was selected by the Laboratoire Aubanelle in the Bandol appellation of Provence.

Alcohol Tolerance: 15% Nitrogen Needs:MED	JM Temp. Range: 17-27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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Enhances Sauvignon blanc varietal characters

Sauvignon blanc, Colombard

LALVIN MSB[™] enhances fruity, tropical and citrus notes while maintaining a balanced mouthfeel.

Sauvignon blanc and other aromatic white wines fermented using MSB maintain their freshness due to negligible malic acid uptake.

This *Saccharomyces cerevisiae bayanus* strain was isolated from the Marlborough Valley in New Zealand by the Lallemand Oenology R&D team.

To optimize thiol uptake and bioconversion MSB should be rehydrated with GO-FERM PROTECT EVOLUTIONTM and nourished with STIMULA SAUVIGNON BLANCTM (see pgs 52 and 54 for more information).

#### Effect of STIMULA SAUVIGNON BLANC™ on Thiol Production in a Wine Fermented with LALVIN MSB™

\$52.50

\$52.45

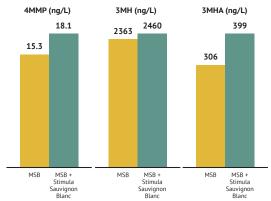
\$102.50

500 g

#33-15141

#33-15099

#33-16027



Alcohol Tolerance: 14.5%	Nitrogen Needs: MEDIUM	Temp. Range: 14-20°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL

#### High maturity, long-aging Bordeaux varieties

LALLEMAND YSEO

Merlot, Cabernet Sauvignon, Petit Verdot, Structured Reds

VITILEVURE  $MT^{\text{\tiny IM}}$  is known for producing wine aromas of strawberry and caramel, especially in Merlot and is recommended for grapes with high maturity and long aging potential.

Wines have good color intensity and tannin structure.

MT has steady fermentation kinetics and benefits from a balanced nutrient strategy. When good fermentation practices are followed, MT produces minimal volatile acidity and H₂S.

500 g

MT was selected in Saint-Émilion, France, by the IFV (formerly ITV) Bordeaux in collaboration with the INRA Montpellier.

Alcoho	l Tolerance: 15%	Nitrogen Needs: MEDIUM	Temp. Range: 15–32°C	ENHANCE	Sensory: D VARIETAL CHARACTERIST	rics, mouthfeel
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NT 50	Ø		,	122 1 (025		d102.50

Hybrid yeast for enhanced berry notes in red wines

Syrah, Pinot noir, Merlot, Cabernet Sauvignon, Cabernet franc, Grenache, Petite Sirah, Fruit Forward Reds

Product of the yeast hybridization program of Infruitec-Nietvoorbij, the Wine and Vine Institute of the Agricultural Research Council in Stellenbosch, South Africa.

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

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

1 kg

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

Alcohol Tolerance: 15.5%	Nitrogen Needs: MEDIUM	Temp. Range: 14-28°C

\$102.50

\$43.00

NT 116

All-purpose strain for New World style whites and reds

Syrah, Cabernet Sauvignon, Merlot, Petite Sirah,

Pinot gris, Aromatic Whites

NT 116 is equally suited for both white and red winemaking due to its release of varietal aromas, glycerol and mannoproteins giving aromatically complex, round wines.

Its ability to reveal volatile thiols and produce esters makes it suitable for aromatic white wine production. Wines are crisp and fresh with citrus and zesty aromas.

Also suitable for full-bodied, high maturity red wines destined

for oak aging.

#33-16026

Temperature control is advised when using this low foaming but vigorous strain.

1 kg

This hybrid strain of S. cerevisiae is a product of the yeast hybridization program of Infruitec-Nietvoorbij, the wine and vine institute of the Agricultural Research Council in Stellenbosch, South Africa.

Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 12-28°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, ESTERS, MOUTHFEEL		ESTERS, MOUTHFEEL
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NT 202	a.d.a	#	33-16032	1 kg	\$102.50

#### Structured and complex reds

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

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

This strain has good fructose utilization and encourages malolactic fermentation. Fermentation temperature should be monitored to control fermentation speed.

This low foaming, hybrid strain of S. cerevisiae is a product of the yeast hybridization program of Infruitec-Nietvoorbij, the wine and vine institute of the Agricultural Research Council in Stellenbosch, South Africa.

Alcohol Tolerance: 16%	Nitrogen Needs:MEDIUM	Temp. Range: 18-27°C	ENHANG	Sensory: CED VARIETAL CHARACTER	ISTICS, ESTERS
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OENOFERM BOUQUET	ERBSLÖH	4	21 15204	500 c	¢42.00

#31-15304

White wine yeast for developing lively and fresh fruit aromas

Riesling, Gewürztraminer, Muscat

Oenoferm® Bouquet is a high ester producer from Erbsloeh, propagated using their F3 process, to strengthen the yeast for the rigors of alcoholic fermentation.

Offers a controlled, slow ferment, with optimal fermentation

temperature range of between 16-20°C (61-68°F). Bouquet has high nitrogen demands, and can ferment up to 15% (v/v).

500 g

White wines fermented with Bouquet have been known to exhibit exotic fruit and sweet flower fragrances.

Alcohol Tolerance: 15%		Nitrogen Needs: HIGH	Temp. R	ange: 16-20°C
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OENOFERM FREDDO (ERBSLÖH		#31-15305	500 g	\$43.00

#### White wine yeast suitable for cold fermentations

Riesling, Sauvignon blanc, Chardonnay, Pinot gris, Rosé

Specifically selected strain for the inoculation of cold grapemust (even as low as 10°C/50°F) and for its aroma preserving capabilities.

Wines produced with Oenoferm® Freddo are known to promote the following aromatics: citrus, grapefruit, apple and peach.

A fast fermenter with low nitrogen requirements, the recommended temperature range is between 13-17°C (55-62°F). Freddo is tolerant up to 15% (v/v).

Freddo has be known to inhibit malolactic fermentation.

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 13-17°C
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#### **OENOFERM PINOTYPE**

#31-15309

500 g

\$43.00

\$52.00

Elegant, spicy and fruity wines from the Pinot family Chardonnay, Pinot noir, Pinot gris, Pinot blanc

Suitable for all Pinot vine varieties, Oenoferm® PinoType is a moder-

ate fermenter that settles quickly after fermentation, and is suitable for early bottling.

PinoType ferments up to 15% (v/v) and is conducive to ma-

lolactic fermentation. An ester promoter, this strain also produces higher levels of glycerol.

PinoType is very suitable for sur lies aging.

Alcohol Tolerance: 15%		Nitrogen Needs: HIGH	Temp. Range: 18-28°C	
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OENOFERM RIESLING	ERBSLÖH	#31-15310	500 g	\$43.00

OFNOTEKIN KIEZLING

For typical fruity Riesling wines

Riesling Oenoferm® Riesling was specially selected for the fermenta-

tion of Riesling musts.

A cool fermentation at temperatures between 17–19°C (62–65°F) promotes the development of fruity, white fleshed peach aromas. In the fermentation range between 19-22°C (65-72°F), exotic aromas develop.

#31-15316

Ideal for fruity-light Riesling wines with typical varietal profile, the strain is alcohol tolerant up to 13% (v/v).

Oenoferm Riesling exhibits moderate fermentation speed.

Alcohol Tolerance: 13%	Nitrogen Needs: HIGH	Temp. Range: 17-22°C
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#### OENOFERM X-THIOL

Hybrid yeast for enhanced exotic aromas

Riesling, Sauvignon blanc, Rosé

As a fast fermenting hybrid strain, marrying a strong bayanus strain to an aromatic, thiol producing cerevisiae, Oenoferm® X-Thiol can deliver exotic aromatics.

Managing fermentation temperature will alter style, with <15°C (59°F) delivering a traditional cool climate style, while

between 18-22°C (64-72°F) the wine is likely to exhibit more fruity, thiol aromatics.

500 g

X-Thiol has alcohol tolerance to 15% (v/v), has low nitrogen demand, and produces low SO₂. Wines made with X-thiol have been noted to display notes of passion fruit and black currant.

Alcohol Tolerance: 15 %	Nitrogen Needs: LOW	Temp. Range: 13-22°C	
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OENOFERM X-TREME

White wines with enhanced spiciness and fruitiness

Riesling, Sauvignon blanc, Chardonnay, Pinot gris, Pinot blanc

A hybrid of two different *saccharomyces cerevisiae* yeast — this strain has been known to promote notes of minerality, along with fruity, floral and spicy components. Aromatics have shown to be long lasting, both on the nose, and the palate.

#31-15317	500 g	\$50.75
#31-15317B	10 kg	\$722.00

Oenoferm® X-Treme has a very high fermentation capacity (17% v/v) and performs very well in cool temperatures $(10-17^{\circ}\text{C/}50-62^{\circ}\text{F}).$

A fast fermenter with low nitrogen demand and produces low SO₂. X-Treme does not promote malolactic fermentation.

Alcohol Tolerance: 17% Nitrogen Needs: LOW Temp. Range: 10-17°C

\$55.00

Low
H₂S and SO₂
producer

PERSY

LALLEMAND YSEO

Sulfur management, fruity aromas and mouthfeel in red wines

Rhône reds, Pinot noir, Tempranillo or other varietals susceptible to hydrogen sulfide production

Red wines fermented with LALVIN PERSY™ have persistent fruit forward aromas and flavors optimizing varietal expression.

Wines have a balanced mouthfeel with good entry and mid-palate and integrated tannins.

Using good fermentation practices, PERSY produces very low

to no $\rm H_2S$, $\rm SO_2$, or volatile acidity and is compatible with malolactic bacteria.

500 g

This hybrid yeast strain was developed for use in red wines produced from varietals naturally susceptible to H₂S. It was developed in collaboration with INRA, SupAgro Montpellier and Lallemand Oenology.

Alcohol Tolerance: 17%	Nitrogen Needs: LOW	Temp. Range: 15-27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL

#33-15137

QA23



Strong fermenter for varietal expression in highly clarified musts

Chardonnay, Sauvignon blanc, Gewürztraminer, Pinot blanc, Albariño, Muscat, Aromatic Whites

LALVIN QA23 $^{\text{\tiny TM}}$ is an excellent thiol converter making it a complementary yeast for developing varietal Sauvignon blanc passion fruit character.

Large amounts of the enzyme beta-glucosidase are produced during growth which allows for the release of bound terpenes responsible for floral and spicy notes in aromatic varieties.

#33-15040	500 g	\$67.00
#33-14040B	10 kg	\$845.00

QA23 has low nutrient and oxygen requirements and can ferment juice with low turbidity at low temperatures to dryness. This strain was 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.

А	Icohol Tolerance: 16%	Nitrogen Needs: LOW	Temp. Range: 15–32°C		ENHANCED	Sensory: VARIETAL CHAF	RACTERISTICS
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R2	LALIEMAND		#	÷33-15055		500 g	\$50.20

Expression of varietal aromas at cold temperatures

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

LALVIN $R2^{TM}$ can enhance varietal characters due to the enzymatic release of aroma precursors producing intensely aromatic white wines with heightened fruity and floral aromas.

Has excellent cold temperature properties and has been known to ferment in conditions as low as $5^{\circ}C(41^{\circ}F)$. Tends to

produce VA without proper nutrition, or when stressed.

This *Saccharomyces cerevisiae bayanus* strain was isolated in the Sauternes region of Bordeaux, France, by Brian Croser of South Australia.

Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 10-30°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS
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#33-15034

RA17



#### Red wines with enhanced varietal character

Pinot noir, Grenache, Fruit-Forward Reds

LALVIN RA17® was selected in Burgundy for its ability to enhance varietal character and to offer fresh, aromatic and supple red wines.

Proper nutrition is recommended to avoid the formation of

H₂S, especially in low nutrient musts.

Enhances cherry and fruit aromas. Wines made with RA17 may be blended with wines fermented with RC 212, W15 or BRL97 to give more complexity and fuller structure.

500 g

Alcohol Tolerance: 15% Nitrogen Needs: HIGH Temp. Range: 16-29°C	
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\$49.80



Yeast Nutrients

Fermentation













#### RC212 (BOURGOROUGE)



Enhanced structure and color in Pinot noir

Pinot noir, Grenache, Rosé

LALVIN RC212 (Bourgorouge)™ is known for its ability to generate ripe berry, bright fruit and spicy characteristics and to consistently produce Pinot noir with good tannin structure.

RC212 requires thoughtful nutrient additions to avoid potential hydrogen sulfide production.

#33-15039	500 g	\$49.80
#33-15039B	10 kg	\$748.00

Wines fermented with RC212 can be blended with wines fermented with ENOFERM AMH™, LALVIN W15™ or LALVIN BRL97[™] to achieve more complexity.

This S. cerevisiae cerevisiae strain was selected from fermentations in Burgundy, France, by the BIVB.

Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 16-30°C		Sensory: ENHANCED VARIETAL CHARACTE	RISTICS
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RHONE 2056	ND	#33-1	15064	500 g	\$49.80

Red wines with enhanced varietal fruit aromas

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

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

Low producer of 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.

Alcohol Tolerance: 16%	Nitrogen Needs: HIGH	Temp. Range: 15-28°C	
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RHÔNE 2226 (formerly L2226)	#33-15058	500 g	\$51.00

Complexity and balance in high alcohol reds

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

Wines made using LALVIN RHÔNE 2226™ have intense color and aromas of black cherry, berries and cherry cola.

This yeast contributes to wine quality by enhancing varietal characters and tannin structure in red wines from warm and hot climate fruit.

RHÔNE 2226™, in addition to its high alcohol tolerance, has a short lag phase and high fermentation vigor. When used in high maturity fruit ensure nutrition is adequate.

This strain was isolated from a vineyard in the Côtes du Rhône region of France.

Alcohol Tolerance: 18%	Nitrogen Needs: HIGH	Temp. Range: 15-27°C	ENHANCEI	Sensory: D VARIETAL CHARACTERIST	TICS, MOUTHFEEL
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RHÔNE 4600	YSEO	#	33-15102	500 g	\$50.10

#### Aromatic and elegant whites and rosés

Rosé, Viognier, Chardonnay, Rhône Whites

LALVIN RHÔNE 4600™ produces wines with complex aromatic notes. Noted for elevating fresh fruit aromas (apple, pear, strawberry) this strain is ideal for rosé and Rhône-style whites. Can produce fatty-acid ethyl esters (apricot and tropical fruit flavors) when fermented in high-sugar, low nutrient musts at cool temperatures 13.5°C(56°F).

Higher roundness with diminished bitterness makes this strain a good choice for Chardonnay.

RHÔNE 4600 has a short lag phase. May produce low levels of SO, and H,S under conditions of stress. Very malolactic friendly. Isolated from a Viognier fermentation in the Côtes du Rhône region of France in collaboration with Inter-Rhône technical department.

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 13-22°C	Sensory: ESTERS
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\$49.80

R-HST
Strong fermenter for Riesling and other aromatic whites

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

LALVIN R-HST $^{\text{m}}$  retains fresh varietal character while contributing structure and mouthfeel. It can produce crisp, premium white wines with citrus and floral notes.

Tolerates fermentation temperatures as low as 10°C(50°F), however, allow the temperature to increase toward the end for a clean finish.

Short lag phase and generation time, even at cold temperatures. R-HST dominates and persist over spoilage yeast such as *Kloeckera apiculata*.

500 g

This strain was selected from Riesling trials conducted in the Heiligenstein region of Austria.

Alcoho	ol Tolerance: 15%	Nitrogen Needs: MEDIUM	Temp. Range: 10-30°C	ENHANCE	Sensory: D VARIETAL CHARACTERIS	TICS, MOUTHFEEL
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RP15	LALLEMAND YSEO		#	±33-15117	500 g	\$59.50

#33-15084

Complex, balanced and concentrated reds

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

ENOFERM RP15™ is recommended for medium to full-bodied red wines to produce a rich, lush, balanced mouthfeel. Wines are characterized by red fruit and mineral notes.

Contributes a rich mid-palate structure and enhances varietal fruit characters. Helps to stabilize color.

Rehydrating the yeast in GO-FERM PROTECT EVOLUTION™ (see pg 52) tends to improve the aromatic profile of this yeast. This strain was isolated from spontaneous Rockpile Syrah fermentations in California.

Impact of SAUVY™ on Volatile Thiols in 2019 Napa Valley Sauvignon blanc

3MHA (ng/L)

4MMP (ng/L)

6.3

97

Alcoho	ol Tolerance: 17%	Nitrogen Needs: MEDIUM	Temp. Range: 20-30°C	ENI	Sensory: HANCED VARIETAL CHARAC	CTERISTICS
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SAUVY	TALLEMAND YSEO		#	±33-15139	500 g	\$59.00

3MH (ng/L)

ıg/L

79

249

#### For mega expression of grassy thiols

Sauvignon blanc, Chenin blanc

 $SAUVY^{\mbox{\tiny TM}}$  was selected to help winemakers make an intensely aromatic and fresh white wine.

SAUVY has a remarkable ability to uptake and reveal volatile thiols, especially 4MMP (passion fruit/box wood/gooseberry). The resulting wines are exceptionally aromatic and can be over-the-top, making SAUVY an excellent blending component especially in grapes from cooler regions.

In warmer regions, or in grapes where there are low levels of 4MMP, the resulting wine still express the green thiol (box wood/gooseberry) character but have a more balanced aromatic profile, especially when used in conjunction with the yeast nutrient STIMULA SAUVIGNON BLANC $^{\text{\tiny ML}}$ . In this scenario wines made using SAUVY are fruity, crisp and refreshing.

SAUVY produces very low to no H₂S, SO₂ and volatile acidity.

SAU-Y are



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#### SENSY (ALLEMAND YSEC

#33-15130 500 g \$52.00

#### Sulfur management and aromatic finesse for whites and rosés

Rosé, Chardonnay, Sauvignon blanc, Pinot blanc

LALVIN SENSY[™] respects varietal aromas and promotes aromatic esters while balancing mouthfeel and freshness in aromatic white wines.

SENSY has a short lag phase, is malolactic bacteria friendly and produces very low to no SO₂ or H₂S even under low tem-

perature and NTU white winemaking conditions. Avoid adding >50 ppm SO, at the crusher.

This hybrid strain of *S. cerevisiae* was selected in collaboration with the INRA, SupAgro Montpellier, ICV and Lallemand Oenology as part of an innovative portfolio of yeast to control the production of negative sulfur compounds.

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 12-17°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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STEINBERGER (DGI 228)

LALLEMAND

High aromatic whites

Riesling, Pinot gris, Gewürtraminer

Slow, cool fermenter with low foam production.

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

#33-15082	500 g	\$50.00
#33-15082B	10 kg	\$745.00

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

	Alcohol Tolerance: 13%	Nitrogen Needs: MEDIUM	Temp. Range: 15-25°C	
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SVG	LALLEMAND	#33-15094	500 g	\$49.80

#### Expression of Sauvignon blanc aromas

Sauvignon blanc, Pinot gris, Riesling, Rhône Whites

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

Notable for its ability to enhance typical Sauvignon Blanc vari-

etal 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.

Alcohol Tolerance: 15%	Nitrogen Need	s: MEDIUM	Temp. Range: 16-28°C			
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SYRAH (ALLEMAND YSEO)		#33-15095	500 g	\$49.80		
Spicy, fruity and floral reds Syrah Merlot Mourvedre Petite Sirah Petit Ver	dot Structured Reds	#33-15035B	10 kg	#744.00		

Syrah, Merlot, Mourvedre, Petite Sirah, Petit Verdot, St

ENOFERM SYRAHTM offers good mouthfeel and stable color extraction. Tends to produce high levels of β -damascenone, which promotes violet and red fruit aromas.

Typical aromas include violets, raspberries, strawberries and black pepper which enhance and respect the varietal character.

This strain has a tendency to produce H_2S under low YAN conditions hence rehydration with GO-FERM PROTECT EVOLUTION and thoughtful nutrition management is essential.

This strain that was isolated from the Côtes du Rhône region of France.

500 g

\$55.50

Alcohol Tolerance: 16%	Nitrogen Needs: MEDIUM	Temp. Range: 15–32°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS

#33-15136

TANGO MALBEC

LALLEMAND YSEO

Balanced reds with perception of sweetness

Malbec, Syrah, Tempranillo, Merlot, Petite Sirah

LALVIN TANGO MALBEC™ respects varietal characteristics producing full-bodied red wines with aromatic complexity including flavors of violet, black cherry, blackberry, raspberry, dark plum and anise.

TANGO MALBEC's interactions with polyphenolic compounds creates wines with intense color, good structure, bal-

ance and the natural sweetness associated with Malbec.

It is a low H₂S and SO₂ producer and malolactic friendly.

TANGO MALBEC was isolated by the National Institute of Agricultural Technology in La Consulta, Uco Valley, Mendoza, Argentina.

Alcohol Tolerance: 15.5% Nitrogen Needs: MEDIUM Te	emp. Range: 15–27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS
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\$49.80

VIN 13

Strong fermenter for thiol expression

Sauvignon blanc, Chenin blanc, Chardonnay, Rosé, Gewürztraminer, Muscat, Albariño, Aromatic Whites

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

Aromatic as well as cold tolerant it is favored for its ease of

\$106.00 #33-16013 1 kg #33-16013B 10 kg \$950.00

use and robustness, making this strain suitable for challenging winemaking conditions.

Temperature control is advised. Do not over inoculate.

This hybrid yeast strain is a product of the yeast hybridization program at the Institute for Wine Biotechnology, University of Stellenbosch in South Africa.

Alcohol Tolerance: 1/% Nitroden Needs: 1 ()W Temp Range: 12-16°(Sensory: CED VARIETAL CHARACTER	ISTICS, ESTERS
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VIN 2000 ©	25	#	33-16015	1 kg	\$106.00

#### Full-bodied aromatic whites

Chenin blanc, Chardonnay, Viognier, Albariño

VIN 2000 is 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).

Moderate speed fermenter with very low SO, production and

low foaming making VIN 2000 suitable for barrel fermentation. This hybrid yeast strain is a product of the yeast hybridization program at the Institute for Wine Biotechnology, University of Stellenbosch in South Africa.

Alcohol Tolerance: 15.5%  Nitrogen Needs: LOW  Temp. Range: 13-16°C  Sensory: ENHANCED VARIETAL CHARACTERISTICS, ESTERS					RISTICS, ESTERS	
~						
VR Bala	B LALLEMAND YSEO	hiah alcohol reds	#	<i>‡</i> 33-15101	500 g	\$53.00

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

UVAFERM VRB™ helps express varietal characteristics and ester production in wines such as Tempranillo, Barbera, and Sangiovese. These wines are described as having flavors of ripe fruit, jam, hazelnut and dried plums.

VRB can soften tannins and add flavor complexity with good

mid-palate volume. Wines tend to have good color intensity and stability with good polyphenolic structure.

VRB softens high acid musts by partially metabolizing malic acid. VRB was selected by Centro de Investigaciones Agrarias (CIDA) in Logroño, Spain.

	Alcohol Tolerance: 17%	Nitrogen Needs: MEDIUM	Temp. Range: 15–27°C	Sensory: ENHANCED VARIETAL CHARACTERISTICS, MOUTHFEEL
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#### Ferments cleanly at low temperatures

Gewürztraminer, Riesling, Pinot gris, Pinot noir, Syrah, Rosé, Aromatic Whites

In white wines, LALVIN W15[™] helps retain bright fruit characters while optimizing mouthfeel and balance. Performs well in Pinot noir and cooler climate Syrah.

Produces glycerol and succinic acid, especially when fermented between 15–20°C(59–68°F), adding complexity to the mid-palate.

500 g #33-15091 #33-15091B 10 kg \$748.00

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

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

Alcohol Tolerance: 16%  Nitrogen Needs: HIGH  Temp. Range: 10-27°C  ENHANCED VARIETAL CHARACTERISTICS, MO	UTHFEEL
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Yeast Nutrients

Malolactic Fermentation

## ORGANIC YEAST STRAINS

#### EC1118 (PRISE DE MOUSSE) ORGANIC



#33-150620O

500 g

\$69.00

The organic version of the original sparkling wine strain Sparkling Base Wines

LALVIN EC1118[™] Organic is the original, steady, low-foamer yeast strain.

This Saccharomyces cerevisiae bayanus strain was selected by the IOC in Epernay, France and is the reference strain for sparkling base wine. 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 EC1118 can producehigh amounts of SO₂ (up to 50 ppm) and, as a result, may inhibit malolactic fermentation.

Alcohol Tolerance: 18 %	Nitrogen Needs: LOW	Temp. Range: 10-32°C	
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VITIFERM ALBA FRIA Elegant and fruity whites and rosés	#37-13425	500 g	\$55.50

Sauvignon blanc, Sémillon, Viognier

VITIFERM™ ALBA FRIA has been carefully selected from a complete organic habitat. ALBA FRIA is 100% organic from the selection to production.

Notable for its steady fermentation, it is a strain with low nutri-

ent demand that is tolerant up to 15% (v/v). With low SO₂ production, this strains performs best between 16-18°C (61-64°F).

ALBA FRIA wines are known for promoting varietal and terroir characteristics.

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 16-18°C	
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VITIFERM ESPRIT For sparkling wines & crisp summer wines	#37-13473	500 g	\$58.00

Chenin blanc, Riesling, Gewurztraminer, Muscat, Sparkling

VITIFERM™ ESPRIT was carefully selected for the secondary fermentation of sparkling wine production.

Its sensorial properties are also ideal for the crafting of crispy and juicy summer wines. ESPRIT is 100% organic from its selection to its production.

Wines made with ESPRIT have been known to produce fresh citrus and lime characteristics.

With low nutrient demand, ESPRIT exhibits excellent riddling properties and is known as a fast flocculating strain.

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Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 16-18°C	
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VITIFERM PINOT ALBA For creamy white wines that undergo bâtonnage	#37-13480	500 g	\$55.50

Chardonnay, Pinot blanc, Pinot gris

Selected from a complete organic habitat, VITIFERM™ PINOT ALBA is 100% organic from the selection to production.

It is a moderate fermenter that has low nitrogen demands and that is tolerant up to 15% (v/v). PINOT ALBA will promote an environment conducive to malolactic fermentation.

Wines display a bâtonnage characteristic due to the quick release of polysaccharides. Notes of yellow fruit and increased creaminess are common with PINOT ALBA as well.

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 18-20°C
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#### VITIFERM RUBINO EXTRA



500 g

\$55.50

#### For red wines full of character

Pinot noir, Malbec, Tempranillo, Young Reds

VITIFERM™ RUBINO EXTRA is the first yeast strain in the world (Species *Saccharomyces cerevisiae*, DSMZ 27009) which has been carefully selected from a complete organic habitat.

VITIFERM™ RUBINO EXTRA is 100% organic from the selection to production.

A low  $SO_2$  producer, this strain has a high alcohol tolerance (up to 17% (v/v)), and is a very fast fermenting strain with low nitrogen demands.

RUBINO EXTRA is a useful strain for restarting stuck fermentations, and will produce wines that promote varietal and terroir characteristics.

Alcohol Tolerance: 17%	Nitrogen Needs: LOW	Temp. Range: 16-32°C
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VITIFERM SAUVAGE



#37-13477

500 g

\$58.00

Emphasizes terroir character in reds and whites

Chardonnay, Pinot blanc, Viognier, Young and Aged Reds

VITIFERM $^{\text{m}}$ SAUVAGE is a wild pure fermentation yeast ($Saccharomyces\ candida$) that has been carefully selected from a complete organic habitat in Hermanus, South Africa.

Known to produce wines that emphasize their local terroir,

SAUVAGE has low nitrogen needs, high alcohol tolerance $(15\% \, \text{v/v})$ and low SO, production.

Very MLF friendly.

#37-13482

#37-13435

Alcohol Tolerance: 15%	Nitrogen Needs: LOW	Temp. Range: 16-32°C

VITIFERM VULCANO



500 g

\$86.00

Blend of wild yeast for higher flavour diversity in all wines

VITIFERM[™] BIO VULCANO has been isolated from an organic habitat of the volcanic German-French border region "Kaiserstuhl". It is a blend of two wild yeast strains of the species *Saccharomyces cerevisiae* and *Pichia kluyveri*.

Due to their proven natural physiological properties, these strains were selected to produce wines with broader flavour diversity. *Pichia kluyveri* is characterized by a wide spectrum of exotic fruit flavours and long-lasting sweet characters on the palate.

VITIFERMTM BIO VULCANO shows no reductive character, and due to the native pectinase activity of the *Saccharomyces cerevisiae* strain, young wines clarify rapidly.

Alcohol Tolerance: 16% Nitrogen Needs: LOW Temp. Range: 16-32°C

INSTRUCTIONS FOR VITIFERM YEAST

Usage: Due to the organic production process, the rehydration process of organic yeast is fundamentally different than other oenological yeasts.

A 50/50 blend of juice and water is required for rehydration. Stir well during addition, with solution temperature between 30-32°C (86-89°F).

Storage: Store in a cool, dry place (max 20°C/68°F). Use immediately once opened.

NON-SACCHAROMYCES YEAST

"Non-Saccharomyces" is the colloquial term for yeast strains associated with vineyards or wineries that are not from the Saccharomyces genus. Due to their unpredictable nature and their ability to produce ethyl acetate and other undesirable characters, non-Saccharomyces have a bad reputation. However, specific organisms within this group have been shown to contribute positively during the pre-fermentative and early fermentation stages. We have gained a better appreciation for these yeasts and use them as bioprotectants, to preserve and enhance the aromatic potential of grapes, and to naturally increase wine acidity.

Non-Saccharomyces are not strong fermenters and they **require different handling** than regular wine yeast. It is important to follow the specific handling recommendations and inoculate with a Saccharomyces yeast to complete the alcoholic fermentation.

SELECTING NON-SACCHAROMYCES YEAST FOR SUCCESS

Non-Saccharomyces	BIODIVA™	FLAVIA™	GAIA™	INITIA™	LAKTIA™
Organism	Torulaspora delbrueckii	Metschnikowia pulcherrima	Metschnikowia fructicola	Metschnikowia pulcherrima	Lachancea thermotolerans
Main activity	Produces polysaccharides and aroma compounds (esters). Consumes some sugar to alleviate osmotic (high sugar) stress on Saccharomyces	Enzyme production to cleave aroma precursors to reveals terpenes and thiols	Bioprotectant against VA producing native microflora	Utilizes oxygen as a growth factor, acts as a bioprotectant inhibiting VA producing native microflora	Converts glucose to lactic acid
Winemaking application	To enhance the mouthfeel, fruit esters and complexity of white, rosé and red wines. Suitable for late harvest, ice- wine and high sugar where VA can be a challenge	Optimize the tropical, citrus and floral notes of certain white and rosé wines	Can be added to white or rosé juices for protection during transportation. Can be added to red grapes to protect during transportation or cold soak	Scavenges oxygen thereby protecting white and rosé juice from oxidative damage and microbial spoliage	Acidification of low acid musts adding freshness and complexity
When to add Non-Saccharomyces	Directly to the fermentation vessel	Directly to the fermentation vessel	Directly to grapes (to protect during transport or cold soak) or juice (protect during juice transport)	To freshly pressed juice to protect during cold settling	Directly to the fermentation vessel
When to add Saccharomyces	After 1.5–3°Brix drop	24 hours after Flavia	Upon juice receipt, or end of cold soak	Once juice racked to fermentation vessel	24–72 hours after Laktia
Suggested compatible Saccharomyces strains	Any strain that meets your winemaking goal	Strains with ß-glycosidase activity (Denoted as strains that enhance varietal characters)	Any strain that meets your winemaking goal. 3001 is specifically recommended for use in Pinot noir musts that have undergone cold soak	Any strain that meets your winemaking goal	Any strain that meets your winemaking goal

BIODIVA



Torulaspora delbrueckii

For enhancing complexity and fruit in whites, reds, late harvest, icewine

LEVEL² BIODIVA™ is a pure culture of *Torulaspora delbrueckii* that can enhance the aroma profile and complexity of wines (see Figure). This non-*Saccharomyces* yeast is an ester producer and can also produce components that lead to a fuller mouthfeel. BIODIVA is osmotolerant making it a good choice for high sugar fermentations, late harvest and icewine production as it will consume some sugar alleviating some of the stress on *Saccharomyces*. This can result in lower final volatile acidity levels.

Usage: Prior to inoculation ensure the free SO_2 <15ppm, turbidity >80 NTU, YAN >150ppm and inoculation temperature >16°C(61°F)*. Rehydrate BIODIVA in ten times its weight of chlorine free, 30°C(86°F) water and stir gently. After 15 minutes stir gently again. Slowly combine some of the must with the rehydrated yeast to drop the temperature 10°C(18°F) and hold for 15 minutes. This step may need repeating until you are within 10°C(18°F) of the must temperature, however the process should not exceed 45 minutes.

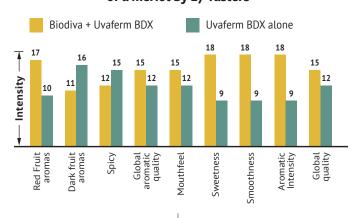
After 1.5-3°Brix drop a compatible *S. cerevisiae* strain should be inoculated following the recommended *Saccharomyces* rehydration protocol (see pg 47).

*If the must is <16°C(61°F) you may observe a long lag phase. **Storage**: Store at 20°C(68°F). Once opened use immediately.

33-15220A 500g \$103.50

Recommended 250ppm 25g/hL 2 lb/1000 gal

Impact of BIODIVA on Sensory Perception of a Merlot by 27 Tasters



Impact: Rounder, fruitier, more complex wines due to over-production of polyols and esters

Add Saccharomyces: After 2-3°Brix drop

Oak & Tannins

Closures

FLAVIA (ALLEMAND

Metschnikowia pulcherrima

For revelation of terpenes and thiols in aromatic whites and rosés

LEVEL2 FLAVIA $^{\text{\tiny TM}}$ is a pure culture of *Metschnikowia pulcherrima* used for its ability to liberate bound terpenes and thiols.

Bound terpenes and thiols are odorless and flavorless but become odor-active once enzymatically released.

FLAVIA, along with a compatible strain of *S. cerevisiae*, has the enzymatic ability to release terpenes and thiols in the juice, thereby elevating the varietal characteristics of the wine.

Wines made using FLAVIA have increase floral (see Figure), tropical and citrus aromas.

An additional benefit of FLAVIA is its ability to suppress the growth of indigenous yeast and bacteria. This bioprotective effect means that FLAVIA can help to minimize microbial spoilage of aromatic white and rosé juice.

This strain was selected in conjunction with the Universitad de Santiago de Chili (USACH).

Usage Prior to inoculation ensure the free SO₂ <10ppm and YAN >150ppm. Rehydrate FLAVIA in ten times its weight of chlorine free, 30°C (86°F) water and stir gently. After 15 minutes stir gently again. Slowly combine some of the must with the rehydrated yeast to drop the temperature 10°C(18°F) and hold for 15 minutes. This step may need repeating until you are within 10°C(18°F) of the juice temperature, however, the process should not exceed 45 minutes. If the initial YAN is

33-15105D 500g \$125.00

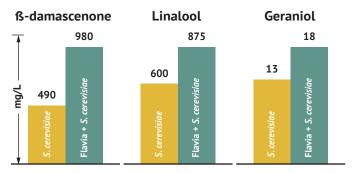
<150ppm we recommend using GO-FERM PROTECT EVO-LUTION™ (see pg 47) during the FLAVIA rehydration.

After 24 hours a compatible *S. cerevisiae* strain should be inoculated, even if there has been no change in °Brix.

Storage: Store for 24 months at 4-11°C(39-52°F). Once opened use immediately.

Recommended	250ppm	25g/hL	2 lb/1000 gal
Dosage		_	

Impact of FLAVIA on Floral Aromatics



Impact: Heightened tropical, citrus and floral aromas due to releases of terpenes and thiols

33-15127A

Add Saccharomyces: After 24 hours

\$127.50

GAIA BIOC

Metschnikowia fructicola

For managing spoilage risks when transporting grapes or juice, or cold soaking reds

GAIA[™] is a non-fermentative yeast that implants and multiplies quickly, controlling the production of ethyl acetate and acetic acid from *Kloeckera apiculata* (see Figure), acetic acid bacteria, and other native microflora during the pre-fermentative stage. GAIA can protect grapes and juice during transport or during pre-fermentation cold soak. This bioprotective effect can last up to five days if the temperature is $<10^{\circ}$ C(50° F). Although GAIA was selected for its use as a bioprotectant, it can also help to preserve fruit characteristics and aroma.

Usage: Prior to inoculation ensure the total SO $_2$ is <50ppm. Rehydrate GAIA in ten times its weight of chlorine free, 30°C(86°F) water and stir gently. After 15 minutes stir gently again. Slowly combine some of the must with the rehydrated yeast to drop the temperature 10°C (18°F) and hold for 15 minutes. This step may need repeating until you are within 10°C(18°F) of the must temperature, however, the process should not exceed 45 minutes.

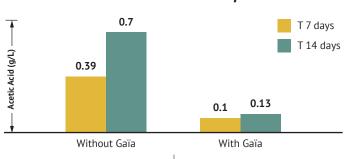
Upon juice receipt or once cold soak has been completed, a compatible *S. cerevisiae* strain should be added following the recommended *Saccharomyces* rehydration protocol (see pg 47).

Storage: Store for 24 months at 4-11°C(39-52°F). Once opened use immediately.



500g

Effect of GAÏA™ on Acetic Acid Production in Must Inoculated with *Kloeckera apiculata*



Impact: Controls the growth of volatile acid-producing native microflora

Add Saccharomyces: When desired (after juice settling, end of cold soak)

NEW

INITIA (ALLEMAN) Metschnikowia pulcherrima

Protects aromas and color from oxidative damage in aromatic whites and rosés

LEVEL² INITIA™ is added into the press or to freshly pressed white or rosé juice where it quickly consumes oxygen thereby protecting the juice from oxidative browning. Using INITIA during pre-fermentation results in enhanced wine quality with fresher aromatics (see Figure) and brighter colors. INITIA's fast oxygen consumption also protects juice from oxidative yeast and acetic acid bacteria. This secondary bioprotective effect means that juice quality is preserved.

INITIA is a pure culture of *Metschnikowia pulcherrima* that was selected by Vincent Gerbaux at the Institut Français de la Vigne (IFV) in Beaune, France. This non-*Saccharomyces* yeast has very low fermentative abilities therefore inoculation with a selected *Saccharomyces* strain and a balanced fermentation nutrition strategy is necessary to complete alcoholic fermentation.

Usage: Prior to inoculation ensure that free SO_2 is < 15ppm, temperature 4-20 °C(39-68°F) and YAN >150ppm. Rehydrate INITIA in ten times it weight of chlorine free, 20-30°C(68-86°F) water and stir gently. After 15 minutes stir gently again. Slowly combine some of the juice with the rehydrated yeast to drop the temperature $10^{\circ}\mathrm{C}(18^{\circ}\mathrm{F})$ and hold for 15 minutes. This step may be repeated until you are within $10^{\circ}\mathrm{C}(18^{\circ}\mathrm{F})$ of the juice temperature, however the process should not take more than 45 minutes. Add rehydrated INITIA to the press pan as the juice is on route to the settling tank.

Once the juice has been racked to the fermentation vessel, a *Sac-charomyces* strain should be added following the recommended *Saccharomyces* rehydration protocol (see pg 47) and using

GO-FERM PROTECT EVOLUTION[™]. Due to the possible consumption of nutrients by INITIA, YAN should be measured and supplemented as necessary when *Saccharomyces* is inoculated.

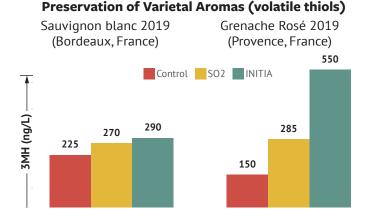
500g

\$103.00

#33-15143

Storage: Dated expiration. Store in a dry environment at 4°C (39°F). Once opened, use immediately.

Recommended	250ppm	25g/hL	2 lb/1000 gal
Dosage			



Impact: Depletes oxygen from juice resulting in improved wine quality with better aromas and brighter colors

33-15225

Add Saccharomyces: Once racked to fermentation tank

\$103.00

LAKTIA (ALLEMAND

Lachancea thermotolerans

Naturally acidifies grapes lacking acidity

LEVEL² LAKTIA™ is a pure culture of *Lachancea thermotolerans* isolated from the Rioja region of Spain. It is added at the beginning of fermentation where it produces lactic acid from sugar, bringing a freshness and aromatic complexity to wines. LAKTIA gives winemakers an interesting blending opportunity for wines lacking in acidity (see Figure). LAKTIA is recommended for red musts but has also been used successfully in whites and rosés.

Although LAKTIA produces some alcohol, it does not have the ability to complete the alcoholic fermentation. It must be followed up after 24-72 hours with *S. cerevisiae*.

It is important to note that lactic acid >3g/L can inhibit malolactic bacteria.

Usage: Prior to inoculation ensure the free SO $_2$ is <15ppm, temperature >17°C(63°F) and YAN >150ppm. Rehydrate LAKTIA in ten times its weight of chlorine free, 30°C(86°F) water and stir gently. After 15 minutes stir gently again. Slowly combine some of the must with the rehydrated yeast to drop the temperature 10°C(18°F) and hold for 15 minutes. This step may need repeating until you are within 10°C(18°F) of the must temperature, however the process should not exceed 45 minutes.

After 24-72 hours a compatible *S. cerevisiae* strain should be inoculated following the recommended *Saccharomyces* rehydration protocol (see pg 47) and using GO-FERM PROTECT EVOLUTION $^{\text{TM}}$. Due to consumption of nitrogen by LAKTIA,

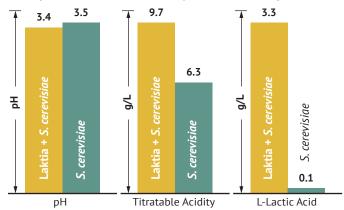
YAN should be measured and supplemented as necessary when *Saccharomyces* is inoculated.

500g

Storage: Store at 20°C(68°F). Once opened use immediately.

Recommended	250ppm	25g/hL	2 lb/1000 gal
Dosage			

Impact of LAKTIA on Acidity in a 2017 Tempranillo



Impact: Adds freshness due to lactic acid production

Add Saccharomyces: After 24-72 hours

HOW TO

SACCHAROMYCES YEAST REHYDRATION

Proper yeast rehydration is one of the most important steps to ensure a strong and healthy fermentation. The normal inoculation rate for wine active dried yeast is 2 lb/1000 gal (25 g/hL). When added properly, this inoculation rate results in an initial yeast cell concentration of 3–4 million viable cells per mL of must/juice. Under favorable conditions, the initial yeast cell population will increase up to 100-150 million viable cells per mL of must/juice before growth stops and alcoholic fermentation begins. This biomass increase is critical for healthy fermentations. Higher inoculation rates are recommended on grapes that are higher maturity (higher sugar). When using a yeast rehydration nutrient such as GO-FERM PROTECT EVOLUTION maintain a ratio of 1 part yeast to 1.25 parts rehydration nutrient. Careful rehydration, attemperation, inoculation and homogenization are all important to help prevent sluggish or stuck fermentations.

Note: This protocol is not appropriate for non-*Saccharomyces* yeast. Please see individual product descriptions for rehydration guidelines (pgs 40-42).

- 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 GO-FERM and GO-FERM PROTECT EVOLUTION, they will not go into solution completely. This is due to the fatty acid and sterol content. Please see pgs 52-53 for information on yeast rehydration nutrients. Important: If not using a yeast rehydration nutrient, water temperature should begin at 40°C(104°F) and the volume of water should be 10 times the weight of the yeast amount. This lower temperature is important, so you do not to harm 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 high sugar conditions and the cooler temperature of the must/juice. This step is essential as it will help to avoid cold shock caused by a rapid temperature drop exceeding 10°C(18°F). This attemperation step may need repeating for very low temperature must/juice. Each attemperation step should last about 15–20 minutes. For every 10°C(18°F) temperature difference between the must/juice and the yeast slurry, an attemperation 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 attemperation steps are required.
- 4. For direct inoculation of yeast post rehydration, ensure you mix the yeast slurry into the full volume of the must/juice.
- 5. For large tanks with long filling times add the yeast slurry to the bottom of the fermentation vessel just as you begin filling with must/juice. This is especially important when inoculating with strains that are sensitive to the competitive factor (refer to pgs 10-17 for individual yeast strain information). This allows the yeast a head start over indigenous organisms.

Note: Copies of "Easy Steps for Optimal Yeast Rehydration" may be downloaded in French and English from our website (scottlabsltd.com).

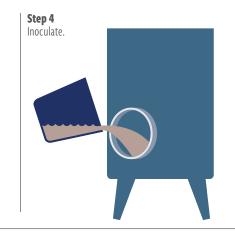
Step 3

Step 1Add GO-FERM or GO-FERM PROTECT Evolution to warm water.









Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

Fining & Stability

Cleaning

Basics

Filtration

Closures

Fruit Wines

General Tools

^{*}The yeast dosage can vary depending on the initial Brix, manufacturer's recommendations and the sanitary state of the grapes or winery. Visit scottlabsltd.com for a video animation of this protocol.

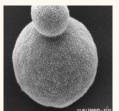
ARTICLE

HARNESSING THE UNIQUE POWERS OF NON-SACCHAROMYCES YEAST

The term non-*Saccharomyces* (or non-Sacc) is a colloquial term that is used to refer to the yeast associated with the pre- and early fermentation stages of winemaking that are not of the genus *Saccharomyces*. These yeast encompass approximately 20 genera and over 700 species. This diverse group of yeast has long been recognized for their contributions to wine aroma, flavor and mouthfeel; however, their behavior is largely unpredictable. Thus, active dried strains of non-*Saccharomyces* yeasts have been developed to harness their positive attributes.

Today, the non-Sacc yeasts available include strains of *Torulaspora delbrueckii*, *Metschnikowia pulcherrima*, *Metschnikowia fructicola* and *Lachancea thermotolerans*. Non-Sacc yeasts often work in different ways than traditional *Saccharomyces* strains. These organisms are either non-fermentative or mildly fermentative and do not have the ability to complete alcoholic fermentation.

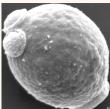
Non-*Sacc* yeasts can enhance aromas and mouthfeel and modulate acid composition allowing you to drive a specific wine style. Non-*Sacc* yeasts can also act as antimicrobial and antioxidant agents. Their actions are different from traditional winemaking tools like SO₂, however during the pre-fermentative stages these yeasts can be more effective than SO₂.



Metschnikowia pulcherrima

Metschnikowia species can protect from microbial spoilage (bioprotectant)

Adaptation is the key to survival. Organisms with successful adaptation strategies are more likely to survive than others. LEVEL² INITIA™ and GAIA are different species of *Metschnikowia* that can inhibit indigenous microflora. This allows them to survive in the challenging juice/must environment. However, their adaptation and survival mechanisms differ. Indigenous yeast require oxygen. INITIA, is a specific strain of *Metschnikowia pulcherrima* that very quickly scavenges oxygen leaving the juice depleted. INITIA in part survives due to its ability to outcompete indigenous microflora for oxygen. GAIA, a specific strain of *Metschnikowia fructicola* suppresses indigenous organisms via a phenomenon called microbial crowding. By using INITIA in white or rosé juice, or GAIA in red must, these bioprotectants suppress volatile acidity-causing yeast and bacteria.



M. pulcherrima

M. pulcherrima and Torulaspora delbrueckii enhances volume and aromatic complexity

LEVEL² FLAVIA™ and LEVEL² BIODIVA™ are strains of *Metschnikowia pulcherrima* and *Torulaspora delbrueckii*, respectively. These organisms have interesting enzymatic abilities that *S. cerevisiae* does not. Inoculated into the fermentation vessel, FLAVIA can release bound varietal compounds like thiols and terpenes whereas BIODIVA produces esters. This means that wines are more complex with enhanced tropical, citrus, fruity and spicy aromas. These specific strains of non-Sacc can also impact mouthfeel due to release of mannoproteins (FLAVIA) or polyols like arabinol (BIODIVA). BIODIVA and other *Torulaspora delbrueckii* strains can initiate fermentation, therefore, they should not be used as a bioprotectant.



Torulaspora delbrueckii



Lachancea thermotolerans

Lachancea thermotolerans can modulate acid composition

LEVEL² LAKTIA[™] is a strain of *Lachancea thermotolerans* that can produce lactic acid and other minor metabolites from glucose. This production of lactic acid can have an impact on pH and titratable acidity. Depending on the level of lactic acid produced (2->9g/L) LAKTIA can be used to enhance complexity or give an interesting blending component for wines lacking freshness.

All photos © Lallemand Oenology 2019

HOW-TO USE NON-SACCHAROMYCES YEASTS

Non-Sacc yeasts need to be handled a little differently from *Saccharomyces* yeast (see usage on pg. 40-42). Non-Sacc yeast have a very low tolerance to ethanol and CO₂, therefore they are most active until the alcohol level reaches approximately 5% v/v. To ensure a complete alcoholic fermentation a *Saccharomyces* strain should be added, and the YAN adjusted accordingly (see pg. 48). Always be sure to consult strain-specific instructions when using a non-*Saccharomyces* yeast as the timing of your secondary *Saccharomyces* inoculation will depend on the Non-*Saccharomyces* strain you have selected.

While they require a bit of extra care, the non-Saccharomyces yeasts in our portfolio are powerful tools to enhance wine quality and allow the winemaker to achieve their desired wine style.

ARTICLE WHAT ARE HYBRID YEAST AND WHY ARE THEY SO EXCITING?

Hybrid yeast can occur in nature when organisms are present in the same ecological niche. By definition, a hybrid is an organism that contains genomic DNA from two or more hereditarily distinct parents.

Yeast reproduce in two ways: sexually and asexually. Under winemaking conditions, yeast will always ferment rather than respire and they will always reproduce asexually. This is due to a phenomenon called glucose catabolite repression (a.k.a. Crabtree effect). In nature however, under conditions of nutrient starvation, yeasts can reproduce sexually to ensure survival of the species. This produces genetically diverse populations. Hybridization is an essential part of this sexual reproduction cycle. Sexual reproduction can be induced in a laboratory (a completely non-GMO process), and just like in nature, new yeast hybrids from different parental strains are obtained. This allows for the selection of hybrid strains that represent the most desired characteristics of the parent strains e.g., strong fermentation kinetics and high aroma production. This process is possible between different yeast species with-

in the same genus, i.e., 2 *Saccharomyces* species. Such hybrids are called inter-species hybrids. Recent research focusing on inter-genus hybrids could bring even more diversity and enologically interesting traits.

The non-GMO, inter-species yeast strains in the Scott Laboratories' portfolio are highlighted in the yeast selection charts (pgs 10-17) and were introduced many years ago due their strong fermentation kinetics and their interesting metabolic profiles. One of the first strains introduced was, the reliable and intensely aromatic VIN 13. Since VIN 13's introduction we have included more strains for a total of 14. These strains were introduced due to their increased aroma production (e.g., EXOTICS NOVELLO, ELIXIRTM), ability to break down small amounts of pectin (EXOTICS MOSAIC) and inability to produce H_2S or SO_2 through primary pathways (LALVIN PERSYTM, IOC BE THIOLS, and LALVIN ICV OPALE 2.0TM). Hybrid yeast strains are robust and reliable fermenters that bring safety, security and aromatic intensity to today's winemaker.

ARTICLE

TROUBLESHOOTING GUIDE FOR SLUGGISH ALCOHOLIC FERMENTATIONS

Many factors influence the success of a fermentation including yeast strain selection, yeast cell number, yeast handling and inoculation practices, availability of nutrition and oxygen, and temperature management. If a fermentation becomes sluggish or you suspect it might be stuck, it is wise to get a complete picture of the wine before jumping into a full restart. Sometimes a simple adjustment or a mixing can be enough to get a fermentation back on track (refer below).

If a restart is necessary, having all the details will help you determine the best course of action.

Recognizing that a fermentation is sluggish or stuck is the first step in rectifying a challenging situation. A fermentation can be viewed as stuck if the sugar has not dropped for >48 hours. A warning sign that a sluggish fermentation may become stuck is when the fermentation approaches ~1 °Brix and fermentation slows to <0.25 °Brix per day (and the temperature is reasonable).

The protocol in our handbook (pg 47) can walk you through the necessary steps to restart a sluggish or stuck fermentation.

Choosing the correct protocol is essential for a successful outcome. If a fermentation sticks and the sugar level is >3 °Brix with an alcohol <11.5% (v/v) it is relatively easy to restart as long as there are no other compounding factors. However, fermentations are more difficult to restart when the alcohol is higher and the sugar is lower.

Our preferred method to restart sluggish and stuck fermentations is the "Recommended Method to Restart a Stuck Fermentation using UVAFERM 43 RESTART" listed on the next page. This protocol was developed in conjunction with Inter-Rhône and is specifically for use with the 43 RESTART yeast strain. Other yeast strains (even ones within our portfolio, including UVAFERM 43TM) should not be attempted with this one-step acclimatization protocol. If a different strain like UVAFERM 43 is preferred for the restart, then the multi-step build-up protocol "Traditional Method to Restart a Stuck Fermentation" can be used (see scottlabsltd.com).

THE JUICE/WINE MIGHT BE TOO CLEAR

If your juice is clear (<50 NTU), there may not be enough solids to keep the yeast in suspension during the early phases of fermentation. Increasing the turbidity is advised. This can be achieved through an addition of RESKUE (pg 60), in addition to stirring. A side benefit of GO-FERM and GO-FERM PROTECT EVOLUTION (pgs 52-53) is that they also help to increase the turbidity of the juice.

THE YEAST MAY NOT HAVE BEEN PROPERLY ACCLIMATIZED

Rehydrated yeast must have time to acclimatize to the changes in sugar concentration and temperature of juice/must during inoculation. Improper acclimatization can delay the start of fermentation after inoculation. Our "Saccharomyces Yeast Rehydration" protocol (pg 43) contains proper timing and steps for acclimatization.

THERE MAY NOT BE ENOUGH YEAST

If you didn't inoculate at the appropriate rate it is possible that you don't have a sufficient population of yeast. In this case a re-inoculation might be necessary.

THE YEAST POPULATION IS NOT HEALTHY

You may have an adequate population, but the cells may not be healthy.

THE YEAST MIGHT NEED ADDITIONAL NUTRIENTS

For a fermentation to be happy and healthy it is essential that the yeast have enough nutrients. Even when starting with high nutrient levels (>300ppm YAN) additional nutrients are almost always needed at 1/3 of the way through the fermentation. If you're at the tail end of the fermentation with just a small amount of sugar left, an addition of RESKUETM (pg 60) and a mixing can be beneficial.

THE TEMPERATURE OF THE WINE IS PROBLEMATIC

Each yeast strain has an optimal temperature range for

fermentation. Anything outside of this range can cause stress for the yeast. If your temperature is too low, try warming the wine slowly. If the temperature is too high, or if it spiked at any point, it's possible that the yeast are no longer viable and a re-inoculation will be necessary. To increase success rates at the end of fermentation, try adjusting the temperature of the wine to $20\text{-}22^{\circ}\text{C}(68\text{-}72^{\circ}\text{F})$.

THE ALCOHOL MAY BE TOO HIGH FOR YOUR SELECTED YEAST STRAIN

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

THE WINE MIGHT NEED A DETOXIFICATION

When wine yeast become stressed, they can produce certain compounds that impede fermentation. RESKUE $^{\text{\tiny TM}}$ (pg 60) can be extremely beneficial in this situation. If possible, RESKUE should be added and racked after 48 hours. If you are unable to rack, adding RESKUE and leaving it in the wine can still help.

THERE MIGHT BE OTHER MICROBIAL POPULATIONS YOU NEED TO ADDRESS

Check your malic acid and volatile acidity (VA). If malic acid has dropped, and you have not used malic acid-degrading yeast or bacteria, you may have a lactic acid bacteria (LAB) infection. A strong LAB population can produce VA and inhibit yeast that are already weak at the end of alcoholic fermentation. VA >0.6g/L can be challenging for yeast, especially in high alcohol situations, and anything greater than 0.8g/L can be inhibitory. In any condition, uncontrolled LAB should be controlled before attempting to restart a stuck fermentation.

Oak & Tannins

RECOMMENDED METHOD TO RESTART HOW TO A STUCK FERMENTATION USING UVAFERM 43 RESTART™

PREPARE THE STUCK WINE

- 1. Address any potential spoilage organism concerns with SO₂.
- 2. Suspend 40 g/hL (3.3 lb/1000 gal) RESKUE™ in 10 times its weight of warm water 30-37°C(86-98°F). Wait 20 minutes then add to stuck wine. Mix thoroughly to incorporate.
- 3. Allow the RESKUE to settle for 48 hours then rack off the settled lees.
- 4. Adjust the temperature of the RESKUE-treated wine to 20-25°C(68-77°F).

PREPARE THE "PIED-DE-CUVE" (STARTER)

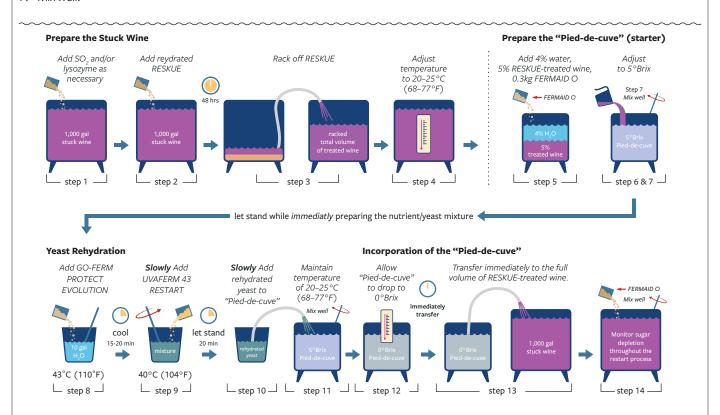
- 5. Prepare the following:
 - ♦ 5% volume of racked RESKUE-treated stuck wine
 - ♦ 4% of total stuck wine volume of chlorine free water
 - ♦ 8 g/hL (0.66 lb/1000 gal) FERMAID O[™]
- 6. Adjust to 5°Brix.
- Mix well.

YEAST REHYDRATION

- 8. Add 53 g/hL (4.4 lbs/1000 gal) of GO-FERM PROTECT EVO-LUTION™ in 10 gallons of water at 43°C (110°F).
- 9. Cool solution to 40°C (104°F) and add 40 g/hL (3.3 lbs/1000 gals) of UVAFERM 43 RESTART™.
- 10. Wait 20 minutes and slowly acclimate the yeast before adding to the "Pied-de-cuve."
- 11. Maintain temperature of 20-25°C (68-77°F).

INCORPORATION OF THE "PIED-DE-CUVE"

- 12. Allow "Pied-de-cuve" to drop to 0°Brix.
- 13. Transfer immediately to the full volume of RESKUE-treated wine.
- 14. Add 40 q/hL (3.3 lbs/1000 gal) of FERMAID O to tank. Mix to homogenize. Monitor sugar depletion throughout the restart process.



STAFF PICK

Our recently introduced RESKUE/43 RESTART protocol has been a game changer for stuck and sluggish ferments. I've seen it solve many problems for winemakers—while saving time and people power!—Mollie Forest, Sales Representative, based in Washington State



Yeast are living organisms. When treated well, they survive most winemaking conditions. Yeast perform the best when their physical and nutritional needs are met. If yeast needs are not met, they become stressed and their performance is diminished. To optimize yeast performance and to encourage a successful fermentation ensure that yeasts' requirements for vitamins, minerals, survival factors and nitrogen are met.

SUPPLEMENTING YEAST NUTRIENTS FOR SUCCESS

Yeast require nitrogen in a form they can assimilate. Yeast assimilable nitrogen (YAN) consists of most amino acids, ammonia, and some types of peptides. Grapes vary in their YAN content. When determining the YAN content of juice/must, both assimilable amino acids (proline is not assimilable) and ammonia need to be measured.

Yeast require vitamins and minerals. Interestingly, the higher the YAN the more vitamins and minerals yeast require. Vitamins and minerals are co-factors for growth and aroma metabolism and yeast cannot survive without them.

Yeast survival factors (sterols and unsaturated fatty acids) are essential for healthy plasma membranes. When yeast have sufficient survival factors, sugar uptake can continue throughout fermentation and the toxic effects of ethanol can be minimized. By providing nitrogen, vitamins, minerals, sterols and unsaturated fatty acids, the cells will be off to a great start and wine quality will be enhanced!

HOW MUCH YAN IS REQUIRED?

The amount of YAN yeast require depends on the following: individual yeast strain requirements, initial sugar content, fermentation temperature, oxygenation, turbidity, pre-fermentation practices and fruit quality.

YAN will vary between vintages, vineyards and varietals so it is necessary to analyze each lot of fruit. Analysis should be conducted as close to yeast inoculation as possible.

YEAST STRAIN NUTRIENT NEEDS

Different yeast strains have different nitrogen demands and are classified as low, medium or high nitrogen need according to the following:

- Low nitrogen-demand: yeast need 7.5 ppm YAN per 1°Brix
- Medium nitrogen-demand: yeast need 9 ppm YAN per 1°Brix
- High nitrogen-demand: yeast need 12.5 ppm YAN per 1°Brix

QUALITY OF NITROGEN

Organic (amino acids) and inorganic nitrogen (ammonia) each have a distinct role and impact on fermentation. While yeast may show an affinity for inorganic nitrogen, a yeast diet balanced with organic nitrogen can produce healthier fermentations, better aromatics (e.g., terpenes and esters) and lower levels of undesirable compounds (e.g., ethyl acetate and hydrogen sulfide).

See more information on nitrogen supplementation and the importance of organic nitrogen at scottlabsltd.com.

INITIAL SUGAR CONTENT

The higher the initial sugar content, the more YAN required.

TEMPERATURE

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

When adding oxygen to the juice/must, nitrogen is captured faster, therefore more nitrogen is needed.

OXYGEN

TURBIDITY

When juice is over-clarified (<50 NTU), many nutritional factors for yeast are removed, making it necessary to supplement with complete and balanced nutrients.

PRE-FERMENTATION PRACTICES

Vitamins and minerals are quickly consumed (even in healthy fruit) by native microflora and other intentionally introduced yeast such as the non-Saccharomyces yeast in our portfolio. This means that prior to Saccharomyces inoculation essential factors may be deficient in musts with significant microbial activity. However, proper supplementation can compensate for these deficiencies.

FRUIT QUALITY

The presence of molds and rot will impact grape juice/must chemistry. Studies have shown that grapes impacted by *Botrytis cinerea* and other molds are highly deficient in YAN and other essential nutrients.

CHOOSING YEAST NUTRIENTS & YEAST DERIVATIVE NUTRIENTS

 Highly Recommended Recommended 	DAP	FERMAID K + FERMAID K (KOSHER)	FERMAID O	FERMCONTROL BIO	GO-FERM	GO-FERM PROTECT EVOLUTION	NUTRIENT VIT END	PHOSPHATE TITRES	RESKUE	STIMULA CABERNET	STIMULA CHARDONNAY	STIMULA SAUVIGNON BLANC	STIMULA SYRAH	BOOSTER BLANC	BOOSTER ROUGE	GLUTASTAR	NOBLESSE	OPTI-MUM RED	OPTI-MUM WHITE	OPTI-RED	OPTI-WHITE
Page#	58	58	59	59	53	52	NA	60	60	53	54	54	55	63	63	64	65	65	65	66	66
Measurable YAN/YAN equivalents* (in ppm) at 25 g/hL dose	50/50	25/25	10/ 40-60	18.5	-	-	-	50/50	-	10/ 40-60	10/ 40-60	10/ 40-60	10/ 40-60	-	-	-	-	-	-	-	-
Measurable YAN/YAN equivalents* (in ppm) at 30 g/hL dose	60/60	30/30	12/ 48-72	22.2	-	-	-	60/60	-	12/ 48-72	12/ 48-72	12/ 48-72	12/ 48-72	-	-	-	-	-	-	-	-
Measurable YAN/YAN equivalents* (in ppm) at 40 g/hL dose	80/80	40/40	16/ 64-96	29.6	-	-	-	80/80	-	16/ 64-96	16/ 64-96	16/ 64-96	16/ 64-96	-	-	-	-	-	-	-	-
Yeast rehydration nutrient					٥	٥															
Yeast stimulant for increasing positive thiols (aromatics)						٥						٥	٥								
Yeast stimulant for increasing positive esters (aromatics)			٥							٥	٥										
Does not contain DAP (inorganic nitrogen)			✓	√	√	√	√		√	√	✓	√	√	√	1	✓	✓	√	√	√	✓
Contains organic nitrogen from autolyzed yeast		√	√	√	√	√	√		√	√	√	√	√			√	√	√	√	√	✓
Contains supplemented vitamins and minerals		√																			
Contains naturally occurring vitamins and minerals			√	√	√	√				√	✓	√	√								
Contains supplemented thiamin		√						✓													
Inactivated yeast for challenging conditions							٥		•												
Protects aromatic freshness and color (antioxidant)														٠		٥	٥		٥		٥
Develops mid-palate intensity in whites and rosés														٥		٥	٠		٥		•
Develops mid-palate intensity in reds															٥		٥	•		٥	
Facilitates oak integration														۵			•	۵		٥	٥
Color and tannin stabilization															•			•		٥	
Decreases alcohol perception														٥	٥		٥	۵		٥	
Increase overall balance			٥			٥					٥	٥	٥	•	•	٥	۵	٨	٥	٥	٥
Reduces bitterness or green character										٥				٥						٥	٥
Reduced production of sulfur off- odors during fermentation		٥	•		٥	•				٠	•	•	٥	٥			0				
Reduces sulfur defects													۵	٥			٥			٥	
OMRI Listed			√		1	√	√										√	√		√	√

MEASURABLE YAN VS YAN EQUIVALENT

Most academic recommendations for YAN supplementation have been based on measurable YAN, often supplemented in the form of inorganic nitrogen (usually DAP). Lallemand Oenology has demonstrated that organic forms of YAN are

4-6 times more efficient than inorganic YAN. This means that a 25 g/hL dose of FERMAID O has 10 ppm measurable YAN but a YAN equivalent of 40-60 ppm. Throughout our recommendations we have taken this efficiency into account.

(dCO₂/dt) max (g/L.h)

ARTICLE

MANAGING HIGH YAN FERMENTATIONS

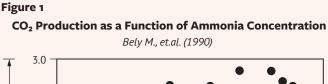
Yeast require a balance of nutrients to insure the timely completion of alcoholic fermentation. Even if nitrogen is not the only nutrient that yeast require, it is the one that wine-makers respond to and manage the most. Yeast assimilable nitrogen (YAN) is the sum of nitrogen from ammonia, primary amino acids (everything except proline) and specific peptides. YAN drives yeast cell number and fermentation rate. As demonstrated in Figure 1 the higher the starting nitrogen the faster the fermentation rate (shown as a function of CO₂ production). However, irrespective of starting YAN (Figure 2), nitrogen in the form of ammonia is depleted at roughly the same point in the fermentation; however, the time it takes to get to that point may vary. When

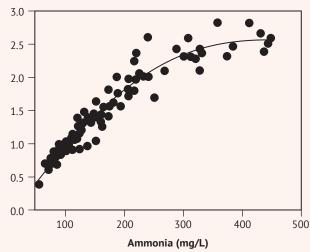
initial YAN is high you may think that you do not need to supplement; however, to support the large cell population and for fermentation to continue a small addition of FERMAID O^{TM} , FERMAID K^{TM} , STIMULA CHARDONNAY or STIMULA CABERNET is recommended at $\frac{1}{3}$ sugar depletion. There is increased evidence that when your starting YAN is >300ppm you will need to support this larger cell population with increased levels of vitamins, minerals and lipids. This can be achieved during the rehydration phase using GO-FERM PROTECT EVOLUTION. If these essential nutrients are deficient, then the ability of the cells to complete fermentation is jeopardized.

BEST PRACTICES FOR HIGH JUICE/MUST YAN:

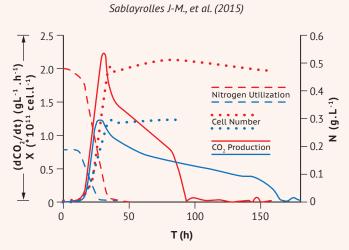
- Choose a medium to high YAN requiring yeast strain with a wide temperature range if you have inadequate cooling
- Rehydrate yeast in GO-FERM PROTECT EVOLUTIONTM to supply the much-needed vitamins, minerals and lipids
- At 1/3 sugar depletion add 10-30g/hL FERMAID O[™] or FERMAID K[™] (or 40g/hL STIMULA CHARDONNAY[™] for fruity whites and rosés or STIMULA CABERNET[™] for reds)
- Ensure that you mix (turning over the tank volume at least once) throughout the fermentation to keep the yeast in suspension

- Try to maintain a fermentation rate of 2-4°Brix drop per day
- If there are signs of yeast stress at the tail end of fermentation (80% complete) such as H₂S production, waxy/soapy aromas, elevated VA or signs of malolactic fermentation, treat appropriately with REDULESSTM or RESKUETM
- If ML is desired, choose an appropriate ML strain and nourish the bacteria with either OPTI'ML BLANC™ or ML RED BOOST™









NUTRIENT SUPPLEMENTATION PLANNER HOW TO

To conduct a healthy and complete fermentation, yeast require minerals, vitamins, fatty acids, sterols and nitrogen. Minerals, vitamins, fatty acids and sterols are provided by GO-FERM PROTECT EVOLUTION™, whereas nitrogen is supplied by FERMAID O^{TM} or FERMAID K^{TM} .

Yeast also use essential nutrients to stimulate certain metabolic pathways resulting in increased wine aroma. The STIMULA™ range of nutrients both nourishes the cells and stimulates metabolic pathways to increase aromas and flavors.

Use the following step-by-step guide to develop a complete yeast nutrition program for each fermentation goal. This planner accounts for the individual needs of the yeast, how much fermentable sugar is present, and how much nitrogen is required by the yeast for the desired wine goal.

- 1. Choose the yeast strain. Strains can be found on pgs 10-17 and are classed as low, medium or high nitrogen-need.
- 2. Measure sugar (Brix) and YAN in juice/must.
- 3. Determine the yeast strain's Measurable YAN requirement using Table 1.
- 4. Calculate the amount of Measurable YAN that needs to be supplemented:
 - [Yeast Measurable YAN Requirement (using Table 1)]
 - [Measurable YAN of Juice or Must] = Amount of YAN Required to Supplement (ppm)
- 5. Determine fermentation goal and follow program as outlined below:

Table 1: Yeast Assimilable Nitrogen (YAN)* needs of yeast at different starting sugars

Sugar	Yeast Strain Measurable YAN* Requirements (ppm N)					
°Brix	Low N need strain	Medium N need strain	High N need strain			
20	150	180	250			
22	165	200	275			
24	180	220	300			
26	195	240	325			
28	210	260	350			
30	225	280	375			
	°Brix 20 22 24 26 28	Sugar (ppm N) °Brix Low N need strain 20 150 22 165 24 180 26 195 28 210	Sugar (ppm N) °Brix Low N need strain Medium N need strain 20 150 180 22 165 200 24 180 220 26 195 240 28 210 260			

^{*} based on supplementation with inorganic nitrogen source, see pg 58 for info on YAN Equivalents

GOAL — FERMENTATION SECURITY

YAN Required to Supplement	At Yeast Rehydration Phase	At 2–3 °Brix Sugar Drop	At 1/3 Sugar Drop
0-50 ppm		No addition	30 g/hL (2.5 lb/1000 gal) FERMAID O
51-100 ppm	30 g/hL (2.5 lb/1000 gal) GO-FERM PROTECT EVOLUTION	20 g/hL (1.7 lb/1000 gal) FERMAID O	20 g/hL (1.7 lb/1000 gal) FERMAID O + 12.5 g/hL (1.0 lb/1000 gal) FERMAID K
101-150* ppm	33 . 2	40 g/hL (3.3 lb/1000 gal) FERMAID O	40 g/hL (3.3 lb/1000 gal) FERMAID K

GOAL — FERMENTATION SECURITY AND REVELATION OF THIOLS IN REDS, WHITES AND ROSÉS

YAN Required to Supplement	At Yeast Rehydration Phase	At 2–3 °Brix Sugar Drop	At 1/3 Sugar Drop	
0-50 ppm	40 g/hL (3.3 lb/1000 gal)		10 g/hL (0.8 lb/1000 gal) FERMAID O	
51-100 ppm	30 g/hL (2.5 lb/1000 gal) GO-FERM PROTECT EVOLUTION	STIMULA SAUVIGNON BLANC or	20 g/hL (1.7 lb/1000 gal) FERMAID O	
101-150* ppm	SO TERMIT NOTECT EVOLUTION	STIMULA SYRAH	40 g/hL (3.3 lb/1000 gal) FERMAID O	

GOAL — FERMENTATION SECURITY AND PRODUCTION OF ESTERS IN REDS, WHITES AND ROSÉS

YAN Required to Supplement	At Yeast Rehydration Phase	At 2–3 °Brix Sugar Drop	At 1/3 Sugar Drop
0-50 ppm		No addition	
51-100 ppm	30 g/hL (2.5 lb/1000 gal) GO-FERM PROTECT EVOLUTION	20 g/hL (1.7 lb/1000 gal) FERMAID 0	40 g/hL (3.3 lb/1000 gal) STIMULA CHARDONNAY or STIMULA CABERNET
101-150* ppm	GOTERMITROTECT EVOLUTION	40 g/hL (3.3 lb/1000 gal) FERMAID O	

^{*}If your calculation requires >150ppm nitrogen it is suggested to choose a yeast strain with a lower nitrogen requirement.

REHYDRATION NUTRIENTS FOR CELL PROTECTION

Rehydration is the first stage of a multi-step yeast nutrient strategy. Yeast rehydration nutrients provide natural micronutrients (vitamins and minerals) and survival factors (sterols and unsaturated fatty acids) to the yeast at a time when they can be used most efficiently. Yeast cells soak these nutrients up like a sponge making them biologically available for many essential reactions. Further, nutrients are available for their intended purpose since they are not consumed by competitive microorganisms, bound up by organic acids, anions, polysaccharides and polyphenols, or inactivated by SO₂.

Never use nutrients containing DAP during yeast rehydration—they are toxic to the yeast.

GO-FERM PROTECT EVOLUTION

LALLEMAND

Yeast rehydration nutrient; OMRI listed

GO-FERM PROTECT EVOLUTION $^{\text{TM}}$ is the latest generation of yeast rehydration nutrients to support healthy fermentations while increasing aroma uptake and production. This formulation has optimized the bioavailability of vitamins, minerals and sterols, all of which are derived from autolyzed wine yeast. The benefits are clearly seen at the end of alcoholic fermentation (Figure 1).

Yeast rehydrated in GO-FERM PROTECT EVOLUTION have enhanced viability (Figure 2), vitality and tolerance to wine stresses such as ethanol, acid, sugar and temperature. The yeast also express more aromatic varietal aromas (Figure 3) due to GO-FERM PROTECT EVOLUTION's high ergosterol content which enables yeast membrane transport systems to better assimilate aromatic precursors.

When used in fermentations where oxygen additions are difficult, GO-FERM PROTECT EVOLUTION's enhanced sterol content can replace the recommended second oxygen addition at ½ sugar depletion.

Usage: Mix GO-FERM PROTECT EVOLUTION in 20 times its weight of clean 43° C(110° F) 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 juice/must to be fermented to the yeast slurry. Do not allow more than 10° C(18° F) difference. Acclimatize yeast as necessary (see pg 43 for more details).

Note: Due to the unique nature of GO-FERM AND GO-FERM PROTECT EVOLUTION, they will not go into solution completely. This is due to the fatty acid and sterol content and is to be expected.

Storage: Dated expiration. Store in a cool and dry environment at $18^{\circ}C(65^{\circ}F)$. Once opened, keep tightly sealed and dry.

ı		
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, use a ratio of 1 part yeast to 1.25 parts GO-FERM PROTECT EVOLUTION.

Stage of Winemaking: During yeast rehydration	Provides: Natural vitamins, minerals, and survival factors in autolyzed yeast base
Impact: Supports healthy fermentation, minimizes yeast stress, optimizes aromas	YAN contribution: Insignificant

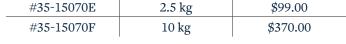


Figure 1: Impact of GO-FERM PROTECT EVOLUTION on Fermentation Kinetics in a High Nitrogen,
Low Sugar Ferment.

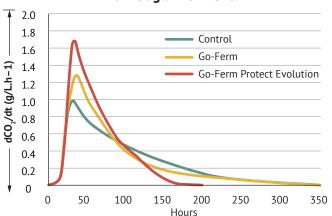


Figure 2: Impact of GO-FERM PROTECT EVOLUTION on Yeast Viability 115 Hours Post-Inoculation

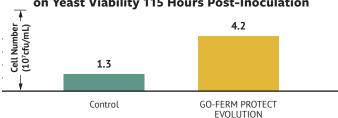
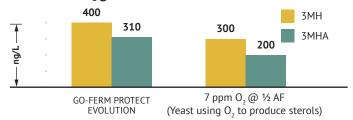


Figure 3: Impact of GO-FERM PROTECT EVOLUTION vs Oxygen on Varietal Thiol Production



GO-FERM



Yeast rehydration nutrient; OMRI listed

GO-FERM™ is the original yeast rehydration nutrient and contains a balance of micronutrients. It was developed to enhance fermentation kinetics and to help avoid fermentation problems like hydrogen sulfide.

Usage: Mix GO-FERM in 20 times its weight of clean 43°C(110°F) 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 juice/must to be fermented to the yeast slurry. Do not allow more than

#35-15070	2.5 kg	\$83.50
#35-15071	10 kg	\$309.00

10°C(18°F) difference. Acclimatize yeast as necessary (see pg 43 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.

Recommended Dosage 30	g/hL 2.5 lb/1000 gal
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Note: This recommendation is based on a yeast inoculum of 2 lb/1000 gallons (25 g/hL). If using more or less yeast, use a ratio of 1 part yeast to 1.25 parts of GO-FERM.

Stage of Winemaking: During yeast rehydration

Provides: Natural vitamins & minerals in autolyzed yeast base

Impact: Supports healthy fermentations

#35-15117

YAN contribution: Insignificant

\$58.50

YEAST STIMULANTS FOR OPTIMIZING AROMAS

The STIMULA™ range of yeast nutrients are some of the most innovative products within the Lallemand Oenology portfolio. Yeast nutrients are generally used to nourish cells and assist them with the challenges of fermentation. The STIMULA range is different. These natural yeast autolysates are formulated to supply optimal levels of specific amino acids, vitamins, minerals and sterols that stimulate the yeast cell functions involved in aroma metabolism. When used at specific times during fermentation, ester production, thiol uptake, revelation and release, are increased. The STIMULA natural yeast autolysates can be used in any varietal where you wish to optimize varietal expression or fruity and floral ester production.

NEW ·

STIMULA CABERNET



Stimulates fruity aroma compounds in red wines

STIMULA CABERNET[™] is a yeast nutrient optimized to stimulate the yeast's production of fruity esters in red wines. When STIMULA CABERNET is added at ⅓ sugar depletion it triggers specific yeast metabolic pathways resulting in red and black fruit aromas (see Figure). Wines made with STIMULA CABERNET are also noted for their increased complexity and diminished vegetal/herbaceous notes. This 100% autolyzed yeast-based nutrient is rich in specific amino acids, small peptides, vitamins and minerals.

Usage: Mix STIMULA CABERNET in 10 times its weight of clean, chlorine-free water or must and add to the fermentation at ½ sugar depletion. It is essential that the timing of addition is respected. STIMULA CABERNET is not fully soluble. Stir to maintain suspension before and during addition.

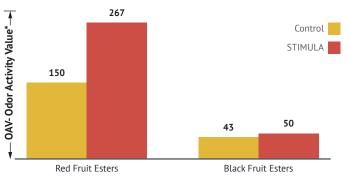
Storage: Dated expiration. Store in a dry environment at 18°C (65°F). Once opened, use immediately.

Recommended Dosage 40g/hL 3.3 lb/1000 gal

1kg

Impact of STIMULA CABERNET™ on red and black fruits aromas on a 2019 Cabernet Sauvignon from Bordeaux, France

Must analysis: 238g/L sugar, 218ppm YAN, pH3.46



*An OAV value is the sum of the aroma compounds compared to their sensory threshold. A positive number means aromas are above sensory threshold.

Stage of winemaking: During fermentation at ½ sugar depletion

Provides: Organic nitrogen with vitamins (biotin) and minerals (magnesium and zinc)

Impact: Stimulates red and black fruity esters and minimizes herbaceous notes

Measurable YAN at 40g/hL dose: 16ppm YAN equivalents at 40g/hL dose: 64-96ppm

STIMULA CHARDONNAY



Stimulates fruity and floral aroma compounds in white and rosé wines

STIMULA CHARDONNAY™ is used to optimize the yeast's production of fruity and floral flavors in white and rosé wines. When STIMULA CHARDONNAY is added at ⅓ sugar depletion it triggers specific yeast metabolic pathways resulting in increased ester production (see Figure). Wines made with STIMULA CHARDONNAY are also noted for their increased complexity and smooth mouthfeel. This 100% autolyzed yeast-based nutrient is rich in specific amino acids, small peptides, sterols, vitamins and minerals allowing for optimized wine aromatic potential.

Usage: Mix STIMULA CHARDONNAY in 10 times its weight of clean, chlorine-free water or juice and add to the fermentation at ½ sugar depletion. It is essential that the timing of addition is respected. STIMULA CHARDONNAY is not fully soluble. Stir to maintain suspension before and during addition.

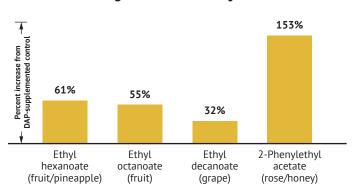
Storage: Dated expiration. Store in a dry environment at 18°C (65°F). Once opened, use immediately.

Stage of winemaking: During	
fermentation at $lambda$ sugar depletion	

Provides: Organic nitrogen with natural vitamins and minerals

#35-15110	1 kg	\$58.50
#35-15110B	10 kg	\$553.00
Recommended Dos	sage 40g/hL	3.3 lb/1000 gal

Impact of STIMULA CHARDONNAY™ on Ester Production in Languedoc Chardonnay



Impact: Increases fruity and
floral aromas

Measurable YAN at 40 g/hL dose: 16 ppm YAN equivalents at 40 g/hL dose: 64-96 ppm

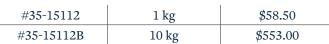
STIMULA SAUVIGNON BLANC



Stimulates tropical and citrus aroma compounds in whites and rosé wines

STIMULA SAUVIGNON BLANC™ is used to optimize the yeast's ability to reveal and enhance varietal compounds originating in certain grapes maximizing fruity, floral and spicy aromas. Adding STIMULA SAUVIGNON BLANC at the beginning of active fermentation stimulates yeast to liberate varietal thiols (see Figure) and terpenes. This results in elevated tropical fruits, citrus and box wood/gooseberry. When used to produce rosé wines, blackcurrant aromas can also be present. Due to the unique formulation, wines made using STIMULA SAUVIGNON BLANC have a fuller mouthfeel and less sulfur off-odors. This 100% autolyzed yeast-based nutrient rich in specific amino acids, small peptides, vitamins and minerals helps to optimize the aromas and flavors associated with many aromatic white cultivars including Sauvignon blanc, Riesling, Pinot gris, Chardonnay and Semillon.

Usage: Mix STIMULA SAUVIGNON BLANC in 10 times its weight of clean, chlorine-free water or juice and add to the fermentation at 2–3°Brix drop. It is essential that the timing of addition is respected. STIMULA SAUVIGNON BLANC is not fully soluble. Stir to maintain suspension before and during addition.

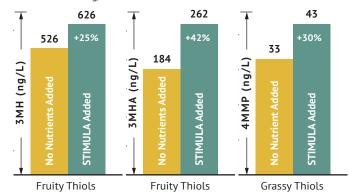


Storage: Dated expiration. Store in a dry environment at 18°C (65°F). Once opened, use immediately.

Recommended Dosage	40g/hL	3.3 lb/1000 gal
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Impact of STIMULA SAUVIGNON BLANC™ on Fruity & Grassy Thiols in 2018 Napa Valley Sauvignon blanc

40g/hl STIMULA SAUVIGNON BLANC Added



Stage of winemaking: During fermentation at 2-3°Brix sugar drop

Provides: Organic nitrogen with natural vitamins and minerals

Impact: Optimizes tropical, citrus and boxwood aromas

Measurable YAN at 40 g/hL dose: 16 ppm YAN equivalents at 40 g/hL dose: 64-96 ppm

STIMULA SYRAH (ALLEN

LALLEMAND

Stimulates floral and spicy compounds in red wines

STIMULA SYRAH™ optimizes the yeast's ability to reveal and enhance varietal compounds originating in certain red grapes maximizing fruity, floral and spicy aromas. Adding STIMULA SYRAH at the beginning of active fermentation stimulates yeast to liberate varietal thiols, terpenes and nor-isoprenoids. Due to its unique formulation, wines made using STIMULA SYRAH have more complexity and less sulfur off-flavors like hydrogen sulfide.

Usage: Mix STIMULA SYRAH in 10 times its weight of clean, chlorine-free water or must and add to the fermentation at 2-3°Brix drop. It is essential that the timing of addition is respected. STIMULA SYRAH is not fully soluble. Stir to maintain suspension before and during addition.

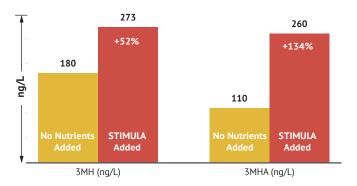
Storage: Dated expiration. Store in a dry environment at 18°C (65°F). Once opened, use immediately.

#35-15119 1kg \$58.50

Recommended Dosage 40g/hL 3.3 lb/1000 gal

Impact of STIMULA SYRAH™ on volatile thiol (blackcurrant) release and conversion on a 2018 South African Syrah

Must analysis: 256g/L sugar, 156ppm YAN, pH3.54 40g/hl STIMULA SYRAH Added



Stage of winemaking: During fermentation at 2-3°Brix drop Provides: Organic nitrogen with vitamins (calcium pantothenate and thiamin) and minerals (magnesium) Impact: Optimizes the uptake and release of varietal precursors, and minimizes hydrogen sulfide in sulfide prone varietals

Measurable YAN at 40g/hL dose: 16ppm YAN equivalents at 40g/hL dose: 64-96ppm

ARTICLE

WHICH STIMULA NUTRIENT SHOULD YOU USE?

Despite their names, STIMULATM nutrients can be used in almost any variety to help achieve a desired wine style. Which STIMULA to use depends on whether fruity esters or tropical, floral or spicy aromas are desired.

STIMULA CHARDONNAY AND STIMULA CABERNET FOR FRUITY ESTERS

Esters contribute sweet-fruity aromas and flavors in white, rosé and red wines. It is the synergy of esters that contributes to overall complexity of wine aromas. Recent research has shown that ester production happens in two phases with the majority of esters produced during last two thirds of fermentation.

Fermentation esters can be split into two major groups: acetate esters (responsible for rose/floral aromas) and ethyl esters, responsible for red berry/fruit aromas. Although yeast vary in their ability to produce esters (see charts pgs 10-17), ester production is highly influenced by nutrient composition and fermentation conditions. Lipids, vitamins and specific amino acids all support ester production which is why STIMULA CHARDONNAY™ is recommended for all fruity and floral white and rosé wines and STIMULA CABERNET™ is beneficial for all red wines where enhanced red and black fruity aromas are desired.

STIMULA SAUVIGNON BLANC AND STIMULA SYRAH FOR ENHANCED VARIETAL CHARACTERISTICS

Thiols and terpenes are aroma molecules that contribute to a wine's varietal character. Most grapes and the resulting wines differ aromatically. This may be due to the release of varietal aromas or the production of fermentative aromas. Varietal aromas (pre-cursors) are often odorless and flavorless. It is the action of yeast during fermentation that are partly responsible for releasing varietal aroma compounds. Once released these compounds are described as tropical, citrus, grassy, floral, fruity and/or spicy.

More specifically, most <code>Saccharomyces</code> yeast can take up aroma pre-cursors, however only certain yeast strains with specialized enzymatic ability (β -lyase, β -glucosidase) can release the odor-active compound. <code>STIMULA SAUVIGNON BLANC</code> and <code>STIMULA SYRAH</code> provides yeast with the key micronutrients at the right time for enzyme synthesis.

In white and rosé wines STIMULA SAUVIGNON BLANC™ helps yeast release thiols increasing tropical notes of passion fruit, guava and grapefruit. In certain grapes grassy, box wood and citrus aromas can be revealed. In red wines STIMULA SYRAH™ increases blackcurrant, floral and spicy aromas from bound thiols and terpenes. STIMULA SAUVIGNON BLANC can be used in any varietal from Sauvignon blanc to Pinot gris and Chardonnay whereas or STIMULA SYRAH can be used in most red cultivars including Pinot noir, Grenache, Merlot or Syrah. The possibilities are endless!

Malolactic Fermentation

Oak & Tannins

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Closures

Fruit Wines & Mead

General Tool

PROTOCOL WINE STYLE GUIDE: MEDIUM-BODIED REDS FERMENTATION PROTOCOL

In general, medium-bodied red wines are described as being fruit-forward (berry, pomegranate and red stone fruits like cherry and plum), spicy and savory (anise, pepper or grilled meat, even tobacco, cedar and leather) or floral with aromas resembling violets and roses. The expression of these aromas and flavors are highly dependent upon the varietal and its handling in the vineyard and winery. In addition to focusing on flavors and aromas, wines can also be concentrated on mouthfeel, either round and smooth or tannin forward and highly structured. There are many factors that can affect final wine taste and quality and although the grape varietal is one of the most influential factors, along with berry size, skin structure, color and thickness, winemakers can drive wine style based on key processing decisions and correct product choice. This guide takes you through yeast, bacteria and nutrients to drive wine style. To review the best practices guide in its entirety, see scottlab.com.

WINEMAKING STAGE	BEST PRACTICE			WINE STYLES		
		FRUIT FORWARD	SPICY/SAVORY	FLORAL	ROUND MOUTHFEEL	TANNIN FORWARD
GRAPE RECEPTION AND PRE-FERMENTATION PROCESSES	Add Non- <i>Saccharomyces</i> Yeast	LEVEL 2 BIODI LEVEL 2 FL <i>A</i> GAIA™ acts a:	ommended NON-SACCHAR VA™ for fruit forward and NIA™ for fruit forward and s a bioprotectant inhibiti VEL 2 LAKTIA™ for enhan	I round wines due to es d spicy wines due to th ng VA producing native	ter and arabinol (poly e release of bound var yeast and bacteria du	ol) production ietal aromas ring cold-soak
	Add Rehydration Nutrient	GO-FEF	Recomme RM PROTECT EVOLUTION	ended REHYDRATION NU at 30g/hL when using	JTRIENT standard yeast dose of	f 25g/hL
	Kenyuration Nutrient		Recommended YE	AST at 25 g/hL dependi	ng on wine style:	
	Add Fermentation Yeast	CSM™ EXOTICS NOVELLO ICV GRE™ ICV OKAY™ PERSY™ TANGO MALBEC™	AMH™ MT48™ RHÔNE 2226™ RP15™	ALCHEMY III ICV D21™ SYRAH™	BDX™ BM 4X4™ CVRP™ ICV D254™	ICV D80™ MT™ NT116
	Fermentation Temperature	15.5-25.5°C	20-28°C	16-28°C	17.5-28°C	15-28°C
ALCOHOLIC FERMENTATION	ERMENTATION Recommended YEAST D			T DERIVATIVE depending on wine style:		
	Add Yeast Derivative	NOBLESSE™ at 30 g/hL	NOBLESSE [™] at 30 g/hL or OPTI-RED [™] at 30 g/hL	NOBLESSE™ at 30 g/hL	OPTIMUM RED™ at 20-40 g/hL	NOBLESSE [™] at 30 g/hL or OPTI-RED [™] at 30 g/hL
			Recommended FERMEN	TATION NUTRIENT* dep	pending on wine style:	
	Add Fermentation Nutrients At 2-3 °Brix Drop	FERMAID O™ at 0-40 g/hL	STIMULA SYRAH™ at 40 g/hL	STIMULA SYRAH™ at 40 g/hL	FERMAID O™ at 0-40 g/hL	FERMAID O™ at 0-40 g/hL
	Add Fermentation Nutrients At 1/3 °Brix Drop	STIMULA CABERNET™ at 40 g/hL	FERMAID O™ at 10-40 g/hL	FERMAID O™ at 10-40 g/hL	FERMAID O™ at 10-40 g/hL	FERMAID K™ at 10-40 g/hL
PRESSING AND RACKING	24-48 Hours Post Fermentation Rack Off Gross Lees	This removes protein, pectin, tartrates, dead and vegetative cells that may negatively impact aromas and mouthfeel			aromas and mouthfeel	
	Add	- I	Recommended MALOLACT	FIC BACTERIA at 1g/hL o	lepending on wine styl	e:
MALOLACTIC FERMENTATION	Malolactic Bacteria Strain	O-MEGA™ MBR 31™	PN4™	BETA™	ALPHA™ SILKA™	ELIOS 1™
	Add Malolactic Nutrient		Recommended Malo	lactic Nutrient-ML RED	BOOST [™] at 20g/hL	

^{*}Depending on the initial YAN, starting sugar and yeast strain choice you may have to adapt these suggestions. See pg 48 for nutrient supplementation planner based on initial YAN, needed YAN, initial sugar and yeast strain needs.

Oak & Tannins

ARTICLE FERMAID O IS MORE EFFICIENT THAN AMMONIA (DAP)

THE IMPORTANCE OF AN ORGANIC SOURCE OF NITROGEN

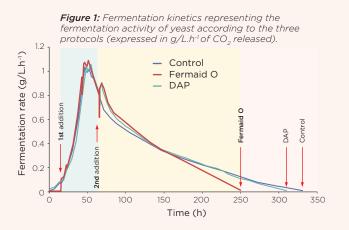
Yeast are living organisms and require a balance of energy sources (sugar), nitrogen-containing compounds, vitamins, minerals, and survival factors to perform at their best. Nitrogen is one of the most important nutrients for yeast and the nitrogen-containing compounds that yeast can use are known as yeast assimilable nitrogen (YAN). YAN comes in two main forms: ammonia, an inorganic source of nitrogen (does not contain carbon), and amino acids which are complex organic based compounds (containing carbon).

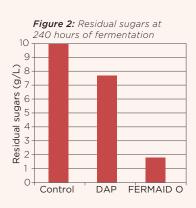
Historically, nitrogen in the form of diammonium phosphate (DAP) has been the focus for yeast nutrition. In fact, most academic recommendations for YAN supplementation are based on DAP addition (see box on Measurable YAN vs YAN Equivalent pg 48). However, nitrogen supplied as DAP is taken up very quickly which can lead to uncontrolled cell growth and hot fermentations and does not necessarily give yeast the staying power to complete a fermentation. Alternatively, when nitrogen is supplied in the form of amino acids (from autolyzed yeast) the fermentation profiles are very different. Ferments do not get as hot, the yeast population is controlled, and the cells are healthier. Interestingly, both aroma and mouthfeel are also improved when DAP is avoided.

Organic and inorganic nitrogen each have a distinct role and impact on fermentation. While yeast may show an affinity for inorganic nitrogen, a yeast diet balanced with organic nitrogen can produce healthier fermentations, better aromatics (e.g. terpenes and esters) and lower levels of undesirable compounds (e.g. ethyl acetate and hydrogen sulfide).

To illustrate the relative effects of different nitrogen sources on fermentation kinetics, trials were done by Lallemand Oenology and the ICV in collaboration with the INRA Pech Rouge Research Station in the Languedoc region of France. The purpose of the trials was to compare the efficacy of adding DAP (inorganic nitrogen) versus FERMAID O™. The trial musts and fermentation protocols were identical. The only difference was that one lot received an addition of the equivalent of 16 ppm of YAN in the form of DAP while another received a similar YAN addition from FERMAID O. This addition was split into two for both treatments, with the first addition added at the onset of fermentation and the second addition added at 1/3 sugar depletion. The control received no addition of nitrogen.

The addition of YAN from FERMAID O resulted in a complete fermentation (Figure 2) in approximately 10 days (Figure 1). Further, the fermentation involving only DAP had a significantly slower conclusion and higher final residual sugars than the wine made with FERMAID O (Figure 2). These trials show the importance of the source of yeast available nitrogen.





NUTRIENTS FOR FERMENTATION SECURITY

Yeast nutrition refers to the utilization of essential nutrients for cellular reactions which ultimately ensures the growth and survival of the cell. Fermentation nutrients are a vital part of a controlled fermentation strategy. Yeast cells use nitrogen for growth, enzyme synthesis, protein synthesis and sugar transport. Yeast cells also require a balanced supply of minerals (magnesium, zinc, etc.), vitamins, sterols including ergosterol and natural sterols from the grapes (phytosterols), polyunsaturated fatty acids, and oxygen.

Tailor your fermentation regime for optimal yeast reproduction, sugar transport and aromatic expression.

DIAMMONIUM PHOSPHATE (DAP)

Inorganic nitrogen source

#30-15053D \$9.35 25 kg \$172.50 # 30-15015

Diammonium phosphate (DAP) should only be used to supplement severely deficient juices/musts. DAP provides inorganic nitrogen and should only be used if necessary and always in combination with complex nutrients.

Usage: Suspend DAP in water or juice/must and mix well before adding, especially during fermentation to avoid CO, release and overflowing of vessel.

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

Stage of winemaking: 1/3 sugar depletion if YAN needs cannot be achieved using FERMAID O or FERMAID K

Provides: Ammonia and phosphate

Impact: Supports cell growth. drives fermentation rate

Measurable YAN at 25 g/hL dose: 50 ppm YAN equivalents at 25 g/hL dose: 50 ppm

FERMAID K*

Complex yeast nutrient

#35-15029 \$53.25 10 kg \$144.65 #35-15028

FERMAID K (Kosher) - certified Kosher for Passover #35-15030 10 kg \$225.00

FERMAID K™ is a complex yeast nutrient to assist with fermentation security, especially in low YAN situations. This reliable nutrient provides many essential key elements required by the yeast for growth and reproduction and is best used at \(\frac{1}{3} \) sugar depletion.

For optimal fermentation results, FERMAID K should be used in conjunction with the rehydration nutrient, GO-FERM PROTECT EVOLUTION[™] (pg 52).

Usage: Suspend FERMAID K in water or juice/must and mix well before adding, especially during fermentation to avoid CO, release and overflowing of vessel.

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

Recommended Dosage 25-50 g/h	hL 2-4 lb/1000 gal
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Stage of winemaking: ½ sugar depletion Provides: Complex nutrient blend	Impact: Fermentation health and security	Measurable YAN at 25 g/hL dose: 25 ppm YAN equivalents at 25 g/hL dose: 25 ppm
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\$82.00

FERMAID O

LALLEMAND OMRI Organic yeast nutrient; OMRI listed

FERMAID O[™] is a blend of highly specific inactivated yeast fractions that are rich in assimilable amino acids (organic nitrogen). Its amino acid profile is highly consistent. Though FERMAID O does not supply a lot of Measurable YAN (see pg 48 for more info), it is a highly effective nutrient. It reliably lowers peak fermentation temperatures, improves fermentation kinetics and the yeast produce lower levels of negative sulfur compounds. FERMAID O use has been correlated with positive aromatic expression (thiols and esters) and mouthfeel. For more info, see article on pg 57.

FERMAID O does not contain any DAP or supplemented micronutrients. For optimal results, FERMAID O should be used

#35-15032	2.5 kg	\$123.50
#35-15032B	10 kg	\$469.00

in conjunction with GO-FERM PROTECT EVOLUTION™ rehydration nutrient (pg 52).

Usage: Suspend FERMAID O in water or juice/must and mix well before adding, especially during fermentation to avoid CO₂ release and overflowing of vessel.

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

Recommended Dosage	10-40 g/hL	0.83-3.3 lb/1000 gal	
	01		

Note: Due to high nutrient requirements, some yeast strains may benefit from additional nutrient supplementation (see yeast reference chart on pgs 10-17 and Nitrogen Supplementation article on pgs 50-51).

Stage of winemaking: Onset of fermentation and/or ½ sugar depletion	Provides: Highly consistent source of amino acids	Impact: Fermentation security and enhanced aroma production	Measurable YAN at 40 g/hL dose: 16 ppm YAN equivalents at 40 g/hL dose: 64-96 ppm

FERMCONTROL BIO

Organic yeast nutrient

FermControl™ BIO is one pouch solution for a complete nutrition and supplementation of yeast during alcoholic fermentation.

It is a special nutrition supplement based on organic yeast derivatives for the support of yeast metabolism. FermControl BIO contains organic nitrogen which has been correlated with positive aromatics in wine. It also contains natural derived vitamins and trace elements that have at least the same functionality and importance as nitrogen.

Addition of other fermentation additives for example glutathione preparation, DAP are not of tangible benefit when using FermControl BIO during the fermentation process.

Usage

Dissolve the recommended dose of FermControl BIO in water or wine at approx. 20°C (68°F). Stir until you get a homogenous suspension without any solids.

The addition of FermControl™ is to be carried out at two stages during the fermentation.

1 kg

To ensure optimum performance of FermControl BIO the minimum recommended YAN is 140. If YAN is insufficient, please adjust with max 20-30g/hL of DAP, added simultaneously with Addition #1.

Storage

#37-13465

Dated expiration. Store in a cool and dry environment at 20°C(68°F). Once opened, use all contents within maximum 7 days.

Recommended Dosage

Addition # 1 15-20 g/hL 1-2 days after yeast inoculation Addition # 2 15-20 g/hL 2/3 way through			
Addition #2 15.20 c/kg 2/3 way through	Addition # 1	15-20 g/hL	
Addition # 2 15-20 g/nL fermentation (< 8 Brix)	Addition # 2	15-20 g/hL	2/3 way through fermentation (< 8 Brix)

I	I		1	
Stage of winemaking: 1-2 days after yeast	Provides: Organic nitrogen from	Impact: Fermentation security and	Measurable YAN at 25 g/hL dose:	
inoculation & 2/3 way through fermentation	autolyed yeast	enhanced aroma production	18.5 ppm	

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 $\frac{1}{3}$ sugar depletion.

Stage of winemaking: Start of alcoholic fermentaion or ⅓ sugar depletion

Provides: Ammonia, phosphate and thiamin

Phosphate Titres contains 1% thiamin.

#38-12090

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

1 kg

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

Recommended Dosage 6 g/hL 0.5 lb/1000 gal

Impact: Supports cell growth, drives fermentation rate

#35-15099

Measurable YAN at 25 g/hL dose: 50 ppm

\$51.00

\$16.95

RESKUE (ALLEMA

Specific inactivated yeast for treating sluggish and stuck fermentations

RESKUE $^{\text{\tiny{TM}}}$ is a specific wine yeast that has been inactivated and treated with a specialized process to create cells with very high bioadsorptive properties specific for short- and medium-chain fatty acids. These fatty acids are toxic to yeast and bacteria and are created by yeast during stressful fermentation conditions. Their presence interferes with yeast membrane sugar transport proteins thereby interfering with sugar uptake rates and fermentation success. Using RESKUE removes these toxins and reinvigorates sluggish or stuck alcoholic and/or malolactic fermentations.

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 challenging fermentation. For stuck fermentations, allow RESKUE to settle for 48 hours then rack off and follow restart protocol (pgs 43 and 81).

1 kg

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

Recommended Dosage | 30-40 g/hL | 2.5-3.3 lb/1000 gal



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

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

Stage of winemaking: Any point during fermentation

Provides: Highly specific autolyzed yeast with bioadsorptive properties

Impact: Reinvigorates and detoxifies sluggish/stuck fermentations

YAN contribution: Insignificant

Malolactic Fermentation

Enzymes

#35-15031

Autolyzed yeast

SIY 33 (FERMAID 2133)

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 K, SIY 33 (Fermaid 2133) does not contain added ammonia salts (DAP) or supplemented micronutrients.

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.

12.5 kg

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

Recommended Dosage 25 g/hL 2 lb/1000 gal

Stage of winemaking: ½ sugar depletion

Provides: organic nitrogen from autolyzed yeast, B vitamins and yeast hulls Impact: Fermentation security Measurable YAN at 25 g/hL dose: 8 mg N/L

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.

#35-15069 20 kg \$763.00

Usage: In order to avoid CO_2 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 $18^{\circ}C(65^{\circ}F)$. Once opened, keep tightly sealed and dry.

Recommended Dosage 25 g/hL 2 lb/1000 gal

Stage of winemaking: During fermentation

Provides: Insoluble fractions of whole yeast cells

Impact: Improve fermentation kinetics & increase the surface area of must

YEAST DERIVATIVE NUTRIENTS

Yeast derivative nutrients are produced from specific strains of wine yeast that have been inactivated and then fully or partially autolyzed to provide enologically attractive compounds like polysaccharides and peptides. These compounds are harvested in their most reactive form. Each of our yeast derivative nutrients can be differentiated by strain, level of refinement, functional contribution, and the presence of specific fractions such as glutathione. These winemaking tools contribute certain fermentative advantages and significant wine quality improvement.

All yeast derivative nutrients will contribute some nitrogen to a fermentation, but different autolyzed yeast products are used for different reasons. The nitrogen (YAN) contribution is only mentioned if the goal of the product is fermentation security. Used alone, these nutrients they should not be viewed as a substitute for the complete range of fermentation nutrition products listed in the preceding pages.

SELECTING YEAST DERIVATIVE NUTRIENTS FOR SUCCESS

Yeast derivatives have been used for centuries, historically in the form of (autolyzed) yeast lees. Lees aging enhances the complexity and stability of wines, but the process is slow and can take years to complete. It also comes with risks of sulfur off-odor release, microbial spoilage, and unpredictable outcomes due to the variability of the yeast used for fermentation. Yeast derivative nutrients are autolyzed (inactivated) yeast that can contribute to balance, aroma preservation and color stability in red, white and rosé wines without the risks associated with lees aging. Yeast derivative nutrients can be used at various stages of the fermentation process, from grape to fermentation completion.

Glutathione and other peptides protect aromas due to their antioxidant and quinone-scavenging properties. Polysaccharides can bind with some aroma compounds leading to a stabilizing effect as well as a lengthening of aroma sensations.

AROMA STABILITY

COLOR STABILITY

High molecular weight polysaccharides can interact positively with polyphenolic compounds. This complex can help stabilize polymeric pigments (color).

PEPTIDES

Peptides act as antioxidants and quinone-scavengers and give the perception of sweetness.

GLUTATHIONE

Glutathione is a natural tripeptide found in grapes and yeast in two forms: reduced (GSH) and oxidized (GSSH). In winemaking, GSH is the active form that can scavenge ortho-quinones and can act as a buffer in redox reactions. This powerful antioxidant helps to protect juice and wine from the harmful effects of oxygen.

MOUTHFEEL

Aging on lees releases mannoproteins and polysaccharides that result in reduced astringency and an increase in mouthfeel. When polysaccharides complex with tannins there are fewer reactive sites where the tannin can react with salivary proteins, thus lowering the perception of astringency.

POLYSACCHARIDES

The main sources of polysaccharides in wine are from grape skin walls or yeast. Yeast-based polysaccharides can improve aroma, color stability and mouthfeel. They can add palate weight, sweetness and decrease astringency and bitterness depending on the molecular weight of the compound, its composition and structure.

\$122.00

YAN contribution: Insignificant

BOOSTER BLANC #35-15081 2.5 kg \$122.00

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

Whites, 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 cell 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.

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.

Recommended Dosage 30 g/hL 2.5 lb/1000 ga

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

DOOGTED DOUGE						
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~~~~~~				
Stage of winemaking: At the beginning or toward the end of fermentation	Provides: inactivated yeast macromolecules	Impact: enhanced mouthfeel	YAN contribution: Insignificant			

#35-15080

Impact: balance & smoother tannin

structure

**BOOSTER ROUGE**For greater and smoother tannin structure in reds

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 foremouth 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.

Provides: inactivated yeast

macromolecules

Stage of winemaking: At crush or

during fermentation

In ultra-premium reds from balanced and mature grapes, Booster Rouge shows good synergy with ICV D254 and ICV D21.

2.5 kg

Booster Rouge may also be added during the latter part of the alcoholic fermentation to contribute tannin intensity and alcohol integration.

**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 pumpover. 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.

Recommended Dosage	30 g/hL	2.5 lb/1000 gal
1		

Oak & Tannins

#### **GLUTASTAR**



Protects and stabilizes aroma and color compounds against oxidative damage

Aromatic Whites and Rosés

GLUTASTAR[™] is a yeast derivative nutrient that is used early in white and rosé winemaking to scavenge quinones. Quinones quickly lead to oxidative damage when left untreated. By scavenging quinones, aroma compounds and color are preserved. GLUTASTAR is a highly soluble, unique, autolyzed yeast that brings protective qualities of both specialized (nucleophilic) peptides and reactive glutathione to wines. The effect of GLU-TASTAR is long-lasting and its positive impact on varietal and fermentation-derived aromas (Figure 1) and wine color (Figure 2) contribute to a prolonged wine shelf-life.

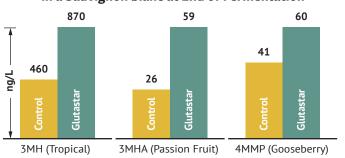
GLUTASTAR can be used in no- and low-SO, winemaking.

Usage: Mix GLUTASTAR in 10 times its weight of water or juice. Add directly to juice post-pressing for optimal protection. This product is mostly 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.

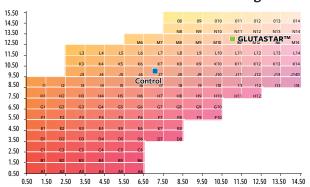
**Recommended Dosage** 30 g/hL 2.5 lb/1000 gal

Figure 1: Impact of GLUTASTAR on Volatile Thiol Content in a Sauvignon blanc at End of Fermentation



#35-15093 2.5 kg \$176.00

Figure 2: Color Analysis in a 2018 Provence Rosé of Syrah/Grenache. Trial Compares Control Wine with **GLUTASTAR added after Pressing** 



Provides: Peptides, polysaccharides and glutathione

Impact: Scavenges quinones to protect aromas and color

YAN contribution: insignificant

#### ARTICLE

Stage of winemaking: Add directly to

juice post-pressing

#### **GLUTASTAR: MORE THAN GLUTATHIONE**

Glutathione protects color and aromas from oxidation. Glutathione is a tripeptide naturally found in grapes and yeast in its reduced or oxidized form. In winemaking, only glutathione in its reduced form, GSH, protects musts and wines against oxidation due to its ability to scavenge ortho-quinones.

GSH plays a critical role in preventing the oxidation of wine phenols via the reaction of its sulfhydryl group with caftaric acid, one of the most browning-susceptible phenols in wine, to generate stable and colorless products. Other wine compounds also contain sulfhydryl groups (some thiols, the amino acid cysteine, and the glutamyl-cysteine dipeptide) but only GSH can react with caftaric acid.

Additionally, GSH can outcompete several wine aromatic thiols such as 3MH, 3MHA and 4MMP, for oxidative orthoquinones thus protecting these wine aromas.

Pure glutathione is not allowed to be added to must or wines but the early addition of GLUTASTAR™, a new GSH-rich yeast derivative, provides a natural alternative to optimize wine quality. GLUTASTAR was developed for the protection of white and rosé wines against oxidation phenomena responsible for color browning and loss of aromas. In fact, studies have shown GLUTASTAR to be more effective than glutathione alone.

NOBLESSE TALLEMAND OMR

Contributes to balance, sweetness and softness on the finish; OMRI listed

Reds, Complex Whites and Rosés

NOBLESSE™ is a partially autolyzed yeast derivative nutrient that gives the perception of sweetness and promotes harmony between mouthfeel characteristics in red, white and rosé wines. Upon addition, NOBLESSE starts to release polysacharides that can help mask sensations of acidity, astringency or bitterness while helping to integrate alcohol and oak.

Wines made using NOBLESSE appear to have more fruit and sweetness due to the contribution of low molecular weight polysaccharides. There is also a decrease in tannin intensity and a reduction in both drying and aggressive characters due to the softening effect of the high molecular weight polysaccharides. NOBLESSE can be used at any time during fermentation and although immediate results are possible, full integration may take three to five months.

2.5 kg

**Usage**: Mix NOBLESSE in 10 times its weight of 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  $18^{\circ}C(65^{\circ}F)$ . Once opened, keep tightly sealed and dry.

Recommended Dosage	30 g/hL	2.5 lb/1000 gal	
Impact: Adds sweetness, harmonizes and integrates mouthfeel	YAN co	ntribution: Insignificant	

#### **OPTI-MUM RED**

Stage of winemaking: Anytime during

fermentation processes



For increased color stability and roundness in red wines; OMRI listed Reds

The yeast strain behind OPTI-MUM RED™ was specifically selected and autolyzed for its highly reactive polysaccharides and oligosaccharides. Upon addition, OPTI-MUM RED's high molecular weight polysaccharides are released and quickly participate in reactions that stabilize color and polyphenolic compounds (tannins). The earlier that OPTI-MUM RED is used the more effective it is in reacting with early diffused color molecules. Using OPTI-MUM RED results in wines that are more intense in color and have a rounder and softer mouthfeel with a decreased perception of astringency.

#35-15078

#35-15077

2.5 kg

\$132.00

\$105.00

**Usage**: Mix OPTI-MUM RED in 10 times its weight of water or juice and add directly to the grapes or must. If adding later in fermentation, add during a pump-over or during tank mixings. This product is mostly 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.

**Recommended Dosage** | 20-40 g/hL | 1.7-3.3 lb/1000 gal

Stage of winemaking: Add directly to	
grapes or at first mixing	

Provides: High molecular weight polysaccharides and oligosaccharides

Provides: High and low molecular

weight polysaccharides

Impact: Color stability, volume and softness

#35-15079

YAN contribution: Insignificant

\$132.00

#### **OPTI-MUM WHITE**

For enhanced aromatic intensity and longevity; OMRI listed Whites

Opti-MUM White® is a yeast derivative nutrient which is produced using a new process that increases the glutathione bioavailability and the level of available polysaccharides.

Glutathione is a natural antioxidant that has been shown to protect against browning, enhance the fruity nature of aromatic wines and minimize undesirable aroma compounds.

Opti-MUM 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 Opti-MUM White should be used with a complete nutritional program.

2.5 kg

**Usage**: Mix Opti-MUM 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, dry environment at 18°C(65°F). Once opened, keep tightly sealed and dry.

**Recommended Dosage** 20-40 g/hL 1.7-3.3 lb/1000 gal

Stage of winemaking: After settling or at the onset of fermentation Provides: Polysaccharides and glutathione

Impact: enhanced aromatic intensity

YAN contribution: Insignificant



Malolactic Fermentation

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OPTI-RED



For rounder and smoother tannins in reds; OMRI listed Reds

OPTI-RED™ is an inactivated and partially autolyzed yeast derivative nutrient. OPTI-RED may be used either at the beginning or towards the end of red wine fermentations. Using OPTI-RED in the must quickly releases polysaccharides. These polysaccharides are then available to complex with polyphenols. This early complexing results in red wines with better color stability. Using OPTI-RED in the latter part of alcoholic fermentation allows the winemaker to shape harsh polyphenolics into smoother, more approachable tannins.

#35-15073	#35-15073 2.5 kg			
#35-15073B	10 kg	\$402.00		

**Usage**: Mix OPTI-RED in 10 times its weight of must or water and add during a punch-down or a pump-over to ensure OP-TI-RED is mixed in well. 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.

Recommended Dosage	30 g/hL	2.5 lb/1000 gal
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Stage of winemaking: An the completion of fer		Provides: High molecular weight polysaccharides	Impact: Early use promotes late use smooths harsh	YAN contribution: Insignificant				
~~~~~~	~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~	~~~~	~~~~~		
OPTI-WHITE CALLEMAND		ess and protects aromatics;	#35-15074	2.5 k	g	\$106.00		
OMRI listed	na smootime	iss and protects aromatics;	#35-15074B	10 kg	3	\$402.00		

Complex Whites and Rosés

OPTI-WHITE™ is prepared using a specific production process

that results in a yeast derivative nutrient containing both antioxidant peptides and polysaccharides. The peptides protect aromatics, whereas the polysaccharides help stabilize aroma compounds and enhance roundness.

When added to the juice at the onset of fermentation OP-TI-WHITE helps to prevent oxidative browning* while bringing smoothness and complexity. When OPTI-WHITE is added during the later stages of fermentation, it helps integrate the flavors.

*Use 50 g/hL for maximum antioxidative properties or use GLUTASTAR™ (pg 54) for maximum anti-browning potential.

Usage: Mix OPTI-WHITE in 10 times its weight of 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.

l	25 50 /1 5	2 4 11 /1000 1
Recommended Dosage	25-50 g/nL	2-4 lb/1000 gai

Stage of winemaking: Any time before the completion of fermentation antioxidant peptides Impact: Balances mouthfeel and protects aromas YAN contribution: Insignificant

FREQUENTLY ASKED QUESTIONS: YEAST NUTRIENTS

What is the difference between GO-FERM $^{^{TM}}$ and GO-FERM PROTECT EVOLUTION $^{^{TM}}$?

GO-FERM PROTECT EVOLUTION is the latest generation of rehydration nutrients, developed in conjunction with INRA, France, for today's winemaking needs. In addition to the vitamins and minerals that GO-FERM provides GO-FERM PROTECT EVOLUTION contains higher levels of unsaturated fatty acids and sterols for improved sugar uptake capacity and fermentation security.

Why doesn't my GO-FERM $^{\text{TM}}$ and GO-FERM PROTECT EVOLUTION $^{\text{TM}}$ 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.

Can I use FERMAID K^{TM} in my yeast rehydration water instead of GO-FERM TM ?

No, FERMAID K contains DAP and using nutrients that contain DAP during the rehydration phase is toxic to the yeast.

Every harvest I add 2 lb/1000 gal of FERMAID K^{TM} 1/3 of the way through fermentation. Is that what is recommended?

A 25g/hL addition at 1/3 of the way through fermentation may suffice, however, this depends on the specific conditions of each fermentation. To help build a nutrient supplementation program, see the planner on pg 51.

The purpose of a nitrogen addition at this point of fermentationis for re-synthesis of the sugar transport system in the yeast cell so that fermentation can continue. Ammonia uptake is inhibited above 10% alcohol; however, new research has shown that amino acids may be used even late in fermentation. A small addition of FERMAID O^{TM} or RESKUETM may be suitable if the 1/3 sugar depletion addition is missed. Though, this really is a case-by-case scenario.

Some suppliers say their nutrients contain a lot more nitrogen than FERMAID O. Why?

Other suppliers may be calculating total nitrogen versus the amount of nitrogen that can be utilized by the yeast (YAN). Not all nitrogen is assimilable by yeast and not all nitrogen is utilized equally. Nitrogen supplied as amino acids from autolyzed yeast are very efficiently used. Research shows that YAN from amino

acids can be four times more efficient than YAN from ammonia (DAP) (see article "FERMAID O^{$^{\text{TM}}$} is More Efficient than Ammonia" at scottlabsltd.com). That means that an addition of 40 g/hL of FERMAID O^{$^{\text{TM}}$} can be calculated as having a yeast assimilable nitrogen equivalent value of 64 ppm. A 40 g/hL addition of DAP as a comparison gives 80 ppm yeast assimilable nitrogen, but this is used up very quickly leading to a deficiency.

I checked my YAN and added DAP accordingly. Why do I still have offaromas and/or stuck fermentations?

Both inorganic (ammonia) and organic (amino acids and peptides) nitrogen occur naturally in grape must. Each type of nitrogen has a distinct role and impact on fermentation. While yeast may show an affinity for inorganic nitrogen, adding only ammonia (in the form of 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 program. If it is early enough in the fermentation, consider increasing your nutrient additions. Organic nutrients such as FERMAID O™ can go a long way in improving aromatics. If you are past the point where additional complex nutrients are recommended, run a bench trial with NOBLESSE™ and REDULESS™. If this is a continual problem, consider using our low- to no-H₃S strains.

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 OPTI-MUM RED $^{\text{TM}}$, OPTI-WHITE $^{\text{TM}}$ or NOBLESSE $^{\text{TM}}$.

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

Inactivated yeast derivative products like GLUTASTAR[™] can help retain aromatic intensity and longevity.

Why don't some nutrients increase YAN?

All yeast derived nutrients will have some nitrogen to contribute to a fermentation, but different autolyzed yeast products are used for different reasons. The YAN contribution is only mentioned if the goal of the product is nitrogen supplementation and fermentation security.



Malolactic fermentation (MLF) converts malic acid to lactic acid and 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.

Modern winemakers rely on Oenococcus oeni, a specific species

of lactic acid bacteria, to perform MLF. Our specfic O. oeni strains are compatible with today's winemaking styles. Their use can prevent unwanted microbial growth in high pH wines, wines with low SO₂, and higher alcohol wines. Additionally, these strains can limit biogenic amines and contribute positive flavors and aromas to wines.

SELECTING BACTERIA FOR SUCCESS

It is very important to know the properties of the wine prior to inoculating with malolactic bacteria. Analyze the wine for pH, SO₂, volatile acidity (VA), residual sugar, malic acid and alcohol. Extremes in one or more of these properties can have a compounding inhibitory effect on the growth of malolactic bacteria. For example, if a wine has low pH and high SO₂, that will be more antagonistic to the bacteria than low pH alone. Creating an optimal environment for malolactic bacteria includes:

TEMPERATURE	ALCOHOL LEVEL	рН	SO ₂
Optimal: 20-25°C(68-77°F)	Optimal: <13% (v/v)	Optimal: >3.5	Optimal:
Challenging: <60°F or >85°F	Challenging: >16% (v/v)	Challenging: <3.5	free SO ₂ <10 ppm, total SO ₂ <45 ppm molecular SO ₂ <0.3 ppm Challenging: free SO ₂ >10 ppm,
EFFECT OF pH, SO TEMPERATURE ON ML (16 15 14 13 12 - 3.3 Temperature OC Alcohol % 10 - 20 18 16 14 12 20 - 30 - 40 - 50 - Total SO PPM Favorable	total $SO_2 > 60 \text{ ppm}$ molecular $SO_2 > 0.3 \text{ ppm}$ ons Harsh

NUTRITIONAL STATUS

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). Good nutrition is important for malolactic bacteria and nutrients such as OPTI'MALO BLANC™ and ML RED BOOST™ will help with the growth and survival of specific malolactic bacteria. Malolactic nutrients are not as critical in a co-inoculation with yeast.

VOLATILE ACIDITY (VA)

Wines may have elevated VA due to high pH which allows other strains of bacteria to grow. The wine should be monitored for unwanted bacteria.

STRAIN COMPATIBILITY

Choose a yeast strain which is compatible with the selected malolactic bacteria. See MLF Compatibility in the yeast charts on pgs 10-17.

MALIC AND LACTIC 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. The higher the malic acid levels the higher the resulting lactic acid levels. This can be stressful for bacteria. Lactic acid levels of 1.5 g/L slow down bacteria and 3 g/L starts to inhibit MLF.

CHOOSING ML BACTERIA AND NUTRIENTS

			Direct Inoculation (MBR) Cultures						,	1-Step Cultures Freeze Dried Build-Up Cultures			Nutrients						
 Highly Recommended Recommended Note: The limits shown a vidually stressful. In comstresses are increased. Caspects such as nutrition be critical. 	bination, Other	BETA CO-INOC	ML PRIME	ALPHA	BETA	ELIOS 1	MBR 31	O-MEGA	PN4	SILKA	VP41	1 STEP ALPHA	1 STEP VP41	IB (INOBACTER)	MT01	ACTI-ML	OPTI'MALO PLUS	OPTI'MALO BLANC	ML RED BOOST
	Page#	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	79	79	78
Alcohol tolerance(% v/v)		<15%	<15.5%	<15.5%	<15%	<14%	<14%	<16%	<16%	<16%	<16%	<15.5%	<16%	<14%	<15%				
pH limit		>3.2	>3.4	>3.2	>3.2	>3.4	>3.1	>3.1	>3.1	>3.3	>3.1	>3.2	>3.1	>2.9	>2.8				
Total SO ₂ limit (mg/L)		<60	<50	<50	<60	<50	<45	<60	<60	<60	<60	<50	<60	<50	<80				
Temperature °C(°F)		>14° (57°)	>20° (68°)	>14° (57°)	>14° (57°)	>18° (64°)	>13° (55°)	>14° (57°)	>16° (61°)	>15° (59°)	>16° (61°)	>14° (57°)	>16° (61°)	>18° (64°)	>15° (59°)				
Relative nutrient demand		High	Low	Low	High	Med	Med	Low	Med	Med	Low	Low	Low	Low	Low				
Typical fermentation kinetics	Start	Slow	Fast	Fast	Slow	Mod	Slow	Fast	Mod	Mod	Fast	Fast	Fast	Fast	Fast				
kinetics	Finish	Fast	Fast	Slow	Fast	Fast	Fast	Fast	Fast	Mod	Fast	Slow	Fast	Fast	Fast				
Reds		٠	•	٠	•	•	٠	•	٠	٥	٠	٥	٥	٠	٠	٠	٠		•
Whites and Rosé		٠		•	•		٠	•	٥		٠	٥	٥	٠	٠	٠	٠	٠	
Fruit, Cider and Mead				٥			٨		٠				٥			٠	•		
Compatible with yeast co-in	noculation	٠	•	٥	٥	٥	٥	٥		٥	٥	٥	٥						
Higher diacetyl production				٥	\ *		٥		•	٥		٥							
Enhances mouthfeel and fu	ıllness			٥	٥	٥			٥	•	٠	٥	•						
Enhances structure				٥		•				•	٥	٥	٥						
Enhances fruitiness and/or	spiciness	٥				٥	٥	•	٥		٥								
Restart stuck or sluggish M	ILF							٥			٥	٥	٥						٠
Bacteria rehydration nutrie	ent															•			
Nutrient for difficult red M	LFs																		•
Nutrient for difficult white	MLFs																	٠	
General ML Nutrient																	٥		
OMRI listed																		٨	•

^{*}when inoculated in sequential order with yeast

DIRECT ADDITION BACTERIA

Grape juice, grape must and wine environments are hostile to malolactic bacteria (ML) and effective winemaking strains must overcome these hostilities. Lallemand Oenology developed the MBR™ process to produce robust, efficient, and well-adapted wine bacteria which can be directly inoculated without rehydration. Our MBR™ ML strains rapidly convert malic acid into lactic acid and positively contribute to the wine sensory profile.

Our ML strains do not contain the decarboxylase enzymes known to produce biogenic amines. They are also cinnamyl esterase negative meaning they cannot produce the precursors for ethyl phenol production by Brettanomyces.

TIMING OF ADDITION: CO-INOCULATION

Malolactic bacteria can be added just after the yeast so that the alcoholic and malolactic fermentation (MLF) occur simultaneously. This co-fermentation is referred to as co-inoculation. Alternatively, malolactic bacteria can be added towards the end or at the end of alcoholic fermentation. This is referred to as sequential inoculation (see Timing of Inoculation: SEQUENTIAL INOCULATION below).

Co-inoculating bacteria with yeast has many benefits. Malolactic bacteria growth conditions are more favorable during alcoholic fermentation due to warmer temperatures, lack of alcohol, and better nutrient availability. This allows MLF to finish shortly after alcoholic fermentation. Co-inoculation favorably impacts aromas and flavors - wines are fresh and fruity with very little diacetyl (butter) character.

BETA CO-INOC



#35-15058C

25 hL (660 gal) dose

\$146.50

Co-inoculation strain of Oenococcus oeni for fresh and fruit-

forward wines

White, Red, Rosé

ENOFERM BETA CO-INOC™ is recommended for fresh, fruit-forward red and

This Oenococcus oeni strain was specifically selected by Lallemand Oenology for reliable malic acid consumption when added to juice/must 24-48 hours after yeast inoculation. BETA CO-INOC is not recommended for use in a sequential MLF.

This strain is a low diacetyl (low buttery aromas) and low VA producer.

BETA CO-INOC is added directly to pH>3.2 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 14-28°C(57-82°F). Total SO₂ at crusher should not exceed 60 ppm.

In co-inoculation fermentations, the health and success of the alcoholic fermentation are keys to success. Factors such as pH, turbidity, temperature and nutrition must be considered. This is especially important if the pH is >3.5. BETA CO-INOC is not recommended for wines with alcohol potential >15% (v/v).

Usage: Add directly to juice 24-48 hours after yeast inoculation and mix thoroughly.

RED FRUITS TROPICAL HIJON J. HOOMS STRUCTURE

Storage: Dated expiration. For short term (<18 months) store at 4°C(39°F). For long term (>18 months) store at -18°C(0°F).

Alcohol Tolerance: <15%	pH: >3.2	Total SO ₂ at crush: <60 ppm	Temp: <28°C once alcohol >5% (v/v)
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TIMING OF ADDITION: SEQUENTIAL INOCULATION

Many winemakers prefer to add malolactic bacteria (ML) towards the end of alcoholic fermentation. This is known as sequential inoculation. In wines with pH >3.5, residual sugar can be consumed by malolactic bacteria to form volatile acidity (VA). When malolactic fermentation is conducted after alcoholic fermentation, the risk of VA production by ML is minimized. Wines made by sequential inoculation can also give different flavor profiles than co-inoculated wines. Sequential inoculation wine may have higher levels of buttery character (especially when using certain ML strains) and enhanced aromatic complexity.

ARTICLE

MANAGING VOLATILE ACIDITY PRODUCTION DURING SIMULTANEOUS ALCOHOLIC AND MALOLACTIC FERMENTATION

Adding malolactic bacteria just after inoculating with yeast allows the alcoholic fermentation and malolactic fermentation to occur simultaneously. A simultaneous alcoholic and malolactic fermentation has several benefits. The bacteria slowly acclimate to ethanol, nutrients are not in short supply, and malolactic fermentation finishes faster (compared to when bacteria is added post alcoholic fermentation). This means that wines can be stabilized sooner. In addition, the wines are fresher and fruitier when malolactic fermentation occurs during alcoholic fermentation.

Even though these benefits have been known for many years there is still a concern that this practice will lead to high acetic acid (VA). This is a valid concern as Oenococcus oeni, the bacteria used to conduct the malolactic fermentation, can produce acetic acid (VA), ethanol, and lactic acid from glucose. The VA risk can be minimized by following some best practices:

- Choose an ML compatible yeast strain for the alcoholic fermentation (see pgs 12-17)
- Monitor Brix and malic acid depletion during alcoholic fermentation
- Manage the alcoholic fermentation temperature
 - » At inoculation temperature should not exceed 25°C (78°F)
 - » Alcohol < 6% temperature should not exceed 35°C (95°F)
 - Alcohol >6 10 % temperature should not exceed 28°C (82°F)
 - Alcohol >10 12 % temperature should not exceed 26°C (79°F)
 - Alcohol > 12 % temperature should be less than 24°C (75°F)
 - Alcohol > 14.5 % temperature should be less than <21 °C (70 °F)

Using BETA CO-INOC™ for co-inoculation has benefits over some of the other direct addition malolactic bacteria in our portfolio. BETA CO-INOC™ is slow to start, so it does not interfere with yeast implantation, but finishes fast. BETA CO-INOC™ preferentially consumes malic acid and once the malic acid has been depleted then citric acid will be consumed. Only after the depletion of the organic acids will the bacteria consume sugar. This preferential uptake of malic acid, then citric acid, then sugar happens irrespective of pH, however at pH>3.5 it will happen quicker than pH<3.5. If the malic acid is gone and there is still residual sugar, then add BACTILESS™ or DELVOZYME to inhibit the bacteria and avoid the production of VA, ethanol, and lactic acid from the remaining glucose.

ML PRIME



Lactobacillus plantarum to reduce the risk of VA increase

ML PRIME is a new concept of freeze-dried starter culture of a powerful Lactobacillus plantarum with very high malolactic activity and no risk of volatile acidity (VA) production.

Selected by Università Cattolica del Sacro Cuore - Piacenza Campus in Italy, it is the perfect tool for winemakers for red vinification with low natural acidity (pH \geq 3.4) and total SO₃ content up to 5 g/hL.

Properly used in co-inoculation, ML PRIME is able to achieve a very fast malolactic fermentation before the growth of indig-

#35-15039A	25 nL (660 gal) dose	\$216.00
#35-15039	100 hL (2640 gal) dose	\$710.00

enous bacteria, often responsible for the VA increase or other wine defects in high pH conditions.

ML PRIME is suited to conduct MLF in the classical red winemaking process (short and medium maceration or vinification in the liquid phase). Addition of press wine with residual malic acid into the same tank previously inoculated with ML PRIME is not recommended.

Storage: Dated expiration. For short term (<18 months) store at 4° C(40° F). For long term (>18 months) store at -18° C(0° F).

Alcohol Tolerance: <15.5%	pH: >3.4	Total SO, at crush: <50ppm	Temp: >20°C

ALPHA	LALLEMAND
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Oenococcus oeni for aroma complexity and mouthfeel enhancement White, Red

#35-15059	2.5 hL (66 gal) dose	\$21.80
#35-15060	25 hL (660 gal) dose	\$164.50
#35-15060A	250 hL (6,600 gal) dose	\$896.80

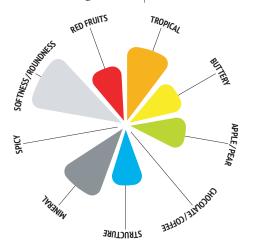
ENOFERM ALPHA $^{\text{\tiny M}}$ contributes to wine aroma complexity and mouthfeel in red and white wines. White wines have increased levels of pear, apricot and pineapple aromas. Red wines have more berry, cherry and plum aromas with a softer, rounder mouthfeel and decreased green and vegetative characters.

ALPHA was selected by the Institut Français de la Vigne et du Vin (IFV, formerly ITV) for its high survival rate, dominance during malolactic fermentation and reliability under varied conditions.

This Oenococcus oeni strain shows good resistance to botrycides.

Usage: Add directly to wine and mix thoroughly.

Storage: Dated expiration. For short term (<18 months) store at 4° C(39°F). For long term (>18 months) store at -18° C(0°F).



Alcohol Tolerance: <15.5%	pH: >3.2	Total SO ₂ : <50ppm	Temp: >14.5°C	

BETA

LALLEMAND

Oenococcus oeni for increased diacetyl production, fruit and floral expression, and tannin integration

Wh	ite,	Rec
V V I I	ıιc,	VEC

#35-15058	2.5 hL (66 gal) dose	\$21.80
#35-15058A	25 hL (660 gal) dose	\$164.50
#35-15058B	250 hL (6,600 gal) dose	\$896.80

RED FRUITS

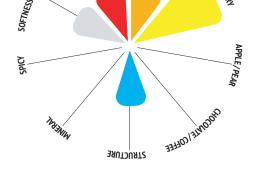
ENOFERM BETA™ preserves and enhances varietal aromas, increases volume and softness, and can impact the diacetyl levels of wines. In white wines buttery aromas and flavors are produced. If the wine is left on the lees, the buttery notes are decreased and tropical fruit aromas like pineapple and mango are evident. In red wines, BETA is used to support tannin structure and red fruit flavors. Compounds such as beta-damascenone and beta-ionone are increased, contributing floral and berry notes.

BETA was isolated in the Abruzzi wine region of Italy for its robustness and aromatic enhancement while respecting grape varietal characteristics.

BETA is a high nutrient demanding strain and benefits from the addition of either ACTI-ML[™] (pg 78) or ML RED BOOST[™] (pg 78).

Usage: Add directly to wine and mix thoroughly.

Storage: Dated expiration. For short term (<18 months) store at 4° C(39°F). For long term (>18 months) store at -18° C(0°F).



TROPICAL

Alcohol Tolerance: <15%	pH: >3.2	Total SO ₂ : <60ppm	Temp: >14°C
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3HOO) HINDORD

STRUCTURE

Cenococcus ceni for enhanced fresh fru

Oenococcus oeni for enhanced fresh fruit, spice and tannin integration

#35-15055 25 hL (660 gal) dose #35-15056 250 hL (6,600 gal) dose \$149.50 \$819.50

Red

LALVIN ELIOS $1^{\text{\tiny TM}}$ is suited for Mediterranean, Rhône style and other warm climate red wines for enhanced red fruit aromas, spice, and tannin intensity. Wines have an integrated mouthfeel with good mid-palate intensity, decreased drying sensations and increased freshness.

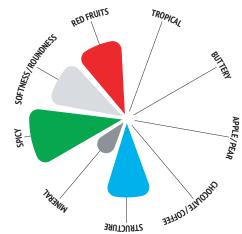
The perception of green and vegetative characters is reduced.

This strain of *O. oeni* was isolated by the Institut Coopératif du Vin (ICV) from a spontaneous malolactic fermentation for its fast implantation and reliable malic acid degradation.

ELIOS 1 has a high capacity to degrade acetaldehyde during malolactic fermentation (MLF) and for a few days after. Since acetaldehyde strongly binds SO_2 , using ELIOS 1 to reduce acetaldehyde may make post MLF SO_2 additions more effective.

Usage: Add directly to wine and mix thoroughly.

Storage: Dated expiration. For short term (<18 months) store at 4° C(39°F). For long term (>18 months) store at -18° C(0°F).



Alcohol Tolerance*: <14% pH: >3.4 Total SO ₂ : <50ppm Temp: >18°C	
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^{*}Alcohol tolerance of ELIOS 1 is improved (up to 15.5%) when the pH>3.5 and TSO₂<35ppm

LALVIN (MBR) 31 (ALLEMAND

Oenococcus oeni for balanced sensory and color stability in low pH wine and low temperature ferments

White, Red, Fruit, Cider

#35-15053	2.5 hL (66 gal) dose	\$21.80
#35-15049	25 hL (660 gal) dose	\$149.50
#35-15054	250 hL (6,600 gal) dose	\$817.00

RED FRUITS

LALVIN 31^{TM} is suitable for cool climate red and white wines, enhancing varietal characters, fruit flavors and promoting color stability. In white wines, it adds complexity due to its light buttery flavor. With lees contact the buttery notes decrease, elevating fruit flavors and mineral notes. In red wines, dark berry fruit flavors, color stability and mouthfeel are increased. Wines made using LALVIN 31 have good body and length.

This *O. oeni* strain was selected by the Institut du Français de la Vigne et du Vin (IFV) in France for its capacity to achieve good and reliable malolactic fermentation under difficult wine conditions such as low pH and low temperature.

LALVIN 31 is tolerant to levels of lactic acid that can be inhibitory to other ML strains.

Due to its high nutrient demand, it is sometimes slow to start but finishes quickly, especially when used in conjunction with OPTI'MALO BLANCTM (pg 79) or ML RED BOOSTTM (pg 78).

Usage: Add directly to wine and mix thoroughly.

Storage: Dated expiration. For short term (<18 months) store at 4°C(39°F). For long term (>18 months) store at -18°C(0°F).

Alcohol Tolerance: <14%	pH: >3.1	Total SO ₂ : <45ppm	Temp: >13°C
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O-MEGA

Oenococcus oeni strain for strong fermentation, freshness and fruit expression

#35-15060B	25hL (660 gal) dose
#35-15060C	250hL (6,600 gal) dose

White, Red

O-MEGA™ is suitable for fresh fruit expression in high maturity grapes. O-MEGA balances and complements ripe flavors in white wines by bringing freshness, mineral and citrus notes. In red wines it highlights red and dark berries like redcurrant, strawberry, blackcurrant and blackberry. Using this bacteria strain in red wines may help stabilize color due to its slow degradation of acetaldehyde. Although recommended for ripe grapes it does well in cold climate Pinot noirs.

O-MEGA has a late degradation of citric acid resulting in very low diacetyl and low volatile acidity.

It should not be used in wine with herbaceous or vegetative notes as these will be amplified.

O-MEGA was selected in the south of France by the Institut du Français de la Vigne et du Vin (IFV) in Burgundy for its ability to complete MLF, even under challenging wine conditions of high alcohol, low pH and low temperatures.

pH: >3.1

Usage: Add directly to wine and mix thoroughly.

Alcohol Tolerance: <16%

Storage: Dated expiration. For short term (<18 months) store at 4°C(39°F). For long term (>18 months) store at -18°C(0°F).

,	RED FRUITS	TROPICAL	
SOFTNESS HOWING			BUTEN
in.		is alignization	APPLE/PEAR CHOCK
	RUCTURE	LJ	

RED FRUITS

Temp: >14°C

TROPICAL

\$161.00

\$880.00

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PN4 (ALLEMAND)	#35-15064	25 hL (660 gal) dose	\$164.80
Oenococcus oeni for fast fermentation with enhanced spice, fruit	#35-15064A	250 hL (6,600 gal) dose	\$817.00

Total SO2: <60ppm

and mouthfeel Red, White

 $PN4^{TM}$  is equally suited to red and white winemaking where it contributes to aromatic complexity, mouthfeel and balance.

Red wines are described as having increased spiciness with elevated notes of nutmeg, licorice and pepper. General fruit notes of plum, cherry and berry are increased, structure is enhanced and herbaceousness masked.

In tank fermented white wines with minimal lees contact, varietal expression is increased. In barrel fermented white wines notes of honey and butter (diacetyl) are reported, mouthfeel is full and creamy and oak is well-integrated.

PN 4 was isolated from a spontaneous malolactic fermentation in a Pinot noir by the Institute of San Michele in the Trentino region of Italy for its fast fermentation kinetics under difficult winemaking conditions. .

**Usage**: Add directly to wine and mix thoroughly.

Storag long te

<b>ge</b> : Dated expiration. For short term (<18 months) store at 4°C(39°F). For erm (>18 months) store at -18°C(0°F).		at 4°C(39°F). For	STRUCTURE STRUCTURE
Alcohol Tolerance: <16%	pH: >3.1	Total SO ₂ : <60ppm	Temp: >16°C

\$164.80

SILKA (ALLEMAND

Oenococcus oeni for silky mouthfeel, aromatic balance and good oak integration

Red

LALVIN SILKA[™] is recognized for its positive impact on aromas and mouthfeel.

SILKA accentuates aromas of chocolate, vanilla, and toast, balanced by aromas and flavors of red currant, blackberry and cherry.

This malolactic bacteria is well-suited for wines fermented and aged on oak where it minimizes astringency and bitterness and masks herbaceous and green flavors resulting in well balanced red wines.

SILKA was isolated in La Rioja, Spain and selected by the Instituto de Ciencias de la Vid y del Vino (ICVV) during an extensive research program for its unique sensory characteristics, steady fermentation kinetics, and tolerance of challenging winemaking environments.

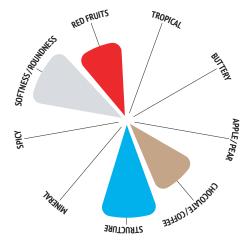
SILKA has a moderate nutrient demand and benefits from the addition of malolactic fermentation nutrient like ML RED BOOST TM  (pg 78).

**Usage**: Add directly to wine and mix thoroughly.

Alcohol Tolerance: <16%

**Storage**: Dated expiration. For short term (<18 months) store at  $4^{\circ}$ C(39°F). For long term (>18 months) store at  $-18^{\circ}$ C(0°F).

pH: >3.3



Temp: >15°C

25 hL (660 gal) dose

#35-15057

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VP41 (ALLEMAND	#35-15063	2.5 hL (66 gal) dose	\$21.80
All-purpose Oenococcus oeni for enhanced complexity and mouthfeel	#35-15061	25 hL (660 gal) dose	\$149.50
Red, White, Rosé	#35-15062	250 hL (6,600 gal) dose	\$822.50

Total SO₂: <60ppm

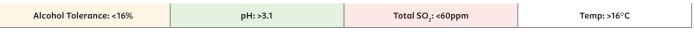
LALVIN VP41™ is appreciated for its ability to enhance aromatic complexity, richness and mouthfeel in red, white and rosé wines. Red wines have increased currant and berry flavors and aromas, with enhanced coffee and chocolate notes, and sweet tannins. White wines have elevated tropical fruit flavors, apple and pear notes and very low diacetyl levels.

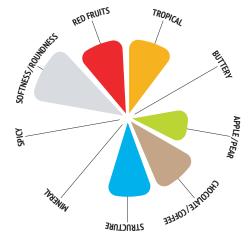
VP41 was isolated in Italy during an extensive European Union collaboration for its strong implantation rate, steady fermentation kinetics, high alcohol tolerance, enhanced mouthfeel and ability to improve wine structure.

Attemperatures below $16^{\circ}C(61^{\circ}F)$ it is a slow starter but can complete fermentation. Recommended strain for restarting stuck malolactic fermentations (see Restart ML protocol pg 81).

Usage: Add directly to wine and mix thoroughly.

Storage: Dated expiration. For short term (<18 months) store at 4° C(39°F). For long term (>18 months) store at -18° C(0°F).





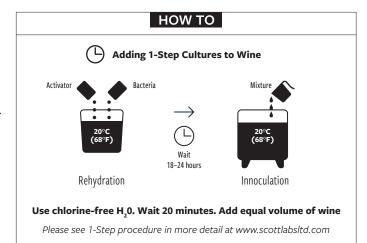
1-STEP CULTURES

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.



1-STEP ALPHA



O. oeni adapted to high alcohol; enhances mouthfeel White, Red

#35-15035C	25 hL (660 gal) dose	\$135.00
#35-15035B	100 hL (2640 gal) dose	\$240.80
#35-15035A	500 hL (13 200 gal) dose	\$1456.00
#35-15035	1000 hL (26 400gal) dose	\$2064.00

1-STEP® ALPHA (same strain as ENOFERM ALPHA) was selected by the IFV in France from a spontaneous malolactic fermentation. It shows good fermentation activity.

The 1-STEP® ALPHA starter kit combines a highly effective malolactic starter culture with an activator to induce malolactic fermentation in an 18–24 hour acclimitization procedure.

Known strain that has proven effective at alcohol levels up to 15.5% (v/v), pH above 3.2, total SO_2 up to 50 ppm, and temperature down to 14°C(57°F).

Storage: Dated expiration. For short term (<18 months) store at $4^{\circ}C(40^{\circ}F)$. For long term (>18 months) store at $-18^{\circ}C(0^{\circ}F)$.

Alcohol Tolerance: <15% pH: >3.2 Total SO ₂ : <50ppm Temp: >14°C	Alcohol Tolerance: <15%	pH: >3.2	Total SO ₂ : <50ppm	Temp: >14°C
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1-STEP VP41



O. oeni adapted to high SO₂ and high alcohol; enhances complexity and mouthfeel White, Red

24 hour build-up procedure.

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–

Known strain that has proven effective at high alcohol levels

	#35-15036	100 hL (2640 gal) dose	\$241.50
	#35-15037	500 hL (13 200 gal) dose	\$1146.00
·	#35-15038	1000 hL (26 400gal) dose	\$1822.00

(up to 16% v/v), pH above 3.1, total SO_2 up to 60 ppm, and temperature down to $16^{\circ}C(61^{\circ}F)$.

Storage: Dated expiration. For short term (<18 months) store at 4° C(40° F). For long term (>18 months) store at -18° C(0° F).

Alcohol Tolerance: <16%	pH: >3.1	Total SO ₂ : <60ppm	Temp: >16°C	
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Yeast Nutrients

Oak & Tannins

Enzymes

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)

25-50 hL (660-1320 gal) dose #35-15042

\$89.80

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

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

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

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

Storage: Dated expiration. For short term (<18 months) store at $4^{\circ}C(40^{\circ}F)$. For long term (>18 months) store at $-18^{\circ}C(0^{\circ}F)$.

Alcohol Tolerance: <14%	pH: >2.9	Total SO ₂ : <50ppm	Temp: >18°C
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MT01

25-50 hL (660-1320 gal) dose

\$81.50

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.

Storage: Dated expiration. For short term (<18 months) store at $4^{\circ}C(40^{\circ}F)$. For long term (>18 months) store at $-18^{\circ}C(0^{\circ}F)$.

AL L LT L 450/		T . 100 00	T 1506
Alcohol Tolerance: <15%	pH: >2.8	Total SO ₂ : <80ppm	Temp: >15°C

MALOLACTIC BACTERIA NUTRITION

The growth and activity of malolactic bacteria is dependent on many factors including wine temperature, pH, SO_2 , alcohol, presence of inhibitors and nutrient availability. Malolactic bacteria have complex nutrient needs. If any of the essential nutrients are missing, then malolactic fermentations may struggle or stick completely. Even under ideal conditions, malolactic bacteria grow slowly. Taking care of their nutritional needs will alleviate some of the challenges associated with malolactic fermentation (MLF). We classify our ML strains' relative nutrient requirement as low, medium or high nutrient need. See "Choosing ML Bacteria and Nutrients" chart (pg 69) for more information.

ACTI-ML



Bacteria rehydration nutrient

Reds, Whites and Rosés

ACTI-ML™ is a bacteria nutrient used during rehydration. This specialized nutrient is a blend of inactivated yeast rich in amino acids, mineral and vitamins.

ACTI-ML was developed by the Lallemand Oenology Bacteria R&D team led by Dr. Sibylle Krieger-Weber, to strengthen the development of direct inoculation strains of bacteria, especially under difficult conditions.

ACTI-ML is also mixed with cellulose to provide more surface area to help keep bacteria in suspension.

#35-15090

1 kg

\$48.50

Usage: Mix ACTI-ML into 5 times its weight of 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.

Recommended	20 /11	.	1 = 11 /1000 1
Dosage	20 g/hL	50 g/60 gal	1.7 lb/1000 gal

ML RED BOOST



Malolactic nutrient for red and stuck malolactic fermentations,

OMRI listed

Reds, Restarts

ML RED BOOST[™] is an advanced bacteria nutrient providing amino acids, peptides, polysaccharides and minerals from specific inactivated yeast.

ML RED BOOST improves the survival rate and the resistance of bacteria against the inhibitory effects of polyphenolic compounds while also compensating for nutritional deficiencies in wine. This results in healthier O. oeni and shorter malolactic fermentations.

ML RED BOOST is highly recommended for restarting sluggish and stuck malolactic fermentations (see protocol on pg 81).

#35-15072C

1 kg

\$48.50

Usage: Suspend in small amount of water or wine and then add directly to the wine 24 hours before adding the malolactic bacteria. ML RED BOOST should not be added to the ML rehydration water (if rehydrating ML).

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

Recommended	20 ~/1-1	50 =/(0 ==1	1 7 11-/10001
Dosage	20 g/hL	50 g/60 gai	1.7 lb/1000 gal

\$48.50

OPTI'MALO BLANC (ALLEMAND OMRI



Malolactic nutrient for white and rosé malolactic fermentations; **OMRI listed**

White and Rosés

OPTI'MALO BLANC™ is a unique malolactic nutrient specifically formulated for white and rosé wines.

This nutrient is a blend of inactivated yeast, rich in amino acids and specific peptides to help overcome the challenges of malolactic fermentation in white and rosé wines.

OPTI'MALO BLANC can compensate for nutritional deficiencies, stimulate the growth and malic acid metabolism of the bacteria and decrease MLF duration allowing wines to be stabilized quicker.

\$48.50 #35-15072B 1 kg

Usage: Suspend in small amount of water or wine and then add directly to the wine just before adding the malolactic bacteria. OPTI'MALO BLANC should not be added to ML rehydration water (if rehydrating ML).

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

Recommended Dosage	20 g/hL	50 g/60 gal	1.7 lb/1000 gal
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#35-15072

OPTI'MALO PLUS



General malolactic fermentation nutrient

Reds, White and Rosés

OPTI'MALO PLUS™ is a general-purpose malolactic fermentation (MLF) nutrient. It is a blend of inactivated yeasts rich in amino acids, minerals, vitamins, cell wall polysaccharides and cellulose. The cellulose provides surface area to keep the bacteria in suspension and to help adsorb toxic compounds that may be present at the end of alcoholic fermentation.

ML RED BOOST[™] (pg 78) is the preferred MLF nutrient over OPTI'MALO PLUS for red wines and OPTI'MALO BLANC™ is preferred for white and rosé wines.

Usage: Suspend in a small amount of water or wine and add directly to the wine just before adding the malolactic bacteria. OPTI'MALO PLUS should not be added to ML rehydration water (if rehydrating ML).

1 kg

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

!			
Recommended	20 g/hL	50 g/60 gal	1.7 lb/1000 gal
Dosage	20 g/IIL	30 g/00 gai	1.7 lb/1000 gai

ARTICLE TROUBLESHOOTING GUIDE FOR SLUGGISH MALOLACTIC FERMENTATIONS

There are many factors that can influence the success of a malolactic fermentation (MLF). Before jumping into a full restart, it is a good idea to assess each of these factors. Sometimes only a small adjustment is needed to help a MLF complete successfully. If MLF continues to struggle after considering the factors listed below, a full MLF restart may be necessary. Our MLF restart protocol is available on pg 81.

WINE TEMPERATURE MIGHT BE TOO LOW

Try warming the tank or barrels; 18-20 °C (64-68 °F) is optimal. A MLF will progress much slower at cooler temperatures.

WINE MIGHT BE LACKING NUTRIENTS

Try adding an ML-specific nutrient like ML RED BOOSTTM or OPTI'MALO BLANCTM (pg 79).

WINE MIGHT NEED A DETOX

If you have already done a nutrient addition, the bacteria should have what it needs. Sometimes toxins can be present that impede the success of an MLF. RESKUE $^{\text{\tiny TM}}$, a specific inactivated yeast for treating stuck fermentations, can be extremely beneficial for detoxification. RESKUE should be added and racked after 48 hours (dosage and usage information on pg 60).

WINE CHEMISTRY MIGHT BE CHALLENGING OR INHIBITORY TO THE BACTERIA

It is essential that you check your pH, alcohol, and free and total SO_2 to see if one of these factors might be inhibiting the fermentation. Winemakers are often surprised by the amount of SO_2 in a wine even if they have added little to no SO_2 . SO_2 can come from several sources including yeast during alcoholic fermentation, vineyards, old barrels, or erroneous

cellar additions. Total SO_2 is just as important to check. SO_2 is often bound to acetaldehyde and when bacteria consume acetaldehyde, free SO_2 is liberated which can inhibit MLF. If wine chemistry is challenging, make sure you have inoculated with a strain that can handle the challenges.

THERE MAY NOT BE ENOUGH HEALTHY OENOCOCCUS OEN! TO GET THE JOB DONE

If you did not inoculate with *Oenococcus oeni*, there may not be enough healthy bacteria to complete MLF. Consider inoculating with a known strain that is appropriately suited to handle the chemistry of your wine. If you have already inoculated, and the wine has low turbidity, it is possible that the bacteria are struggling to stay in suspension. Try stirring your tanks or barrels more frequently.

YOU MIGHT JUST NEED TO GIVE IT MORE TIME

MLF can be a test of patience taking weeks, or even months, to complete. To determine if MLF is complete, malic acid must be measured — it is nearly impossible to determine completion by sensory analysis — and is considered complete when malic acid is $\leq 0.1 g/L$ (some say $\leq 0.2 \ g/L$). If initial malic acid content was high (>7.0 g/L) then lactic acid produced by MLF may be high. Lactic acid levels >3g/L can inhibit ML bacteria.

Oak & Tannins

HOW TO

RECOMMENDED METHOD TO RESTART A STUCK MALOLACTIC FERMENTATION

PREPARE THE STUCK WINE

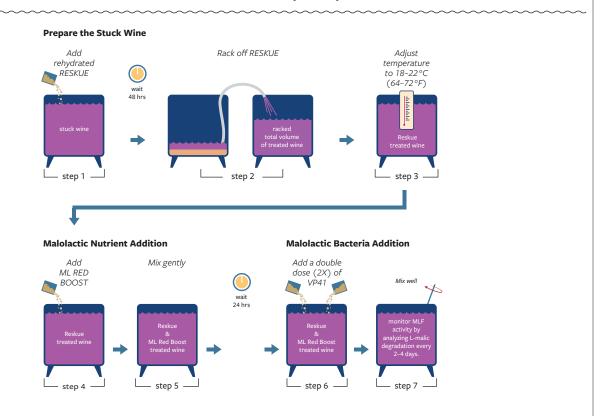
- Add 30 g/hL (2.5 lb/1000 gal) of RESKUE™ prior to restarting. Suspend RESKUE in 10 times its weight of warm water 30–37°C(86–98°F) (see pg 60 for more about RESKUE). Wait 20 minutes then add to stuck wine.
- 2. Allow tank to settle for 48 hours then rack off the settled lees.
- 3. Adjust temperature of RESKUE-treated wine to 18-22°C(64-72°F).

MALOLACTIC BACTERIA NUTRIENT ADDITION

- Add 20 g/hL (1.7 lb/1000 gal) of ML RED BOOST™ to RE-SKUE-treated wine. When restarting a stuck MLF, ML RED BOOST is used for white, red, and rosé wines.
- 5. Mix gently and wait 24 hours before bacteria addition.

MALOLACTIC BACTERIA ADDITION

- 6. Add a double dose of LALVIN VP41™ direct inoculation culture (Example: for 1000 gallons, add 3 x 25hL (660 gal) packets).
- 7. Check for MLF activity by analyzing L-malic acid degradation every 2–4 days.



ARTICLE A CLOSER LOOK: TIMING OF MALOLACTIC INOCULATION TO DRIVE WINE STYLE

Malolactic fermentation is more than a simple conversion of malic acid to lactic acid. The ability of the malolactic bacteria, *Oenococcus oeni*, to affect wines in a positive way, both texturally and sensorially, is now being used to influence wine aromas and drive wine style. Common terms used to describe the positive effect of MLF on wine flavor are fruity, spicy, toasty, nutty and buttery. The butter aroma is due to diacetyl, an intermediate metabolite in the metabolism of citric acid (see Figure 1). High diacetyl concentrations in wine can be perceived as overly 'buttery' and may be regarded as undesirable by consumers. Lower diacetyl concentrations, depending on wine type and style, can contribute a desirable 'buttery' or butterscotch flavor character.

The timing of inoculation has a strong impact on diacetyl levels. In citric acid metabolism, pyruvic acid is decarboxylated to diacetyl via α -acetolactate (see Figure 1). Diacetyl is chemically

unstable and can be reduced further by active O. *oeni* and yeast to less flavor-active products (acetoin and 2,3-butanediol). When ML bacteria is added 24-48 hours after yeast inoculation and alcoholic and malolactic fermentations occur together (coinoculation), diacetyl is converted to the less buttery compounds resulting in fruitier wines.

Using a co-inoculation strategy in white wines or red wines is a powerful tool to enhance fresh, fruit-driven styles and to avoid the production of diacetyl, even with bacteria known for high diacetyl production (see Figures 2 and 3).

If high diacetyl concentrations are desired, a sequential inoculation of *O. oeni* after alcoholic fermentation will promote the retention of diacetyl. The potential of diacetyl production is strain dependent (see Figure 2). For protocols to increase or decrease diacetyl go to scottlab.com.

Figure 1:

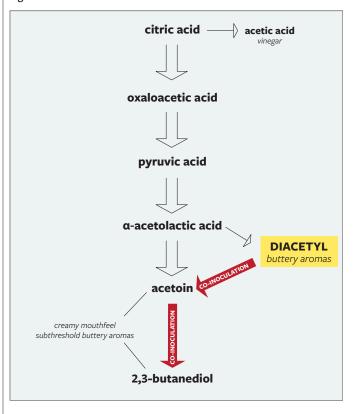
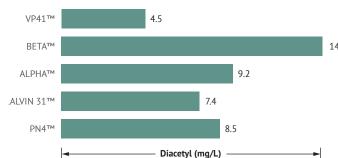


Figure 2: CITRIC ACID METABOLISM

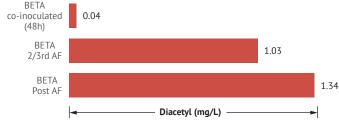
Effect of ML Strain on Diacetyl Concentration
in a Sequential Inoculation



Diacetyl concentration of Cabernet Sauvignon (Clare Valley, Australia) with sequential MLF (Bartowsky, AWRI results).

Figure 3:

Effect of ML Inoculation Timing on Diacetyl Concentration in Chardonnay



Impact of the timing of inoculation on diacetyl content in Chardonnay wines

Relative Diacetyl Potential by ML Bacteria Added Post Alcoholic Fermentation

	0-MEGA	VP41	LALVIN 31	ALPHA	SILKA	ELIOS 1	PN4	BETA	
Less Diacetyl	Very low producer	Only attacks citric acid after completion of malic acid	Medium to low producer	Medium producer	Medium producer	Medium producer	Early attack of citric acid	High producer when used in sequential inoculation	More Diacetyl

FREQUENTLY ASKED QUESTIONS: MALOLACTIC BACTERIA & ML NUTRIENTS

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 Oenologys' proprietary manufacturing process means its bacteria is stable. Sealed packets can be delivered and stored for a few weeks at ambient temperature (<25°C/77°F) without significant loss of viability. Place the bacteria in the freezer (-18°C/0°F is preferred but up to 4°C/40°F is acceptable) and store until you need it.

I would like to have less diacetyl in my white wines. Which strain should I choose?

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). High inoculation levels of strains like O-MEGA^{M} and LALVIN VP41 $^{\mathrm{M}}$, will help control excessive diacetyl production. See article on pg 82 for more information.

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. Citric acid 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 LALVIN BETA $^{\text{TM}}$ or PN4 $^{\text{SM}}$. See article on pg 82 for more information.

Why is my malolactic fermentation not finishing?

Check wine parameters (free and total SO_2 , alcohol, pH, VA, malic acid and temperature) to determine if there is an obvious reason that the fermentation is not completing. Pesticide and fungicide residue, juice concentrates and preservatives in juice or wine can also inhibit malolactic bacteria, as can lack of essential nutrients. See "Troubleshooting Guide for Malolactic Fermentations" on pg 80 for more information.

When is my ML complete?

There is some controversy among wine scientists and professionals regarding this topic. At Scott Laboratories we think that MLF is complete when malic acid is ≤ 0.1 g/L. Others say that MLF is complete when malic acid is ≤ 0.2 g/L.

Does the yeast strain used for primary fermentation affect the malolactic fermentation?

Yes. Some yeast strains are harder for malolactic fermentation than others. Yeast strains differ in nutrient demand, production of SO_2 and rate of autolysis which has a resulting effect on the bacteria. Please refer to the yeast charts on pgs 10-17 for their MLF compatibility ratings.

Does my bacteria need nutrients?

Unfortunately, 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. See "Choosing ML Bacteria and Nutrient Chart" on pg 69 and "Troubleshooting Guide for Malolactic Fermentations" on pg 80 for more information.

How do I choose the correct strain of bacteria for my wine?

Each bacteria strain performs best within specific environmental parameters. Consider free and total SO_2 levels, pH, alcohol, and temperature constraints as well as malic acid concentration when choosing a ML strain (see pg 69 for more information).

Why does the total SO_2 need to be measured when choosing the correct strain of bacteria?

 ${\rm SO_2}$ can be bound to acetaldehyde. Bacteria can break that bond, increasing free ${\rm SO_2}$, making the wine environment more challenging for MLF.

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. However, before giving up, consult the "Troubleshooting Guide for Malolactic Fermentations" on pg 80 to make sure that all the factors have been considered.

I'm thinking of trying co-inoculation. Which bacteria strain should I use? BETA CO-INOC[™] (pg 70) was developed by Lallemand Oenology for use in co-inoculation. Due to its slow growth, there is less risk of malolactic fermentation finishing before primary. Therefore, there is also less risk of volatile acid production resulting in

If I am doing a co-inoculation, which bacteria nutrient do I need? When should I add it, and how much should I add?

timely completion of both fermentations.

As long as you have a good yeast nutrient strategy and add complex nutrients for primary fermentation, additional ML nutrients aren't always necessary. If wine conditions are very difficult — low pH (<3.2), high alcohol (>15.5 % v/v), high SO $_2$ (>45 mg/L total or 5 mg/L free SO $_2$) — and MLF has not started by the end of alcoholic fermentation, ML nutrient additions are recommended. Add 20 g/hL of ML RED BOOST $^{\rm TM}$ (pg 78) for structured red wines or 20 g/hL OPTI'MALO BLANC $^{\rm TM}$ (pg 79) for white wines.



Scott Laboratories offers a variety of tannins and oak infusion products to provide winemakers flexible tools to achieve winestyle goals. Sources of tannin include oak (American and European, toasted and untoasted), grapes (skin and seeds), chestnut, gall nuts and exotic woods. Each of these tannins have distinct functions and all provide some degree of protection from oxidation. We also offer oak chips and oak infusion

products with multiple toast profiles to boost oak aroma and flavors, structure, and color. Our proprietary Thermic range of oak infusion products from THE OAK LAB™ positively impacts weight, length and complexity of wine. Whether oak infusion or tannin products, Scott Laboratories has a broad portfolio to assist in improving wine quality.

SELECTING OAK & TANNINS FOR SUCCESS

The goal of using oak and tannins is to bring out the best that grapes have to offer from the moment they enter the winery. Oak and tannins can be used in all aspects of winemaking and their selection is determined by the state of the grapes, juice or wine, the grape variety and the intended wine style. Tannins and oak can affect structure and aroma, provide protection against oxidation and promote color stability. They can also be used to mask greenness and enhance fruit characters. Use of oak and tannins in aging and finishing are especially useful in wines that lack structure, complexity and balance.

STABILITY

Fermentation tannins, which are generally a mix of condensed and ellagic tannins, combine with the anthocyanins to create optimal color stability. In protein-rich grape varieties, some of the gall nut derived tannins can help remove proteins. Tannins help protect juice from browning, especially in grapes affected by *Botrytis* and other rot. They act as an antioxidant and can inhibit laccase.

STRUCTURE AND BALANCE

Untoasted oak chips added during fermentation can reinforce the structure of the juice, bringing length and perceived sweetness to the finished wine. Toasted oak chips can minimize the impact of astringency due to underripe fruit. Fermentation tannins added early can help mask greenness and build structure in a wine that is lacking in tannin. Oak infusion products and finishing tannins can be used during cellaring and aging, or as last-minute wine additions to bring balance, complexity and structure.

AROMA

The use of tannins and oak can positively impact aromas in almost all stages of wine-making. Tannins can reveal and enhance fruit aromas and mask some undesired green/herbaceous characters. The addition of oak infusions can affect the ripe fruit profiles and integrate wood and oak characters to balance the aromatic profile of the wine.

Yeast Nutrients

Malolactic Fermentation

Filtration

Closures

Fruit Wines & Mead

General Tools

CHOOSING OAK AND TANNINS

Winemaking Stage	Wine Type	Goal	Suggested Tannin	Suggested Oak
Incoming grapes and in press	Red, White, Rosé	Minimize <i>Botrytis</i> damage	FT BLANC, FT ROUGE	
ing g in pr	White, Rosé	Limit oxidation	FT BLANC, FT BLANC SOFT, FT BLANC CITRUS	
coming grape and in press	White, Rosé	Increase citrus aromas and flavors	FT BLANC CITRUS	
Ē	Red	Increase berry aromas and flavors	FT ROUGE BERRY	
t	White, Rosé	Limit oxidation	FT BLANC, FT BLANC SOFT, FT BLANC CITRUS	
/Mus	Red, Rosé	Increase berry aromas and flavors	FT ROUGE BERRY, FT ROUGE	
Juice/Must	Red	Limit oxidation, minimize greenness & stabilize color	FT ROUGE, FT ROUGE SOFT	FEELWOOD! BALANCE & STRUCTURE, FEELWOOD! SWEET & FRESH
	White, Rosé	Enhance freshness	FT BLANC CITRUS	FEELWOOD! SWEET & FRESH
	Red, White, Rosé	Increase fruit expression	FT BLANC CITRUS, FT ROUGE BERRY	FEELWOOD! BALANCE & STRUCTURE, FEELWOOD! SWEET & FRESH, THERMIC FAN PACKS, OAK CUBES
ion	White, Red	Add oak texture, flavors and aromas		FEELWOOD! BALANCE & STRUCTURE, FEELWOOD! SWEET & FRESH, THERMIC FAN PACK, OAK CUBES
ıntat	Red	Minimize greenness	FT ROUGE SOFT, FT ROUGE, FT ROUGE BERRY	FEELWOOD! BALANCE & STRUCTURE
Fermentation	Red, White, Rosé	Add mid-palate	FT ROUGE, FT BLANC SOFT, UVA'TAN SOFT	FEELWOOD! SWEET & FRESH, THERMIC FAN PACK, OAK CUBES
	Red, White, Rosé	Build structure	FT BLANC, FT BLANC SOFT, FT ROUGE	FEELWOOD! BALANCE & STRUCTURE, THERMIC FAN PACKS, OAK CUBES
	Red	Color stability	FT ROUGE, FT COLORMAX, VINITANNIN MULTI-EXTRA, VINITANNIN SR	
	Red, White	Limit oxidation	ESTATE, FT BLANC	
	White, Rosé	Increase citrus aromas, flavors and freshness	FT BLANC CITRUS	
90	Red, Rosé	Increase berry aromas and flavors	ESTATE, FT ROUGE BERRY	THERMIC FAN PACKS, OAK CUBES, BARREL INSERTS
Ageing	White, Red	Increase oak flavors and aromas		THERMIC FAN PACKS, OAK CUBES, BARREL INSERTS
A.	Red	Minimize greenness	FT ROUGE BERRY	THERMIC FAN PACKS, OAK CUBES, BARREL INSERTS
	Red	Enhance mid-palate	ESTATE	THERMIC FAN PACKS, OAK CUBES, BARREL INSERTS
	Red, White, Rosé	Soften mouthfeel	FT BLANC SOFT, UVA'TAN SOFT	THERMIC FAN PACKS, OAK CUBES, BARREL INSERTS
	Red, White, Rosé	Build structure	ESTATE, FT BLANC SOFT	THERMIC FAN PACKS, OAK CUBES, BARREL INSERTS
3	White, Rosé	Enhance citrus aromas and freshness	FT BLANC CITRUS, FT BLANC	
tling	Red, White, Rosé	Increase fruit expression	FT BLANC CITRUS, FT ROUGE BERRY,	THERMIC OAK CUBES
Finishing ks before bot	Red, White, Rosé	Increase oak flavors and aromas and sweetness perception	RICHE, RICHE EXTRA	THERMIC OAK CUBES
Finishing (3-6 weeks before bottling)	Red, White, Rosé	Enhance mid-palate	FT BLANC SOFT, FT ROUGE BERRY, RICHE, RICHE EXTRA	THERMIC OAK CUBES
м 9-1	Red, White, Rosé	Soften mouthfeel	FT BLANC SOFT, RICHE EXTRA, UVA'TAN SOFT	THERMIC OAK CUBES
(3	Red	Mask off flavors	RICHE, RICHE EXTRA	THERMIC OAK CUBES
(g _i	Red, White, Rosé	Enhances freshness, reveals fruits, balances mouthfeel	RADIANCE	
tling e bottlin	Red, Rosé	Enhances fruit, adds complexity, minimizes greenness	ONYX	
Pre-bottling (2 days before bottling)	Red, White	Increases structure, enhances aromatic complexity and masks off odors	ROYAL	
(2 da)	Red, White, Rosé	Soften mouthfeel	SEE FLASHGUM R LIQUIDE AND ULTIMA SOFT IN FINING AND STABILITY SECTION (pgs 104-105)	

TANNINS

Tannins can be used in all varietals of wine and in all stages of winemaking to enhance aromas and mouthfeel, stabilize color and add structure. They aren't just for red wines, whites and rosés can also benefit from tannin additions to limit oxidation, enhance freshness, and increase expression of certain flavor profiles. The possibilities are endless!

COMPLEX 0

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 colour 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.

Usage: During transfer or racking add Complex into the wine. Mix well to ensure homogeneity. Following organoleptic evaluations, 2–3 further additions can be made subsequent to final rackings.

#38-12310 1 kg \$59.50

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

Recommended Dosage

Prior to Barrel Aging				
50-300 ppm	5-30 g/hL	0.42-2.5 lb/1000 gal		
Prior to Bottling (3-6 weeks)				
30-100 ppm	3-10 g/hL	0.25-0.83 lb/1000 gal		

Note: Complex is best used prior to barrel aging. This encourages tannin integration in the wine over time. It may also dramatically improve a red wine when added prior to bottling. At this stage, Complex should be added at least six weeks before bottling to allow reaction and polymerization.

Successful additions can be made closer to bottling, but this may result in less throughput during filtration.

Stage of Winemaking: Aging	Minimum Contact Time: 6 weeks	Impact: structure; color stability
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### **ESTATE** O

Enhances fruit, spice and mid-palate

SCOTT'TAN™ ESTATE can enhance mid-palate, aromatic complexity and mouthfeel. Tastings demonstrate that ES-TATE can add spiciness and highlight fruit (red and dark). When used in neutral barrels it compensates for the lack of tannins, building mid-palate and enhancing structure.

**Usage**: During transfer or racking add ESTATE into the wine. Mix well to ensure homogeneity. Following organoleptic evaluations, 2–3 further additions can be made prior to racking. Additions should be made at least 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.

1 kg

\$140.20

# **Recommended Dosage**

#38-12315

Prior to Barrel Aging Red Wine

The terminal state of the state				
	50-300 ppm	5-30 g/hL	0.42-2.5 lb/1000 gal	
	Prior to Bottling (3-	-6 weeks) or Dur	ring Racking	
	50-100 ppm	5-10 g/hL	0.42-0.83 lb/1000 gal	

Stage of Winemaking: Aging	Minimum Contact Time: 6 weeks	Impact: Aroma and structure
Stage of Willelmaking, Aging	William Contact Time: O Weeks	

\$51.60

# FT BLANC O

# Protection from oxidation and early protein removal

White, Rosé, Red, Fruit Wines, Cider

SCOTT'TAN $^{\text{TM}}$  FT BLANC tannin is a white gall nut tannin for use on grapes and juice to protect from oxidative browning.

In protein-rich grape varieties such as Sauvignon blanc, FT BLANC can help remove some heat unstable proteins. FT BLANC will also contribute notes of minerality. On *Botrytis* infected grapes an addition of FT BLANC can inhibit laccase damage due to its antioxidant properties.

**Usage**: Add FT BLANC by sprinkling directly on grapes at the crusher, adding to juice, or adding to wine during a tank mixing. Good homogenization is important. If an addition 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.

1 kg

# **Recommended Dosage**

#38-12300

Recommended Do	sage	
White/Rosé Juice		
50-150 ppm	5-15 g/hL	0.42-1.2 lb/1000 gal
Red Wine		
50-300 ppm	5-30 g/hL	0.42-2.5 lb/1000 gal
Fruit Wine, Cider, Me	ad	
50-200 ppm	5-20 g/hL	0.42-1.6 lb/1000 gal
White/Rosé Wine*		
50-300 ppm	5-30 g/hL	0.42-2.5 lb/1000 gal

Stage of Winemaking: Pre-fermentation, Finishing Minimum Contact Time: 3 weeks Impact: Antioxidant protection and protein remov
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# FT BLANC CITRUS O

# Enhances fruity and floral aromas

White, Rosé, Hybrids, Cider

SCOTT'TAN™ FT BLANC CITRUS is a mixture of condensed tannins from citrus wood and gall nuts. The use of FT BLANC CITRUS during alcoholic fermentation increases wine aromas, especially when used in combination with yeast strains that have beta-glycosidase activity (See yeast section pgs 10-17). Resulting wines present more intense aromas of lemon, grapefruit, apple and white flowers. FT BLANC CITRUS also protects the juice and wine from oxidation.

**Usage**: Dissolve FT BLANC CITRUS in about 10 times its weight of warm water (35–40°C/95–104°F) then add it to the juice/wine and mix well. If using during alcoholic fermentation add 24–48 hours after yeast inoculation. Final additions should be made at least 3 weeks prior to bottling.

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

#38-12302A	1 kg	\$86.00
#38-12302	5 kg	\$414.00

# **Recommended Dosage**

White Juice, Cider	<b>White</b>	Juice.	Cider
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20-150 ppm	2-15 g/hL	0.17–1.2 lb/1000 gal
Rosé Juice		
50-150 ppm	5-15 g/hL	0.42-1.2 lb/1000 gal
White or Rosé Wine		
50-100 ppm	5-10 g/hL	0.42-0.83 lb/1000 gal

Stage of Winemaking: Pre-fermentation, Finishing Minimum Contact Time: 3 weeks Impact: Aromatic Enhancement
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# FT BLANC SOFT O

Oxidation protection and mouthfeel enhancement

White, Rosé, Red, Hybrids, Fruit Wine, Cider, Mead

SCOTT'TAN™ FT BLANC SOFT combines the benefits of FT BLANC (see pg 87) with improved softness and mouthfeel. White and rosé wines made with FT BLANC SOFT have enhanced texture with a perception of sweetness. Relatively small dosages can contribute to minerality. Similar improvements can be seen in fruit wines and mead.

**Usage**: Add FT BLANC SOFT by sprinkling directly on grapes at the crusher, adding to juice, or adding to wine during a tank mixing. Good homogenization is important. If an addition 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.

#38-12301	1 kg	\$65.10
#38-12301A	5 kg	\$315.00

# **Recommended Dosage**

White/Rosé Juice		
50-150 ppm	5-15 g/hL	0.42-1.2 lb/1000 gal
Red Wine		
50-300 ppm	5-30 g/hL	0.42-2.5 lb/1000 gal
Fruit Wine, Cider, Me	ad	
50-200 ppm	5-20 g/hL	0.42-1.6 lb/1000 gal
White/Rosé Wine		
50-300 ppm	5-30 g/hL	0.42-2.5 lb/1000 gal

Stage of Winemaking: Pre-fermentation, Finishing	Minimum Contact Time: 3 weeks	Impact: Antioxida	nt and Mouthfeel
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FT COLORMAX •	#38-12303	1 kg	\$61.25

Promote color stability

Red, Hybrids, Fruit Wine

SCOTT'TAN™ FT COLORMAX is a natural catechin product developed for its superior ability to stabilize color. Its special formulation goes into solution more easily than conventional fermentation tannin products. It is intended for use in conjunction with FT ROUGE or FT ROUGE SOFT (pgs 88-89).

Usage: Add FT COLORMAX at 1/3 sugar depletion during alcoholic fermentation. If a cold soak has been done, add FT COLORMAX during the first mixing.

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

Recommended Dosage

Red Must

100–300 ppm 10–30 g/hL 0.8–2.5 lb/1000 gal
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Stage of Winemaking: Fermentation	Contact Time: During fermentation	Impact: Co	lor Stability
FT ROUGE O	······		
Promotes color, structure and fruit	#38-12305	1 kg	\$37.35
Promotes color, structure and fruit	#38-12305A	5 kg	\$179.50

Red, Fruit Wine

SCOTT'TAN™ FT ROUGE is a tannin blend of highly reactive tannins derived from exotic woods and chestnut. The addition of FT ROUGE at the beginning of red wine fermentations helps preserve the grapes' natural tannins so they can combine with anthocyanins for optimal color stability. Mouthfeel is also enhanced. FT ROUGE provides some antioxidative protection. For maximum antioxidant protection in the case of mold damage and high laccase potential, SCOTT'TAN FT BLANC (pg 87) is the preferred tannin.

Usage: Gradually pour directly on grapes at the crusher or add to the must during a pump-over to obtain good homogenization. If subsequent additions are desired, this can be done in increments of 0.5 lb/1000 gal (~60 ppm) during pump-overs. If an addition 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.

Recommended Dosage Red Vinifera Must 200-500 ppm 20-50 g/hL 1.6-4.0 lb/1000 gal Red Non-Vinifera Must 300-600 ppm 30-60 g/hL 2.5-5.0 lb/1000 gal Fruit 200-500 ppm 20-50 g/hL 1.6-4.0 lb/1000 gal

Stage of Winemaking: Fermentation Contact Time: During fermentation Impact: Color Stability; Structure
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FT ROUGE BERRY O

Enhances red berry fruit, diminishes vegetative notes Rosé, Red, Hybrids

SCOTT'TAN™ FT ROUGE BERRY is a mixture of condensed tannins that enhances strawberry, cherry and blueberry aromas. FT ROUGE BERRY increases and protects classical varietal flavors and aromas and masks green/vegetative notes. To further enhance berry flavors, conduct the alcoholic fermentation with a yeast strain with beta-glycosidase enzyme activity (See yeast section pgs 10-17).

FT ROUGE BERRY is beneficial for low aromatic and low color varietals to bring flavor, aromas, and color stability.

Usage: Dissolve FT ROUGE BERRY in about 10 times its weight of warm water (35–40°C/95–104°F) then add it to the must/wine and mix well. If using during alcoholic fermentation add 24–48 hours after yeast inoculation. When used post alcoholic fermentation add it to the wine and mix well. Final

#38-12307	1 kg	\$96.00
#38-12307B	5 kg	\$466.50

additions should be made at least 3 weeks prior to bottling.

Storage: Dated expiration. Unopened, store in a cool dry, ventilated area. Once opened, keep tightly sealed and dry.

Recommended	Dosage
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Recommended Dosage			
Rosé Must			
20-150 ppm	2-15 g/hL	0.17-1.2 lb/1000 gal	
Red Must			
50-200 ppm	5-20 g/hL	0.42-1.6 lb/1000 gal	
Red Wine			
50-200 ppm	5-20 g/hL	0.42-1.6 lb/1000 gal	

Stage of Winemaking: Fermentation, Finishing	Minimum Contact Time: 3 weeks	Impact: Aromatic enhancement	

FT ROUGE SOFT

Promotes color, mouthfeel and fruit

Red, Fruit Wine

SCOTT'TAN[™] FT ROUGE SOFT is appreciated for its ability to highlight fruit aromas and flavors, and softness.

FT ROUGE SOFT additions results in stable color and integrates well. FT ROUGE SOFT is respectful and does not leave an obvious tannin addition impression. Mouthfeel and roundness are improved, and bitterness is reduced.

FT ROUGE SOFT provides antioxidative protection.

Usage: Add to the grapes at the crusher or add to the must during a pump-over. Ensure tannin is mixed in well after addition. If subsequent additions are desired, this can be done in increments of 0.5 lb/1000 gal (~60 ppm) during pump-overs. If an addition is made post-fermentation, we recommend waiting 3–6 weeks after the tannin addition before racking, fining,

#38-12306	l kg	\$43.40
#38-12306A	5 kg	\$204.00

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.

Recommended Dosage

Red $Vinifera$ Must			
200–500 ppm 20–50 g/hL		1.6-4.0 lb/1000 gal	
Red Non-Vinifera Must			
300-600 ppm	30-60 g/hL	2.5-5.0 lb/1000 gal	
Fruit			
200-500 ppm	20-50 g/hL	1.6-4.0 lb/1000 gal	

:	Stage of Winemaking: Fermentation	Contact Time: During fermentation	Impact: Color Stab	bility, Mouthfeel
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ONYX	0	#38-12385	250 g	\$190.00

Enhances red fruit, berry aromas and minimizes greenness Red, Rosé, Hybrids

SCOTT'TAN™ ONYX is derived from French oak. It can be used in red and rosé wines to bring out berry and sweet red fruit notes. ONYX respects varietal characteristics but adds complexity and minimizes greenness. It helps soften and integrate flavors.

ONYX integrates rapidly and is great for "last-minute" additions. It can be added up to 48 hours before membrane (final) filtration. Always conduct filterability trials prior to addition to avoid filtration challenges.

**Usage**: Dissolve ONYX in about ten times its weight of warm water 35–40°C(95–104°F) until fully dissolved. Add to wine gradually during a transfer or pump-over. Good mixing is important.

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

# Recommended Dosage

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

Stage of Winemaking: Pre-bottling	Minimum Contact Time: 48 hours	Impact: Complexity, Integration	
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# RADIANCE O

# Enhances freshness, reveals fruit and oak aromas

White, Red, Rosé, Cider

SCOTT'TAN™ RADIANCE is a blend of tannins for use in white, red and rosé wines as well as ciders. It will help unmask and refine aromas and flavors of fresh fruit, vanilla, coconut and caramel. RADIANCE promotes balance and mouthfeel while maintaining acidity.

RADIANCE integrates rapidly and is great for "last-minute" additions. It can be added up to 48 hours before membrane (final) filtration. Always conduct filterability trials prior to addition to avoid filtration challenges.

#38-12387

250 g

\$190.00

\$201.00

Usage: Dissolve RADIANCE in about ten times its weight of warm water 35-40°C(95-104°F) until fully dissolved. Add to wine gradually during a transfer or pump-over. Good mixing is important.

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

# **Recommended Dosage**

10–100 ppm   1–10 g/h	L 0.08-0.83 lb/1000 gal

Stage of Winemaking: Pre-bottling	Minimum Contact Time: 48 hours	Impact: Mouth	ifeel, Aromas
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~	~~~~~~
RICHE O	#38-12322	500 g	\$137.00

Sweetness and finesse White, Rosé, Red, Hybrids

SCOTT'TAN™ RICHE is notable for enhancing aromatic 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.

Usage: Dissolve 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.

Recommended Dosage

White	/Rosé	Wine

	White/Rosé Wine			
	30-100 ppm	3-10 g/hL	0.25-0.83 lb/1000 gal	
Red Wine				
	30-200 ppm	3-20 g/hL	0.25-1.6 lb/1000 gal	

Stage of Winemaking: Finishing	Minimum Contact Time: 3 weeks	Impact: Aroma, Mouthfeel
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### RICHE EXTRA O

# Smoothness and richness

Red, White, Hybrids

SCOTT'TAN™ RICHE EXTRA is 100% toasted American oak. This tannin contributes nuances similar to SCOTT'TAN™ RICHE but with heightened perception of vanilla. RICHE EX-TRA can help smooth a wine's finish.

Usage: Dissolve 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.

500 g

### **Recommended Dosage**

# White/Rosé Wine

#38-12334

	30-100 ppm	3-10 g/hL	0.25-0.83 lb/1000 gal	
Red Wine				
	30-200 ppm	3-20 g/hL	0.25-1.6 lb/1000 gal	

Stage of Winemaking: Finishing	Minimum Contact Time: 3 weeks	Impact: Aroma, Mouthfeel	

\$190.00

\$205.50

0 ROYAL

Increases structure, enhances aromatic complexity and masks off odors

White, Red

SCOTT'TAN™ ROYAL may be used in red and white wines to add structure, balance and length on the palate. ROYAL is extracted from American oak and complements wines aged in used American oak barrels. It is known to bring out hints of cocoa, chocolate, coffee and butterscotch. ROYAL has also been known to help mask off-aromas and flavors of Brettanomyces.

ROYAL integrates rapidly and is great for "last-minute" additions. It can be added up to 48 hours before membrane (final) filtration. Always conduct filterability trials prior to addition to avoid filtration challenges.

**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 pump-over. Good mixing is

250 g

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

# **Recommended Dosage**

#38-12355

#38-12389

important.

10-100 ppm	1-10 g/hL	0.08-0.83 lb/1000 gal
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Stage of Winemaking: Pre-bottling	Minimum Contact Time: 48 hours	Impact: Structure, Balance
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IIVA?TAN COET		

UVA'TAN SOFI

Grape skin tannin for mouthfeel enhancement and balancing oak Red, White, Rosé

SCOTT'TAN™ UVA'TAN SOFT is prepared from freshly pressed white grapes. These grape skin tannins are highly reactive. Like UVA'TAN, UVA'TAN SOFT can be used at all stages of winemaking. UVA'TAN SOFT is useful when grapes' native tannins are deficient, and mouthfeel is lacking. Due to lack of catechins, UVA'TAN SOFT positively impacts mouthfeel, increasing roundness and softness without imparting bitterness. The grape skin tannins in UVA'TAN SOFT assist with the integration of oak tannins during barrel aging.

Additions of UVA'TAN SOFT should be made at least six weeks before bottling. 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.

Usage: Pour UVA'TAN evenly on the must/juice at the crusher or into wine during a transfer or racking. If further additions are required, two to three adds can be made after racking. Final additions can be made up to three weeks before bottling, though six weeks are recommended for more complete polymerization, settling, and optimal filtration.

500 g

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

Recomme	nded	Dosage
		Doguge

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		

Stage of Winemaking: Fermentation, Aging	Minimum Contact Time: 6 weeks	Impact: Round, smooth mouth and oak integration	
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VINITANNIN MULTI-EXTRA



Red grape skin tannin to increase & improve colour Red must/wine

VINITANNIN[™] MULTI-EXTRA is a highly purified tannin preparation derived from high quality red grape skins. VINITANNIN[™] MULTI-EXTRA can be used for 4 applications: during cold soak, fermentation, after pressing-off and for refinement before bottling.

It helps to optimize colour concentration and stabilization of colour pigments (anthocyanin chains) in the juice or wine stage. VINITANNIN $^{\text{TM}}$ MULTI-EXTRA also improves colour intensity and the texture of the wines without adding any bitterness or harsh astringent flavours and improves the aging potential of the wine.

Usage: Dissolve 100 g of VINITANNIN™ MULTI-EXTRA in 1 L of liquid (water, wine) at a temperature of 40–50°C (104–122°F). Acidify the suspension with 10 g/L of tartaric acid and stir well. Follow this by adding the suspension homogenously into the juice or mash.

It is very important to add the VINITANNIN[™] MULTI-EXTRA always before adding SO_2 . For optimal results, we recommend to apply ViniTannin[™] Multi-Extra as early as possible in the pre–sulphur stage, minimum 1 day before adding any SO_2 . This will lead to stable colours, anthocyanin chains and the best possible integration of the product into the wine's own molecular structure.

If used just prior to bottling, please do not perform the final filtration for at least 10 days.

Storage: Dated expiration. Unopened the shelf life is approximately 2 years at room temperature (25–30°C/77–86°F). Protect against light and humidity. Once opened, use within

#37-13325	1 kg	\$183.70
#37-13325A	5 kg	\$838.00

1 month.

Recommended Dosage

	Pinot noir, Pinotage	Cabernet, Merlot, Malbec	Tempranillo, Grenache, Syrah
Juice (cold soak)	2-5 g/100 kg	5-10 g/100 kg	5-10 g/100 kg
Fermentation	2-5 g/100 kg	5-10 g/100 kg	10-15 g/100 kg
Before bottling	1-2 g/hL	3-5 g/hL	3-5 g/hL

It is not recommended to exceed a total dose rate for all applications of 15 g/hL.

	Pinot noir, Pinotage	Cabernet, Merlot, Malbec	Tempranillo, Grenache, Syrah
Cold soak	20-30g/	10-20g/	10 -20g/
	100 kg	100 kg	100 kg
Fermentation	20-30g/	10-20g/	10-20g/
	100 kg	100 kg	100 kg
Pressing-off	20-30g/	10-20g/	10-20g/
	100 kg	100 kg	100 kg
Pre-bottling	10-20 g/hL	5-10 g/hL	5-10 g/hL

It is not recommended to exceed a total dose rate for all applications of 15g/hL.

Stage of Winemaking: Fermentation, aging, finishing

Minimum Contact Time: 10 days

Impact: colour improvement and stabilization

VINITANNIN SR

2B

Red grape skin tannin Red must/wine

VINITANNIN™ SR is a highly-purified tannin preparation derived from red grape skins. It optimizes the stabilization of the colour pigments (anthocyanin chains) at the juice and wine stage.

VINITANNIN™ SR also improves the texture of the wines

 $VINITANNIN^{TM}$ SR also improves the texture of the wines without adding any bitterness or harsh astringent flavours, while improving the aging potential of the wine.

Usage: Dissolve 10 g of VINITANNINTM SR in 250 ml of wine or water at a temperature of 35–40°C (95–104°F). Acidify the suspension with 10 g/L of tartaric acid and stir well. Follow this by adding the suspension homogenously into the juice or mash. It is very important to add VINITANNINTM SR always before adding SO₂. It is necessary to wait at least 15 minutes before adding SO₃.

Storage: Dated expiration. Unopened the shelf life is approximately 2 years at room temperature (25–30°C/77–86°F).

#37-13350 1 kg \$305.00

Protect against light and humidity. Once opened, use within 1 month.

Recommended Dosage

	Pinot noir, Pinotage	Cabernet, Merlot, Malbec	Tempranillo, Grenache, Syrah
Juice (cold soak)	2-5 g/100 kg	5-10 g/100 kg	5-10 g/100 kg
Fermentation	2-5 g/100 kg	5-10 g/100 kg	10-15 g/100 kg
Before bottling	1-2 g/hL	3-5 g/hL	3-5 g/hL

It is not recommended to exceed a total dose rate for all applications of 15 g/hL.

Stage of Winemaking: Fermentation, finishing

Minimum Contact Time: 10 days

Impact: color stabilization; structure

VINITANNIN W



White grape skin tannin for fermentation and finishing

White and rosé must/wine

 $VINITANNIN^{\text{\tiny M}}$ W is a highly purified tannin preparation derived from white grape skins that can be used for during fermentation and for refinement prior to bottling. It improves complexity, optimizes the redox potential of the juice and therefore, the aromatic stability.

VINITANNIN™ W also improves the texture of the wines without adding any bitterness or harsh astringent flavours and improves the aging potential of the wine. ViniTannin™ W helps also to prevent early aging in wines without addition of SO₂.

Usage: Dissolve 10 g of VINITANNIN[™] W in 250 ml of wine or water at a temperature of 35–40°C(95–104°F). Acidify the suspension with 10 g/L of tartaric acid and stir well. Follow this by adding the suspension homogenously into the juice or mash.

It is very important to add VINITANNIN $^{\text{TM}}$ W always before adding SO_2 . It is necessary to wait at least 15 minutes before adding SO_2 .

#37-13340

1 kg

\$199.50

Storage: Dated expiration. Unopened the shelf life is approximately 2 years at room temperature (25–30°C/77–86°F). Protect against light and humidity. Once opened, use within 1 month.

Recommended Dosage

	Chardonnay, Pinot blanc, Pinot gris	Sauvignon blanc, Riesling	Chenin blanc, Viognier
Fermentation	1-3 g/hL	0.5-1 g/hL	1-2 g/hL
Before bottling	0.5-1 g/hL	Not recommended	0.5-1 g/hL

It is not recommended to exceed a total dose rate for all applications of 15 g/hL

Stage of Winemaking: Fermentation, finishing

Minimum Contact Time: 10 days

Impact: complexity; structure

OTT TANNINS

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

BOLD

0

Vanilla oak character and perception of sweetness

White, Rosé, Red

Scott'Tan™ Bold was developed to provide an amplified final touch to your wine. Wood, caramel and vanilla notes are highlighted on the nose and mouth of wines adjusted with Bold. These wines also exhibit a pronounced oaky aroma. Bold can increase the perception of sweetness, while also altering the tannin profile to reduce the perception of alcohol in reds.

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.

500 g

\$325.00

#38-12360

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.

Recommended Dosage

Red, White and Rosé Wine

30-150 ppm 3-	-15 g/hL	0.25-1.2 lb/1000 gal
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Stage of Winemaking: Finishing	Minimum Contact Time: 3 weeks	Impact: aroma, sweetness

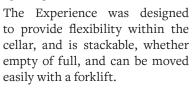
Garbellotto is a family owned and operated cooperage with its roots in the Veneto region of Italy, in the town of Conegliano. Founded in 1775, Garbellotto has positioned itself as the market leader in the production of large format casks and vats.

THE EXPERIENCE

A dual purpose, fermentation and aging vessel, the Experience is crafted from French oak and has a 1000L capacity.

With a surface area similar to a 500L tonneau, the Experience has been designed with a fully sealable lid, made from

316 stainless steel, with handles to open and a central opening of 160mm for top ups during aging. During fermentation this top can be completely removed for more practical processing, with a total opening of 1200mm.





LA BOTTICELLA

A 1000L round cask, the Botticella provides the winemaker with the convenience of a larger cask with the refining speed of a barrel.

Crafted from French oak, the Botticella is available in various toasting levels, including: light, medium, medium plus & strong.

The staves are arched using direct flame and using a DTS® (Digital Toasting System) procedure wherein the toasting temperature is controlled throughout the entire process.



STANDARD ACCESSORIES

- Small wooden door
- Stainless steel valve fixed to the door (choice of attachments and sizes)
- Stainless steel wine-tasting spoon fixed to the centre of front end
- Silicone stopper for upper hole

OPTIONAL ACCESSORIES

- Stainless steel AISI 304 Front Door
- Stainless steel AISI 304 Discharging unit

OAK VATS

Regarded as the global leader in large format oak vessels, Garbellotto produces conical trunk vats ranging in size from 10hL to 200hL. The convenient stainless steel features, along with the micro-oxygenation & anti-oxidizing benefits of the wood make these large format vessels useful during the fermentation, refining and storage phases.

CONICAL TRUNK VATS

- Standard 1000-20,000L
- Larger formats available upon request



OAK BARRELS

225 L FRENCH OAK BARREL

With option to select French region (Allier, Nevers, Limousin or Vosges)

\$1045.00

ACACIA 225L BARREL

\$972.00

NIR BARRELS

With NIR (Near Infra-Red) technology, every stave is analyzed under infra-red light, and its structure and aromatic features allow Garbellotto to segregate each stave to the appropriate NIR barrel options, thus providing NIR barrels with the ultimate in consistency.

• Profiles: Structure, Sweet, Spice or Equilibrium

\$1190.00

Yeast

Yeast Nutrients

/mes

Fining & Stability

Cleaning

asics

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sures

Fruit Wines & Mead

eneral Tools

TW BOSWELL COOPERACES 1912 MAPA

For over 100 years the Boswell Family has built a strong foundation of excellence and a passion for quality.

T.W. Boswell barrels are intentionally limited to maintain uncompromising levels of excellence. Premium oak is nurtured for 2-3 years according to the highest specifications, before being crafted into a barrel by certified T.W. Boswell craftsmen.

AMERICAN OAK COLLECTION

225 L Standard Silver, Soleil, Legacy, Avant Barrels	\$670.00
225 L Special Reserve* Silver, Soleil, Legacy, Avant Barrels	\$730.00

Silver: Elegant and subtle expression of American oak, the Silver barrel is all about the fruit — clean, soft and refined with light structure.

Soleil: Surrounding the fruit with rich, toasted oak flavors, this barrel highlights confectionary notes and a soft mouthfeel.

Legacy: Designed to impart a subtle old-world nuance, the American oak Legacy barrel complements your finest wines,

while maintaining a proper balance of oak and fruit.

Avant: With minimal oak impact, Avant is a soft, quiet expression of American oak. The Avant barrel encourages the bright, rounded fruit characters of your wine to shine through. Look for added structure in the mid-palate with an elevated, vibrant fruit finish.

* Special Reserve barrels feature extra fine grain and 36 month seasoning.

FRENCH OAK COOL CLIMATE SERIES

All Cool Climate barrels are 36-month seasoning and extra fine grain.

Aromatic Fruit: Utilizing an extended water bend, this method heightens complexity and marries well with elegant and aromatic fruit.

Bright Fruit: This barrel highlights the purity of bright fruit and keeps the focus exactly where you want it to be.

225 L French Oak Barrels \$1395.00

Dark Fruit: Using a long, low temperature toast, this barrel offers balance and added dimension.

Minerality: This barrel uses an extended water bending method and a specific toast to accentuate fruit, acidity and minerality. Pairs especially well with structure-driven white and light red varietals.

WORLD COOPERAGE



World Cooperage is a family-owned company whose story is rooted in family values, technology and innovation.

Thanks to four generations of experience in the oak industry, World Cooperage can maintain a long-term vision for every aspect of its business - most importantly, to craft enduring partnership with wineries around the world.

TRADITIONAL OAK BARRELS

225 L American Oak - Traditional	\$595.00
225 L American Oak - Extra Fine Grain	\$618.00
225 L French Oak	\$1280.00
225 L French American Hybrid	\$745.00

The Traditional Series offers a classic barrel for your winemaking needs. This barrel is the world's best value thanks to the amazingly consistent and well-rounded oak character it imparts during aging.

TOAST LEVELS

Light: Enhanced structure and light notes of toast **Medium:** Soft caramel accented by toasted bread

Medium Long: Supple tannins, subtle oak,

accentuated fruit complexity

Medium Plus: Sweet cream with notes of vanilla & brown sugar

Heavy: rich mocha character accentuates darker fruits

OAK ALTERNATIVES

AROBOIS OAK CHIPS



Arobois French oak chips have been a staple in our portfolio since 2000. With a minimum of 18 months of open air seasoning, Arobois oak chips are a great tool during either the winemaking or aging processes.

Product #	Name	Chip size	Size	Price
36-15511	Arobois Light Toast	XS	25 kg	\$260.00
36-15513	Arobois Light Toast	Medium	25 kg	\$260.00
36-15521	Arobois Medium Toast	XS	25 kg	\$260.00
36-15523	Arobois Medium Toast	Medium	25 kg	\$260.00
36-15533	Arobois Heavy Toast	Medium	25 kg	\$260.00
36-15502	Arobois Untoasted	Medium	25 kg	\$235.00
30-15053Q	Winemaster Light Toast	Medium	1 kg	\$15.50
30-15053R	Winemaster Heavy Toast	Medium	1 kg	\$15.50
36-15500	Oak Chips Bag			\$5.60

^{*} Chip toast = aromatic complexity

OAK PASSION OAK CHIPS Carpassian



Oak Passion was born from a union of three globally recognized brands, resulting in unique proprietary blends, and delivering a diverse range of results to the winemaker.

Product #	Name	Size	Origin	Toast Level	Price
41-13441	Darkan Blend	1 kg	French Oak	Medium	\$13.25
41-13441B	Darkan Blend	5 kg*	French Oak	Medium	\$55.00
41-13442	Darkan Blend	1 kg	French Oak	Medium+	\$13.25
41-13442B	Darkan Blend	5 kg*	French Oak	Medium+	\$55.00
1-13443	Darkan Blend	1 kg	French Oak	Untoasted	\$13.25
41-13451	Dulsao	1 kg	American Oak	Medium	\$13.25

^{**} Chip size = extraction speed

OAK CHIPS

FEELWOOD! BALANCE & STRUCTURE

#38-12392

10kg (2 x 5kg units)

\$77.00

Boosts ripe fruit, masks vegetative characteristics Red, White, Rosé

FEELWOOD! BALANCE & STRUCTURE oak chips are used during fermentation to minimizes harsh and astringent characters in fruit. Herbaceous notes are minimized while fruit aromatics are amplified. Initial volume and mid-palate sweetness are enhanced. These 100% French oak chips are aged for 24 months and are a blend of toast levels (untoasted, light, medium).

Usage: For whites and rosés, chips must be used with infusion bags. For reds, add into the tank while filling or by using infusion bags.

Storage: Dated expiration. Unopened, the shelf-life is 4 years at 25°C(77°F). Once opened, keep tightly sealed and dry.

Recommended Dosage

Whites, Rosé		
0.5-1 g/L	50-100 g/hL	4.15-8.3 lb/1000 gal
Reds		
1-3 g/L	100-300 g/hL	8.3-25 lb/1000 gal

Stage of Winemaking: Fermentation Minimum Contact Time: 2 weeks Impact: Minimize Herbaceousness, Enhance Structure
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FEELWOOD! SWEET & FRESH

#38-12393

10kg (2 x 5kg units)

\$88.00

Enhances fruit profile, sweetness and length

Red, White, Rosé

These 100% untoasted French oak chips are used during fermentation to enhance fruit, add mid-palate sweetness and increase the length of the finish. FEELWOOD! SWEET & FRESH chips are aged for 24 months.

Usage: For whites and rosés, chips must be used with infusion bags. For reds, add into the tank while filling or by using infusion bags.

Storage: Dated expiration. Unopened, the shelf-life is 4 years

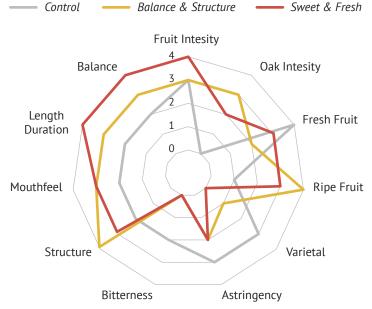
at 25°C(77°F). Once opened, keep tightly sealed and dry.

Recommended Dosage

White, Rosé		
0.5-1 g/L	50-100 g/hL	4.15- 8.3 lb/1000 gal
Reds		
1-3 σ/Ι.	100-300 g/hI.	8 3 - 25 lb/1000 gal

Stage of Winemaking: Fermentation	Minimum Contact Time: 2 weeks	Impact: Enhance Fruit, Sweetness, Length
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Impact of FEELWOOD! Oak Chips on Merlot



Impact of 3 g/L FEELWOOD! BALANCE & STRUCTURE and SWEET & FRESH on the flavor and aroma profile of a 2018 Merlot from Bordeaux, France- 2 week contact time.

OAK INFUSION PRODUCTS/BARREL ALTERNATIVES

Oak has been used to ferment and store wine for centuries. Oak impacts wine color, aroma, flavor, texture and structure. Its volatile flavor components are an important contributor and driver of many wine styles. Oak barrels are the traditional way to impart oak character, but barrels are costly. Modern winemaking includes the use of oak infusion products and other barrel alternatives to impart oak character to wine while saving money, space and labor.

To meet these demands of the industry, Scott Laboratories launched THE OAK LABTM to provide winemakers with the highest quality oak infusion products on the market. The THERMIC line of products includes different oak toasts and formats and using them alone, or in conjunction with our full range of SCOTT'TANTM tannins, gives winemakers the freedom to craft wines that achieve their precise & consistent oak profiles.

THERMIC & öaklab

Oak infusion products that provide consistent oak flavors, structure, and mouthfeel

Red, White, Rosé

THE OAK LAB™ THERMIC range of oak infusion products are produced using a specific type of thermal modification resulting in a wide spectrum of flavor profiles. THERMIC products come in three formats and five distinct profiles (see descriptions below) offering consistent and reproducible results. THERMIC profiles can be used on their own or blended to produce the desired oak characteristics.

We believe the THERMIC range of oak infusion products are the most consistent range of oak infusion products on the market. This is due to the unique production process, oak quality and oak sourcing. Your wine matrix will change each year, but THERMIC will not!

THERMIC Color Profile	1	2	3	4	5
	THERMIC 1	THERMIC 2	THERMIC 3	THERMIC 4	THERMIC 5
Aroma	Coconut, sweet oak	Nutty, toasty, toffee	Vanilla, dark fruits, complexity	Warm spice, vanilla	Espresso, smoked meat, complexity
Mouthfeel	Fresh and light, addition of length	Rounding, boost of mid-palate	Texture, weight, volume, length	Full, viscous, rich	Balanced, rich, round

THE OAK LAB THERMIC FAN PACK © öaklab. Classical oak infusion format for structural and aroma enhancement; slow extraction Red, White, Rosé



THERMIC COLOR PROFILE's 1-5 fan packs are used during fermentation and aging allowing you to achieve your oak flavor, aroma and structure goals. Fan packs are sometimes preferred over other formats due to the slower release of volatile compounds which results in a less immediately impactful and more subtle integration of oak compounds. Depending on oak style goals, color profiles may be used alone or in combination with other profiles.

Fan packs can remain in contact with the wine for up to 18 months. Wine must be tasted and evaluated frequently to determine exact contact time.

Fan packs are bound by food grade nylon zip ties to allow for easy installation and removal. Each fan pack has a surface area

#36-16121	15lb	\$117.00
#36-16122	15lb	\$117.00
#36-16123	15lb	\$117.00
#36-16124	15lb	\$117.00
#36-16125	15lb	\$117.00
	#36-16122 #36-16123 #36-16124	#36-16121 15lb #36-16122 15lb #36-16123 15lb #36-16124 15lb #36-16125 15lb

of 20 sq. ft, there are 20 fans per pack and each fan within the pack is 36°x 1 1/16° x 13/16°. All profiles are 100% Pennsylvanian American white oak (*Quercus alba*).

Usage: Attach the zip-tie to the D-rings that may be pre-installed on tank walls. When fan packs are used during fermentation, ensure that the staves remain well below the cap.

Storage: Store in a cool, dry, odor free environment below 25°C(77°F). Keep tightly sealed and dry until ready to use. Once opened use immediately.

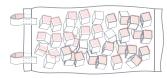
Recommended	Dosage
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3.6-14.4g/L	2-8 fan packs/1000 gal	30-120lb/1000 gal
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THE OAK LAB THERMIC OAK CUBES ** öaklab.

Oak infusion format for structural and aroma enhancement; fast extraction

Red, White, Rosé



THERMIC Color 1 Oak Cubes	#36-16131	20lb	\$228.00
THERMIC Color 2 Oak Cubes	#36-16132	20lb	\$228.00
THERMIC Color 3 Oak Cubes	#36-16133	20lb	\$228.00
THERMIC Color 4 Oak Cubes	#36-16134	20lb	\$228.00
THERMIC Color 5 Oak Cubes	#36-16135	20lb	\$228.00

THERMIC COLOR PROFILE's 1-5 oak cubes are used during fermentation, aging and finishing. Oak cubes are recommended for fast extraction of aroma, flavor and structural components and are particularly useful for fast, targeted pre-bottling adjustments. Depending on oak style goals, color profiles may be used alone or in combination with other profiles. Oak cubes can remain in contact with the wine for up to 9 months.

Wine must be tasted and evaluated frequently to determine exact contact time.

Oak cubes are packaged in food grade mesh bags. The bags have rugged handles to allow for easy tank installation and removal. The oak has a surface area of 34 sq. ft, the oak cube dimensions are 1" x 1 1/16" x 13/16". All profiles are 100% Pennsylvanian American white oak (*Quercus alba*).

Usage: Attach the handle on the mesh bag to the D-rings that may be pre-installed on tank walls. When used during fermentation ensure that the cubes remain well below the cap.

Storage: Store in a cool dry, odor free environment below 25°C(77°F). Keep tightly sealed and dry until ready to use. Once opened use immediately.

Recommended Dosage

4.8-1	9.2 g/L	2-8 cube bags/1000 gal	40-160 lb/1000gal
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THE OAK LAB THERMIC BARREL INSERTS/SLEEVES © öaklab. Oak infusion for wine fermented and aged in barrels

Red, White, Rosé



#36-16141 3.5lb THERMIC Color 1 Barrel Inserts \$93.00 #36-16142 3.5lb \$93.00 THERMIC Color 2 Barrel Inserts #36-16143 3.5lb \$93.00 THERMIC Color 3 Barrel Inserts #36-16144 3.5lb \$93.00 **THERMIC Color 4 Barrel Inserts** #36-16145 3.5lb \$93.00 THERMIC Color 5 Barrel Inserts

THERMIC COLOR PROFILE's 1-5 barrel inserts are added into barrels to infuse new oak into wines during fermentation, aging and finishing. THERMIC barrel inserts enhance structure and impact oak flavors and aromas. Barrel inserts should remain in contact with the wine from 3-12 months. Wine must be tasted and evaluated frequently to determine exact contact time. The longer the contact time the greater the impact.

Barrel inserts contain 20 sections, contained within food grade mesh netting, and an eyelet screw for easy attachment to barrel bungs. The oak has a surface area of 5.5 sq. ft, each

section is 9" x 1 1/16" x 13/16". All profiles are 100% Pennsylvanian American white oak ($Quercus\ alba$).

Usage: Attach the eyelet screw to barrel bung and insert into barrel.

Storage: Store in a cool dry, odor free environment below 25°C(77°F). Keep tightly sealed and dry until ready to use. Once opened use immediately.

Recommended Dosage	1 insert/60 gallon barrel
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I am using tannins, enzymes and SO,. Can I add them at the same time?

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 SO₃ first, allow to disperse, then follow with the tannin addition.

Can I use tannins or oak on white and rosé juice and wine?

Yes. A tannin or oak addition is beneficial in white juice to remove off-aromas, improve clarification, inhibit laccase activity from Botrytis or rot, and serve as an antioxidant. Sweet oak characters or toasted oak characters can be imparted depending on the oak profile. (see choosing chart on pg 85).

Why should I use tannins on my red grapes since red grapes have tannins?

Tannins can be used to protect the color and phenolic structure of your wines. For the easiest and most efficient integration of tannins, add at the crusher. If needed, an addition of tannin prior to aging can help reinforce phenolic balance. During long maturation in barrels, tannins will help prevent excessive oxidation that can result in loss of structure and freshness. For improved SO₂ management add small amounts of SCOTT'TAN 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. Research indicates that early addition of tannins, such as SCOTT'TAN™ FT ROUGE, binds up available proteins. This preserves grapes' own natural tannins making them available to bind with grape anthocyanins, thereby providing increased color stability.

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

If increased tannin structure and flavor is desired post-fermentation, make additions with SCOTT'TAN™ ESTATE. Addition is best before barrel aging when tannins can be incorporated into the wine and when oxidation and polymerization are slow. SCOTT'TAN™ RICHE, and SCOTT'TAN™ RICHE EXTRA are the best tannins to use prior to bottling (3-6 weeks) when a bit of

oak influence is desired. For last minute additions SCOTT'TAN™ ONYX, SCOTT'TAN™ RADIANCE or SCOTT'TAN™ ROYAL can be used. Post alcoholic fermentation bench trials should be conducted to determine most suitable tannin/oak product and the correct dosage.

Will adding tannins or oak inhibit barrel aging?

FREQUENTLY ASKED QUESTIONS: OAK & TANNINS

No. Tannins and oak infusion products protect wine from oxidation during barrel aging, help integrate tannins extracted from oak, increase aroma complexity and balance mouthfeel. 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 older barrels, indigenous tannin may be depleted. A small tannin addition of 5–10 g/hL of SCOTT'TAN™ UVA'TAN or SCOTT'TAN™ ESTATE will increase the phenolic content and protect the wine. Alternatively, an oak infusion barrel insert can be used.

Can tannins or oak 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 either a more refined, highly polymerized tannin or oak infusion product to the wine, balance can be restored, 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?

SCOTT'TAN™ UVA'TAN SOFT (tannins from white grape skins only) are comprised of 100% grape tannin.

Why can ONLY ONYX, RADIANCE and ROYAL be added 48 hours before bottling?

SCOTT'TAN™ ONYX, SCOTT'TAN™ RADIANCE and SCOTT'TAN™ ROYAL undergo a specific extraction process, which increases their solubility. This means that they can safely be added without the worry of precipitation.

Will SCOTT'TAN™ ONYX, RADIANCE and ROYAL cause filtration problems?

No filtration problems have been reported when the filtration occurs 48 hours after the tannin addition.



Enzymes have been used in the fruit industry since the 1930s. In the early days, enzymes for grapes were basic pectinases, were poorly understood and used primarily for increasing juice yields. After decades of research, Scott Laboratories started offering specialized enzymes for the wine industry and has done so for the past 30 years. These enzymes can accelerate a variety of natural reactions that would otherwise occur slowly in grapes, juice, must and wine. They can be used to increase yield before fermentation, improve aromas and mouthfeel and make clarification and filtration easier.

At the heart of many enzyme-solvable problems is pectin. Grape skins and grape pulp are rich in pectins which are linked together with other structural molecules such as cellulose and hemicellulose. In addition to this complexing, pectin itself can be highly branched with many side chains, necessitating multiple formulations for different winemaking applications. At almost every stage in the winemaking process proper enzyme use can improve quality and save costs.

SELECTING ENZYMES FOR SUCCESS

It is important to match the winemaking goal, enzyme blend and correct dosage to achieve maximum success. The amount of enzyme necessary to achieve success will depend on: the method of harvest, varietal, pectin content, skin thickness, contact time, grape chemistry (pH and temperature) and the presence of inactivating agents like SO_2 , bentonite and tannins. Consider the following when choosing an enzyme and determining its dosage:

VARIE	ΙA	ıL (OP	I IIVII	ZAI	Ю	N	

Skin contact enzymes can help release bound aroma precursors into the must or juice.

PRESSING & CLARIFICATION

Enzymes break down grape pulp threby releasing trapped juice, decreasing solids, increasing yield and resulting in higher quality juice. Press cycles are optimized and lees are more compact.

COLOR & PHENOLICS

Enzymes accelerate the release of anthocyanins and tannins resulting in wines with brighter, more stable color and enhanced structure.

MOUTHFEEL

Enzymes promote tannin extraction which impacts mouthfeel. Some enzymes, like beta-glucanase will aid with yeast autolysis, releasing mannoproteins which increases mouthfeel and sweetness perception.

AROMA REVEALING

Aroma compounds, if not released from their precursor form, can be undetectable. Some enzymes have the ability to release these compounds.

SUGAR LEVEL

Enological beta-glucosidase/glycosidase enzymes are inhibited by sugar. It is recommended that these enzymes are used once the glucose level is <5%.

FILTRATION

Grapes impacted by *Botrytis* can be filtration nightmares. Enzymes help break down glucans and other polysaccharides that are colloidal in nature and can make the wine very difficult to filter.

CHOOSING ENZYMES

Winemaking Stage	Wine Type	Winemaking Goal	Recommended Enzymes
	White, Rosé	Increase aromas from white and rosé grapes	LALLZYME CUVEE BLANC™, RAPIDASE® REVELATION AROMA
Incoming Grapes	White, Rosé	Increase juice yield, higher quality free-run and some aroma enhancement	SCOTTZYME®PEC5L, SCOTTZYME®CINN-FREE
/Fruit and In Press	Muscat, Hybrid, American grapes Hard to Press, Fruit Wines	Increase juice yield, reduced solids and improved filtration efficiency	SCOTTZYME® HC in conjunction with SCOTTZYME® PEC5L
	White, Rosé	Increase aromas and flavors	SCOTTZYME® CINN-FREE
Juice/Must	White, Rosé	Faster settling, decrease solids, compact lees and some aroma increase	RAPIDASE® CLEAR EXTREME, SCOTTZYME® PEC5L, SCOTTZYME® KS, SCOTTZYME® CINN-FREE
Succession	Muscat, Hybrid, American grapes Hard to Press, Fruit Wines	Faster settling, decrease solids, compact lees and some aroma increase	RAPIDASE® CLEAR EXTREME,SCOTTZYME® PEC5L in conjunction with SCOTTZYME® HC, SCOTTZYME® KS
	Reds	Increase fruit aromas and color stability, decrease herbaceous aromas and aggressive tannins	SCOTTZYME® COLOR PRO, LALLZYME EX™
Must	Reds	Increase aroma complexity, color and structure. Decrease skin contact time (faster to press)	LALLZYME EX-V™, SCOTTZYME® COLOR-PRO
Flotation	White, Rosé	Optimize depectinization and processing time for flotation	RAPIDASE® CLEAR EXTREME, SCOTTZYME® PEC5L
	White, Rosé	Compact lees, increase filtration efficiency, minimize loss	SCOTTZYME® KS, SCOTTZYME® PEC5L
Fermentation	Cider, Fruit Wines or Mead	Compact lees, increase filtration efficiency, minimize loss	SCOTTZYME® KS PLUS, SCOTTZYME® HC in conjunction SCOTTZYME® PEC5L
	Botrytis-affected fruit	Break-down glucans, improve settling and filtration efficiency	LALLZYME MMX™
	,,,		DADDAGE® DEUGLATION ASSAULT SCATTFORMS
	All	Increase aromas and complexity	RAPIDASE® REVELATION AROMA, SCOTTZYME® BG
	All	Increase body, perception of sweetness and speed up autolysis	LALLZYME MMX™
Post Fermentation	All	Improve clarity, increase filtration efficiency and minimize loss	SCOTTZYME® KS, SCOTTZYME® KS PLUS
	Non-grape wines	Improve clarity, filtration efficiency and minimize loss	SCOTTZYME® KS PLUS, SCOTTZYME® PEC5L, SCOTTZYME® HC

LALLZYME CUVÉE BLANC

Skin contact enzyme for early and continual aroma release in whites

LALLZYME CUVÉE BLANC™ is added to white grapes pre-pressing for increased aroma release from grapes and wine. This specialized enzyme is a blend of pectinase with β -glycosidase side-activities but low macerating abilities. In the juice phase, enzyme activity allows for the release of aroma compounds while gently extracting juice (even at low pressure), and fast settling. At the onset of fermentation, β -glycosidase activity will be inhibited due to the high glucose concentration (>5%), however as fermentation continues this inhibition is removed allowing the enzyme to release more aroma compounds. This granular enzyme from Lallemand Oenology allows for easier processing, increased aromas, flavors, and complexity.

#35-16013

100 g \$48.00

Usage: Dissolve LALLZYME CUVÉE BLANC in 10 times its weight of water, gently stir and allow to sit for a few minutes. Add directly to the grapes or add in the press.

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

Recommended Dosage

Crushed Grapes	Juice	Wine
20 g/ton	Not recommended	Not recommended

Stage of Winemaking: White Grapes	Activity: Pectinase and glycosidase	Impact: Enhanced aromatics		
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LLZYME EX (ALLEMAND)	#35-16012	100 σ	<b>\$</b> 22 15	

LAL

Increased fruity aromas, mouthfeel and color stability in reds

LALLZYME EX[™] is a granular enzyme with pectinase, cellulase and hemicellulase activities to improve color stability and mouthfeel in red wines. Specific side activities contribute to the macerating action on the grape cell wall which allows progressive liberation of polyphenols and tannin bound-polysaccharides. LALLZYME EX increases juice extraction, improves wine filterability and provides gentle maceration, even in when phenolic maturity has not been reached.

**Usage**: Dissolve LALLZYME EX in 10 times its weight of water, gently stir and allow to sit for a few minutes. Add directly to grapes at the beginning of fermentation or start of cold

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

# Recommended Dosage

Crushed Grapes	Juice	Wine
15-30 g/ton	Not recommended	Not recommended

Stage of Winemaking: Red Grapes Activity: Pectinase, Cellulase, Hemicellulase Impact: Gentle extraction of juice, arom
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# LALLZYME EX-V



Increased aroma complexity, color stability, mouthfeel and tannin structure in reds

LALLZYME EX-V™ is a granular enzyme with pectinase, cellulase and hemicellulase activities for use in red wines intended for aging. It has a specific action on grape cell walls and cell membranes that allows for rapid and efficient release of anthocyanins and tannins leading to stable polymeric pigments. This results in structured wine with deep, stable color. Aromatic analysis shows that LALLZYME EX-V increases the release of aromatic compounds while respecting varietal

**Usage**: Dissolve LALLZYME EX-V in 10 times its weight of water, gently stir and allow to sit for a few minutes. Add to the grapes at the beginning of fermentation or the onset of cold

100 g

\$33.15

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

### **Recommended Dosage**

#35-16025

Crushed Grapes	Juice	Wine
10-20 g/ton	Not recommended	Not recommended

Stage of Winemaking: Red Grapes Activity: Pectinase, Cellulase, Hemicellulase Impact: Enhanced structure, color, and complexity

\$34.50

LALLZYME MMX

LALLEMAND

Increased sweetness, roundness, and filterability of white and red wines

LALLZYME MMX™ is a granular enzyme with beta-glucanase and pectinase activities sourced from *Trichoderma harzianum* and *Aspergillus niger*. This enzyme improves yeast autolysis when wine is aged on yeast lees, leading to rounder, fuller-bodied wines. Glucanase and pectinase activities act synergistically to improve clarity and filterability of wines infected with *Botrytis*. In order to maximize benefit of LALLZYME MMX, a contact time of 6-8 weeks is recommended.

Usage: Dissolve LALLZYME MMX in 10 times its weight of wa-

#35-16020 100 g \$51.00

ter, gently stir, allow to sit for a few minutes then add to wine.

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

Recommended	Dosage Bench	trials recommended for wine
Crushed Granes	luice	Wine

Crusned Grapes	Juice	wine
Not recommended	Not recommended	1–3 g/hL 40–114 g/1000 gal

Stage of Winemaking: Wine	Activity: Pectinase and beta-glucanase	Impact: Mouthfeel, clarification and filterability

# RAPIDASE CLEAR EXTREME

RAPIDASE

Superior juice clarification under difficult conditions

Hybrid and American grape varieties may be difficult to clarify. RAPIDASE® CLEAR EXTREME is a granular enzyme that can be used after pressing to 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). CLEAR EXTREME will remain active at 6–50°C(43–122°F).

**Usage**: Dissolve RAPIDASE CLEAR EXTREME in 10 times its weight of 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(39–45°F). Once rehydrated, use within a few hours.

100g

# Recommended Dosage

#40-16325

Crushed Grapes	Juice	Wine
Not recommended	1-4 g/hL 38-152 g/1000 gal	Not recommended

Stage of Winemaking: Juice Settling	Activity: Pectinase	Impact: Clarification under extreme conditions
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# ARTICLE

# OPTIMAL CONDITIONS FOR ENZYME ACTIVITY

Grape enzymes are generally inactive in the juice, must and wine environment. However, fungal-derived enological enzymes are not, and they work well under most winemaking conditions. Used from grape processing to pre-bottling, enzymes play a pivotal role in winemaking where they optimize aromas, color and mouthfeel, increase yield and quality of free run juice, and assist with processes like clarification and filtration.

However, there are certain factors that have an adverse impact on the activity of the enzyme. One key parameter is temperature. The lower the temperature, the lower the activity of the enzyme. At temperatures <50 °F/10°C enzymes will still work, but slowly. In cases of high temperature, more than  $140^{\circ}F/60^{\circ}C$ , the enzyme can be destroyed. The ideal temperature for enzymes to work in winemaking is  $50\text{-}86^{\circ}F$  ( $10\text{-}30^{\circ}C$ ). The other key parameters to consider are time and dosage. The longer the enzyme is left to work, the more work it can do. Unfortunately, due to processing demands, time is often the limiting factor. The dosage required varies depending on contact time, grape varietal and ripeness, and the stage of winemaking. When using enzymes ensure that the presence of other enological products, processes or conditions do not stop the enzyme from working. Examples of products include high sulfur dioxide concentrations, bentonite or excessive enological tannin additions. These will immediately halt all enological enzyme activity. Time your  $SO_2$ , tannin and bentonite additions carefully and never mix enzymes directly with any of these additives. To completely stop all enzyme activity make a bentonite addition of 5-10 g/hL. Lastly, fungal derived  $\beta$ -glycosidase enzymes (e.g., SCOTTZYME® BG and RAPIDASE® REVELATION AROMA) which release aroma compounds from sugars, are inhibited by glucose (not fructose) concentrations >5%. Once the glucose concentration is less than 5% this inhibition is removed. Interestingly, yeast-produced  $\beta$ -glycosidase are not inhibited by glucose concentration.

To ensure your chosen enzymes are working to your advantage pay attention to temperature, dosage, potential inhibitory factors and the winemaking stage.

# RAPIDASE REVELATION AROMA

Increased release of tropical, fruity and floral aromas

RAPIDASE® REVELATION AROMA is a granular enzyme that contains alpha- and beta-glycosidase activities to breakdown sugar-bound aroma precursors. Respects varietal characters and increases terpenes for intense and complex aromas. Since glycosidase activity is inhibited by glucose levels above 5% glucose a REVELATION AROMA addition after fermentation can be beneficial. Once the desired aroma has been obtained, enzyme action can be stopped via a (5-10g/hL) bentonite addition.

**Usage**: Dissolve RAPIDASE REVELATION AROMA in 10 times its weight of water, stir gently, allow to sit for a few minutes. Pour over crushed fruit, add to the juice before the start of alcoholic fermentation, or add to wine post-fermentation. Enzyme can be deactivated with a 5-10 g/hL bentonite treatment.

#40-16330 100g \$65.00

**Storage**: Dated expiration. Store refrigerated at 5-15°C (41-59°F). Once rehydrated, use within a few hours

	<b>Recommended Dosage</b> Bench trials recommended for wine		
	Whites		
	Crushed Fruit	Juice	Wine
	15–22 g/ton	1–1.5 g/hL 35–55 g/1000 gal	1–2 g/hL 35–70 g/1000 gal
	Reds		

Crushed Fruit	Juice	Wine
		2-2.5 g/hL
	70-90 g/1000 gal	70-90 g/1000 gal

Stage of Winemaking: Red or white grapes, juice or wine	Activity: Pectinase and glycosidase	Impact: Aroma release
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CCOTTZVME DC		1

#40-16176

SCOTTZYME BG

Post-fermentation enzyme to increase aromas and flavors

SCOTTZYME® BG is a powdered pectinase with beta-glucosidase side-activities for the release of bound terpenes. It is generally used in white wines, but may also be used in red, rosé and fruit wines for the release of aroma and flavor compounds. BG should only be used at the end of fermentation, never on grapes or in juice as the glucosidase activity is inhibited by sugars. The wine should have less than 5% glucose remaining for proper enzyme activity. Once the desired aroma has been obtained, enzyme action can be halted via a (5-10g/hL) bentonite addition.

Usage: Dissolve SCOTTZYME BG in 10 times its weight of cool water, stir gently, allow to sit for a few minutes and add to

wine. Enzyme can be deactivated with a 5-10 g/hL bentonite treatment.

1 kg (890 mL)

\$283.00

114-190 g/1000 gal

Storage: Store at room temperature for 1–2 years. Once opened, keep tightly sealed and dry. Once rehydrated, use within a few hours.

Recommended Dosage Bench trials recommended for wine

Crushed Grapes Juice Wine

Not Not 3-5 g/hL

recommended

if, sen genery, anow to sit for a few infinites and add to			
Stage of Winemaking: Wine	Activity: Pectinase and beta-glucosidase	Impact: Aroma release	

recommended

SCOTTZYME CINN-FREE O

All-purpose enzyme for white and rosé juice

SCOTTZYME® CINN-FREE is a purified liquid 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, 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.

Usage: Dilute SCOTTZYME CINN-FREE to approximately a

#40-16175	1 kg (890 mL)	\$82.50
#40-16165	25 kg (22.25 L)	\$1530.00

10% solution in cool water. Pour over the grapes before pressing or add to juice before the start of alcoholic fermentation.

Storage: Store at 4°C(39°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

Recommended Dosage		
Crushed Grapes	Juice	Wine
15-30 mL/ton	1.3-1.6 mL/hL 50-60 mL/1000 gal	Not recommended

Stage of Winemaking: White grapes or juice	Activity: Pectinase	Impact: Aroma and clarification	
	_	•	П

\$69.50

SCOTTZYME COLOR PRO O

Increased roundness and color stability and reduced "veggie" character in red wine

SCOTTZYME® COLOR PRO is a specialty liquid pectinase with protease side-activities. These side-activities are important for helping break down cell walls of red grapes to gently extract anthocyanins, phenolic compounds and tannins. This gentle extraction creates wines that are rounder in the mouth, bigger in structure, and with improved color stability. Wines made with COLOR PRO tend to have increased tannins, improved clarity and reduced herbaceous or veggie characters. 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.

#40-16172	1 kg (890 mL)	\$69.50
#40-16162	25 kg (22.25 L)	\$1437.50

Usage: Dilute SCOTTZYME COLOR PRO to approximately a 10% solution in cool water. Pour the solution over the crushed grapes or add directly to tank and mix thoroughly.

Storage: Store at 4°C(39°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

Recommended Dosage

#40-16173

Reds

Crushed Grapes	Juice	Wine
60-100 mL/ton	Best used before fermentation	Best used before fermentation

Stage of Winemaking: Grapes, juice and wine Activity: Pectinase and protease Impact: Rounder, bigger wines with increased color

SCOTTZYME COLOR X C

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 colour response of Color X is similar to Color Pro.

Usage: Dilute Scottzyme Color X to approximately a 10% solution in cool water.

Pour the solution over the crushed grapes or add during a pumpover before alcoholic fermentation. Best used before fermentation. **Storage**: Store at 4°C(40°F) for 1-2 years. Keep tightly sealed and refrigerated once opened.

1 kg (890 mL)

 $\begin{tabular}{ll} \textbf{Recommended Dosage} \ \textit{Bench trials recommended for wine} \\ \textbf{Reds} \end{tabular}$

Crushed Fruit	Juice	Wine
60-100 mL/ton		Best used before fermentation

Stage of Winemaking: Before Fermentation Activity: Pectinase Impact: Color and structure

ARTICLE CHOOSING COLOR PRO OR COLOR X?

It is important to know your grapes. Scottzymes will have little effect on overall colour if your grapes are deficient in compounds contributing to colour (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 colour effect due to the Scottzymes may be negligible. Trials, however, have shown changes in mouthfeel and structure even when colour change has been minimal.

SCOTTZYME HC •

For fruit and American grapes to increase yield, clarity and filterability

SCOTTZYME® HC is a liquid pectinase and cellulase blend developed to increase yield, reduce solids and improve filtration. It is a strong enzyme useful for hard-to-press or slimy grapes (such as Concord), pome fruit (apple or pear), and stone (pitted) fruits. HC is best used in conjunction with SCOTTZYME® PEC5L.

Usage: Dilute SCOTTZYME HC to approximately a 10% solution in cool water. Pour the solution over the crushed fruit or add during a tank mixing before alcoholic fermentation. If adding to wine, gently mix a 10% solution into the tank for even dispersion.

#40-16171	1 kg (890 mL)	\$69.50
#40-16161	25 kg (22.25 L)	\$1437.50

Storage: Store at 4°C(39°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

Recommended Dosage Bench trials recommended for wine		
Crushed Fruit	Juice	Wine
	5.3-7.9 mL/hL	6.6-9.2 mL/hL
60-100 mL/ton	200-300 mL/	250-350 mL/
	1000 gal	1000 gal

Stage of Winemaking: Grapes and Fruit	Activity: Pectinas	e and cellulase	Impact: Clarificati	ion and filtration
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
SCOTTZYME KS O Improved settling and filterability in grape juice and wine		#40-16174	1 kg (890 mL)	\$69.50
		#40-16164	25 kg (22.25 L)	\$1450.00

SCOTTZYME® KS is a liquid blend of enzymes developed to create a special formulation for difficult-to-settle or hard-tofilter juice or wine. The earlier in the process KS is used, the more effective it will be. However, it should never be used before pressing in either red or white grapes. It is never too late to use KS. Customers have reported very favorable results when used to solve "nightmare" filtrations before bottling.

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.

Warning: Never use Scottzyme KS before pressing. 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 sol-

	20 118 (22120 2)	P2 .00.00
ids (even from Botry	etis). The goal is to m	ake the juice or wine

more manageable.

**Storage**: Store at 4°C(39°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

<b>Recommended Dosage</b> Bench trials recommended for wine			
Reds			
Crushed Grapes	Must	Wine	
Not	Not	5.3-7.9 mL/hL	
recommended	recommended	200-300 mL/1000 gal	
Whites			
Crushed Grapes	Juice	Wine	
Not	2.6-4.0 mL/hL	5.3-7.9 mL/hL	
Not recommended	100-150 mL/	200-300 mL/	
recommended	1000 gal	1000 gal	

Stage of Winemaking: Juice or wine	Activity: Pectinase, cellulase and protease	Impact: Clarification and filtration
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\$89.50

\$1800.00

**SPECTRUM: 20.8 NTU** 

\$58.25

\$1200.00

\$206.00

### SCOTTZYME KS PLUS

Concentrated formulation for fast throughput, improved filtration efficiency and crossflow cleaning

SCOTTZYME® KS PLUS is a powerful liquid enzyme created for use in wine that is very difficult to clarify. It has higher enzyme activities for the most difficult tasks. KS PLUS should be used on finished wine only, either to assist with settling or to help with filtration issues before bottling.

**Usage**: Dilute SCOTTZYME KS PLUS to approximately a 10% solution in cool water. Add to the wine after alcoholic fermentation during a tank mixing.

Warning: Never use SCOTTZYME KS PLUS before pressing or on the juice. It is our most aggressive enzyme and may result in over clarification of juice.

**Storage**: Store at 4°C(39°F) for 1–2 years. Keep tightly sealed and refrigerated once opened.

Recommended Dosage Bench trials recommended		
Fruit	Juice	Wine
Not recommended	Not recommended	4 mL/hL 150 mL/1000 gal

Stage of Winemaking: Wine Activity: Pectinase, cellulase and protease

Impact: Clarification and filterability in very difficult lots

Control: 120 NTU

#40-16170

#40-16160

#40-16177

#40-16167

### SCOTTZYME PEC5L

Improve pressability, clarification and settling for white and fruit wines

SCOTTZYME® PEC5L is a highly concentrated liquid pectinase blend developed and formulated specifically for winemaking.

It is used on crushed grapes for easier pressing and higher yields and in juice for improved settling, clarification and filtration. It is also useful for berries, pome and stone fruits. When adding to fruit, it is beneficial to use in conjunction with SCOTTZYME HC.

**Usage**: Dilute SCOTTZYME PEC 5L to approximately a 10%

1		'	
solution in cool water.	Pour over the	grapes or fruit b	efore press-
ing or add to the juice		~ .	-

1 kg (890 mL)

25 kg (22.25 L)

1 kg (890 mL)

25 kg (22.25 L)

Impact of SCOTTZYME KS PLUS on Turbidity after Four

**Day Settling at Room Temperature** 

Enzyme A: 46.1 NTU

**\SCOT** 

CONTROL

ing or add to the juice before the start of alcoholic fermentation. **Storage**: Store at 4°C(39°F) for 1–2 years. Keep tightly sealed

and refrigerated once opened.

Recommended	<b>Dosage</b> Bench trials red	commended for wine
Crushed Grapes		Wine
		1.3–1.6 mL/hL 50–60 mL/1000 gal

Stage of Winemaking: White grapes and fruit, juice and wine	Activity: Pectinase	Impact: Clarification	

### TRENOLIN FASTFLOW DF

Enzyme for intensive pectin degradation in pectin-rich grape varieties

A liquid multi-pectinase formulation targeting the breakdown of the branch points for more effective pectin hydrolysis in grape juice.

Grape pectin is rich in arabinogalactan-ll-side chains, and for this reason grape pectins are very difficult to break down, often times resulting in a larger portion of branched pectin residues remaining in the must, juice and wine. FastFlow rids pectin of its water binding capacity and thus viscosity is reduced.

Application at low temperatures is possible and increased filtration rates in red and white wines are realized.

Usage: Dilute Trenolin® FastFlow DF in a small amount of wa-

ter and add preferably to the mash or the grape must. Mix well to assure good distribution.

1 kg

**Storage**: Store in a cool environment. Use and reseal tightly.

### **Recommended Dosage** Bench trials

recommended for wine

#31-15081

Whites	
Grapes	6-10 mL/hL
Reds	
Juice	Wine
4-8 mI /hI	3-6 mI /hI

Stage of Winemaking: All Activity: Pectinase Impact: clarification and filtration
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### TRENOLIN FRIO DF

Enzyme for clarification — depsidase-free

Trenolin® Frio DF is a liquid, highly active special enzyme for a quick, effective pectin degradation in mash and must, in the course of cold maceration and cold clarification at temperatures as low as 5°C.

**Storage**: Store in a cool and dry place. Reseal opened packaging tightly and use quickly.

### #31-15080

1 kg

\$269.00

### **Recommended Dosage** Bench trials recommended

Improvement of pressability: pectin hydrolysis in the mash

Temperature	Dosage	Reaction time
10°C	2-4 mL/100 kg	1-2 hours
8°C	3-6 mL/100 kg	2-3 hours
5°C	5-10 mL/100 kg	4-6 hours

### **Recommended Dosage** Bench trials recommended

Acceleration of must clarification: pectin degradation in the must

Temperature	Dosage	Reaction time
10°C	1-3 mL/100 kg	2 hours
8°C	3-5 mL/100 kg	3 hours
5°C	5-8 mL/100 kg	4 hours

|--|

### TRENOLIN ROSÉ

**€RBSLÖH** 

Low colour extracting press enzyme

Trenolin® Rosé DF is the ideal choice for grapes rich in anthocyanins, warm harvest conditions and high pH values. Due to the rapid reduction in viscosity, very little time on the skins is needed to achieve the highest yield possible.

**Usage**: Enzyme should be added before pressing and diluted to achieve homogenous distribution. The recommended doses are based on a temperature of 15-17°C. As bentonite deactivates the enzyme, bentonite should not be used until

#31-15084C

#31-15085

1 kg

\$201.00

\$101.00

after the pectin has been fully degraded (pectin test).

**Storage**: Store in a cool and dry place. Reseal opened packaging tightly and use quickly.

## Recommended Dosage Bench trials recommended

Rosés

Grapes 2-3 mL/hL

Stage of Winemaking: Before pressing Activity: Pe	ectinase Impact: Gentle extraction of juice
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### TRENOLIN SUPER PLUS

**€ ERBSLÖH** 

Highly active, depsidase free, liquid pectinase

Trenolin® Super Plus is a highly active liquid pectinase that provides for a quick pectin degradation. Pressing time is reduced and press capacity increased.

A quick and compact sedimentation of lees is achieved in the juice and subsequent filtration steps are improved. Due to a purification process, undesired side activities are eliminated, and freshness and varietal characters of the grape are preserved.

**Usage**: Ideal treatment temperature is 15°C (59°F), but Trenolin Super functions as low as 12°C (54°F). The higher the temperature, the more active the enzyme.

Add to small amount of juice/wine and mix thoroughly before

adding into the vessel. Stir thoroughly.

Minimum contact time is 1 hr and longer contact time is advantageous.

**Storage**: Store in a cool environment. Use and reseal tightly.

1 kg

## **Recommended Dosage** Bench trials recommended Reds/Whites

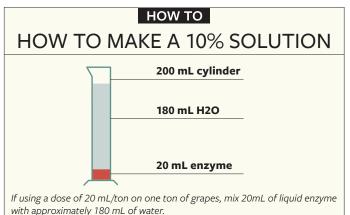
Grapes	Juice	Wine
8 mL/hL	3 mL/hL	5 mL/hL

Stage of Winemaking: All	Activity: Pectinase	Impact: Clarification and filterability

### FREQUENTLY ASKED QUESTIONS: ENZYMES

### What is the best way to add liquid enzymes?

First calculate the dosage then dilute SCOTTZYMES® to approximately a 10% solution (v/v) in cool water (see below). Pour the solution over the crushed grapes/fruit or during a pump-over before fermentation. If adding to juice or wine, gently mix a 10% solution into the tank for even dispersion. Thorough mixing is important.



### How do I add powdered or granular enzymes?

Granular enzymes need to be dissolved in 10 times their weight of water (for every gram of enzyme dissolve in 10 mL 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 water (~21°C/70°F) 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 SO,?

Yes, enzymes are inhibited by  $SO_2$ . Deactivation occurs around 500 ppm. Do not add  $SO_2$  and enzymes together. It is okay to add enzymes after the  $SO_2$  is adequately dispersed or to add the  $SO_2$  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 $^{\otimes}$ COLOR PRO, LALLZYME EX $^{\rm TM}$ or LALLZYME EX-V $^{\rm TM}$ ?

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 are you no longer recommending SCOTTZYME[®] COLOR PRO on whites?

SCOTTZYME COLOR PRO is still fine to use on whites, however we have other enzymes that are more appropriate for white wine processing.

### When should I choose LALLZYME EXTM or LALLZYME EX-VTM?

LALLZYME EX is recommended for fruit forward red wines and EX-V is for highly-structured reds.

### What should I do if the optimal time to add enzymes has passed?

Low temperatures, alcohol and  $SO_2$  all inhibit enzyme activity, but the enzymes will still work. This is why recommended enzyme dosage levels for wine are higher than for juice in most cases. 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 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.

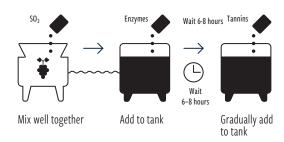
# I had *Botrytis* on my grapes this harvest and I want to use a beta-glucanase enzyme. Do you carry a beta-glucanase enzyme? Yes, LALLZYME $\mathsf{MMX}^\mathsf{TM}$ is a blend of beta-glucanase and pectinase.

How long should I leave the enzyme on white grapes before pressing? In general, waiting 2–12 hours before pressing should be enough time for the enzyme to work.

I am using tannin and enzymes. Will  $SO_2$  interfere with my additions? Using all three products together is fine, but timing is important! High  $SO_2$  content can inhibit enzyme activity. Do not add  $SO_2$  and enzymes at the same time. It is okay to add enzymes after the  $SO_2$  is adequately dispersed OR to add  $SO_2$  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.





Add  ${\rm SO_2}$  and mix well prior to adding enzymes. Tannins can be added 6–8 hours later. Yeast derivative nutrients (e.g. OPTI-RED) can be added at any point during fermentation.



Fining and stabilizing are complementary actions that remediate and protect juice and wine from off-odors, off-colors, and unsightly hazes and precipitates.

Fining removes unwanted elements from juice and wine by physical removal. Though fining agents work by different mechanisms, they all react with or adsorb unwanted substances that are then removed by racking, filtration, centrifugation, or other means. Stabilizers react with substances to prevent wine hazes and precipitates from occuring.

A properly fined, stabilized and filtered wine ultimately leads to a bottle-stable wine.

### SELECTING FINING & STABILITY AGENTS FOR SUCCESS

To properly select appropriate fining and stabilizing agents many considerations must be taken into account. First identify the fining or stability goal and then choose a treatment appropriate for the stage of winemaking. Early, proactive treatments are always recommended. Treating problems early can avoid compounded problems later.

## BROWNING & OXIDATION

Grape juice and wine can oxidize leading to unwanted visual, sensory, and chemical changes. Conditions leading to browning and oxidation are not always understood, but treating problems early is always encouraged. Early fining with activated carbon and PVPP/Casein based products can help remove oxidized phenolics and brown pigments in both the juice and wine phase.

### CLARIFICATION

High solids can be problematic. Solids removal can be achieved using enzymes, gelatins, PVPP, bentonite, and casein. These options can be used pre- and post-fermentation. Post-fermentation isinglass can be used to reduce turbidity due to polysaccharides and colloids thereby eliminating multiple filtration steps.

### HAZE

Haze can be caused by many things: microbes, heat unstable proteins, tartrates, residual fining aids, etc. Protein instability can be remedied by using bentonite and residual fining aids can be removed by Cristalline Plus and silica gels like Gelocolle. Microbial hazes can be reduced via fining and filtration. Microbial stability can also be achieved through appropriate use of microbial control agents (see pgs 131-133).

## TARTRATE INSTABILITY

Preventing tartrate precipitation in a finished wine can be achieved in a number of ways. Traditionally, tanks are seeded with potassium bitartrate and chilled close to freezing temperatures to induce tartrate precipitation before bottling. Recent advances include adding tartrate inhibitors like mannoproteins and gum arabic. These products work by inhibiting tartrate crystal formation, thereby keeping tartrates in solution.

### SENSORY ASPECTS

Wines with perceived astringency and bitterness may be improved with the use of gelatins or other protein-based products that complex with polyphenols. When the goal is to improve aromatic profiles, products like isinglass (pg 123), tannins (pgs 85-93) as well as gelatins (pg 120) are useful.

## ALWAYS CONSIDER THE FOLLOWING FACTORS WHEN CHOOSING OR APPLYING A FINING OR STABILIZING AGENT:

### Fining/stability agent preparation Most dry

Most dry agents should be prepared in water. Always read product directions and follow accordingly.

### **Dosage** Bench trials

Bench trials must be conducted on each wine to determine proper dose rate.

### Contact time | Most agents

react rapidly when contact is made, but may need time to settle out.

## Shape and size of ves-

Vessel type may impact settling time.

### Temperature

Temperature imapcts settling time. Both high and low temperatures can inhibit sedimentation.

### Winemaking stage

Ensure the treatment is compatible with winemaking stage.

## Previous treatments

Previous treatments can interfere with downstream treatments.

## Addition method

Pumping using a Venturi is an efficient way to disperse agents. Closed circulation afer addition is also beneficial.

## CHOOSING FINING & STABILITY AGENTS

WINEMAKING STAGE	WINE TYPE	WINEMAKING GOAL	RECOMMENDED PRODUCTS
	White, Rosé	Counteract moldy aromas	FRESHPROTECT, GRANUCOL GE
On Incoming Grapes and in Press	White, Rosé	Oxidation prevention and treatment	FRESHPROTECT, GRANUCOL FA
	White, Rosé	Remove unwanted color	GRANUCOL FA
	White, Rosé	Counteract moldy aromas	BENTOLACT S, CASÉINATE DE POTASSIUM, GRANUCOL GE, POLYCACEL
	White, Rosé	Oxidation prevention	FRESHPROTECT, POLYCACEL
	White, Rosé	Oxidation treatment, dimish bitterness	BENTOLACT S, CASÉINATE DE POTASSIUM, FRESHPROTECT, POLYCACEL
Juice	White, Rosé	Remove unwanted color	GRANUCOL FA
	White, Rosé	Clarification	BENTOLACT S, NACALIT® PORE-TEC
	White, Rosé	Remove potential haze forming proteins and compact lees	GRANUBENT PORE-TEC, NACALIT® PORE-TEC
	White, Rosé	Reduce sulfur off odors	BENTOLACT S, REDULESS™
Flotation	White, Rosé	Aids flotation	GRANUBENT PORE-TEC, INOCOLLE WITH GELOCOLLE, NACALIT® PORE-TEC
	White, Rosé	Remove color	POLYCEL
Fermentation	Aromatic White, Rosé	Remove haze forming proteins	FERMOBENT® PORE-TEC
	Red, White, Rosé	Reduce sulfur defects	BENTOLACT S, REDULESS™
	Red, White, Rosé	Counteract unwanted aromas	GRANUCOL GE, BENTOLACT S
	Red, White, Rosé	Oxidation prevention	POLYCACEL, POLYCEL
	Red, White, Rosé	Oxidation treatment	CASÉINATE DE POTASSIUM, FRESHPROTECT, GRANUCOL FA, POLYCACEL
	Red, White, Rosé	Remove unwanted color	GRANUCOL FA, FRESHPROTECT, POLYCEL
	Red, White, Rosé	Diminish bitterness	BENTOLACT S, CASÉINATE DE POTASSIUM, FRESHPROTECT, POLYCACEL, POLYCEL
Post-Fermentation	Red, White, Rosé	Clarification	CRISTALLINE PLUS, INOCOLLE, NACALIT® PORE-TEC
	Red, White, Rosé	Help compact lees	GELOCOLLE, NACALIT® PORE-TEC
	Red, White, Rosé	Remove haze forming proteins	BLANCOBENT UF(CROSSFLOW), GRANUBENT PORE-TEC
	Red, White, Rosé	Protects against over-fining	GELOCOLLE
	Red, Hard-Press White, Rosé	Diminish harsh & astringent tannins, minimize greeness	COLLE PERLLE, FRESHPROTECT
	Red, White, Rosé	Unmask aromas	INOCOLLE, CASÉINATE DE POTASSIUM, POLYCACEL
	Red, White, Rosé	Reduce sulfur defects	REDULESS™, BENTOLACT S
	Red, White, Rosé	Promote potassium bitartrate stability	CLARISTAR®, ULTIMA SOFT
	Red, White, Rosé	Stabilize colloids/ prevent deposits in the bottle	FLASHGUM R LIQUIDE, ULTIMA SOFT, CLARISTAR®
Immediately Prior to Bottling	Red, White, Rosé	Minimize tannin sensations of bitterness, harshness or astringency	ULTIMA SOFT
	Red, White, Rosé	Increase roundness and perception of sweetness	CLARISTAR®, FLASHGUM R LIQUIDE, ULTIMA SOFT

## ACTIVATED CARBON

### **GRANUCOL BI**

**€**ERBSLÖH

Decolorizing carbon

Rosé, Red

Granucol BI is for the reduction of tannins and polyphenols, and the decolorization of high-color wines. These activated carbon pellets are prepared for ease of use in the cellar.

**Usage**: Add Granucol BI directly to wine. The pellets immediately dissolve after addition. Stir vigorously for several minutes to ensure even distribution. The activated carbon deposit should be racked as soon as possible.

#31-15034 1 kg

**Storage**: Dated expiration. Store in a dry, odor-free and wellventilated environment below 25°C (77°F). Reseal opened packaging immediately.

\$23.00

### Recommended Dosage Bench trials recommended

Wine

0.8-4.2 lb/1000 gal 100-500 ppm 10-50 g/hL

Stage of Winemaking: Wine fining	Contact Time: 24 hours	Impact: Removes tannins and polyphenols
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### GRANUCOL FA

Decolorizing carbon

Red, White, Rosé

GRANUCOL® FA is a decolorizing carbon for the elimination of off-colors due to browning in juice and wine. These acti-

vated carbon pellets are prepared for ease of use in the cellar.

Usage: Add GRANUCOL FA directly to juice or wine. The pellets immediately dissolve after addition. Stir vigorously for several minutes to ensure even distribution. The activated carbon deposit should be racked as soon as possible.

**Storage**: Dated expiration. Store in a dry, odor-free and

#31-15032	1 Kg	\$23.00
#31-15032B	10kg	\$147.00

### Recommended Dosage Bench trials recommended

Juice

10-100 g/hL 100-1000 ppm 0.83-8.3 lb/1000 gal 10-30 g/hL 0.83-2.5 lb/1000 gal 100-300 ppm

well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Impact: Removes color

GRANUCOL GE **€** ERBSLÖH

Stage of Winemaking: Juice, Wine

Deodorizing carbon

Red, White, Rosé

#31-15031 1 kg \$23.00 10kg #31-15031B \$147.00

GRANUCOL® GE is a deodorizing carbon for the absorption of off-tastes and off-aromas. It is especially useful in removing moldy aromas from grapes contaminated with rot. These activated carbon pellets are prepared for ease of use in the cellar.

**Usages:** Add GRANUCOL GE directly to juice or wine. The pellets immediately dissolve after addition. Stir vigorously for several minutes to ensure even distribution. The activated carbon deposit should be racked as soon as possible.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

### **Recommended Dosage** Bench trials recommended

Juice

Contact Time: 24 hours

100-1000 ppm 10-100 g/hL 0.83-8.3 lb/1000 gal Wine 100-600 ppm 10-60 g/hL 0.83-5.0 lb/1000 gal

Stage of Winemaking: Juice, Wine Contact Time: 24 hours Impact: Removes off-odors and flavors

## BENTONITE

Bentonite is aluminum silicate clay which is mined in several areas around the world. The wine industry uses two types of bentonite, sodium (Na) and calcium (Ca), to remove heat unstable protein from wines. Sodium-based bentonites are better at protein removal. Its lattice structure readily separates in water, exposing negative charges that quickly adsorb and trap positively charged proteins. The stronger the positive charge of the protein, the more reactive it is with bentonite. At lower pH, protein has a stronger charge. At higher pH, the protein charge is weaker, so a sodium-based bentonite is recommended.

Calcium bentonite is gentler. Its structure does not separate as easily in water, it flocculates faster, and forms a more compact sediment.

In addition to protein removal, bentonite can also be used as a counter-fining and clarifying agent in conjunction with positively charged fining agents (e.g. gelatin, isinglass, etc.). Bentonite is also used in sparkling winemaking as an adjuvant to help riddling.

The quality of bentonite determines its effectiveness. The most refined bentonites are lighter in color with no or very low levels of sand and grit. We're happy to offer Erbslöh bentonites, considered to be some of the highest quality bentonites in the world.

Note for successful bentonite preparation: The temperature of the water used to swell Erbslöh bentonite in not important, however, the quality of the water is. Hard water or acidic water makes swelling less effective as it inhibits cation exchange. Pay close attention to swelling times. If bentonite is not swelled as recommended its efficacy will be reduced. The longer the swelling time, the greater the adsorption area. Prior to using stored bentonite, ensure that it has not picked up any off-odors.

### AKTIVIT PORE-TEC

**ERBSLÖH** 

#31-15020

#31-15028

20 kg

\$71.00

\$113.00

Calcium-sodium bentonite

White, Rosé

Granulated pure calcium-sodium bentonite that performs over a large surface area, Aktivit will ensure protein stabilization and aid in clarification where pure calcium bentonite is ineffective.

**Usage**: Stir slowly into an approx. 3–5 x of water under constant stirring. Allow to swell and settle for at minimum of 4–6 hours, for best results wait 12 hours. Pour off supernatant and liquefy the prepared slurry with some of the beverage to treat. Then add the suspension to the vessel and mix thoroughly to provide for even distribution.

**Storage**: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

## Recommended Dosage Bench trials recommended Wine

700–1500 ppm | 70-150 g/hL | 5.8-12.6 lb/1000 gal

Stage of Winemaking: Wine fining	Contact Time: 1-7 days	Impact: Clarification and protein removal

### BLANCOBENT UF CERBSLÖH

Bentonite for use during crossflow filtration

Red, White, Rosé

BLANCOBENT UF is a highly purified and particularly effective powdered bentonite for protein removal. It was formulated for use in conjunction with crossflow filtration. Due to the preparation of the bentonite and the absence of particles >100  $\mu m,\, BLANCOBENT$  UF does not cause excessive abrasion to crossflow membranes. Owing to its defined particle size distribution, it is compatible with direct dosing into hollow fiber membrane crossflow systems. In this way, filtration and protein stabilization happen in one step!

**Usage**: Add BLANCOBENT UF slowly to approximately 10 times its weight of water under constant stirring. Allow a rest period of 30-60 minutes, then stir again thoroughly. Let the mixture swell for 6-12 hours. Dispose of supernatant and add remaining bentonite slurry to the wine while thoroughly

25 kg

**Storage**: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.



Competitor Bentonite.

**Recommended Dosage** Bench trials recommended Wine

200–2000 ppm | 20–200 g/hL | 1.6–16.8 lb/1000 gal

and is free of crossflow-damaging grit and sand.

Stage of Winemaking: Pre-crossflow filtration (wine)

BLANCOBENT UF has fine particles

Contact Time: 1 hour

Impact: Removes proteins

### CA-GRANULAT

Bentonite specifically targeted for must/juice Must/juice, wine

Ca-Granulat is a granuled calcium bentonite for stabilization of juice, grape must and wine by adsorption of haze forming proteins and other colloids. In case of a combined treatment with silica sol and protein based fining agent the clarification is supported by enhanced flocculation. Furthermore, the treatment has a postive impact on the sensorial value of beverages and wines due to a limited polyphenol adsorption.

**Usage**: Slowly add Ca-Granulat into a 5-10 fold water amount under constant stirring and swell for minimum 4-8 hours. Prior to application check prepared suspension for off-flavour. Di#31-15003 20 kg \$69.00

lute the pre-swollen suspension with beverage before use and agitate.

**Storage**: Dated expiration. Store in a dry, odor-free and wellventilated environment below 25°C (77°F). Reseal opened packaging immediately.

### Recommended Dosage Bench trials recommended Juice/Wine

	500–2000 ppm	50-200 g/hL	4.2-16.8 lb/1000 gal
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Stage of Winemaking: Juice/must Contact Time: Variable Impact: Removes protein	Stage of Winemaking: Juice/must		Impact: Removes protein
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#31-15027

### FERMOBENT PORE-TEC

Bentonite for use during fermentation

White, Rosé

FERMOBENT® PORE-TEC is a pure granular sodium-calcium based bentonite with low iron for the specific treatment of juice. Due to its low iron content, fermenting on FERMO-BENT is possible and encouraged. Fermenting on bentonite improves the release of CO₂ during fermentation and the constant contact between fermenting juice and bentonite may eliminate the need for protein stabilization before bottling. This also helps to preserve varietal aromatics as protein fining takes place before volatile aromatics are produced.

**Usage**: Add FERMOBENT PORE-TEC slowly to approximately 5 times its weight of water and allow to swell. Allow a rest period of 4-6 hours. Dispose of supernatant and add remain-

ing bentonite slurry to the must while thoroughly mixing. After fermentation, rack off bentonite and gross lees.

20kg

\$99.00

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

### Recommended Dosage Bench trials recommended

Juice

1000-2000ppm 100-200 g/hL 8.4-16.8 lb/1000 gal

Stage of Winemaking: Ferm	entation	Contact Time: Duri	ng fermentation	Impact: Rem	oves proteins
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GRANUBENT PORE-TEC	ERBSLÖH		#31-15026	20 kg	\$74.50

Bentonite for general protein stability

Red, White, Rosé

GRANUBENT PORE-TEC is a highly purified sodium-based bentonite for the removal of heat unstable proteins in juice and wine. Its refined, granular formation is produced using PORE-TEChology, making it almost dust-free and easy to use.



Usage: Add GRANUBENT PORE-TEC slowly to approximately 10 times its weight of water under constant stirring. Let the mixture swell for 4-8 hours. Dispose of supernatant and add remaining bentonite slurry to the wine while thoroughly mixing.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Recommended Dosage Bench trials recommended			
Juice			
350-750 ppm	35-75 g/hL	2.9-6.3 lb/1000 gal	
Wine			
200-1500 ppm	20-150 g/hL	1.7-12.6 lb/1000 gal	

Stage of Winemaking: Juice or wine Contact Time: 1-7 days Impact: Removes proteins	
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\$94.00

\$96.00

MOSTREIN PORE-TEC CERBSL

Bentonite & Activated Carbon granulate Must/juice

MostRein* PORE-TEC is a bentonite-activated carbon granulate for the preventive, careful treatment of mash/crushed grapes and must/grape juice from white and red grapes and thus for the making of clean aroma wines from damaged grapes. It eliminates residues of spraying agents and other disturbing and undesirable substances, prevents off-taste and off-smell and fermentation disturbances.

Usage: Prior to application, check prepared suspension for off-smell. Stir slowly into approx. 3–5x of water under constant stirring. Allow to swell and settle for at minimum of 4–6 hours, for best results wait 12 hours. Pour off supernatant and

#31-15040 20 kg \$106.00

liquefy the prepared slurry with some of the beverage to treat. Then add the suspension to the vessel and mix thoroughly to provide for even distribution.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

$\textbf{Recommended Dosage} \ \textit{Bench trials recommended}$

Must/juice

#31-15021

#31-15025

1500–2500 ppm | 150-250 g/hL | 12.6- 21 lb/1000 gal

Stage of Winemaking: Must/juice	Contact Time: Before fermentation	Impact: Treatment of damaged grapes	

NACALIT PORE-TEC CERBSLÖH

Sodium-calcium bentonite for clarification

White, Rosé

NaCalit PORE-TEC is a granulated sodium and calcium bentonite that is specifically formulated for instances where superior flocculation, adsorption and clarification are required.

Usage: Add NaCalit PORE-TEC slowly to approximately 5-10 times its weight of water under constant stirring. Allow to swell for a minimum of 4–12 hours. Dispose of supernatant and add remaining bentonite slurry to the wine while thoroughly mixing.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

20 kg

Recommended Dosage Bench trials recommended

50–1500 50–150 g/hL 4.2–12.6 lb/1000 gal

Stage of Winemaking: Cold settling for juice, protein stabilization for wine	Contact Time: 1-7 days	Impact: Clarification and protein removal	
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SEPORIT PORE-TEC CERBSLÖH

Bentonite specifically targeted for must/juice

Must/juice

Seporit PORE-TEC is the granulated bentonite specially for must/grape juice to achieve clean fermentation. Aids in a clean fermentation and a careful, mild protein stabilisation.

Usage: Prior to application, check prepared suspension for offsmell. Stir slowly into an approx. 3–5 x of water under constant stirring. Allow to swell and settle for at minimum of 4–6 hours, for best results wait 12 hours. Pour off supernatant and liquefy the prepared slurry with some of the beverage to treat. Then add the suspension to the vessel and mix thoroughly to provide for even distribution.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

20 kg

Recommended Dosage Bench trials recommended

Must/juice

1000–2000 ppm | 100-200 g/hL | 8.4-16.8 lb/1000 gal

Bench trial recommended to determine exact dose rate required.

Stage of Winemaking: Must/juice	Contact Time: Before fermentation	Impact: Removes proteins
Stage of Willemaking: Must/Juice	Contact Time: Before fermentation	IIIIpac

ULTRABENT PORE-TEC

€ ERBSLÖH

CA-NA Bentonite for use with Pall Oenofine XL Crossflow System White, Rosé

UltraBent PORE-TEC UF was specially developed for protein stabilisation in connection with PALL Oenofine XL Crossflow System crossflow microfiltration systems.

Ultrabent is a granulated calcium-sodium bentonite. Due to the fineness of the bentonite and the absence of particles $> 100 \mu m$, it does not cause any abrasive wear to crossflow membranes. Owing to the defined particle-size distribution it is excellently suitable, after pre swelling, for direct dosing into hollow fibre membranes. In this way, clarification and stabilisation need only one process step. Purity and high protein adsorbency reduce the dosage as against conventional bentonites.

Usage: Stir UltraBent PORE-TEC UF slowly into a 5-10 fold of water, ensuring constant stirring. After a rest period of 30-60

20 kg #31-15030

minutes, the suspension is again thoroughly mixed and then allowed to swell for a minimum of 4-8 hours. Pour off supernatant, stir the bentonite suspension once again, then add to the wine or juice. The use of warm water facilitates handling and reduces the swelling time.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Recommended Dosage Bench trials recommended

Juice, Wine

25-200 g/hL 250-2000 ppm 2.1- 16.8 lb/1000 gal

Stage of Winemaking: Pre-crossflow filtration (wine)

Contact Time: 1 hour

#38-12010

Impact: Removes proteins

\$28.20

\$39.00

\$127.00

CASEIN and/or PVPP

BENTOLACT S

For the preventative treatment of oxidation and removal of off-odors White, Rosé, Fruit Wine

BENTOLACT S is a proprietary IOC blend of soluble casein and bentonite. It is most effective when used early in the winemaking process to clean-up moldy fruit, remove bitter characters, assist with clarification and help remove volatile sulfur off-odors.

Usage: Suspend BENTOLACT S in approximately 10 times its weight in cold water and mix vigorously to remove lumps. Mix well and allow the mixture to stand for 3 hours. Add during a pump-over or a good mixing. BENTOLACT S additions may take up to 7 days to settle.

Once hydrated, BENTOLACT S should not be stored for more than 24 hours.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal

1 kg

opened packaging immediately.

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	8.4-16.8 lb/1000 gal
	*	•

Stage of Winemaking: Cold settling for juice, pre-bentonite add for wine

Contact Time: 1-2 weeks

Impact: Cleans up off odors and flavors. Preventative treatment for oxidation

CASEINATE DE POTASSIUM

To help prevent oxidation and remove oxidized components White, Rosé, Fruit Wine, Cider

CASÉINATE DE POTASSIUM is used in both juice and wine for the treatment of oxidized phenolics and bitter compounds. It helps freshen wine and reveal muted aromas. Although the potassium helps with solubility, once added a thorough mixing is essential.

Usage: Suspend CASÉINATE DE POTASSIUM in approximately 10 times its weight of cold water. Mix well and allow the solution to stand for 4 hours. Stir to remove lumps. For juice, add before settling or at the start of alcoholic fermentation. For wine, mix vigorously after adding as CASÉINATE DE POTASSIUM can float.

Once hydrated, CASÉINATE DE POTASSIUM should be

used within 48 hours.

#38-12015

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

1 kg

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

Stage of Winemaking: Pre-fermentation for juice, pre-

bentonite add for wine

Contact Time: 1-2 weeks

Impact: Treats oxidation

Yeast

\$53.00

\$76.50

\$44.00

FRESHPROTECT DICE

For treatment of oxygen sensitive juice and wine

White, Rosé, Fruit Wine

FRESHPROTECT is a proprietary IOC blend of polyvinylpolypyrrolidone (PVPP), bentonite, cellulose and gum arabic. It is used to remove oxidized characters, bitterness and herbaceousness in both juice and wines. It is especially useful in the treatment of hard-press wine where it reduces aggressiveness and reveals fruit. FRESHPROTECT must be removed from wine via filtration per TTB regulations due to the PVPP.

Usage: Suspend FRESHPROTECT in approximately 10 times its weight of cool water. Mix well and allow to sit for 1 hour.

1 kg \$41.00 #38-12110

Add the mixture into the tank slowly; making sure the solution is thoroughly mixed.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Recommended	Dosage	Bench trial	s recommended
	1		1

200-1000 ppm	20-100 g/hL	1.7-8.3 lb/1000 gal
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Stage of Winemaking: Juice: Cold settling, young wines	Contact Time: 1-2 weeks	Impact: Softens wine and removes oxidized characters

POLYCACEL **愛IOC**

For treatment of oxidized must and wine or for the preventative treatment of browning and pinking

White, Rosé, Fruit Wine

POLYCACEL is an IOC blend of polyvinylpolypyrrolidone (PVPP), micropulverized cellulose and casein for use on phenols associated with browning and pinking. It can reduce bitterness and reveal hidden aromas. POLYCACEL must be removed from wine via filtration per TTB regulations due to the PVPP.

Usage: Suspend POLYCACEL in approximately 20 times its weight in cool water. 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. This is important as the casein portion can float.

Stage of Winemaking: Cold settling for juice, pre-bentonite addition for wine

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

1 kg

Recommended Dosage Bench trials recommended

#38-12100

#38-12095

#30-15053P

	Juice		
300-700 ppm 30-7		30-70 g/hL	2.5-5.8 lb/1000 gal
	Wine		
	150-300 ppm	15-30 g/hL	1.25-2.5 lb/1000 gal
		_	

Contact Time: 10-21 days Impact: Treatment of oxidation, unmasking of aromas

POLYCEL 7 IOC

For treatment of pinking or browning, removal of bitter compounds White, Rosé

POLYCEL is a blend of polyvinylpolypyrrolidone (PVPP) and cellulose formulated to help prevent and/or treat compounds which cause pinking and browning. It can also be used to treat bitterness and herbaceousness. As POLYCEL can bind color molecules and catechins it is best to use in young wines. POLYCEL must be removed from wine via filtration per TTB regulations.

Usage: Suspend POLYCEL in approximately 20 times its weight of cool water. Mix well and allow to sit for 1 hour. Add 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.

Storage: Dated expiration. Store in a dry, odor-free and

well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

1 kg

Recommended Dosage Bench trials recommended

	Juice		
	400-800 ppm	40-80 g/hL	3.3-6.7 lb/1000 gal
Wine (Preventative)			
	150-300 ppm	15-30 g/hL	1.25-2.5 lb/1000 gal
Wine (Curative)			
	300-500 ppm	30-50 g/hL	2.5-4.2 lb/1000 gal

1 kg

Stage of Winemaking: Cold settling for juice, young wines post early racking	Contact Time: 1-2 weeks	Impact: Oxidation control, removal of bitter
wines post early racking		compounds

PVPP

For treatment of pinking or browning, removal of bitter compounds

White, Rosé

PVPP (polyvinylpolypyrrolidone) is used to prevent and treat oxidation, and to remove bitter compounds.

GELATINS

COLLE PERLE

Gelatin for clarification and treatment of astringent wines

Red, White, Fruit Wines

COLLE PERLE is a hydrolyzed gelatin solution which can be used for clarification or softening bitter and astringent tannins. COLLE PERLE flocculates and settles well. It is particularly useful for young wines or hard pressed fractions.

Usage: Add and mix 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. 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.

#38-12025 1 L

COLLE PERLE can be used in conjunction with GELOCOLLE to improve settling or prevent overfining (see pg 123 for directions).

\$9.10

\$418.00

9.10

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Once open use immediately.

Recommended Dosage Bench trials recommended

800-1500 ppm 80-150 mL/hL 3.0-5.7 L/1000 gal

Stage of Winemaking: Post alcoholic fermentaion but pre-bentonite addition

Contact Time: 1 week

#31-15051

#38-12075

Impact: Clarification, removal of bitter and astringent compounds

ERBIGEL FLOT

✓ ERBSLÖH

Gelatin for flotation

White, Rosé

Erbigel Flot is a special gelatin with a high capacity for flocculation and binding of phenols during flotation. The acidic factor and the bloom value provide a quick binding of phenols and an

It is highly efficient even in circumstances with increased phenol content and glucans from botrytis.

Usage: Pour approximately 5 L cold water into a vessel for every every 5 kg of Erbigel Flot required. Subsequently add the gelatin slowly while stirring intensively and allow a rest period

of approximately 20 minutes to swell. Afterwards, mix with 4-5 parts hot water and stir intensively until the gelatin is dissolved. Use up the dissolved gelatin as quickly as possible.

25 kg

Storage: Protect from humidity and foreign odours. Reseal tightly after opening.

Recommended Dosage *Bench trials recommended for wine*

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

Stage of Winemaking: Juice/must	Contact Time: During flotation	Impact: Clarification
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INOCOLLE **POC** 

Multi-purpose gelatin for use in juice and wine

Red, White, Rosé, Fruit Wines, Cider

INOCOLLE is a multi-purpose, partially hydrolyzed gelatin solution that can be used in red, white and rosé wines. In white and rosé wines it can be used for clarification resulting in improved brilliance and suppleness. In red wines, INOCOLLE can improve the aromas and flavors of finished wine, while removing both colloidal and unstable material. It is particularly useful for juice fining and flotation.

### Usage: Juice

Dilute INOCOLLE 1:1 in water. Introduce into juice gradually while mixing vigorously to ensure even treatment. Racking should be done after 1 week.

### Usage: Wine

Dilute INOCOLLE 1:1 in water. Introduce into wine gradually while mixing to ensure even treatment. Racking should be done after 1 week. Filtration is possible 48-72 hours after treating with INOCOLLE. 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 gelatin in wine for more than 30 days.

1 L

INOCOLLE can be used in conjunction with GELOCOLLE to improve settling or prevent overfining (see pg 123 for directions).

**Storage**: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Recommended Dosage Bench trials recommended

300-1000 ppm 30-100mL/hL 1.1-3.8 L/1000 gal

Stage of Winemaking: Cold settling for juice, prebentonite addition for wine

Contact Time: 1 week

Impact: Clarification and aroma revelation

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.

**Usage**: Mix Inocolle Extra  $N_1$  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

1 kg

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).

Recommended Dosage Bench trials recommended

Wine

#38-12080P

50-100 ppm 5-10 g/hL 0.4-0.84 lb/1000 gal

Stage of Winemaking: Wine fining Contact Time: 1 week Impact: Clarification & tannin fining

## INACTIVATED YEAST & BENTONITE BLENDS

**CLEAR UP BIO** 



Highly purified yeast cell wall product

Must, White, Rosé, Red

Clear Up Bio is a highly-purified yeast cell wall product whose special washing and production process ensures a high absorption capacity of various substances which can have inhibitory or negative sensory impact on the wine. It is also useful in making sensory corrections in the presence of volatile phenols, notably brettanomyces. The third application is Clear Up's ability to increase the inner surface in heavily pre-clarified musts, which results in better yeast dynamics and higher final fermentation gravity in sugar-rich juices.

**Usage**: Clear Up Bio can be applied to all musts and young wines. For all applications, it is important to ensure that

#37-13455

#35-15103

1 kg

\$64.55

\$49.80

\$29.00

Clear up Bio is well suspended and well distributed. Dilute in 10 L of wine/juice for every 1 kg of Clear Up Bio used.

Minimum contact time is 1-2 hours, and a maximum contact time should not exceed 24 hours.

**Storage**: Store in a cool and dry place. Open containers must be consumed immediately.

<b>Recommended Dosage</b>	Bench	trials	recommended
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Sluggish or stuck fermentation	30-40 g/hL
To absorb off-flavours and odour effects	10-30 g/hL
To increase the inner surface	10-20/hL

Stage of Winemaking: All Impact: Facilitates fermentation & enhances aromas

NEW <

### PURE-LEES DELICACY



Gentle fining and oxygen scavenging, compatible with no/low SO, winemaking

Red

PURE-LEES[™] is a new range of specific inactivated yeasts developed and produced from an innovative process called High Pressure Homogenization (HPH™). This mechanical process leads to the disruption of wine yeast cells to maximize the interaction capacity of yeast constituents with the wine matrix.

PURE-LEES DELICACY™ can be used as recommended alternative to lees during a long-period of contact during weeks/months of ageing but thanks to the high interaction with wine matrix, a quick effect is observed even after several days of contact.

PURE-LEES DELICACY™ improves red wine quality by smoothing the texture without modifying the wine structure.

**Usage**: Suspend PURE-LEES DELICACY[™] in ten times its weight of water or wine, Mix well for a quick and optimized impact & Add to the wine towards the end of alcoholic fermentation.

1 kg

**Storage**: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Recommended Dosage Bench trials recommended

200–400 ppm   20–40 g/hL	1.7-3.4 lb/1000 gal
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Stage of Winemaking: Post-fermentation	Contact Time: 1-9 months	Impact: Scavenges oxygen
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NE REPI

### REDULESS 4

LALLEMAND OMRI

Reduces sulfur off-aromas; OMRI listed

Red, White, Rosé, Cider

REDULESS[™] is a unique fining product used to reduce sulfur off-odors such as  $\rm H_2S$  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.

**Usage**: Mix REDULESS in 10 times its weight of 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

#35-15083

2.5 kg

\$203.50

or filter after 72 hours. The maximum potential copper transfer, when used according to the recommendation, is  $0.01~\rm ppm$ .

**Storage**: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

### Recommended Dosage Bench trials recommended

	1	
100-150 ppm	10-15 g/hL	0.8-1.2 lb/1000 gal

Stage of Winemaking: Post-fermentation	Contact Time: 1-3 days	Impact: Reduction	of sulfur off-odors
EW	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~	
PRISE BIO 28 June 20 J	#37-13453	1 kg	\$73.00

Reduces sulfur off-aromas; OMRI listed Red

RePrise  $^{\rm TM}$  BIO is an inactive yeast specifically designed for wine maturation after alcoholic fermentation and for the treatment of aged wines. It is produced exclusively on the basis of natural raw materials from certified organic agriculture, and contains no known allergens. Reprise BIO serves as an antioxidant, harmonization of phenols, and aids in colour stabilization of red wines or refreshment of old wines. Rerpise has reducing, adsorbing as well as complementary properties when applied in the wines. In addition, due to its natural production, RePrise  $^{\rm TM}$ -BIOdoes not add its own yeasty taste to the wine.

**Usage**: dissolve in 10x litres of WINE. Mix well and ensure contact time of minimum 2 hours, however contact time up to 6 months is possible.

**Storage**: Dated expiration. Store in a dry, odor-free and well-ventilated environment below 25°C (77°F). Reseal opened packaging immediately.

Recommended Dosage Bench trials recom		nmended
100-400 ppm	10-40 g/hL	0.8-3.2 lb/1000 gal

Stage of Winemaking: Post-fermentation	Contact Time: 2 hours - 6 month	5	Impact: Improves	ageing potential
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~		
VINICOMPLEX XS 28	#37-1	3615	1 kg	\$335.00

Special polysaccharide preparation to enhance mouthfeel White, red

ViniComplex XS is a highly purified polysaccharide preparation derived from premium pure yeast cells.

ViniComplex XS amplifies and improves the sensory impression of wines by enhancement of the mouthfeel. It optimizes the stabilization of the colour pigments (anthocyanin chains) in the juice or wine stage. ViniComplex XS also improves the texture and palate weight in all wines. It can be used during aging or as a refinement before bottling.

Usage: Dissolve in 5 times its weight in wine or water at a temperature of 35-40°C. Add the suspension homogenously into the wine and stir gently.

After adding ViniComplex XS, avoid any filtration within 10 days. The optimal reaction time is 4-6 weeks and the minimal contact time before bottling is 10 days

Storage: Store in a cool and dry place. Open containers must be consumed within one month.

Recomm	Recommended Dosage Bench trials recommended			
Prior to bo	Prior to bottling			
White, rosé	10-20 ppm	1-2 g/hL	0.08-0.17-lb/1000 gal	
Red	20-30 ppm	2-3 g/hL	0.17-0.25 lb/1000 gal	

Stage of Winemaking: Post-fermentation or pre-bottling Contact Time: 10 days minimum Impact: Mouthfeel enhancement & color stabilization

\$13.80

\$95.00

SILICA GEL

GELOCOLLE 📸 🗅

Silica gel for improved settling, lees compaction and prevent overfining Red, White, Rosé, Fruit Wines, Cider

GELOCOLLE is a negatively charged solution of suspended silica that can be used alone or in conjunction with INOCOLLE, COLLE PERLE, CRISTALLINE PLUS or other fining agents. GELOCOLLE initiates the flocculation of fining agents, speeds up clarification, and helps compact lees. GELOCOLLE also reduces the risk of leaving residual protein-based fining agent in the low tannin wines (overfining). GELOCOLLE can be used in hard-to-filter wines where it chelates proteins and other compounds facilitating filtration throughput.

Usage: GELOCOLLE can be used alone or in concert with other fining agents. To aid in settling GELOCOLLE should be added directly to wine 1 hour before the addition of protein-based fining agents (gelatin, isinglass, etc.). To prevent overfining

#38-12040 1 L

GELOCOLLE should be added directly into wine 1 hour after the addition of protein-based fining agents (gelatin, isinglass, etc.). Post-addition GELOCOLLE should be mixed thoroughly.

Storage: Dated expiration. Store in a dry, odor-free and well-ventilated environment 10-20°C (50-68°F). Reseal opened packaging immediately.

Do not refrigerate or freeze! Gelocolle solidifies at temperatures of less than 0°C(32°F). This process is irreversible.

Recommended Dosage I	Bench	trials	recommended
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200–1000 ppm | 20–100 mL/hL | 0.75–3.8 L/1000 gal

10 kg

Note: Use 1.0 mL of GELOCOLLE to 1.0 mL of gelatin.

Stage of Winemaking: Wine fining Contact Time: 1-2 weeks Impact: Speeds settling, compacts lees, aids filtration

KLAR-SOL 30

€RBSLÖH

Alkaline Silica Gel

White, rosé, red

Klar-Sol 30 is a transparent alkaline silica sol for clarification/ fining. The transparency of Klar-Sol 30 is due to an especially small particle size which is responsible for the good clarifying effect on wine and fruit juice. When applied in young wine, the wine should already be separated from the yeast and racked off, as the stirred up yeast inhibits an otherwise thorough settling. Klar-Sol 30 shows excellent clarifying properties and leads to a low volume of lees.

Usage: Shake well before use.

#31-15061

Storage: Store absolutely frost protected.

Recommended Dosage Bench trials recommended

Wine

200-500 ppm | 20-50 mL/hL | 0.75-1.9 L/1000 gal

Stage of Winemaking: Wine fining Contact Time: 1-2 weeks Impact: Lees compaction

MANNOPROTEINS, GUM ARABICS & METATARTARIC ACID FOR STABILITY

FLASHGUM R LIQUIDE 🥻

Gum arabic for colloidal protection

Red, White, Rosé, Cider, Mead

FLASHGUM R LIQUIDE is a gum arabic derived from *Acacia seyal*. This preparation offers colloidal protection and gives perception of sweet and soft characters on the palate. Gum arabic products can help reduce the risk of colloidal deposits in unfiltered bottled wine. 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.

Usage: FLASHGUM R LIQUIDE should be the last commercial product added to the wine. It is best to do inline additions

#38-12035

#38-12070

1 L

\$12.70

\$15.50

\$119.00

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).

Recommended Dosage Bench trials recommended

400–1200 ppm | 40–120 mL/hL | 1.5–4.5 L/1000 gal

Stage of Winemaking: 24-72 hours Pre-bottling	Contact Time: Indefinitely	Impact: Colloidal protection, sweetness
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

### INOGUM 300

00 **%**IOC

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 colour while preserving flavour and structure.

**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.

1 L

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).

## **Recommended Dosage** Bench trials recommended Wine

Wine

400-700 ppm | 40-70 mL/hL | 1.5-2.65 lb/1000 gal

Stage of Winemaking: 24-72 h Pre-bottling	Contact Time: Indefinitely	Impact: Colloidal stabilization

#38-12740

### INOSTAB MES 📸 🖂

Carboxymethylcellulose (CMC)

White

INOSTAB MES is a highly purified cellulose gum solubilized at 5% in water. INOSTAB MES delays the formation of tartaric salts (both potassium and calcium) in wine under the principle of stopping the crystal growth by "coating" their surface.

**Usage**: Dilute in 2 x its volume of wine, then add to vessel. Mix well. In some cases, INOSTAB MES can create a loss of filterability of wine. Bench trials are recommended to decide if INOSTAB MES must be added before or after filtration. Used on red or rosé wine, INOSTAB MES can cause a loss of colour

by precipitation, especially at low temperature. Wine to be treated must be protein stable.

**Storage**: Store in odourless and dry premises between the temperature of 5° and 25°C. Once opened, the product must be used rapidly and cannot be conserved.

10 L

Recommended Dosage Bench trials recommended

Wine

0.8-2 mL/L

Stage of Winemaking: Pre-bottling Contact Time: Indefinitely Impact: Inhibits potassium tartrate precipitation

METAGUM **≪** ERBSLÖH

Metatartaric acid and gum arabic

White, Rosé, Red

A blend of highly esterified metatartaric acid and gum arabic, Metagum aids in the prevention of crystal precipitation. It increases crystal stability, even at higher storage temperatures, improves organoleptic properties and can improve colour stability in red and rosé wines.

**Usage**: Dilute in 20 x wine under constant stirring. Allow to settle for several minutes and then stir again to achieve complete dissolution. Add to the wine and mix thoroughly. Dose Metagum at least 2–3 days before bottling, ensuring that #31-15073 1 kg \$35.50

wine is stirred again immediately before bottle filling.

### Storage

MetaGum is hygroscopic and has to be protected from moisture, also from air moisture. Reseal opened packaging immediately, seal tightly and use within a short time.

Recommended Dosage Bench trials recommended			
Wine			
100 ppm	10 g/hL	0.84 lb/1000 gal	

Stage of Winemaking: Pre-bottling	Contact Time: Indefinitely	Impact: Promotes tartrate stability

METARTARIC ACID

#38-12005

1 kg

\$29.00

\$147.00

Added to wine prior bottling, or to sparkling wine prior disgorging, Metatartaric Acid will prevent the risk of tartaric precipitation.

**Usage**: 24 hours prior use, prepare a solution of Metatartaric Acid at 375 g/L. Filter the solution before use.

Dissolution must be made exclusively in cold water. Dissolution in hot water would generate the immediate hydrolisis of Metatartaric Acid. As a result, efficiency would be lost, and could moreover increase the risk of tartaric precipitation.

In solution: Add the necessary quantity of metatartaric acid solution to your wines or finishing liqueur. Thorough blending is essential.

**Storage**: Store the original unopened packs in a dry and odourless room at a temperature between 5 and 25°C. Metatartaric Acid in solution will preserve well at + 4°C during a maximum of 15 days.

Wine

100 ppm 10 g/hL

0.84 lb/1000 gal

Still Wine

10 g/hL (26 mL of solution)

#38-12275

Disgorging Liqueur (Sparkling Wines)

7.5 g for 100 bottles (20 mL of solution)

Stage of Winemaking: Pre-bottling	Contact Time: Indefinitely	Impact: Promotes tartrate stability

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

7 IOC

White, Red

UltiMA Fresh is a proprietary blend of specific mannoproteins together with gum arabic. 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.

**Usage:** Add UltiMA Soft by mixing with 10 times its weight of water. UltiMA Soft should be the last commercial product added to the wine. Ideally it should be added to the wine using a dosing pump. If the wine is to be filtered, it is recommended that the addition be done 24-72 hours before the membrane filtration and that filterability trials be conducted prior to filtration.

1 kg

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

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

Stage of Winemaking: 24-72 h before bottling

Contact Time: Indefinitely

Impact: Enhances volume & reduces bitterness and acidity

ULTIMA SOFT RICC

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

Red, White, Rosé

ULTIMA SOFT is a unique blend of mannoproteins and gum arabic. On white wines, ULTIMA SOFT can soften, enhance body, add 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 or thorough analysis.

**Usage**: Add ULTIMA SOFT by mixing with 10 times its weight of water. ULTIMA SOFT should be the last commercial product

#38-12270

1 kg

\$149.60

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).

### Recommended Dosage Bench trials recommended

| 150–300 ppm | 15–30 g/hL | 1.2–2.4 lb/1000 gal

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

Stage of Winemaking: 24-72 hours pre-bottling

Contact Time: Indefinitely

Impact: Balancing and softening

## COPPER CITRATE

**KUPZIT** 

**€RBSLÖ**H

Copper citrate preparation for the treatment of sulphide off odours

An innovative copper citrate preparation developed for the elimination of sulphide off-flavours, including hydrogen sulphide odours in wine and fruit wine. Kupzit contains 2 % copper citrate and reacts quickly and specifically with sulphurous, disagreeably smelling compounds such as hydrogen sulphide and mercaptans. These compounds are precipitated out, and when dosed accurately, insignificantly increase the copper content of the beverage.

**Usage**: Prepare a slurry of Kupzit^{*} and wine in a ratio of 1:10. Then mix into wine and stir thoroughly for even distribution. The reaction is completed within a few minutes after addition.

Separation of the lees/sediments is conducted by filtration within 1–2 days.

#31-15135

1 kg

\$44.00

When applied properly, the copper content is not, or only slightly increased, which means in most cases after the Kupzit treatment, blue fining is not required. Application can be conducted either separately or combined with clarification/fining. In case of a combined fining, Kupzit is added as first component.

**Storage**: Store in a dry and light-protected environment. Protect from foreign odours. Reseal opened packaging tightly.

### Recommended Dosage Bench trials recommended

Generally dose rates are 5-20~g/100~L (50-200 ppm; 0.42-1.68 lb/1000 gal). However in some cases up to 50g/hL (500 ppm; 4.2 lb/1000 gal) can be applied.

Stage of Winemaking: Wine fining Contact Time: 1-2 days Impact: Reduction of sulfur off-odors

### FREQUENTLY ASKED QUESTIONS: FINING & STABILITY

### Do I need to run bench trials before I use a fining agent?

Yes. Bench trials are essential to determine proper dosing, efficiency, and outcome in the wine. Each fining product works by 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.

### 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.

### 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 (see scottlab.com for more information).

### Do I need to use hot water to swell the Erbslöh bentonites?

These bentonites are not hot water swelling and can be prepared in room temperature water. That is one of the many benefits of these products.



### BENEFITS OF AIRD® PRODUCTS

- Specially formulated products for the wine industry
- Significant water savings no citric rinse is required
- Non-dusting product
- Innovative BUILT FORMULA for more effective cleaning
- Effective at low doses over wide temperature ranges
- Does not require hazardous shipping
- No chlorine, other halogens, phosphates, silicates or fillers
- Safer and lower environmental impact than bulk chemical cleaners

### WATER SAVINGS WITH AIRD PRODUCTS

### AIRD PROCESS VS CLASSICAL METHOD

DUE TO ITS UNIQUE FORMULATION, AIRD PRODUCTS CAN RESULT IN UP TO 50% WATER SAVINGS.*

AiRD Process	Water Used*	
Rinse	100 gallons	
AiRD Product	200 gallons	
Short Rinse	100 gallons	
TOTAL	400 gallons	

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

Classical Method	Water Used*	
Rinse	100 gallons	
Caustic	200 gallons	
Long Rinse	200 gallons	
Citric	200 gallons	
Rinse	100 gallons	
TOTAL	800 gallons	

## CHOOSING CLEANING PRODUCTS FOR SUCCESS

Highly Recommended	Cleaning Agents		
<b>♦</b> Recommended	CLEANSKIN & CLEANSKIN-K	DESTAINEY-I F	
Page#	129	129	129
Dosage	1.0-4.0% w/v	0.5-1.5% w/v	1.0-2.0% w/v
Water temperature for use	68-140°F 20-60°C	104-140°F 40-60°C	68-86°F 20-30°C
pH (1% solution)	~11.3	~10.8	~10.65
Removes tartrates	•	٥	•
Removes color	٥	•	٠
Microbial neutralizing		٥	•
General purpose cleaning	٥	•	
Barrel cleaning			•

### INSTRUCTIONS FOR CLEANING PRODUCTS

Consult the chart above for water temperature requirements of each product. Cleaning is most effective when soft or treated water is used.

Prepare appropriate volume of potable water (typically 10% of vessel volume you are cleaning), accurately measuring the correct weight of the cleaner. Slowly add the powder into the

water, mixing until a consistent solution is obtained. Initially the prepared solution will appear milky but will clarify. Once the solution has clarified it is ready for use. Products can be used manually or with automated CIP systems. Contact time is based on water temperature and quality, amount of product used and turbulence of contact.

\$43.50

\$43.75

## **CLEANING AGENTS**

### CLEANSKIN and 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. Secondarily, it is effective at removing wine color, protein and organic soils. In addition to the potassium carbonate, CLEANSKIN-K contains propri-

CLEANSKIN
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	CLEARISKIII	
#86-55110	5 kg	\$39.50
	CLEANSKIN-K	
#86-55111	5 kg	\$44.75

etary percarbonates, chelation and sequestering aids, polysurfactants and a rinse aid to leave your surfaces bright, clean, neutral and spot free.

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

### Dosage

#86-55121

1.0-4.0% w/v	10-40 g/L	1.3-5.4 oz/gal

### DESTAINEX-LF (LOW FOAMING) ∞AIRD

Multi-purpose oxidizing cleaner for organic soils and molds Bottling systems, winery surfaces, lines, equipment and difficult-to-rinse systems

Destainex is a proprietary sodium percarbonate based cleaning agents with microbial neutralizing abilities. This highly effective formulation can be used at low levels to remove wine color, protein stains, mold, mildew, and biofilms from wine contact surfaces such as: stainless steel, galvanized metals, concrete, polyethylene (low and high density), polypropylene, plastics, flexible hoses, glass and powder-coated surfaces.

Destainex can be used in both automated (CIP) and manual systems. The sodium percarbonate in Destainex is comple-

mented with proprietary surfactants and chelation agents, water conditioning materials and rinse aids for a bright, clean and spot free neutral surface.

5 kg

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

### Dosage

#86-55130

0.5-1.5% w/v	5-15 g/L	0.7–2.0 oz/gal

5 kg

### OAK RESTORER SAIRD

Oak cleaner and refresher

Barrels, staves and oak chips

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 subse-

quent neutralization is required. OAK RESTORERS leave your wooden surfaces refreshed, odorless and pH neutral.

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

### Dosage

0.5–2.0% w/v 5–20 g/L 0.7–2.7 oz/gal	_		
	0.5-2.0% w/v	5-20 g/L	0.7–2.7 oz/gal

### WINEGLASS SAIRD

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. #86-55150 5 kg \$47.00

Dosage



Yeast Nutrients

Malolactic Fermentation

& Tannins En:



## ACIDITY MANAGEMENT

### **ACIDIFICATION**

### DEACIDIFICATION

30-15053J	Ascorbic Acid	500 g	\$19.10
30-15053G	Citric Acid	1 kg	\$10.10
30-15004	Citric Acid	25 kg	\$141.25
30-15053M	Malic Acid	1 kg	\$9.70
30-15008	Malic Acid	25 kg	\$197.50
30-15053F	Tartaric Acid	1 kg	\$16.70
30-15005	Tartaric Acid	25 kg	\$296.25
	-	•	

30-15006	Calcium Carbonate	22.7 kg	\$167.00
30-15030A	Potassium Bicarbonate	22.7 kg	\$196.00
30-15030	Potassium Bitartrate	25 kg	\$327.50
31-15005	Neoantacid	25 kg	\$326.25
NEW			
30-15023	Potassium Polyaspertate	20 kg	\$385.00

### NEOANTIACID

**ERBSLÖH** 

Special lime for double-salt deacidification

A specially selected lime for double-salt deacidification, Neoanticid is composed of precipitated, chemically pure calcium carbonate (E170).

Useful in the double-salt deacidification of must/grape juice and young wine to reduce malic acid and tartaric acid at the same time.

**Usage**: The total Neoanticid quantity needed is mixed with some must/wine and the resulting paste is added to the tank as first component. Only then the determined partial quantity of must or wine to be treated is allowed to run in. To determine the amount of Neoanticid required and the partial quantities

#31-15005

25 kg

\$326.25

of must or wine, please refer to the Neoanticid deacidification table available on www.scottlabsltd.com. After stirring briefly (5–15 minutes), the precipitated sediment can be separated by filtration (best by kieselguhr filter, without kieselguhr dosage). Afterwards, mix the residual partial quantity with the deacidified portion.

**Storage**: Protect from odour and humidity. Opened packaging must be resealed immediately and tightly.

**Recommended Dosage:** To remove 1% or  $1\ g/L$  of acid,  $67\ g$  of Neoanticid is required per hL of beverage to be deacidified.

An important part of making wine is controlling microbes during pre-fermentation, fermentation, aging and packaging. Practices such as adding yeast and ML starter cultures, controlled sulfur dioxide additions, acidification, winery hygiene, and filtration are all ways in which microbial control is applied throughout

the winemaking process. 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 inhibit or eliminate unwanted microorganisms.

MICROBIAL CONTROL ACTION			
REMOVAL	INHIBITION	DESTRUCTION	
Microorganisms are physically removed from the wine. Removal strategies include filtration, centrifugation and some types of fining followed by racking.	Microbe replication is slowed or stopped, but organisms are not necessarily killed. Microbes may start to grow and multiply once the inhibitory pressure is removed. Inhibition strategies include acidification to lower pH and use of sulfur dioxide and lysozyme at non-lethal concentration.	Microorganisms are killed and will not survive to replicate. Destruction strategies include the addition of alcohol (as in the case of fortified wines).	

SELECTING MICROBIAL CONTROL AGENTS FOR SUCCESS					
INCREASING VOL-	HIGH pH WINEMAKING	MICROBIAL STABILIZATION	ACETIC ACID BACTERIA (AAB)	LACTIC ACID BACTERIA (LAB)	YEAST Highly diverse
VA can be increased by stressed wine yeast, spoilage yeast and bacteria (acetic and lactic acid bacteria). In general, pre-fermentation VA increases are due to acetic acid bacteria and non-Saccharomyces yeast.	The higher the pH, the more diverse the microbial population. Careful attention to wine microbiology and chemistry is advised.	Strategies include pH, temperature management, thoughtful rackings, filtration and the use of SO ₂ . Generally accepted SO ₂ levels to control microbes in winemaking are 0.5ppm molecular for bacteria and 0.8ppm molecular for yeast.	AAB are generally problematic in the pre- and post-fermentation phases. They are responsible for the oxidation of ethanol to acetic acid (VA), production of polysaccharides that can give clarification and filtration issues as well as changes in aromas and flavors. Control growth via SO ₂ and by limiting oxygen.	LAB are responsible for converting malic acid into lactic acid. 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. Some LAB can convert sugar to VA. Control growth with SO ₂ .	group of organisms that can be both beneficial or detrimental depending on the stage of winemaking. Control growth post-fermentation with SO ₂ .

Please be advised, Chitosan & Chitin-Glucan have yet to be approved by Health Canada for use in Canadian wine. We are actively working to gain this approval, and promise to spead the good news when approval is granted!

Yeast Nutrients

Malolactic Fermentation

Oak & Tannins

Filtration

## CHOOSING MICROBIAL CONTROL AGENTS

WINEMAKING STAGE	WINE TYPE	WINEMAKING GOAL	RECOMMENDED PRODUCTS
Incoming grapes and in press	Red, White, Rosé	Protect from indigenous yeast and bacteria	POTASSIUM METABISULFITE
luico/Must	White, Rosé	Protect from indigenous yeast and bacteria	LEVEL 2 INITIA™ (See pg 42), POTASSIUM METABISULFITE
Juice/Must	Red	Protect from indigenous yeast and bacteria	GAIA™ (see pg 41), POTASSIUM METABISULFITE
	Red, White, Rosé	Protect from indigenous yeast and bacteria	INOCULATE WITH YEAST (see pgs 10-17)
	Red, White, Rosé	Protect from lactic acid bacteria during sluggish/stuck fermentation	POTASSIUM METABISULFITE
Fermentation	Red, White, Rosé	Delay MLF	POTASSIUM METABISULFITE
	Red, White, Rosé	Inhibit MLF	INODOSE TABLETS, POTASSIUM METABISULFITE
	Red, White, Rosé	Control Brettanomyces	Inoculate ML bacteria with yeast (co-inoculation) or add ML bacteria as soon as alcholic fermentation is complete (see ML section pg 69)
	Red, White, Rosé	Control lactic acid bacteria	INODOSE TABLETS, POTASSIUM METABISULFITE
Aging	Red, White, Rosé	Control acetic acid bacteria	INODOSE TABLETS, POTASSIUM METABISULFITE
	Red, White, Rosé	Control Brettanomyces	INODOSE TABLETS, POTASSIUM METABISULFITE
Pre-Bottling	Red, White, Rosé	Control spoilage organisms	INODOSE TABLETS, POTASSIUM METABISULFITE

## SULFUR DIOXIDE, SORBATE AND TARTARIC ACID

Wine quality can be preserved with sulfur dioxide (SO₂) and is used for its antioxidant and antimicrobial properties.

The effectiveness of SO₂ as an antimicrobial agent is dependent upon pH as well as the presence of other SO₂-binding compounds. As pH increases, the portion of sulfur dioxide that is active against microorganisms decreases. Therefore, increases in pH require the addition of more SO, to maintain adequate antimicrobial activity. INODOSE TABLETS are an easy and effective way to add SO, to grapes, juice or wine.

### **INODOSE TABLETS** Effervescent sulfur dioxide tablets

#38-12068	2 g (48/box)	\$22.85
#38-12069	5 g (42/box)	\$28.95

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 helps prevent overdose problems associated with traditional forms of SO₂. Sealed strip packages keep unused tablets fresh for optimal efficacy. The potassium bicarbonate fraction in these tablets has little or no effect on pH.

**Usage**: Various applications include:

- Add to gondolas or picking bins to inhibit oxidation of grapes and juice.
- Add during transport of must or juice to inhibit indigenous yeast and bacteria.
- Add in tanks before or after fermentation.
- Add directly into barrels after malolactic fermentation.
- To make SO₂ additions to wine during aging.

Storage for Granules and Tablets: Store in a dry, well-ventilated environment at temperatures below 25°C(77°F). Once the pack has been opened it should be used immediately.

Dosage: INODOSE 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 a precise dose of pure SO₂ when added to the wine, measured as total SO. These products are blends of potassium metabisulfite and potassium bicarbonate and weigh more than 2 g, 5 g, etc.

### POTASSIUM METABISULFITE

IOC	#30-15053	1 kg	\$7.95
	#20 15010	25 1	¢1.52.75

Potassium metabisulfite can be used throughout the winemaking process from grape receipt to finished wine.

### SULFUR DISQUES (5 g)

#38-12645 1 kg

\$22.00

5 g sulfur disques protect empty barrels from microbial infections.

### POTASSIUM SORBATE

200	100
(m	OC
100	

#30-15053B	1 kg	\$15.90
#30-15017	25 kg	\$244.00

Potassium sorbate prevents refermentation of wines with residual sugars, when used in conjunction with sulfur dioxide.

### TARTARIC ACID



#30-15053F	1 kg	\$16.70
#30-15005	25 kg	\$296.25

Used to correct tartaric acid deficiencies, to decrease the pH and/or increase the titratable acidity of grapes, juice and wine thereby enhancing microbial stability, wine color and flavor.



Scott Laboratories' expertise in wine filtration dates back to the 1940s. Though it began with filter sheets, today it extends to virtually every stage in filtration — from juice clarification to membranes for bottling lines.

Whether you are a small or large producer, Scott Laboratories has a full range of filtration equipment and media to suit your needs.

### SHEET FILTRATION

### 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 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.

### Available grades:

EKS, EK1, EK, KS50, KS80, K100, K150, K200, K250, K300, K700, K800, K900, T1500

### SHEET FILTER

Standard and combination/recessed models available for either low or high solids. Available in 40 x 40 cm and 60 x 60 cm with a capability to receive a varying number of plates. Stainless steel, Noryl plastic, or Rislan plates are available.

### LENTICULAR FILTRATION

### LENTICULAR MEDIA



With a massive amount of surface area packed into a tight footprint, lenticular media take 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.

### Available sizes:

### Available grades:

• 12" (1.8m2) & 16" (5m2)

• EK, 1um, 2um, 2.5um, 3um, 7um

### LENTICULAR HOUSING

• Available in 12" and 16" diameter and are modular to allow for up to four high.

### CARTRIDGE FILTRATION

### 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.

### Available grades:

On Pall (PALL)

On Scott Cart SCOTT

**30**" .20, .45, .65, 1um

30" .20, .45, .65, 1 um, 5 um

20" .45

10" .45, 1um

### CARTRIDGE HOUSING

Multiple round, cartridge housings are available in 1, 3, 7, 12, and 15.

### CROSSFLOW FILTRATION

### CROSSFLOW FILTER

Instead of doing multiple filtrations with different grades of media, crossflow filtration offers the power filtering in a single step. Keeping solids in suspension the machine is able to run for longer durations of time than would have fouled a traditional depth media filter. Ideal for preparing wine, cider, and mead for absolute pre-bottle filtration.

We are the proud exclusive distributor to of Pall crossflow and high solids recovery units to the Canadian wine industry.

### PLUMA SELECTIVE DEPTH MEDIA FILTRATION

New from Velo Acciai is the PLUMA which offers the power of crossflow automation but with the flexibility of depth media. Using specially designed depth media the system can be loaded with multiple grades for selective retention. Operating at lower pressure the process is gentler and requires less power.

### LEES-STOP HIGH SOLIDS LEES RECOVERY SYSTEM

Also new from Velo Acciai is the LEES-STOP filtration system capable of processing juice and wine lees with up to 45% incoming solids. Utilizing the power of crossflow technology along with large diameter, sintered stainless elements the system can recover very high quality results that were previously difficult to achieve. Available in semi and fully automatic versions.

### TRUB EX NEU CERBSLÖH

### Cellulose product used as pressing aid for processing lees

Trub-ex Neu is a cellulose product which can be used as a pressing aid for mashes with weak structure or for the processing of lees/deposits (especially for small amounts).

Trub-ex Neu is a very voluminous and structure-giving cellulose with long fibres. It has a high liquid absorbing capacity and a good pressability. Liquids can be sucked up first and then released by pressing. Sediment particles are retained thereby by the fibrous structure of the cellulose and a good degree of clarification is obtained.

### Usage:

### Trub-ex Neu as pressing aid

Through the voluminous and long fibres of Trub-ex Neu a drainage in the press cake is obtained and thus the cake structure is improved. This is of particular importance for fruits with a weak structure of solid matter, with problematic grape mashes and stored fruits, all of which are very difficult to press. By Trub-ex Neu application pressing time is reduced, yield and clarification degree are increased.

### Trub-ex Neu for lees processing

Trub-ex Neu is added to the lees/deposits. The fibres absorb the liquid and thus bind the sediment particles. This mixture can subsequently be pressed out easily and a well clarified product is obtained. Trub-ex Neu is particularly suitable for the processing of deacidification lees and lees from clearing of the must/grape juice. By clarification an extraction of undesirable taste-giving agents is prevented.

#31-15255 10 kg \$93.80

**Storage:** Protect against the influences of odour and humidity. Reseal opened packaging units immediately.

**Disposal:** Trub-ex Neu is completely biodegradable (100% biomass). In dependence on the processed material, the product can be disposed of, or composted in a environmentally friendly manner.

### **Recommended Dosage**

Dependent on the liquid portion of the press mash or of the lees to be processed, 1–3 kg Trub-ex Neu/100 kg mash or 100 L lees/deposits are applied. The fibres are picked from the bale and should then be swelled in liquid. Allow a swelling time of about 2 minutes. Preswelling is advisable, since by preswelling, mixing-in and distribution of the fibres is facilitated. If this is not possible, the fibres can also be added directly to the mash, or stirred into the lees/sediments.

135

Yeast Nutrients

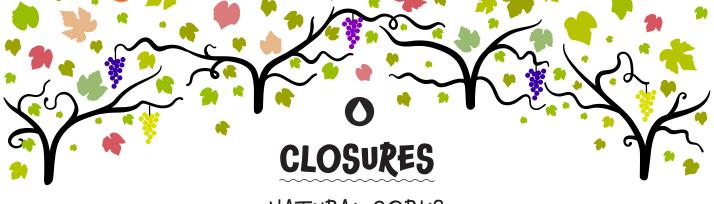
Malolactic Fermentation

Oak & Tannins

Enzymes

Basics

Closures



NATURAL CORKS

Scott Labs started to be involved in the cork market more than 40 years ago and is now the senior North American vendor of cork closures.

Scott Labs sources cork directly from independent, medium sized producers in Portugal. Scott's buying arm in Portugal is very selective, and requires stringent quality protocols on the part of the producers. Every lot from every supplier is kept separate in Portugal.

Discrete lots remain discrete. Incoming lots are never rewashed or blended. Traceability is maximized. Quality controls

(including SPME testing for TCA) are done on every lot. A second quality testing (including SPME) is done in North America. No corks are accepted until they pass testing here.

Scott Labs' independence works entirely in favor of our customers by allowing us to optimize Quality and Value without the pressure of off loading sub-par product. Try ScottCork with your next bottling and experience the Quality of Independence firsthand.

### STERISUN WASH CORK

These natural corks have received a light hydrogen peroxide and water wash followed by neutralizing rinses. Corks are then dried to a moisture level between 5 and 8%.

**Lengths:** 54 mm (2 ½"), 49 mm (2"), 45 mm (1 ½"), 38 mm (1 ½")

**Diameter:** 24 mm (±0.5)

Qualities: USS, US+, US, UFS, UF, UFB, UFB1, UFBB, UFB4

Minimum Order Quantity: 1000

UFB1 is regularly stocked in Canada

3 weeks for delivery

Branding options available



### NATURAL WASH CORKS

**Lengths:** 54 mm (2 ½"), 49 mm (2"), 45 mm (1 ¾"), 38 mm (1 ½")

**Diameter:**  $24 \text{ mm } (\pm 0.5)$ 

Qualities: USS, US+, US, UFS, UF, UFB, UFB1, UFBB, UFB4

Minimum Order Quantity: 1000

All 3 weeks for delivery on all natural wash cork

Branding options available



## TECHNICAL CORKS

### **ONE+ONE CORKS**

Combining natural cork ends with an agglomerated middle makes this cork an economic alternative.

**Lengths:** 45 mm  $(1 \frac{3}{4})$ , 38 mm  $(1 \frac{1}{2})$ 

Diameter: 23.5 mm

Qualities: US (A), UF (B), UFB1 (C)

Stock: UF

Special Order: US & UFB1

Minimum Order Quantity: 1000



### SCOTT MICRO-AGGLO CORKS

The Scott Micro-Agglo stopper is the latest in new-generation technical stoppers, developed from natural cork using cutting-edge technology.

Scott Micro-Agglo corks are available in two separate grades: Scott Micro and Scott Micro Plus. Ideal for early-to-drink wines, the structural stability of this cork provides value and security.

Standard Dimensions:  $44 \text{ mm } (\pm 1) \text{ x } 24 \text{ mm } (\pm 0.4)$ 

Ovalization: 0.3 mm Moisture: 4%-9%

Specific Weight: 240-320 kg/m3Extraction Force: 20-40 daN

Peroxide Content: 0.1 mg/stopper

**Dust Content:** 3 mg/stopper

Oxygen Transfer Rate: (12 months): 1.2 mg/stopper Oxygen Transfer Rate: (24 months): 1.3 mg/stopper TCA:  $\leq 1$  ppt (Scott Micro)  $/ \leq 0.5$  ppt (ScottMicro Plus)

Minimum Order Quantity: 1000

Branding options available





## SPARKLING WINE CLOSURES

### **CHAMPAGNE CORKS**

Our Champagne corks are produced by Relvas Cortiças, a family company dedicated to quality. From the cork forest to the bottle, Relvas Cortiças controls each factor in champagne cork manufacture.

Relvas Cortiças purchases and stores its own raw material in the Alentejo region of Portugal. Raw cork processing is done at Relvas' state of the art facility in the region. Moistures are tightly controlled at this stage to minimize any potential for problems later.

Discs are punched between 24 and 48 hours after boiling the raw materials. This dramatically reduces the potential for mold and consequential TCA. Using a battery of Relvas designed machines, over

150 million pieces are produced annually. All stoppers are individually molded, while quality control occurs at each step of the process.

Customers include the most prestigious houses on five continents.

**Length:** 47 mm **Diameter:** 30 mm

Minimum Order Quantity: 500

Branding options available for a minimal order of 10 000 pieces



### **WIREHOODS**

Standard wirehoods with free belt and a traditional twist finish. These wirehoods are only for use with natural Champagne corks. The wire is galvanized to protect against corrosion.

### **Availabilities:**

38CL, gold disc & silver wire, finished disc size: 26.5 mm 38CL, black disc & black wire, finished disc size: 26.5 mm 38CL, silver disc & silver wire, finished disc size: 26.5 mm

Minimum Order Quantity: 2700 wirehoods

Branding options available







Making wine from sources other than grapes can be quite a different process and can pose many challenges. However, numerous tools used in grape fermentation can also be utilized in fruit or mead fermentations.

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.

## CHOOSING PRODUCTS FOR FRUIT WINES AND MEAD

- ♦ Highly Recommended
- $\delta$  Recommended

Yeast	Fruit	Mead	Page#
71B [™]	•		19
CVW5 [™]	•	٥	23
DV10™	•	٥	23
EC1118 [™]	•	٥	24
ICV D47™	•		27
K1 (V1116)™	•	٥	29
ICV OKAY™	•		28
QA23 [™]	•	٥	33
R2 [™]	•		33
SENSY™	•		36
VIN 13	•	٨	37

Nutrients			
GO-FERM PROTECT EVOLUTION™	•	•	52
FERMAID K™	٨	•	58
FERMAID O™	٨	٨	59

Malolactic Bacteria				
LALVIN (MBR) 31™	•		73	
O-MEGA™	٨		74	

Enzymes		
SCOTTZYME® BG	•	106
SCOTTZYME® HC	•	108
SCOTTZYME® KS	•	108
SCOTTZYME® KS PLUS	•	109
SCOTTZYME® PEC5L	•	109

Tannins	Fruit	Mead	Page#
SCOTT'TAN™ FT BLANC	•		87
SCOTT'TAN™FT BLANC CITRUS	•	•	87
SCOTT'TAN™FT BLANC SOFT	•	•	88
SCOTT'TAN™FT COLORMAX	٠		88
SCOTT'TAN™FT ROUGE	•		88
SCOTT'TAN™FT ROUGE BERRY	٠		89
SCOTT'TAN™FT ROUGE SOFT	٨		89
SCOTT'TAN™ RADIANCE	٨		90

Fining/Stability Agents			
BENTOLACT S	•		118
CASÉINATE DE POTASSIUM	•		118
COLLE PERLE	•		120
FRESHPROTECT	•	٥	119
FERMOBENT	•		116
FLASHGUM R LIQUIDE	•	٨	124
GELOCOLLE	•	٨	123
INOCOLLE	•		120
NACALIT	•		122
POLYCACEL	•		119
REDULESS™	٨	۵	122

Yeast Derivative Nutrients			
GLUTASTAR™	•	•	64
ICV NOBLESSE™	•	•	65
OPTI-MUM RED™	•		65
OPTI-MUM WHITE™	•		65
OPTI-RED™	•		66
OPTI-WHITE™	•	•	66

### SELECTING PRODUCTS FOR SUCCESS IN FRUIT WINES & MEAD

### YEAST

Using a selected yeast strain can maximize the positive attributes that come with that strain (e.g. mouthfeel, complexity, aromas, fermentation kinetics), while avoiding unpleasant aromas and poor fermentation kinetics that may come with a "wild" strain. The key to yeast choice is matching it to the wine style, and more importantly, the fermentation conditions. Proper rehydration and acclimatization of the selected yeast strain is essential.

### **NUTRIENTS**

Fruit wines and mead are notorious for having low nutrient content. Proper nutrition for both yeast and malolactic bacteria is essential to ensure good fermentation kinetics, with positive flavor and aroma profiles. Nutrients can also help to avoid stuck or prolonged fermentations and H₂S and VA problems.

## YEAST DERIVATIVE NUTRIENTS

GLUTASTAR™ and OP-TI-WHITE™ are used either pre-fermentation or early in the fermentation to increase mouthfeel, help avoid browning and protect freshness and aromas during aging. OPTI-RED™ and OPTI-MUM RED™ are 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 or near the end of fermentation.

### MALOLACTIC BACTERIA

Malolactic fermentation can soften wines made from fruit high in malic acid. Many fruits have unbalanced acid profiles and the resulting wine may have a very low pH. Be sure to choose a bacteria strain that works under the conditions of the fruit. If the winemaker's goal is to reduce acid without adding flavor/aroma characteristics, then a neutral strain should be used. Other strains can produce subtle changes in flavor and/or texture.

### **TANNINS**

Tannins help give wine its structure and contribute to its longevity. Honey and some types of fruit contain very little natural tannin. Enological tannins can be used to add structure and enhance flavor and aroma. They reduce the risk of oxidation and help stabilize wine color. SCOTT'TAN™ FT BLANC SOFT adds to the midpalate texture without darkening lighter colored fruit wines and meads. For darker meads and fruit wine, there is a whole array of complex tannins derived from oak, exotic wood, grape skins and seeds, and more. For color stabilization, there is SCOTT'TAN[™] FT COLORMAX, which is most effective when used in conjunction with SCOTT'TAN™ FT ROUGE or FT ROUGE SOFT. SCOTT'TAN™ ONYX, RADI-ANCE, and ROYAL are ideal tannins for a finishing touch, even just before bottling.

### **ENZYMES**

All fresh fruit contains pectin. For many fruits, excess pectin can be responsible for inadequate juice extraction, lack of clarity, slow sedimentation and poor filterability. Pectinases break down pectin. When pectinases are used at pressing, they result in the release of more juice. At the juice stage, enzymes speed settling of solids prior to racking and fermentation. In finished wine, pectinases aid filterability and final clarification. For most fruit wines, a combination of SCOTTZYME® PEC5L and HC will work for most situations. For certain difficult situations, such as fruit compromised by rot, stronger enzymes like SCOTTZYME® KS or LALLZYME MMX[™] may be necessary. Both of these should only be used on juice or wine according to directions. Some enzymes, such as SCOTTZYME® BG and RAPI-DASE® REVELATION AROMA. release aromas that are bound to sugars, thereby increasing the aromatic intensity of the wine.

### FINING AGENTS

Most fining of fruit wine and mead is done for clarification. The fining agents pull minute particles together. The heavier particles then settle faster and form a more compact sediment. Fining agents can also be used to remove oxidized phenolic compounds from young wines. CASÉINATE DE POTASSIUM (casein) and POLYCEL (PVPP) are effective at removing the bitterness and browning caused by oxidation of young wines. REDULESS™ is used to treat wines suffering from reduced sulfur compounds (e.g. H₂S). For fruit wines subject to protein instability, bentonite fining is the only way to remove the unstable proteins.

## MICROBIAL CONTROL Sulfur dioxide (SO₂), Lyso-

zyme, BACTILESS[™] and NO BRETT INSIDE™ can all be used to protect wine quality against microbial spoilage. Although its primary use is microbial control, SO, also helps reduce the risk of oxidation. INODOSE SO₂ Tablets are pre-measured, and no mixing is necessary once added to the wine. No Brett Inside specifically targets and kills Brettanomyces. Lysozyme attacks gram-positive bacteria, such as Lactobacillus, Pediococcus and Oenococcus. BACTILESS™ kills a wider range of bacteria, from lactic acid bacteria to acetic acid bacteria. Both BACTILESS[™] and Lysozyme can be used to delay or inhibit malolactic fermentation.



### **VOLUME CONVERSIONS**

mL = milliliter, fl oz = fluid ounce, gal = gallon, L = liter, hL = hectoliter 1 mL = 0.035 fl oz1 fl oz = 30 mL1 L = 1000 mL 1 L = 0.2642 gal1 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 g1 kg = 2.205 lb1 q = 1000 mg1 lb = 453.6 q1 lb = 0.4536 kg1 metric ton = 1000 kg 1 metric ton = 2205 lb 1 US ton = 2000 lb 1 US ton = 907 kg

### INTERNET CONVERSION PROGRAMS

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

### TEMPERATURE CONVERSIONS

$F^{\circ}$ = Degree Fahrenheit $C^{\circ} \rightarrow F^{\circ} = (C^{\circ} \times 9/5) + 32$	F°	0	32	40	50	60	70	80	90	100	110	120
$C^{\circ}$ = Degree Celsius $F^{\circ} \rightarrow C^{\circ} = (F^{\circ} - 32) \times (5/9)$	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)

### 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.)

(sample size in mLs) x (desired concentration in ppm) x (0.0001) mLs of stock solution to add per sample bottle % concentration (w/v) of stock solution

### FOR LIQUID PRODUCTS (SCOTTZYMES, GELATINS, ETC.)

(sample size in mLs) x (desired concentration in mLs/1000 gal) x (0.000024) mLs of stock solution to add per sample bottle % 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:

(375) x (150) x (0.000024) mLs of stock solution 0 135 ml

Therefore, you would need to add 0.135 mL of a 10% Color Pro stock solution to a 375 mL bottle to represent a concentration of 150 mL/1000 gal.

^{*}Standard barrel size is 60 gallons. 59 and 70 gallon barrels are also common and sometimes the three not visually distinct in size.

Oak & Tannins

# Seneral Tools

## BENCH TRIAL PROTOCOLS AND PROCEDURES

A bench trial is a small-scale test that simulates the effect a tannin, fining agent or other additive will have on a large volume of wine. Bench trials are used to: evaluate the efficacy of treatments, determine proper dose rate, and gain familiarity with addition methods. By working in small volumes, large volume mistakes can be avoided.

Wine matrices differ for many reasons (vintage variations, winemaking practices, etc.) and bench trials must be repeated for every lot of

wine. An additive that worked last year or in a different lot, may not work again in the same way or at the same dose.

Bench trials also demonstrate how an additive will behave during preparation (rehydration) or mixing. Many fining products have unique and sometimes difficult solubility issues which can pose a challenge in the cellar. Bench trials alert the winemaker to potential issues and can help formulate a more efficient plan when additions are made in the cellar.

### HOW TO DO A BENCH TRIAL

TOOLS:					
100 mL graduated cylinder or volumetric flask.	Scale that can weigh to a tenth of a gram.	1 mL pipette divided into 100th's.	5 mL pipette divided into 1/10 mL.		

### PROCEDURE

- 1. Make sure to keep a CONTROL. A control is an untreated portion of wine.
- Decide which dosages to prepare (100 ppm, 200 ppm and 300 ppm for example). Consult product technical information for manufacturer's recommended dosages.
- 3. Prepare stock solutions. Make a 2.5%, 5% or 10% stock solution by adding 2.5, 5.0, or 10.0 grams of product to total volume of 100 mL, respectively. After weighing out the product, mix it with 80 mL of water until either dissolved or all lumps are gone. Put it into the graduated cylinder or volumetric flask and fill to the 100 mL mark. Additives that are liquids can also be prepared in this way by adding 2.5, 5.0, or 10 mL product to total volume of 100 mL.
- 4. Using either the Bench Trial Calculator (previous page) or the Cheat Sheet here, add the appropriate volume of stock solution to either 375 mL or 750 mL bottles, then fill to the proper level (evacuating the head space with gas, if possible).
- After capping or corking, agitate gently to get a good mix. If the product is not completely soluble (e.g., Noblesse, fining agents), occasional agitation to stir up the product in the wine might be necessary to duplicate what would take place in the barrel or tank.
- 6. Taste and/or test after the appropriate waiting period. For fining agents, this might just be as long as it takes the agent to settle. For tannins, it should be at least several days, but it is even better if the trial can sit for at least two weeks.

### Cheat Sheet:

Circut Sirect.					
Desired Dosage	Stock Solution	mLs of solution to add to 375 mL bottle	mLs solu- tion to add to 750 mL bottle		
	2.5%	1.5	3.0		
100 ppm	5.0%	0.75	1.5		
	10.0%	0.375	0.75		
	2.5%	3.0	6.0		
200 ppm	5.0%	1.5	3.0		
	10.0%	0.75	1.5		
	2.5%	4.5	9.0		
300 ppm	5.0%	2.25	4.5		
	10.0%	1.125	2.25		
	2.5%	6.0	12.0		
400 ppm	5.0%	3.0	6.0		
	10.0%	1.5	3.0		
	2.5%	7.5	15.0		
500 ppm	5.0%	3.75	7.5		
	10.0%	1.875	3.75		

## PRODUCT STORAGE AND STABILITY GUIDELINES

Product	Optimal Storage Temperature (unopened)	Recommended Storage (once opened)
Cleaning Products (AiRD)	10-20°C(50-68°F)	Tightly sealed, dry, odor-free environment, protected from light.
Enzymes- LALLZYME	25°C(77°F)	Dry: Tightly sealed, dry, odor-free environment.  Rehydrated: Use within a few hours.
Enzymes- RAPIDASE CLEAR EXTREME	4-8°C(39-45°F)	Dry: Tightly sealed, dry, odor-free environment.  Rehydrated: Use within a few hours.
Enzymes- RAPIDASE REVELATION AROMA	5-15°C(41-59°F)	Dry: Tightly sealed, dry, odor-free environment.  Rehydrated: Use within a few hours.
Enzymes- SCOTTZYMES	1–2 years: Store liquid forms: @ 4°C(39°F) Store dry forms: @ 18–24°C(60–77°F)	Rehydrated: Use within a few hours.
Fining Agent- GELOCOLLE	10-20°C(50-68°F). Do not freeze.	Use immediately.
Fining Agent- Other not listed	Below 25°C(77°F)	Tightly sealed, dry, odor-free environment.
Malolactic Bacteria	Short term: @ 4°C(39°F) Long term: @ -18°C(0°F)	Use immediately.
Microbial control- INODOSE TABLETS	25°C(77°F)	Use immediately.
Microbial Control- Potassium Metabisulfite	25°C(77°F)	Use immediately.
Nutrients- Yeast, Bacteria And Yeast Derivative Nutrients	18°C(65°F)	Tightly sealed, dry, odor-free environment.
Oak	25°C(77°F)	Tightly sealed, dry, odor-free environment.
Stability- FLASHGUM R LIQUID	Below 25°C(77°F)	Tightly sealed, dry, odor-free environment.
Stability- ULTIMA SOFT	Below 25°C(77°F)	Tightly sealed, dry, odor-free environment.
Tannins	18°C(65°F)	Tightly sealed, dry, odor-free environment.
Tartaric Acid	25°C(77°F)	Tightly sealed, dry, odor-free environment.
Yeast- CVW5	4-11°C(39-55°F)	Use immediately.
Yeast- EXOTICS MOSAIC & NOVELLO	5-15°C(41-59°F)	Use immediately.
Yeast- FLAVIA & GAIA	4-11°C(39-55°F)	Use immediately.
Yeast- INITIA	4°C(39°F)	Use immediately.
Yeast- Other not listed	20°C(68°F)	Use immediately.

Note: Most products have an expiration date on the package. Please check the product and store appropriately.

## HOW TO ORDER

### SCOTTLABSLTD.COM

Our easy-to-use website makes planning and submitting your orders easier than ever. Try one, or all, of these convenient features:

### QUICK-ORDER SHOPPING CART

Our website's shopping cart allows you to quickly enter orders without navigating to every item page. Simply open the site directly to scottlabsltd.com/en-us/shop/basket and start entering search terms or item numbers.

### PDF ORDER FORM

Use order **Planner** at scottlabsltd.com/en-us/harvest-planner to easily plan and organize your winemaking products list in one place.

### **ORDER TEMPLATES**

If you have groups of items that you order regularly or want to save for quick re-ordering, nothing beats our Order Templates feature. Just assemble a shopping cart by browsing the site or using any of the handy tools listed above, and from the Shopping Cart page choose "Save as Template." Next time you want to start an order from this list of items you can load it from either your "My Account" section of the site, or directly from the Shopping Cart page. Great for recurring purchases.