

# **Handbook** of Services and Supplies **2018**



## ABOUT ENARTIS USA

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Beginning as the pioneering Vinquiry Wine Laboratory in the early days of the modern US wine industry, Enartis USA is now a leading supplier to the North American Wine Industry.

In addition to the high-quality analytical services provided by its network of laboratories, Enartis USA is a leading supplier of winemaking products and laboratory supplies.

The analytical and consulting services provided by Vinquiry Laboratories (a brand of Enartis USA), are tailored to the needs of modern winemaking and are fundamental tools in crafting great wines.

The ISO 17025:2005 Accreditation of our main laboratory verifies the high-quality of analytical services that we provide our clients, which range from basic chemistry testing to most recent techniques such as Real Time Quantitative PCR (RT-qPCR), a molecular biology technique for the detection of spoilage microorganisms, and grape and wine phenolic analysis (Phenolic Fingerprint), among many others. Our laboratories are also TTB certified for testing of wine, beer and distilled beverages.

In January of 2009, we became part of the multinational company Essecogroup, which manufactures the Enartis range of premium winemaking products. Being part of the world leading manufacturer of winemaking products has allowed us to incorporate the technologically advanced Enartis range into our extensive product offerings, as well to develop tailored solutions for the US wine industry. These

solutions include Enartis Ferm WS active dry yeast isolated from late harvest Zinfandel from Williams-Selyem Winery and considered one of the most robust California yeast strains, and Enartis ML MCW for Direct Addition, a bacteria strain isolated in 1981 from Chardonnay produced at Matanzas Creek Winery (Sonoma, California) that has become the choice for many winemakers for its sensory characteristics and resistance to harsh conditions.

Enartis USA is a leading supplier of winemaking products, with the capability to meet the needs of wineries of all sizes. Enartis' primary pledge is geared toward the quality of Enological coadjuncts. Quality is indispensable in order to guarantee food safety and to provide wine producers with peace-of-mind. The Food Safety System Certification FSSC 22000 granted to Enartis guarantees the safety, purity and quality consistency of our products which conform to technical specifications and originally established applications.

Coordinated and continuing work between Enartis' laboratories and some of the most important international research centers sustains our leadership in the Enological sector. It also enriches innovations and processes used to produce a "universally" better wine which is in touch with the times.

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## ... About Excellence in Customer Service

### COURIER SERVICE

Going the Extra Mile for You - **Free Sample Pick-up Services** in the areas surrounding our offices. Call your local office to request a sample pick-up:

Windsor (707) 838-6312  
Napa Valley (707) 967-0290

Santa Maria (805) 922-6321  
Paso Robles (805) 591-3321



### VINQUIRY LABS SAMPLE EXPRESS

This service allows our customers that are located far from our facilities to be closer to us! You can use our UPS account to send us an unlimited number of sample shipments for one year for a flat fee. No shipping costs for you! Your samples for Enartis USA analytical, microbiology and consulting services will arrive to us in a timely manner.

California: \$150/year

Other States: \$ 200/year

SAMPLE TYPE	California	Other States
WINE	UPS Ground	UPS 2 <sup>nd</sup> Day Air
JUICE	UPS Ground*	UPS Next Day Air
DISTILLED BEVERAGES	UPS Ground	UPS 2 <sup>nd</sup> Day Air
BEER	UPS Ground	UPS 2 <sup>nd</sup> Day Air
CIDER	UPS Ground	UPS 2 <sup>nd</sup> Day Air
OTHER SAMPLES	UPS Ground	UPS 2 <sup>nd</sup> Day Air

*\*Next Day Air for samples sent from Southern California to our Windsor office.*

### ONLINE RESULTS

VINQUIRY  
LABORATORIES


Powered by  
InnoVint


### WEB RESULTS - ACCESS YOUR DATA ANY TIME, ON ANY DEVICE!

Enartis USA offers its clients the ability to access analysis reports and current and historical data relative to all testing performed at our labs. In addition, our customers can pre-submit samples online, print labels and sample submission forms, making the sample submission process simple and fast. To set-up your account, contact our laboratory customer service team at (707) 838-6312.

### SAMPLE DROP BOX LOCATIONS

#### SONOMA COUNTY


 **Windsor Branch**  
7795 Bell Road  
Windsor, CA 95492

 **Punchdown Cellars**  
1160 Hopper Avenue  
Santa Rosa, CA 95403


#### NAPA COUNTY


 **Napa Fermentation**  
575 3rd Street  
Suite A  
Napa, CA 94559

#### CENTRAL COAST

 **Central Coast Branch**  
2717 Aviation Way  
Suite 100  
Santa Maria, CA 93455


 **Paso Robles Branch**  
1850 Ramada Drive  
Suite 3  
Paso Robles, CA 93446

 **Paso Robles Wine Services**  
6305 Buena Vista Drive  
Paso Robles, CA 93446

 **Lucas & Lewellen**  
123 Easy Street  
Buellton, CA 93427

 **Stolpman**  
1700 Industrial Way  
Lompoc, CA 93436

#### MENDOCINO COUNTY

 **McNab Ridge Winery**  
2350 McNab Ranch Road  
Ukiah, CA 95482

## Vinquiry Labs - Your Enology Lab

Vinquiry Laboratories by Enartis USA is more than a service lab, we are Your Enology Lab. We embrace our legacy and focus on offering great support to our customers by providing:

- Accurate results in a timely manner
- Support and expertise
- Winemaking solutions through our premium winemaking products
- Consulting and educational services



### In-House Laboratory QC

Whether you only perform simple chemical analysis or you have a laboratory running continuously, Vinquiry Laboratories is your ideal partner. We provide:

- Consulting for laboratory set-up, upgrade and troubleshooting
- Collaborative Testing Services for quality control
- Full range of laboratory equipment and supplies with free training
- Repair and calibration services
- Education: Microscope Workshops, Harvest Bootcamp and custom training\*

### New Product Development and Troubleshooting

Combining our testing capabilities, the expertise of our staff and the premium range of Enartis products, we can assist you with:

- New product development
- Wine troubleshooting
- Optimizing ageing potential and shelf life

### Ensure Total Wine Stability

Stability is key in modern winemaking. With our knowledge and expertise as a winemaking product supplier, world leader in wine stability and enological lab, Enartis USA provides tools and solutions to help winemakers achieve total wine stability in regards to:

- Protein Stability
- Tartrate Stability
- Color Stability
- Oxidative Stability
- Microbial Stability

### Process Optimization and QC

Enartis technical team offers support to winemakers for optimizing the key steps of the wine production processes:

- Consulting services for sanitation and HACCP
- Oxygen and sanitation audits
- Closure and packaging QC
- Education: Microscope Workshops, Sanitation Seminars, TCA Threshold Testing and custom training\*

## Path to Quality

### ANALYSIS

#### GRAPES

Grape Quality Monitoring Panel  
Total Grape Phenolic Panel  
Botrytis Panel

#### JUICE/MUST

Juice Panel  
Predictive Acid Adjustment Guidelines  
Yeast Nutrition Panel

#### FERMENTATION

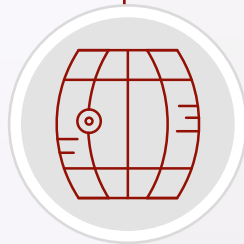
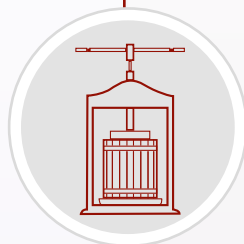
Fermentation Assessment Panel  
Malolactic Fermentation Assessment Panel  
Post-Fermentation  
Core Wine Chemistry Panel  
Wine Phenolic Fingerprint

#### WINE QUALITY MONITORING

Monthly QC Panel  
Antioxidant Capacity  
Wine Phenolic Fingerprint  
PCR Panel  
Oak Aroma Compounds Panel

#### PREPARATION FOR BOTTLING

Bentonite Fining Trials  
Pinking Potential  
CMC Panel  
Wine Improvement Panel  
Filterability Panel  
Unfiltered Bottling Panel



### WINEMAKING PRODUCTS

ENZYMES  
SULFITING AGENTS  
TANNINS

FINING AGENTS  
ENZYMES

YEAST  
YEAST NUTRIENTS  
MALOLACTIC BACTERIA  
TANNINS  
OAK ALTERNATIVES  
YEAST DERIVATIVES

STABILIZING AGENTS  
OAK ALTERNATIVES  
POLYSACCHARIDES  
MICRO-OXYGENATION  
TANNINS  
SULFITING AGENTS  
ENZYMES

STABILIZING AGENTS  
FINING AGENTS  
TANNINS  
POLYSACCHARIDES  
SULFITING AGENTS



## Analytical Panels

Panel	Analyses	Price	Sample Volume	Why choose this panel?	When?
Grape Quality Monitoring Panel: Red Grapes	<i>Sample Preparation, Berry Weight, °Brix, pH, Titratable Acidity, Total Grape Phenolic, Catechin</i>	\$ 165.00	5 Clusters	- Assist with picking decisions - Adapt winemaking processes to grape quality and wine style	From veraison to harvest
Grape Quality Monitoring Panel: White Grapes	<i>Sample Preparation, Berry Weight, °Brix, pH, Titratable Acidity</i>	\$ 80.00	5 Clusters		
Total Grape Phenolic Panel	<i>Total Tannins, Total Phenolics, Total Anthocyanins, Water Content (%)</i>	\$ 95.00	5 Clusters	- Monitor phenolic development in grapes - Assist with picking decisions - Adapt winemaking processes and extraction protocols for targeted wine style	From veraison to harvest
Total Grape Phenolic Panel with Catechin	<i>Total Tannins, Total Phenolics, Total Anthocyanins, Water Content (%), Catechin</i>	\$ 110.00	50 mL	With Catechin: - Understand grape seed ripeness levels	
Botrytis Panel	<i>PCR for Botrytis, Gluconic Acid</i>	\$ 70.00	50 mL	- Understand presence and impact of <i>Botrytis</i> - Early detection of spoilage - Adapt winemaking process to limit spoilage	Harvest
Core Juice Panel	<i>°Brix, Ammonia, Assimilable Amino Nitrogen, YAN Calculation, Malic Acid, pH, Titratable Acidity</i>	\$ 85.00	250 mL	- Overview of fruit maturity, acid content and nutrient composition of juice - Assist alcoholic fermentation management	After crushing or cold soak
Juice Panel	<i>°Brix, Ammonia, Assimilable Amino Nitrogen, YAN Calculation, Organic Acid Profile, pH, Titratable Acidity, Potassium, Gluconic Acid</i>	\$ 130.00	500 mL	- Complete snapshot of fruit maturity, quality, acid balance and nutrient composition of juice - Assist alcoholic fermentation management	After crushing or cold soak
Juice Panel with Predictive Acid Adjustment Guidelines	<i>°Brix, Ammonia, Assimilable Amino Nitrogen, YAN Calculation, Organic Acid Profile, pH, Titratable Acidity, Potassium, Gluconic Acid, Buffer Capacity, Acid Adjustment Recommendations</i>	\$ 195.00	750 mL	With Predictive Acid Adjustment Guidelines: - Provide tartaric acid addition rates for specified pH targets - Predict pH after malolactic fermentation with different rates of tartaric acid additions - Adjust juice acid balance	After crushing or cold soak
Predictive Acid Adjustment Guidelines for Juice	<i>°Brix, pH, TA, Organic Acid Profile, Potassium, Buffer Capacity, Acid Adjustment Recommendations</i>	\$ 120.00	250 mL	- Adjust juice acid balance - Provide tartaric acid addition rates for specified pH targets - Predict pH after malolactic fermentation with different rates of tartaric acid additions	After crushing or cold soak
Organic Acid Profile for Juice	<i>Malic Acid, Tartaric Acid, Lactic Acid, Acetic Acid</i>	\$ 80.00	50 mL	- Complete overview of acid profile, ratio and balance of juice - Assist with acid adjustments and pH management	After crushing or cold soak
Yeast Nutrition Panel	<i>Ammonia, Assimilable Amino Nitrogen, YAN Calculation</i>	\$ 48.00	50 mL	- Know juice nutrient composition - Manage yeast nitrogen nutrition	After crushing or cold soak
Fermentation Assessment Panel	<i>Alcohol, Microscopic Scan, Acetic Acid, Malic Acid, Glucose, Fructose</i>	\$ 120.00	50 mL	- Determine degree of completion of fermentation - Identify reasons of stuck/sluggish fermentation	Stuck fermentation
Malolactic Fermentation Assessment Panel	<i>Alcohol, Microscopic Scan, Acetic Acid, Lactic Acid, Malic Acid, Total SO<sub>2</sub>, pH</i>	\$ 130.00	250 mL	- Determine degree of completion of fermentation - Identify reasons for stuck/sluggish malolactic fermentation	Stuck fermentation
Post-Fermentation Panel	<i>Acetic Acid, Malic Acid, Glucose + Fructose</i>	\$ 50.00	50 mL	- Verify health and completion of alcoholic and malolactic fermentations	Post-fermentation
Organic Acid Profile for Wine	<i>Malic Acid, Tartaric Acid, Lactic Acid, Acetic Acid, Succinic Acid, Citric Acid</i>	\$ 100.00	50 mL	- Complete overview of acid profile, ratio and balance of wine - Assist with acid adjustments and pH management	Post-fermentation
Core Wine Chemistry Panel	<i>Alcohol, Acetic Acid, pH, Titratable Acidity, Free SO<sub>2</sub>, Total SO<sub>2</sub>, Glucose + Fructose, Malic Acid</i>	\$ 105.00	250 mL	- Essential snapshot of wine composition	Post-fermentation to bottling
Core Wine Chemistry Panel for Sparkling Base Wine	<i>Alcohol, Glucose + Fructose, Free SO<sub>2</sub>, Total SO<sub>2</sub>, pH, Titratable Acidity, Cold Stability, Malic Acid, Calcium, Microscopic Scan</i>	\$ 185.00	750 mL	- Complete snapshot of sparkling base wine - Evaluate base wine's ability to go through second fermentation - Predict potential wine instabilities after second fermentation	Pre-tirage
Foaming Capacity Improvement	<i>Maximum Foam Height, Foam Retention Height and Foam Persistence for two treatments and control</i>	\$ 140.00	750 mL	- Evaluate and improve foaming capacity (bubble formation and retention) of base wine - Trials with fining agents and/or use of polysaccharides	Pre-tirage, Pre-dosage

Panel	Analyses	Price	Sample Volume	Why choose this panel?	When?
Foaming Capacity	Maximum Height, Foam Retention Height, Foam Persistence	\$ 60.00	250 mL	- Evaluate foam quality of sparkling wine - Predict foam capacity (bubble formation and retention) of sparkling base wine	Pre-tirage, Pre-dosage
Monthly QC Panel	pH, Free SO <sub>2</sub> , Total SO <sub>2</sub> , Molecular SO <sub>2</sub> , Acetic Acid, Microscopic Scan	\$ 75.00	50 mL	- Routine wine quality control during ageing	Ageing, every month
Molecular SO <sub>2</sub> Panel	pH, Free SO <sub>2</sub> , Molecular SO <sub>2</sub>	\$ 32.00	50 mL	- Calculate amount of SO <sub>2</sub> as active anti-microbial	Ageing, every 2 months
Brett Assessment Panel	PCR for <i>Brettanomyces</i> , 4-ethylphenol, 4-ethylguaiacol, Plating for <i>Brettanomyces</i>	\$ 120.00	250 mL	- Understand presence, growth, activity of <i>Brettanomyces</i>	Ageing, every 2 months
PCR Panel for Bacteria	PCR for Acetic Acid Bacteria ( <i>Acetobacter</i> , <i>Gluconobacter</i> and <i>Gluconacetobacter</i> ), <i>Lactobacillus</i> , <i>Oenococcus</i> , and <i>Pediococcus</i>	\$ 60.00	50 mL	- Detect and quantify main spoilage microorganisms in wine - Early detection of microbial contamination - Wine quality monitoring	Ageing, every 2 months
PCR Panel for Yeast	PCR for <i>Brettanomyces</i> , <i>Saccharomyces</i> , and <i>Zygosaccharomyces bailii</i>	\$ 60.00	50 mL		
PCR Panel for Yeast and Bacteria	PCR for Acetic Acid Bacteria ( <i>Acetobacter</i> , <i>Gluconobacter</i> and <i>Gluconacetobacter</i> ), <i>Brettanomyces</i> , <i>Lactobacillus</i> , <i>Oenococcus</i> , <i>Pediococcus</i> , <i>Saccharomyces</i> , and <i>Zygosaccharomyces bailii</i>	\$ 110.00	50 mL		
Stab Micro Challenge	Initial PCR Panel, two dosages of Enartis Stab Micro Fining followed by PCR Panel	\$ 280.00	750 mL	- Determine minimum dosage of Enartis Stab Micro to remove spoilage microorganisms from wine	Ageing
Color Profile	CIE Lab	\$ 55.00	50 mL	- Visible color measurement - Assist decisions in winemaking process - Evaluate color consistency and benchmark wine with previous vintages or targeted wine style	Any time
Oxidative Stability	Browning Test	\$ 55.00	50 mL	- Predict wine sensitivity for browning and oxidation	Ageing, pre-bottling
Antioxidant Capacity	CaOX, RedOX	\$ 150.00	250 mL	- Know antioxidant capacity and ageing potential - Adapt winemaking process, ageing program, wine packaging and closure to wine potential - Manage wine release to the market for optimum quality	Any time
Wine Phenolic Fingerprint	Total Phenolics, Total Tannin, Total Pigments, Free Anthocyanins, Pigmented Tannins	\$ 80.00	50 mL	- Know phenolic profile and color stability of red wine - Monitor phenolic extraction process - Assist blending decisions - Benchmark wine with previous vintages or targeted wine style	Any time
Predictive Acid and Tartrate Stability Panel	Alcohol, Tartaric Acid, pH, Potassium, Titratable Acidity, Density, Acetic Acid, Predictive Acid Report	\$ 100.00	500 mL	- Evaluate acidity changes due to tartaric stabilization, acidification, de-acidification or alcohol removal	Ageing to wine stabilization
Volatile Sulfur Compounds Detection and Removal Trial	Sensory Evaluation, Trials with Copper Sulfate, Fining Agents and Tannins, Report	\$ 85.00	250 mL	- Determine type of reduction present in wine - Provide treatment solution to reduce reductive notes	Ageing
Fining Trial	Sensory Evaluation, Trials with Various Fining Agents, Report	\$ 85.00	750 mL	- Correction of bitterness, astringency, off-flavors, color, oxidation - Enhance aromatic profile of wine - Balance wine mouthfeel	Ageing
Wine Improvement Panel	Sensory Evaluation, Problem Identification, Acidification/De-Acidification, Fining Trials, Tannins and Polysaccharide Trials, Mini-Consult	\$ 275.00	750 mL	- Diagnose and correct wine faults - Improve wine profile - Provide treatment solutions to improve wine quality or achieve targeted wine style	Ageing
Oak Aroma Compounds	Lactones (cis and trans), Vanillin, Eugenol, Isoeugenol, Guaiacol, 4-Methylguaiacol, Furfural, 5-Methylfurfural	\$ 165.00	50 mL (no Headpace)	- Know aromatic compounds released by oak - Evaluate different oak treatments - Monitor evolution of oak extraction during ageing - Benchmark wine with previous vintages or targeted wine style	Ageing, oak alternatives trials



Panel	Analyses	Price	Sample Volume	Why choose this panel?	When?
Blending Panel: Red Wines	<i>Alcohol, pH, Titratable Acidity, Glucose + Fructose, Oak Aroma Compounds Panel, Wine Phenolic Fingerprint</i>	\$ 250.00	750 mL	<ul style="list-style-type: none"> <li>- Understand primary components of a blend</li> <li>- Assist practical decisions for final blend</li> <li>- Benchmark wine with previous vintages or targeted wine style</li> </ul>	Pre-blending
Blending Panel: White Wines	<i>Alcohol, pH, Titratable Acidity, Glucose + Fructose, Oak Aroma Compounds Panel</i>	\$ 170.00	750 mL		
Pinking Potential	<i>Peroxide Test, Absorbance Measure</i>	\$ 65.00	250 mL	- Predict wine sensitivity for pinking	Pre-bottling
Bentonite Fining Trial	<i>Control and four dosages of Bentonite followed by Heat Test</i>	\$ 80.00	750 mL	- Determine minimum dosage of bentonite to ensure protein stability	Wine stabilization
CMC Panel for White/Rosé Wines	<i>Cold Stability Test, Turbidity, Heat Stability Test, Colloidal Stability Test, two dosages of CMC followed by Cold Stability Test</i>	\$ 125.00	750 mL	<ul style="list-style-type: none"> <li>- Determine levels of tartrate and colloid instability in wine</li> <li>- Determine the minimum dosage of CMC (and colloidal stabilizer for red wines) necessary to achieve full stability</li> <li>- Suitable for white, rosé, sparkling and red wines</li> </ul> <p>Note: unless specified by the customer, Enartis Cellogum LV20 will be used</p>	Wine stabilization, Pre-tirage
CMC Panel for Red Wines	<i>Cold Stability Test, Turbidity, Color Stability Test, two dosages of CMC combined with Colloidal Stabilizer followed by Cold Stability Test, Cold Hold</i>	\$ 155.00	750 mL		
CMC Panel for Sparkling Wines	<i>Cold Stability Test, Heat Stability Test, two dosages of CMC followed by Cold Stability Test</i>	\$ 100.00	750 mL		
Filterability Panel	<i>Vmax, Filterability Index</i>	\$ 50.00	750 mL	<ul style="list-style-type: none"> <li>- Predict filterability of a wine and clogging effect through sterile membrane</li> <li>- Evaluate impact of pre-bottling treatment on filterability</li> </ul>	Pre-filtration (5 days before)
Velcorin® Challenge	<i>Plating for yeast, Brettanomyces and Bacteria before and after Velcorin® treatment</i>	\$ 220.00	750 mL	<ul style="list-style-type: none"> <li>- Determine the effectiveness of Velcorin® before bottling</li> </ul> <p>Note: specify the Velcorin® dosage you would like to test for</p>	Pre-bottling
Unfiltered Bottling Panel for Red Wines	<i>Glucose + Fructose, Malic Acid, Turbidity, Acetic Acid, Culture for Brettanomyces, Culture for Bacteria, 4EP/4EG</i>	\$ 155.00	500 mL	<ul style="list-style-type: none"> <li>- Evaluate risks of bottling wine unfiltered</li> <li>- Evaluate microbial stability, potential re-fermentation, turbidity and potential spoilage</li> </ul>	Pre-bottling
Unfiltered Bottling Panel for White/Rosé Wines	<i>Glucose + Fructose, Malic Acid, Turbidity, Acetic Acid, Culture for Yeast, Culture for Bacteria</i>	\$ 105.00	500 mL		
Cork Aroma Evaluation for Sparkling Wine	<i>Corks, individually soaked in neutral alcohol-water solution.</i>	\$ 500.00	125 Corks	- Essential QC of cork closure	Pre-bottling
Cork Aroma Evaluation for Still Wine	<i>Aroma evaluation by trained personnel.</i>	\$ 400.00	125 Corks		Any time
Haloanisoles Panel for Wine	<i>2,4,6 -Trichloroanisole (TCA), 2,3,4,6 -Tetrachloroanisole (TeCA)</i>	\$ 150.00	250 mL (glass w/ foil cap)	<ul style="list-style-type: none"> <li>- QC of cork closure, cellar and storage conditions</li> <li>- Early detection of potential "cork taint"</li> <li>- Troubleshooting and identification of "cork taint"</li> </ul>	Any time
Haloanisoles: Environmental	<i>2,3,4,5,6 - Pentachloroanisole (PCA) 2,4,6 -Tribromoanisole (TBA)</i>	\$ 150.00	Trap provided by Vinquiry Labs		Quarterly
Haloanisoles Panel for Cork or Wood		\$ 170.00	100 Corks		Pre-bottling

Panel	Analyses	Price	Sample Volume	Why choose this panel?	When?
Export Panel for VI-1 Long Form, China and Japan	<i>Actual Alcohol, Total Alcohol, Titratable Acidity, Extract, Total SO<sub>2</sub>, Sorbic Acid, Volatile Acidity, Citric Acid, Glucose + Fructose, Certificate of Analysis</i>	\$ 198.00	2 Finished Bottles	- Analyses and Certificate of Analysis required for exportation - Additional countries available. Please contact us for more information and check with TTB International Trade Division Guides for Export Requirements - Check with your distributor for required analysis and certificates needed  Note: Ochratoxin A can be added to China export panel	Export
Export Panel for Brazil	<i>Actual Alcohol, Density, Turbidity, Titratable Acidity, pH, Extract, Total SO<sub>2</sub>, Volatile Acidity, Dissolved CO<sub>2</sub>, Glucose + Fructose, Certificate of Analysis</i>	\$ 263.00	2 Finished Bottles		
Export Panel for China, Taiwan or Pacific Rim	<i>Actual Alcohol, Extract, Total SO<sub>2</sub>, Sorbic Acid, Glucose + Fructose, Certificate of Analysis</i>	\$ 146.00	2 Finished Bottles		
Export Panel for EU, VI-1 Long Form	<i>Actual Alcohol, Total Alcohol, Titratable Acidity, Extract, Total SO<sub>2</sub>, Volatile Acidity, Citric Acid, Glucose + Fructose, Certificate of Analysis</i>	\$ 192.00	2 Finished Bottles		
Export for Japan	<i>Actual Alcohol, Extract, Total SO<sub>2</sub>, Sorbic Acid, Certificate of Analysis</i>	\$ 124.00	2 Finished Bottles		
Distilled Beverage Panel	<i>Fusel oils (n-propanol, isobutanol, 1-butanol, isoamyl alcohol, active amyl alcohol), acetaldehyde, ethyl acetate, methanol</i>	\$ 290.00	250 mL		Distilled Beverages

## Individual Analyses

Analysis	Method	Price	Sample Volume
Absorbance 280 nm	UV-Vis Spectrophotometry	\$ 17.00	50 mL
Absorbance 320 nm	UV-Vis Spectrophotometry	\$ 17.00	50 mL
Absorbance 420 nm	UV-Vis Spectrophotometry	\$ 17.00	50 mL
Absorbance 520 nm	UV-Vis Spectrophotometry	\$ 17.00	50 mL
Absorbance 620 nm	UV-Vis Spectrophotometry	\$ 17.00	50 mL
Acetaldehyde	GC	\$ 100.00	50 mL
Acidification / De-acidification Trial	Sensory	\$ 85.00	750 mL
Alcohol (Ethanol)	NIR or GC	\$ 25.00	50 mL
Alcohol (Ethanol) for Kombucha and Distilled Beverage	GC	\$ 28.00	50 mL
Alcohol by Weight	Various	\$ 50.00	50 mL
Allergen - Egg (Albumin)	ELISA	\$ 100.00	50 mL
Allergen - Milk (Casein)	ELISA	\$ 100.00	50 mL
Ammonia	Sequential Analyzer	\$ 27.00	50 mL
Anaerobic Culture for Bacteria	Direct Plating	\$ 27.00	50 mL
Antioxidant Capacity (CaOX/RedOX)	Voltammetry	\$ 150.00	250 mL

Analysis	Method	Price	Sample Volume
Apparent Proof	Densitometer	\$ 35.00	500 mL
Arsenic	ICP	\$ 220.00	250 mL
Ascorbic Acid	Sequential Analyzer	\$ 35.00	50 mL
Assimilable Amino Nitrogen	Sequential Analyzer	\$ 27.00	50 mL
Bentonite Fining Trial	Manual	\$ 80.00	750 mL
Berry Weight	Manual	\$ 20.00	n.a.
Bitterness Units	UV-Vis Spectrophotometry	\$ 35.00	50 mL
Blending Panel: Red Wines	Various	\$ 250.00	750 mL
Blending Panel: White Wines	Various	\$ 170.00	750 mL
Botrytis Panel	Various	\$ 100.00	50 mL
Bottled Wine Sterility	Direct Plating	\$ 35.00	1 Finished Bottle
Brett Assessment Panel	Various	\$ 120.00	250 mL
Brix	Refractometer	\$ 19.00	50 mL
Calcium	AA	\$ 28.00	50 mL
Calcium Stability	Various	\$ 70.00	250 mL
Catechin	HPLC	\$ 50.00	50 mL
Citric Acid	Sequential Analyzer	\$ 26.00	50 mL

NEW

NEW

Analysis	Method	Price	Sample Volume
CMC Panel for Red Wines	Various	\$ 155.00	750 mL
CMC Panel for Sparkling Wines	Various	\$ 100.00	750 mL
CMC Panel for White/Rosé Wines	Various	\$ 125.00	750 mL
Cold Stability	Conductivity	\$ 36.00	250 mL
Color Stability	Manual	\$ 50.00	250 mL
Colloid/Color Stability	Manual	\$ 50.00	250 mL
Color Profile	UV-Vis Spectrophotometry	\$ 55.00	50 mL
Copper	AA	\$ 28.00	50 mL
Core Juice Panel	Various	\$ 85.00	250 mL
Core Wine Chemistry Panel	Various	\$ 105.00	250 mL
Core Wine Chemistry Panel for Sparkling Base Wine	Various	\$ 185.00	750 mL
Cork Aroma Evaluation for Sparkling Wine	Sensory	\$ 500.00	125 Corks
Cork Aroma Evaluation for Still Wine	Sensory	\$ 400.00	125 Corks
Cork Sterility	Culture Plating	\$ 75.00	1 Unopened Bag
Culture Plating for Bacteria	Direct Plating	\$ 27.00	50 mL
Culture for <i>Brettanomyces</i>	Direct Plating	\$ 27.00	50 mL
Culture for Yeast	Direct Plating	\$ 27.00	50 mL
Density	Densitometer	\$ 30.00	50 mL
Direct Yeast Count	Microscopy	\$ 40.00	50 mL
Dissolved CO <sub>2</sub>	Carbodoseur	\$ 28.00	250 mL
Dissolved O <sub>2</sub>	OSE	\$ 30.00	1 Finished Bottle
Distilled Beverages Panel	GC	\$ 290.00	250 mL
Ethyl Acetate	GC	\$ 100.00	50 mL
Ethylphenols (4EP/4EG)	GCMS	\$ 68.00	50 mL
Export for Japan	Various	\$ 124.00	2 Finished Bottles
Export Panel for Brazil	Various	\$ 263.00	2 Finished Bottles
Export Panel for China, Taiwan or Pacific Rim	Various	\$ 146.00	2 Finished Bottles
Export Panel for EU, VI-1 Long Form	Various	\$ 192.00	2 Finished Bottles
Export Panel for VI-1 Long Form, China and Japan	Various	\$ 198.00	2 Finished Bottles
Export, Certificate of Analysis Reissue	Various	\$ 25.00	
Extract	Evaporation	\$ 59.00	100 mL
Fermentation Assessment Panel	Various	\$ 120.00	50 mL
Filterability Panel	Filtrachek	\$ 50.00	750 mL
Fining Trial	Sensory	\$ 85.00	750 mL
Foaming Capacity	Mosalux	\$ 60.00	250 mL
Foaming Capacity Improvement	Various	\$ 140.00	750 mL

Analysis	Method	Price	Sample Volume
Free SO <sub>2</sub>	Aeration Oxidation	\$ 20.00	50 mL
Free SO <sub>2</sub>	Autotitrator	\$ 17.00	50 mL
Free SO <sub>2</sub>	Ripper	\$ 30.00	50 mL
Free SO <sub>2</sub>	Segmented Flow	\$ 17.00	50 mL
Fusel Oils	GC	\$ 165.00	50 mL (no Head-space)
Glucans	Manual	\$ 40.00	50 mL
Gluconic Acid	Sequential Analyzer	\$ 30.00	50 mL
Glucose + Fructose	Sequential Analyzer	\$ 24.00	50 mL
Glucose + Fructose (Inverted)	Sequential Analyzer	\$ 36.00	50 mL
Glucose and Fructose Individual Panel	Sequential Analyzer	\$ 50.00	50 mL
Glycerol	Sequential Analyzer	\$ 75.00	50 mL
Grape Quality Monitoring Panel: Red Grapes	Various	\$ 165.00	5 Clusters
Grape Quality Monitoring Panel: White Grapes	Various	\$ 80.00	5 Clusters
Haloanisoles Panel for Cork or Wood	GCMS	\$ 170.00	100 Corks
Haloanisoles Panel for Wine	GCMS	\$ 150.00	250 mL (Glass Bottle w/ Foil Cap)
Haloanisoles: Environmental TCA with kit	GCMS	\$ 150.00	n.a.
Heat Stability	Various	\$ 20.00	250 mL
Iron	AA	\$ 28.00	50 mL
Juice Panel	Various	\$ 130.00	500 mL
Juice Panel and Predictive Acid Adjustment Guidelines	Various	\$ 195.00	750 mL
Lactic Acid	Sequential Analyzer	\$ 30.00	50 mL
Lead	ICP	\$ 115.00	250 mL
Malic Acid	Sequential Analyzer	\$ 24.00	50 mL
Malolactic Fermentation Assessment Panel	Various	\$ 130.00	250 mL
Methanol	GC	\$ 90.00	50 mL
Microscopic Scan	Microscopy	\$ 40.00	50 mL
Molecular SO <sub>2</sub> Panel	Various	\$ 32.00	50 mL
Monthly QC Panel	Various	\$ 75.00	50 mL
Oak Aroma Compounds Panel	GCMS	\$ 165.00	50 mL (no Head-space)
Ochratoxin A	ELISA	\$ 210.00	1 Finished Bottle
Organic Acid Profile for Juice	Sequential Analyzer	\$ 80.00	50 mL
Organic Acid Profile for Wine	Sequential Analyzer	\$ 80.00	50 mL
Oxidative Stability	Various	\$ 55.00	50 mL

Analysis	Method	Price	Sample Volume
PCR for <i>Botrytis</i>	Real Time PCR	\$ 55.00	50 mL
PCR Panel for Bacteria	Real Time PCR	\$ 60.00	50 mL
PCR Panel for Yeast	Real Time PCR	\$ 60.00	50 mL
PCR Panel for Yeast and Bacteria	Real Time PCR	\$ 110.00	50 mL
Pectin Test	Manual	\$ 30.00	50 mL
Percent Solids	Manual	\$ 20.00	250 mL
pH	Autotitrator	\$ 15.00	50 mL
pH and Titratable Acidity Combo	Autotitrator	\$ 22.00	50 mL
Pinking Potential	Various	\$ 65.00	250 mL
Post-Fermentation Panel	Sequential Analyzer	\$ 50.00	50 mL
Potassium	AA	\$ 28.00	50 mL
Predictive Acid Adjustment Guidelines for Juice	Various	\$ 120.00	250 mL
Predictive Acid and Tartrate Stability Panel	Various	\$ 100.00	500 mL
Pressure/Vacuum	Manual	\$ 50.00	1 Finished Bottle
Problem Identification/Characterization	Sensory	\$ 85.00	250 mL
Quick ML Activity Test	Various	\$ 100.00	250 mL
Sample Preparation (berries or clusters)	Manual	\$ 50.00	N.A.
Sediment/Haze Identification	Microscopy	\$ 60.00	250 mL
Sensory Evaluation	Sensory	\$ 85.00	250 mL
Serial Dilution/Plate Count	Serial Dilution Plating	\$ 115.00	50 mL
Smoke Taint Markers (Grapes)	GCMS	\$ 170.00	50 mL
Smoke Taint Markers (Wine/Juice)	GCMS	\$ 125.00	50 mL
Sodium	ICP	\$ 26.00	50 mL
Sorbic Acid	UV-Vis Spectrophotometry	\$ 40.00	50 mL

Analysis	Method	Price	Sample Volume
Specific Gravity	Densitometer	\$ 28.00	50 mL
Stab Micro Challenge	Various	\$ 280.00	750 mL
Succinic Acid	Sequential Analyzer	\$ 30.00	50 mL
Sucrose	Sequential Analyzer	\$ 30.00	50 mL
Tartaric Acid	Sequential Analyzer	\$ 22.00	50 mL
TCA: 2,4,6-Trichloroanisole	GCMS	\$ 125.00	50 mL
Titrateable Acidity	Autotitrator	\$ 15.00	50 mL
Total Bacteria Plate Count	Direct Plating	\$ 60.00	250 mL
Total Grape Phenolic Panel	Various	\$ 95.00	5 Clusters
Total Grape Phenolic Panel and Catechins	Various	\$ 110.00	50 mL
Total SO <sub>2</sub>	Aeration Oxidation	\$ 25.00	50 mL
Total SO <sub>2</sub>	Autotitrator	\$ 17.00	50 mL
Total SO <sub>2</sub>	Ripper	\$ 25.00	50 mL
Total SO <sub>2</sub>	Segmented Flow	\$ 18.00	50 mL
True Proof	Distillation	\$ 80.00	500 mL
Turbidity	Nephelometry	\$ 15.00	50 mL
Unfiltered Bottling Panel for Red Wines	Various	\$ 155.00	500 mL
Unfiltered Bottling Panel for White/Rosé Wines	Various	\$ 105.00	500 mL
Velcorin® Challenge	Various	\$ 220.00	750 mL
Volatile Acidity	Cash Still	\$ 30.00	50 mL
Volatile Acidity (Acetic Acid)	Sequential Analyzer	\$ 35.00	50 mL
Volatile Sulfur Compounds Detection and Removal Trial	Various	\$ 85.00	250 mL
Wine Improvement Panel	Various	\$ 275.00	750 mL
Wine Phenolic Fingerprint	UV-Vis Spectrophotometry	\$ 80.00	50 mL
Yeast Nutrition Panel	Sequential Analyzer	\$ 48.00	50 mL
Zinc	ICP	\$ 40.00	250 mL

## TROUBLESHOOTING: WHICH ANALYSIS TO RUN?

## EVALUATE OXIDATION IN WINE

- Sensory Evaluation
- Color Profile
- Absorbance 420 nm
- Absorbance 520 nm
- Antioxidant Capacity
- Acetaldehyde
- Free SO<sub>2</sub>

## EVALUATE WINE MICROBIAL STABILITY AND SPOILAGE

- PCR Panel
- Culture Plating for Yeast, Bacteria, *Brettanomyces*
- Microscopic Scan
- Ethylphenols (4EP/4EG)
- Volatile Acidity
- Sensory Evaluation

## I HAVE A SLUGGISH FERMENTATION. WHAT SHOULD I CHECK BEFORE DOING A RESTART?

- Fermentation Assessment Panel

## EVALUATE PROTEIN STABILITY

- Heat Stability Test
- Bentonite Fining Trial

## MY WINE IS PROTEIN STABLE BUT NOT COLLOID STABLE

This situation is challenging only if you want to use CMC to stabilize your wine for tartrate precipitation. In this case, you can add 1 or 2 lb/1,000 gal of bentonite and test again for Colloid Stability.

## EVALUATE TARTARIC PRECIPITATION

- Cold Stability Test
- CMC Panels

## I WANT TO BOTTLE MY WINE UNFILTERED. WHAT SHOULD I CHECK?

Unfiltered Bottling Panels to ensure microbial stability.

## ISSUES WITH FILTERING WINE

- Filterability Panel
- Glucans
- Pectins
- Turbidity
- Fining Trial to improve clarification

## THERE IS SOMETHING WRONG WITH MY WINE AND I DON'T KNOW WHAT IT IS

- Problem ID/Characterization via sensory evaluation
- PCR Panel

## I AM CLOSE TO BOTTLING AND I'M NOT COMPLETELY SATISFIED WITH MY WINE

Wine Improvement Panel (includes copper and/or acid adjustments, as well as fining, polysaccharides and finishing tannin trials).

## KNOW MORE ABOUT SOME KEY WINE ANALYSIS

### WHY MEASURE FOAMING CAPACITY?

Mousse parameters are extremely variable and affected by pouring, reception vessel shape and type as well as temperature. To evaluate mousse quality, it is important to monitor these parameters in an accurate, repeatable manner. Vinquiry Laboratories by Enartis USA offers a Foaming Capacity Test that allows winemakers to evaluate and monitor mousse quality.

### WHAT IS CIELab?

CIELab is a color measurement system based on a three-dimensional color space: L\* describing light to dark, b\* for blue to yellow, and a\* for red to green. This system was developed to mimic human color perception. The difference between two colors can be described by the total distance between those two colors in the three dimensional CIELab color space ( $\Delta E^*$ ).

*The CIELab system is the OIV standard for wine color determination.*

### WHAT IS REAL-TIME QUANTITATIVE PCR?

Real-Time Quantitative PCR is a rapid method to identify organisms by amplification and detection of unique sequences of their DNA. About an hour after DNA is isolated, millions of copies of the unique genetic sequence from the target organism are generated, detected and quantified with fluorescence probes. Vinquiry Laboratories has validated Real-Time PCR assays for Acetic Acid Bacteria (*Acetobacter*, *Gluconobacter* and *Gluconacetobacter*), *Brettanomyces*, *Lactobacillus*, *Oenococcus*, *Pediococcus*, *Saccharomyces cerevisiae*, *Zygosaccharomyces bailii* and *Botrytis cinerea*.

### WHAT IS THE DIFFERENCE BETWEEN PLATING AND PCR TO DETECT MICROBIAL POPULATIONS?

Plating provides information on **actively growing** yeast or bacteria populations but will not detect cells in a viable, non-culturable state. Results are available in approximately one week.

The PCR Panel for Yeast and Bacteria, based on DNA analysis, identifies **all viable** yeast and bacteria in a sample. PCR Panels can be done within 24 hours. These tests can be complementary to provide information on the percentage of yeast and bacteria actively growing versus viable, non-culturable cells.

### HOW ARE 4-ETHYLPHENOL (4-EP) AND 4-ETHYLGUAIACOL (4-EG) FORMED?

4-EP and 4-EG are formed from cinnamic acid precursors in wine. There are several steps in the synthesis pathway which can involve several wine microorganisms. The last step, specific to *Brettanomyces*, is the conversion of vinyl phenols to ethyl phenols. As a common byproduct of *Brettanomyces*, 4-EP is an excellent indicator of *Brettanomyces* presence and activity.

### WHY ANALYZE ETHYLPHENOLS (4-EP AND 4-EG)?

- Early detection and control of spoilage due to *Brettanomyces* populations. This allows the winemaker to arrest the development of *Brettanomyces* at very early stages.
- Ethylphenol analysis can be used to monitor or control *Brettanomyces* activity in a wine where *Brettanomyces* is known to exist: Static 4-EP concentrations can be assumed to have inactive populations.

### WHY MEASURE PHENOLICS IN GRAPES?

Full understanding of grape maturity - measurement of Brix, TA and pH is not enough to fully understand grape physiological maturity. Grape phenolic content, along with grape water content, can characterize grape maturation and quality to provide helpful information for picking decisions, picking logistics and vineyard block selection.

### WHAT PHENOLIC ANALYSIS PARAMETERS REPRESENT?

- Grape Total Phenolics (AU/g) measures all colored and non-colored phenolic molecules present in grape skins, flesh and seeds.
- Grape Total Tannins (mg epicatechin equivalents/g) measures tannins present in both seeds and skins.
- Grape Total Anthocyanins (mg malvidin-3-glucoside equivalents/g) is a direct measurement of monomeric and polymeric forms of anthocyanins, which are the basis of red wine color.
- Grape Water Content: Changes in grape water content can greatly influence grape and wine composition, therefore monitoring grape water percentage is important when making picking decisions.
- Catechin is used as an indicator of seed ripening and for monitoring seed extraction in wines. As seeds ripen, catechins and other seed phenolics become less extractable.

### WHAT ARE THE ORIGINS OF TCA, TeCA, PCA AND TBA?

The origin of haloanisoles is often attributed to the biodegradation of halophenols by microorganisms (molds and soil bacteria). Trichlorophenol (TCP), tetrachlorophenol (TeCP), pentachlorophenol (PCP) and tribromophenol (TBP) are converted to Trichloroanisole (TCA), Tetrachloroanisole (TeCA), Pentachloroanisole (PCA) and Tribromoanisole (TBA) respectively. TCP in wineries is often traced to the former use of bleach as a sanitizer. TeCP, PCP and TBP are wood preservatives. TBP can be present in plastics and other polymers. It may also result from the use of bromine as a sanitizer.

### HOW CAN WINE GET "CORK TAIN" IN THE CELLAR?

Various materials, including tank coatings, hoses, oak products, bungs, bentonite, filtration media and closures, can pick-up airborne haloanisoles and contaminate wine by contact. Airborne haloanisoles can be detected before they represent a serious threat to wine: just ask for our "atmosphere traps."

# SULFITING AGENTS

Enartis is proud to offer the highest purity potassium metabisulfite on the market: WINY.

Potassium metabisulfite (KMBS) is one of the most widely used additives in winemaking. When used in winemaking, KMBS can:

- Scavenge oxygen radicals responsible for oxidation
- Bind with oxidation byproducts such as acetaldehyde
- Inhibit oxidasic enzymes thus preventing browning
- Reduce spoilage by inhibiting the growth of many microorganisms detrimental to wine.

## Pure Potassium Metabisulfite

### WINY

Winy is produced from high quality raw materials, i.e. without metals which could favor oxidation of potassium metabisulfite. Winy undergoes a purification process that eliminates oxygen and sulfites that could create sulfates. Enartis controls and guarantees the technical specifications of its products. The specifications of Winy are often better than those specified by law and the average concentration values are often higher.

- Pure and high quality potassium metabisulfite.
- Low odor (less irritation), easy to dissolve, low clumping formulation.
- Scavenges oxygen and oxidation byproducts.
- Prevents juice browning by inhibiting oxidasic enzymes.
- Wide spectrum antimicrobial.

**Dosage:** 1 g of Winy contains approximately 0.56 g of SO<sub>2</sub>

1 Kg	(Item #35-820-0001)	\$ 4.50
25 Kg	(Item #35-820-0025)	\$ 72.50

#### CALCULATION FOR ADDITION OF WINY

$$\text{g WINY to add} = \frac{(\text{mg/L Total SO}_2 \text{ desired}) \times (\text{L of wine})}{0.56 \times 1,000}$$



COMPETITOR'S KMBS - 20% W/V SOLUTION  
WINY - 20% W/V SOLUTION

#### WINY ADDITION GUIDELINES

SO <sub>2</sub> addition (mg/L)	g/hL	g/barrel	g/1,000 gal	lbs/1,000 gal
5	0.9	2	34	0.08
10	1.8	4	68	0.15
30	5.4	12	204	0.45
50	8.9	20	337	0.7
60	11	25	416	0.9

## Effervescent Potassium Metabisulfite

Effervescent sulfiting agents combine the benefits of KMBS with several additional advantages. Upon contact with wine or juice, these products release CO<sub>2</sub>, creating natural mixing for homogenization of the product with no further agitation needed.

#### Advantages of EFFERGRAN/EFFERBARRIQUE

- Reduces risk of incorrect additions and poor SO<sub>2</sub> distribution in wine
- Reduces labor time for sulfiting barrel or small vessels
- Reduces risk for cellar worker health (low odor, low irritation)
- Rapid, complete and homogeneous distribution of SO<sub>2</sub> without mixing in barrels and tanks up to 50,000 L (13,200 gal)

### EFFERBARRIQUE/EFFERGRAN DOSE 5

- Effervescent, granulated potassium metabisulfite.
- Strong antioxidant and antimicrobial effect.
- Individually packaged for single use in barrels or small vessels.
- Homogeneous and rapid distribution of SO<sub>2</sub> without requiring mixing.

**Recommendations:** Sulfiting barrel; small vessels; homogeneous SO<sub>2</sub> released.

**Dosage:** 1 package of Efferbarrique releases 2 g of SO<sub>2</sub>  
1 package of Effergran Dose 5 releases 5 g of SO<sub>2</sub>

Efferbarrique (40 packs)	(Item #35-800-0000)	\$ 18.50
Effergran Dose 5 (25 packs)	(Item #35-805-0000)	\$ 17.50

### EFFERGRAN

- Effervescent, granulated potassium metabisulfite.
- Strong antioxidant and antimicrobial effects.
- When added to grapes, it assures a homogeneous and a rapid release of SO<sub>2</sub>, minimizing oxidation during transport from vineyard to winery.
- When added to wine, it rapidly dissolves, assuring a homogeneous and rapid distribution of SO<sub>2</sub> without requiring pump-overs in tank volumes of up to 50,000 L (13,200 gal).

**Recommendations:** Sulfiting tank; homogeneous SO<sub>2</sub> released; wines; juices; grapes; grapes transport.

125 g	(Item #35-810-0000)	\$ 3.38
250 g	(Item #35-815-0000)	\$ 5.50
1 Kg	(Item #35-810-0001)	\$ 17.00



**Calculation for addition of EFFERGRAN/EFFERBARRIQUE**

$$\text{g EFFERGRAN to add} = \frac{(\text{mg/L Total SO}_2 \text{ desired}) \times (\text{L of wine})}{0.40 \times 1,000}$$

**EFFERGRAN AND EFFERBARRIQUE ADDITION GUIDELINES**

SO <sub>2</sub> addition (mg/L)	g/hL	g/barrel	g/1,000 gal	lbs/1,000 gal
5	1.2	3	45	0.1
10	2.4	5	91	0.2
30	7.1	16	269	0.6
50	11.9	27	450	1
60	14.3	32	541	1.2

**Complex Anti-Oxidant Blends****AST**

- Potassium metabisulfite, ascorbic acid and hydrolyzable tannins.

- Strong antioxidant and antimicrobial actions. When used on grapes, AST acts as an antibacterial and antioxidant.

**Recommendations:** Antioxidant; moldy grapes; antimicrobial; harvest machine; grape transport.

**Dosage:** 150-200 g/ton of grapes

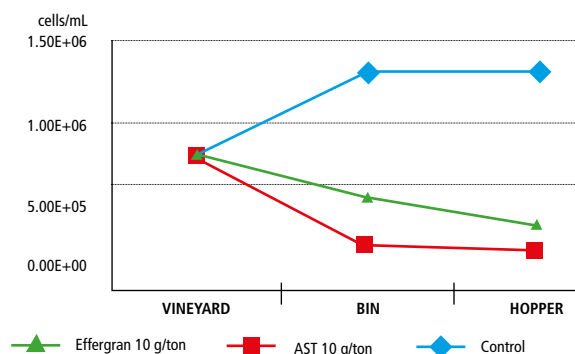
15-20 g/hL (1.2-1.7 lb/1,000 gal) in juice

10 g/hL (0.8 lb/1,000 gal) of AST contains approximately 28 ppm SO<sub>2</sub>

**1 Kg**

**(Item #35-825-0001)**

**\$ 38.00**

**ANTIMICROBIAL ACTION OF EFFERGRAN AND AST  
EFFECT IN GRAPES AND MUST**

## MICROBIAL CONTROL

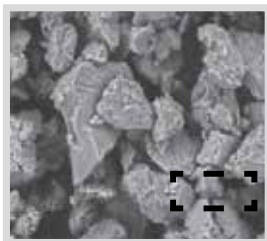
Ensuring microbial stability is fundamental for quality and economic reasons. Microbial contaminations are the most common cause of wine defects worldwide. Capable of developing at any time during the winemaking process, spoilage microbes are opportunistic organisms, which are difficult to control and eliminate. The best way to prevent and control the development of spoilage microorganisms is to be proactive with good hygiene, early detection and effective treatment.

### What is Chitosan?

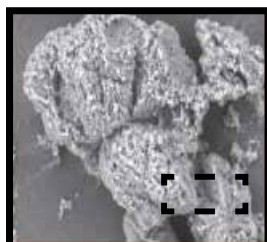
Produced from the partial de-acetylation of Chitin (from *Aspergillus niger*), chitosan is a cationic polysaccharide that interacts with a wide spectrum of microorganisms, alters their cell wall permeability, inhibits cell growth and leads to cell death. The antimicrobial activity of chitosan is attributed to its positive charges ( $\text{NH}_3^+$  groups) that interfere with the negatively-charged residues of macromolecules on the microorganism's cell wall surface.

### Why is Enartis' Chitosan more efficient?

It's pre-activated. Enartis developed a pre-activation process which increases the molecular charge, solubility and contact surface of chitosan. Pre-activated chitosan is very effective in eliminating potentially harmful microorganisms such as acetic acid bacteria, *Pediococcus*, *Lactobacillus*, *Oenococcus*, *Brettanomyces*, *Zygosaccharomyces*, *Schizosaccharomyces* and some other non-Saccharomyces yeast. Pre-activated chitosan-based products, Enartis Stab Micro M and Enartis Stab Micro react faster and at lower concentrations than standard chitosan available on the market.



STANDARD CHITOSAN



ENARTIS  
ACTIVATED CHITOSAN  
(ENARTIS STAB MICRO AND  
ENARTIS STAB MICRO M)

### ENARTIS STAB MICRO

- Preparation of pre-activated chitosan from *Aspergillus niger*.
- Allergen-free, vegan alternative to lysozyme and  $\text{SO}_2$  for antimicrobial properties.
- Removes spoilage organisms through fining.
- Recommended after fermentation in low turbidity wines.
- Interacts with a wide spectrum of microorganisms, reduces their activity and growth and precipitates them.
- Reduces sulfide defects and volatile phenols.
- Improves clarification and filterability.

**Dosage:** 3-20 g/hL (0.25-1.7 lb/1,000 gal)

**0.5 Kg**

(Item #35-761-0500)

**\$ 300.00**

### ENARTIS STAB MICRO M

- Preparation of pre-activated chitosan from *Aspergillus niger* and purified yeast hulls.
- Allergen-free, vegan alternative to lysozyme and  $\text{SO}_2$  for antimicrobial properties.
- Designed for treatment of grapes, juice or must.
- Interacts with a wide spectrum of microorganisms, reduces their activity and growth and precipitates them.
- Reduces sulfide defects, volatile phenols, VA and off-flavor production.
- Improves clarification and filterability.

**Tip:** Use Stab Micro M as a preventive treatment on grapes or juice to improve *Saccharomyces* dominance, limit stuck fermentations and produce clean aromas.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**1 Kg**

(Item #35-762-0001)

**\$ 275.00**

"Starting from a no- $\text{SO}_2$  trial, using Enartis Stab Micro M has now become a part of my winemaking protocol on all of my red wines. It not only helps me to control spoilage organisms proactively, but also helps to reduce my  $\text{SO}_2$  addition with a better protection than  $\text{SO}_2$  on its own." Matthieu Finot, Winemaker, King Family Vineyards, VA.

## APPLICATIONS OF ENARTIS STAB MICRO AND STAB MICRO M?

### WIDE SPECTRUM ANTIMICROBIAL AT ANY TIME

Enartis Stab Micro & Stab Micro M are used:

- To control a wide spectrum of microbes: *Acetobacter*, *Lactobacillus*, *Pediococcus*, *Oenococcus*, *Brettanomyces*, *Zygosaccharomyces* and some other non-*Saccharomyces* yeast (Figure 1)
- As a treatment to remove/reduce high populations of microbes. Dosage: 10- 20 g/hL followed by racking
- As a preventive measure to eliminate small populations before they become spoilage. Dosage: 3-4 g/hL
- As an alternative to SO<sub>2</sub> for microbial control

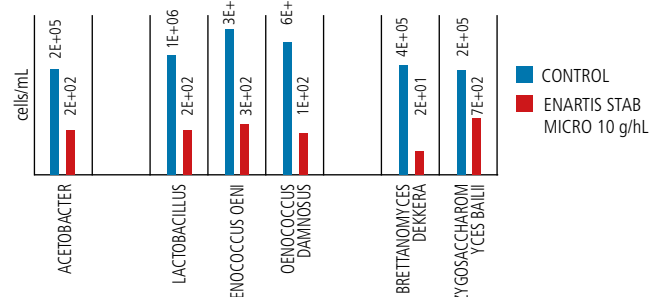


Figure 1: Enartis Stab Micro can reduce populations of the main spoilage microorganisms present in wines.

### PREVENT VA PRODUCTION DURING COLD SOAK AND GRAPE TRANSPORT

Enartis Stab Micro M on grapes, during crushing, in the juice pan, or in must reduces wild non-*Saccharomyces* yeast and bacteria populations, thus limiting VA production during the first stage of the winemaking process (Figure 4).

Dosage: 20 g/hL

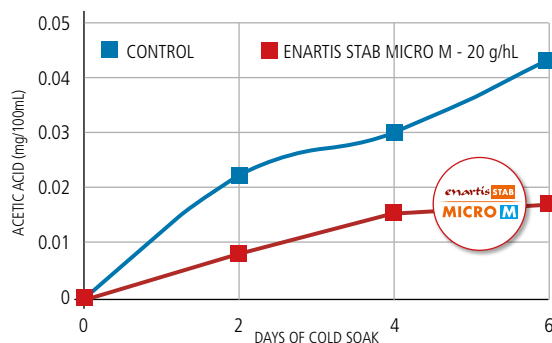


Figure 4: The addition of Enartis Stab Micro M on grapes controls VA production during cold soaking.

### REDUCE VOLATILE PHENOLS

After fining with Enartis Stab Micro, wines appear cleaner, fresher and often fruitier. Enartis Stab Micro can reduce volatile phenols (Figure 6), treat "reduction" issues and remove other off-flavors.

Dosage: 10-20 g/hL

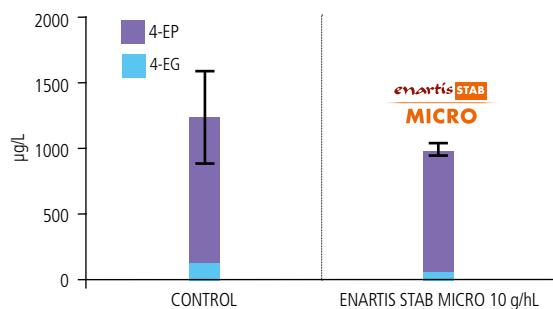


Figure 6: Enartis Stab Micro can reduce volatile phenols (4-EP/4-EG) concentration in wine - results from 15 wines.

### CONTROL MLF

#### ALLERGEN-FREE ALTERNATIVE TO LYSOZYME

Enartis Stab Micro and Stab Micro M can eliminate *Oenococcus* and prevent, delay or stop MLF (Figure 2). Alternatives to lysozyme, these products have some additional advantages: no impact on protein stability, no interference with colloid stability and no significant impact on color (Figure 3).

Dosage: 10 g/hL to prevent MLF; 20 g/hL to stop MLF

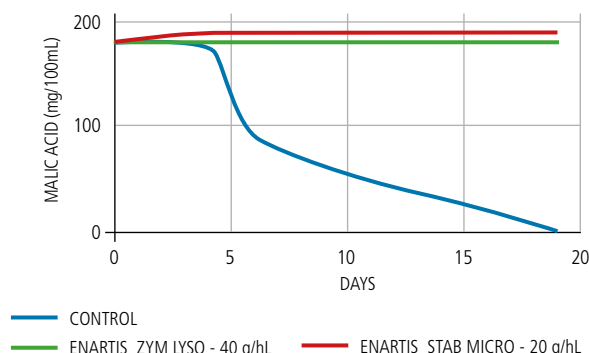


Figure 2: Enartis Stab Micro and Enartis Zym Lyso are efficient at controlling malolactic fermentation.

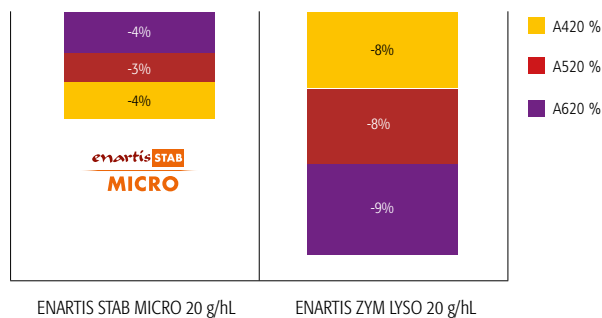


Figure 3: Enartis Stab Micro has no significant impact on color.

### LIMIT STUCK FERMENTATIONS

#### PROMOTE CLEAN AND COMPLETE FERMENTATIONS

Enartis Stab Micro M:

- Improves fermentation kinetics and ensures completion by removing spoilage microbes that inhibit yeast (Figure 5). Dosage: 10 g/hL
- Improves the start native fermentations by reducing microbial competition. Dosage: 5 g/hL
- Does not impact fermentation kinetics of *Saccharomyces*

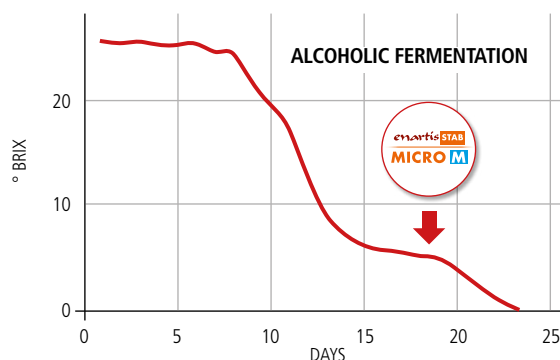


Figure 5: The addition of Enartis Stab Micro M to a sluggish fermentation helps complete fermentation.

# ENZYMES

Enzymes are biological catalysts of reactions and naturally present in all living systems. Highly specific, they act on one or a limited number of substrates to facilitate and accelerate reactions. Enological enzymes are “cocktails” in which each enzyme’s activity plays a role to reach a specific objective. The main enological enzymes are pectinases, glucanases and glycosidases which contain naturally-occurring side activities such as hemicellulasic, cellulosic and/or proteasic.

In order to offer optimum quality and performance, all Enartis enzymes undergo a purification process to remove any potentially detrimental activities such as:

- Cinnamyl-esterase activity: a side activity that puts wine at risk of aromatic spoilage through the production of vinyl-phenols
- Anthocyanase: side activity that causes color loss
- Oxidase: side activity that promotes oxidation of polyphenols and aromatic compounds.

## White and Rosé Wine Fermentation

### CLARIFICATION

#### ENARTIS ZYM RS

- Liquid pectolytic enzyme, rich in cellulosic, hemicellulasic and polygalacturonasic side activities.
- Break down “hairy zone” of pectins and hemicelluloses.
- Intense and fast depectinization.

**Recommendations:** “Difficult-to-clarify” juice; varieties rich in pectins; mechanical grape processing; overripe grapes.

**Dosage:** 1-3 mL/hL (38-113 mL/1,000 gal)

1 Kg (Item #35-160-0001) \$153.00

#### ENARTIS ZYM RS(P)

- Micro-granulated pectolytic, rich in cellulosic, hemicellulasic and polygalacturonasic side activities.
- Break down “hairy zone” of pectins and hemicelluloses.
- Intense and fast depectinization.

**Recommendations:** “Difficult-to-clarify” juice; varieties rich in pectins; mechanical grape processing; overripe grapes.

**Dosage:** 0.5-3 g/hL (0.04-0.25 lb/1,000 gal)

0.1 Kg (Item #35-160-0100) \$ 17.00



Picture of juice settling 2 hours after 4 g/hL of Enartis Zym RS(P) addition.  
Enartis Zym RS(P) improves clarification and increases speed of settling.

### FLOTATION

#### ENARTIS ZYM QUICK

- Liquid pectolytic enzyme preparation developed for juice clarification by flotation.
- High pectin-lyase content for fast depectinization and quick decrease in viscosity.

**Dosage:** 0.5-2 mL/hL (19-75 mL/1,000 gal)

1 Kg (Item #35-110-0001) \$ 99.00  
25 Kg (Item #35-110-0020) \$ 2,375.00

### MACERATION

#### ENARTIS ZYM AROM MP

- Micro-granulated pectolytic enzyme preparation developed to increase aromatic compounds extraction, press yield, improve juice clarification and protein stability.
- Rich in cellulosic, hemicellulasic and proteasic side activities.
- Contributes to protein stability.

**Dosage:** 20-40 g/ton

0.25 Kg (Item #35-130-0250) \$ 52.50  
1 Kg (Item #35-130-0001) \$ 190.00

HEAT STABILITY TEST AT END OF ALCOHOLIC FERMENTATION ( $\Delta$ NTU) (Wine considered stable when $\Delta$ NTU<2)	SAUVIGNON BLANC	PINOT GRIS
Control	11	3.7
40 g/hL Pluxbenton N	5.3	2.1
80 g/hL Pluxbenton N	0.27 (stable)	0 (stable)
2 g/hL Enartis Zym Arom MP + 40 g/hL Pluxbenton N	0 (stable)	0 (stable)

The use of Enartis Zym Arom MP during fermentation improves protein stability and reduces the amount of bentonite needed to stabilize wine.

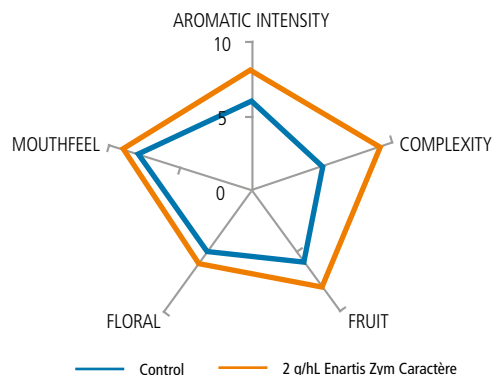
## ENARTIS ZYM CARACTÈRE

- Micro-granulated pectolytic enzyme preparation developed to increase aromatic expression, press yield and juice clarification.
- Hemicellulasic and  $\beta$ -glycosidasic side activities to reduce juice viscosity, maximize juice yield and increase aromatic intensity of wines from grapes with glycosylated precursors (terpenes, norisoprenoids...).

**Dosage:** 10-30 g/ton or 3-4 g/hL (0.25-0.3 lb/1,000 gal)

**0.25 Kg (Item #35-125-0250) \$ 62.50**

## IMPACT OF ZYM CARACTÈRE ON WINE ORGANOLEPTIC PROFILE



After 2 months contact, 2 g/hL of Enartis Zym Caractère enhances aromatic intensity, complexity and mouthfeel of wine.

## Red Wine Fermentation

The final quality of wine - aromatic profile, color stability and intensity, structure, tannic quality and ageing potential - is largely dependent on maceration. Enzymes are effective tools for winemakers to optimize and accelerate the effects of maceration.

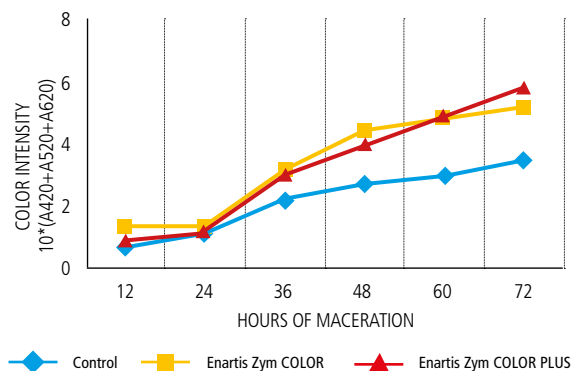
## ENARTIS ZYM COLOR PLUS

- Micro-granulated enzyme preparation developed to increase phenolic compound and improve color stability.
- Cellulasic and hemicellulasic side activities accelerate and increase extraction of phenolic compounds.
- Hydrolyzes proteins and reduce precipitation of tannins and pigments.
- Improves color stability and intensity.
- Highly effective in improving clarification and filterability.

**Dosage:** 20-40 g/ton

**0.25 Kg (Item #35-141-0250) \$ 49.75**  
**1 Kg (Item #35-141-0001) \$ 189.00**

## IMPACT OF ENARTIS ZYM COLOR PLUS AND ENARTIS ZYM COLOR ON COLOR INTENSITY



Enartis Zym COLOR and Enartis Zym COLOR PLUS increased color extraction speed, color intensity and stability.

## ENARTIS ZYM COLOR

- Micro-granulated pectolytic enzyme.
- Cellulasic and hemicellulasic side activities accelerate and increase extraction of phenolic compounds (anthocyanins and tannins in particular).
- Improves color stability and intensity.
- Enhances intensity and complexity of wine aromas.

**Dosage:** 20-40 g/ton

**0.5 Kg (Item #35-135-0500) \$ 82.50**

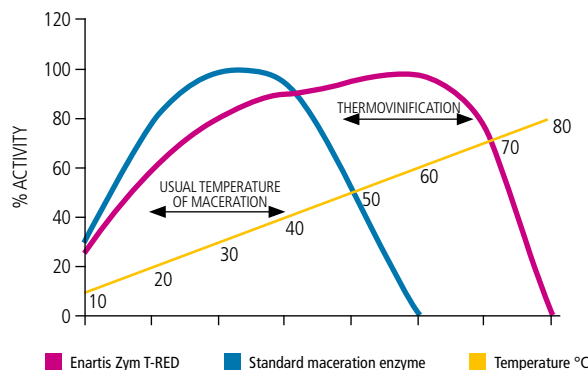
## ENARTIS ZYM T-RED

- Liquid pectolytic enzyme preparation, developed for thermovinification and flash-detente.
- Optimal activity at 55°C (131°F). Stays active at temperatures over 65°C (150°F).
- Improves extraction and stabilization of color compounds.
- Highly effective in improving clarification and filterability.

**Dosage:** 0.5-4 mL/hL (20-150 mL/1,000 gal) or 20-60 mL/ton

**1 Kg (Item #35-145-0001) \$ 75.00**

## ACTIVITY OF ENARTIS ZYM T-RED



Enartis Zym T-RED is highly active at temperatures used during thermovinification.

## Maturation

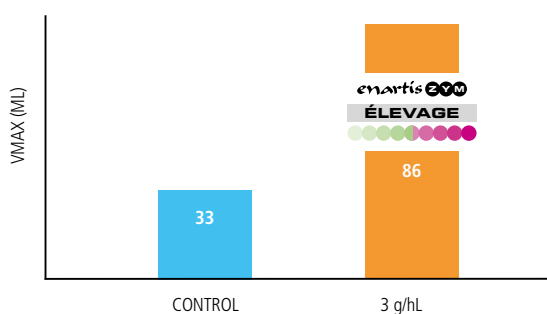
### ENARTIS ZYM ÉLEVAGE

- Micro-granulated pectolytic enzyme preparation with significant  $\beta$ -glucanase activity, developed to enhance wine sensory characteristics during lees ageing and improve wine filterability.
- Accelerates yeast cell lysis and increases mannoprotein content in wines matured on lees.
- Enhances roundness, volume and mouthfeel.
- Improves filterability, especially for wines made with *Botrytis* infected grapes.

**Dosage:** 2-10 g/hL (0.17-0.8 lb/1,000 gal)

**0.25 Kg (Item #35-150-0250) \$ 82.50**

IMPACT OF ENARTIS ZYM ÉLEVAGE ON FILTERABILITY



Enartis Zym Élevage improves wine filterability. Average result from six wines.

## Lysozyme

### ENARTIS ZYM LYSO

- Purified, micro-granulated preparation of lysozyme.
- Antibacterial activity specific for the control of lactic acid bacteria. Does not interfere with primary fermentation. Alternative to  $\text{SO}_2$  to control the development of lactic acid bacteria.
- Delays or prevents MLF.

**Dosage:** 10-50 g/hL (0.8-4.2 lb/1,000 gal)

**0.25 Kg (Item #35-155-0250) \$ 72.50**  
**1 Kg (Item #35-155-0001) \$ 285.00**

	Clarification/ Cold Settling	Clarification of Difficult Juices	Clarification by Flotation	Maceration of White Grapes	Rosé Wine Production	Maceration of Red Grapes	Color Stability	Flash Détente/ Thermovinification	Aromatic Enhancement	Yeast Lysis	Improve Filtration	Botrytis	Anti-Bacterial	Form	Dosage	Package Size	
ENARTIS ZYM RS(P)	***	***	**		**						*			Powder	1-2 g/hL	0.25 Kg	1 Kg
ENARTIS ZYM RS	***	***	**		**						*			Liquid	1-3 mL/hL	1 Kg	
ENARTIS ZYM QUICK	**		***		**						*			Liquid	0.5-2 mL/hL	1 Kg	25 Kg
ENARTIS ZYM AROM MP	*			***	***						*			Powder	20-40 g/ton	0.25 Kg	1 Kg
ENARTIS ZYM CARACTÈRE	*			*					***		*			Powder	3-4 g/hL	0.25 Kg	
ENARTIS ZYM COLOR PLUS					***	***	***	**			*			Powder	20-40 g/ton	0.25 Kg	1 Kg
ENARTIS ZYM COLOR						**	*				*			Powder	20-40 g/ton	0.5 Kg	
ENARTIS ZYM T-RED								***			**			Liquid	0.5-4 mL/hL	1 Kg	
ENARTIS ZYM ÉLEVAGE										***	***	***		Powder	2-5 g/hL	0.25 Kg	
ENARTIS ZYM LYSO													**	Powder	10-50 g/hL	0.25 Kg	1 Kg



## ABOUT ENOLOGICAL ENZYMES

### WHY USE ENOLOGICAL ENZYMES?

Enzymes are essential for improving press yield, clarification, flotation, wine filterability, aroma and polyphenol extraction, as well as enhancing aromatic expression, improving mouthfeel, contributing to protein stability and helping to stabilize color.

### WHAT ARE ENZYMES EXTRACTED FROM?

Enological enzymes are produced by diverse species of fungi such as *Aspergillus*, *Rhizopus* and *Trichoderma*, except for lysozyme which is extracted from egg whites.

### WHY SO MANY PECTOLYTIC ENZYMES?

Pectolytic enzymes include enzymes (Figure 1) that break down homogalacturonan chains and enzymes that break down other pectin components such as rhamnogalacturonans I, II and their side chains. The balance between these pectolytic activities impacts the performance of the enzyme preparation.

- Pectin lyase (PL) randomly separates the pectin chain and releases midsize polymers. This activity promotes a fast depectinization and fast reduction of viscosity.
- Polygalacturonase (PG) separates galacturonic acids only when they are not esterified.
- Pectin methyl esterase (PME) de-esterifies galacturonic acid, allowing PG to perform.
- Rhamnogalacturonase, arabinanase and galactanase break down "branched pectins," commonly referred to as the "hairy zone."

These activities are especially important to improve settling or filtration of difficult juices.

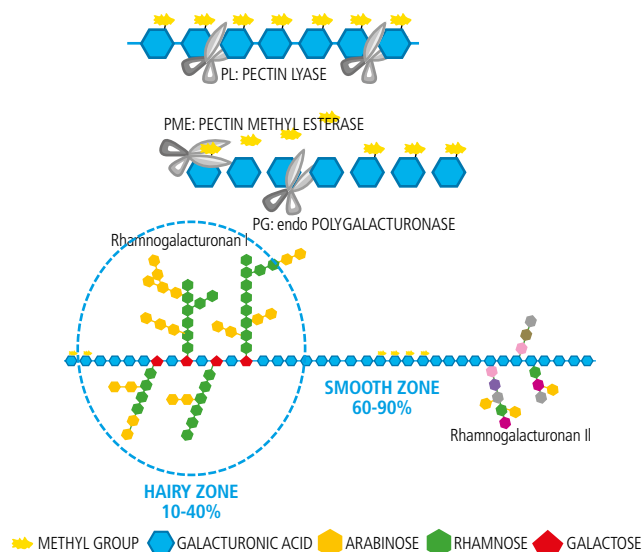


Figure 1: Representation of main pectolytic activities on pectin chains.

### WHAT ARE THE DIFFERENCES BETWEEN POWDERED AND LIQUID FORMS OF ENZYMES?

Powdered enzymes are easy to store, have a long shelf life with limited risk of contamination and require no preservatives. Liquid enzymes are convenient to use and dose. They require cold storage and have a shorter shelf life due to possible microbiological contamination after opening.

### 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.

### HOW DOES TEMPERATURE AFFECT ENZYMATIC ACTIVITIES?

Most enzymes are denatured at temperatures above 60°C (140°F) and inactivated at temperatures below 5°C (40°F). Optimum temperature for enological enzymes is around 40°C (104°F).

### DOES SO<sub>2</sub> AFFECT ENZYME ACTIVITY?

Even with an addition of 2000 ppm of SO<sub>2</sub>, the enzymatic activity of **Enartis Zym RS**, for example, is not affected (Figure 2). Using SO<sub>2</sub> and enzymes is fine, however timing is important. Add enzymes after SO<sub>2</sub> has adequately dispersed or vice versa. Do not add SO<sub>2</sub> and enzymes at the same time.

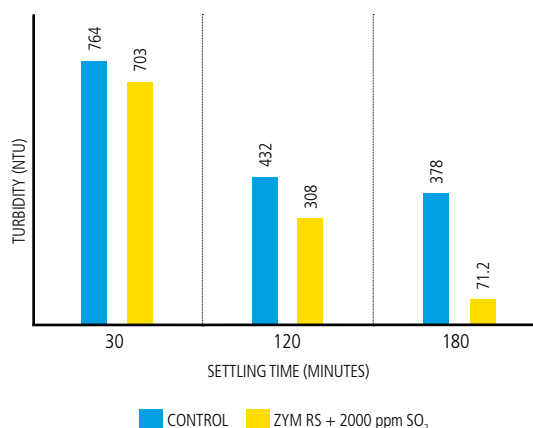


Figure 2: Impact of SO<sub>2</sub> addition on Enartis Zym RS effect.

### HOW DO TANNIN OR BENTONITE ADDITIONS INTERFERE WITH ENZYME ACTIVITY?

As shown, the addition of bentonite or tannin does not have a significant effect on the clarification capacity of **Enartis Zym RS** (Figure 3). We recommend waiting 30 minutes after the complete homogenization of the enzyme before adding tannin or bentonite.

### HOW DO I DECIDE WHAT DOSAGE OF ENZYME TO USE?

Dosage is related to the desired effect, contact time, temperature and inhibiting factors. Cold temperatures, short contact times or alcohol presence can be compensated for by higher dosages.

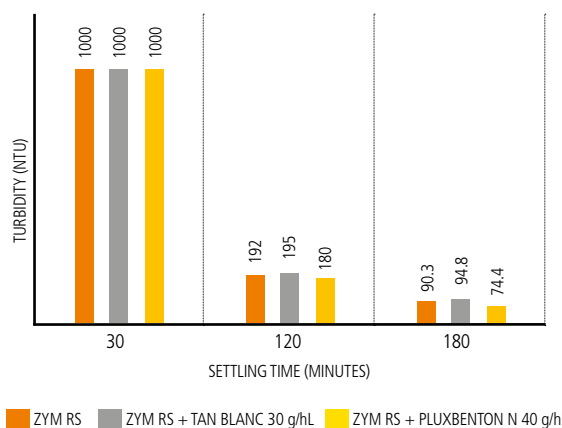
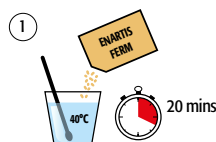


Figure 3: Impact of tannin and bentonite addition on Enartis Zym RS effect.

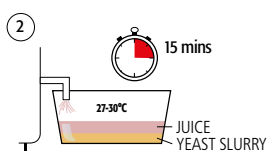
# YEAST

## Protocol for Yeast Rehydration

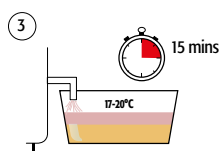
Proper yeast rehydration is an important step to help ensure a strong and healthy fermentation. Careful rehydration, acclimation and inoculation are all important to help prevent sluggish or stuck fermentations.



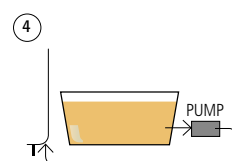
Rehydrate 20-40 g/L of active dry yeast in 10 times its weight of chlorine-free water at 35-40°C (95-104°F). Stir gently to break up any clumps. Wait 20-30 minutes.



Slowly add some juice/must to yeast suspension to drop temperature: temperature drop should not be more than 10°C (18°F). This helps yeast acclimate to cool temperature of the juice and avoid cold shock. Let stand for 15 minutes.



Repeat (2) until the temperature difference between the tank and yeast slurry is below 10°C (18°F).



Add yeast slurry to the bottom of the fermentation vessel and mix the tank.

## Enartis California Premium Vineyards Collection



*Continuing the tradition of isolating, characterizing and preserving indigenous microflora from selected vineyards, Enartis USA provides the industry with selected microbiological cultures either as exclusive, proprietary cultures or as commercial strains, available in active dry form.*

### ENARTIS FERM WS: MORE THAN 25 YEARS OF EXCELLENCE.

With more than 25 years of history, Enartis Ferm WS is a cult yeast, highly appreciated around the world for many varieties and wine styles.

### ENARTIS FERM D20: FAST SUCCESS FOR OBVIOUS QUALITY STRAIN.

In 2013, Daniel Daou approached Enartis to isolate a yeast resistant to high fermentation temperatures and leading to stable color and balanced tannins. The isolation started with Cabernet Sauvignon grapes coming from the top block on DAOU Mountain in Paso Robles, in the Adelaida Appellation. In 2015, after many trials and selections of isolates, Enartis Ferm D20 in active dry form was produced. One year later, its success is recognized around the world.

### ENARTIS FERM MB15: A UNIQUE YEAST FOR UNIQUE WINES.

The uniqueness of this strain was evident since the beginning. During the isolation process with Bannister Wines, only one genetic profile of *Saccharomyces cerevisiae* was identified throughout the fermentation. This isolate is now branded as Enartis Ferm MB15 as a tribute to the contributions of Marty Bannister to the wine industry. In just two years, Enartis Ferm MB15 has been isolated, tested and made available around world.

Enartis Ferm MB15 produces wines characterized by elegant, delicate bouquet with intense color and balanced mouthfeel.

## White and Rosé Wine Fermentation

### VQ 10

- Moderate speed fermenter.
- Short lag phase.
- Wide fermentation temperature range (10-25°C).
- Alcohol tolerant (up to 17%).
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Preserves varietal fruit characters and produces delicate wines.

**Recommendations:** Varietal expression; white, rosé and sparkling wines; barrel fermentation.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-500-0500)	\$ 44.50
10 Kg	(Item #45-500-0010)	\$ 580.00

### ENARTIS FERM SB

- Fast fermenter.
- Short lag phase.
- Wide fermentation temperature range (10-30°C).
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S production.
- Produces clean wines.

**Recommendations:** White, rosé and sparkling wines; large volume fermenter; ester and acetate production; charmat method.

**Dosage:** 20-40 g/hL (1.67-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-155-0500)	\$ 24.50
10 Kg	(Item #45-155-0010)	\$ 290.00

### ENARTIS FERM TOP ESSENCE

- Moderate speed fermenter.
- Short lag phase.
- Medium nutrient requirements.
- Low VA and H<sub>2</sub>S production.
- Produces aromatic wines and intense tropical fruit, pineapple, passion fruit and banana notes.

**Recommendations:** Neutral grapes; ester and acetate production; young wines.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-165-0500)	\$ 24.75
10 Kg	(Item #45-165-0010)	\$ 425.00

### ENARTIS FERM AROMA WHITE

- Moderate speed fermenter.
- Medium/high nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Expresses thiols (β-lyase activity).
- Fermentation at 15-17°C favors fresh citrus and mineral notes; 18-21°C favors tropical and stonefruit aromas.
- Low producer of riboflavin: reduce risk of light-struck defect.

**Recommendations:** Thiol production; varietal expression; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-110-0500)	\$ 39.50
10 Kg	(Item #45-110-0010)	\$ 490.00

### ENARTIS FERM ES 123

- Medium speed fermenter.
- Medium lag phase.
- Medium/high nutrients requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Expresses thiols (β-lyase activity).
- Fermentation at 15-17°C favors fresh citrus and mineral. Fermentation at 18-21°C favors tropical and stonefruit aromas.

**Recommendations:** Neutral grapes; ester and acetate production; elegant wines.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-105-0500)	\$ 39.50
10 Kg	(Item #45-105-0010)	\$ 490.00

### ENARTIS FERM ES FLORAL

- Blend of *S. cerevisiae* and *S. bayanus*.
- Moderate speed fermenter.
- Medium nutrient requirements.
- Low VA and SO<sub>2</sub> production.
- Produces intense fresh aromas of peach, pear, apricot, white flowers, violet and roses.

**Recommendations:** Neutral grapes; fruity and floral aromas; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-160-0500)	\$ 24.75
10 Kg	(Item #45-160-0010)	\$ 425.00

**ENARTIS FERM ES 181**

- Fast fermenter.
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Expresses thiols (β-lyase activity) in reductive conditions and produces intense varietal and fermentation aromas.
- Produces complex wines with grapefruit, tropical fruit, passion fruit and fresh fruit aromas.

**Recommendations:** Intense aromas; thiol production; varietal expression; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-120-0500)	\$ 39.50
10 Kg	(Item #45-120-0010)	\$ 490.00

**ENARTIS FERM Q CITRUS**

- Fast fermenter.
- Medium nutrient requirements.
- Low VA and H<sub>2</sub>S production.
- Expresses terpenes and norisoprenoids (β-glycosylase activity).
- Produces complex wines with intense zesty, citrus, grapefruit, tropical fruit, peach, pear and pineapple aromas.

**Tip:** Increase terpenes and norisoprenoids production by using Enartis Tan Citrus during fermentation.

**Recommendations:** Varietal expression; citrus aromas; thiol production; terpenes and norisoprenoids production; ester and acetate production.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-302-0500)	\$ 39.70
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Enartis Ferm Q Citrus gave my wines incredible aromatics and massive sensory expression. We frequently perceive distinct notes of pineapple, orange and guava. Enartis Ferm Q Citrus reminds me of landing in Hawaii! - Lucas Meeker, Winemaker at The Meeker Vineyards (CA)

**ENARTIS FERM Q9**

- Fast fermenter.
- High nutrient requirements.
- Low VA, SO<sub>2</sub> and H<sub>2</sub>S production.
- Expresses thiols (β-lyase activity).
- Produces complex wines with high mineral, roasted coffee and flinty notes. Intense gunpowder, citrus, grapefruit, tropical fruit, pear and pineapple aromas.

**Recommendations:** Minerality; "flinty"; varietal expression; thiol production; ester and acetate production; intense aromas.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-047-0500)	\$ 39.50
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**ENARTIS FERM VINTAGE WHITE**

- Moderate speed fermenter.
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Release high amount of polysaccharides and create compact lees.
- Preserves varietal fruit, produces delicate wines with round and complex mouthfeel.

**Recommendations:** Barrel fermentation; varietal expression; lees ageing; complexity; elegant wines; roundness.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-115-0500)	\$ 39.50
10 Kg	(Item #45-115-0010)	\$ 490.00

**ENARTIS FERM ES PERLAGE**

- Fast fermenter.
- Alcohol tolerant (up to 17%), resistant to SO<sub>2</sub> and low pH.
- Wide range of fermentation temperatures (10-30°C).
- Low nutrient requirements.
- Low VA and SO<sub>2</sub> production.
- Produces clean, elegant, delicate and complex wines with round and balanced mouthfeel.

**Recommendations:** Base wines; sparkling wines; traditional method; varietal expression.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-180-0500)	\$ 39.50
10 Kg	(Item #45-180-0010)	\$ 490.00

**ENARTIS FERM TOP 15**

- Fast fermenter.
- Short lag phase.
- Wide fermentation temperature range (10-30°C).
- Alcohol tolerant (up to 17%).
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Preserves clean and varietal wines.

**Recommendations:** White, rosé, sparkling and red wines; base wines; large volume fermenter; charmat method.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-150-0500)	\$ 24.75
10 Kg	(Item #45-150-0010)	\$ 425.00

NEW

## Red and Rosé Wine Fermentation

### ENARTIS FERM ES 401

- Moderate speed fermenter.
- Medium nutrient requirements.
- Metabolizes a portion of malic acid (25%).
- Produces clean, fresh, fruity and balanced wines.

**Recommendations:** Young wines; red, white, rosé and red wines; fruity aromas; ester and acetate production; easy-to-drink wines.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-130-0500)	\$ 24.75
10 Kg	(Item #45-130-0010)	\$ 425.00

### VQ ASSMANSHAUSEN

- The most popular yeast for Pinot noir
- Slow-moderate speed fermenter.
- Long lag phase.
- Medium nutrient requirements.
- Produces complex, varietal and spicy wines with round and balanced structure.

**Recommendations:** White, rosé and red wines; varietal expression; spicy aromas; complexity; elegant wines.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-510-0500)	\$ 44.50
10 Kg	(Item #45-510-0010)	\$ 580.00

### ENARTIS FERM MB15

PINOT NOIR ISOLATE FROM SONOMA COAST, CALIFORNIA

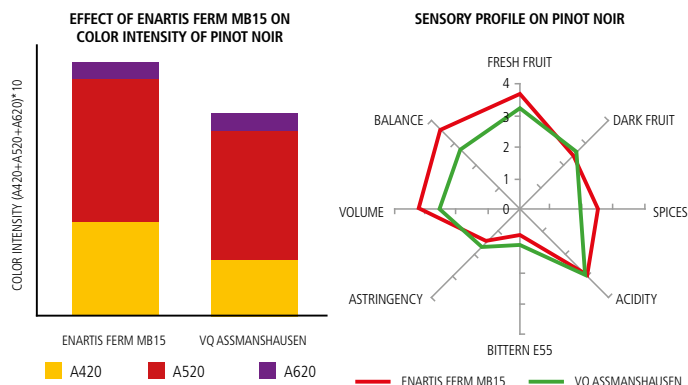


- Moderate speed fermenter.
- Low nutrient requirements.
- High polyphenol extraction capacity.
- Produces varietal, delicate and complex wines with spicy, fruity and floral notes.

**Recommendations:** Fruity and spicy aromas; varietal expression; intense color; structure and roundness.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-065-0500)	\$ 42.50
10 Kg	(Item #45-065-0010)	\$ 550.00



**ENARTIS FERM RED FRUIT**

ONE OF THE MOST BELOVED STRAINS OF THE ENARTIS FERM PORTFOLIO

- Fast fermenter.
- High nutrient requirements.
- Expresses terpenes and norisoprenoids ( $\beta$ -glycosydase activity).
- Produces intense floral, red fruit and berries aromas.

**Tip:** Increase terpenes and norisoprenoids production by using Enartis Tan Red Fruit during fermentation.

**Recommendations:** Ester and acetate production; fruity and spicy aromas; varietal expression; roundness; young wines.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-140-0500)	\$ 39.50
10 Kg	(Item #45-140-0010)	\$ 490.00

**ENARTIS FERM ES 488**

- Moderate speed fermenter.
- High nutrient requirements.
- Expresses thiols ( $\beta$ -lyase activity).
- Produces intense floral, spicy and red berry aromas.
- Reduces herbaceous notes in unripe grapes.

**Tip:** Increase spicy aromas by using Enartis Pro Blanco at inoculation.

**Recommendations:** Thiol production; varietal expression; fruity, floral and spicy aromas; reduce herbaceous notes; unripe grapes.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-185-0500)	\$ 39.50
10 Kg	(Item #45-185-0010)	\$ 490.00

**ENARTIS FERM ES 454**

- Moderate speed fermenter.
- Medium nutrient requirements.
- Produces elegant, complex, varietal wines with spicy aromas and balanced structure.

**Recommendations:** Varietal expression; complexity; structure and roundness; Bordeaux varieties.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-170-0500)	\$ 39.50
10 Kg	(Item #45-170-0010)	\$ 490.00

**ENARTIS FERM Q5**

- Moderate speed fermenter.
- Medium nutrient requirements.
- High production of glycerol.
- Expresses terpenes and norisoprenoids ( $\beta$ -glycosydase activity).
- Produces intense red fruit (strawberry, raspberry, black cherry) and floral notes with soft structure.

**Tip:** Increase terpenes and norisoprenoids production by using Enartis Tan Red Fruit at inoculation.

**Recommendations:** Ester and acetate production; terpenes and norisoprenoids production; varietal expression; complexity; fruity and spicy aromas.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-301-0500)	\$ 39.70
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**ENARTIS FERM VINTAGE RED**

- Moderate speed fermenter.
- Medium nutrient requirements.
- Wide fermentation temperature range (18-35°C).
- High production of glycerol and mannoproteins.
- Produces elegant, complex wines with ripe red fruit, leather and spicy aromas and round, full-bodied mouthfeel.

**Recommendations:** Varietal expression; complexity; long ageing; lees ageing; roundness and structure.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-125-0500)	\$ 39.50
10 Kg	(Item #45-125-0010)	\$ 490.00

**VQ 51**

- Moderate speed fermenter.
- Medium nutrient requirements.
- High production of glycerol and mannoproteins.
- Produces structured, round and complex wines with ripe red fruit aromas.

**Recommendations:** Varietal expression; complexity; lees ageing; roundness and structure.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-505-0500)	\$ 44.50
10 Kg	(Item #45-505-0010)	\$ 580.00



### ENARTIS FERM PRIMITIVO

- Moderate speed fermenter.
- Alcohol tolerant (up to 16.5%).
- Medium nutrient requirements.
- High production of fresh fruit, plum, dark cherry, ripe berry and spicy aromas.

**Recommendations:** Hot climate areas; varietal expression; medium-to-long ageing; freshen overripe grapes; high °Brix grapes.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-054-0500)	\$ 39.50
10 Kg	(Item #45-054-0010)	\$ 490.00

### ENARTIS FERM AMR-1

ISOLATE FROM DRIED GRAPES DESTINATED FOR AMARONE WINE

- Fast fermenter.
- Wide fermentation temperature range (10-30°C).
- Alcohol tolerant (up to 17%) and resistant to low pH.
- Low nutrient requirements.
- Produces elegant, clean, fresh wines with round and smooth mouthfeel.

**Recommendations:** Late harvest; high °Brix grapes; fruity and spicy aromas; varietal expression; white, rosé and red wines; low temperature fermentation.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-511-0500)	\$ 39.50
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### ENARTIS FERM WS

ZINFANDEL ISOLATE FROM WILLIAM SELYEM WINERY, CALIFORNIA

- Fast fermenter.
- High alcohol tolerant (up to 18%).
- Low nutrients requirements.
- Produces elegant, clean, fresh, fruity and spicy wines with round and smooth mouthfeel.

**Recommendations:** High °Brix grapes; white, rosé and red wines; fruity and spicy aromas; restart stuck fermentations.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-053-0500)	\$ 42.50
10 Kg	(Item #45-052-0010)	\$ 550.00

*"I love the fruity and clean aromas that WS gives to the wine."*

**Heather Perkin, Associate Winemaker at Elk Cove Vineyards (OR)**

*"I use WS on my late harvest wines; it ferments up to 18% alcohol with no problem."* - **Ken Wright, Winemaker at Ken Wright Cellar (OR)**

*"In 2017, I used Enartis Ferm WS on our 2017 Zinfandel and 25% of our Cabernet Sauvignon to produce intense color, rich mouthfeel and balanced tannin structure and was very happy with the results."* - **David Bradley, owner/Winemaker, Vindemia Vineyards (CA)**

### ENARTIS FERM D20

CABERNET SAUVIGNON ISOLATE FROM DAOU VINEYARDS & WINERY, CALIFORNIA



- Moderate speed fermenter.
- High alcohol tolerant (up to 17%) and resistant to high temperatures (up to 38°C).
- Medium nutrient requirements.
- Produces powerful, complex and structured wines with long ageing potential.

**Recommendations:** High °Brix grapes; varietal expression; high temperature fermentation; white, rosé and red wines; fruity aromas; ester and acetate production.

**Dosage:** 200 g/ton

0.5 Kg	(Item #45-060-0500)	\$ 47.50
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*"The Enartis Ferm D20 has improved the mouthfeel of our wines while delivering a more balanced wine that had increased phenolics."* - **Daniel Daou, co-proprietor and winemaker of Daou Vineyards & Winery.**

## Restart Fermentation

### ENARTIS FERM EZ FERM 44

- Moderate speed fermenter.
- *Saccharomyces cerevisiae* and *bayanus*.
- Wide fermentation temperature range (12-34°C).
- Alcohol tolerant (up to 17.5%).
- Fructophilic.
- Low nutrient requirements.
- Low VA, H<sub>2</sub>S and SO<sub>2</sub> production.
- Ideal to prevent or restart sluggish/stuck fermentations.

**Recommendations:** Restart stuck fermentation; high fructose content; hot climate grapes and drought areas.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

0.5 Kg	(Item #45-175-0500)	\$ 39.50
10 Kg	(Item #45-175-0010)	\$ 490.00

## RESTART AND/OR COMPLETE A STUCK FERMENTATION

The successful restart of a stuck fermentation depends upon three critical factors: Diagnose the causes of fermentation arrest, appropriate wine treatment and proper acclimation of the yeast.

### 1- DIAGNOSIS

Vinquiry Laboratories by Enartis USA offers a comprehensive **Fermentation Assessment Panel** that provides essential analytical information needed to determine the cause(s) of the problem(s) and the degree of fermentation completion.

### 2- TREAT THE STUCK WINE BEFORE THE RESTART - 24 HOURS PRIOR TO YEAST PREPARATION

1. Press off skins.
2. Adjust pH, Alcohol, VA.
3. Remove spoilage microbes with **Enartis Stab Micro M** at 15 g/hL
4. Rack off lees 24 hours after treatment and add **Nutriferment No Stop** at 20 g/hL.

### 3- PREPARE AND ACCLIMATE THE YEAST

#### STEP 1: Prepare starter

*Tip: Use a sanitized tank able to hold the entire volume of stuck wine.*

- Take 2.5 % of stuck wine.
- Add the same amount of water (2.5% of total volume).
- Add 10 g/hL of **Nutriferment Energy** (calculated on the volume of stuck wine).
- Adjust sugar level to 50 g/L (5°Brix).
- Maintain temperature at 20-23°C (68-75°F).

#### STEP 2: Yeast rehydration

Rehydrate 30 g/hL (calculated on the volume of stuck wine) of **Enartis Ferm EZ FERM 44** in 10 times its weight of chlorine-free water at 40°C (104°F) and wait 20 minutes.

#### STEP 3: Acclimate the yeast and start fermentation

- Add rehydrated yeast to STEP1 and monitor °Brix and Temperature.
- At 1/2 °Brix depletion, add 20% of stuck wine + 5 g/hL of **Nutriferment Advance** (calculated on volume of stuck wine).
- At 1/2 °Brix depletion, add another 20% of stuck wine.
- At 1/2 °Brix depletion, add the remaining stuck wine.

#### Why use Nutriferment No Stop?

*Nutriferment No Stop acts as a protector by improving yeast membrane integrity. Additionally, it eliminates medium chain fatty acids and pesticides residues which may inhibit fermentation.*

#### Why use Nutriferment Energy?

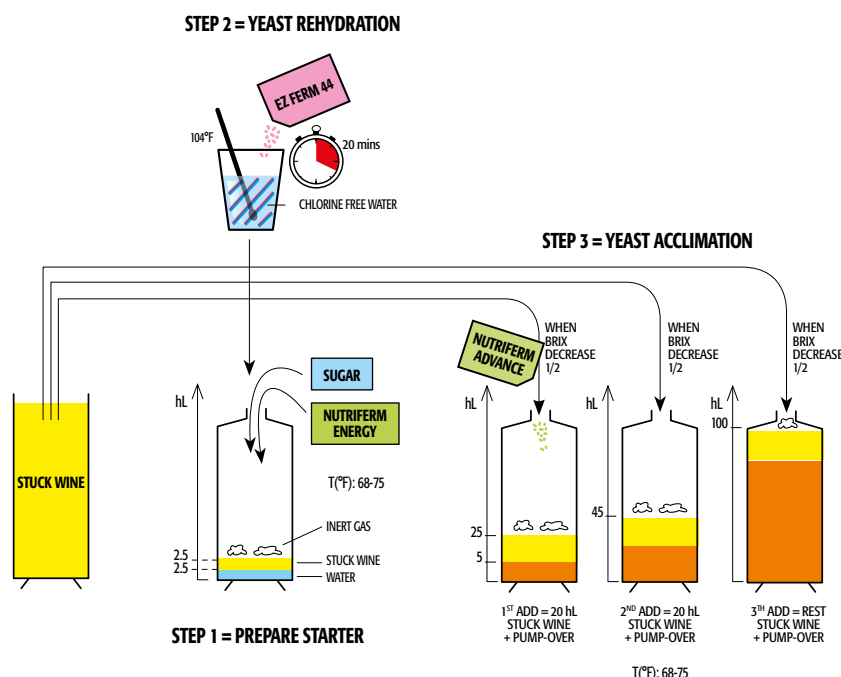
*Nutrient content in stuck wine cannot support yeast growth. Complex yeast nutrients improves yeast activity and facilitates their acclimation to hostile wine conditions. Nutriferment Energy provides essential elements for yeast development.*

#### Why using Enartis Ferm EZ FERM 44?

*It is a fructophilic yeast, vigorous fermenter with low nutrition needs. It has high implantation rate and strong resistance to alcohol and VA.*

### 4- PRODUCT NEEDS FOR 100 hL:

WINEMAKING PRODUCT	QUANTITY (Kg)
ENARTIS STAB MICRO M	1.5
NUTRIFERM NO STOP	2
ENARTIS FERM EZ FERM44	3
NUTRIFERM ENERGY	1
NUTRIFERM ADVANCE	0.5



## YEAST/WINE STYLE RECOMMENDATIONS

	VARIETAL EXPRESSION	HIGH AROMATIC IMPACT	THIOL EXPRESSION	ESTER AND ACETATE PRODUCTION	YOUNG WHITES	AGED WHITES	ROSÉS	YOUNG REDS	RESERVE REDS	LATE HARVEST	SPARKLING BASE WINES	STUCK FERMENTATIONS
ENARTIS FERM AMR-1	★						★	★	★	★		
ENARTIS FERM AROMA WHITE	★	★	★	★	★	★	★					
ENARTIS FERM D20	★			★		★		★	★			
ENARTIS FERM ES 123		★		★	★		★	★				
ENARTIS FERM ES 181	★		★	★	★	★	★			★		
ENARTIS FERM ES 401		★		★			★	★				
ENARTIS FERM ES 454	★								★			
ENARTIS FERM ES 488	★	★	★				★	★				
ENARTIS FERM ES FLORAL		★		★	★		★					
ENARTIS FERM EZ FERM 44										★	★	★
ENARTIS FERM MB15	★							★	★			
ENARTIS FERM ES PERLAGE	★				★	★					★	
ENARTIS FERM PRIMITIVO	★							★	★			
ENARTIS FERM Q5	★			★					★			
ENARTIS FERM Q9	★	★	★	★	★	★	★					
ENARTIS FERM Q CITRUS		★	★	★	★		★					
ENARTIS FERM RED FRUIT	★	★		★			★	★				
ENARTIS FERM SB				★	★		★				★	
ENARTIS FERM TOP 15					★		★	★		★	★	
ENARTIS FERM TOP ESSENCE		★		★	★		★					
ENARTIS FERM VINTAGE RED	★								★			
ENARTIS FERM VINTAGE WHITE	★				★	★						
VQ 10	★				★	★				★	★	
VQ 51	★								★			
VQ ASSMANSHAUSEN	★				★	★			★			
ENARTIS FERM WS	★	★		★			★	★	★		★	★

## ENARTIS YEAST CHARACTERISTICS

	OPTIMAL TEMPERATURE RANGE (°C)	LAG PHASE	FERMENTATION SPEED	ALCOHOL TOLERANCE (% V/V)	KILLER FACTOR	NITROGEN NEEDS	OXYGEN NEEDS	VA PRODUCTION	H <sub>2</sub> S PRODUCTION	SO <sub>2</sub> PRODUCTION	COMPATIBILITY MLF	RESISTANCE TO SO <sub>2</sub>
ENARTIS FERM AMR-1	10-30	short	high	17	N	med	low	low	low	low	N	high
ENARTIS FERM AROMA WHITE	14-24	med	med	15	K	high	med	low	low	low	N	med
ENARTIS FERM D20	18-38	short	med	17	N	med	med	low	med	low	N	med
ENARTIS FERM ES 123	15-25	short	med	14	K	high	med	low	low	low	low	high
ENARTIS FERM ES 181	10-20	short	high	16.5	K	low	low	low	low	low	low	high
ENARTIS FERM ES 401	15-30	med	med	15	N	high	med	med	med	low	high	high
ENARTIS FERM ES 454	18-30	med	med	16	S	med	med	med	low	low	high	med
ENARTIS FERM ES 488	15-28	short	med	16	K	high	high	low	med	low	high	med
ENARTIS FERM ES FLORAL	10-25	med	med	15	N	med	low	low	med	low	high	high
ENARTIS FERM EZ FERM 44	15-30	short	high	17.5	N	low	low	med	low	low	N	high
ENARTIS FERM MB15	18-30	med	med	16	N	med	low	low	low	med	N	med
ENARTIS FERM ES PERLAGE	10-30	short	high	17	K	low	low	low	med	low	low	high
ENARTIS FERM PRIMITIVO	18-30	med	med	16.5	N	med	med	med	low	low	N	med
ENARTIS FERM Q5	15-30	short	med	16	N	med	high	low	low	low	high	med
ENARTIS FERM Q9	15-20	short	high	14	N	high	med	low	low	low	N	med
ENARTIS FERM Q CITRUS	10-20	short	high	15	N	med	med	med	low	med	low	high
ENARTIS FERM RED FRUIT	14-34	short	high	16	K	high	high	med	low	med	low	high
ENARTIS FERM SB	10-30	short	high	15	N	low	low	low	low	low	N	med
ENARTIS FERM TOP 15	10-30	short	high	17	K	low	low	low	low	low	N	high
ENARTIS FERM TOP ESSENCE	15-25	short	med	15	K	med	med	low	low	med	low	high
ENARTIS FERM VINTAGE RED	18-32	short	med	16	N	med	med	med	med	low	high	med
ENARTIS FERM VINTAGE WHITE	14-24	short	med	15.5	K	high	med	low	low	low	high	med
VQ 10	10-25	short	med	17	K	low	low	low	low	low	N	med
VQ 51	20-30	short	med	16	S	med	med	low	low	med	high	med
VQ ASSMANSHAUSEN	20-30	long	slow	15	N	med	low	med	low	low	high	med
ENARTIS FERM WS	16-30	short	med	18	N	low	low	low	low	low	N	med

K: killer factor; N: neutral; med: medium/moderate

#### WHAT IS A "YEAST KILLER" FACTOR?

Killer yeast contain a toxin in their cell wall structure that allows them to kill toxin-sensitive yeast cells. Most killer strains of *S. cerevisiae* have good fermentation kinetics and a greater chance of dominating the fermentation. Yeast strains can be killer, sensitive to killer factor or have a neutral reaction to this factor. A killer yeast will inhibit the development of most indigenous yeast and yeast sensitive to killer factor.

Understanding the nutritional requirements of yeast is fundamental to accomplish successful fermentations and prevent stuck fermentations. Managing nutrient requirements allows for regular and complete fermentations, as well as minimizing sulfur compound production, such as H<sub>2</sub>S, and enhancing sensory qualities. Enartis recommends a two-step nutrient addition; providing amino acids and micro-nutrients at inoculation and inorganic nitrogen with survival factors at 1/3 sugar depletion.

## Organic Nitrogen Nutrients (do NOT contain inorganic source of nitrogen)

The timing and form of nitrogen supplementation are important to manage a successful fermentation. During growth phase, yeast need amino acids, vitamins and minerals to build biomass and 'healthy' cells resistant to stress. Since yeast assimilation of amino acids is inhibited by the presence of ethanol and high concentration of ammonium ions, the optimum time to add organic nitrogen is at inoculation.

### NUTRIFERM ENERGY

- Amino acids, vitamins (thiamine), mineral salts and micro nutrients.
- Shortens lag phase, prevents formation of H<sub>2</sub>S and acetic acid, and increases production of polysaccharides.
- Vital in initial phases of yeast multiplication.

**Usage:** Dissolve in 10 times its weight of water and add to juice after yeast inoculation.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

1 Kg	(Item #35-200-0001)	\$ 40.00
10 Kg	(Item #35-200-0010)	\$ 350.00

"I've been using Nutriferm Energy on red wines at yeast inoculation. It's a very reliable nutrient that allows smooth and clean fermentations without challenges. Nutriferm Energy respects the aromatic profile of the fruit." - Alberto Bianchi, Winemaker at Newton vineyards.

### NUTRIFERM AROM

- Amino acids, vitamins (thiamine), mineral salts and trace elements.
- High content of selected amino acids used by yeast as precursors of aromatic compounds to increase intensity, freshness and complexity.

**Tip:** To increase the aromatic impact of Nutriferm Arom, use a ester and acetate producer yeast.

**Usage:** Dissolve in 10 times its weight of water and add to juice after yeast inoculation.

**Dosage:** 15-30 g/hL (1.3-2.5 lb/1,000 gal)

1 Kg	(Item #35-210-0001)	\$ 42.00
10 Kg	(Item #35-210-0010)	\$ 320.00

"I have been using Enartis nutrients almost exclusively for 6 years, and my copper sulfate purchases have dropped significantly, as well as my restart products." - Lucas Meeker, Winemaker at The Meeker Vineyard (CA)

### NUTRIFERM AROM PLUS

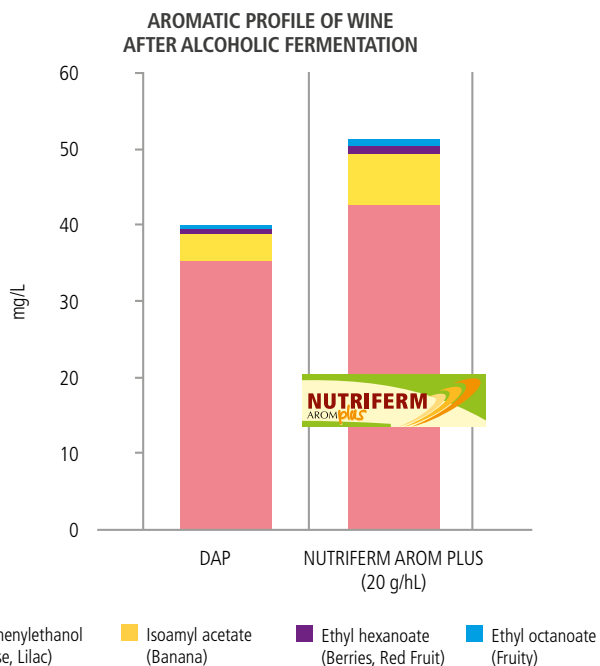
- Amino acids, vitamins (thiamine), mineral salts and micro-nutrients.
- Elevated content of selected amino acids used by yeast as precursors of aromatic compounds to strongly increase intensity, freshness and complexity.
- Provides survival factors to improve yeast viability and ensure successful fermentations.

**Tip:** To increase the aromatic impact of Nutriferm Arom Plus, use a ester and acetate producing yeast.

**Usage:** Dissolve in 10 times its weight of water and add after yeast inoculation.

**Dosage:** 15-30 g/hL (1.3-2.4 lb/1,000 gal)

1 Kg	(Item #35-211-0001)	\$ 50.50
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Nutrifer Arom Plus increases the production and content of aromatic compounds in wine.

## Nutrients Containing Di-Ammonium Phosphate (DAP)

At 1/3 fermentation, yeast become stressed, their activity is reduced and their nitrogen assimilation limited. To complete fermentation and increase their alcohol resistance, yeast need survival factors, oxygen, detoxifying agents and ammonium ions.

### NUTRIFERM SPECIAL

- Complex nutrient containing DAP, yeast cell walls and thiamine.
- Facilitates fermentation and prevents stuck fermentations.
- Prevents production of H<sub>2</sub>S.

**Usage:** Dissolve in 10 times its weight of water and let stand 15-20 minutes before addition to juice.

**Dosage:** 30-40 g/hL (2.4-3.4 lb/1,000 gal)

**10 Kg (Item #35-225-0010) \$ 162.50**

### NUTRIFERM ADVANCE

- Complex additive containing DAP, yeast cell walls and cellulose.
- Prevents irregular kinetics while maintaining efficient sugar transport.
- Improves yeast alcohol tolerance, prevents H<sub>2</sub>S formation and exerts detoxifying action.

**Usage:** Suspend in 10 times its weight of warm water and add at 1/3 sugar depletion.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

**1 Kg (Item #35-215-0001) \$ 23.00**

**10 Kg (Item #35-215-0010) \$ 160.00**

### NUTRIFERM GRADUAL RELEASE

- Innovative nutrient composed of DAP, gallic tannin and untoasted oak tannins.
- Specific packaging that controls the release of its content during fermentation. Due to the particular permeability of the bag, yeast nutrients are gradually released into fermenting must. Release begins at end of yeast growth phase and continues for up to 8 days.
- Ensures complete fermentation, prevents H<sub>2</sub>S production, prevents stuck or sluggish fermentation and improves aromatic cleanliness.
- Facilitates nutrition management by limiting cellular operations.

**Recommendations:** Barrel fermentation; Tank fermentation; Sparkling tank fermentation (Charmat method).

**Usage:** Anchor bag to bottom of tank or to barrel bung before filling.

**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

**0.5 Kg (Item #35-216-0500) \$ 25.00**

**1 Kg (Item #35-216-0001) \$ 45.00**

**5 Kg (Item #35-216-0005) \$ 150.00**

### DIAMMONIUM PHOSPHATE (DAP)

**1 l (Item #30-015-0000) \$ 3.00**

**50 lb (Item #30-015-0055)**

Please inquire for pricing.

## Fermentation Aids

### CELLFERM

- Pure cellulose.
- Removes toxins such as medium-chain fatty acids and promotes clean, healthy fermentations.
- Provides solids to promote yeast growth in very clean juice, reduces H<sub>2</sub>S formation and reduces excess copper present in wine.

**Usage:** Suspend in 5 times its weight of warm water.

**Dosage:** 10-20 g/hL (0.8-1.7 lb/1,000 gal)

**1 Kg (Item #35-220-0001) \$ 11.00**

**20 Kg (Item #35-220-0020) \$ 200.00**

### NUTRIFERM CONTROL

- Yeast cell walls.
- Removes toxins and promotes clean and complete fermentations.

**Usage:** Dissolve in 10 times its weight of water.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**1 lb (Item #30-024-0000) \$ 8.50**

**20 Kg (Item #30-024-0020) \$ 190.00**

### NUTRIFERM NO STOP

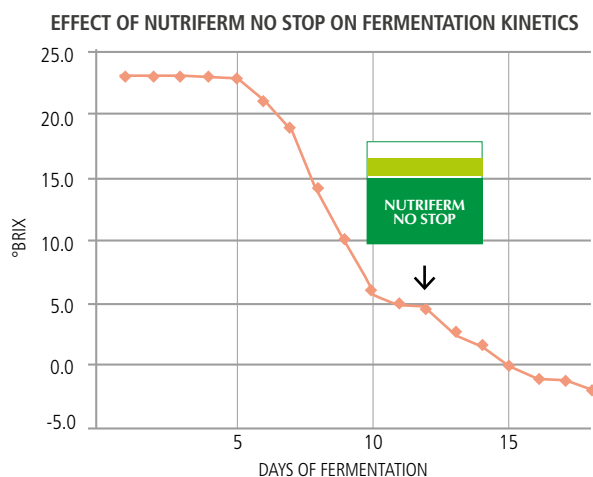
- Purified yeast cell walls rich in sterols and unsaturated long-chain fatty acids and vitamins.
- Helps maintain yeast membrane integrity, prevents and corrects fermentation anomalies.

**Usage:** Dissolve in 10 times its weight of water.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

**1 Kg (Item #35-212-0001) \$ 25.50**

**10 Kg (Item #35-212-0010) \$ 215.00**



The addition of Nutriferm No Stop helped complete fermentation. In addition to having a detoxifying effect, Nutriferm No Stop provides essential elements for yeast to stay resistant, active and complete fermentation.



## KNOW MORE ABOUT YEAST NUTRITION

Yeast nutrition is an essential factor in managing the overall health and success of fermentations. Without proper nutrition introduced at the right stage of their growth cycle, yeast can face stress and produce undesirable characteristics. Stuck or sluggish fermentations are also hazards of poor yeast nutrition.

### WHAT NITROGEN FORMS ARE NATURALLY PRESENT IN GRAPES?

Grapes provide nitrogen in the form of proteins, peptides, alpha amino acids and ammonium ions.

### WHAT ARE YEAST NUTRITIONAL NEEDS?

Yeast require Assimilable Nitrogen (YAN), vitamins (thiamine), mineral salts (Mg, Zn), sterols and long-chain unsaturated fatty acids to succeed at fermentation. The quantity and quality of these compounds play an essential role in yeast metabolism, fermentation kinetics and the organoleptic profile of wine.

- Vitamins have a role in cell growth, fermentation activity and nitrogen metabolism.
- Minerals impact yeast fermentative metabolism.
- Sterols and unsaturated fatty acids help yeast survive and resist stress.

### WHAT IS YEAST ASSIMILABLE NITROGEN (YAN)?

YAN is the sum of ammonium ions and alpha amino acids (except proline). Yeast use nitrogen for growth, protein, cell wall components, enzyme synthesis and sugar transport.

- Ammonium ions are fast and preferentially assimilated by yeast.
- Amino acids are a more efficient form of nitrogen for cell metabolism and aromatic production than ammonia. Yeast use them as a source of nitrogen and to synthesize esters and acetates.

A balanced diet of organic nitrogen, inorganic nitrogen, vitamins and minerals produce healthier fermentations with better aromatics and fewer off-flavors.

### HOW MUCH YAN IS NEEDED?

The range of YAN in grapes can vary depending on the vintage conditions, vineyard practices and grape variety. Generally, to build-up a sufficient yeast biomass for fermentation, a minimum YAN of 150 mg/L is required. The initial sugar content (°Brix) and initial YAN of juice are essential to determine the proper nutrition supplementation. The higher the initial sugar concentration, the more YAN is required to complete the fermentation.

Depending the yeast strain and other juice factors, nitrogen needs for yeast can vary. To calculate the actual needs of a chosen strain, you can use the following guidelines and table:

- Low nitrogen requiring strains: sugar (g/L) x 0.75
- Medium nitrogen requiring strains: sugar (g/L) x 0.9
- High nitrogen requiring strains: sugar (g/L) x 1.25  
(conversion note: 1°Brix ~ 10 g/L sugar)

### WHICH OTHER FACTORS SHOULD BE CONSIDERED REGARDING YEAST NUTRITION?

- Temperature: An increase in temperature stimulates yeast growth and fermentation rate, thereby requiring increased levels of nitrogen.
- Turbidity: In whites and rosés, juice clarification eliminates some nutrients, sterols and fatty acids essential for yeast survival. If the turbidity after clarification is below 80 NTU, add 30 g/hL of Nutriferm No Stop.
- Fruit affected by mold requires more amino acids and vitamins than healthy fruit.
- Yeast strains: Each yeast strain has specific nutritional requirements.

### WHAT IS THE YAN CONTRIBUTION OF DAP?

10 g/hL of DAP represents 20 mg/L of YAN.

### WHAT IS THE LEGAL LIMIT OF NUTRIENT ADDITIONS?

Maximum TTB approved limited for DAP is 96 g/hL (8 lb/1,000gal).

### MY WINE IS AROUND 5°BRIX AND I MISSED THE 1/3 SUGAR DEPLETION NUTRIENT ADDITION, WHICH NUTRIENT CAN I ADD?

Nitrogen uptake is inhibited as soon as alcohol becomes a stress. At this point during fermentation, the addition of Nutriferm No Stop will improve yeast resistance and help maintain an active sugar transport system.

### WHY USE NUTRIFERM NO STOP?

- Restores cell membrane
- Increases yeast viability
- Eliminates toxins such as short-chain fatty acids
- Restores sugar consumption
- Provides physical support to keep yeast in suspension

### YEAST NUTRITION GUIDELINES

WINEMAKING STAGE	YAN<130 mg/L	130 mg/L<YAN<200 mg/L	YAN>200 mg/L
INOCULATION	15 g/hL Nutriferm Energy or 30 g/hL Nutriferm Arom (Plus)	15 g/hL Nutriferm Energy or 25 g/hL Nutriferm Arom (Plus)	10 g/hL Nutriferm Energy or 20 g/hL Nutriferm Arom (Plus)
12 HOURS AFTER INOCULATION	10-40 g/hL DAP (adjust YAN ~ 150 mg/L)	-	-
1/3 SUGAR DEPLETION	40 g/hL Nutriferm Advance	30 g/hL Nutriferm Advance	20 g/hL Nutriferm Advance
	If Brix > 25°, add 15 g/hL DAP If Brix > 26°, add 25 g/hL DAP	If Brix > 25°, add 10 g/hL DAP If Brix > 26°, add 20 g/hL DAP	-
	10-20 mg/L Oxygen		
1/2 SUGAR DEPLETION	15 g/hL Nutriferm No Stop		

## YEAST DERIVATIVES

Enartis offers Enartis Pro (fermentation) and Surli (maturation) yeast and grape natural polysaccharide preparations. The polysaccharides contained in Enartis Pro and Surli contribute directly to wine quality by:

- Improving aroma complexity.
- Increasing softness, roundness and volume of wine.
- Balancing and reducing astringency sensation.
- Improving color, tartrate and protein stability.

### Fermentation

The Enartis Pro range supplies yeast mannoproteins and natural antioxidants to increase the stabilizing and organoleptic effect of polysaccharides released from yeast during fermentation. Wines produced with the Enartis Pro range have a longer shelf life, greater stability and better sensory qualities. The Enartis Pro range was developed for addition at yeast inoculation or 1/3 alcoholic fermentation.

#### STANDARD YEAST CELL WALLS

##### ENARTIS PRO R

- Yeast cell walls with high readily-soluble mannoprotein content.
- Softens astringency and improves color stability.

**Recommendations:** Improve mouthfeel; roundness and volume.

**Dosage:** 30-40 g/hL (2.4-3.3 lb/1,000 gal) in red wine

**1 Kg** (Item #35-450-0001) **\$ 37.00**  
**10 Kg** (Item #35-450-0010) **\$ 320.00**

##### ENARTIS PRO AROM

- Yeast cell walls containing antioxidant sulfur-peptides.
- Ensures antioxidant protection.
- Produces fresher and more intense aromatic profiles.

**Recommendations:** Antioxidant; improve mouthfeel; roundness and volume; white and rosé wines.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

**1 Kg** (Item #35-400-0001) **\$ 65.00**

##### ENARTIS PRO ROUND

- Yeast cell walls, condensed and ellagic tannins.
- Enhances fruit aromas, softens astringency and balances mouthfeel.
- Improves color stability by promoting co-pigmentation.

**Recommendations:** Rosé and young red wines; color stability; fruity aromas; volume and structure.

**Dosage:** 150-500 g/ton

**1 Kg** (Item #35-405-0001) **\$ 37.00**

#### YEAST CELL WALLS WITH HIGH READILY-SOLUBLE MANNOPROTEIN CONTENT

##### ENARTIS PRO UNO

- Yeast cell walls which release large quantities of readily soluble mannoproteins.
- Improves aroma persistence, color stability and wine shelf life
- Softens astringency, balances bitterness and increases roundness.

**Recommendations:** Improve mouthfeel; roundness and volume; softness; increase wine length; white, rosé and red wines.

**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

**1 Kg** (Item #35-921-0001) **\$ 150.00**

##### ENARTIS PRO BLANCO

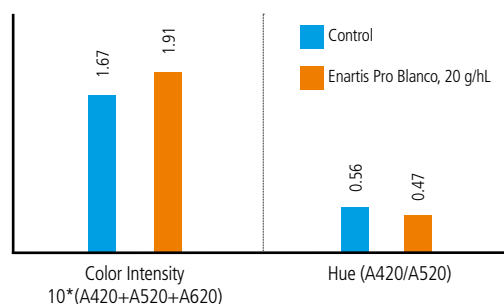
- Yeast cell walls rich in antioxidant sulfur-peptides. Releases large quantities of readily soluble mannoproteins.
- High antioxidant protection.
- Enhances production of tropical and spicy aromas. Produces fresher, more intense and lasting aromas.
- Softens astringency and balances bitterness.
- Improves color, protein and tartrate stability.

**Recommendations:** Antioxidant; improve mouthfeel; white, rosé and red wines; fruity and spicy aromas; roundness and volume; softness; increase wine length.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**1 Kg** (Item #35-410-0001) **\$ 110.00**

IMPACT OF ENARTIS PRO BLANCO ON ROSÉ WINE



Enartis Pro Blanco added at inoculation improves color intensity and protects wine from browning (lower hue).

## ENARTIS PRO TINTO

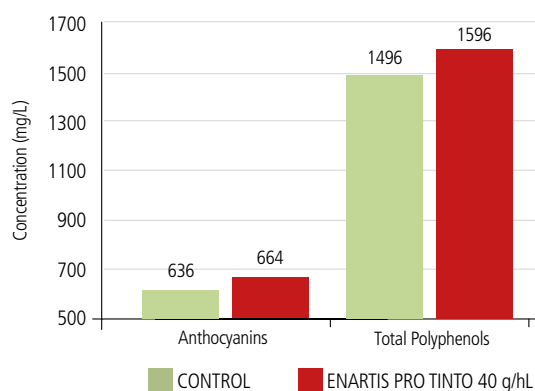
- Yeast cell walls, grape seed tannins and ellagic tannins. Releases large quantities of readily soluble mannoproteins.
- Specifically designed to favor anthocyanin/tannin condensation during fermentation, it increases color intensity and stability.
- Promotes bright and clean aromas, builds-up mid-palate, softens astringency and balances mouthfeel.
- **The best choice for color stabilization and sensory optimization of wine.**

**Recommendations:** Color stability; fruity aromas; improve mouthfeel; roundness, volume and structure; flash-détente; red and rosé wines.

**Dosage:** 150-400 g/ton

**1 Kg (Item #35-415-0001) \$ 155.00**

### EFFECT OF ENARTIS PRO TINTO ON PHENOLIC COMPOSITION OF WINE



The addition of Enartis Pro Tinto at 1/3 fermentation increases the concentration of anthocyanins and total polyphenols in finished wine.

## BLENDS CONTAINING PVI / PVP

PVI/PVP is an adsorbent co-polymer (polyvinylimidazole and polyvinylpyrrolidone) capable of removing metals in wine such as copper (Cu), iron (Fe) and aluminum (Al) and binding with phenolic compounds, substrates of oxidative reactions. By removing catalyzers and precursors of oxidation reactions, PVI/PVP is an excellent wine stabilizer and limits oxidation reactions. Blends of PVI/PVP and yeast cell walls, Enartis Pro FT and Enartis Pro XP are excellent antioxidants and improve wine stability, ageing potential and shelf life.

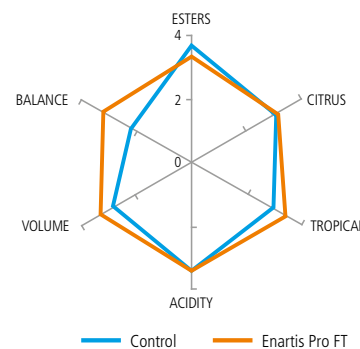
## ENARTIS PRO FT

- PVI/PVP and yeast cell walls rich in antioxidant sulfur-peptides. Releases large quantities of readily soluble mannoproteins.
- Removes metals and limits the damaging effects of copper and iron responsible for wine oxidation.
- Enhances production of tropical and spicy aromas. Produces fresher, more intense and lasting aromas.
- Softens astringency and balances bitterness.
- Improves resistance to oxidation.

**Recommendations:** Antioxidant; fruity aromas; roundness and volume; resistance to oxidation; white and rosé wines.

**Dosage:** 50-80 g/hL (4.2-6.7 lb/1,000 gal)

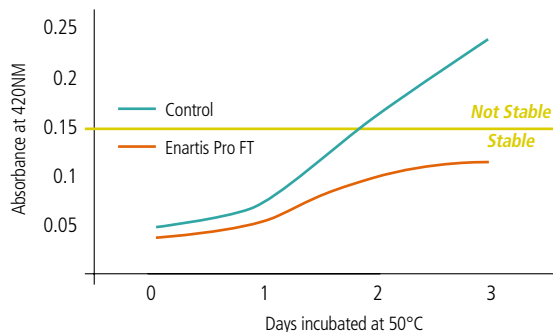
**1 Kg (Item #35-416-0001) \$ 140.00**



Sauvignon Blanc with Enartis Pro FT at inoculation.

Picture and sensory evaluation done two months after alcoholic fermentation. Enartis Pro FT added at inoculation protects against color and aroma oxidation.

### OXIDATIVE STABILITY



## ENARTIS PRO XP

- PVI/PVP and yeast cell walls. Releases large quantities of readily soluble mannoproteins.
- Removes heavy metals and limits the damaging effects of copper and iron responsible for wine oxidation.
- Produces fresher, more intense and lasting aromas.
- Softens astringency and balances bitterness.
- Improves resistance to oxidation.

**Recommendations:** Antioxidant; fruity aromas; improve resistance to oxidation; white and rosé wines.

**Dosage:** 50-80 g/hL (4.2-6.7 lb/1,000 gal)

1 Kg (Item #35-417-0001) \$ 140.00

## Maturation

During the maturation phase, yeast cell walls can be used as a substitute for natural yeast hulls or to amplify their effect. Enartis has generated a range of polysaccharide-based products that improve wine sensory properties and stability.

## SURLÌ ONE

- Yeast cell walls enzymatically activated.
- Contributes to protein, tartrate and polyphenol stabilization.
- Improves aromatic complexity and longevity.
- Enhances natural sensation of volume and roundness, builds-up mid-palate and improves wine length.
- Mimics lees ageing, with the security of microbial stability.

**Recommendations:** Volume and roundness; improve mouthfeel; lees ageing; white, rosé and red wines.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

2.5 Kg (Item #35-425-0002) \$ 175.00

"Surli One was a game changer for my 2015 Merlot. It improved the mouthfeel, filled-up the mid-palate, and increased the overall perception of roundness and length of the wine."- **Bénédict Rhyne**, Winemaker at Kuhlman Cellars (TX)

## SURLÌ ROUND

- Yeast cell walls, condensed tannins and ellagic tannins.
- Improves wine oak ageing capacity.
- Enhances wine structure, balance and aromatic complexity.
- Improves color intensity and stability.

**Recommendations:** Structure and roundness; increase wine length; improve mouthfeel; lees ageing; rosé and red wines.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal)

2.5 Kg (Item #35-430-0002) \$ 100.00

## SURLÌ ELEVAGE

- Yeast cell walls with high content of readily soluble mannoproteins.
- Improves aromatic cleanliness while preserving original fruit characteristics.
- Improves wine balance, roundness, volume sensation and length. Balances and softens astringency.

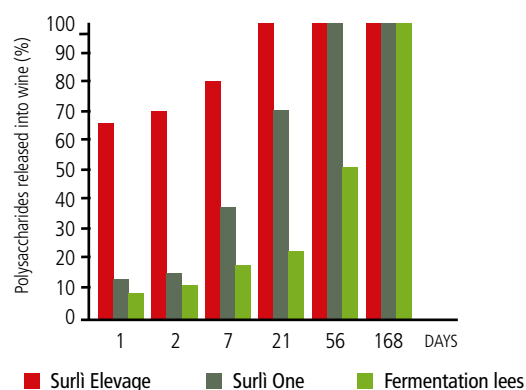
**Recommendations:** Improve mouthfeel; volume and roundness; softness; increase wine length; lees ageing; white, rosé and red wines; pre-bottling.

**Dosage:** 5-30 g/hL (0.4-2.5 lb/1,000 gal)

0.25 Kg (Item #35-435-0250) \$ 45.00

1 Kg (Item #35-435-0001) \$ 160.00

SURLÌ SHORTENS LEES AGEING



Surli Elevage and Surli One quickly increase the content of mannoproteins in wine and allow for shorter lees ageing.

## Pre-Bottling

How to choose the proper Surli? In order to choose the best possible dosage and Surli product for your wine, it is highly recommended to set up a tasting bench trial. (See page 81 for Preparing Lab Bench Trials.)

### SURLI VELVET

- Completely soluble yeast cell wall mannoproteins.
- Enhances aromatic complexity and intensity, increases volume and roundness and reduces the sensation of astringency.
- Improves colloidal structure and stability of wine.

**Tip:** Filterable, Surli Velvet can be added immediately prior to bottling.

**Recommendations:** Improve colloidal stability; improve mouthfeel; roundness and volume; softness; increase wine length; white, rosé and red wines; pre-bottling.

**Dosage:** 0.50-5 g/hL (0.04-0.4 lb/1,000 gal)

**0.5 Kg (Item #35-455-0500) \$ 320.00**

### SURLI VELVET PLUS

- Completely soluble yeast cell wall mannoproteins, rich in a antioxidant sulfur peptides.
- Antioxidant properties to extend shelf life of wine.
- Enhances aromatic complexity and intensity, increases volume and roundness and reduces the sensation of astringency.
- Improves colloidal structure and stability of wine.

**Tip:** Filterable, Surli Velvet Plus can be added immediately prior to bottling.

**Recommendations:** Antioxidant; improve colloidal stability; improve mouthfeel; roundness and volume; softness; increase wine length; white, rosé and red wines; pre-bottling.

**Dosage:** 1-10 g/hL (0.08-0.8 lb/1,000 gal)

**0.5 Kg (Item #35-460-0500) \$ 327.50**

### SURLI VITIS PLUS

- Grape skin tannins and Gum Arabic.
- Enhances fresh and fruit aromas.
- Balances mouthfeel, increases length, roundness and builds up mid-palate.

**Tip:** Surli Vitis Plus can often replace fining by balancing mouthfeel and softening astringency

**Recommendations:** Improve mouthfeel; roundness and volume; softness; increase wine length; freshen aromas; pre-bottling.

**Dosage:** 2-15 g/hL (0.2-1.2 lb/1,000 gal)

**0.25 Kg (Item #35-465-0250) \$ 82.50**

**1 Kg (Item #35-465-0001) \$ 295.00**

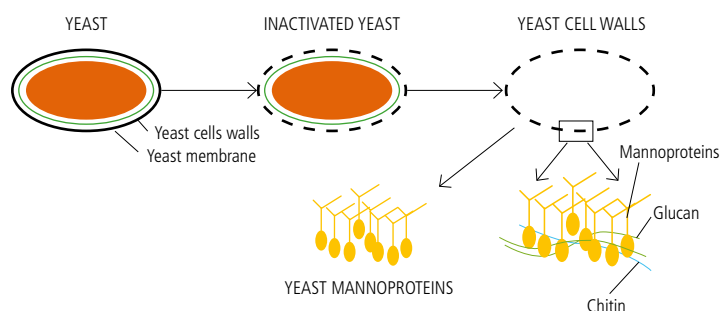
		COMPOSITION	ANTIOXIDANT	AROMA PROTECTION	AROMA ENHANCEMENT	MOUTHFEEL IMPROVEMENT	SOFTEN IMPROVEMENT	COLOR STABILITY
FERMENTATION	ENARTIS PRO R	Yeast cell walls	★	★	★	★★★	★★	
	ENARTIS PRO ROUND	Yeast cell walls Condensed tannins Ellagic tannins	★★	★	★	★★★	★★	★★
	ENARTIS PRO AROM	Yeast cell walls Sulfur peptides	★★★	★★	★★	★★★	★★★	
	ENARTIS PRO BLANCO	Yeast cell walls Sulfur peptides	★★★★	★★★★	★★★★	★★★★	★★★★	★
	ENARTIS PRO UNO	Yeast cell walls	★	★★	★	★★★	★★★	★
	ENARTIS PRO FT	Yeast cell walls PVI/PVP	★★★★	★★★★	★★★★	★★★★	★★★★	★
	ENARTIS PRO XP	Yeast cell walls PVI/PVP	★★★★	★★	★	★★★	★★★	★
	ENARTIS PRO TINTO	Yeast cell walls Condensed tannins Ellagic tannins	★★	★★	★	★★★★	★★★★	★★★★
MATURATION	SURLI ONE	Yeast cell walls		★★	★	★★★★	★★★★	★
	SURLI ROUND	Yeast cell walls Condensed tannins Ellagic tannins		★★	★	★★★★	★★★	★★★
	SURLI ÉLEVAGE	Yeast mannoproteins		★★	★	★★★★	★★★★	★
PRE-BOTTLING	SURLI VELVET	Yeast mannoproteins		★★	★	★★★★	★★★★	★
	SURLI VELVET PLUS	Yeast mannoproteins	★★	★★★★	★★	★★★★	★★★★	★
	SURLI VITIS PLUS	Grape skin tannins Polysaccharides		★	★★★	★★★	★★★	★★

## KNOW MORE ABOUT YEAST POLYSACCHARIDES

### WHAT ARE YEAST CELL WALLS AND MANNOPROTEINS?

Yeast cell walls are part of yeast hulls or yeast ghosts. They mainly contain yeast mannoproteins and other yeast polysaccharides such as chitin-glucans. Yeast mannoproteins are formed by a polypeptide (protein) chain linked to highly branched mannose side chains by glycosidic bonds. Wine naturally contains mannoproteins as they are released during yeast fermentation and then later during yeast autolysis.

### THE DIFFERENT YEAST BYPRODUCTS



### WHY AGE ON LEES OR/AND USE YEAST MANNOPROTEINS?

Lees ageing is often used to increase the sensation of roundness, volume and softness in wine. It can balance the astringency and bitterness sensation and increase the wine length. In addition to sensory properties, yeast mannoproteins released during lees ageing participate in wine full stability and ageing potential.

### YEAST MANNOPROTEIN APPLICATIONS

Yeast mannoproteins are usually used as a substitute for natural yeast lees or to amplify their effect. Yeast autolysis and the natural release of mannoproteins in wine is a very slow process and not always qualitative. We recommend using yeast mannoproteins:

- When fruit is contaminated to compensate for poor lees quality and strong clarification.
- If natural lees are not "clean" due to off-aroma development, reductive notes or microbial contamination.
- To accelerate and enhance lees ageing effects (mouthfeel, stabilizing, complexity).
- For aroma enhancement during fermentation.
- As antioxidant protection.

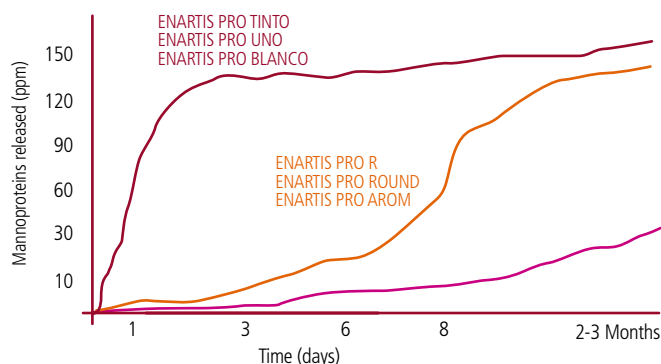
### WHAT IS THE LEGAL LIMIT OF YEAST CELL WALL ADDITION?

Yeast cell walls used shall not exceed 3 lb/1,000 gal (36 g/hL).

### WHAT ARE YEAST CELL WALLS CONTAINING ANTIOXIDANT SULFUR PEPTIDES?

Antioxidant sulfur peptides are referring to glutathione and cysteine. Glutathione has a strong antioxidant activity, higher than ascorbic acid and  $\text{SO}_2$ . These peptides can also be used by yeast as aromatic precursors of thiolic compounds. Enartis Pro Blanco, Pro FT, Pro Arom and Surli Velvet Plus contain antioxidant sulfur peptides, which increases their antioxidant capacity and enhances aromatic complexity.

### WHAT IS THE DIFFERENCE BETWEEN ENARTIS PRO RANGE PRODUCTS?



*The release of mannoproteins is faster with Enartis Pro Tinto, Pro Uno and Pro Blanco than with Enartis Pro R, Pro Round and Pro Arom and faster than natural yeast autolysis.*



Tannins can act as an antioxidant and/or antioxidasic, improve color and protein stability, contribute to wine flavor, structure and body and prevent pinking and the “light-struck” defect.

The different origins and properties of enological tannins can produce substantially different results. In association with research centers, Enartis has studied exogenous tannins and their effects for many years to select and produce an extensive range of the highest quality tannins for winemaking.

## White and Rosé Wine Fermentation

### ANTIOXIDANT TANNINS

#### ENARTIS TAN BLANC

- Gallic tannins.
- High antioxidant activity and antimicrobial activity, it strengthens the protective action of SO<sub>2</sub>.
- Protects wine from browning, “light-struck” defects and oxidation.

**Recommendations:** Antioxidant; prevent browning; prevent “light-struck” defects; white and rosé wines.

**Dosage:** 4-10 g/hL (0.3-0.8 lb/1,000 gal)

1 Kg	(Item #35-310-0001)	\$ 60.00
12.5 Kg	(Item #35-310-0012)	\$ 650.00

#### ENARTIS TAN CLAR

- Micro-granulated ellagic tannins.
- Highly reactivity with proteins, it facilitates clarification, improves protein stability and reduces bentonite protein fining.

**Recommendations:** Protein removal; clarification; white and rosé wines.

**Dosage:** 4-10 g/hL (0.3-0.8 lb/1,000 gal)

1 Kg	(Item #35-315-0001)	\$ 34.00
12.5 Kg	(Item #35-315-0012)	\$ 250.00

#### ENARTIS TAN AROM

- High molecular weight, hydrolyzable tannins and yeast hulls.
- Highly reactive tannin, it has a strong antioxidant effect, inhibits oxidative enzymes (laccase) and facilitates clarification.
- Yeast hulls provide a source of thiol precursors.

**Recommendations:** Antioxidant; fruity and spicy aromas; white and rosé wines.

**Dosage:** 2-20 g/hL (0.17-1.7 lb/1,000 gal)

1 Kg	(Item #35-500-0001)	\$ 160.00
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### TANNINS FOR AROMA ENHANCEMENT

#### ENARTIS TAN ELEGANCE

- Condensed tannins extracted from white grape skins.
- Antioxidant, it protects from browning and preserves aromatic freshness.
- Enhances fruit and floral notes, balances mouthfeel and increases wine length.
- Improves aromatic stability and freshness through ageing.

**Recommendations:** Antioxidant; increase wine length; floral aromas; white and rosé wines.

**Dosage:** 5-15 g/hL (0.4-1.3 lb/1,000 gal)

0.25 Kg	(Item #35-350-0250)	\$ 47.50
1 Kg	(Item #35-350-0001)	\$ 180.00

#### ENARTIS TAN CITRUS

- Gallic and condensed tannins extracted from acacia and lemon tree wood.
- Production process at cold temperature to preserve aromatic precursors from wood (nor-isoprenoids and terpenes).
- Enhances floral, citrus, spicy and fruity notes.

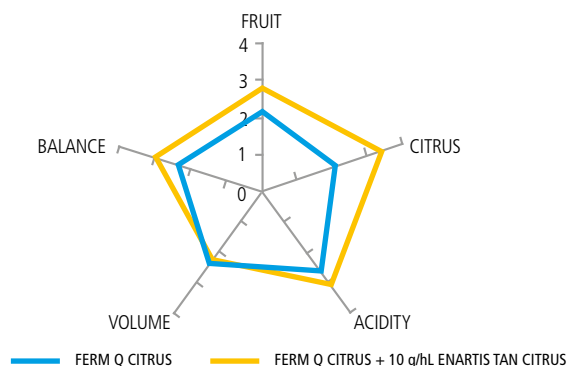
**Tip:** To optimize aromatic effect, use Enartis Tan Citrus during fermentation in combination with a yeast that expresses terpenes and nor-isoprenoids.

**Recommendations:** Floral and citrus aromas; white and rosé wines.

**Dosage:** 5-15 g/hL (0.4-1.3 lb/1,000 gal)

1 Kg	(Item #35-306-0001)	\$ 185.00
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SENSORY IMPACT OF ENARTIS TAN CITRUS ADDED AT 1/3 OF FERMENTATION



The addition of Enartis Tan Citrus at 1/3 of fermentation, in combination with Enartis FERM Q Citrus, increases citrus notes and improves wine balance.

## Red and Rosé Wine Fermentation

### SACRIFICIAL AND ANTIOXIDANT TANNINS

When grapes are crushed, proteins are released, bound to tannins and precipitated. The first tannins released in wine and lost by precipitating with proteins are skin tannins, the most interesting tannins for future wine structure and mouthfeel. "Sacrificial" tannins are added to crushed grapes in order to bind with grape proteins and precipitate instead of freshly extracted skin tannins.

#### ENARTIS TAN FP

- Condensed and ellagic tannins.
- High antioxidant activity, it protects color and aromatic compounds from oxidation.
- High reactivity with proteins, it inhibits oxidases (laccase) and facilitates clarification.

**Recommendations:** "Sacrificial" tannin; antioxidasic; antioxidant; color stability; red and rosé wines.

**Dosage:** 150-400 g/ton

1 Kg	(Item #35-300-0001)	\$ 30.00
15 Kg	(Item #35-300-0015)	\$ 300.00

#### ENARTIS TAN ROUGE

- Hydrolysable ellagic and condensed tannins.
- Intense antioxidant and antioxidasic activities, it inhibits laccase, PPO and protects color and aromatic compounds from oxidation.
- Favors the formation of stable color compounds.
- Reinforces wine structure and improves wine balance.

**Recommendations:** "Sacrificial" tannin; antioxidant; color stability; red and rosé wines.

**Dosage:** 150-400 g/ton

1 Kg	(Item #35-305-0001)	\$ 38.00
15 Kg	(Item #35-305-0015)	\$ 442.50

### ENARTIS TAN FERMCOLOR

- Condensed and hydrolyzable tannins.
- High antioxidant activity, it protects color and aromatic compounds from oxidation and contributes to color stabilization.
- Enhances aromatic complexity, softens structure, and improves length and ageing potential.

**Recommendations:** "Sacrificial" tannin; antioxidant; thermovinification; flash détente.

**Dosage:** 200-400 g/ton

1 Kg	(Item #35-304-0001)	\$ 44.50
10 Kg	(Item #35-304-0010)	\$ 380.00

"We have been using Enartis Tan Fermcolor and Tan Rouge as sacrificial tannins pre and post flash détente. We saw an impressive impact on color stability, mid-palate and wine structure, especially on our Bordeaux varieties and Zinfandels." - Megan McCollough, Winemaker at Hahn Family Wines (CA).

### ENARTIS TAN ANTIBOTRYTIS

- Gallic, di-gallic, ellagic and condensed tannins.
- Intense antioxidant, antiradical and antioxidasic properties, it protects color and aromatic compounds from oxidation with a long lasting effect.
- Protects from oxidation, limits oxidasic enzyme activities and strengthens the protective action of SO<sub>2</sub>.

**Recommendations:** "Sacrificial" tannin; antioxidant; antioxidasic; moldy grapes; white, rosé, sparkling and red wines.

**Dosage:** 50-200 g/ton, 3-20 g/hL (0.25-1.7 lb/1,000 gal)

1 Kg	(Item #35-386-0001)	\$ 65.00
10 Kg	(Item #35-386-0010)	\$ 590.00

PRODUCT	DOSAGE	REDUCTION OF OXIDASIC ENZYME ACTIVITY
SO <sub>2</sub>	50 ppm	25%
	75 ppm	62%
ENARTIS TAN ANTIBOTRYTIS	20 g/hL	60%

## TANNINS FOR CO-PIGMENTATION

Co-pigmentation is the formation of complexes between anthocyanins and co-factors such as flavonols, hydroxycinnamates or colloids via a weak electrostatic bond. The desirable feature of a co-factor is its planarity, which allows the stacking of anthocyanins, thus keeping them stable and soluble. Co-pigmentation protects pigments from oxidation during the early stages of winemaking, limits color loss and has hyperchromic and bathochromic effects (higher intensity and darker colored wines). These molecules, important in young red wines, are considered 'semi-stable' pigments.

### ENARTIS TAN XC

- Mono catechins and low molecular weight tannins extracted from exotic species wood and untoasted oak.
- Due to its planar shape and high reactivity, it promotes co-pigmentation and increases color stability in young red and rosé wines.

**Tip:** Fraction the addition in two parts: at crushing and after inoculation.

**Recommendations:** Color stability; co-pigmentation; young wine red and rosé wines.

**Dosage:** 100-400 g/ton / Rosé: 5-15 g/hL (0.4-1.3 lb/1,000 gal)

**1 Kg (Item #35-919-0001) \$ 95.00**

### ENARTIS TAN FRUITAN

- Condensed tannins mostly extracted from white grape seeds.
- Protects anthocyanins from oxidation and improves color stability.
- Reduces herbaceous notes, enhances fruit characters and freshens aromas.
- Improves structure and length without imparting astringency.

**Recommendations:** Color stability; fruity aromas; reduce herbaceous notes; unripe grapes; smoke tainted grapes; thermovinification; flash détente; red and rosé wines.

**Dosage:** 10-20 g/hL (0.8-1.7 lb/1,000 gal)

**0.5 Kg (Item #35-345-0500) \$ 90.00**

**1 Kg (Item #35-345-0001) \$ 165.00**

## TANNINS FOR CONDENSATION

Condensed pigments can be formed via direct bonds between anthocyanins and tannins or in oxidative conditions via acetaldehyde bridges. They lead to more stable color.

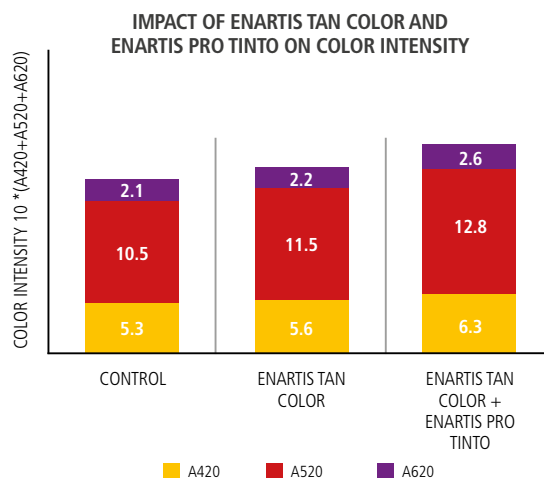
### ENARTIS TAN COLOR

- Blend of condensed tannins extracted from grape seed, gallic and ellagic tannins and yeast derivatives rich in antioxidant peptides.
- Protects anthocyanins and aromatic compounds from oxidation.
- Highly reactive in condensing with anthocyanins to form stable and soluble color pigments with vibrant hue.
- Promotes production of spicy and dark fruit aromas.

**Recommendations:** Antioxidant; color stability; condensation; freshen aromas; fruity and spicy aromas; increase wine length.

**Dosage:** 50-200 g/ton

**1 Kg (Item #35-920-0001) \$ 172.50**



The addition of Enartis Tan Color at inoculation and Enartis Pro Tinto at 1/3 fermentation improves color intensity and stability of wine.  
Enartis Tan Color and Enartis Pro Tinto have a synergistic effect on color intensity and stability.  
Data after MLF.

### ENARTIS TAN V

- Mono catechins and low molecular weight condensed tannins extracted with water from non-fermented grape seeds.
- Highly reactive, it specifically condenses with free anthocyanins to protect them from oxidation and promote long-lasting color stability.

**Recommendations:** Color stability; condensation; short maceration; thermovinification; flash détente; balance mouthfeel; increase wine structure.

**Dosage:** 10-30 g/hL (0.8-2.5 lb/1,000 gal)

**1 Kg (Item #35-311-0001) \$ 195.00**

## TANNINS FOR CONDENSATION USING MICRO-OXYGENATION

Oxygen added at the end of alcoholic fermentation promotes the production of acetaldehyde, a product of ethanol oxidation. This compound acts as a bridge in polymerization reactions involving tannins and anthocyanins, creating more stable color compounds. The time frame (end of alcoholic fermentation, before malolactic fermentation) and the following are essential:

- Warm temperatures to promote faster reactions (~15°C/ 59°F).
- Free anthocyanins and enough tannins available for condensation.
- Ethanol can be oxidized into acetaldehyde.
- No SO<sub>2</sub> present to bind with acetaldehyde.
- Limited microbial activity that would consume oxygen and acetaldehyde.

### ENARTIS TAN E

- High concentration of mono-catechins and low molecular weight condensed tannins extracted with water from non-fermented grape seeds.
- Highly reactive, it specifically condenses free anthocyanins to promote a long-lasting color.
- **One of our best tannins for color stabilization**, particularly efficient during macro-oxygenation to condense with anthocyanins via acetaldehyde bridges.
- Increases wine structure, aromatic complexity and prevents premature oxidation.

**Recommendations:** Color stability; condensation; macro-oxygenation; micro-oxygenation; increase wine structure; thermovinification; flash-détente.

**Dosage:** 10-30 g/hL (0.8-2.5 lb/1,000 gal) for reds;  
0.5-5 g/hL (0.04-0.4 lb/1,000 gal) for whites and rosés

**1 Kg (Item #35-312-0001) \$ 255.00**

### ENARTIS TAN MICROFRUIT

- Ellagic tannins extracted from oak and condensed tannins from grape seeds, red fruit tree wood and exotic species wood.
- Specifically developed for micro-oxygenation, it has a synergistic effect with oxygen on color stabilization.
- Enhances aromas of fresh red fruit, reduces herbaceous notes, increases softness and reduces bitterness.

**Tip:** Enartis Tan Microfruit can be added any time wine comes in contact with oxygen.

**Recommendations:** Color stability; macro-oxygenation; micro-oxygenation; fruity aromas; reduce herbaceous notes; red and rosé wines.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

**1 Kg (Item #35-303-0001) \$ 195.00**

## TANNINS FOR AROMA ENHANCEMENT

### ENARTIS TAN RED FRUIT

- Condensed tannins mostly extracted from red fruit tree wood.
- Production process at cold temperature to preserve aromatic precursors from wood such as norisoprenoids.
- Provides aromatic precursors responsible for berry, red fruit, floral and spicy notes in wine.
- Improves color stability.

**Tip:** To optimize the aromatic effect, use Enartis Tan Red Fruit during fermentation in combination with a yeast that expresses norisoprenoids.

**Recommendations:** Fruity and spicy aromas; freshen aromas; red and rosé wines.

**Dosage:** 100-200 g/ton

**1 Kg (Item #35-385-0001) \$ 190.00**

## Maturation & Finishing Tannins

For finishing tannins, we recommend doing preliminary lab bench trials to select the appropriate combinations and dosages for each wine. (See page 81 for Preparing Lab Bench Trials)

### OAK TANNINS

Enartis oak tannins are produced from wood used for barrels: same ageing in open air, same processing and same quality. After seasoning and toasting, tannins are extracted with an appropriate solvent to obtain smoother tannins while avoiding bitter and astringent substances. The tannin solution is then concentrated and spray-dried, in order to maintain the aromatic and sensory properties of the tannin.

#### ENARTIS TAN COEUR DE CHÊNE

- Ellagic tannins extracted from toasted French oak.
- Extends barrel life and boosts oak characters in neutral barrels
- Contributes to elegant and delicate aromas of vanilla, caramel and spices.
- Balances mouthfeel and improves length, softness and oak integration.

**Recommendations:** Extend barrel life; oak aromas; complexity; balance mouthfeel; increase wine length; softness; roundness; white, rosé, red and sparkling wines.

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

0.25 Kg	(Item #35-330-0250)	\$ 96.25
1 Kg	(Item #35-330-0001)	\$ 370.00

#### ENARTIS TAN DARK CHOCOLATE

- Ellagic tannins extracted from medium-heavy toasted French oak.
- Boosts heavy-toasted oak characters in neutral barrels.
- Increases dark chocolate, roasted coffee and spice aromas.
- Softens astringency and increases wine length and complexity.

**Recommendations:** Extend barrel life; toasted oak aromas; balance mouthfeel; structure; complexity.

**Dosage:** 0.5-15 g/hL (0.04-1.3 lb/1,000 gal)

0.5 Kg	(Item #35-361-0500)	\$ 475.00
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#### ENARTIS TAN ÉLEVAGE

- Ellagic tannins extracted from toasted oak staves.
- Binds with mercaptans and eliminates sulfur off-aromas.
- Contributes to elegant vanilla, caramel and licorice notes.

**Recommendations:** Eliminate and prevent reductive notes; clean aromas; reduce off-aromas; rosé and red wines.

**Dosage:** 2-15 g/hL (0.17-1.3 lb/1,000 gal)

1 Kg	(Item #35-340-0001)	\$ 230.00
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#### ENARTIS TAN EXTRA

- Ellagic tannins extracted from medium-toasted oak.
- Enhances vanilla, caramel, cocoa and toasted oak aromas.
- Contributes to softness and “sweetness” sensation and balances astringency.

**Recommendations:** Oak aromas; improve mouthfeel; softness; roundness; white, rosé and red wines.

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

0.25 Kg	(Item #35-335-0250)	\$ 155.00
1 Kg	(Item #35-335-0001)	\$ 600.00

#### ENARTIS TAN MAX NATURE

- Condensed and ellagic tannins extracted from exotic species of wood.
- Removes reductive characters, masks herbaceous notes and increases aromatic freshness and complexity.
- Increases roundness and builds mid palate.

**Recommendations:** Balance mouthfeel; reduce off-aromas; eliminate and prevent reductive notes; reduce herbaceous notes; complexity; white, rosé, sparkling and red wines.

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

1 Kg	(Item #35-320-0001)	\$ 70.00
10 Kg	(Item #35-320-0010)	\$ 600.00

#### ENARTIS TAN NAPA

- Ellagic tannins extracted from toasted American oak.
- Extends barrel life and boosts oak aromas in neutral barrels.
- Enhances aromas of vanilla, caramel, coconut, coffee and cocoa.
- Increases wine structure and “sweetness” and balances astringency.

**Recommendations:** Extend barrel life; oak aromas; complexity; balance mouthfeel; increase wine length; softness; white, rosé, red and sparkling wines.

**Dosage:** 3-15 g/hL (0.25-1.3 lb/1,000 gal)

0.25 Kg	(Item #35-307-0250)	\$ 275.00
1 Kg	(Item #35-307-0001)	\$ 915.00



**ENARTIS TAN RICH**

- Condensed and ellagic tannins extracted from oak.
- Protects from oxidation, helps color stability, protein stability and clarification.
- Contributes to elegant oak notes, gently increases structure and volume.

**Recommendations:** Oak aromas; complexity; structure; balance mouthfeel; color stability; clarification; white, rosé and red wines.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

**1 Kg (Item #35-325-0001) \$ 85.00**

**ENARTIS TAN SLI**

- Ellagic tannins extracted from long-seasoned, untoasted American oak at low temperature.
- Extraordinary capability to scavenge oxygen and radicals, chelate metals and reduce wine redox potential.
- Binds to mercaptans and eliminates other sulfur off-aromas.
- Protects from oxidation, strengthens action of SO<sub>2</sub> and improves wine shelf life.

**Recommendations:** Antioxidant; stabilize wine redox potential; improve shelf life; complexity; freshen aromas; clean aromas; reduce off-aromas; eliminate and prevent reductive notes.

**Dosage:** 0.5-15 g/hL (0.04-1.3 lb/1,000 gal)

**0.5 Kg (Item #35-308-0500) \$ 185.00**

**ENARTIS TAN SUPEROAK**

- Condensed and ellagic tannins extracted from oak.
- Protects from oxidation and helps stabilize color.
- Enhances toasted oak aromas and increases structure and “sweetness” perception.

**Recommendations:** Oak aromas; complexity; structure; color stability; white, rosé and red wines; barrel ageing.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

**1 Kg (Item #35-370-0001) \$ 55.00**

**ENARTIS TAN TOFFEE**

- Ellagic tannins extracted from medium-plus toasted French oak, aged in open air spaces for minimum two years.
- Balances redox potential and prevents reductive characters
- Increases butterscotch, caramel, toffee and coffee aromas
- Improves wine structure, length and softens astringency.

**Recommendations:** Prevent reductive notes; vanilla and toffee aromas; structure; softness.

**Dosage:** 1-15 g/hL (0.08-1.3 lb/1,000 gal)

**0.5 Kg (Item #35-313-0500) \$ 252.50**

**ENARTIS TAN VANILLA**

- Ellagic tannins extracted from medium-toasted French oak.
- Balances redox potential and prevents reductive characters.
- Increases vanilla, custard and coconut aromas.
- Improves wine structure and “sweetness” perception.

**Recommendations:** Prevent reductive notes; vanilla and coconut aromas; structure; softness.

**Dosage:** 1-15 g/hL (0.08-1.3 lb/1,000 gal)

**0.5 Kg (Item #35-314-0500) \$ 252.50**

**GRAPE TANNINS**

Grape tannins mostly come from white grape skins and seeds. They are condensed tannins used to balance mouthfeel, build structure, improve wine length and/or enhance aromas.

**ENARTIS TAN SKIN**

- Condensed tannins extracted from white grapes skins.
- Improves aromatic cleanliness, enhances fruitiness and brightness.
- Builds up mid palate, improves mouthfeel and complexity.
- Contributes to color stability.

**Tip:** Highly recommended for varieties poor in skin tannins, short maceration and grapes with low phenolic extraction ratio.

**Recommendations:** Color stability; freshen aromas; fruity aromas; balance mouthfeel; white, rosé and red wines.

**Dosage:** 3-20 g/hL (0.25-1.7 lb/1,000 gal)

**0.25 Kg (Item #35-360-0250) \$ 112.50**

**1 Kg (Item #35-360-0001) \$ 420.00**

**ENARTIS TAN UVASPEED**

- Condensed tannins extracted from unfermented white grape skins.
- Provides intense fruit notes, freshens wines, increases wine structure and softness.

**Recommendations:** Fruity aromas; freshen aromas; balance mouthfeel; softness.

**Dosage:** 3-20 g/hL (0.25-1.7 lb/1,000 gal)

**0.25 Kg (Item #35-365-0250) \$ 102.50**

**1 Kg (Item #35-365-0001) \$ 390.00**



## ENARTIS TAN UVA

- Condensed tannin extracted from mature white grape seeds.
- Promotes color stability by condensation with anthocyanins.
- Enhances fruit aromas, balances astringency and improves structure, mouthfeel and complexity.

**Recommendations:** Fruity aromas; structure; balance mouthfeel; freshen aromas; complexity; color stability.

**Dosage:** 3-10 g/hL (0.25-0.8 lb/1,000 gal)

0.25 Kg	(Item #35-355-0250)	\$ 96.25
1 Kg	(Item #35-355-0001)	\$ 365.00

## ENARTIS TAN FRESH FRUIT

- Condensed tannins extracted from lemon trees wood and white grape skins.
- Production process at cold temperature to preserve aromatic precursors from wood such as norispenoids and terpenes.
- Good antioxidant capacity.
- Freshens wine aromas, reduces overripe fruit notes, increase wine softness and wine length.

**Recommendations:** Freshen aromas; floral and citrus aromas; antioxidant; balance mouthfeel; white, rosé and sparkling wines.

**Dosage:** 0.5-10 g/hL (0.04-0.8 lb/1,000 gal)

1 Kg	(Item #35-362-0001)	\$ 395.00
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## ENARTIS TAN TOTAL FRUITY

- Condensed tannins extracted from red fruit trees wood and white grape skins.
- Freshens wine aromas, reduces overripe fruit notes and increases softness, structure and wine length.

**Recommendations:** Freshen aromas; fruity and spicy; antioxidant; balance mouthfeel; red and rosé wines.

**Dosage:** 0.5-20 g/hL (0.04-1.7 lb/1,000 gal)

1 Kg	(Item #35-371-0001)	\$ 390.00
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## UNICO RANGE

*Enartis is constantly looking for new botanical species and raw materials (wood, leaf, seed, etc.) to obtain tannins with unique sensory characteristics. Developed by Enartis, the Unico range is a unique line of tannins with no close matches in the market.*

### Why are Unico tannins different from other tannins?

The extraction, as well as the spray-drying, is made at low temperatures (approx. 20°C or 68°F) and low pressure. This unique process, proprietary to Enartis, extracts flavors of the raw material and prevents loss of aromatic compounds and formation of off-flavors caused by high temperatures. Unico tannins have intense, distinct aromas that account for the lower addition rates compared to normal enological tannins.

## UNICO #1

- Ellagic tannins extracted from toasted oak selected for the quality and richness of its aromas.
- Intense and delicate vanilla, chocolate and toasted oak aromas.
- Contributes to volume and structure of wine.

**Recommendations:** Medium-toasted oak aromas; structure; balance mouthfeel; white, rosé, red and sparkling wines.

**Dosage:** 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

0.25 Kg	(Item #35-380-0250)	\$ 328.75
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## UNICO #2

- Condensed tannins extracted from of red fruit tree wood.
- Significantly enhances red fruit aromas such as cherry, fresh berries and black currant.
- Increases softness, structure and "sweetness."

**Recommendations:** Red fruit aromas; freshen aromas; structure; rosé and red wines.

**Dosage:** 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

0.25 Kg	(Item #35-375-0250)	\$ 195.00
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## UNICO #3

- Condensed and hydrolyzable tannins extracted from exotic species of wood.
- Freshens wine aroma, enhances citrus, botanical and floral notes.

**Tip:** Particularly suitable for white, sparkling and late harvest wines.

**Recommendations:** Freshen aromas; citrus, floral and botanical aromas; structure; white, rosé and sparkling wines.

**Dosage:** 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

0.25 Kg	(Item #35-395-0250)	\$ 165.00
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	PROTEIN REMOVAL	ANTIOXIDANT	COLOR STABILITY	STRUCTURE ENHANCEMENT	ASTRINGENCY	SOFTNESS	AROMA INTENSITY	WHITE ROSE WINES	RED/ROSE WINES	AROMA CONTRIBUTION
GRAPE/FERMENTATION TANNIN										
ENARTIS TAN ANTIBOTRYTIS	★★	★★★★★	★	★★	★	★	★	•	•	Elder, Wood
ENARTIS TAN AROM	★★	★★★	★★	★★	★★	★★	★★★	•	•	Tropical fruit, Pineapple
ENARTIS TAN BLANC	★★	★★★★★	★	★★	★★	★	★	•		Elder, Wood
ENARTIS TAN CITRUS	★	★★★	★	★★	★★	★★	★★★★	•		Citrus, White flowers, Orange blossom
ENARTIS TAN CLAR	★★★★	★★	★★★	★★★	★★★	★	★	•		Wood
ENARTIS TAN COLOR	★★	★★★	★★★★	★★	★★	★★★	★★		•	Black currant, Spices
ENARTIS TAN ELEGANCE	★★	★★	★★	★★	★	★★★	★★★	•		Stonefruit, White flower
ENARTIS TAN FERMCOLOR	★★★	★★★	★★★★	★★★	★★	★★	★★		•	Oak, Cherry
ENARTIS TAN FP	★★★	★★★	★★★	★★★	★★★	★	★		•	Oak
ENARTIS TAN FRUITAN	★★★	★★★	★★★	★★★	★★★	★★	★★		•	Red fruit, Spices
ENARTIS TAN ROUGE	★★	★★★★	★★★	★★★	★★★	★	★		•	Oak
ENARTIS TAN RED FRUIT	★★★	★★	★★	★★	★★	★★	★★★		•	Strawberry, Plum, Cherry
ENARTIS TAN V	★★	★★★	★★★★★	★★★★	★★★	★★	★★	•	•	Grapes, Stonefruit, Tea
ENARTIS TAN XC	★★★	★★	★★★	★★	★★	★	★		•	Oak
POST FERMENTATION										
ENARTIS TAN E	★★	★★	★★★★	★★★★	★★★	★	★★		•	Grapes, Stonefruit
ENARTIS TAN ÉLEVAGE	★★	★★	★	★★★	★★	★★	★★		•	Toasted oak
ENARTIS TAN SKIN	★★	★★	★★★	★★	★★	★★	★★★	•	•	Grapes, Stonefruit, Tea
ENARTIS TAN UVA	★★	★★	★★	★★	★★	★★	★★	•	•	White flower, Honeydew
MATURATION/FINISHING TANNINS										
ENARTIS TAN COEUR DE CHENE	★	★	★★	★★	★	★★★	★★★★	•	•	Caramel, Spices, Medium-toasted oak
ENARTIS TAN DARK CHOCOLATE	★	★	★★	★★★	★	★★★	★★★★	•	•	Cocoa, Toasted hazelnut, Coffee
ENARTIS TAN EXTRA	★	★	★	★★	★★	★★★	★★★★		•	Vanilla, Caramel, Coffee
ENARTIS TAN FRESH FRUIT	★★	★★	★	★★	★	★★	★★★★	•		Lemon, Citrus, Flowers
ENARTIS TAN MAX NATURE	★	★	★★	★	★	★★★★	★	•	•	Chamomille
ENARTIS TAN NAPA	★	★	★	★★	★	★★★	★★★★	•	•	Coconut, Vanilla, Cocoa
ENARTIS TAN RICH	★★	★	★	★★	★★	★★★	★★★		•	Toasted oak, Coffee, Spices
ENARTIS TAN SLI	★★	★★★	★★	★★	★	★★★	★★	•	•	Oak, Coconut, Vanilla
ENARTIS TAN SUPEROAK	★	★	★	★★	★	★★	★★		•	Vanilla, Caramel, Tobacco
ENARTIS TAN TOFFEE	★	★	★	★★	★★	★★★	★★★	•	•	Toffee, Vanilla, Caramel
ENARTIS TAN TOTAL FRUITY	★★	★	★	★★	★★	★★	★★★		•	Plum, Cherry, Berries
ENARTIS TAN UVASPEED	★	★★	★★★	★★	★	★★★★	★★★	•	•	Grape, Honeydew, Flowers
ENARTIS TAN VANILLA	★	★	★	★★	★★	★★	★★★★	•	•	Vanilla, Butterscotch, Coconut, Almond
UNICO #1	★	★★	★	★★★★	★	★★★★	★★★★★	•	•	Vanilla, Caramel, Spices, Medium-toasted oak
UNICO #2	★	★	★	★★★	★	★★★★	★★★★★		•	Red berries, Plums, Cherry
UNICO #3	★	★★	★	★★	★	★★★★	★★★★★	•		Lemon, Mint, Herbal

## KNOW MORE ABOUT POLYPHENOLS IN WINEMAKING

### DIFFERENT CATEGORIES OF POLYPHENOLS:

#### Grape polyphenols:

- **Non-flavonoids:** The major non-flavonoid phenolic compounds in grapes are hydroxycinnamates. They are the preferred substrate for polyphenol oxidase and usually the first compounds involved in the oxidation of grape juice.
- **Flavonoids:** One of the major classes of phenolic compounds in grapes. They are localized in skins and seeds. Flavonoids include three main groups: tannins, flavonols and anthocyanins.
  - The tannin group contains complex combinations of catechins (also Flavan-3-ols) found in grape seeds and skins, correctly described as condensed tannins.
  - Anthocyanins are mostly found in grape skins and are the main source of color pigments in red wine.
  - Flavonols: Found in grape skins, they are known as co-factors for the color-enhancing phenomenon known as co-pigmentation.

**Hydrolyzable tannins:** Derived from wood, they are oligomeric forms of gallic acid and can be specified as gallotannins or ellagitannins whether they are constituted of gallic acid or ellagic acid moieties.

### A LITTLE BIT ABOUT COLOR IN WINE...

The initial color of red wine is mainly due to anthocyanins, extracted from grapes during the winemaking process. In their cationic form, anthocyanins are highly reactive with any nucleophile. In the presence of SO<sub>2</sub> and H<sub>2</sub>O, this reaction can lead to color loss. Stabilization of wine pigments can occur via co-pigmentation, condensation or cycloaddition.

**Co-pigmentation** is the enhancement of color due to formation of complexes between anthocyanins and cofactors such as flavonols, hydroxycinnamates and/or colloids via a weak electrostatic bond. The desirable feature of a co-factor is its planarity, which allows the stacking of anthocyanins, thus keeping them stable and soluble. Co-pigmentation has hyperchromic and bathochromic effects, which initially lead to higher intensity and darker colored wines. These molecules, important in young red wines, are considered 'semi-stable' pigments.

**Condensation** leads to more stable pigments. They can be formed via direct bonds between anthocyanins and tannins or in oxidative environments via acetaldehyde bridges.

**Cycloaddition** involves yeast metabolites and can lead to the most stable form of pigments. It consists of a cycloaddition between flavylum ions and compounds with polymerized double bonds.

### COLOR STABILIZATION IN RED WINES

Enartis continually develops color stabilization strategies and technology to achieve stability during maceration. Color stability has to be managed as soon as possible, starting in the vineyard. Most red grape varieties have more anthocyanins than tannins, which can lead to color stability issues.

WINEMAKING STAGE	REACTIONS	ENARTIS PRODUCTS
HARVEST	Prevent oxidation of color/phenolic compounds with antioxidant protection.	100-150 g/ton of <b>AST</b>
COLD SOAK	"Sacrificial" tannins reinforce SO <sub>2</sub> antioxidant effect and eliminate proteins that would react with grape polyphenols, thus protecting grape tannins.	150-200 g/ton <b>Enartis Tan FP, Tan Rouge</b> or <b>Tan Fermcolor</b> .
	Maceration enzymes improve grape skin tannin extraction, favoring anthocyanin/tannin reactions and stabilizing color pigments. The protease activity decreases protein capacity to precipitate grape tannins.	30 g/ton of <b>Enartis Zym Color Plus</b>
YEAST INOCULATION	At the first stage of alcoholic fermentation, anthocyanins are extracted much faster than tannins. To encourage the stabilization of anthocyanins via co-pigmentation and condensation, increase the concentration of grape tannin and use mannoproteins.	Co-pigmentation: 150 g/ton of <b>Enartis Tan XC</b>
		Condensation: 200 g/ton of <b>Enartis Tan Color</b> or <b>Enartis Tan V</b>
		Condensation: Co-pigmentation: 250 - 400 g/ton of <b>Enartis Pro Tinto</b>
AFTER AF, BEFORE MLF	At this stage, short macro-oxygenation encourages the formation of stable color compounds produced by condensation between free anthocyanins and tannins through acetaldehyde bridges.	10 g/hL <b>Enartis Tan Microfruit</b> or <b>Enartis Tan E</b>

## OAK ALTERNATIVES

Enartis offers a diverse portfolio of oak chips and mini-staves to meet all wine needs and expectations. With Incanto Chips and Barrel Boost, winemakers have ultimate control over their oak program and can create a unique signature for their brand or label.

### Incanto: Our Range of Oak Alternatives

*Incanto Chips and Barrel Boost Ministaves are produced from French and American oak aged 18-36 months and toasted using a unique process to ensure high quality products. The convection toasting with a progressive heating scheme allows for a deep, homogeneous and consistent toast. The process of oak selection, leaching, drying and toasting time/temperature are defined based on the final aromatic profile of the product and the consistency across lots and quality.*

Incanto Oak Alternatives are available as:

#### INCANTO CHIPS

Size: 2-4 mm

Dosage: 1-4 g/L for white wines; 1-6 g/L for red wines

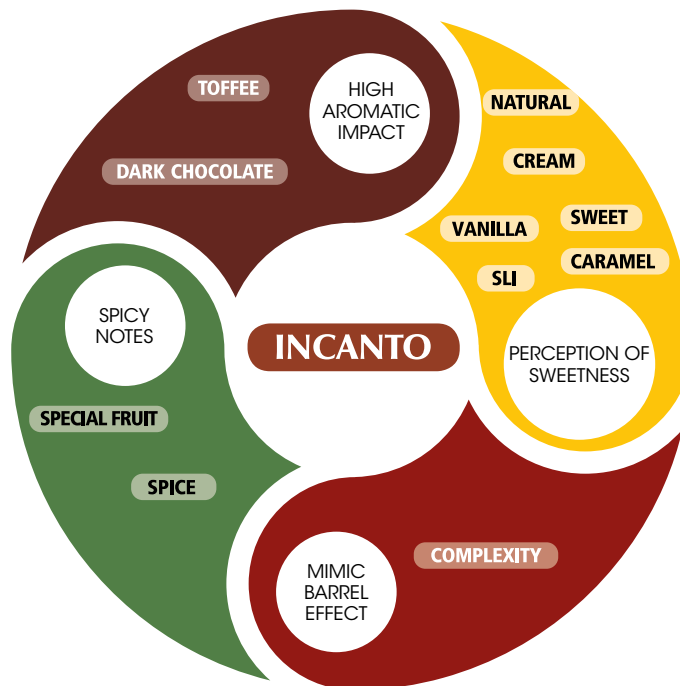
Contact time: Minimum of 4 weeks

#### BARREL BOOST, MINI-STAVES

Size: 25 cm x 2.7 cm x 0.9 cm

Dosage: 1 barrel boost/barrel is equivalent to 25% new oak.

Contact time: Minimum of 3 months, optimal at 4 months



### PERCEPTION OF SWEETNESS

#### INCANTO SLI

NEW

- American oak, untoasted.
- Respects aromatic characters of grapes/wine and enhances freshness and fruitiness.
- Increases volume, roundness and softens tannin structure.
- Increases ageing potential.

**10 Kg Chips** (Item #35-927-0010) **\$ 80.00**  
(Not available in Barrel Boost)

#### INCANTO NATURAL

- French oak, untoasted.
- Enhances fruit, vanilla, coconut, cedar and freshness. Preserves aromatic characteristics of wine.
- Increases wine structure, volume, and smoothness and improves balance and finesse.

**10 Kg Chips** (Item #35-922-0010) **\$ 80.00**  
(Not available in Barrel Boost)

**INCANTO VANILLA**

- American oak, medium-toasted.
- Vanilla, coconut, Bourbon, honey, tropical fruit, hazelnut, toasted almond, butter.
- Increases smoothness, volume and freshness without imparting excessive tannins.

**Barrel Boost** (Item #35-930-0005) \$ 98.00  
**10 Kg Chips** (Item #35-925-0010) \$ 135.00

**INCANTO CREAM**

- French oak, medium-toasted.
- Vanilla, coconut, butter, cappuccino, and licorice.
- Increases smoothness, volume and sweetness without imparting excessive tannins.

**Barrel Boost** (Item #35-930-0000) \$ 98.00  
**10 Kg Chips** (Item #35-920-0010) \$ 135.00

**INCANTO CARAMEL**

- French oak, medium-toasted.
- Caramel, cappuccino, toasted sugar, butter, almond, toasted hazelnut, vanilla and light spice.
- Increases smoothness and sweetness.

**Barrel Boost** (Item #35-930-0001) \$ 98.00  
**10 Kg Chips** (Item #35-919-0010) \$ 135.00

**ENHANCE SPICY NOTES****INCANTO SPECIAL FRUIT**

- French oak, medium-toasted.
- Spicy, black pepper, caramel, licorice, vanilla and coconut notes. Enhances freshness, fruitiness and complexity.
- Increases smoothness, volume and structure without imparting excessive tannins.

**Barrel Boost** (Item #35-930-0003) \$ 98.00  
**10 Kg Chips** (Item #35-923-0010) \$ 135.00

**INCANTO SPICE**

- French and American oak, various toast levels.
- Very complex and intense spice aroma.
- Increases smoothness and structure.

**10 Kg Chips** (Item #35-926-0010) \$ 210.00  
*(Not available in Barrel Boost)*

**MIMIC BARREL EFFECT****INCANTO COMPLEXITY**

NEW

- French oak, medium-heavy toast.
- Complex and subtle aromatic impact: coffee, caramel, vanilla, coconut.
- Increases structure, softness and sweetness perception.

**10 Kg Chips** (Item #35-928-0010) \$ 95.00  
*(Not available in Barrel Boost)*

**HIGH AROMATIC IMPACT****INCANTO TOFFEE**

- French oak, medium-plus toast.
- Café macchiato, toasted bread, toasted almond, hazelnut, vanilla, and apricot.
- Very smooth, sweet and complex.

**Barrel Boost** (Item #35-930-0004) \$ 98.00  
**10 Kg Chips** (Item #35-924-0010) \$ 135.00

**INCANTO DARK CHOCOLATE**

- French oak, medium plus toast.
- Dark chocolate, cocoa, black coffee, toasted almond, toasted hazelnut and licorice.
- Increases volume, structure and tannins.

**Barrel Boost** (Item #35-930-0002) \$ 98.00  
**10 Kg Chips** (Item #35-921-0010) \$ 135.00

INCANTO RANGE	OAK	TOAST	AROMATIC IMPACT	MOUTHFEEL
● INCANTO SLI	US	Untoasted	Fruit, fresh, neutral	Sweetness, round, soft
● INCANTO NATURAL	FR	Untoasted	Fruit, fresh, cedar	Sweetness, structure, soft
● INCANTO VANILLA	US	Medium	Vanilla, coconut, bourbon, butter	Sweetness, fresh, round
● INCANTO CREAM	FR	Medium	Vanilla, stone fruit, coconut, cedar	Sweetness, soft, round, length
● INCANTO CARAMEL	FR	Medium-Heavy	Caramel, toasted hazelnut, butter	Sweetness, soft, round, length
● INCANTO SPECIAL FRUIT	FR	Medium Plus	Spice, chocolate, fruit, complexity	Smooth, structure, length
● INCANTO SPICE	FR, US	Medium, Heavy	Black pepper, licorice, complexity	Smooth, round, structure, length
● INCANTO COMPLEXITY	FR	Medium Plus	Coffee, caramel, vanilla, fruit, complexity	Round, structure, length
● INCANTO TOFFEE	FR	Medium Plus	Toffee, caffè macchiato, toasted bread, hazelnut	Smooth, soft, length
● INCANTO DARK CHOCOLATE	FR	Medium Plus	Cocoa, coffee, toasted almond, licorice	Volume, structure

## Incanto N.C. Range

*Incanto N.C. (No Chips) products are soluble wood extracts containing only the active molecules used in oak powder:*

- Wood tannins to protect against oxidation, improve color stability and enhance structure.
- Polysaccharides to increase volume and soften tannins.
- Aromatic compounds derived from wood and toasting.

**Dosage:**

5-30 g/hL for white must

20-50 g/hL for red must

**Applications of Incanto N.C:**

- Increase complex oak aromas
- Highlight fruit and floral notes
- Improve wine mouthfeel and structure
- Increase sweetness perception
- Minimize herbaceous notes in underripe grapes
- Decrease reductive characters during fermentation

**Why use the Incanto NC Range?**

- Low dosage
- Easy-to-use for winery staff
- Better integration in wine
- NO color adsorption by solids
- NO microbial contamination
- NO solids = NO damage to harvest machinery



### INCANTO N.C. WHITE

- Soluble oak extract, acacia tannins and yeast cell walls rich in antioxidant sulfur peptides.
- Mimics the effect of untoasted oak powder.
- Protects juice from oxidation and prevents the appearance of reductive odors. Additionally, it provides light floral and vanilla notes, increases fresh fruit aromas and enhances softness and volume.

**Recommendations:** Untoasted oak; antioxidant; complexity; volume and structure.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

1 Kg	(Item #35-918-0001)	\$ 87.50
10 Kg	(Item #35-918-0010)	\$ 775.00

### INCANTO N.C. CHERRY

NEW

- Soluble wood extract from toasted oak, cherry tree wood and yeast cell walls rich in antioxidant sulfur peptides.
- Mimics the effects of oak powder.
- Promotes color stabilization, prevents oxidation, enhances fresh red fruit notes and increases wine volume, structure and length.

**Recommendations:** Color stability; antioxidant; complexity; fruity and spicy aromas; volume and structure; freshen overripe fruit.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

1 Kg	(Item #35-913-0001)	\$ 97.00
10 Kg	(Item #35-913-0010)	\$ 875.00



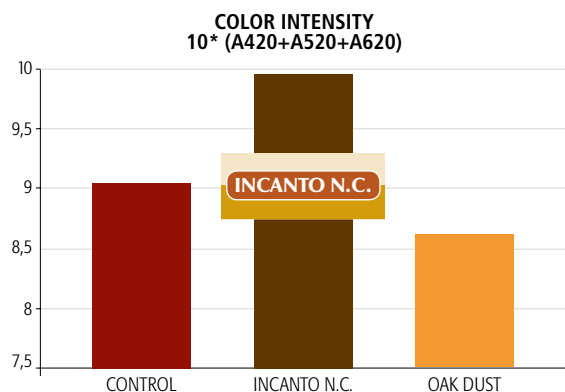
**INCANTO N.C.**

- Soluble oak extract from toasted oak and yeast cell walls.
- Mimics the effect of medium-toasted oak powder.
- Enhances oak aromas and aromatic complexity, increases roundness, structure and balance.
- Improves color stability.

**Recommendations:** Medium-toasted oak; color stability; complexity; volume and structure.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

1 Kg	(Item #35-916-0001)	\$ 77.50
10 Kg	(Item #35-916-0010)	\$ 675.00



*Incanto NC during fermentation improves color intensity and stability.*

**INCANTO N.C. RED**

- Soluble oak extract from toasted oak and yeast cell walls.
- Mimics the effect of medium-plus toasted oak powder.
- Decreases green aromas of unripe grapes, prevents reduction and increases structure, volume and sweetness.
- Increases color stability.

**Recommendations:** Medium-plus toasted oak; reduce herbaceous notes; complexity; volume and structure.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

1 Kg	(Item #35-917-0001)	\$ 87.50
10 Kg	(Item #35-917-0010)	\$ 775.00

**INCANTO N.C. DARK CHOCOLATE****NEW**

- Soluble oak extract from heavy-toasted oak and yeast cell walls.
- Mimics the effect of French oak, heavy-toast oak powder.
- Enhances toasted oak aromas and aromatic complexity, increases volume, structure and balance. Masks herbaceous notes from unripe grapes
- Improves color stability.

**Recommendations:** Heavy-toasted oak; reduce herbaceous notes; color stability; complexity; volume and structure.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

1 Kg	(Item #35-914-0001)	\$ 127.50
10 Kg	(Item #35-914-0010)	\$ 1,175.00

## KNOW MORE ABOUT OAK AGEING

### WHAT DOES OAK BARREL AGEING DO TO WINE?

There are two main reactions happening during oak ageing: the extraction of oak compounds and oxygen diffusion. During oak ageing, wine aromatic complexity increases, color stability is enhanced, astringency is reduced and structure becomes softer.

### WHY THERE IS SO MUCH VARIATION IN OAK AROMAS?

There are many causes of variation and many of them interact to form a wide array of potential aroma profiles:

- Source of the oak: oak species, geographic origin, growing conditions and age can strongly affect wood structure and composition.
- Stave position on a trunk has been shown to influence its aroma composition.
- Stave seasoning and drying: Kiln drying or air drying, time, humidity, etc.
- Cooperage processes add a considerable layer of variability.

### WHAT IS THE EFFECT OF TOASTING?

Toasting oak during barrel processing modifies the structure and chemical properties of wood. Increasing temperature and length of toasting will:

- Reduce oak lactone content that contributes to "fresh oak" and coconut aromas.
- Increase "vanilla," "caramel-like" and "roasted coffee" aromas associated with vanillin, furfural, 4-methylfurfural and maltol. At heavy toast levels these compounds decrease and are replaced by "spicy" (eugenol, isoeugenol, 4-methylguaiacol) and "smoky" characters (4-methylguaiacol, guaiacol, 2-methylphenol).

### WHY USE BARREL ALTERNATIVES?

- **Cost** is the most common reason for using barrel alternatives. Oak chips are, on average, 20 times less expensive than barrel ageing, and barrel boost inserts are at least 4 times less expensive. Additionally, using barrel alternatives reduce cellar work, storage space and microbiological risks.
- **Timing:** Contact time for Enartis Incanto Barrel Boost is 6-8 months and 4 weeks for Enartis Incanto Chips.
- **Consistency:** Incanto Chips and Barrel Boost provide a consistent oak aromatic profile to wine. Additionally, bench trials can be done with the oak alternatives to confirm the product choice and ensure consistency of the oak profile before using.

### ABOUT OAK AROMA COMPOUNDS

Vinquiry Laboratories measures key oak aroma compounds in wine or any oak solution. By determining the oak aroma profile of a targeted wine, winemakers can choose the appropriate **Incanto Chips** or **Barrel Boost** blend for matching wine style.

### WHAT ABOUT STORAGE AND REUSE OF OAK ALTERNATIVES?

Oak alternatives should be treated with care and stored in a clean, dry warehouse and in original packaging. Reuse is not recommended: the extraction and result in wine will be different and the risk microbial contamination increases.

### HOW MUCH OXYGEN DO INCANTO OAK CHIPS DISSOLVE INTO WINE?

When added to wine, oak chips transfer air from their porosity to wine, thus dissolving oxygen. 5 g/L of Incanto Chips will dissolve 0.6 ppm of oxygen into wine.

### SET-UP LAB BENCH TRIALS WITH OAK ALTERNATIVES

The extraction of oak compounds (oak aromas, polyphenols, polysaccharides, etc.) and the sensory impact on wine depend on many variables including the physiochemical characteristics of the wine, storage temperature, contact time, etc. It is important to set up bench trials in order to base decisions on accurate and representative data.

#### Setting up the trial is easy. Just follow the steps below to get started:

- Request Incanto Oak Chip samples from Enartis USA.
- Use a 0.750 L bottle for each sample.
- Select desired dosages (2-10 g/L).
- Write the date, wine lot, Incanto Oak Chip type and dosage on a label for each sample. Prepare a control sample bottle, without oak chips.
- Calculate the amount of Incanto Oak Chips for each 0.750 L wine sample:  $(\text{dosage g/L}) \times 0.750 \text{ L} = \text{g of Incanto Oak Chips}$ .
- Weigh the Incanto Oak Chips, add to the sample bottle and fill with wine up to 0.750 L.
- To prevent potential oxidation, add 5 mg/L  $\text{SO}_2$  at this time.
- After 3-4 weeks contact time, the samples are ready to be tasted.

*Tip: Consider blending samples to determine the optimum Incanto Oak Chip blend.*

Malolactic fermentation (MLF) is the conversion of malic acid into lactic acid by *Oenococcus oeni* which impacts wine quality and stability. The success of MLF depends on wine conditions, choice of ML strain and preparation of the inoculum. Enartis is proud to offer a complete portfolio of malolactic bacteria, activators and nutrients for an easy, clean and successful MLF.

## ML Bacteria

### How to choose ML bacteria strains

Each strain of bacteria performs best within specific environmental parameters. When selecting the appropriate ML bacteria strain, it is important to consider the relative stress conditions of the wine such as pH, SO<sub>2</sub> and alcohol content. Additionally, ML bacteria can be selected for their effects on wine aroma and mouthfeel.

### ENARTIS ML ONE

- Freeze-dried form for direct addition after rehydration.
- Ensures complete malolactic fermentation.
- Produces clean and varietal aromas. Respects aromatic characteristics of wine and reduces herbaceous notes.
- Low production of biogenic amines.

#### Package designed for:

2.5 hL (66 gal)	(Item #35-500-0000)	\$ 15.00
25 hL (660 gal)	(Item #35-500-0025)	\$ 75.00
250 hL (6,600 gal)	(Item #35-500-0250)	\$ 590.00
1,000 hL (26,400 gal)	(Item #35-500-1000)	\$ 1,750.00

### ENARTIS ML SILVER

- Freeze-dried form for direct addition after rehydration.
- Fast and complete malolactic fermentation even under difficult conditions such as high alcohol and high polyphenol content.
- Respects aromatic characteristics of wine and does not produce biogenic amines.

#### Package designed for:

2.5 hL (66 gal)	(Item #35-505-0000)	\$ 23.00
25 hL (660 gal)	(Item #35-505-0025)	\$ 125.00
250 hL (6,600 gal)	(Item #35-505-0250)	\$ 705.00
1,000 hL (26,400 gal)	(Item #35-505-1000)	\$ 2,600.00

ENARTIS STRAINS	ML MCW	ML SILVER	ML ONE
SPECIES	<i>Oenococcus oeni</i>		
pH TOLERANCE	>3.1	>3.1	>3.2
TOTAL SO <sub>2</sub> RESISTANCE (mg/L)	<40	<45	<40
FREE SO <sub>2</sub> RESISTANCE (mg/L)	<10	<10	<10
ALCOHOL TOLERANCE (%v/v)	>15	>15	<14
CONVERSION SPEED	Moderate/High	High	Moderate
AROMATIC CHARACTERISTICS	Buttery, "Sweet"	Fruity, Floral	Fruity, Varietal

### ENARTIS ML MCW

- Freeze-dried form for direct addition after rehydration and culture build-up.
- Isolated from Sonoma County, California.
- Resistant to extreme conditions such as high alcohol and low pH.
- Produces high diacetyl and contributes to creamy, "buttery" characters in wine.



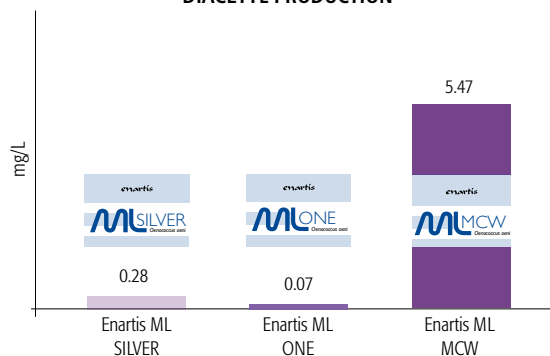
Build-up: (dosage: 1 g/hL) See our website for protocols.

10 g	(Item #30-031-0010)	\$ 65.00
40 g	(Item #30-031-0040)	\$ 110.00
120 g	(Item #30-031-0120)	\$ 230.00
500 g	(Item #30-031-0500)	\$ 700.00

Direct addition - package designed for:

2.5 hL (66 gal)	(Item #30-031-0003)	\$ 28.00
25 hL (660 gal)	(Item #30-031-0025)	\$ 125.00
250 hL (6,600 gal)	(Item #30-031-0250)	\$ 720.00

DIACETYL PRODUCTION



Enartis ML MCW produces high amounts of diacetyl which contributes to buttery, creamy notes in wine.

## ML Nutrients and Activators

### What nutrients do ML bacteria need?

After alcoholic fermentation has completed, yeast usually leave a wine deficient in vitamins, amino acids, minerals and other necessary nutrients for ML bacteria. To increase the survival rate of ML bacteria, increase their resistance to the hostile wine environment, activate their metabolism and ensure the completion of MLF, Enartis offers Nutriferm Osmobacti and Nutriferm ML, specifically designed for the needs of ML bacteria.

### NUTRIFERM OSMOBACTI

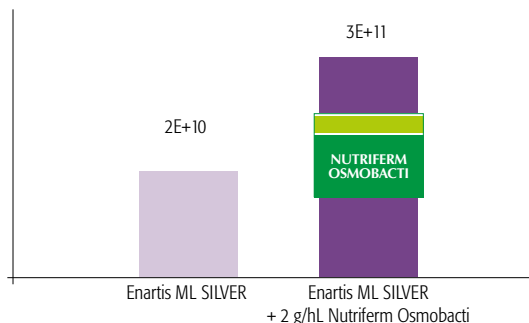
- Activator and regulator of osmotic pressure specific for ML bacteria.
- Improves survival rate of ML bacteria during rehydration and resistance in difficult wine conditions.
- Activates ML bacteria, allowing a faster start and completion of malolactic fermentation.

**Recommendations:** Nutrient during rehydration; ML in difficult conditions; increase MLF speed.

**Dosage:** 2 g/hL (0.17 lb/1,000 gal)

100 g (Item #35-511-0100) \$ 6.50

EFFECT OF NUTRIFERM OSMOBACTI



Nutriferm Osmobacti used during rehydration of ML bacteria increases the cell division and survival rate of the ML bacteria.

### NUTRIFERM ML

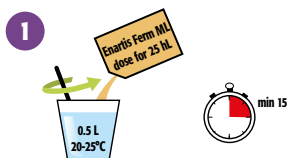
- Nutrient specific for ML bacteria: amino acids, vitamins, polysaccharides, cellulose, and co-factors.
- Stimulates bacterial growth, ensures domination of inoculated strain over natural flora, improves cell division and reduces the length of malolactic fermentation.

**Recommendations:** ML in difficult conditions; prevent stuck/sluggish MLF; increase MLF speed.

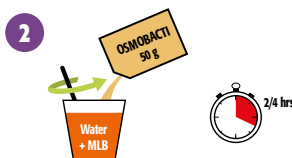
**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

50 g (Item #35-510-0050) \$ 12.50  
1 Kg (Item #35-510-0001) \$ 30.00

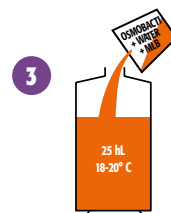
### PROTOCOL FOR ML BACTERIA PREPARATION AND INOCULATION – DIRECT ADDITION, 25 hL



Rehydrate 25 hL pack of ML bacteria in 500 mL of chlorine-free water at 20-25°C. Stir gently and wait 15 minutes.



Add Nutriferm Osmobacti to the ML bacteria slurry in order to improve survival rate and activate ML bacteria. Stir gently and let stand for 4 hours at 18-20°C.



Stir the suspension gently and add to wine during pump-over or mixing.

## KNOW MORE ABOUT ML BACTERIA

### WHAT ARE THE PRINCIPAL FACTORS INFLUENCING THE DEVELOPMENT OF LACTIC ACID BACTERIA (LAB)?

pH, temperature, alcohol and SO<sub>2</sub> (Free and Total) have a negative synergistic effect, making the completion of MLF difficult when combined. Additionally, vineyard sprays, initial malic acid content, yeast strain used for alcoholic fermentation and wine polyphenol content can be stress factors. Problems can arise when pH <3.4, alcohol >14.5%, wine temperature <65°F or >80°F, total SO<sub>2</sub> >30 mg/L and/or free SO<sub>2</sub> >10 mg/L.

### HOW TO CHOOSE THE ML BACTERIA STRAIN TO USE

Each strain of bacteria performs best within specific conditions. The **Quick ML Activity Test**, offered by Vinquiry Laboratories by Enartis USA, rates wines based on fermentation conditions and recommends the appropriate bacteria strain and, if needed, suggested adjustments in order ensure a successful ML fermentation.

### DOES THE YEAST STRAIN USED FOR ALCOHOLIC FERMENTATION AFFECT MLF?

Yes. Some yeast strains can impact lactic acid bacteria (LAB) development by producing toxins and SO<sub>2</sub>. (See page 30 for yeast strain compatibility with malolactic bacteria).

### WHAT ARE THE RISKS OF A SPONTANEOUS MLF?

Uncontrolled, spontaneous MLF can result in the production of off-characters such as yogurt, rancid, sweat, burnt matches or even rotten fruit. Another undesirable consequence of spontaneous growth is the production of biogenic amines. Inoculating with selected *Oenococcus oeni* ensures a rapid onset of MLF and better control over the production of aromas and wine mouthfeel.

### WHAT ABOUT OXYGEN AND LAB?

Molecular oxygen stimulates the growth of some LAB, behaving as a growth factor. However, if too much oxygen is applied, acetic acid may be produced.

### WHAT ARE BIOGENIC AMINES?

Biogenic amines are a group of compounds mostly formed by lactic acid bacteria via decarboxylation of amino acids. Known as a human health threat and to cause headaches and digestion issues, biogenic amines can also be associated with off-aromas in wine such as rotten flesh, algae and fish food.

The main biogenic amines found in wine are putrescine, histamine, tyramine and cadaverine.

Biogenic amine formation in wine can be prevented by inhibition of indigenous lactic acid bacteria and other spoilage microbes.

### HOW TO MONITOR MLF

The most common way to monitor MLF is by tracking malic acid degradation. MLF is considered complete when malic acid is below 30 mg/100 mL.

### WHAT ABOUT THE PRODUCTION OF DIACETYL?

Produced by LAB, this compound is characterized by buttery notes. Diacetyl is formed from pyruvate, which comes from acid and sugar catabolism. The entire winemaking process impacts the production of diacetyl: a slower MLF speed (with low inoculation rate and/or low temperature) and slightly oxidative environment will increase diacetyl production, while yeast lees contact will break down diacetyl and SO<sub>2</sub> can bind with diacetyl, thus reducing its content in wine.

### CAN I SAVE SOME OF THE BACTERIA TO USE LATER?

No. Once the packet of bacteria is open, it must be used immediately. Exposure to oxygen and excess moisture can be detrimental to the survival of bacteria.

## RESTART AND/OR COMPLETE A STUCK ML FERMENTATION - 100 hL

The successful restart of a stuck ML fermentation depends upon three critical factors: Diagnosis of the causes of fermentation arrest, the appropriate wine treatment and the proper acclimation of the ML bacteria.

### 1-DIAGNOSIS

Vinquiry Laboratories by Enartis USA offers the **Malolactic Fermentation Assessment Panel** that provides essential analytical information needed to determine the cause(s) of the problem(s) and the degree of fermentation completion.

### 2-TREAT STUCK WINE BEFORE RESTART - 24 HOURS PRIOR TO ML BACTERIA PREPARATION

- Adjust pH, alcohol, VA.
- Remove spoilage microbes with Enartis Stab Micro M (5 g/hL).
- Absorb toxins with 15 g/hL of Celferm.
- Rack off lees 24 hours after treatment.

### 3-PREPARE AND ACCLIMATE ML BACTERIA

- Rehydrate 4x25 hL pack of Enartis ML Silver in chlorine-free water at 20-25°C (68-77°F) and wait 15 minutes.
- Add 200g of Nutriferm Osmobacti to the suspension and wait 2-4 hours.
- Prepare 50 L of wine + 50 L water + 1 Kg Nutriferm ML and add the ML bacteria culture.
- At ½ of malic acid depletion, add 200 L of wine to the bacteria culture.
- At ½ malic acid depletion, add the ML bacteria culture to the remaining wine volume.

## MICRO-OXYGENATION

Oxygen is essential in winemaking. When added without control, it can cause major problems; however, if used properly, it becomes an important tool in the production of quality wines and for different wine styles intended to meet specific needs of the market.

*Micro-oxygenation is a technique of adding controlled amounts of oxygen to wine. The speed and rate of oxygen additions are very important. Rapid exposure to high doses of oxygen can quickly saturate wine, resulting in the accumulation of oxygen leading to oxidation, browning and loss of aromas. The objective of MOX is to allow small doses of oxygen to slowly be consumed through redox reactions, thus avoiding oxygen accumulation.*

### ENARTIS WIN – IQ OX


NEW

Enartis has developed a new micro-oxygenation device with simplified network control. Enartis WIN-IQ OX system offers wineries the opportunity to precisely diffuse measured amounts of oxygen, creating solutions for various winemaking objectives

- High accuracy: oxygen dosage controlled by mass flow meter
- Automatic adjustments to changes in temperature and pressure
- Customized programs
- Intuitive and user friendly
- Control via touchscreen or any network connected device.
- Remote access for dynamic and complete control
- Over 30 analysis parameters can be downloaded, graphed and tracked
- Applicable across a broad range of tank volumes: 100-1,000,000 gal
- Individualized tank mounted devices, independently controllable and completely network connectable

(Item #50-300-1000)

Please inquire for pricing.

FEATURES	ENARTIS WIN-IQ OX
PORTABLE	✓
MOUNTABLE	✓
IP65 RATING	✓
EMI PROTECTED	✓
SURGE PROTECTED	✓
LARGE TANK VOLUME (up to 1,000,000 gal)	✓
PROGRAMMABLE	✓
NETWORK CAPABLE	✓
WIFI CAPABLE	✓
REMOTE ACCESS	✓
TOUCHSCREEN	✓
USER FRIENDLY	✓
DOWNLOAD CAPABLE	✓
INTEGRATED ANALYTIC	✓
CUSTOMER SUPPORT	✓
MADE IN USA	





## KNOW MORE ABOUT MICRO-OXYGENATION (MOX)

### WHAT ARE THE APPLICATIONS OF MOX?

#### CONTROLLED JUICE/ MUST OXYGENATION

<b>Objective</b>	Improve resistance to oxidation and pinking.
<b>Rate</b>	5-30 mg/L
<b>Timing</b>	After pressing. Treatment usually done in 2-6 hours.
<b>Comments</b>	No SO <sub>2</sub> , healthy grapes, no spoilage microbes, temperature 10-13°C (50-55°F). Fining after MOX with <b>Claril SP</b> .

#### PREPARATION OF STARTER CULTURES

<b>Objective</b>	Increase yeast biomass. Improve yeast cell membrane resistance by increasing the production of unsaturated fatty acids.
<b>Rate</b>	3 mg/L every 3-4 hours
<b>Timing</b>	After yeast rehydration.
<b>Monitor</b>	Yeast cell count and viability.

#### DURING ALCOHOLIC FERMENTATION

<b>Objective</b>	Improve yeast cell membrane resistance by increasing the production of unsaturated long-chain fatty acids. Decrease production of sulfur compounds.
<b>Rate</b>	10-15 mg/L
<b>Timing</b>	At 1/3 of fermentation.
<b>Comments</b>	Effect reinforced with addition of <b>Nutriferm Advance</b> .

#### BETWEEN ALCOHOLIC FERMENTATION AND MALOLACTIC FERMENTATION (MLF)

<b>Objective</b>	Stabilize color compounds: production of acetaldehyde acting as a bridge in polymerization reactions. Improve wine structure by increasing polyphenol polymerization. Minimize herbaceous and reductive characters.
<b>Rate</b>	1-4 mg/L/day during 3-7 days
<b>Timing</b>	After alcoholic fermentation and pressing, prior to malolactic fermentation.
<b>Comments</b>	Temperature: 15-20°C (59-68°F). Remove any spoilage microbes with <b>Enartis Stab Micro M</b> . Use <b>Enartis Tan Microfruit</b> or <b>Enartis Tan E</b> to increase tannin/anthocyanin ratio.
<b>Monitor</b>	Daily sensory analysis to detect acetaldehyde (green apple aroma), <b>Micro-Ox Panel</b> and <b>acetaldehyde</b> .

#### POST MLF MATURATION

<b>Objective</b>	Improve, develop and harmonize mouthfeel and aromas. Mimic barrel ageing.
<b>Rate</b>	0.5-3 mg/L/month
<b>Timing</b>	After MLF, over a few months.
<b>Comments</b>	Depending on objectives, use tannins, polysaccharides or oak alternatives: - To mimic barrel ageing, use <b>Incanto Oak Chips</b> with <b>Surli One</b> . - To reduce green characters, use <b>Enartis Tan Max Nature</b> . - To increase fruitiness, use <b>Enartis Tan Microfruit</b> .
<b>Monitor</b>	Weekly tasting, <b>Microscopic Scan</b> .

## PARAMETERS TO MONITOR DURING MICRO-OXYGENATION/TROUBLESHOOTING

Micro-oxygenation is used to speed up the development of stable color in red wine, as well as improve mouthfeel and aroma profile. During this process, it is important to monitor critical parameters such as:

**Temperature** impacts oxygen solubility and the speed of reactions. A temperature between 15-20°C (59-68°F) is recommended for best integration of oxygen in wine.

**Dissolved Oxygen (DO):** Oxygen should be added in a manner so it does not cause an increase in dissolved oxygen. Measuring DO helps to adjust the dosage rate: DO should stay below 0.5 mg/L.

**Volatile Acidity (VA):** An increase in VA is an indicator of microbial spoilage and/or too high rate of oxygen dosing.

**Free SO<sub>2</sub>:** A typical decrease of free SO<sub>2</sub> is 3-4 mg/L for 1 mg/L of oxygen. A rapid decrease in free SO<sub>2</sub> indicates too high of an addition rate of oxygen and/or microbial spoilage.

**Polyphenol Content** serves as an indicator of the wine potential.

**Acetaldehyde:** An increase of acetaldehyde indicates too high rate of oxygen. If acetaldehyde is higher than its sensory threshold in wine (~60 ppm), dosing should be stopped.

**Tasting** is crucial to adjust, understand and fine tune oxygen dosage.

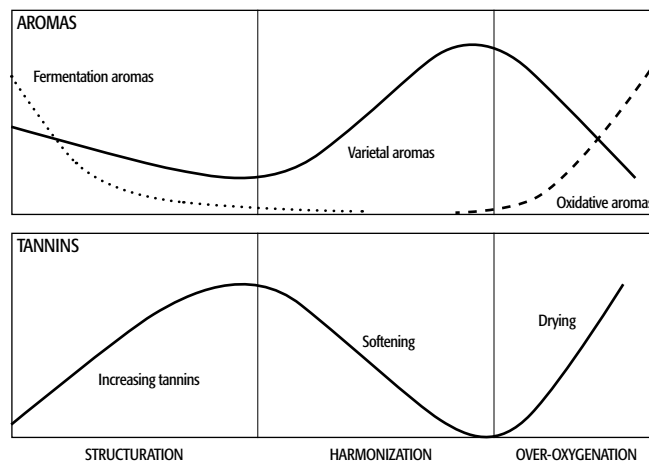
## GENERAL SENSORY EVOLUTION OF MICRO-OXYGENATION

During micro-oxygenation treatment, wines go through three stages that can be distinguished by changes in aroma and tannin appearance:

**1-Structuring:** Tannins become more reactive and aggressive. Acidity stands out. Fresh, fruity and fermentation aromas decrease.

**2-Harmonization:** Tannins become less reactive and softer as they condense to medium/high molecular weight. Color becomes darker and more stable, fruit flavor and complexity increases and acidity perception decreases; the palate is fuller and rounder. Oxygen dosage will be slowly decreased. Tasting is the best way of deciding the time to stop treatment.

**3-Over-oxygenation:** Mid-palate becomes thinner and tannins dryer, resulting from excessive polymerization and increasing development of aldehyde and oxidation of aromas and flavors.



*Classic evolution of aromas and tannins in wine during micro-oxygenation.*

# CLARIFICATION FINING AGENTS

## ALLERGEN-FREE FINING AGENTS

New labeling restrictions for wines sold or produced in Europe and Canada have made it mandatory to declare the use of co-adjuncts derived from eggs, milk and fish (Canada) on the label. Enartis has developed an allergen-free line of fining agents, suitable for vegetarian and vegan wines, as alternatives to egg albumin, casein, potassium caseinate, isinglass and fish gelatin.



## Enzymes

Enzymes can be used to help with clarification and filterability and improve organoleptic properties of wine. In wine, it is necessary to compensate for alcohol's inhibiting effect by increasing enzyme dosage and contact time.

### ENARTIS ZYM ÉLEVAGE

- Micro-granulated pectolytic enzyme preparation with significant  $\beta$ -glucanase activity, developed to enhance wine sensory characteristics during lees ageing and improve wine filterability.
- Accelerates yeast cell lysis and increases mannoprotein content in wines matured on lees.
- Enhances roundness, volume and mouthfeel.
- Improves filterability, especially for wines made with *Botrytis* infected grapes.

**Dosage:** 2-10 g/hL (0.17-0.8 lb/1,000 gal)

**0.25 Kg (Item #35-150-0250) \$ 82.50**

### ENARTIS ZYM CARACTÈRE

- Micro-granulated pectolytic enzyme preparation developed to increase aromatic expression, press yield and juice clarification.
- Hemicellulasic and  $\beta$ -glycosidasic side activities to reduce juice viscosity, maximize juice yield and increase aromatic intensity of wines from grapes with glycosylated precursors (terpenes, norisoprenoids...).

**Dosage:** 10-30 g/ton or 3-4 g/hL (0.25-0.3 lb/1,000 gal)

**0.25 Kg (Item #35-125-0250) \$ 62.50**

## Plant Proteins

Plant proteins, free of genetically modified organisms and allergenic proteins, are suitable for vegetarian and vegan beverage production. Often used to correct oxidation, browning and bitterness, plant proteins have excellent clarifying and stabilizing properties.

### PLANTIS AF-P

- Gluten-free potato protein, free of allergenic proteins.
- **One of the most reactive proteins.**
- Removes catechins and small molecular weight polyphenols responsible for oxidation and astringency.
- Alternative to gelatin, casein and potassium caseinate.

**Recommendations:** Free of allergenic proteins; vegan; treat oxidation; remove browning; reduce astringency.

**Usage:** Dissolve in 10 times its weight of cold water. Stir constantly during addition.

**Dosage:** 5-30 g/hL (0.4-2.4 lb/1,000 gal)

**1 Kg (Item #35-761-0001) \$ 95.00**

**10 Kg (Item #35-761-0010) \$ 900.00**

### PLANTIS AF

- Pure, allergen-free and gluten-free pea protein.
- Removes catechins and short chain-length polyphenols responsible for oxidation and bitterness.
- Reduces astringency and some off-flavors present in wine.
- Alternative to gelatin, casein and potassium caseinate.

**Recommendations:** Allergen-free; vegan; treat oxidation; remove browning; reduce astringency bitterness.

**Dosage:** 10-30 g/hL (0.8-2.4 lb/1,000 gal)

**20 Kg (Item #35-760-0002) \$ 450.00**



## Gelatins

Gelatins are obtained from the partial hydrolysis of collagen contained in animal bones and skin. Gelatin is often used to improve clarification and reduce phenolic compounds responsible for dryness, bitterness and astringency. Gelatin effects and applications can vary depending on the type of hydrolysis (isoelectric point), degree of hydrolysis (molecular weight) and charge density. Gelatin is positively charged at wine pH and binds via hydrogen bonds to polyphenols. Enartis has developed a wide range of high quality gelatins to provide solutions for many situations.

TANNIN REMOVAL Low MW High degree of hydrolysis Low density of charge		
	MW (Kda)	density of charge
HYDROCLAR 45	<9	300-400
HYDROCLAR 30	12	450-650
HYDROCLAR 20	20	550-700
FINEGEL	20	500-600
CLARGEL	30	650-750
PULVICLAR S	150	800-1000
GOLDEN INSTANT	250	1100-1200
CLARIFICATION High MW Low degree of hydrolysis High density of charge		

Characteristics of Enartis range of gelatins

### GOLDENCLAR INSTANT

- Granulated food-grade gelatin. High molecular weight, very low hydrolysis and very high charge density.
- Improves clarity and filterability.
- Reduces astringency and softens mouthfeel without affecting structure.
- Allergen-free alternative to egg albumin.

**Recommendations:** Allergen-free; clarification; reduce bitterness; reduce astringency; soften mouthfeel; aged red wines.

**Usage:** Dissolve in 20 times its weight of room temperature water. Stir constantly during addition.

**Dosage:** 2-12 g/hL (0.17-1 lb/1,000 gal)

1 Kg (Item #35-626-0001) \$ 40.00

### PULVICLAR S

- Granulated food-grade gelatin. High molecular weight, low hydrolysis and high charge density.
- Highly effective for clarification by flotation.

**Recommendations:** Flotation; clarification; juice.

**Usage:** Dissolve in 20 times its weight of warm water (40°C, 104°F). Stir constantly during addition.

**Dosage:** 4-15 g/hL (0.3-1.3 lb/1,000 gal)

1 Kg (Item #35-630-0001) \$ 28.00  
20 Kg (Item #35-630-0020) \$ 360.00

### CLARGEL

- Liquid food grade gelatin. Medium-high molecular weight.
- Very effective for clarification.
- Improves balance and eliminates excessive astringency without affecting wine structure.

**Recommendations:** Clarification; reduce astringency; young red wines.

**Usage:** Add directly to juice/wine via Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 20-150 mL/hL (0.76-5.7 L/1,000 gal)

1 L (Item #35-635-0001) \$ 10.00  
25 Kg (Item #35-635-0025) \$ 187.50

### HYDROCLAR 20

- 20% liquid solution of food grade gelatin. Low hydrolysis, medium-high molecular weight.
- Good for clarification.
- Removes excessive astringency.

**Recommendations:** Flotation; clarification; reduce astringency.

**Usage:** Add directly to juice/ wine via Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 10-60 mL/hL (0.4-2.3 L/1,000 gal)

1 L (Item #35-695-0001) \$ 10.50  
25 Kg (Item #35-695-0025) \$ 212.50

### HYDROCLAR 30

- 30% liquid solution of food grade gelatin. Medium hydrolyzed gelatin.
- Good for clarification.
- Reduces dryness and astringency at the middle-end of the palate.

**Recommendations:** Flotation; clarification; reduce astringency; reduce dryness.

**Usage:** Add directly to juice/ wine via Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 10-60 mL/hL (0.4-2.3 L/1,000 gal)

1 L (Item #35-610-0001) \$ 12.50  
25 Kg (Item #35-610-0025) \$ 262.50

### HYDROCLAR 45

- 45% liquid solution of food grade gelatin. Extremely hydrolyzed gelatin and low charge density.
- Powerful effect on removing undesirable polyphenols.

**Recommendations:** Reduce excessive astringency; reduce dryness; press wines.

**Usage:** Add directly to juice using Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 5-40 mL/hL (0.2-1.5 L/1,000 gal)

1 L (Item #35-615-0001) \$ 16.00  
25 Kg (Item #35-615-0025) \$ 312.50

## Fish Gelatin

### FINEGEL

- 20% liquid solution of high quality fish gelatin.
- Good for clarification of wine.
- Reduces oxidative and vegetal characteristics, eliminates harsh tannins and improves finesse.

**Tip:** Finegel solidifies at temperatures lower than 10°C (50°F).

**Recommendations:** Treat oxidation; reduce dryness.

**Usage:** Add directly to wine via Venturi tube or dosing pump. Stir constantly during addition.

**Dosage:** 20-100 mL/hL (0.75-3.8 L/1,000 gal)

1 L	(Item #35-640-0001)	\$ 25.00
20 L	(Item #35-640-0000)	\$ 400.00

## Isinglass

Isinglass is a form of collagen obtained from the dried swim bladders of fish. Used to improve brilliance and clarity of wine, it also reduces monomers and smaller polyphenolic compounds responsible for wine bitterness. Isinglass is usually used as a final touch before bottling or even as a riddling aid for sparkling wines.

### FINECOLL

- Granular isinglass.
- Good for clarification and improving brilliance.
- Reduces bitterness, oxidative and herbaceous characteristics without affecting wine structure.

**Tip:** Isinglass is more efficient at low temperatures (<15°C, 59°F). Use in combination with Sil Floc or Pluxcompact to help settling and compacting lees.

**Recommendations:** Reduce bitterness; clarification; brilliance.

**Usage:** Dissolve in 100 times its weight of room temperature water. Allow to swell for 1-2 hours. Stir constantly during addition.

**Dosage:** 1-4 g/hL (0.08-0.3 lb/1,000 gal)

0.25 Kg	(Item #35-650-0250)	\$ 65.00
1 Kg	(Item #35-650-0001)	\$ 210.00

## Potassium Caseinate

Potassium caseinate is the major protein in milk. With its positive charge, it adsorbs negatively-charged particles as it settles. It is usually used to reduce browning, bitterness and oak flavors (good "sponge" effect). Potassium caseinate has a strong affinity with condensed tannin, primarily responsible for astringency.

### PROTOCLAR®

- Pure potassium caseinate containing over 90% protein.
- Prevents and treats oxidation, browning and pinking.
- Reduces bitterness.
- Removes off-flavors.

**Recommendations:** Treat oxidation; remove browning; reduce astringency; reduce off-flavors.

**Usage:** Dissolve in 20 times its weight of cold water. Stir constantly during addition.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

1 Kg	(Item #35-645-0001)	\$ 65.00
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## PVPP

Polyvinylpolypyrrolidone (PVPP) specifically binds with low molecular weight polyphenols such as monomers and dimers responsible for oxidation, browning, pinking and bitterness.

### STABYL PVPP

- Pure polyvinylpolypyrrolidone.
- Highly effective in removing oxidized and oxidizable polyphenols, browning compounds and off-flavors.
- Prevents and treats oxidation, prevents pinking and reduces bitterness.

**Recommendations:** Treat and prevent oxidation; reduce browning; remove bitterness; press wines.

**Usage:** Suspend in 10 times its weight of warm water (40°C, 104°F). Allow to swell for 1 hour. Stir constantly during addition.

**Dosage:** 5-50 g/hL (0.4-4.2 lb/1,000 gal)

1 Kg	(Item #35-655-0001)	\$ 75.00
20 Kg	(Item #35-655-0020)	\$ 1,170.00



## PVI/PVP

PVI/PVP is an adsorbent co-polymer (polyvinylimidazole and polyvinylpyrrolidone) capable of removing metals in wine such as copper (Cu), iron (Fe) and aluminum (Al). Also, PVI/PVP has the ability to bind with phenolic compounds, the substrates of oxidative reactions. Wines treated with PVI/PVP are fresher, more aromatic, more balanced, have a lower oxidation potential and improved shelf life.

### Why use PVI/PVP?

- To remove any trace of metals and limit oxidation reactions at any stage of winemaking process.
- To stabilize wine with regards to oxidation and improve wine shelf life.
- To remove any excess copper or iron.

### Why is it important to remove residual metals?

It is through redox reactions, catalyzed by transition metals such as  $\text{Cu}^+$  and  $\text{Fe}^{2+}$ , that oxygen is converted into highly reactive radicals, capable of oxidizing a number of organic compounds. Removing metals such as  $\text{Cu}^+$  and  $\text{Fe}^{2+}$ , limits oxidation reactions, reduces reaction speed and increases wine resistance to oxidation.



## STABYL MET

- PVI/PVP (polyvinylimidazole/ polyvinylpyrrolidone) and silica.
- Absorbs metals (high affinity with Cu) and removes hydroxycinnamic acids and low molecular weight catechins.
- Limits oxidation, browning and destruction of varietal thiols.
- Prevents pinking and formation of copper haze.

**Tip:** To increase effectiveness, keep STABYL MET in suspension in wine for at least 1-2 hours.

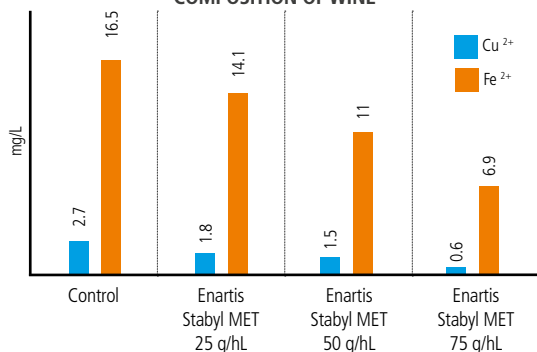
**Recommendations:** Prevent oxidation; reduce browning; remove bitterness.

**Usage:** Suspend in 20 times its weight of room temperature water. Allow to swell for 1 hour. Stir constantly during addition.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

2.5 Kg	(Item #35-657-0002)	\$ 537.50
10 Kg	(Item #35-657-0010)	\$ 1,850.00

EFFECT OF ENARTIS STABYL MET ON METAL COMPOSITION OF WINE



Stabyl MET reduces the content of  $\text{Cu}^{2+}$  and  $\text{Fe}^{2+}$  in wine. The effectiveness of the treatment is directly related to the dosage of Stabyl MET.

## Blends

Enartis has developed blends of fining agents which combine specific characteristics to create unique products that provide solutions for many situations.

## CLARIL AF

- Bentonite, PVPP, plant protein and silica.
- Prevents and treats oxidation, prevents pinking and reduces bitterness.
- Improves protein stability and clarification.
- Alternative to casein and potassium caseinate.

**Recommendations:** Prevent oxidation; reduce browning; remove bitterness; protein stability.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell for 3-6 hours. Stir constantly during addition.

**Dosage:** 50-150 g/hL (4.2-12.6 lb/1,000 gal)

1 Kg	(Item #35-666-0001)	\$ 45.00
10 Kg	(Item #35-666-0010)	\$ 350.00



## COMBISTAB AF

- PVPP, plant protein and silica.
- Prevents and treats oxidation, prevents pinking.
- Reduces bitterness.
- Alternative to casein and potassium caseinate.

**Recommendations:** Prevent oxidation; reduce browning; remove bitterness.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell 1 hour. Stir constantly during addition.

**Dosage:** 10-50 g/hL (0.8-4.2 lb/1,000 gal)

1 Kg	(Item #35-667-0001)	\$ 47.50
10 Kg	(Item #35-667-0010)	\$ 375.00



## PROTOMIX AF

- Bentonite, PVPP, plant protein and cellulose.
- Prevents and treats oxidation, prevents pinking and reduces bitterness.
- Improves protein stability and clarification.
- Detoxifies juice/must to facilitate alcoholic fermentation.

**Recommendations:** Prevent oxidation; reduce browning; remove bitterness.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 30-100 g/hL (2.4-8.3 lb/1,000 gal)

10 Kg	(Item #35-668-0010)	\$ 255.00
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## NEOCLAR AF

- Bentonite, gelatin and activated carbon.
- Ensures fast clarification with minimal volume of lees.
- Improves organoleptic cleanliness of wine, reduces herbaceous characters and contributes to protein stability.

**Recommendations:** Improve cleanliness; reduce herbaceous notes; remove off-flavors.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 40-150 g/hL (3.4-12.6 lb/1,000 gal)

**1 Kg (Item #35-670-0001) \$ 30.00**

## CLARIL SP

- Bentonite, PVPP, potassium caseinate and silica.
- Prevents and treats oxidation, browning and pinking.
- Improves aromatic cleanliness and reduces bitterness.

**Recommendations:** Improve cleanliness; treat oxidation; reduce browning; reduce bitterness.

**Usage:** Dissolve in 10 times its weight of cold water. Allow to swell for 3-6 hours. Stir constantly during addition.

**Dosage:** 30-150 g/hL (2.4-12.6 lb/1,000 gal)

**1 Kg (Item #35-665-0001) \$ 31.00**

**10 Kg (Item #35-665-0010) \$ 270.00**

"We started using Claril SP while experimenting with hyper-oxidation four vintages ago. Since then, Claril SP has become an SOP for all our hyper-oxidized juices. Up front it helps with settling, lees compaction, and of course color, but in the long run we are making consistently cleaner and better tasting wines that require less work in the finishing stages." - Samantha C. Taylor, Assistant Winemaker, Hope Family Wines



## CLARIL HM

- PVI/PVP (polyvinylimidazole/polyvinyl pyrrolidone) and pre-activated chitosan.
- Adsorbs heavy metals (Cu, Fe, Al) and removes hydroxycinnamic acids and low molecular weight catechins.
- Prevents oxidation, browning, pinking and destruction of varietal thiols.

**Tip:** To increase effectiveness, keep CLARIL HM in suspension in wine for at least 1-2 hours.

**Recommendations:** Prevent oxidation; reduce browning; preserve aromas; prevent copper haze.

**Usage:** Suspend in 20 times its weight of room temperature water. Allow to swell for 1 hour. Stir constantly during addition.

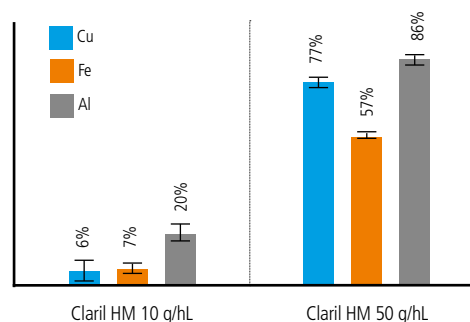
**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

**2.5 Kg (Item #35-661-0001) \$ 425.00**

**10 Kg (Item #35-661-0010) \$ 1,550.00**



REDUCTION OF METALS IN WINE IN %  
COMPARING TO CONTROL



Claril HM fining reduces the amount of Cu, Fe, Al, thus improving wine oxidation stability and limiting oxidation reactions. Average results from 5 wines.

## CLARIL QY

- Autolyzed yeast, pre-activated chitosan.
- Reduces astringency and bitterness.
- Eliminates unstable color compounds.
- Reduces reductive and vegetal characters.
- Reduces off-flavors such as "smoke taint" compounds.

**Tip:** To increase effectiveness, keep CLARIL QY in suspension in wine for at least 30 minutes.

**Recommendations:** Allergen-free; vegan; reduce astringency; reduce bitterness; reduce reductive notes; reduce browning.

**Usage:** Suspend in 10 times its weight of room temperature water. Stir constantly during addition.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

**1 Kg (Item #35-662-0001) \$ 35.00**

**10 Kg (Item #35-662-0010) \$ 275.00**



## Bentonite

Many types of bentonites are available for winemakers including sodium bentonite, calcium bentonite and activated bentonite. Based on its composition, bentonites can have different properties and act differently regarding its ability to remove proteins, to compact lees and the aromatic impact.

### What type of bentonite should I use?

There are three type of bentonite commercially available. It is important to test and treat wines with the same bentonite.

-Sodium bentonite: the most reactive with proteins

-Calcium bentonite: used to compact lees

-Calcium bentonite sodium activated: good reactivity with proteins and good lees compaction.

### Should I rehydrate my bentonite in water or wine?

Water. Bentonite should be rehydrated with clean, chlorine-free water.

### Can I use bentonite in red wines?

Yes. Low rates of bentonite help eliminate unstable color, proteins and clarify wines.

### How to choose between Enartis bentonites

FUNCTION	ENARTIS PRODUCT
CLARIFICATION	Pluxcompact > Pure Bento > Pluxbenton N
LEES COMPACTION	Pluxcompact > Pure Bento > Pluxbenton N
PROTEIN REMOVAL	Pure Bento > Bentolit Super > Pluxbenton N
ORGANOLEPTIC IMPACT	Bentolit Super > Pluxbenton N > Pure Bento

## BENTOLIT SUPER

- Powdered calcium bentonite sodium activated.
- Excellent clarification with good protein removal.

**Usage:** Dilute in 20 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 20-120 g/hL (1.7-10 lb/1,000 gal)

1 Kg	(Item #35-675-0001)	\$ 3.20
25 Kg	(Item #35-675-0025)	\$ 48.75

## PLUXCOMPACT

- Granulated calcium bentonite sodium activated.
- Generates limited amount of compact lees.

**Usage:** Dilute in 10 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 20-120 g/hL (1.7-10 lb/1,000 gal)

1 Kg	(Item #35-680-0001)	\$ 3.20
20 Kg	(Item #35-680-0020)	\$ 62.00

## PLUXBENTON N

- Granular sodium bentonite.
- Excellent protein removal and good clarification properties.
- Reduces riboflavin, the molecule responsible for "light-struck" defect in white wines.

**Usage:** Dilute in 20 times its weight of cold water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 20-120 g/hL (1.7-10 lb/1,000 gal)

1 Kg	(Item #35-685-0001)	\$ 3.60
20 Kg	(Item #35-685-0020)	\$ 50.00

## PURE BENTO

- Powdered calcium bentonite sodium activated. Selected from the purest natural bentonites to meet the strictest requirements from the food industry.
- Very large adsorption surface, high protein removal capacity.
- Removal of unstable color and pinkening matter.

**Usage:** Dilute in 20 times its weight of room temperature water. Allow to swell 1 hour. Stir constantly during addition.

**Dosage:** 5-30 g/hL (0.4-2.4 lb/1,000 gal)

5 Kg	(Item #35-681-0005)	\$ 250.00
25 Kg	(Item #35-681-0025)	\$ 1,000.00

## Silica Sol

### SIL FLOC

- Pure silicon dioxide in aqueous solution.
- Acts as a counter-fining agent with protein fining agents.

**Usage:** Add directly to juice/wine via Venturi tube or dosing pump. Add before gelatin or after other clarifying agents. Stir constantly during addition.

**Dosage:** 25-100 mL/hL (1-3.8 L/1,000 gal)

1 L	(Item #35-690-0001)	\$ 9.00
25 Kg	(Item #35-690-0025)	\$ 150.00



## Carbon

### FENOL FREE

- Enological activated carbon in powder form.
- Deodorizing, high affinity with volatile phenols related to *Brettanomyces* and smoke taint.
- Low effect on wine color.

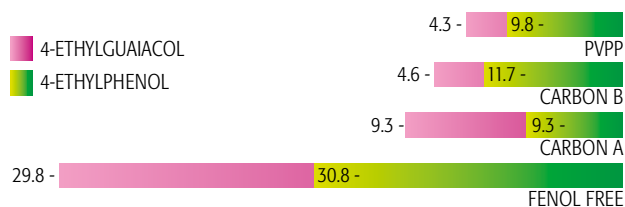
**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

1 Kg	(Item #35-705-0001)	\$ 35.00
10 Kg	(Item #35-705-0010)	\$ 250.00



FENOL FREE: VOLATILE PHENOLS REMOVAL



### ENOBLACK PERLAGE

- Enological activated carbon in pellet form (reduces spread of carbon dust).
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

**Usage:** Disperse in small amount of water or directly to wine. Keep in suspension for 15-20 minutes.

**Dosage:** 5-100 g/hL (0.4-8.3 lb/1,000 gal)

1 Kg	(Item #35-701-0001)	\$ 30.00
15 Kg	(Item #35-701-0015)	\$ 375.00



### BLACK PF

- Enological activated carbon in damp form (reduces the spread of carbon dust)
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

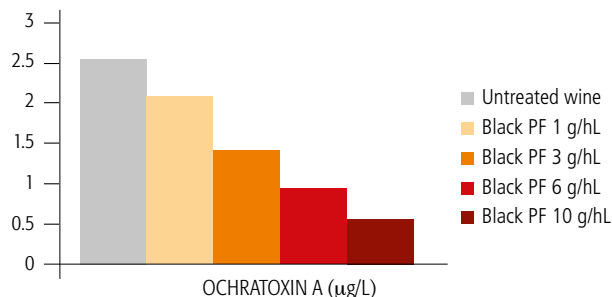
**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

1 Kg	(Item #35-710-0001)	\$ 22.00
15 Kg	(Item #35-710-0015)	\$ 180.00



BLACK PF EFFICIENCY IN REMOVING OCHRATOXIN A



### ENOBLACK SUPER

- Enological activated carbon in powder form.
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

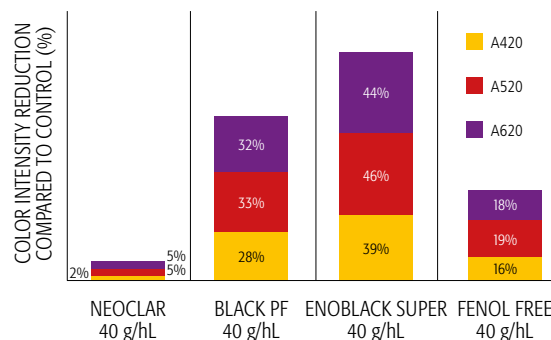
**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

1 Kg	(Item #35-700-0001)	\$ 25.00
10 Kg	(Item #35-700-0010)	\$ 150.00



DECOLORIZING EFFECT OF ENARTIS CARBON RANGE



ENARTIS PRODUCT	COMPOSITION	DOSAGE	CLARIFICATION	COMPACT LEES	PROMOTE PROTEIN STABILITY	REMOVE UNSTABLE COLOR	REMOVE BITTERNESS	REDUCE ASTRINGENCY	TREAT/PREVENT OXIDATION	REMOVE METALS	REMOVE VOLATILE PHENOLS	REMOVE OFF-FLAVORS	DECOLORIZING	TREAT MOLDY JUICE/WINE
BENTOLIT SUPER	Bentonite	20-120 g/hL	★		★★★	★								
PLUXBENTON N	Bentonite	20-120 g/hL	★		★★★	★								
PLUXCOMPACT	Bentonite	20-120 g/hL	★★	★★★	★	★								
PURE BENTO	Bentonite	5-30 g/hL	★		★★★★	★								
NEOCLAR AF	Bentonite, Gelatin, Carbon	40-150 g/hL	★				★★	★★			★★★		★★	
PROTOMIX AF	Bentonite, PVPP, Plant Protein, Cellulose	50-100 g/hL	★★		★		★★	★	★★★					
CLARIL AF	Bentonite, PVPP, Plant Protein, Silica	30-80 g/hL	★★		★		★★	★	★★★					
CLARIL SP	Bentonite, PVPP, Potassium Caseinate	30-150 g/hL	★★		★		★★★	★	★★★		★			
BLACK PF	Carbon	20-100 g/hL									★★	★★★	★	
ENOBLACK PERLAGE	Carbon	20-100 g/hL									★★	★★★	★	
ENOBLACK SUPER	Carbon	20-100 g/hL									★★	★★★	★	
FENOL FREE	Carbon	20-100 g/hL								★★★	★★★	★		
ZYM CARACTERE	Enzyme		★★											
ZYM ELEVAGE	Enzyme		★★											★★
FINEGEL	Fish Gelatin	20-100 g/hL	★★★				★★	★★★						
CLARGEL	Gelatin	20-150 mL/hL	★★★				★	★★						★
GOLDENCLAR INSTANT	Gelatin	2-12 g/hL	★★★			★	★★	★★	★		★			★
HYDROCLAR 20	Gelatin	10-60 mL/hL	★★★				★	★★	★		★			
HYDROCLAR 30	Gelatin	10-60 mL/hL	★★				★	★★★	★		★			★
HYDROCLAR 45	Gelatin	7-40 mL/hL	★				★★	★★★★	★					★
PULVICLAR S	Gelatin	4-15 g/hL	★★★★			★		★★						
FINECOLL	Isinglass	1-4 g/hL	★★★	★★			★★★	★						
PLANTIS AF	Plant Protein	10-30 g/hL	★★				★★	★★	★★★	★★	★			★
PLANTIS AF-P	Plant Protein	5-30 g/hL	★				★★	★★	★★		★			
PROTOCLAR	Potassium Caseinate	20-100 g/hL					★★★	★★	★★★	★	★★★			
STABYL MET	PVI/PVP	20-50 g/hL	★					★★★	★★★★					
STABYL PVPP	PVPP	5-50 g/hL				★	★★★	★★	★★★					
CLARIL HM	PVI/PVP, Chitosan	20-50 g/hL	★				★★		★★★	★★★★				
COMBISTAB AF	PVPP, Plant Protein, Silica	10-50 g/hL					★★★	★	★★★	★				
SIL FLOC	Silica	25-100 mL/hL	★★	★★★										
CLARIL QY	Yeast Derivatives, Chitosan	5-20 g/hL	★★			★★	★	★	★★★★	★	★	★★		

## KNOW MORE ABOUT FINING

### WHY FINING?

Fining agents can be used for many purposes in winemaking including clarification, filterability improvement, prevention of haze and sediment formation, organoleptic profile and wine color improvement, and removal of undesirable elements from wine.

### HOW DOES FINING WORK?

Each fining agent has specific properties and reacts with various wine molecules depending on its origin, density of charge, molecular weight and chemical properties. Fining is based on two main principles:

- Flocculation: molecular interactions based on charge, chemical bonds, absorption or adsorption of compounds and formation of flocculates.
- Sedimentation: since the flocculates formed are not soluble and heavier than wine/juice, they settle.

### WHAT ARE THE MAIN FACTORS THAT INFLUENCE FINING EFFECTIVENESS?

Product preparation and addition, temperature, pH, wine redox potential and previous fining treatments are factors that can influence the effectiveness of fining.

### HOW TO CHOOSE THE RIGHT FINING AGENT

Set up a bench trial with different fining agents and dosages. (See page 81 for Preparing Lab Bench Trials)

EFFECT	ENARTIS OPTIONS
TREAT OXIDIZED COLOR	PROTOCLAR - CLARIL SP - STABYL PVPP - CLARIL QY - PLANTIS AF - PLANTIS AF-P
CLARIFICATION	GOLDENCLAR INSTANT - PULVICLAR S - HYDROCLAR 20 - CLARGEL - FINECOLL
REDUCE ASTRINGENCY	HYDROCLAR 45 - HYDROCLAR 30 - FINEGEL
REDUCE BITTERNESS	PROTOCLAR - PVPP - FINECOLL - CLARIL SP
TREAT OFF-FLAVORS	PROTOCLAR - NEOCLAR AF - FENOL FREE

### SUGGESTIONS FOR FINING PROCEDURE:

- Prepare fining agent as recommended on the technical data sheet (TDS).
- Slowly incorporate fining agents to wine, using a Venturi tube or dosing pump.
- Add flocculation aids before the fining agent and allow 1-2 hours between additions.
- Fining agents should not remain in wine more than 15 days.
- Protein-based fining agents work best at temperatures lower than 15°C (59°F).
- Bentonite works best at temperatures higher than 10°C (50°F).

### WHY DO WE NEED FLOCCULATION AIDS?

Some protein-based fining agents (particularly gelatin and isinglass) require the addition of negatively-charged colloids such as tannin, silica sol and bentonite to ensure complete flocculation and precipitation.

### ARE ALL GELATIN PRODUCTS THE SAME?

No. The gelatins we offer are refined, purified then separated into specific fractions by capillary electrophoresis. Gelatins can be used to change wine structure or to enhance aroma and flavor.

ENARTIS PRODUCT	WATER TEMPERATURE	PRODUCT/WATER RATIO	REHYDRATION TIME
BENTOLIT SUPER	12-16°C (55-62°F)	1:20	3-6 hr
CLARIL AF	12-16°C (55-62°F)	1:10	3-6 hr
CLARIL HM	Room Temperature	1:20	1 hr
CLARIL QY	Room Temperature	1:10	-
CLARIL SP	12-16°C (55-62°F)	1:10	3-6 hr
COMBISTAB AF	12-16°C (55-62°F)	1:10	3-6 hr
FINECOLL	Room Temperature	1:100	1-2 hr
GOLDENCLAR INSTANT	Room Temperature	1:20	-
NEOCLAR AF	12-16°C (55-62°F)	1:10	3-6 hr
PLANTIS AF	12-16°C (55-62°F)	1:10	-
PLANTIS AF-P	12-16°C (55-62°F)	1:10	-
PLUXBENTON N	12-16°C (55-62°F)	1:20	3-6 hr
PLUXCOMPACT	12-16°C (55-62°F)	1:10	3-6 hr
PROTOCLAR	12-16°C (55-62°F)	1:20	-
PROTOMIX AF	12-16°C (55-62°F)	1:10	3-6 hr
PULVICLAR S	40°C (104°F)	1:20	-
PURE BENTO	12-16°C (55-62°F)	1:20	1 hr
STABYL PVI/PVP	Room Temperature	1:20	1 hr
STABYL PVPP	40°C (104°F)	1:10	1 hr

# STABILIZATION

In today's wine market, it is crucial for wines to be visually appealing to consumers: any haze or precipitate is unacceptable and can damage brand reputation. This section will cover the main instabilities that we encounter in wine and the Enartis approach for successfully managing them. Because of their purity and microbial stability, all of our stabilizers can be added with confidence at any stage during preparation for bottling.

## Gum Arabic

Gum Arabic, extracted from *Acacia Verek* or *Acacia Seyal* is widely used in food, beverages and pharmaceutical industries to assist the formation and stabilization of emulsions and for the encapsulation of flavors. The major applications for Gum Arabic in winemaking are to stabilize wine against tartrate precipitation, stabilize young red wines against color pigment precipitation and to improve mouthfeel.

In keeping with its philosophy of meeting different winemaking needs with appropriate products, Enartis has developed a complete range of Gum Arabic preparations to meet all winemaking needs.



### CITROGUM®: TARTRATE STABILIZATION MECHANISM



CONTROL



200 mL/hL CITROGUM

The addition of Citrogum® prevents crystal growth by competing with potassium and tartrate ions for attachment sites on the surfaces of microcrystals.

### CITROGUM® PLUS

NEW

- Solution of Gum Arabic extracted from *Acacia Seyal* and yeast mannoproteins.
- Prevents precipitation of colloids, pigments and tartrates.
- Reduces bitterness and astringency perception, increases sweetness, softness and volume perception.
- Low filter clogging effect.

**Recommendations:** Tartrate stability; reduce astringency perception; increase sweetness; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 100-300 mL/hL (3.8-11.3 mL/1,000 gal)

### CITROGUM®

- Solution of Gum Arabic extracted from *Acacia Seyal* with low calcium content and high hydrolysis.
- Prevents precipitation of colloids, pigments and tartrates.
- Improves wine balance and organoleptic features.
- Enhances aroma, reduces bitterness and astringency perception and increases softness and body.
- The most filterable gum on the market: No filter membrane clogging effect.

**Recommendations:** Tartrate stability; reduce astringency perception; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 50-200 mL/hL (1.9-7.6 L/1,000 gal)

1 L	(Item #35-725-0001)	\$ 12.00
25 Kg	(Item #35-725-0025)	\$ 200.00
200 Kg	(Item #35-725-0200)	\$ 1,100.00
1,000 Kg	(Item #35-725-1000)	\$ 5,000.00

### CITROGUM® DRY

- Granulated form of Citrogum®. The properties of Citrogum® Dry (low calcium content, sensory and stabilizing characteristics, filterability) are similar to those of liquid Citrogum®.
- Impurity-free Gum Arabic that dissolves quickly both in water and wine without forming lumps.

**Recommendations:** Tartrate stability; reduce astringency perception; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 10-100 g/hL (0.8-8.3 lb/1,000 gal)

1 Kg	(Item #35-730-0001)	\$ 40.00
15 Kg	(Item #35-730-0015)	\$ 487.50

### AROMAGUM

- Gum Arabic solution.
- Stabilizes wine aromas, intensifies fruit aroma perception and maintains freshness over time after bottling.
- When used at recommended dosages, it has a limited blocking effect on filtration membranes and can be added to wine before microfiltration.

**Recommendations:** Aromas stability; reduce astringency perception; soften mouthfeel; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 50-100 mL/hL (1.9-3.8 L/1,000 gal)

1 L	(Item #35-720-0001)	\$ 13.50
25 Kg	(Item #35-720-0025)	\$ 250.00



## MAXIGUM

- Gum Arabic solution obtained from Acacia Verek. High molecular weight, highly branched structure.
- Extremely effective in preventing precipitation of color substances in wine ready for bottling.
- Improves the sensory characteristics of wine, increases mouthfeel and reduces astringency perception.

**Recommendations:** Color stability; volume and roundness; reduce astringency perception; improve foaming capacity; white, rosé, red and sparkling wines.

**Dosage:** 20-100 mL/hL (0.76-3.8 L/1,000 gal)

1 L	(Item #35-735-0001)	\$ 15.50
25 Kg	(Item #35-735-0025)	\$ 237.50

## Carboxymethyl Cellulose

### What is Carboxymethyl cellulose (CMC)?

CMC is a cellulose derivative characterized by its polymerization and substitution degrees; parameters affecting viscosity and solubility. Due to its negative charge at wine pH, CMC interacts with the electropositive surfaces of crystals, thus inhibiting their growth and precipitation. CMC flattens the crystal surface, which becomes unable to grow.

### How CMC works?

CMC interferes with potassium bitartrate crystal nucleation and growth, hence inhibiting their precipitation. CMC, negatively charged at wine pH, competes with bitartrate ions by attracting  $K^+$  ions, thus inhibiting the formation of crystals and tartrate precipitation.

### CMC and proteins: what are the interactions?

CMC has the ability to crosslink with proteins in wine to form a haze. Consequently, wines must be protein and colloid stable before any CMC additions. Lysozyme is a protein and will generate a haze if present with CMC.

### What about CMC in red wines?

CMC can react with color compounds and result in color precipitation. To use CMC in red wines, it is important to stabilize color compounds by using Maxigum in combination with CMC.

## CELLOGUM L

- Solution of Carboxymethyl cellulose (CMC).
- Stabilizes against tartrate precipitation over long-term and inhibits the formation, growth and precipitation of potassium bitartrate crystals.

**Tip:** If used to stabilize red wine, needs to be combined with Maxigum to stabilize color.

**Recommendations:** Tartrate stability; white, rosé and sparkling wines.

**Dosage:** 100-200 mL/hL (3.8-7.6 L/1,000 gal)

1 L	(Item #35-795-0001)	\$ 8.00
25 Kg	(Item #35-795-0025)	\$ 175.00
200 Kg	(Item #35-795-0200)	\$ 1,200.00

*"Tartaric stability has always been a challenge in winemaking and sometimes is a source of tough decisions right before bottling. Last year, we started encouraging and assisting our customers to use in-line dosing following the final filter; Cellogum L for white wine and Maxigum and Cellogum L for red wine. This practice implied considerable savings in terms of economy and time.*

*Thanks to Enartis, we are happy to provide this convenient tool to winemakers to help them achieve perfect stability in the bottle without the concern of blockage of membranes."*

**Matteo Meglioli, Enologist at Viniserve (Canada)**

*"We use Cellogum L on our whites and rosés whenever possible. It is the best alternative to chilling for tartrate stabilization and it doesn't impact the mouthfeel of the wine. Enartis offers the CMC Panel to test if Cellogum L can be used and how much is required to stabilize the wine. They make it easy and convenient - that's one of the reasons we will continue to use it for years to come."* - Kevin Sass, Winemaker at Halter Ranch (CA).

## CELLOGUM LV 20

- Solution of Carboxymethyl cellulose (CMC) with low viscosity and high substitution degree.
- Stabilizes against tartrate precipitation over long-term. Inhibits the formation, growth and precipitation of potassium bitartrate crystals.
- Low impact on wine filterability.

**Tip:** If used to stabilize red wine, needs to be combined with Maxigum to stabilize color.

**Recommendations:** Tartrate stability; white, rosé and sparkling wines.

**Dosage:** 25-50 mL/hL (1-1.9 L/1,000 gal)

1 L	(Item #35-794-0001)	\$ 32.00
25 Kg	(Item #35-794-0025)	\$ 687.50



CONTROL



CELLOGUM LV 20



MAXIGUM

MAXIGUM  
+ CELLOGUM LV 20

Cellogum LV 20 stabilizes wine against tartrate precipitation and Maxigum stabilizes wine against color matter precipitation. In red wines, using Cellogum LV 20 and Maxigum together ensure complete stability.

## Mannoproteins

### ENARTIS STAB CLK+

- Completely, soluble polysaccharides extracted from yeast cell walls.
- Stabilizes against tartrate precipitation.
- Increases mouthfeel, roundness and volume sensation.

**Recommendations:** Tartrate stability; volume and roundness; softness; red and rosé wines.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

0.5 Kg	(Item #35-360-0002)	\$ 242.50
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## Blends

### CELLOGUM MIX

- Solution of Carboxymethyl cellulose (CMC) and Acacia Seyal Gum Arabic, selected for their high filterability.
- Synergistic effect to stabilize against tartrate precipitation. Inhibits the formation, growth and precipitation of potassium bitartrate crystals.

**Recommendations:** Tartrate stability; white, rosé and sparkling wines; volume and roundness.

**Dosage:** 30-100 mL/hL (1.1-3.8 L/1,000 gal)

1 L	(Item #35-797-0001)	\$ 17.50
25 Kg	(Item #35-797-0025)	\$ 350.00

### ENARTIS STAB MEGA

- Solution of low viscosity Carboxymethyl cellulose (CMC), high molecular weight Gum Arabic from Acacia Verek and mannoproteins.
- Complete and highly efficient stabilizer against tartrate and color precipitation.
- Improves mouthfeel, contributes to roundness and "sweetness."

**Recommendations:** Tartrate stability; color stability; volume and roundness; softness.

**Dosage:** 0.5-1.5 mL/L (1.9-5.7 L/1,000 gal)

1 L	(Item #35-798-0001)	\$ 50.00
25 Kg	(Item #35-798-0025)	\$ 1,000.00

## Zenith range

### ZENITH® UNO

NEW

- Potassium Polyaspartate solution.
- Strongly effective for tartrate stabilization in white and rosé wines.
- Completely filterable.
- Long-lasting stabilizing effect.
- Environment sustainable, practical, easy to use and respectful of wine quality.

**Recommendations:** Tartrate stability; white, rosé and red wines.

**Dosage:** 100 mL/hL

1 L	(Item #35-792-0001)	\$14.00
20 Kg	(Item #35-792-0020)	\$250.00
1000 Kg	(Item #35-792-1000)	\$11,500.00

### ZENITH® COLOR

NEW

- Potassium Polyaspartate and Arabic Gum from Acacia Verek solution.
- Strongly effective for tartrate and color stabilization in red and rosé wines.
- Completely filterable.
- Long-lasting stabilizing effect.
- Environment sustainable, practical, easy to use and respectful of wine quality.
- Increase roundness, wine length and volume.

**Recommendations:** Tartrate stability; volume and roundness; color stability; red and rosé wines.

**Dosage:** 200 mL/hL

1 L	(Item #35-793-0001)	\$18.00
20 Kg	(Item #35-793-0020)	\$320.00
1000 Kg	(Item #35-793-1000)	\$15,250.00

## KNOW MORE ABOUT ZENITH

### WHAT IS POTASSIUM POLYSPARTATE?

Potassium polyaspartate (KPA) is a polyamino acid produced from L-aspartic acid, an amino acid present in grapes. Enartis has used its expertise in stabilization products to create a revolutionary range of products that harnesses the synergy and power of potassium polyaspartate and colloids for both tartaric and color stabilization.

### WHY USE ZENITH?

The revolution in colloid stabilization for all wines and all levels of instability!

Suitable for all wineries currently using cold stabilization for their wines that want to reduce production costs and increase their sustainability standards, while simultaneously achieving ultimate stability. Enartis, the market leader in stabilization products, provides a cutting-edge, cost-effective and eco-friendly product range allowing you to switch off your cooling system and dramatically reduce production costs and gas emissions, while maintaining the organoleptic aspects of your wine and ensuring the best color and tartaric stabilization over time and under temperature stress.

### ZENITH IS

- INNOVATION

An ambitious challenge and six years of passionate research in collaboration with public and private European institutions, universities and major players in the winemaking industry to develop a cutting-edge product.

- PERFORMANCE

The most effective tartaric and color stabilizer overtime, under all conditions and temperature stress. Maximum filterability up to 0.45µm.

- QUALITY

Respects organoleptic aspects of wine.

- COST-EFFECTIVENESS

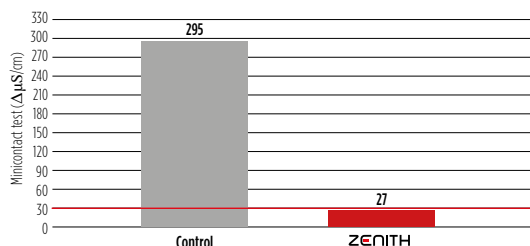
Easy-to-use, eliminates wine loss during stabilization and dramatically cuts energy and water consumption while reducing labor and ancillary costs. Up to 80% saving in energy and water consumption.

- SUSTAINABILITY

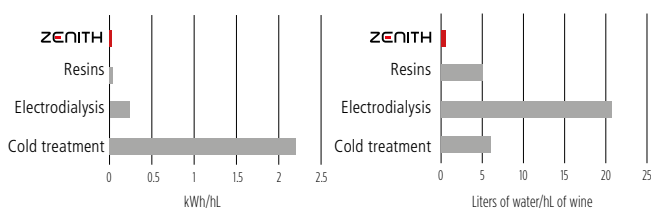
An eco-friendly product that guarantees 90% reduction of CO<sub>2</sub> emissions for greater environmental sustainability. Zenith loves the planet!



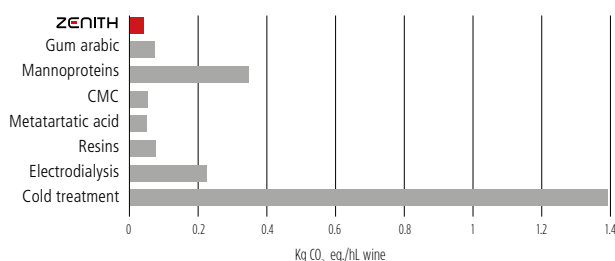
### THE BEST STABILIZATION PERFORMANCE UP TO 300 ΔμS OVER TIME AND UNDER TEMPERATURE STRESS



### UP TO 80% SAVINGS IN ENERGY AND WATER CONSUMPTION



### 90% REDUCTION ON CO<sub>2</sub> EMISSIONS



## KNOW MORE ABOUT STABILIZATION

### Tartaric Stabilization

#### HOW TO TEST FOR TARTARIC INSTABILITY?

The most accurate test, and the reference test in the United States, is the mini-contact test. It measures the drop in conductivity for a 20 minute period after a sample has been cooled to 0°C and seeded with potassium bitartrate crystals. The wine is considered cold stable if  $\Delta\mu S < 3\%$ .

#### WHY LOOK AT ALTERNATIVE METHODS TO STABILIZE WINE?

Traditional tartrate stabilization methods such as cooling, contact seeding and electro dialysis prevent precipitation by separating unstable ions or salts from wine. These methods are expensive, require copious amounts of water and energy, impact organoleptic qualities of wine and might require more time than anticipated. Enartis offers superior alternatives to traditional methods of tartrate stabilization. The use of colloidal stabilizers helps speed-up wine preparation, respects wine sensory properties, removes the need for refrigeration and reduces production costs and wine losses.

	Traditional Method (Chilling)	Physical Treatments	Additive Methods (CMC, Arabic Gum, Mannoproteins, Zenith®)
TARTARIC STABILITY	★★★★	★★★★	★★★★
COST	★★★	★★★★★★★	★
TIME FOR TREATMENT	★★★★★★	★★	★
LABOR	★★★★	★★	★
ENERGY AND WATER CONSUMPTION	★★★★	★★★	0
WINE QUALITY	---	★	★

#### HOW COLLOIDAL STABILIZERS WORK?

Colloidal stabilizers work by inhibiting the nucleation and growth of tartrate crystals, thus preventing their precipitation. Nothing is removed from the wine; the crystallization process is simply disrupted for efficient long-term cold stability.

#### WHICH PRODUCTS CAN BE USED TO COLD STABILIZE WINE?

**Citrogum®** is effective in wines that show a 3-7% conductivity change after mini-contact testing. It has a positive impact on the palate, enhancing mouthfeel and flavor intensity.

**Cellogum L** and **Cellogum LV 20** are effective in wines with up to 20% conductivity change after mini-contact testing and have no organoleptic impact.

**Enartis Stab CLK+** has variable effectiveness on wine stabilization and increases roundness, volume and sweetness.

**Cellogum Mix** can stabilize wines with up to 20% conductivity change after mini-contact testing and enhances roundness and volume sensations.

**Enartis Stab Mega** combines the action of all three stabilizers: CMC, Arabic gum and mannoproteins. It can achieve both cold and color stability of moderately unstable red wines.

**Zenith® Uno** can stabilize wines with very high tartaric instabilities (up to 30% conductivity change) without impacting other wine components and mouthfeel.

**Zenith® Color** corrects tartrate and color instabilities. It is effective in wines with very high instabilities (up to 30% conductivity change).

	CELLOGUM L	CELLOGUM LV 20	CITROGUM	CLK+	STAB MEGA	ZENITH® UNO	ZENITH® COLOR
TARTARIC STABILITY	★★★	★★★	★★	★★	★★★	★★★	★★★
LENGTH	★★★	★★★	★★★	★★	★★★	★★★	★★★
FILTERABILITY	★★	★★★	★★★	★	★	★★★	★★★
COLOR STABILITY	-	-	0	★	★★	0	★★★
COLLOIDS STABILITY	---	---	0	0	0	0	
MOUTHFEEL	0	0	★	★★	★	0	★

#### HOW DO I DETERMINE THE DOSAGE RATE?

Zenith® doesn't need to be tested before addition: 100 mL/hL for Zenith® Uno and 200 mL/hL for Zenith® Color. The other colloidal stabilizers need to be tested to determine the dosage required and assure the efficacy of treatment. Another reason is due to possible interactions between CMC and residual proteins in wine, leading to the formation of undesirable hazes. **Vinquiry Laboratories by Enartis USA** offers testings to determinate the effectiveness and the appropriate dosage of CMC on a specific wine to reach stability.

#### CAN I ADD A COLLOIDAL STABILIZER TO WINE BEFORE CROSSFLOW FILTRATION?

If used prior to crossflow filtration, these colloids can damage the membranes of your equipment. Furthermore, we recommend doing the addition when wines are ready to be bottled with a turbidity of <1 NTU.

#### WHAT IS THE MAXIMUM DOSAGE APPROVED BY THE TTB FOR CMC AND GUM ARABIC ADDITION?

TTB limits are 16 lb/1,000 gal (1.92 g/L) of pure Gum Arabic and 0.8% of wine volume for CMC.

## WHAT ARE THE REQUIREMENTS FOR ADDING STABILIZING COLLOIDS TO A WINE?

Prior to the addition of Zenith®, Citrosum®, Cellogum L, Cellogum LV 20, Cellogum Mix and CLK+, we recommend wines be:

- Heat stable
- Have a turbidity <1 NTU
- Have a Filterability Index (FI) <12, (filterable)
- Colloid stable (for CMC use)

## HOW STABLE ARE THESE PRODUCTS ONCE ADDED TO WINE?

Zenith®, Citrosum®, Cellogum L, Cellogum LV 20 and Cellogum Mix are not hydrolyzable in wine, therefore they are excellent choices for long-term stability.

## HOW MUCH SO<sub>2</sub> CAN THE ADDITION OF A LIQUID STABILIZER IMPART TO WINE?

An addition of 100 mL/hL can increase the SO<sub>2</sub> of wine by 2 ppm.

## Protein Stabilization

### WHERE DO WINE PROTEINS COME FROM?

Most proteins found in wine come from grapes. Their content in grapes varies with vintage, grape variety, soil, climate and vineyard practices.

### TESTING FOR PROTEIN STABILITY

One of the reference tests used to evaluate heat stability is the Heat Test:

Filter 20 mL through a 0.45 micron membrane and measure turbidity (T1). Place wine in a water bath at 60°C for 24 hours. Allow sample to cool to room temperature and measure turbidity again (T2). The wine is considered protein stable if T2-T1 < 2.

### HOW TO PROTEIN STABILIZE A WINE

Unstable proteins are commonly removed using bentonite. Protein stability can be improved from the earliest stages of winemaking using tannins, enzymes with side protease activity and mannoproteins, thus reducing bentonite treatments and consequently preserving better aromatic quality.

### HOW TO FIND THE APPROPRIATE DOSAGE OF BENTONITE TO ACHIEVE STABILITY

**Bentonite Fining Trials** offered by Vinqury Laboratories by Enartis USA determine the amount of bentonite needed to stabilize a wine.

### CAN BLENDING TWO PROTEIN-STABLE WINES COMPROMISE FINAL STABILITY?

Yes. Even small changes in alcohol content, pH and colloid composition can significantly modify protein solubility leading to protein instability. A new test of the final blend must be conducted and additional fining may be needed.

Enartis has developed a program dedicated to the improvement of wine shelf life that helps to prevent premature ageing when wine is stored for a prolonged period of time before or after bottling.

#### What is premature ageing?

Mainly caused by oxidation, premature ageing in wine, is characterized by browning, pinking, loss of varietal and fresh aromas and loss of complexity, balance, identity and terroir.

#### What is pinking?

Pinking is when white or rosé wines turn pink after bottling. Pinking, caused by phenolic instability, may occur in conjunction with rapid exposure to air during bottling. Certain varieties, and especially wines made under reductive winemaking techniques, are prone to these alterations, and in most cases these changes are not reversible.

#### How can we predict the oxidative sensitivity of a wine?

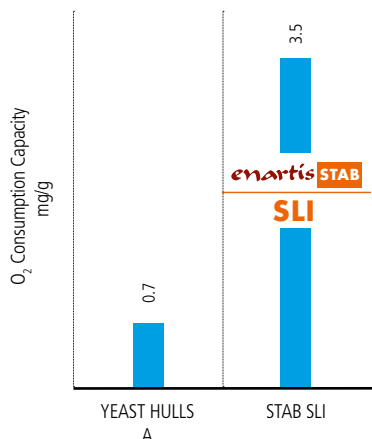
Vinquiry Laboratories by Enartis USA offers several tests to understand the oxidative sensitivity of a wine.

- **The Pinking Potential** test evaluates the presence of precursors that can lead to color issues in the bottle, particularly for white and rosé wines.
- **The Oxidative Stability** test evaluates the sensitivity of wine to oxidation and browning.
- **The CaOX** indicates the antioxidant capacity of a wine, its resistance to oxidation and its ageing potential.

#### What is redox potential?

Redox reactions involve the transfer of electrons from a reductant to an oxidant. Redox potential refers to the tendency to gain or yield electrons of a specific atom, molecule or solution.

Wine redox potential is impacted by its composition (phenolic compounds, metals compounds, ethanol, pH...), its "life story," the presence of microorganisms and lees ageing. During ageing, the redox potential of wine tends to increase, which facilitates and increases the risk of oxidation. Stabilizing redox potential is an essential key to 'slow down' oxidation reactions and preserve young, vibrant, fresh and stable wine over time.



Enartis STAB SLI, selected for its affinity with O<sub>2</sub>, consumes more dissolved O<sub>2</sub> than any other yeast hulls.

## Other Stabilizing Agents

### CITROSTAB rH

- Citric acid, ascorbic acid, potassium metabisulfite and gallic tannins.
- Balanced formulation to stabilize wine redox potential and prevent post-bottling oxidation reactions.
- Protects bottled wine from oxidation alteration: pinking, and atypical ageing.

**Recommendations:** Stabilize wine redox potential; prevent browning; prevent light-stuck; antioxidant; prevent pinking.

**Dosage:** 50 g/hL (4.2 lb/1,000 gal)

**1 Kg (Item #35-760-0001) \$ 25.00**

### ENARTIS STAB SLI

- Yeast derivatives, PVPP and untoasted tannins.
- Prevents degradation and oxidation of wine aroma during storage.
- High capacity for consuming dissolved oxygen, lowers wine redox potential and protects from oxidation and browning.
- Extends wine shelf life.

**Tip:** Highly recommended to protect wines that have been clarified, filtered and eventually stabilized.

**Recommendations:** Antioxidant; stabilize wine redox potential; prevent browning; prevent pinking.

**Dosage:** 20-40 g/hL (1.7-3.4 lb/1,000 gal)

**2.5 Kg (Item #35-763-0001) \$ 137.50**

**10 Kg (Item #35-763-0010) \$ 500.00**



Control (left) and Enartis STAB SLI (right) in both images (Chardonnay, Grenache rosé). Picture six months after shelf ageing. Control is oxidized and brown. Enartis STAB SLI protected wine and kept it fresh, vibrant and young.



To optimize each stage of sparkling wine production and provide winemakers quality tools, Enartis has developed the Perlage range. These products are designed to fill the specific needs of sparkling wine production, whether made by traditional or modern methods. Vinquiry Laboratories by Enartis USA offers services to help winemakers adapt the production process and improve sparkling wine quality.

## Yeast

Key words for alcoholic fermentation in sparkling winemaking are “complete” and “clean.” Base wine must have good fermentation capacity, no residual toxins from the first fermentation, low free  $SO_2$  (<15 ppm), low VA, low total  $SO_2$ , low residual  $CO_2$  and low alcohol (<11.5%).

Specific resistant yeast should be used for the “prise de mousse.” At this stage, the choice of yeast will define the wine’s personality. Our sparkling-specific yeasts have the criteria required to produce high-quality sparkling wine.

### ENARTIS FERM PERLAGE D.O.C.G

Used for primary fermentation of base wines and *prise de mousse* in pressure tanks, it assures a regular and complete fermentation. It produces very clean wines characterized by delicate white fruit aromas, low volatile acidity and an elegant palate.

**Recommendations:** Base wine; *prise de mousse*; pressure tank; Charmat method; clean aromas; elegant.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal)

0.5 Kg (Item #45-182-0500) \$ 39.00

### ENARTIS FERM PERLAGE FRUITY

In addition to ensuring a complete and clean fermentation, this yeast strain is used to produce ‘modern’ style base white with intense aromas of fresh fruit. It releases a large amount of mannoproteins during *sur lies* ageing that improve mouthfeel and color stability.

**Recommendations:** White, rosé and red sparkling base wines; aromatic sparkling wines; *prise de mousse*; pressure tank; Charmat method.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal)

0.5 Kg (Item #45-181-0500) \$ 39.00

### ENARTIS FERM ES PERLAGE

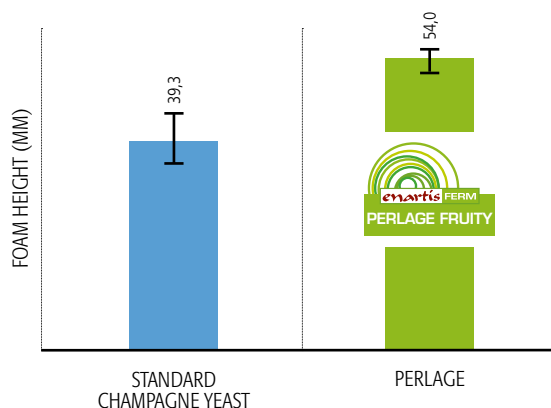
Yeast selected for the production of traditional method sparkling wines. Resistant to extreme conditions such as pressure, high °Brix, high alcohol content, low pH and low temperatures, it produces elegant, delicate and clean wines. It respects varietal and terroir characteristics.

**Recommendations:** High quality base wines; *prise de mousse*; traditional method; Charmat method; white and rosé wines.

**Dosage:** 20-40 g/hL (1.7-3.3 lb/1,000 gal).

0.5 Kg (Item #45-180-0500) \$ 39.40  
10 Kg (Item #45-180-0010) \$ 485.00

#### YEAST IMPACT ON FOAM HEIGHT



Enartis FERM ES PERLAGE during “prise de mousse” improves the foaming capacity of wine.

## Fermentation Polysaccharides

Yeast mannoproteins in sparkling wines are used to amplify natural lees effects. Yeast autolysis and natural release of mannoproteins in wine is a very slow process. Using Enartis Pro Perlage increases the amount of mannoprotein released in wine and improves wine balance, roundness, volume, foaming capacity and antioxidant capacity.

### ENARTIS PRO PERLAGE

- Yeast cell walls rich in antioxidant sulfur peptides. Releases a large quantity of readily-soluble mannoproteins.
- Ensures antioxidant protection and protects aromas and color.
- Improves colloidal, protein and tartrate stability and foaming properties
- Increases shelf life of base wines and protects wine during storage before second fermentation.
- Produces fresh, round and balanced sparkling base wines.

**Recommendations:** Antioxidant; aroma protection; improve mouthfeel; improve foaming properties; protect base wine during storage.

**Dosage:** 20-50 g/hL (1.7-4.2 lb/1,000 gal)

**1 Kg (Item #35-418-0001) \$ 80.00**

## Yeast Nutrition

### NUTRIFERM PDC

- Amino acids, vitamins (thiamine), mineral salts, oligo-elements and survival factors.
- Specific nutrient for *pied de cuve* preparation, it provides essential elements for yeast to survive and ferment in difficult conditions.
- Stimulates yeast growth and shortens lag phase.
- Prevents formation of H<sub>2</sub>S and acetic acid.

**Usage:** Dissolve in 10 times its weight of water and add during preparation of *pied de cuve*.

**Dosage:** 2 g/g of yeast

**1 Kg (Item #35-209-0001) \$ 40.00**

### NUTRIFERM PDC AROM

- Amino acids, vitamins, mineral salts and micro-nutrients.
- Specific nutrient for *pied de cuve* preparation, it provides essential elements for yeast to survive and ferment in difficult conditions.
- High content of selected amino acids used by yeast as precursors of aromatic compounds to increase intensity, freshness and complexity.
- Stimulates yeast growth and shortens lag phase.
- Prevents formation of H<sub>2</sub>S and acetic acid.

**Tip:** Recommended for the production of aromatic and fruity sparkling wines in combination with Enartis Ferm Perlage Fruity.

**Usage:** Dissolve in 10 times its weight of water and add during preparation of *pied de cuve*.

**Dosage:** 2 g/g of yeast

**1 Kg (Item #35-207-0001) \$ 45.00**

### NUTRIFERM GRADUAL RELEASE

- Innovative nutrient composed of DAP, gallic tannin and untoasted oak tannins.
- Specific packaging that controls the release of its content during fermentation. Due to the particular permeability of the bag, yeast nutrients are gradually released into fermenting must. Release begins at the end of yeast growth phase and continues for up to 8 days.
- Ensures complete fermentation, prevents H<sub>2</sub>S production, prevents stuck or sluggish fermentation and improves aromatic cleanliness.
- Facilitates nutrition management by limiting cellar operations.

**Recommendations:** Barrel fermentation; tank fermentation; Charmat method.

**Usage:** Anchor bag to bottom of tank or to barrel bung before filling.

**Dosage:** 20-30 g/hL (1.7-2.4 lb/1,000 gal)

**0.5 Kg (Item #35-216-0500) \$ 25.00**

**1 Kg (Item #35-216-0001) \$ 45.00**

**5 Kg (Item #35-216-0005) \$ 150.00**

### NUTRIFERM TIRAGE

- Complex nutrient containing DAP and yeast cell walls rich in sterols and phospholipids.
- Specific yeast nutrient for second fermentation.
- Supplies yeast with essential nitrogen elements and survival factors needed for second fermentation.
- Ensures a complete and regular fermentation in both traditional and Charmat methods.

**Usage:** Dissolve in 10 times its weight of water and add to wine before tirage or second fermentation.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000gal) in base wine

**1 Kg (Item #35-208-0001) \$ 40.00**

## NUTRIFERM REVELAROM

- Complex nutrient containing DAP, purified yeast cell walls and copper salts.
- Specific yeast nutrient for second fermentation.
- Supplies yeast with essential nitrogen elements and survival factors needed for second fermentation, even in difficult conditions.
- Prevents formation of H<sub>2</sub>S, sulfur compounds and off-flavors.

**Tip:** 10 g/hL of Nutriferm Revelarom gives 0.5 ppm of copper.

**Usage:** Dissolve in 10 times its weight of water and add to wine before tirage or second fermentation.

**Dosage:** 5-15 g/hL (0.4-1.3 lb/1,000 gal) in base wine

**1 Kg (Item #35-206-0001) \$ 25.00**

*"To be able to ensure a fast, clean and complete secondary fermentation in sparkling wine production is key to a successful bottle of bubbles. Nutriferm Revelarom is a fantastic product and I would recommend it to anyone who makes sparkling wine!" - Matthew Iaconis, Winemaker, Brick&Mortar Wines, CA*

## Fining Agents for Juice and Base Wine

It is important to consider the quality variations from press juices to choose and adapt the winemaking process. Removal of undesired elements present in juice (solids, polyphenols, color, proteins, lipids...) before starting fermentation is fundamental.

Enartis developed fining agents specific for sparkling wine production that remove unwanted elements while respecting foaming properties.

### PROCLAIR BC

- Bentonite, PVPP and cellulose.
- Eliminates oxidases and polyphenols responsible for oxidation.
- Improves protein stability while respecting foaming capacity.
- Increases freshness and shelf life of base wines.

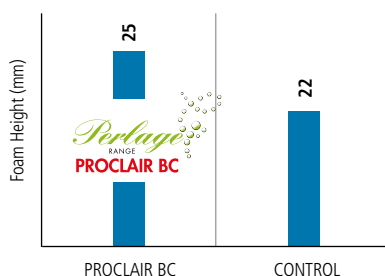
**Recommendations:** Juice clarification; protein stability; freshen base wine; respect foaming properties

**Dosage:** 30-150 g/hL (2.4-12.6 lb/1,000 gal)

**1 Kg (Item #35-671-0001) \$75.00**

**10 Kg (Item #35-671-0010) \$ 650.00**

EFFECT OF PROCLAIR BC ON FOAMING PROPERTIES OF SPARKLING BASE WINE



Fining with Proclair BC improves foaming properties of sparkling base wines and increases foam height. The foam height, criterion of quality in sparkling wine is measured with Mosalux.

## ENOBLOCK PERLAGE

- Enological activated carbon in pellet form (reduces spread of carbon dust).
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

**Recommendations:** Decolorizing; juice; base wine; treat oxidation.

**Usage:** Disperse in small amount of water or directly in wine. Keep in suspension for 15-20 minutes.

**Dosage:** 5-100 g/hL (0.4-8.3 lb/1,000 gal)

**1 Kg (Item #35-701-0001) \$ 30.00**

**15 Kg (Item #35-701-0015) \$ 375.00**



## CLAIRPERLAGE UNO

- Selected bentonites and plant proteins.
- Highly effective in removing unstable proteins while preserving mannoprotein content and wine foaming properties.
- Improves clarity and eliminates components that have negative effect on foam.

**Recommendations:** Base wine; clarification; protein stability; respect foaming properties; lees compaction; allergen-free.

**Usage:** Dissolve in 20 times its weight of warm water. Allow to swell 3-6 hours. Stir constantly during addition.

**Dosage:** 20-100 g/hL (1.7-8.3 lb/1,000 gal)

**10 Kg (Item #35-673-0010) \$ 80.00**

## CLAIRPERLAGE DUE

- PVPP, plant protein and silica.
- Prevents and treats oxidation notes in juice and sparkling base wines.
- Eliminates polyphenols responsible for oxidation, bitterness and brown color.

**Recommendations:** Prevent oxidation; treat oxidation; freshen base wine; respect foaming properties.

**Usage:** Sprinkle directly over must or wine surface during pump-over. Stir constantly during addition.

**Dosage:** 15-40 g/hL (1.3-3.3 lb/1,000 gal)

1 Kg	(Item #35-672-0001)	\$ 45.00
10 Kg	(Item #35-672-0010)	\$ 500.00

## Bottle Clarification - Riddling Agents

### CLAIRBOUTEILLE P

- Powdered riddling agent containing blend of selected bentonites.
- Improves clarity of sparkling wines produced with traditional method and compacts lees.
- Prevents yeast adhesion to bottle walls during ageing.
- Reduces processing time for automatic and manual riddling.

**Recommendations:** Riddling agent; automatic and manual riddling; clarification; compact lees.

**Usage:** Dissolve in 30 times its weight of cold water. Allow to swell for 24-48 hours. Add homogeneously to pied de cuve. Stir constantly during addition and keep in suspension for 30 minutes.

**Dosage:** 3-5 g/hL (0.25-0.4 lb/1,000 gal)

0.5 Kg	(Item #30-208-0500)	\$ 62.50
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### ENARTIS TAN CLAIRBOUTEILLE

- Gallic and ellagic tannins used as riddling agent.
- Improves clarification, compacts lees.

**Tip:** When used in combination with Clairbouteille P, Enartis Tan Clairbouteille helps with clarification in bottle and formation of compact lees.

**Recommendations:** Riddling agent; clarification.

**Dosage:** 1-4 g/hL (0.08-0.3 lb/1,000 gal)

1 Kg	(Item #35-316-0001)	\$ 55.00
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## Wine Sensory Improvement

Enartis developed a range of products designed for the production of sparkling wines to "fine-tune," customize and improve the wine profile to meet the needs of each market: softness, mouthfeel, elegance and finesse, foam quality, freshness or aromatic complexity. These products can be added during tirage or with the liqueur d'expédition, at disgorgement.

Before using any finishing products, we recommend setting up bench trials (See page 81 for Preparing Lab Bench Trials).

### SURLI MOUSSE

- Yeast cell walls rich in readily-soluble mannoproteins.
- Improves foaming capacity, bubble persistence and quality of sparkling wines.
- Enhances natural sensation of volume and roundness, builds mid-palate and improves aromatic complexity.

**Recommendations:** Improve foaming properties; increase roundness; complexity; lees ageing; Charmat method; traditional method; white, rosé and red sparkling wines.

**Dosage:** 10-15 g/hL (0.8-1.3 lb/1,000 gal)

1 Kg	(Item #35-421-0001)	\$ 170.00
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### SURLITAN PERLAGE

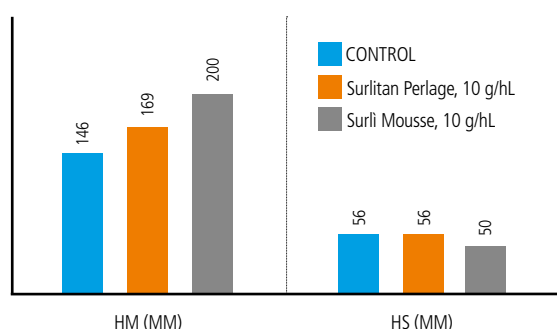
- Yeast derivatives rich in readily-soluble mannoproteins and gallic tannins.
- Made for “thin” wines to improve structure and length.
- Improves bubble persistence while limiting the production reductive notes during second fermentation.

**Recommendations:** Structure; volume and roundness; improve foaming properties; improve wine ageing potential; prevent reductive notes.

**Dosage:** 5-20 g/hL (0.4-1.7 lb/1,000 gal)

1 Kg (Item #35-422-0001) \$ 85.00

EFFECT ON FOAMING CAPACITY



SURLI MOUSSE and SURLITAN PERLAGE both improve foaming capacity of base wine. Additionally, they increase roundness, volume and structure.

### ENARTIS TAN TRG

- Condensed tannins from grapes and ellagic tannins extracted from medium-toasted oak.
- Reinforces wine structure, builds up mid-palate and increases wine ageing potential.
- Protects aroma from premature ageing and prevents production of sulfur compounds during second fermentation.

**Recommendations:** Prevent reductive notes; structure; improve wine ageing potential.

**Dosage:** 0.5-8 g/hL (0.04-0.6 lb/1,000 gal)

1 Kg (Item #35-322-0001) \$ 290.00

### ENARTIS TAN FINESSE

- Condensed tannins extracted from exotic species of wood.
- Improves sparkling wine harmony and aromatic quality.
- Reduces herbaceous notes in base wines.

**Tip:** Enartis Tan Finesse can be added to base wine for prise de mousse or at disgorging.

**Recommendations:** Reduce herbaceous notes; elegant wines; clean aromas; complexity.

**Dosage:** 3-10 g/hL (0.25-0.8 lb/1,000 gal)

1 Kg (Item #35-317-0001) \$ 35.00

### ENARTIS TAN FRAGRANCE

- Condensed tannins extracted from red fruit tree wood.
- Extraction process preserves the aromatic precursors (terpenes and norisoprenoids) present in wood.
- Antioxidant, it protects wine aromas from oxidation and ageing.
- Berries, red fruit and floral aromas and improves wine complexity.

**Recommendations:** Antioxidant; fruity aromas; complexity; white, rosé and red sparkling wines.

**Dosage:** 1-8 g/hL (0.08-0.6 lb/1,000 gal)

1 Kg (Item #35-318-0001) \$ 250.00

### ENARTIS TAN STYLE

- Tannins extracted from untoasted oak.
- Aromatically neutral and very soft, it enhances wine roundness and structure.
- Prevents production of sulfur compounds during second fermentation.

**Tip:** Enartis Tan Style can be added to base wine for prise de mousse or at disgorging.

**Recommendations:** Prevent reductive notes; reduce off-flavors; balance structure; second fermentation; volume and roundness.

**Dosage:** 1-10 g/hL (0.08-0.8 lb/1,000 gal)

1 Kg (Item #35-321-0001) \$ 80.00

### ENARTIS TAN LAST TOUCH

- Tannins from oak and grape skins.
- Freshens and widens aromatic bouquet and wine complexity.
- Balances wine, increases aromatic persistence and opens wines for early consumption.

**Recommendations:** Sparkling wine; complexity; improve wine balance; freshen aromas.

**Dosage:** 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

1 Kg (Item #35-319-0001) \$ 595.00

## KNOW MORE ABOUT SPARKLING WINE PRODUCTION

### PERLAGE RANGE: WHICH PRODUCT FOR WHICH SPARKLING WINE STYLE?

	FRESH, FRUIT FORWARD, MODERN	AGED, CLASSIC, COMPLEX
ENARTIS FERM PERLAGE D.O.C.G	★	
ENARTIS FERM PERLAGE FRUITY	★	
ENARTIS FERM ES PERLAGE		★
ENARTIS PRO PERLAGE	★	
NUTRIFERM PDC		★
NUTRIFERM PDC AROM	★	
NUTRIFERM TIRAGE		★
NUTRIFERM REVELAROM	★	
PROCLAIR BC	★★	★
CLAIRPERLAGE UNO	★	★
CLAIRPERLAGE DUE	★	
ENARTIS TAN FINESSE	★	
ENARTIS TAN FRAGRANCE	★	
ENARTIS TAN STYLE	★	★
ENARTIS TAN LAST TOUCH		★

### PERLAGE RANGE: WHICH PRODUCT FOR WHICH PRODUCTION METHOD?

	TRADITIONAL METHOD	CHARMAT METHOD
ENARTIS FERM PERLAGE D.O.C.G	★	★★★
ENARTIS FERM PERLAGE FRUITY	★	★★★
ENARTIS FERM ES PERLAGE	★★★	★★★
NUTRIFERM PDC	★★★	★★★
NUTRIFERM PDC AROM	★	★★★
NUTRIFERM TIRAGE	★★★	★★★
NUTRIFERM REVELAROM	★	★★★
CLAIRPERLAGE UNO	★★★	★★★
CLAIRPERLAGE DUE	★★★	★★★
CLAIRBOUTEILLE P	★★★	
ENARTIS TAN CLAIRBOUTEILLE	★★★	
SURLI MOUSSE	★	★★★
SURLITAN PERLAGE	★★	★★★
ENARTIS TAN TRG	★★★	★
ENARTIS TAN FINESSE	★	★★★
ENARTIS TAN FRAGRANCE	★★	★★★
ENARTIS TAN STYLE	★	★★★
ENARTIS TAN LAST TOUCH	★★★	★★

### BEFORE STARTING SECOND FERMENTATION, A BASE SPARKLING WINE NEEDS TO BE PREPARED:

#### 1. Stabilization of Base Wine:

**Protein stability:** Vinquiry Laboratories offers **Bentonite Fining Trials** intended to determine the amount of bentonite needed to stabilize a specific wine. The degree of stability needs to be determined in context to the winemaker's goal, the future of the wine or consumer expectations.

**Malolactic bacteria control:** Good cellar hygiene, regular microbial monitoring, temperature, SO<sub>2</sub> and pH management are all important for microbial control. Even if still commonly used for microbial stability, sterile filtration reduces foaming capacity and foam quality by removing positively charged colloids. As an alternative to sterile filtration, **Enartis Stab Micro**, a pre-activated chitosan fining agent, reduces spoilage microbe populations, while maintaining excellent foaming capacity.

**Tartaric stabilization:** Using colloidal stabilizers such as Enartis Cellogum LV 20 allows winemakers to stabilize base wines, thus preventing crystallization during and after fermentation. To determine the appropriate dosage needed to stabilize wine after fermentation, Vinquiry Laboratories offer the **CMC Panel for Sparkling Wines**.

#### 2. Improve Foaming Capacity of Base Wine

Quality of sparkling wine is visually assessed by its color, bubble behavior and foam retention. The two main parameters that define mousse quality are bubble size and foam retention. Vinquiry Laboratories offers analysis that measures the **Foaming Capacity** of base wine using the unique and powerful Mosalux technology.

Foaming capacity can be improved by increasing the quantity of pro-foam agents such as colloids, mannoproteins and arabic gums or by reducing the quantity of anti-foam agents such as fatty acids with fining.

#### 3. Make Base Wine a Healthy Environment for Yeast

Before starting second fermentation, some parameters need to be checked in the base wine: No residual toxins from the first fermentation, low Free SO<sub>2</sub> (<15 ppm), low total SO<sub>2</sub>, low residual CO<sub>2</sub> and low alcohol (<11.5%).



## GENERAL TOOLS

### PREPARING LAB BENCH TRIALS

Bench trials are essential to determine proper dosing and the efficiency of a treatment (addition of fining agents, tannins or polysaccharides). To set-up bench trials, follow these steps:

- Prepare 1% (1g in 100 mL), 2% (2g in 100 mL) or 5% (5g in 100 mL) treatment solutions of the product to be tested:
  - For fining agents: prepare solution in water as recommended in the TDS.
  - For tannins and polysaccharides, use neutral alcohol-water solution (~13%).
  - For polysaccharides: prepare solution in water as recommended in the technical data sheet.
  - For liquid products: use solution as it is or dilute if necessary.
- Label each sample bottle. Keep one untreated sample as a control.
- Fill samples with wine and leave some space for the addition.
- Add the treatment solution. Refer to the tables below.
- Mix immediately after addition, top each bottle with wine and mix again.
- For fining agents: store in refrigerator for settling (usually 1-2 days). Let come to room temperature before evaluating.
- For tannins and polysaccharides: wines can be tasted immediately after addition.

### PRODUCT DENSITY

PRODUCT	DENSITY (kg/dm³)		
	MINIMUM	MAXIMUM	AVERAGE
AROMAGUM	1.095	1.105	1.1
CELLOGUM L	1.05	1.05	1.05
CELLOGUM LV 20	1.1	1.1	1.1
CITROGUM	1.095	1.105	1.1
CLARGEL	1.033	1.037	1.035
ENARTIS ZYM COLOR			1.12
ENARTIS ZYM QUICK			1.13
ENARTIS ZYM T-RED			1.13
FINEGEL	1.1	1.1	1.1
HYDROCLAR 20	1.1	1.1	1.1
HYDROCLAR 30	1.105	1.115	1.11
HYDROCLAR 45	1.155	1.165	1.16
MAXIGUM	1.095	1.105	1.1
SILFLOC	1.115	1.225	1.17
ZENITH® COLOR			1.107
ZENITH® UNO			1.05

### ADDITIONS WITH 1% SOLUTION

wine sample (mL)	50	100	125	375	750
rate (g/hL)					
5	0.3	0.5	0.6	1.9	3.8
7	0.4	0.7	0.9	2.6	5.3
15	0.8	1.5	1.9	5.6	11.3
20	1.0	2.0	2.5	7.5	15.0

### ADDITIONS WITH 2% SOLUTION

wine sample (mL)	50	100	125	375	750
rate (g/hL)					
25	0.6	1.3	1.6	4.7	9.4
30	0.8	1.5	1.9	5.6	11.3
40	1.0	2.0	2.5	7.5	15.0
50	1.3	2.5	3.1	9.4	18.8

### CONVERSION CHARTS

#### TEMPERATURE CONVERSIONS

$C^{\circ} \text{ to } F^{\circ} = (C^{\circ} \times 9/5) + 32$	$F^{\circ}$	0	32	40	50	60	70	80	90	100	110	120
$F^{\circ} \text{ to } C^{\circ} = (F^{\circ} - 32) \times (5/9)$	$C^{\circ}$	-18	0	4	10	16	21	27	32	38	44	49

#### WEIGHT EQUIVALENTS

1.0 Kg	1000 g	2.2 lbs
1.0 g	1000 mg	
1.0 mg	1000 µg	
1 lb	454 g	16 oz
1 oz	28.35 g	
1 ton	2000 lbs	907 Kg

#### VOLUME EQUIVALENTS

1 mL	1000 µL	
1 oz	29.6 mL	
1 L	1000 mL	33.8 oz
1 hL	100 L	26.4 gal
25 hL	660 gals	
1 gal	3.78 L	128 oz

#### WEIGHT/VOLUME EQUIVALENTS

1 lb/1000 gal	0.12 g/L
	120 ppm
	12 g/hL
1 g/hL	37.8 g/1000 gal
	0.084 lb/1000 gal

#### VOLUME/VOLUME EQUIVALENTS

1 mL/L	100 mL/hL
	3780 mL/ 1000 gal
	3.78 L/ 1000 gal

## THE WINE DOCTOR BY ENARTIS

Below are product recommendations for correcting common wine defects. To evaluate the effects these products and determine the optimum dosage, we highly recommend setting up bench trials. (See page 81 for Preparing Lab Bench Trials).

Depending the time available for treatment, we would recommend different products:



### FRESHEN WHITE OR ROSÉ WINES

- Fining with Claril SP, Protoclar, Stabyl PVPP
- Enartis Tan Fresh Fruit, Tan Citrus, Unico #3

### TREAT/PROTECT AGAINST OXIDATION IN WHITE AND ROSÉ WINES

- Fining with Claril SP, Protoclar, Claril HM, Claril QY
- Unico #3, Enartis Tan SLI
- Enartis Stab SLI during ageing
- Aromagum pre-bottling

### INCREASE VOLUME AND ROUNDNESS OF WHITE OR ROSÉ WINES

- Surli One, Surli Elevage during ageing
- Surli Velvet, Surli Vitis Plus pre-bottling
- Citrogum, Citrogum Plus, Maxigum pre-bottling

### ENHANCE AROMATIC COMPLEXITY IN WHITE OR ROSÉ WINES

- Enartis Tan Elegance, Tan SLI, Tan Max Nature, Tan Uvaspeed

### BALANCE ASTRINGENCY AND BITTERNESS FROM WHITE OR ROSÉ WINES

- Fining with Finecol, Finegel, Goldenclar Instant, Claril SP
- Surli One, Surli Elevage during ageing
- Surli Velvet, Surli Vitis Plus pre-bottling
- Citrogum, Citrogum Plus, Maxigum pre-bottling

### COLOR CORRECTION OF WHITE OR ROSÉ WINES

- Black PF, Enoblack Perlage, Enoblack Super, Stabyl PVPP

### INCREASE STRUCTURE OF RED WINES BEFORE AGEING

- Enartis Tan E, Tan V, Tan Fruitan, Tan Skin, Tan Uva

### INCREASE FRUITINESS IN RED WINES

- Tan Total Fruity, Tan Microfruit, Tan Uvaspeed, Tan Skin, Tan Uva, Unico #2

### TREAT/PREVENT OXIDATION AND FRESHEN RED WINES

- Fining with Claril QY, Protoclar
- Enartis Tan Total Fruity, Tan SLI, Tan Microfruit, Tan Uvaspeed, Tan Skin, Tan Uva, Unico #2

### INCREASE OAK AROMAS AND COMPLEXITY IN RED WINES

- Incanto Oak Chips with four weeks of contact time
- Enartis Tan Extra, Tan Napa, Tan Coeur de Chene, Tan Vanilla, Tan Toffee, Tan Dark Chocolate, Unico #1

### SOFTEN HARSH TANNIN PROFILE IN RED WINES

- Fining with Hydroclar 45, Hydroclar 30, Goldenclar Instant, Claril QY, Protoclar
- Surli One, Surli Elevage during ageing
- Surli Velvet pre-bottling
- Citrogum, Citrogum Plus, Maxigum pre-bottling

### CORRECT GREEN CHARACTERS IN RED WINES

- Enartis Tan Max Nature, Tan SLI, Tan Napa, Tan Coeur de Chene, Tan Vanilla, Tan Toffee, Unico #1
- Surli One, Surli Elevage during ageing
- Surli Velvet, Surli Vitis Plus pre-bottling
- Citrogum, Citrogum Plus, Maxigum pre-bottling

### REMOVE SMOKE TAINT OR BITTER, ASH AFTERTASTE

- Fining with Claril QY, Enartis Stab Micro M, Fenol Free
- Surli One, Surli Elevage during ageing
- Citrogum, Citrogum Plus, Maxigum pre-bottling

### TREAT REDUCTIVE CHARACTERS

- Aeration during fermentation can volatilize some low boiling point sulfur compounds such as H<sub>2</sub>S, however, also produce disulfides and heavy sulfur compounds
- Fining with Copper Sulfate, Neoclar AF, Enartis Stab Micro M
- Tan Max Nature, Tan SLI, Tan Elevage

### ANTIFOAM, FOOD GRADE

250 mL	(Item #30-026-0237)	\$ 24.00
500 mL	(Item #30-026-0437)	\$ 33.00
1 L	(Item #30-026-0946)	\$ 49.00

### ASCORBIC ACID POWDER, FOOD GRADE

1 lb	(Item #30-014-0001)	\$ 9.00
25 Kg	(Item #30-014-0050)	\$ 400.00

### CITRIC ACID, FOOD GRADE

1 lb	(Item #30-036-1050)	\$ 6.00
50 lb	(Item #30-036-0050)	\$ 110.00

### COPPER SULFATE CRYSTALS, FOOD GRADE

(CuSO<sub>4</sub> • 5H<sub>2</sub>O)

50 g	(Item #10-057-0050)	\$ 21.00
100 g	(Item #10-057-0100)	\$ 37.00
500 g	(Item #10-057-1500)	\$ 46.00

### MALIC ACID POWDER, FOOD GRADE

1 lb	(Item #30-037-0001)	\$ 11.00
50 lb	(Item #30-037-0050)	\$ 150.00

### DIAMMONIUM PHOSPHATE (DAP)

1 lb	(Item #30-015-0000)	\$ 3.00
50 lb	(Item #30-015-0055)	

Please inquire for pricing.

### POTASSIUM BITARTRATE POWDER

FOOD GRADE

1 lb	(Item #30-130-0001)	
25 Kg	(Item #30-130-0050)	

Please inquire for pricing.

### POTASSIUM CARBONATE

1 lb	(Item #30-020-0000)	\$ 4.25
25 Kg	(Item #30-020-0025)	\$ 168.75

### TARTARIC ACID

FOOD GRADE

1 lb	(Item #30-038-0001)	
25 Kg	(Item #30-038-0025)	

Please inquire for pricing.

### WINY-POTASSIUM METABISULFITE

1 Kg	(Item #35-820-0001)	\$ 4.50
25 Kg	(Item #35-820-0025)	\$ 72.50

## NOTES ON SHIPPING CHEMICALS

Most items in our catalog are in stock and will be shipped within 24 hours. Materials considered hazardous to ship are marked with a ● symbol in the catalog. They may have limitations on their shipment and are subject to shipping surcharge. Call our main office for details (707) 838-6312.

Product	Volume	Item	Price	Product	Volume	Item	Price
● ACID NEUTRALYSER, Kolorsafe	1 L	10-277-0946	\$ 35.00	● HYDROCHLORIC ACID, 37%	2.5 L	10-121-2500	\$ 150.00
● ALCOHOL, ISOPROPYL 70%	4 L	10-009-4000	\$ 76.00	HYDROGEN PEROXYDE, 15%	250 mL	10-123-0237	\$ 31.00
ALCOHOL, REAGENT ANHYDROUS, 95%	250 mL	10-010-0237	\$ 19.00	HYDROGEN PEROXYDE, 15%	500 mL	10-123-0473	\$ 51.00
ALCOHOL, REAGENT ANHYDROUS, 95%	500 mL	10-010-0473	\$ 28.00	● HYDROGEN PEROXYDE, 15%	1 L	10-123-0946	\$ 82.00
● ALCOHOL, REAGENT ANHYDROUS, 95%	1 L	10-010-0946	\$ 40.00	HYDROGEN PEROXYDE, 3%	250 mL	10-122-0237	\$ 11.75
● ALCOHOL, REAGENT ANHYDROUS, 95%	4 L	10-010-4000	\$ 126.00	HYDROGEN PEROXYDE, 3%	500 mL	10-122-0473	\$ 16.00
ANTIFOAM B, LABORATORY USE	60 mL	10-013-0060	\$ 31.50	HYDROGEN PEROXYDE, 3%	1 L	10-122-0946	\$ 22.00
ANTIFOAM B, LABORATORY USE	500 mL	10-013-0473	\$ 160.00	HYDROGEN PEROXYDE, 30%	250 mL	10-124-0237	\$ 46.00
ASCORBIC ACID POWDER FOOD GRADE	100 g	10-014-0100	\$ 18.50	● HYDROGEN PEROXYDE, 30%	500 mL	10-124-0473	\$ 85.00
ASCORBIC ACID POWDER FOOD GRADE	250 g	10-014-0250	\$ 36.00	IODIDE/IODATE SOLUTION, 0.0156N (N/64)	1 L	10-130-0946	\$ 37.00
ASCORBIC ACID POWDER FOOD GRADE	500 g	10-014-0500	\$ 51.50	IODIDE/IODATE SOLUTION, 0.02 N	1 L	10-130-1946	\$ 28.00
BOILING CHIPS, 80Z		10-059-0001	\$ 46.00	IODINE, 0.0156N (N/64)	1 L	10-129-0946	\$ 26.00
BUFFER SOLUTION pH 10	500 mL	10-033-0473	\$ 49.00	IODINE, 0.02N	250 mL	10-127-0237	\$ 12.00
BUFFER SOLUTION pH 3	500 mL	10-028-0473	\$ 50.00	IODINE, 0.02N	500 mL	10-127-0473	\$ 15.50
BUFFER SOLUTION pH 4	250 mL	10-029-0237	\$ 14.50	IODINE, 0.02N	1 L	10-127-0946	\$ 21.50
BUFFER SOLUTION pH 4	500 mL	10-029-0473	\$ 17.50	IODINE, 0.1 N	250 mL	10-128-0237	\$ 15.00
BUFFER SOLUTION pH 4	1 L	10-029-0946	\$ 22.50	IODINE, 0.1 N	500 mL	10-128-0473	\$ 22.50
BUFFER SOLUTION pH 7	250 mL	10-031-0237	\$ 14.50	IODINE, 0.1 N	1 L	10-128-0946	\$ 35.00
BUFFER SOLUTION pH 7	500 mL	10-031-0473	\$ 17.50	LAB CLEANER	1 L	10-153-0946	\$ 36.00
BUFFER SOLUTION pH 7	1 L	10-031-0946	\$ 22.50	METHYLENE BLEU, REDUCING SUGAR, 1%	60 mL	10-195-0060	\$ 12.00
CALCIUM CHLORIDE DESICCANT	50 g	10-037-0050	\$ 31.00	METHYLENE BLEU, YEAST VIABILITY STAIN	60 mL	10-194-0060	\$ 16.80
CALCIUM CHLORIDE DESICCANT	200 g	10-037-0200	\$ 60.00	PHENOLPHTHALEIN, 1%	60 mL	10-204-0060	\$ 12.60
● CHROMATOGRAPHY SOLVENT	500 mL	10-043-0473	\$ 62.50	PHENOLPHTHALEIN, 1%	250 mL	10-204-0237	\$ 18.75
COPPER SULFATE, 1%	250 mL	10-054-0237	\$ 10.50	PHOSPHORIC ACID, 25%	250 mL	10-205-0237	\$ 12.50
COPPER SULFATE, 1%	500 mL	10-054-0473	\$ 14.50	PHOSPHORIC ACID, 25%	500 mL	10-205-0473	\$ 18.50
COPPER SULFATE, 1%	1 L	10-054-0946	\$ 19.00	● PHOSPHORIC ACID, 25%	1 L	10-205-0946	\$ 33.50
COPPER SULFATE, 10%	250 mL	10-055-0237	\$ 13.00	● PHOSPHORIC ACID, 85%	2.5 L	10-206-2500	\$ 200.00
COPPER SULFATE, 10%	500 mL	10-055-0473	\$ 17.50	POTASSIUM BITARTRATE, REAGENT GRADE	100 g	10-207-0010	\$ 28.00
COPPER SULFATE, 10%	1 L	10-055-0946	\$ 24.00	POTASSIUM BITARTRATE, REAGENT GRADE	500 g	10-207-0500	\$ 98.00
HYDROCHLORIC ACID, 0.01 N	250 mL	10-116-0237	\$ 19.50	POTASSIUM IODIDE	500 g	10-212-0500	\$ 175.00
HYDROCHLORIC ACID, 0.01 N	500 mL	10-116-0473	\$ 24.50	POTASSIUM IODIDE, 20%	500 mL	10-211-0473	\$ 55.00
HYDROCHLORIC ACID, 0.01 N	1 L	10-116-0946	\$ 42.00	POTASSIUM IODIDE, 20%	1 L	10-211-0946	\$ 89.00
HYDROCHLORIC ACID, 0.1 N	250 mL	10-118-0237	\$ 19.50	SO <sub>2</sub> INDICATOR	60 mL	10-222-0060	\$ 10.80
HYDROCHLORIC ACID, 0.1 N	500 mL	10-118-0473	\$ 24.50	SO <sub>2</sub> INDICATOR	250 mL	10-222-0237	\$ 21.00
HYDROCHLORIC ACID, 0.1 N	1 L	10-118-0946	\$ 42.00	● SO <sub>2</sub> INDICATOR	500 mL	10-222-0473	\$ 36.00
HYDROCHLORIC ACID, 1 N	500 mL	10-120-0473	\$ 20.00	SODIUM CARBONATE, 20%	500 mL	10-225-0473	\$ 30.00
● HYDROCHLORIC ACID, 1 N	1 L	10-120-0946	\$ 27.00	SODIUM HYDROXYDE, 1 N	500 mL	10-232-0473	\$ 20.00

Product	Volume	Item	Price
● SODIUM HYDROXYDE, 1 N	1 L	10-232-0946	\$ 26.00
SODIUM HYDROXYDE, 0.01 N	500 mL	10-228-0473	\$ 15.00
SODIUM HYDROXYDE, 0.01 N	1 L	10-228-0946	\$ 22.00
SODIUM HYDROXYDE, 0.067 N	1 L	10-236-0946	\$ 22.00
SODIUM HYDROXYDE, 0.1 N	500 mL	10-231-0473	\$ 15.00
SODIUM HYDROXYDE, 0.1 N	1 L	10-231-0946	\$ 22.00
● SODIUM HYDROXYDE, 10 M	500 mL	10-230-0473	\$ 36.00
SODIUM HYDROXYDE, 10%	500 mL	10-227-0473	\$ 21.50
● SODIUM HYDROXYDE, 10%	1 L	10-227-0946	\$ 28.00
● SODIUM HYDROXYDE, PELLETS	500 g	10-237-0500	\$ 72.00
SODIUM THIOSULFATE, 0.02 N	500 mL	10-239-0473	\$ 15.00
SODIUM THIOSULFATE, 0.02 N	1 L	10-239-0946	\$ 22.00
SODIUM THIOSULFATE, 0.1 N	500 mL	10-240-0473	\$ 26.00
SODIUM THIOSULFATE, 0.1 N	1 L	10-240-0946	\$ 40.00
STANDARD, Acetic acid	100 mL	10-243-0100	\$ 57.00
STANDARD, CHROMATOGRAPHY Malic Acid, 200 mg/100 mL	60 mL	10-254-0060	\$ 12.00
STANDARD, CHROMATOGRAPHY Citric Acid, , 200 mg/100 mL	60 mL	10-245-0060	\$ 12.00
STANDARD, CHROMATOGRAPHY Lactic Acid, , 200 mg/100 mL	60 mL	10-251-0060	\$ 12.00
STANDARD, CHROMATOGRAPHY Succinic Acid, , 200 mg/100 mL	60 mL	10-256-0060	\$ 12.00
STANDARD, CHROMATOGRAPHY Tartaric Acid, , 200 mg/100 mL	60 mL	10-258-0060	\$ 12.00
STANDARD, CONDUCTIVITY, 1413 $\mu$ S	60 mL	10-045-0060	\$ 49.50
STANDARD, Ethanol	1 L	10-095-0946	\$ 74.00
STANDARD, Ethanol, 14%	250 mL	10-095-0237	\$ 55.00
STANDARD, Ethanol, 14%	500 mL	10-095-0473	\$ 64.00
STANDARD, Fructose	100 mL	10-248-0100	\$ 60.00
STANDARD, Glucose	100 mL	10-250-0100	\$ 60.00
STANDARD, Lactic acid	100 mL	10-252-0100	\$ 60.00
STANDARD, Malic acid	100 mL	10-253-0100	\$ 60.00
STANDARD, REFRACTOMETER, 15°BRIX	60 mL	10-217-0060	\$ 8.40
STANDARD, REFRACTOMETER, 15°BRIX	250 mL	10-217-0237	\$ 11.00
STANDARD, REFRACTOMETER, 15°BRIX	1 L	10-217-0946	\$ 20.00
STANDARD, REFRACTOMETER, 20°BRIX	60 mL	10-218-0060	\$ 8.40
STANDARD, REFRACTOMETER, 20°BRIX	250 mL	10-218-0237	\$ 11.00
STANDARD, REFRACTOMETER, 20°BRIX	1 L	10-218-0946	\$ 20.00
STANDARD, REFRACTOMETER, 25°BRIX	60 mL	10-219-0060	\$ 8.40
STANDARD, REFRACTOMETER, 25°BRIX	250 mL	10-219-0237	\$ 11.00
STANDARD, REFRACTOMETER, 25°BRIX	1 L	10-219-0946	\$ 20.00
STANDARD, Sorbic acid	100 mL	10-247-0100	\$ 60.00
STANDARD, Tartaric acid	100 mL	10-259-0100	\$ 60.00

Product	Volume	Item	Price
STANDARD, Tartaric acid	100 mL	10-259-0100	\$ 60.00
STANDARD, Turbidit 1NTU	100 mL	10-273-1100	\$ 105.00
STARCH INDICATOR	500 mL	10-261-0473	\$ 18.50
STARCH INDICATOR	1 L	10-261-0946	\$ 25.00
STOPCOCK GREASE	5.3 oz	10-281-0000	\$ 45.00
SULFURIC ACID, 25%	500 mL	10-264-0473	\$ 18.50
● SULFURIC ACID, 25%	1 L	10-264-0946	\$ 22.00
● SULFURIC ACID, 96%	2.5 L	10-267-2500	\$ 150.00

## STORAGE AND STABILITY GUIDELINES FOR REAGENTS COMMONLY USED IN WINE ANALYSIS

REAGENT	WARNING	SHELF LIFE	RECOMMENDED STORAGE AFTER OPENING
Acetic standard, custom concentrations	Wear eye protection, avoid vapor	2 months	Refrigerate
Alcohol, Isopropyl, 70%	Poison, flammable	1 year	Flammable liquid storage, closed container
Ethyl Alcohol, 200-Proof, Anhydrous	Poison, flammable	1 year	Flammable liquid storage, closed container
Antifoam B	Wear eye protection	2 years	General storage
Brix Standards	Not hazardous	1 month	Refrigerate
Buffers	Wear eye protection	4-12 months	General storage
Copper Sulfate, 1%	Wear eye/skin protection, poison	Indefinite	General storage
Copper Sulfate, 10%	Wear eye/skin protection, poison	Indefinite	General storage
Chromatography Solvent	Wear eye/skin protection, flammable, will stain, irritant, avoid breathing fumes	Indefinite	Tightly closed in cool, dry, dark place
Ethanol Standard, 0.5% v/v to 50% v/v	Wear eye protection, avoid vapor, keep from flame	Once opened, head space will affect accuracy	Refrigerate
Fehlings A (Copper Sulfate)	Wear eye/skin protection	3-6 months	General storage in dark
Fehlings B (Alkaline Potassium-Sodium Tartrate)	Wear eye/skin protection	3-6 months	General storage in dark
Glucose Standard, custom concentration	Not hazardous	2 months	Refrigerate
Gold Coast #1 (Copper Sulfate)	Wear eye/skin protection, poison	Indefinite	General storage in dark
Gold Coast #2 (Alkaline Potassium-Sodium Tartrate)	Wear eye/skin protection, corrosive, irritant	3-6 months	General storage in dark
Gold Coast #3 (Potassium Iodide)	Wear eye/skin protection, irritant, will stain	3-6 months	General storage in dark
Gold Coast #5 (Starch)	Wear eye/skin protection, corrosive, irritant	6 months (or until mold forms)	General storage in dark
Gold Coast #6 (Sodium Thiosulfate)	Wear eye/skin protection, irritant	3-6 months	Tightly closed in dark
Hydrochloric Acid, 0.01N	Wear eye/skin protection	6-12 months	General storage
Hydrochloric Acid, 0.1N	Wear eye/skin protection, corrosive, irritant	6-12 months	General storage
Hydrogen Peroxide, 3%	Wear eye/skin protection, corrosive, irritant	1 year	General storage



REAGENT	WARNING	SHELF LIFE	RECOMMENDED STORAGE AFTER OPENING
Hydrogen Peroxide, 15%	Wear eye/skin protection, irritant	3 months	Refrigerate
Hydrogen Peroxide, 30%	Wear eye/skin protection, hazardous, strong oxidizer	3 months	Refrigerate
Iodide/Iodate	Wear eye/skin protection, hazardous, strong oxidizer	3 months	Refrigerate
Iodine, 0.1N	Wear eye protection, avoid vapor	2 years	General storage
Iodine, 0.02N	Wear eye/skin protection, avoid vapor, standardize frequently	3-6 months	Refrigerate or cool, dark place
Malic Standard, custom concentrations	Wear eye protection	2 months	Refrigerate
Phenolphthalein Indicator, 1%	Wear skin/eye protection, flammable, irritant	Indefinite	General storage
Phosphoric Acid, 25%	Wear eye protection	Indefinite	Acid storage with secondary containment
Potassium Iodide, 20%	Wear eye/skin protection, contains iodine	Indefinite	General storage
SO <sub>2</sub> Indicator	Wear eye/skin protection, flammable, will stain	Indefinite	General storage
Sodium Hydroxide, 0.01N to 0.5N	Wear eye/skin protection, corrosive, standardize frequently	1-3 months	General storage, tightly closed
Sodium Hydroxide, 1N	Wear eye/skin protection, corrosive	2 years	General storage
Sodium Hydroxide, 10%	Wear skin/eye protection, corrosive, irritant	2 years	General storage
Sodium Thiosulfate, 0.02N	Wear eye/skin protection, corrosive	3-6 months	Refrigerate
Sodium Thiosulfate, 0.1N	Wear eye/skin protection	1 year	General storage away from acids
Sorbic Acid Standard, custom concentrations	Wear eye/skin protection	2 months	Refrigerate
Starch Indicator, 0.5%	Wear eye/skin protection	6 months	Refrigerate
Sulfuric Acid, 25%	Wear eye/skin protection, strong acid	Indefinite	Acid storage with secondary containment
Sulfuric Acid, 1+10	Wear eye/skin protection, strong acid	2 years	General storage

## LABWARE AND SUPPLIES

For items not in stock, we are pleased to accommodate special orders.  
Please visit [www.enartis.com](http://www.enartis.com) for additional offerings and technical information.  
We also offer consultation on planning and set-up of your own laboratory.

### ALCOHOL BURNER

Product	Item	Price
Alcohol Burner	20-001-0000	\$18.50
Alcohol Burner Wick	20-002-0000	\$ 2.25

### AROMA RECOGNITION TRAINING KITS BY AROMA ACADEMY

Product	Item	Price
Bourbon Gift Box	10-303-0014	\$ 155.00
Gin Gift Box	10-303-0011	\$ 155.00
Rum Gift Box	10-303-0015	\$ 155.00
Whiskey Gift Box	10-303-0010	\$ 155.00
Whiskey Wooden Box	10-303-0013	\$ 250.00
Wine Gift Box	10-303-0009	\$ 155.00
Wine Wooden Box	10-303-0012	\$ 255.00
Refill Aroma Strips	10-303-0016	\$ 16.00

### BALANCES AND DIGITAL SCALES

Product	Item	Price
Balance O'Haus Dial-O-Gram1610	50-017-0000	\$ 395.00
Balance Scout Ohaus 1.0-8,200g	50-017-0011	\$ 450.00
Balance Scout Ohaus (0.01-420g)	50-017-0008	\$ 715.00
Balance Scout Ohaus (0.01-220g)	50-017-0001	\$ 555.00
Balance Scout Ohaus (0.1-420g)	50-017-0002	\$ 310.00

### BOTTLES

Product	Item	Price
Bottle Dropper Glass, 60 mL	20-031-0000	\$ 8.25
Bottle Dropper Polyethylene, 60 mL	20-030-0000	\$ 3.25
Bottle Wash, narrow mouth, 500 mL	20-033-0500	\$ 12.25
Bottle Wash, narrow mouth, 750 mL	20-033-0750	\$ 15.50
Bottle Wash, wide mouth, 1000 mL	20-033-1000	\$ 15.50
Bottle Wash, Nalgene red, 250 mL	20-034-0250	\$ 11.25
Bottle Wash, Nalgene red, 500 mL	20-034-0500	\$ 14.25

### BEAKERS

Product	Item	Price
BEAKER GLASS		
50 mL	20-012-0050	\$ 4.75
100 mL	20-012-0100	\$ 4.75
150 mL	20-012-0150	\$ 4.75
250 mL	20-012-0250	\$ 4.75
400 mL	20-012-0400	\$ 7.25
600 mL	20-012-0600	\$ 8.25
1000 mL	20-012-1000	\$ 15.50
2000 mL	20-012-2000	\$ 37.50
BEAKER POLYPROPYLENE		
50 mL	20-013-0050	\$ 4.50
100 mL	20-013-0100	\$ 5.00
150 mL	20-013-0150	\$ 7.75
250 mL	20-013-0250	\$ 8.00
400 mL	20-013-0400	\$ 15.50
600 mL	20-013-0600	\$ 18.50
1000 mL	20-013-1000	\$ 18.50
2000 mL	20-013-2000	\$ 46.00
BEAKER POLYPROPYLENE, HANDLE		
1000 mL	20-014-1000	\$ 9.00
2000 mL	20-014-2000	\$ 14.00
3000 mL	20-014-3000	\$ 18.00
5000 mL	20-014-5000	\$ 46.50
BEAKER TRI-POUR DISPOSABLE		
100 mL	20-011-0100	\$ 1.75
400 mL	20-011-0400	\$ 1.80
800 mL	20-011-0800	\$ 1.80
1000 mL	20-011-1000	\$ 3.75

### BRUSHES

Product	Item	Price
Brush Buret	20-035-0001	\$ 8.00
Brush Cylinder/Bottle	20-035-0002	\$ 10.00
Brush Flask	20-035-0003	\$ 22.00
Brush Pipet	20-035-0004	\$ 7.00
Brush Test Tube	20-035-0005	\$ 3.50

## BURETS

Product	Item	Price
Buret Self-zeroing Kit, 25 or 50 mL (includes Nalgene bottle with tabulation and buret adapter)	20-040-0000	\$ 36.00
Buret, Digital, Titrette, 10 mL	20-039-0010	\$ 1,070.00
Buret, Digital, Titrette, 25 mL	20-039-0025	\$ 1,070.00
Buret, Digital, Titrette, 50 mL	20-039-0050	\$ 1,065.00
Buret, glass, straightbore, 10 mL	20-041-0010	\$ 45.00
Buret, glass, straightbore, 25 mL	20-041-0025	\$ 45.00
Buret, glass, straightbore, 50 mL	20-041-0050	\$ 45.00
Buret, Premium glass, straightbore, 10 mL	20-040-0010	\$ 155.00
Buret, premium glass, straightbore, 25 mL	20-040-0025	\$ 155.00

## CLAMPS & SUPPORT

Product	Item	Price
Clamp Buret Double holder	20-049-0001	\$ 65.00
Clamp Buret Single polyethylene	20-049-0002	\$ 25.00
Clamp Buret Single V-jaw	20-049-0003	\$ 28.00
Clamp Clip Joint Green	20-052-0000	\$ 12.00
Clamp Holder regular	20-049-0004	\$ 25.00
Clamp Large 3-fingered (3 1/4")	20-049-0005	\$ 51.50
Clamp Med 3-fingered (2 1/4")	20-049-0006	\$ 51.50
Clamp Pinch Connector, metal	20-273-0000	\$ 14.25
Support, black stamped steel	20-213-0000	\$ 36.00
Support with double buret holder	20-216-0000	\$ 260.00
Support ring with clamp holder, 5"	20-214-0003	\$ 26.00

## CASH STILL

Product	Item	Price
Cash Still R&D 80 - Complete Glassware, No Support System	50-015-0000	\$ 730.00
Cash Still R&D 80 - Complete Assembly with Support System	20-039-0025	\$ 1,070.00
(Cash Still, 2 Clamp holders regular, 2 Clamp medium 3-fingered, Flow indicator, 2 Quick-disconnect connectors, Support ring 5" with holder, Support stand black stamped steel, T connector 5/16" ID, 10 ft tubing amber latex 1/4", 10 ft Tubing clear Tygon 1/4", 2 tubing clamp nalgene)	50-009-0000	\$ 950.00
Cash Still - Glass Body	50-013-0000	\$ 575.00
Cash Still R&D 80 Condenser	50-005-0000	\$ 130.00
Cash Still R&D 80 Cord with switch	50-006-0000	\$ 105.00
Cash Still R&D 80 Heating coil	50-007-0000	\$ 38.00

## CHECK STAB

Check Stab instruments are the newest generation of instruments for conductivity based tartaric stability testing in wine. These automatic analyzers are integrated with ®Check.NET software for data collection and management, making tartrate stability testing simple and precise. Three versions are available which vary on the degree of automation and availability of existing cold baths in the winery lab.

Product	Item	Price
<b>Check Stab α2014 iCheck®</b>		
Wireless system, performs all analyses of classic instruments, can be used in any thermal bath. It can be supplied complete with iDis, a wireless battery operated automatic KHT dispensing system. iCheck® is interfaced with Check Stab Instruments software Check.NET and can run with any other Check Stab instruments.	50-300-2010	Please inquire for pricing
<b>Check Stab α2016 Magic® +</b>		
Semi-automatic, manual addition of KHT. Measuring assembly "Easy Flex" allows for easy handling and cleaning.	50-300-2011	Please inquire for pricing
Conductivity Probe for Checkstab	50-301-2008	\$ 650.00

		CHECK STAB α2014 iCHECK®	CHECK STAB α2014 iCHECK® WITH DISPENSER	CHECK STAB α2016 MAGIC® +	CHECK STAB α2016 LIFE®
AUTOMATIC DISPENSER		NO	YES	NO	YES
COLD BATH		NO	NO	YES	YES
INTEGRATION WITH SOFTWARE CHECK .NET		YES	YES	YES	YES
TEST PERFORMED	Mini-Contact	YES	YES	YES	YES
	Mini-Contact with Forecast	YES	YES	NO	YES
	Saturation Temperature	NO	NO	YES	YES
	Calcium Saturation Temperature	YES	YES	NO	YES

## CUVETTES & RACK

Product	Item	Price
Cuvette rack polypropylene	20-061-0004	\$ 36.00
Cuvettes, methacrylate 10 mm (100)	20-061-0002	\$ 51.50
Cuvettes, methacrylate 10 mm (500)	20-061-0000	\$ 175.00
Cuvettes, quartz 1 mm (2)	20-061-0001	\$ 450.00

## CONNECTORS & TUBING

Product	Item	Price
Clamp Pinch Connector, metal	20-273-0000	\$ 14.25
T Connector 1/4" ID	20-275-0000	\$ 8.25
T Connector 5/16" ID	20-276-0000	\$ 4.25
Y Connectors 5/16" ID	20-278-0000	\$ 14.00
Quick Disconnect Connector, 3/8" to 1/4" ID	20-274-0000	\$ 7.00
Tubing 1/4" clear tygon, 1ft	20-271-0000	\$ 2.75
Tubing 1/4" Amber latex, 1 ft	20-270-0000	\$ 4.25
Tubing Clamp	20-272-0000	\$ 2.60

## FLASKS

Product	Item	Price
FLASK ERLLENMEYER		
125 mL	20-097-0125	\$ 5.00
250 mL	20-097-0250	\$ 6.00
500 mL	20-097-0500	\$ 8.50
1000 mL	20-097-1000	\$ 14.50
FLASK ERLLENMEYER, WIDE MOUTH		
250 mL	20-097-1250	\$ 8.00
500 mL	20-097-1500	\$ 10.50
FLASK VOLUMETRIC 'A'		
10 mL	20-105-0010	\$ 10.50
50 mL	20-105-0050	\$ 13.00
100 mL	20-105-0100	\$ 13.00
200 mL	20-105-0200	\$ 18.00
250 mL	20-105-0250	\$ 17.50
500 mL	20-105-0500	\$ 22.00
1000 mL	20-105-1000	\$ 32.00
2000 mL	20-105-2000	\$ 90.00
Flask Erlenmeyer, 2000 mL		
Flask Calibration, 20°C, 750 mL	20-102-0750	\$ 495.00
Flask Calibration, 15.6°C, 750 mL	20-102-1560	\$ 500.00
Filter Flask with tub, 1000 mL	20-104-1000	\$ 33.00

## CYLINDERS

Product	Item	Price
CYLINDER GRADUATED, GLASS		
10 mL	20-062-0010	\$ 10.00
25 mL	20-062-0025	\$ 12.50
50 mL	20-062-0050	\$ 14.00
100 mL	20-062-0100	\$ 15.50
250 mL	20-062-0250	\$ 20.50
500 mL	20-062-0500	\$ 41.00
1000 mL	20-062-1000	\$ 65.00
CYLINDER GRADUATED, NALGENE		
25 mL	20-063-0025	\$ 31.00
50 mL	20-063-0050	\$ 45.00
100 mL	20-063-0100	\$ 42.00
250 mL	20-063-0250	\$ 47.00
500 mL	20-063-0500	\$ 60.00
1000 mL	20-063-1000	\$ 75.00
2000 mL	20-063-2000	\$ 125.00
CYLINDER HYDROMETER, GLASS		
250 mL	20-064-0250	\$ 87.00
300 mL	20-064-0300	\$ 98.00
500 mL	20-065-0500	\$ 41.00
500 mL	20-066-0000	\$ 108.00

## DISPENSERS

Product	Item	Price
Seripettor Pro, Glass, 10 mL	20-170-0010	\$ 400.00
Dispenser Tilt-a-pet, 5 mL	20-069-0005	\$ 150.00
Dispenser Tilt-a-pet, 10 mL	20-069-0010	\$ 155.00
Dispenser Variable Volume, 25 mL	20-070-0025	\$ 51.50

## DRAIN STANDS

Product	Item	Price
Drain Stand 12 pins, 14 loops	20-192-0000	\$ 150.00

## FILTERS FOR LABORATORIES

Product	Item	Price
Prefilter Glass, AP15, 25 mm (100)	20-077-0001	\$ 80.00
Prefilter Glass, AP15, 47 mm (100)	20-077-0002	\$ 120.00
Prefilter Glass, AP25, 25 mm (100)	20-078-0001	\$ 85.00
Prefilter Glass, AP25, 47 mm	20-078-0002	\$ 1.50
Prefilter Glass, AP25, 47 mm (100)	20-078-0003	\$ 120.00
Filter Membrane, 0.45µ, 25 mm (25)	20-073-0001	\$ 41.00
Filter Membrane, 0.45µ, 25 mm (100)	20-073-0002	\$ 165.00
Filter Membrane, 0.45µ, 47 mm	20-074-0001	\$ 1.05
Filter Membrane, 0.45µ, 47 mm (150)	20-074-0003	\$ 130.00
Filter Membrane, 0.65µ, 47 mm (25)	20-075-0001	\$ 70.00
Filter Membrane, 0.65µ, 47 mm (100)	20-075-0002	\$ 250.00
Filter Membrane, 1.2µ, 47 mm (100)	20-076-0001	\$ 275.00

## FLOWMETERS

Product	Item	Price
Flow indicator	20-106-0000	\$ 40.00
Flowmeter, water flow 0.4-40 mL/min, air flow 20-2100 mL/min	20-107-0000	\$ 195.00

## FUNNELS

Product	Item	Price
Funnel Nalgene, with screen, 12"	20-109-0000	\$ 16.00
Funnel Glass, short stem, 65 mm	20-111-0065	\$ 19.00
Funnel Nalgene, short stem, 65 mm	20-112-0065	\$ 8.00
Funnel Glass, 80 mm	20-113-0080	\$ 20.00
Funnel Nalgene, 80 mm	20-114-0080	\$ 8.50
Funnel, Glass thistle for 10 or 25 mL buret	20-117-0000	\$ 13.50

## KIMWIPES

Product	Item	Price
Kimwipes, 4.5" X 8.5" (280)	20-141-0000	\$ 7.00

## LAB TAPE DISPENSER

Product	Item	Price
Lab tape dispenser	20-295-1000	\$ 72.00
Lab tape roll, White, 1" X 500"	20-295-0000	\$ 13.50

## PARAFILM

Product	Item	Price
Parafilm roll, 4" X 125"	20-152-0000	\$ 70.00

## LAB SCOOPS

Product	Item	Price
Lab scoop, large polypropylene	20-183-0001	\$ 11.00
Lab scoop, stainless steel	20-183-0003	\$ 7.25
Lab spatula/spoon	20-183-0002	\$ 10.25

## HYDROMETERS

Product	Item	Price
HYDROMETER BRIX		
-5 to 5°Brix	20-129-0000	\$ 21.00
0 to 11°Brix	20-123-0000	\$ 21.00
0 to 35°Brix	20-124-0000	\$ 21.00
9 to 21°Brix	20-133-0000	\$ 21.00
10 to 31°Brix	20-127-0000	\$ 21.00
HYDROMETER WITH THERMOMETER (°C)		
-5 to 5°Brix	20-130-0000	\$ 41.00
0 to 35°Brix	20-126-0000	\$ 41.00
0 to 10°Brix	20-139-0004	\$ 51.00
10 to 20°Brix	20-139-0006	\$ 46.00
20 to 30°Brix	20-139-0007	\$ 46.00
30 to 40°Brix	20-139-0008	\$ 46.00
HYDROMETER WITH THERMOMETER (°F)		
-5 to 5°Brix	20-138-0005	\$ 41.00
0 to 10°Brix	20-138-0004	\$ 46.00
0 to 35°Brix	20-138-0009	\$ 41.00
10 to 20°Brix	20-138-0006	\$ 46.00
20 to 30°Brix	20-138-0007	\$ 41.00
30 to 40°Brix	20-138-0008	\$ 46.00
HYDROMETER PROOF		
20-40 Proof	20-134-0002	\$ 62.00
40-60 Proof	20-132-0007	\$ 62.00
60-80 Proof	20-132-0001	\$ 62.00
75-95 Proof	20-132-0000	\$ 62.00
90-110 Proof	20-132-0002	\$ 62.00
105-125 Proof	20-132-0008	\$ 62.00
125-145 Proof	20-132-0009	\$ 62.00
145-165 Proof	20-132-0010	\$ 62.00
165-185 Proof	20-132-0011	\$ 62.00
185-206 Proof	20-132-0012	\$ 62.00
HYDROMETER SG		
0.940 - 1.01	20-135-0000	\$ 50.00
1.000 - 1.070	20-136-0000	\$ 50.00
HYDROMETER MUSTIMETER WITH THERMOMETER		
0.98 - 1.130	20-138-0001	\$ 135.00
Storage Rack 7"	20-121-0000	\$ 150.00

## PIPETES

Product	Item	Price
PIPET GLASS, SEROLOGICAL		
1 mL	20-163-0001	\$ 4.75
5 mL	20-163-0005	\$ 5.25
10 mL	20-163-0010	\$ 5.25
25 mL	20-163-0025	\$ 12.25
50 mL	20-163-0050	\$ 83.00
PIPET GLASS, SEROLOGICAL, DISPOSABLE		
5 mL	20-163-0000	\$ 1.00
PIPET GLASS, SEROLOGICAL, WIDE TIP		
5 mL	20-163-1005	\$ 20.50
10 mL	20-163-1010	\$ 20.50
25 mL	20-163-1025	\$ 36.00
PIPET GLASS, VOLUMETRIC 'A'		
1 mL	20-165-0001	\$ 4.25
2 mL	20-165-0002	\$ 4.25
3 mL	20-165-0003	\$ 4.75
5 mL	20-165-0005	\$ 4.75
10 mL	20-165-0010	\$ 8.25
20 mL	20-165-0020	\$ 8.25
25 mL	20-165-0025	\$ 9.25
50 mL	20-165-0050	\$ 14.50
100 mL	20-165-0100	\$ 20.50
ADJUSTABLE VOLUME PIPETTOR		
Eppendorf Pipettor, 100-1000 µL	20-072-0001	\$ 600.00
Eppendorf Pipettor, 10-100 µL	20-072-0002	\$ 600.00
Eppendorf tips 2-200 µL (1000)	20-071-0001	\$ 100.00
Eppendorf tips 50-1000 µL (1000)	20-071-0002	\$ 100.00
Transferpette S, 10-100 µL	20-071-0008	\$ 330.00
Transferpette S, 100-1000 µL	20-071-0009	\$ 330.00
Transferpette S, 2-20 µL	20-167-0005	\$ 300.00
Pipette Tips, 50-1000 µL (5x96 tips)	20-167-0004	\$ 46.00
Pipette Tips, 2-200 µL (5x96 tips)	20-167-0003	\$ 32.00
PIPET PARAPHERNALIA		
Pipet Pasteur, 5 3/4"	20-161-0001	\$ 0.20
Pipet dropper with bulb, 3"	20-156-0000	\$ 2.75
Pipet filler bulb blue	20-157-0000	\$ 50.00
Pipet safety bulb red	20-160-0000	\$ 16.50
Pipet Rack polypropylene	20-159-0000	\$ 50.00
Pipet pump 10mL	20-158-0000	\$ 35.00
Transfer Pipet plastic	20-162-0001	\$ 0.25
Transfer pipet plastic (500)	20-162-0002	\$ 85.00

## SAFETY SUPPLIES

Product	Item	Price
Safety Glasses	20-173-0000	\$ 6.50
Safety Goggles, Uvex 9305	20-175-0000	\$ 20.00
Gloves S disposable (100)	20-174-0000	\$ 31.00
Gloves M disposable (100)	20-174-0001	\$ 21.00
Gloves L disposable (100)	20-174-0002	\$ 20.50
Gloves XL disposable (90)	20-174-0003	\$ 31.00
Labmat bench liner, 50 ft	20-177-0000	\$ 90.00
Safety Tong, 9 1/2"	20-178-0000	\$ 17.00

## STOPPERS

Product	Item	Price
STOPPER, ONE HOLE, WHITE		
#1	20-197-0001	\$ 2.00
#11	20-197-0002	\$ 12.00
#2	20-198-0001	\$ 1.25
#5	20-198-0003	\$ 3.50
#6	20-198-0005	\$ 3.50
STOPPER SOLID, WHITE		
#7	20-211-0001	\$ 4.75
#8	20-211-0002	\$ 6.75
STOPPER TWISTIT, WHITE		
#4	20-212-0002	\$ 3.00
#5	20-212-0003	\$ 3.00
#6	20-212-0004	\$ 3.00
#7	20-212-0005	\$ 3.50
#8	20-212-0006	\$ 3.50
#9	20-212-0007	\$ 3.50
#10	20-212-0008	\$ 3.50

## WEIGHT BOATS

Product	Item	Price
Large (12)	20-286-0001	\$ 6.50
Medium (12)	20-286-0002	\$ 3.75
Small (12)	20-286-0003	\$ 3.25



## WINE THIEVES

Product	Item	Price
D RING BENT		
16" L, 3/4" D	20-236-0001	\$ 70.00
16" L, 1 1/4" D	20-236-0005	\$ 70.00
18" L, 3/4" D	20-237-0001	\$ 70.00
18" L, 1 1/4" D	20-237-0005	\$ 70.00
BENT PLASTIC GRIP		
16" L, 3/4" D	20-236-0002	\$ 70.00
16" L, 1 1/4" D	20-236-0006	\$ 70.00
18" L, 3/4" D	20-237-0002	\$ 70.00
18" L, 1 1/4" D	20-237-0006	\$ 70.00
D RING HANDLE STRAIGHT		
16" L, 3/4" D	20-236-0003	\$ 70.00
PLASTIC GRIP STRAIGHT		
16" L, 3/4" D	20-236-0004	\$ 67.00
18" L, 1 1/4" D	20-237-0007	\$ 70.00
PLASTIC		
19" L, 1 1/4" D, 3 pieces	20-238-0000	\$ 8.50
19.5" L, 1 1/4" D, 1 piece	20-238-0001	\$ 7.00
BOSWELL		
10" L, bent	20-241-0000	\$ 56.50
14" L, bent	20-241-0001	\$ 56.50
10" L, bent with stopper	20-242-0000	\$ 56.50
14" L, bent with stopper	20-242-0001	\$ 56.50

## STIRRERS

Product	Item	Price
THERMOLYNE MAGNETIC STIRRER		
Stir bar retriever magnetic	20-194-0007	\$ 25.75
Stirrer, 4"x4" 120V Ceramic	50-114-0001	\$ 350.00
Stirrer, 4"x5", hotplate-stirrer, cimarec	50-114-0002	\$ 700.00
Stirrer, 5"x7", Hotplate-stirrer, Corning 420D	50-063-0000	\$ 715.00
Stirrer, 7"x7", hotplate-stirrer, cimarec	50-114-0003	\$ 675.00
STIRRING BAR MAGNETIC		
1/2"	20-194-0001	\$ 12.50
1"	20-194-0002	\$ 12.50
1 1/2"	20-194-0003	\$ 12.50
2"	20-194-0004	\$ 12.50
3"	20-194-0005	\$ 42.00
1 1/4" x 5/8", eggshape	20-194-0006	\$ 16.50

## SYRINGES AND SYRINGE FILTERS

Product	Item	Price
Syringe Filter Holder, 25 mm	20-218-0025	\$ 30.00
Syringe Filter Holder, 47 mm	20-218-0047	\$ 95.00
Syringe Luerslip polypropylene, 20 mL	20-219-0020	\$ 2.65
Syringe Luerslip polypropylene, 60 mL	20-219-0060	\$ 2.65

## TEST TUBES AND RACKS

Product	Item	Price
Glass screw top with cap, 20x150 mm	20-226-0000	\$ 1.55
Glass screw top with cap, 25x200 mm	20-227-0000	\$ 6.75
centrifuge, 50 mL	20-224-0000	\$ 1.00
centrifuge, 50 mL (25)	20-225-0000	\$ 29.00
Rack, Epoxy Coated, 18-20 mm (40)	20-223-0005	\$ 55.00
Rack, Epoxy Coated, 25-30 mm (24)	20-223-0004	\$ 55.00
Rack, Epoxy Coated, 18-20 mm (20)	20-223-0003	\$ 40.00
Rack, Nalgene, 20 mm (20)	20-223-0009	\$ 30.00
Polystyrene screw cap, sterile, 16x125 mm (25)	20-220-0000	\$ 36.00

## THERMOMETERS

Product	Item	Price
Digital, long stem	20-228-0001	\$ 72.00
Floating	20-232-0003	\$ 20.00
Metal case	20-230-0000	\$ 18.00
0 to 230°F, EVERSAFE	20-233-0001	\$ 6.50
-20 to 110°C, EVERSAFE	20-231-0001	\$ 7.00
-20 to 110°C, EVERSAFE, non-toxic for food and beverage processing	20-232-0000	\$ 15.50
-40 to 120°F, EVERSAFE, non-toxic for food and beverage processing	20-232-0001	\$ 31.00

## WATCH GLASSES

Product	Item	Price
Watch glass 75 mm (12)	20-284-0002	\$ 70.00
Watch glass 90 mm (12)	20-285-0002	\$ 75.00

## SO<sub>2</sub> TESTINGS APPARATUS AERATION-OXIDATION

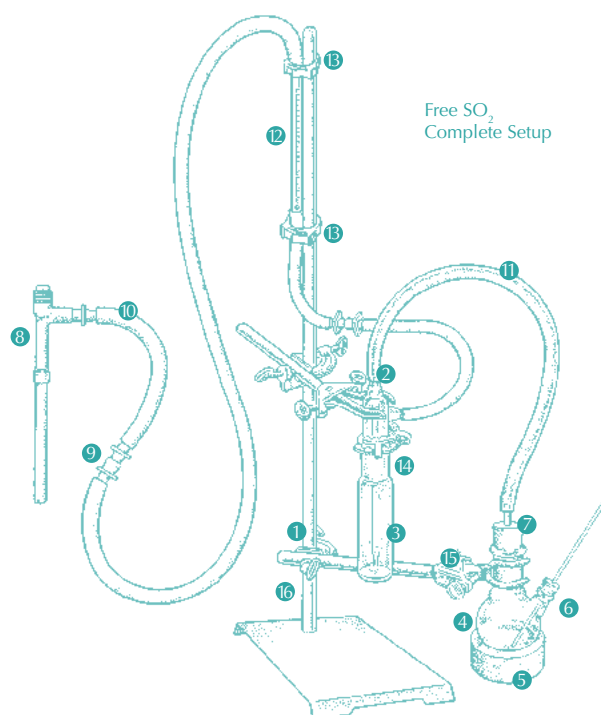
Product	Item	Price
SO <sub>2</sub> AO Complete Setup #2: Nalgene aspirator, flowmeter, clamps/support stand (includes #1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16)	50-112-0001	\$ 555.00
SO <sub>2</sub> AO Complete Setup #3: Accuflow (pump/timer/flowmeter), clamps/support stand (includes #1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16)	50-112-5000	\$ 865.00
AccuFlow 5000	50-107-1000	\$ 550.00
Impinger Plastic Base	50-112-0004	\$ 12.50
Impinger Top	50-112-0005	\$ 57.00
Impinger Bottom	50-112-0006	\$ 56.50

1	Support Stand Black Stamped Steel	20-213-0000	\$ 35.00
2, 3	Impinger Set	50-112-0014	\$ 93.00
4	Flask Side Port, 100mL	50-112-0007	\$ 65.00
5	Flask Ring Stand	50-112-0008	\$ 6.00
6	Bubbler/stopper	50-112-0010	\$ 6.25
7	Stopper/tubing adapter	50-112-0011	\$ 6.25
8	Airejector Aspirator pump, Nalgene	50-112-0013	\$ 31.00
9	Quick Disconnect Connector	20-274-0000	\$ 7.00
10	Tubing ¼" Amber latex, 1ft (10 ft in kits)	20-270-0000	\$ 4.25
11	Tubing ¼" clear tygon, 1ft (10 ft in kits)	20-271-0000	\$ 2.75
12	Flowmeter, water flow 0.4-40 mL/min, air flow 20-2100 mL/min	20-107-0000	\$ 195.00
13	Clamps (2 in kits)	20-049-0009	\$ 1.80
14	Clamp Clip Joint Green	20-052-0000	\$ 12.00
15	Clamp Med 3-fingered, 2 ¼" (2 in kits)	20-049-0006	\$ 51.50
16	Clamp Holder regular (2 in kits)	20-049-0004	\$ 25.00

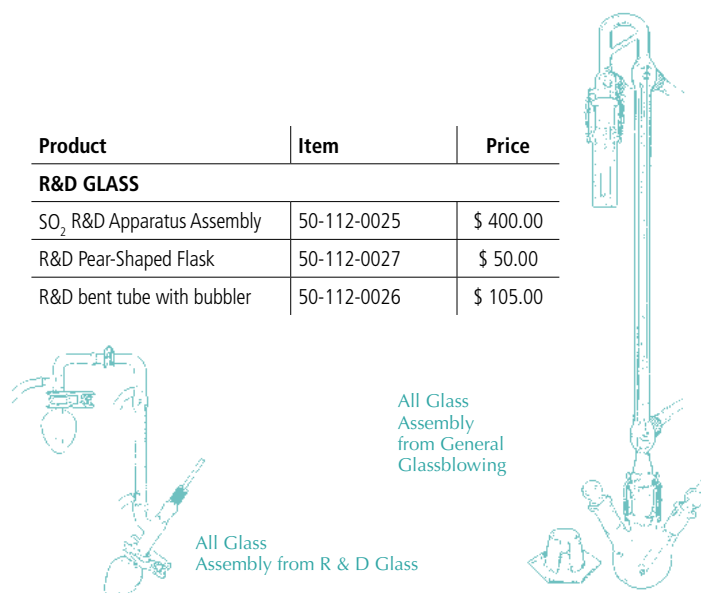
## RIPPER METHOD

Product	Item	Price
<b>GENERAL GLASS BLOWING</b>		
SO <sub>2</sub> Apparatus all glass	50-112-0015	\$ 615.00
3-neck round Flask, with hooks, 19/38, 100 mL	50-112-0018	\$ 170.00
Condenser/Impinger body	50-112-0017	\$ 250.00
Fritted Bubbler Tube	50-112-0016	\$ 98.00
Glass Stopper 19/38	50-112-0021	\$ 31.00
Impinger Bottom with hooks	50-112-0019	\$ 105.00
Springs (2) 1 ¾"	50-112-0020	\$ 12.50

Product	Item	Price
<b>ADDITIONAL ITEMS FOR TOTAL SO<sub>2</sub></b>		
Graham Condenser, 300mm (24/40 joints)	50-112-0003	\$ 205.00
Heating Mantle Controller	50-112-0023	\$ 300.00
Heating Mantle extension support	50-112-0024	\$ 150.00
Heating Mantle Series M	50-112-0028	\$ 395.00
Electrothermal Mantle with controller	50-112-0040	\$ 660.00
Impinger Bottom	50-112-0006	\$ 56.50



Free SO<sub>2</sub>  
Complete Setup



All Glass  
Assembly  
from General  
Glassblowing

All Glass  
Assembly from R & D Glass

## MICROBIOLOGY SUPPLIES

## AGAR

Product	Item	Price
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## APPLE ROGOSA + ACTIDIONE

100 mL	10-168-0100	\$ 31.00
250 mL	10-168-0250	\$ 39.00
500 mL	10-168-0500	\$ 65.00

## WL NUTRIENT

100 mL	10-170-0100	\$ 26.00
250 mL	10-170-0250	\$ 36.00
500 mL	10-170-0500	\$ 51.50

## YEAST/MOLD + ACTIDIONE

100 mL	10-172-0100	\$ 26.00
250 mL	10-172-0250	\$ 36.00
500 mL	10-172-0500	\$ 52.00

## YEAST/MOLD WITH CALCIUM CARBONATE

50 mL	10-173-0050	\$ 20.50
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## DRY MEDIA

Product	Item	Price
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WL Nutrient, 100 g	10-182-0100	\$ 42.50
YM Agar, 100 g	10-188-0100	\$ 62.00

## CULTURE PLATES

Product	Item	Price
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## CULTURE PLATE: APPLE ROGOSA + ACTIDIONE (FOR WINE BACTERIA)

50 mm	10-047-0050	\$ 2.60
100 mm	10-047-0100	\$ 3.10

CULTURE PLATE: WL NUTRIENT  
(YEAST AND BACTERIA IN BOTTLED WINES)

50 mm	10-049-0050	\$ 2.30
100 mm	10-049-0100	\$ 2.85

## CULTURE PLATE: YEAST/MOLD + ACTIDIONE (BRETTANOMYCES)

50 mm	10-050-0050	\$ 2.30
100 mm	10-050-0100	\$ 2.90

CULTURE PLATE: YEAST/MOLD WITH CALCIUM CARBONATE  
(CONFIRMING BRETTANOMYCES)

50 mm	10-051-0050	\$ 2.85
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## OTHER SUPPLIES

Product	Item	Price
Counting Chamber Levy, double Neubauer ruling	50-039-0002	\$ 330.00
Cover Slips, 1oz box	20-191-0000	\$ 25.00
Filter Forceps	20-108-0000	\$ 22.00
Hockey Stick glass	20-120-0000	\$ 5.25
Immersion Oil, 15 mL	10-280-0000	\$ 19.50
Inoculating Loops	20-140-0002	\$ 4.00
Inoculating Loops (12)	20-140-0001	\$ 46.00
Lens Paper (50)	20-142-0000	\$ 5.75
Microfunnel Disposable Filter (20)	20-078-0004	\$ 195.00
Petri dish, sterile, 100x15 mm (20)	20-154-0002	\$ 15.00
Petri dish, sterile, 50x9 mm (25)	20-153-0002	\$ 16.00
Slides, 25x75 mm (72)	20-190-0000	\$ 20.50

## SANITATION MONITORING

Product	Item	Price
Hygiena EnSURE, ATP Luminometer	50-205-0002	\$ 1,775.00
Hygiena SystemSure PLUS, ATP Luminometer	50-205-0000	\$ 1,525.00
Hygiena Swabs Aquasnap, Total Water ATP Test (100)	50-205-0005	\$ 325.00
Hygiena Swabs Supersnap, High Sensitivity ATP Surface Test (100)	50-205-0004	\$ 350.00
Hygiena Swabs Ultrasnap, ATP Surface Test (100)	50-205-0001	\$ 300.00
AquaSnap Free	50-205-0006	\$ 325.00



## MICROSCOPES

Product	Item	Price
Microscope Starter Kit (Professional microscope - 1000x phase contrast magnification, 50 lens paper, slides 25x75mm 1/2 gross, 1oz box cover slips, 12 pack inoculating loops, counting chamber, 15 mL immersion oil, 60 mL methylen blue stain 1%, 2 hours training for wine microorganism identification and microscope usage)	50-116-4000	\$ 3,600.00
Microscope, NIKON (Standard Compound Binocular Microscope featuring a Siedentopf type binocular head with 30° inclination and 360° rotation, widefield eyepieces WF 10X/18mm, a reversed quintuple nosepiece, achromatic objectives PL 4X, 10X, 40X S, and 100X S-Oil, coaxial coarse and fine focusing adjustment, built-in low position coaxial mechanical stage, focusable 1.25 N.A Abbe condenser, iris diaphragm with filter holder, and built-in LED illumination with intensity control.)	50-116-3000	Please inquire for pricing
Microscope PACKAGE (Nikon Transmitted Light Microscope with halogen illuminator for bright field and phase contrast applications, CFIE Plan Achromat 40x/0.65, CFI Achromat 100x/1.25 oil Ph2 objectives, Local set-up and 2 hours training for wine microorganism identification and microscope usage.)	50-116-1000	Please inquire for pricing
Microscope adapted for Camera	50-116-0002	\$ 3,995.00
Microscope Camera Adapter - Orion-Steady Pix Universal (Microscope users can now add a high resolution camera with this adaptor to lock the camera lens in position through the eyepiece on the microscope)	50-116-2000	\$ 70.00

The Veriflow® system is a game-changing detection technology that brings affordable, on-site PCR testing to your winery. It contains a small customized thermocycler, pre-aliquoted PCR reagent tubes, and proprietary buffers. Semi-quantitative test results are obtained in less than four hours via hand-held cassette, and quantitative results can be tracked, stored and exported via the Veriflow Reader.

- Same-day results
- Easy-to-use: Quick and easy sample preparation, no need for DNA extraction
- Reliability: Veriflow® provides information with the same AOAC approved technology used in the food safety market
- Cost-effective: Capital-efficient molecular platform with no service contracts



The vinoBRETT, powered by Veriflow®, allows for same-day detection and semi-quantification of *Brettanomyces bruxellensis*. This system quantifies viable *Brettanomyces* populations in less than 4 hours on the cassette, with only minutes of hands-on time to perform the test.



The vinoPAL, powered by Veriflow®, allows for same-day detection and semi-quantification of *Pediococcus* and *Lactobacillus*. The vinoPAL was developed specifically for wine makers and has been validated and implemented by a variety of award-winning, quality-centric wineries around the world.

Product	Item	Price
Invisible Sentinel Thermocycler	50-112-0000	\$ 5,750.00
Veriflow® PCR Loading Tray	20-092-0003	\$ 85.00
VinoBrett Kit by Veriflow, 24 tests (Brettanomyces)	10-092-0001	\$ 840.00
Vino PAL Kit by Veriflow, 24 tests (Pediococcus and Lactobacillus)	10-092-0002	\$ 840.00
Invisible Sentinel Reader	20-092-0004	\$ 5,750.00
Centrifuge, 6 x 50 mL Tubes	50-208-0000	\$ 3,250.00
Transferpette, 2-20 µL	20-167-0005	\$ 300.00
Transferpette, 100-1000 µL	20-071-0009	\$ 330.00
Tips, 2-200 µL, 480 (5x96)	20-167-0003	\$ 32.00
Tips, 50-1000 µL, 500 (5x100)	20-167-0004	\$ 46.00



Veriflow Thermocycler



Veriflow Cassette

## ALLA FRANCE



Product	Item	Price
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## CARBODOSEUR

Carbodoseur Complete Kit (pictured)	50-001-0001	\$ 265.00
Replacement Cylinder	50-001-0100	\$ 95.00

## CHROMATOGRAPHY

Glass dome, revealer bottle, 25 paper strips 15x10 cm, petri plate 120 mm, petri box 80mm, 25 plastic transfer pipettes, 3 paperclips

Chromatography Kit	20-045-0002	\$ 123.00
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## EBULLIOMETERS, ELECTRIC

Economy Electric Ebulliometer	50-028-0012	\$ 1,080.00
Precision Electric Ebulliometer (Pictured)	50-028-0010	\$ 1,990.00
Heating Element Replacement Economy Model	50-028-0013	\$ 205.00
Heating Element Replacement Precision Model	50-037-0014	\$ 210.00

## REFRACTOMETERS

Refractometers are temperature compensated

AllaFrance Analog, 0-32 °Brix, ATC	50-111-0019	\$ 80.00
AllaFrance Digital, 0.0-85.0 °Brix, ATC	50-111-0018	\$ 295.00



## ATAGO



Product	Item	Price
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## REFRACTOMETERS

Refractometers are temperature compensated

MASTER-Alpha 53, 0-32 °Brix (Analog)	50-111-0011	\$ 300.00
PAL-1, 0.0-53.0 °Brix (Digital)	50-111-0007	\$ 370.00
PEN-PRO, 0.0-85.0 °Brix (Digital)	50-111-0015	\$ 550.00
Refractometer case for PAL-1	50-111-0012	\$ 41.00

## pH METER: DIGITAL / PORTABLE

Digital pH meter DPH2	50-111-0016	\$ 140.00
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PAL-1



MASTER-Alpha 53



DPH2



## DUJARDIN SALLERON

For spare/replacement parts for all instruments, please call to inquire for pricing.

Product	Item	Price
<b>CARBODOSEUR</b>		
Carbodoseur Complete	50-001-0000	\$ 270.00
Carbodoseur 100 mL Cylinder	50-002-0100	\$ 112.50
Carbodoseur Glass Tube Insert	50-003-0000	\$ 51.50
Carbodoseur Thermometer	50-004-0000	\$ 51.50
Carbodoseur Cap	50-003-0001	\$ 51.50

## EBULLIOMETERS, Determination of Alcohol Content in Wine

### MODEL 360

Ebulliometer, Complete (pictured)	50-028-0000	\$ 1,080.00
Alcohol Burner	50-028-0001	\$ 115.00
Boiling Chamber	50-028-0002	\$ 340.00
Calculating Dial	50-028-0003	\$ 65.00
Condenser	50-028-0004	\$ 190.00
Sample Measure	50-028-0005	\$ 25.00
Stopcock	50-028-0006	\$ 105.00
Stopper	50-033-0000	\$ 11.00
Thermometer	50-028-0007	\$ 105.00
Wicks	50-028-0009	\$ 20.00

### ELECTRONIC

- Rapid (less than 6 minutes)
- High-accuracy (for dry wines: 0.1% Vol)
- Digital display and electronic measurement of boiling temperature
- Automatic compensation for atmospheric pressure

LDS Electric Ebulliometer, Electronic Probe and Digital Screen (pictured)	50-600-0005	\$ 2,850.00
Ebullilog USB Key	50-600-0008	\$ 135.00
LDS Electric Ebullitronic	50-600-0007	\$ 4,530.00
LDS Electric Ebullitronic for Kombucha and Vinegar	50-600-0015	\$ 4,400.00

## DETERMINATION OF FREE AND TOTAL SO<sub>2</sub>

- Adapted to red wine, must, juice, vinegar and alcohol

LDS Sulfilysier, semi-automatic determination of SO <sub>2</sub> . Manual control of titration	50-600-0001	\$ 2,800.00
LDS Iodolysier, automatic determination of Free and Total SO <sub>2</sub>	50-600-0003	\$ 4,500.00

Product	Item	Price
<b>TITRALYSER, Determination of pH, Total Acidity and Volatile Acids (Tartaric Acid, Acetic Acid)</b>		
<ul style="list-style-type: none"> <li>• Automatic titration with pH electrode</li> <li>• Direct reading in pH, g/L tartaric acid/acetic acid</li> <li>• Additional programs and manual titration available</li> </ul>		
LDS Titralsier	50-600-0013	\$ 4,700.00
LDS Combination pH Electrode for Titralsier	50-600-0014	\$ 350.00

## FERMENTEST, Reducing Sugars Analysis

Kit (syringe filter and pads, forceps, pipet, test tube, test tube brush, de-colorizing carbon, 36 tablets, color chart and carrying case.	10-044-0010	\$ 120.00
Tablets Re-fill (36 tablets)	10-044-0020	\$ 65.00



Ebulliometer, Model 360



Sulfilysier



Electronic Ebulliometer



Iodolysier





## VINTESENTIAL LABORATORIES

### KITS FOR MANUAL SPECTROPHOTOMETERS

Product	Item	Price
Acetic Acid, 100 tests	10-091-0009	\$ 510.00
Acetic Acid, 30 tests	10-091-0007	\$ 188.00
Amino Acid Nitrogen, 30 tests	10-091-0006	\$ 84.00
Ammonia, 30 tests	10-091-0005	\$ 84.00
Citric Acid, 30 tests	10-091-0011	\$ 140.00
D-Glucose/D-Fructose, 100 tests	10-091-0004	\$ 285.00
D-Glucose/D-Fructose, 30 tests	10-091-0003	\$ 108.00
Gluconic Acid, 30 tests	10-091-0008	\$ 195.00
L-Malic Acid, 100 tests	10-091-0002	\$ 268.00
L-Malic Acid, 30 tests	10-091-0001	\$ 108.00
L-Lactic Acid, 30 tests	10-091-0012	\$ 144.00
Sucrose, 30 tests	10-091-0013	\$ 144.00

### VINTESENTIAL STARTER KIT AND SPECTROPHOTOMETERS

Kit includes: Spectrophotometer, Transferpette® S, 10µL<100µL, Transferpette® S, 100µL<1000µL, Cuvettes (100 pack), Cuvette rack, Roll of Parafilm, Tips for 2-200µL (5 boxes 96 tips) 480 tips, Tips for 50-1000µL (5 boxes 100 tips) 500 tips

Product	Item	Price
Visible Spectrophotometer V120 Kit	50-113-0121	\$ 2,680.00
Visible Spectrophotometer V140 Kit	50-113-0141	\$ 2,990.00
Visible Spectrophotometer V120	50-113-0120	\$ 1,905.00
Visible Spectrophotometer V140	50-113-0140	\$ 2,265.00
UV Spectrophotometer UV120	50-113-1120	\$ 4,999.00

### KITS FOR DISCRETE ANALYSERS

Product	Item	Price
Acetic Acid, 500 tests	10-091-0014	\$ 255.00
Ammonia, 500 tests	10-091-0018	\$ 128.00
Combined Standards Kit for DA	10-091-0019	\$ 98.00
D-Glucose/D-Fructose, 500 tests	10-091-0015	\$ 128.00
L-Malic Acid, 500 tests	10-091-0016	\$ 128.00
Primary Amino Nitrogen, 500 tests	10-091-0017	\$ 128.00
YAN Calibration Standards	10-091-0020	\$ 98.00



### DISCRETE ANALYZERS BY VINTESENTIAL

Please inquire for pricing

Product	Item
Vintessential Chemwell 2910	50-209-0001
Vintessential Chemwell T	50-209-0002



Chemwell T

**POLYSCAN P200****NEW****Measures:**

- 1) EasyOx - Easily oxidizable polyphenols
- 2) PhenOx - Total polyphenols

These indexes allow the winemaker to manage critical winemaking steps such as pressing or fermentative skin contact based on objective measurements of the quality of must and wine.

- Disposable electrode, specific to wine oxidizable compounds (sold separately)
- Reference index values provided by grape variety when applicable to the database

Product	Item	Price
NomaSense PolyScan P200	50-250-0200	\$ 4,400.00
Electrode Strips (multiples of 50)	50-250-0019	\$ 165.00

**COLOR P100****NEW****Measures Color**

- Technology based on the principle of reflectance
- Accurate, real-time measurements performed directly on sample or in comparison with a standard
- Results expressed using L\*a\*b\* and L\*C\*h coordinates, depending on the CIELab system
- No need to prepare samples

Product	Item	Price
NomaSense Color P100	50-250-0100	\$ 3,289.00
5 mm glass cell (X2)	50-250-0018	\$ 44.00

Oxygen Dipping Probe  
PSt3 5m

NOMASense P300

**O<sub>2</sub> P300 & P6000****NEW****Measures Dissolved Oxygen (in tank, in bottle or any clear glass vessel, ex: sight glass)**

- Technology based on the principle of luminescence
- Measurement at every stage of the winemaking process: in tanks (immersion sensor), in transit (sight glasses) and during packaging (bottles, Bag-in-Box)
- Measurement of dissolved and headspace O<sub>2</sub> for calculation of TPO (Total Package O<sub>2</sub>)
- Integrated temperature sensor and barometer for measurement compensation



Piercing System for Still Wines



Product	Item	Price
NOMASense P300	50-250-0300	\$ 4,675.00
NOMASense P6000	50-250-6000	Inquire for pricing

**Additional Items Strongly Recommended**

Sensor Spot PSt3 5mm (10)	50-250-0004	\$ 22.00
NOMASense O <sub>2</sub> Starter kit (valid for P300 or P6000)	50-250-0301	\$ 55.00
Piercing System for Still Wines	50-250-0012	\$ 1,430.00
Piercing System for Sparkling Wines	50-250-0013	\$ 1,650.00
Syringe for Piercing System	50-250-0014	\$ 27.50
Needle for Piercing System	50-250-0015	\$ 88.00

Product	Item	Price
Oxygen Dipping Probe (PSt3) 5 m	50-250-0001	\$ 594.00
Weight for Oxygen Dipping Probe	50-250-0010	\$ 53.90
Sensor Spot PSt3 10mm (10)	50-250-0005	\$ 38.50
Polymer Optical Fiber 1 m	50-250-0003	Inquire for pricing
BiB Starter Kit (long and short Vitop spouts and cone meter)	50-250-0011	\$ 27.50
Silicon Glue	50-250-0006	\$ 55.00
Spatula (to glue dots inside of bottle)	50-250-0009	\$ 27.50
Ullage Meter	50-250-0007	\$ 11.00
Syringes (5pk.)	50-250-0008	\$ 1.10
PT100 Temperature Probe (P300/P6000)	50-250-0016	\$ 220.00
Spare Battery Pack	50-250-0017	\$ 44.00

# thermo scientific

Most meters are sold as kits. If you only want the meter or the meter you are looking for is not in our catalog, we can special order it for you. Please inquire for pricing.

## METERS

Meter Type	Manufacturer Part	Description	Enartis Item #	Price
pH Bench Top	Orion Star A111 Kit	8157BNUMD ROSS ULTRA Triode, pH buffer kit, electrode stand	50-105-0028	\$ 1,050.00
pH Bench Top	Orion Star A211 Kit	8302BNUMD ROSS Glass, refillable pH/ATC Triode; 810199 ROSS pH buffer kit, ROSS storage and cleaning solutions, electrode storage bottle, electrode stand	50-105-1003	\$ 1,210.00
pH Portable	Orion Star A121 Kit	9107BNMD Gel-filled Epoxy pH/ATC Triode, 1.5 m cable, 916099 pH buffer kit, storage and cleaning solutions, 911110 Rinse solution pouches, STARA-CS Star A hard carrying case, STARA-AR Star A armor with stand and electrode holders	50-105-1004	\$ 860.00
pH/DO Bench Top	Orion Star A216 Kit	8157BNUMD ROSS Epoxy Refillable pH/ATC Triode, 083005MD Polarographic DO Probe, 1.5m cable, calibration sleeve, 810199 ROSS pH buffer kit, storage and cleaning solutions, electrode storage bottle, electrode stand, 080513 probe maintenance kit, 970802 BOD funnel and stirrer, 080360 BOD adapter	50-105-0013	\$ 2,725.00
pH/DO Portable	Orion Star A326 Kit	8107UWMMD ROSS Gel-filled Epoxy pH/ATC Triode with 3 m cable, 087010MD RDO probe with 3 m cable; 910410 pH buffer kit, storage and cleaning solutions, 810001 ROSS electrode storage bottle, hard carrying case, armor with stand and electrode holders	50-105-0024	\$ 2,250.00
DO Meter Portable	Orion Star A123 Kit	Polarographic DO Probe, 3 m cable, calibration sleeve, DO probe maintenance kit, hard-sided field case. Meter only accepts Polarographic probes not RDO	50-105-0032	\$ 1,505.00
DO Meter Portable	Orion Star A123	Meter Only. Meter only accepts Polarographic DO probes not RDO	50-105-0027	\$ 645.00
DO Meter Portable	Orion Star A223 Kit	RDO/DO Kit, 3 m cable RDO optical DO sensor, 087010MD	50-105-1006	\$ 1,650.00
Conductivity Meter, Bench Top	Orion Star A112 Kit	011050MD ORION 2-CELL (K= 1.0) Conductivity probe, 011007 ORION 1413µS conductivity standard, electrode stand	50-105-0030	\$ 1,165.00
ph/Cond/ISE/RDO/DO Portable	Orion Star A329 Kit	8107UWMMD Orion ROSS Triode pH/ATC probe with 3 m cable, 013010MD Orion DuraProbe conductivity cell, 3 m cable, 087010MD Orion RDO probe with 3 m cable, stainless steel guard, calibration sleeve, Orion, pH buffer kit, 810001 Orion ROSS electrode storage solution, 01100710 Orion 1413 µS conductivity standard, 911110 rinse solution, protective armor with probe holders, hard carrying case	50-105-0031	\$ 3,055.00



A112 Bench Top  
Conductivity Meter



A329 Portable



A326 Portable  
pH/DO Meter Kit



A211 Bench Top pH Meter

## DISSOLVED OXYGEN PROBES

Meter	Type of Probe	Description	Connector	Enartis Item #	Price
Versa Star 90, Versa Star 30, A216, A213, A113, A329, A326, A223, A323, A123	Polarographic	DO Probe 083010MD, 3 m cable	Mini DIN	50-069-0010	\$ 855.00
		DO Probe 083025MD, 10 m cable	Mini DIN	50-071-0010	\$ 890.00
		DO Probe 081010MD. Meant for water, not recommended for wine.	Mini DIN	50-069-0004	\$ 565.00
Versa Star 90, Versa Star 30, A216, A213, A329, A326, A223, A323	RDO (Optical)	RDO Probe 10 m cable 087030MD.	Mini DIN	50-073-0010	\$ 915.00
		RDO Probe 3 m cable 087010MD.	Mini DIN	50-073-0013	\$ 825.00
		RDO Probe 6 m cable 087020MD	Mini DIN	50-073-0016	\$ 850.00
		RDO Optical Sensor Cap with o-ring	N/A	50-073-0009	\$ 110.00

## THERMO ORION AND ROSS pH PROBES

Meter	Probe	Description	Warranty	Enartis Item#	Price
Orion Star A Series	8102BN	ROSS, Electrode, Glass Body, Connection = BNC	1 year	50-087-0001	\$ 450.00
Orion Star A Series	815600	ROSS, Electrode, Epoxy Body, Connection= BNC	1 year	50-087-0002	\$ 450.00
Orion Star A Series	8165BNWP	ROSS, Epoxy Body, Electrode, Sure-Flow®, Connection= BNC Waterproof	1 year	50-087-0003	\$ 510.00
Orion Star A Series	8172BNWP	ROSS, Electrode, Epoxy Body, Sure-Flow®, Connection = BNC Waterproof	1 year	50-087-0004	\$ 535.00
Orion Star A Series	8104BN	ROSS, Electrode, Glass Body, Connection = BNC	1 year	50-087-0007	\$ 475.00
Orion Star A Series	8157BNUMD	ROSS, Triode, Epoxy Body, Connection= BNC Waterproof & Mini DIN	2 years	50-087-0008	\$ 595.00
Orion Star A Series	8102BNUWP	ROSS Ultra, Electrode, Glass Body, Connection = BNC Waterproof	2 years	50-087-0011	\$ 515.00
Orion A+ Series (Old)	9107BN	Epoxy Body, Triode, Connection = BNC & 8Pin	6 months	50-094-0000	\$ 260.00
Orion Star A Series	9107BNMD	Epoxy Body, Triode, Connection = BNC & Mini DIN	6 months	50-095-0000	\$ 280.00
Orion Star A Series	8107BNUMD	ROSS Ultra, Epoxy Body, Triode, Connection = BNC Waterproof & Mini DIN	1.5 years	50-095-0001	\$ 510.00
Orion Star A Series	8302BNUMD	ROSS Ultra, Glass Body, Triode, Connection = BNC Waterproof & Mini DIN	2 years	50-095-0002	\$ 605.00
Orion A+ Series (Old)	9157BN	Epoxy Body, Triode, Connection = BNC & 8Pin	1 year	50-098-0000	\$ 385.00
Orion Star A Series	9157BNMD	Epoxy Body, Triode, Connection = BNC & Mini DIN	1 year	50-098-0001	\$ 390.00
PrepHecT (old meters)	OR927005	ATC PROBE ONLY PerpHect, Connection = 3.5mm Phono Tip	1 year	50-097-0002	\$ 275.00
Orion Star A Series	OR927007MD	ATC PROBE ONLY Star Connection = Mini DIN	1 year	50-097-0010	\$ 335.00

## BECKMAN pH PROBES

Meter	Probe	Description	Warranty	Enartis Item#	Price
Beckman	BKA57195	Low Ionic Strength (for Water Measurements) Epoxy Body, Electrode, Connection = BNC	1 year	50-084-0008	\$ 285.00
Beckman	BKA57186	Epoxy Body, Electrode, Connection = BNC	1 year	50-084-0009	\$ 235.00
Beckman	BKA51707	Epoxy Body, Electrode, Refillable Calomel pHree Mercury-free Product, Connection = BNC	1 year	50-085-0001	\$ 275.00
Beckman	BKA51708	Epoxy Body, Electrode, Refillable Calomel pHree Mercury-free Product Connection = BNC	1 year	50-085-0002	\$ 305.00
Beckman	BKA51705	Gel-filled, Electrode, Non-refillable, Epoxy Body Calomel pHree contains no Mercury, Connection = BNC	1 year	50-085-0003	\$ 205.00
Beckman	8157BNUMD	Gel-filled, Electrode, Non-refillable, Calomel pHree contains no Mercury, Glass Body, Connection = BNC	1 year	50-085-0004	\$ 215.00
Beckman	8102BNUWP	Gel-filled, Triode, Non-Refillable, Epoxy Body, Connection = BNC & 2.5mm Phono Tip	1 year	50-085-0005	\$ 285.00
Beckman	9107BN	Gel-filled, Electrode, Non-refillable, Epoxy Body, Connection = BNC	1 year	50-085-0006	\$ 165.00

## What are the different types of connectors?

- All pH probes connect to meters via BNC connector cable
- The ATC (Automatic Temperature Compensation) or temperature probe connector differs from model to model
  - Orion Star = Mini DIN
  - Orion A+ (older discontinued models) = 8 Pin
  - Beckman = 2.5 mm phono tip



BNC Waterproof



BNC



2.5 mm Phono Tip



MiniDIN (Star)



8 Pin (A+ Series)



Banana Plug



EDIN Waterproof

**Electrode vs Triode**

- An Electrode is a pH probe ONLY
- A Triode is a combination pH electrode with built-in temperature sensor. Convenience with being able to measure pH and temperature with one probe. BNC connector for pH measurement and alternative connector for temperature measurement (See chart on previous page). Temperature connector and temperature element are unique to meter model.

**pH PROBE FILLING AND STORAGE SOLUTION TABLE**

Type of Solution	Supplier Item #	Description	Vol.	Enartis Item #	Price
<b>Filling and Storage Solutions for ROSS, Thermo Orion pH Probes</b>					
Filling Solution: ROSS 3M KCl	OR 810007	8102BN, 815600, 8165BNWP, 8172BNWP, 8104BN, 8157BNUMD, 8102BNUWP, 8107BNUMD, 8302BNUMD	60 mL	10-083-0050	\$ 33.00
Filling Solution: Ag/AgCl	OR 900001	9107BN, 9107BNMD, 9157BN, 9157BNMD	60 mL	10-074-0060	\$ 18.60
Storage Solution	OR 910001	All ROSS & Thermo Orion Probes	100 mL 475 mL	10-271-0100 10-271-0475	\$ 28.00 \$ 48.45
Filling Solution	OR 900004	Silver Chloride with 2M Ag/AgCl for PerpHecT Ag/AgCl and refillable green pH electrode models	60 mL	10-078-0060	\$ 24.00
Filling Solution	OR 900011	Silver Chloride pH electrode fill solution, 4M KCl with Ag/AgCl	60 mL	10-079-0060	\$ 30.00
Cleaning Kit	OR 900023	pH Ele Cleaner, electrode cleaning solution (hydrochloric acid), 30 mL poly beaker with small transfer pipet	120 mL	10-082-0000	\$ 90.00
<b>Filling and Storage Solutions for Beckman pH Probes</b>					
Filling & Storage Solution: 1M KCl	BKA51713	BKA51707, BKA51708, BKA51705, BKA51706	100 mL	10-077-0100	\$ 52.00
Filling & Storage Solution: 3.5M KCl/AgCl	BKA60217	BKA57186, BKA57198, BKA57177	100 mL	10-073-0100	\$ 45.00
<b>Other pH Probe Solutions</b>					
Filling Solution	BK598943	Beckman: 1M KCl saturated Ag/AgCl. Contains potassium chloride and silver chloride	100 mL	10-076-0100	\$ 31.00
Filling Solution	BK566467	Beckman: 4M KCl	100 mL	10-080-0100	\$ 40.00
Filling Solution	BK566468	Saturated solution of potassium chloride	100 mL	10-075-0100	\$ 51.50
Storage Solution	BK566576	Buffered chloride storage solution	100 mL	10-081-0100	\$ 51.00
<b>Other Electrode Solutions &amp; Membranes</b>					
Filling Solution	OR 951202	Ammonia ISE electrode filling solution	60 mL	10-062-0060	\$ 78.00
Ionic Strength Adjuster	OR 951211	Low level ammonia pH adjusting ISA	475 mL	10-061-0475	\$ 104.50
Membrane	OR 951204	Membranes for use with 9512 Ammonia Gas Sensing Electrode	20	10-279-0000	\$ 125.00
Solution Standard	OR 951006	0.1M NH <sub>4</sub> Cl (Ammonium Chloride)	475 mL	10-066-0475	\$ 95.00
Solution Standard	OR 951207	Ammonia 100 PPM as N	475 mL	10-067-0475	\$ 85.50
Solution Standard	OR 951007	Ammonia 1000 PPM as N	475 mL	10-064-0475	\$ 95.00
Soaking Solution	N/A	Ammonium Chloride soaking solution	500 mL	10-065-0473	\$ 15.50
Filling Solution	OR 900065	Potassium ISE probe filling solution	60 mL	10-067-0060	\$ 30.60
Filling Solution	OR 080514	Polarographic DO Probe Electrolyte Filling Solution	60 mL	50-073-0006	\$ 26.00
Solution Standard	OR 011007	Conductivity Standard 1413µS	60 mL	10-045-0060	\$ 49.50

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## HOURS

Enartis USA is open Monday-Friday 8:30 AM to 5:00 PM (extended hours during harvest)

## PRICING

Enartis USA makes every attempt to keep our pricing stable, but as our suppliers' prices change, we must pass along changes, whether an increase or decrease. Prices vary slightly every year; this catalog is a guideline to pricing. If you require confirmed prices for your purchase, please contact the supply department at our Windsor branch: 707 838 6312.

## RETURNS & ORDER CANCELLATIONS

All returns must be authorized; call 707 838 6312 and ask for a Merchandise Return Authorization (MRA) number. Include the MRA number with your shipment. Returns must be made within 15 days of receipt and are subject to a 20% restocking charge. All items must be returned in an unused and resalable condition. All winemaking products along with supplies that require refrigeration or freezing cannot be returned.

Live cultures, analytical standards, and special order items are available according to demand. Orders of these products are considered to be final.

Any cancellation or modification of a pending order will result in a charge up to the full dollar amount of the order.

## TEMPERATURE AND BACTERIA VIABILITY

Don't worry! If ice packs melted during shipment or the container arrived warm, a few days out of the freezer at temperatures below 25°C (77°F) will not spoil the product or affect bacteria viability.

However, we always advise our customers to select the most expeditious shipping means possible and to store bacteria in the freezer at -18°C (0°F) upon arrival.

## HAZARDOUS MATERIALS ●

Materials considered hazardous to ship are marked with this symbol in the catalog. Hazardous materials are subject to a shipping surcharge, must be shipped via ground service and may have other limitations on their shipment. Ask us for details

## DAMAGED SHIPMENTS

Items damaged in shipping should be reported to the carrier immediately. Containers and packing material must be kept for inspection.

## TERMS

Shipping charges and sales tax (as required) are additional. Due to manufacturers' changes, our prices may change without prior notice.

Terms for payment are 30 days net. A service charge of 2% (minimum \$ 5.00) will be added to any outstanding balance after 30 days.

For international orders, please call or fax for details of shipment and payment.



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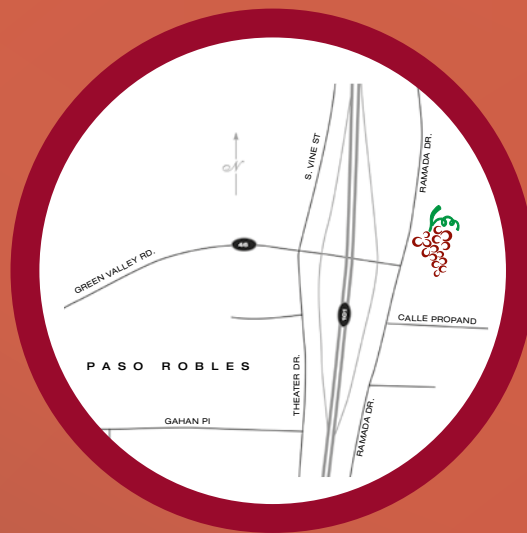
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#### NAPA VALLEY BRANCH

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