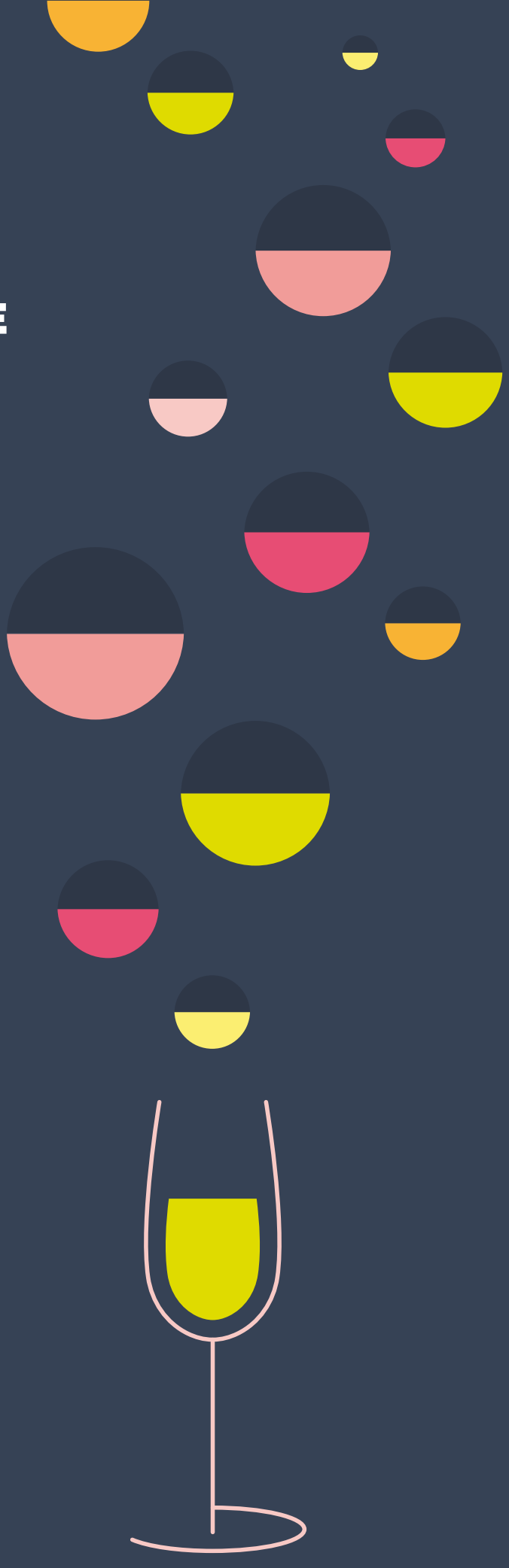
SPARKLING WINE HANDBOOK



enartis

Inspiring innovation.

enartis

WE PROVIDE
WINERIES WORLDWIDE
WITH INNOVATION AND EXPERTISE,
THROUGH ENOLOGICAL PRODUCTS
AND TECHNICAL SUPPORT
TO IMPROVE BOTH
WINERY EFFICIENCIES
AND WINE QUALITY.

300+
specialized products

Introduced into the international market, including yeast, tannins, enzymes, nutrients, bacteria, stabilizing and fining agents to cover all the winemaking stages, from harvest to the bottle.

10,000+
application trials every year

Our highly skilled team of experienced enologists and winemakers ensure an outstanding wealth of knowledge to address application problems and guarantee wines that fully express their character.

2M euros
invested in innovation every year

Innovation projects are developed in our five laboratories and in the three R&D Centers based in Italy, Spain and USA. Here, our daily effort is to find new winemaking techniques more and more respectful of the natural quality of the wine.

200+
employees

Belong to our international network that works every day to meet the needs of wineries of all sizes and guarantees an immediate and precise service thanks to the proximity and the knowledge of the territory.

FSSC 22000 ISO & OHSAS

Enartis is certified with FSSC 22000 International Food Safety Certification and works in compliance with the most stringent enological and food quality regulations. The company is also an active member of Oenoppia and ISO 14001, OHSAS 18001, ISO 9001 certified.

10,000
wine producers in 50 countries

Enartis supports more than 10,000 manufacturers in 50 countries with innovative solutions and safe products to provide wine producers with peace of mind.

100%
part of the local winemaking communities

Continuously working with more than 10 prestigious winemaking associations and our internal research centers provides us the unique ability to understand the market and guarantee quick knowledge-sharing while sustaining our leadership in the enological sector.

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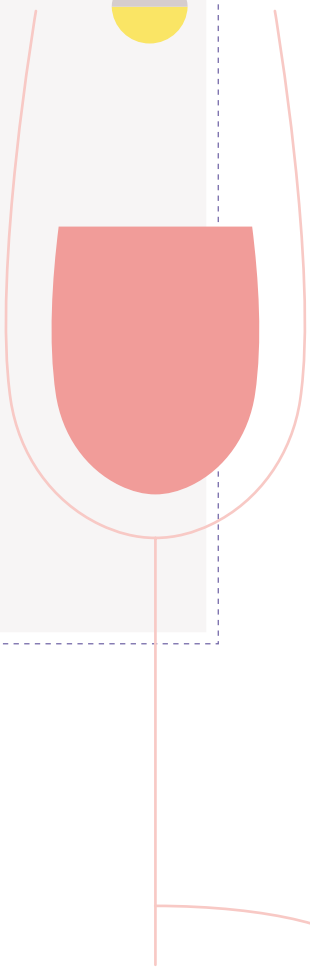
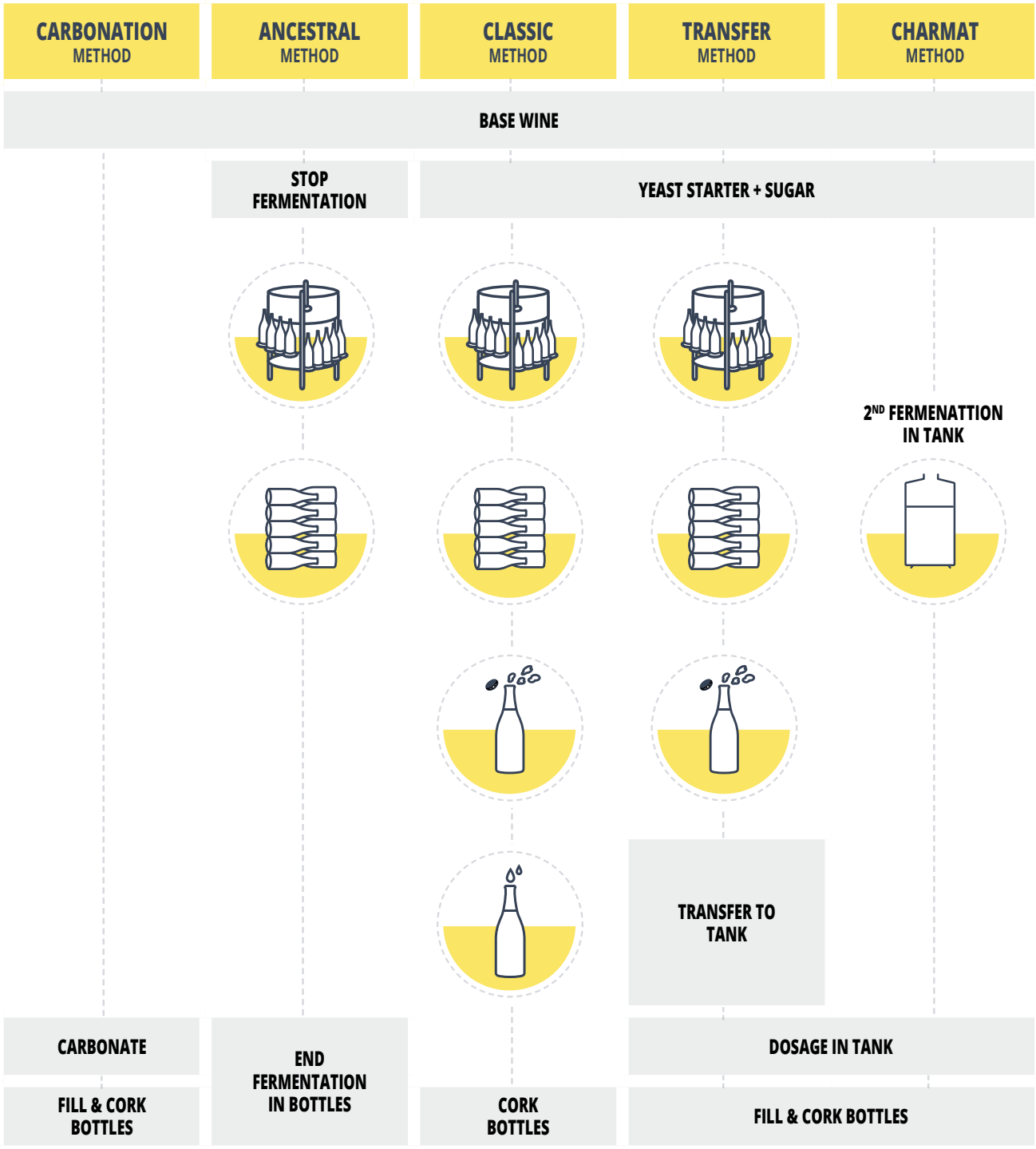


SPARKLING WINEMAKING METHODS

There are several different methods for sparkling wine production.
Enartis can assist in you in maximizing wine quality regardless of the method you select.



FINING AGENTS

Fining agents can be used for many purposes in winemaking including clarification, filterability improvement, prevention of haze and sediment formation, improvement of organoleptic profile and wine color, and removal of undesirable elements from wine.

The Fining Process

Each fining agent has specific properties and reacts with various wine constituents depending on its origin, density of charge, molecular weight and chemical properties. Product preparation, temperature, pH, metal content of wine and previous fining treatments are factors that can influence the effectiveness of fining.

Fining in Sparkling Wines

It is important to consider quality variations from press juices to choose and adapt the winemaking process. Removal of undesired elements present in juice (solids, polyphenols, color, proteins, lipids, etc.) before starting fermentation is fundamental. Enartis has developed fining agents specific for sparkling wine production that remove unwanted elements while respecting foaming properties.

PROCLAIR BC	Bentonite, PVPP, cellulose Eliminates polyphenols responsible for oxidation. Removes unstable proteins while preserving wine foaming properties Increases freshness and elongates shelf life of base wine
CLAIRPERLAGE UNO	Selected bentonites and plant proteins Removes unstable proteins while preserving wine foaming properties Improves clarity and elongates shelf life of base wine
CLAIRPERLAGE DUE	PVPP, plant protein and silica Eliminates oxidases and polyphenols responsible for oxidation Respects foaming properties. Increases freshness of base wine
CLARGEL	Liquid food grade gelatin, medium-high molecular weight Very effective for clarification Improves balance, eliminates excessive astringency and respects foaming properties
FINECOLL	Granular isinglass Respects foaming properties Good for clarification and improving brilliance Reduces bitterness and oxidative and herbaceous notes
ENOBLACK PERLAGE	Enological activated carbon in pellet form (reduces spread of carbon dust) High decolorizing capacity
PLUXBENTON N	Granular sodium bentonite Excellent protein removal and good clarification properties Reduces riboflavin, the molecule responsible for "light-struck" defect
CLARIL HM	PVI/PVP (polyvinylimidazole/polyvinyl pyrrolidone) and activated chitosan Adsorbs heavy metals (Cu, Fe, Al), removes hydroxycinnamic acids and low molecular weight catechins Prevents oxidation

POLYSACCHARIDES FOR BASE WINE FERMENTATION

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 quickly increases the amount of mannoproteins released in wine and improves balance, roundness, volume, foaming capacity and antioxidant capacity.

ENARTIS PRO PERLAGE	Yeast cell walls rich in antioxidant sulfur peptides and with high content of readily-soluble mannoproteins Ensures antioxidant protection, improves protein and tartrate stability, enhances foaming quality and protects wine during storage before second fermentation

RIDDLING AGENTS

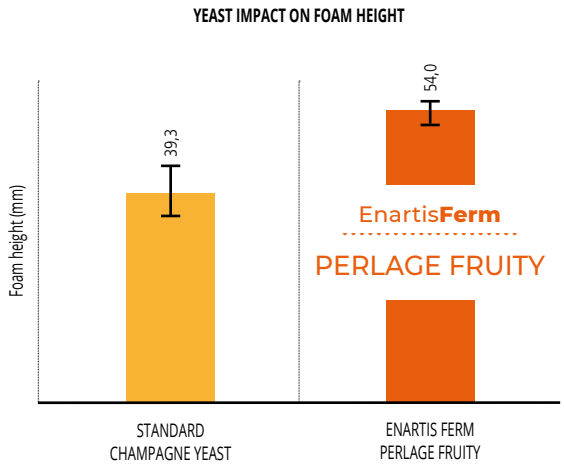
CLAIRBOUTEILLE P	Powdered riddling agent containing blend of selected bentonites. Improves clarity of sparkling wines produced by traditional method and compacts lees. Reduces processing time for automatic and manual riddling
ENARTIS TAN CLAIRBOUTEILLE	Gallic and ellagic tannins used as riddling agent Improves clarification, compacts lees Highly recommended for riddling rosé sparkling wines

YEAST FOR BASE WINE AND SECOND FERMENTATION

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, choice of yeast will define the wine's "personality". Our sparkling-specific yeasts meet the criteria required to produce high-quality sparkling wines of any style.

Yeast Impact on Foam Properties

Yeast have a strong impact on wine composition, especially the amount of mannoproteins released into wine, thus impacting the foaming properties of sparkling wine.



Enartis FERM PERLAGE during "prise de mousse" improves the foaming capacity of wine.

Product	Recommendations	Wine Style
ENARTIS FERM PERLAGE D.O.C.G	Base wine; *prise de mousse*; Charmat method; rosé and red sparkling wine	Clean, elegant, delicate white fruit aromas
ENARTIS FERM PERLAGE FRUITY	Base wine; prise de mousse; Charmat method; aromatic sparkling wines; white, rosé and red sparkling base wines	*"Modern Style," aromatic, intense fresh fruit*
ENARTIS FERM ES PERLAGE	Base wine; *prise de mousse*; traditional method; Charmat method; white and rosé wines; high mannoproteins; lees ageing	Elegant, delicate, clean, traditional style, round

YEAST NUTRITION

Understanding the nutritional requirements of yeast is fundamental for successful fermentations and preventing stuck fermentations. Managing nutrient requirements allows for regular and complete fermentations, as well as enhancing sensory qualities and minimizing sulfur compound production, such as H_2S. Enartis recommends providing amino acids and micro-nutrients during the *pied de cuve* preparation to build strong and resistant yeast cells and inorganic nitrogen with survival factors at tirage to ensure completion of fermentation without off-flavor development.

Enartis Nutrients for *Pied de Cuve* Preparation

During growth phase, yeast need amino acids, vitamins and minerals to build biomass and "healthy" cells, resistant to stress. Given that 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 during *pied de cuve* preparation. Enartis has developed yeast nutrients for *pied de cuve* preparation that shorten lag phase, prevent H_2S and acetic acid formation, and increase production of polysaccharides.

Enartis Nutrients	Composition and Recommendations
NUTRIFERM PDC	Autolyzed yeast and thiamine *Pied de cuve*; traditional method; Charmat method; clean, elegant wines
NUTRIFERM PDC AROM	Autolyzed yeast and thiamine Elevated content of selected amino acids used by yeast as precursors of aromatic compounds to increase intensity and freshness *Pied de cuve*; aromatic wines; traditional method; modern-style wines

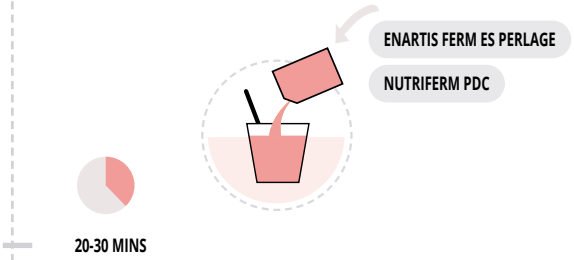
Enartis Nutrients for Base Wine at *Tirage*

As soon as alcohol is present, yeast become stressed, their activity reduced and their nitrogen assimilation limited. To complete fermentation and increase their resistance to alcohol, yeast need survival factors, oxygen, detoxifying agents and ammonium ions.

Enartis Nutrients	Composition and Recommendations
NUTRIFERM GRADUAL RELEASE	Innovative nutrient composed of DAP, gallic tannin and untoasted oak tannins Specific packaging that controls the release of yeast nutrients during fermentation Base wine fermentation; tank fermentation; Charmat method; clean wines
NUTRIFERM TIRAGE	Complex nutrient containing DAP and autolyzed yeast Second fermentation; traditional method; Charmat method; clean, elegant wines
NUTRIFERM REVELAROM	Complex nutrient containing DAP, purified yeast cell walls and copper salts Prevents H_2S production Second fermentation; traditional method; Charmat method; clean, elegant wines; rosé wines

GUIDELINES TO PREPARE *PIED DE CUVE*

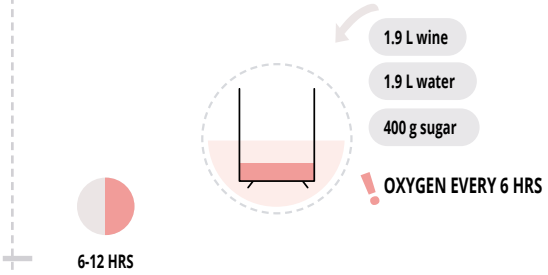
FOR 10 hL OF BASE WINE, TRADITIONAL METHOD



STEP 1

Yeast Preparation

- Rehydrate 400 g of Enartis Ferm ES Perlage in 4 L of chlorine-free water at 35-40°C (95-104°F)
- Add 400 g of Nutriferm PDC. Stir gently to break up any clumps
- Wait 20-30 minutes

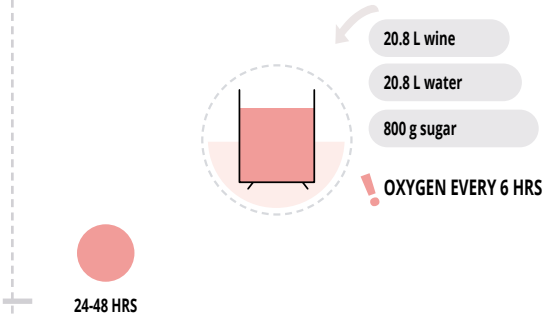


STEP 2

Yeast Population Acclimatization

Keep at 20°C (68°F)

- Add 1.9 L of base wine and 1.9 L of chlorine-free water to step 1
- Add 400 g of sugar
- Proceed with aeration (oxygen sparging or pump-over every 6 hours)
- Wait 6-12 hours

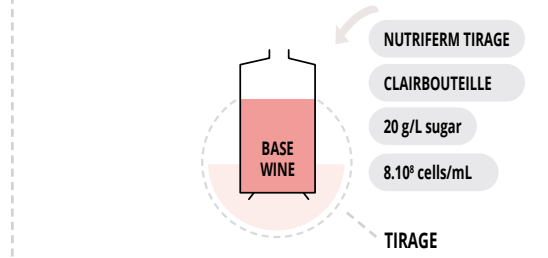


STEP 3

Yeast Population Build-up

Keep at 20°C (68°F)

- Add 20.8 L of base wine and 20.8 L of chlorine-free water to step 2
- Add 800 g of sugar
- Proceed with aeration (oxygen sparging or pump-over every 6 hours)
- Wait 24-48 hours
- At the same time, rehydrate the riddling agent



STEP 4

Add to Base Wine

Maximum 24 hours before Tirage

- Add 120 g of Nutriferm Tirage
- Add *pied de cuve* or yeast preparation (when residual sugar <20 g/L and yeast cell count ~8.108 cells/mL)
- Add rehydrated riddling agent

In Summary: What do you need?

Enartis Ferm ES Perlage	0.40	kg
Nutriferm PDC	0.40	kg
Sugar	25	kg
Clairbouteille P	0.04	kg
Tan Clairbouteille	0.02	kg
Nutriferm Tirage	0.12	kg

SENSORY IMPROVEMENT PRODUCTS

Enartis has developed a range of products designed for the production of sparkling wines to "fine-tune," customize and improve 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 expedition*, at disgorgement. Before using finishing products, we recommend setting up bench trials.
(See page 99 of our 2019 Handbook of Services and Supplies for Preparing Lab Bench Trials).

At *Tirage*		
	**SURLÌ MOUSSE**	- Yeast cell walls rich in readily-soluble mannoproteins - Improves foaming capacity, bubble persistence and overall quality of sparkling wine - Enhances natural sensation of volume and roundness and builds mid-palate
	SURLITAN PERLAGE	- Yeast derivatives rich in readily-soluble mannoproteins and gallic tannins - Improves structure, wine length and bubble persistence - Prevents production reductive notes during second fermentation
	ENARTIS TAN TRG	- Condensed tannins from grapes and ellagic tannins extracted from medium-toasted oak - Reinforces wine structure, builds mid-palate and increases wine ageing potential - Prevents production of reductive notes during second fermentation
At *Tirage* or in the *Liqueur d'Expédition*		
	**ENARTIS TAN FINESSE**	- Condensed tannins extracted from exotic species of wood - Increases wine elegance, aromatic complexity and wine length - Reduces herbaceous notes
	ENARTIS TAN FRAGRANCE	- Condensed tannins extracted from red fruit tree wood - Reinforces wine structure and increases wine ageing potential - Enhances berry, red fruit and floral aromas - For rosé and red sparkling wines
	ENARTIS TAN STYLE	- Tannins extracted from untoasted oak - Enhances wine roundness and structure - Eliminates reductive notes
	ENARTIS TAN LAST TOUCH	- Tannins from oak and grape skins - Freshens and increases aromatic complexity - Balances wine structure - For early release wines
	CITROGUM® PLUS	- Solution of Gum Arabic and yeast mannoproteins - Prevents precipitation of tartrates - Improves wine balance, reduces bitterness and astringency perception and enhances softness and volume - Increases foaming quality
	AROMAGUM	- Gum Arabic solution - Reduces bitterness and astringency perception and enhances softness - Stabilizes wine aromas, maintains freshness over time after bottling and increases foaming quality
	MAXIGUM	- Gum Arabic solution - Prevents precipitation of color matter in rosé and red sparkling wine - Reduces bitterness and astringency perception and enhances softness - Increases foaming quality

LABORATORY SERVICES

JUICE/MUST

Core Juice Panel
Juice Panel

FERMENTATION

Fermentation Assessment Panel
Core Wine Chemistry Panel

WINE QUALITY MONITORING

Foaming Capacity Improvement
Foaming Capacity
PCR Panel for Bacteria
Wine Improvement Panel

PREPARATION FOR BOTTLING

CMC Panel for Sparkling Wines
Cork Aroma Evaluation
for Sparkling Wine

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		✓

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	♦♦♦	
SURLì MOUSSE	♦	♦♦♦
SURLITAN PERLAGE	♦♦	♦♦♦
ENARTIS TAN TRG	♦♦♦	♦
ENARTIS TAN FINESSE	♦	♦♦♦
ENARTIS TAN FRAGRANCE	♦♦	♦♦♦
ENARTIS TAN STYLE	♦	♦♦♦
ENARTIS TAN LAST TOUCH	♦♦♦	♦♦

HOW TO PREPARE BASE WINE FOR SECOND FERMENTATION

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_2 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 or Zenith® UNO 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 offers CMC or Zenith® Panels for Sparkling Wines.

2. Improve Foaming Capacity of Base Wine

The quality of sparkling wine is visually assessed by its color, bubble behavior and foam retention. The two main parameters that define foam 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 gum Arabic 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_2 (<15 ppm), low total SO_2, low residual CO_2 and low alcohol (<11.5%).

MAIN BRANCH
7795 Bell Road
Windsor, CA 95492
Tel: (707) 838.6312 - Fax: (707) 838.1765

NAPA VALLEY BRANCH
1282 Vidovich Avenue
Suite C
St. Helena, CA 94574
Tel: (707) 967.0290 - Fax: (707) 967.0295

BUELLTON BRANCH
270 E Hwy 246
Suite 109
Buellton, CA 93427
Tel: (805) 922.6321 - Fax: (805) 922.1751

PASO ROBLES BRANCH
1850 Ramada Drive
Suite 3
Paso Robles, CA 93446
Tel: (805) 591.3321 - Fax: (805) 591.3322

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