Anchor OENOLOGY

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Révélons votre différence

SPARKLING WINE CATALOGUE 2026

CONTENTS

NOTE: For information on all things related to the production, products and protocols for still white, rosé and red wines, see our ***AO Still Wine Catalogue 2026***.

A COLLABORATION OF BRANDS FOR SPARKLING WINE PRODUCTION

Anchor OENOLOGY

SUPPORTING YOU FROM GRAPE TO GLASS

IOC

Révélons votre différence

RAPIDASE

HIGH SPEED ENZYMES SINCE 1922

FINALtouch®

WINE PERFECTION

1 | ANCHOR OENOLOGY

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> For Harvest 2026, we will again be supporting you from base wine to bubbles!

ORDERS AND DELIVERIES

ACCOUNT DETAILS

- Open an account before the harvest season to allow adequate time for a credit check.
- Banking details:

  Beneficiary: Rymco (Pty) Ltd t/a Anchor Yeast
  Bank: Nedbank
  Branch: 198765 (Industria)
  Account type: Current
  Account no.: 196-328-3910
  Reference - account holder: Account number starting with SA
  Reference - COD customers: Invoice number (delivery after proof of payment)
  Payment terms: 30 days from account statement
- Normal terms and conditions apply for all account holders, otherwise COD.

ORDERS & CONTACT DETAILS

- **Online orders:** Place your order at www.anchoroenology.com
- **Email orders:** biotechorders@anchor.co.za
- **General enquiries:** 021 534 1351 | oenology@anchor.co.za
- **Website:** www.anchoroenology.com (order online)
- **Facebook:** @AnchorOenology

FINE PRINT

- No unused product will be taken back after the season.
- Products have adequate shelf-life, when stored correctly.

CERTIFICATION & DOCUMENTATION

- **Enquiries:** Your Technical Sales Manager
- **Download:** Visit www.anchoroenology.com

2 | PRODUCT CATALOGUE

VEGAN STATEMENT

Vegan products can be defined as:

- Products that do not contain ingredients nor additives from animal origin.
- Products that have not been produced with the use of substrates, ingredients or additives derived from animal origin.

Based on this definition and to the best of our knowledge, all products listed in this catalogue are vegan.

BASE WINE

While there are no restrictions on the grape cultivars allowed to produce sparkling wines, the majority are made from Chardonnay and/or Pinot Noir. Chenin Blanc, Sauvignon Blanc and Pinotage are among the alternative grape varietals used. Many sparkling wines are a blend of different grape cultivars.

Harvest

- Irrespective of the cultivar selected, it is imperative to find the balance between picking grapes that are either too green or too ripe. The former will result in wines with unpleasant herbaceous notes and the latter in flabby wines, which may have overripe flavours. This optimal harvest date usually occurs between 17 - 20 ˚B and require a balance in order to ensure complexity.
- Manual harvesting reduces the extraction of phenolic compounds and the risk for oxidation. The extraction of phenolic compounds also negatively affect foaming, may cause bitterness, as well as reduce ageing capacity.

Processing

- Minimise skin contact to prevent phenolic extraction, potassium that could negatively influence the pH, solids and oxidative enzymes. Gentle pressing also limits the phenolic content, this is beneficial for the foaming capacity of the wine. Depending on the style, the extraction of aroma precursors could be encouraged or avoided.
- Whole bunch pressing is advised. The first press fraction is unwanted and can be discarded or added to the *taille* fraction. The cuvée fraction that follows is mainly used for the production of Prestige Cuvée wines, while the following taille fractions are processed separately for adding complexity.
- Continuous monitoring of the acid levels and colour extractability in the case of rosé wines, are important to ensure a balance between sufficient anthocyanin extraction, without excessive astringent polyphenols.

PRESS AND DOWNSTREAM PROCESSING

ENZYMES

Aroma extraction

RAPIDASE EXPRESSION AROMA

Aroma precursor extraction in white and rosé base wines.

- An enzyme for fast, early and targeted aroma precursor extraction in white and rosé grape maceration. Skin contact allows for enhanced aroma intensity and complexity. Sufficient skin integrity is maintained to ensure effective downstream processing.
- Application: Skin and pulp cell wall degradation; reduce maceration time; replace more oxidative mechanical methods; increase precursor and aroma extraction.
- Dosage: 2 - 4 g/100 kg
- SKU: 100 g

Clarification

RAPIDASE CLEAR

Clarification of must.

- This is an enzyme for fast and efficient grape must and wine clarification. Rapidase Clear decreases the viscosity allowing for more compact lees during settling and clearer must and wine.
- Application: Pectin degradation; decrease in lees percentage; decrease in turbidity.
- Dosage: 1 - 3 g/hL or 1 - 4 mL/hL.
- SKU: 100 g; 1, 5 & 20 kg

RAPIDASE CLEAR EXTREME

Clarification under difficult settling conditions.

- An enzyme for fast, efficient clarification of grape must in difficult and extreme conditions. The use of this enzyme allows for more compact lees and clearer must when settling conditions are difficult, including low temperatures, pH and/or hard to settle varieties.
- Application: Pectin and side chain degradation down to 6 °C; decrease viscosity; promote solid particle aggregation; decrease in settling time and turbidity; increase in clear juice percentage.
- Dosage: 1 - 4 g/hL
- SKU: 100 g

RAPIDASE FLOTATION

Enhanced efficiency during flotation.

- Enzyme for fast, efficient flotation of grape must. The use of this enzyme enables rapid viscosity decrease, allowing for faster migration of solid particles.
- Application: Soluble pectin degradation; reduce flotation time; promotes more compact foam by facilitating the accumulation of haze particles; decrease in the percentage lees and turbidity.
- Dosage: 1 - 2 mL/hL
- SKU: 5 kg

Protection

In order to avoid the enhanced extractability of compounds in the presence of SO_2, aim to add sulphur during pressing. An addition of 30 mg/L SO_2 to the cuvée fraction will prevent browning and preserve aromatics. SO_2 additions, together with other fining agents, can be added to the various press fractions, including the *tailles* (see protocol on page 32 for dosage indications).

IOC TANIN CRISTALLIN

Protect against oxidation.

- A tannin that protects against oxidation and eliminates protein haze by precipitating excess proteins in must. Add during pressing.
- Composition: Gallic tannin (tara nut).
- Application: Enhance the antioxidant properties of sulphur dioxide; early usage on must avoids bitter sensations in finished wines; facilitates clarification; use at harvest or bottling to improve preservation; add structure and finesse to white wines.
- Dosage: 2 - 6 g/hL
- SKU: 1 kg

IOC SULFITANIN

Sulphur adjustment.

- Sulfitanin is a solution of ammonium bisulphate and tara tannin at 100 g/L of pure SO_2 and is used to adjust sulphur levels in must. In the must tank for white base wine production, Sulfitanin prevents oxidation and microbiological alterations. For rosé in the maceration tank, the desired amount of colour is extracted and stabilised with the use of the product.
- Application: Antiseptic action prevents the growth of indigenous, undesirable yeast and bacteria; prevent oxidation; tannins reinforce the anti-oxidant mechanism of SO_2 and give better structure and ageing ability, without increasing the astringency in white wines; stabilise the colour in rosé wines.
- Dosage: 50 - 80 mL/hL (white and rosé wine) or 50 - 100 mL/hL (red wines).
- SKU: 5 & 10 L

CLARIFICATION AND JUICE FINING

SETTLING

IOC COLORPROTECT V

Prevent and treat oxidation.

- A blend of bentonite, PVPP and vegetable proteins that has been developed to be used on must for preventing oxidation and pinking. It reduces the levels of oxidisable and oxidised phenolic compounds in must. Rehydrate for three hours before use.
- Application: Protecting musts that are sensitive to oxidation; reduce brown colouring in oxidised must; significant reduction of pinking phenomena; reduce the level of protein instability.
- Dosage: 25 - 80 g/hL
- SKU: 1 & 5 kg

IOC INOFINE V

[FLOTATION]

Prevent oxidation in must.

- Inofine V is a formula made up exclusively of pea proteins combined with mineral-derived additives. It is particularly used for applications involving must clarification due to its high reactivity with oxidisable and oxidised phenolic compounds. Also suitable for flotation. Rehydrate for two hours before usage.
- Application: Alternative to gelatine; it provides efficient sedimentation of suspended matter; reduce turbidity in must.
- Dosage: 10 - 30 g/hL
- SKU: 1 & 15 kg

FLOTATION

Flotation is a technique for the clarification of mainly white and rosé juice. This dynamic process of clarification is based on separating the particles in suspension in the juice by fixing them to gas bubbles and concentrating them in a surface foam. Flotation is a relevant technique to decrease off-flavour formation in juice. It limits the contact time between the juice and undesirable compounds, whilst limiting oxidation.

Requirements for efficient flotation

Enzymes

- Juice depectinisation is essential.
- Prior to flotation, a pectin test will help to evaluate the presence of pectin, in order to optimise the process and enzyme usage.
- Enzymes decrease the juice turbidity and allow efficient migration of the particles to the surface.
- The use of a suitable pectolytic enzyme allows for a decrease in juice viscosity and helps particles to aggregate.
- It actively contributes to particle migration and significantly increases the flotation yield.
- Enzymes need to be added as soon as possible. Contact time must be between 2 to 3 hours according to the temperature, the enzyme dosage and the pectin concentration.

Flotation gas

- Bubbles must be of sufficient size to adhere to flocculates, whilst making a compact cake to help its elimination.
- Nitrogen is usually preferred because it ensures suitable bubble size for flotation, while limiting oxidation.
- The required pressure is between 5 - 7 bars. Beyond this pressure, bubbles move too quickly and have insufficient time to fix aggregates.

Adjuvants

- These adjuvants increase particle interactions and help to obtain bigger aggregates, which migrate with more speed and efficiency.

Practical considerations

- The shape of the tank is important.
  - A tank with a small diameter and large height will produce a thick and heavy cap that may submerge.
  - With a tank of too large a diameter, it will be difficult to circulate all of the must.
- The minimum liquid height is 1 m to allow for the formation of the cap and to ensure it is not broken by the flow of liquid during circulation. The maximum height is around 7 m. Beyond this, the formed cap will be too heavy and at risk of submersion.
- Provide a nitrogen cylinder with a suitable pressure reducer, which will supply the flotation unit with a pressure of around five bars.
- In general, the pumping time should correspond to approximately 1.5 times the volume of must.
- The juice must be completely depectinised: it is advised to add enzyme to the must at least two hours before flotation.
- The temperature should be kept above 13 °C: ideally between 15 and 20 °C.
- The must should not contain seeds, skins and other solids. Homogenise the tank well using the main pump, without gas or additives.

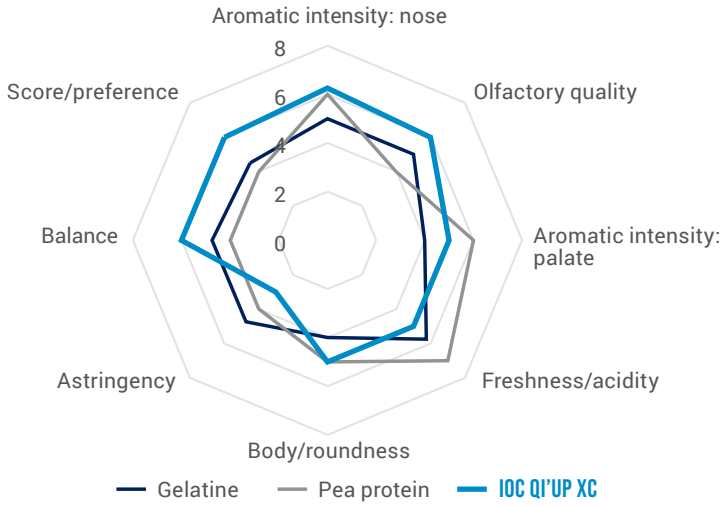
IOC QI'UP XC

Concentrated solution for the flotation of white and rosé juice.

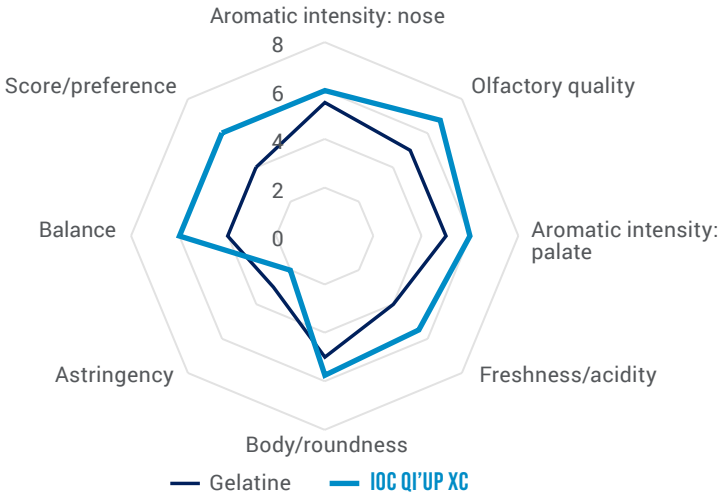
- Qi'Up XC is a unique and innovative chitin-derived flotation adjuvant, free of all allergens and synthetic products, vegan and organic compatible. Its efficacy and fast action allow it to float all types of must, while preserving the organoleptic qualities of the juice.
- Application: Enhance the speed and performance with which the particles separate from the suspension; alternative to the use of gelatine; increase fresh fruit aromas.
- Dosage: 3 - 10 g/hL (white or rosé must).
- SKU: 1 kg

IOC QI'UP XC preserves all the organoleptic qualities of the must, as well as the wines made from them. Here are two examples of white and rosé must, comparing the action of IOC QI'UP XC with a solution of gelatine and a solution of pea proteins. All treatments followed the same vinification process. Sensory analyses were performed during the three months following the end of alcoholic fermentation.

A white wine from Aligoté (Burgundy).
The IOC QI'UP XC treatment differs significantly by its greater balance and reduced astringency.



Mean of analysis of variance in rosé wine from Syrah and Grenache from Côtes du Rhône.
The IOC QI'UP XC treatment differs significantly by its greater aromatic intensity and greater freshness.



IOC BENT'UP

Bentonite for flotation.

- High-performance, active sodium bentonite powder for improved flotation. Brings about excellent cap compaction for optimal juice recovery. This adjuvant is used in addition to the flocculation aid and requires at least two hours swelling before use. Vegan and organic compatible.
- Application: Effective clarification and sediment compaction; rapid flotation times; remove protein fractions, oxidation enzymes and unstable phenolic fractions; remove thermosensitive proteins; use together with Acticarbone.
- Dosage: 30 - 80 g/hL
- SKU: 15 kg

IOC ACTICARBONE

Remove discolouration.

- This active vegetal charcoal is created for the treatment of discolouration in must. This product should be incorporated approximately one hour before the start of flotation in order to give it sufficient reaction time. Vegan and organic compatible. If using Acticarbone, it must be used first and then followed with the mandatory use of Bent'Up to remove fine carbon particles.
- Application: Remove discolouration without affecting the aroma profile; use in flotation, combined with enzymes and fining additives; treat must as soon as possible, in combination with a pectolytic enzyme.
- Dosage: To determine dosage, contact your Technical Sales Manager (authorised legal dosage: 100 g/hL). The dosage is to be determined according to the colour of the must.
- SKU: 15 kg

FINING THE JUICE

During the processing of the base wine, it is important to consider quality variations from the various press fractions and adapt the winemaking process and treatments accordingly. Removal of undesired elements present in the juice (solids, polyphenols, colour, proteins, lipids, etc.) before starting the fermentation is fundamental. It is important to select fining agents that remove unwanted elements while respecting foaming properties.

IOC QI FINE

Fining must during settling to improve the mouthfeel.

- A natural, biodegradable, non-allergenic product for fining must. Qi Fine is a blend of chitosan with a high charge density and unmatched flocculation and sedimentation rate and pea protein, specifically selected for its strong reactivity to phenolic compounds.
- Application: Effective in the absorption of polyphenolic compounds involved in the oxidation chain; correct the brown colour of oxidised must; reduce defects linked to bitterness and astringency; reduce harsh phenolic taste of tannins.
- Dosage: 10 - 30 g/hL (white and rosé free-run must) or 20 - 50 g/hL (white and rosé press juice).
- SKU: 1 kg

Prevention and treatment of oxidation

The oxidation of wine results in a loss of clean, fruity characters, together with the appearance of bitter notes and browning. This is in contrast to consumers wanting fresh, crisp, clean wines with a floral or fruity expression. Whether in the must or the wine, the oxidative mechanisms, as well as the molecules involved, are similar. Three entities contribute to oxidative spoilage: polyphenols (particularly ortho-diphenols linked to browning), oxygen and catalysts.

Catalysts may be chemical (cupric or ferric salts) or biological (e.g. laccase enzymes). Without catalysts, the oxidation of polyphenols is unlikely. All these reactions contribute to the formation of compounds that reduce fruity or floral notes and the appearance of oxidative notes.

Qi No[Ox] is a unique and innovative technological aid, made from plant polysaccharides, free from allergenic or synthetic products. Its effectiveness and fast action combat the production of oxidative by-products, both in the must and in the wine. Qi No[Ox] softens the bitter taste and oxidative notes in wine while preserving the sensory properties.

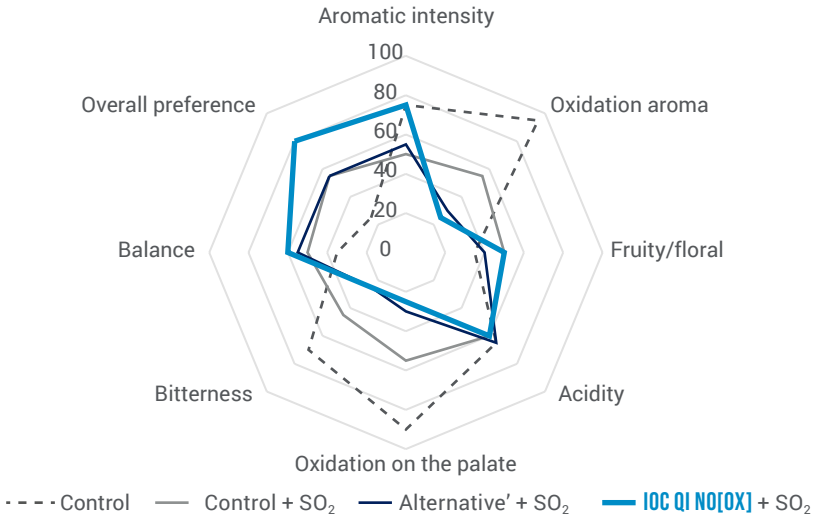
IOC QI NO[OX]

Remove discoloured, oxidised compounds and improve the sensory profile.

- Consists of pea protein, chitosan and selected, ultrafiltered bentonite that assists with rapid sedimentation. It is an alternative to casein. It has been developed for its anti-oxidative properties, to be used in must.
- Application: Remove the brown discolouration, as well as caramel and Madeira notes; increase freshness; reduce vegetal notes and bitterness.
- Dosage: 30 - 80 g/hL
- SKU: 1 kg

The anti-oxidative action of Qi No[Ox] was compared to that of an 'alternative' treatment (PVPP, plant protein and bentonite) in a blend of Pinot Noir and Chardonnay, particularly affected by oxidation. Before the treatment, the wine had distinctive oxidative notes on both the nose and the palate, accompanied by a bitterness typical of intense oxidation and a lack of fruity/floral character.

Each of the two formulations tested (**IOC QI NO[OX]** and the 'alternative') was able to change the quality of the wine from average to being appreciated by the tasting panel. However, wines treated using the 'alternative' formulation were scored as weaker and more unbalanced, unlike the treatment with **IOC QI NO[OX]** , which fully preserved the sensory characteristics of the wine.



PRIMARY FERMENTATION

YEAST

Bioprotection and bio-acidification

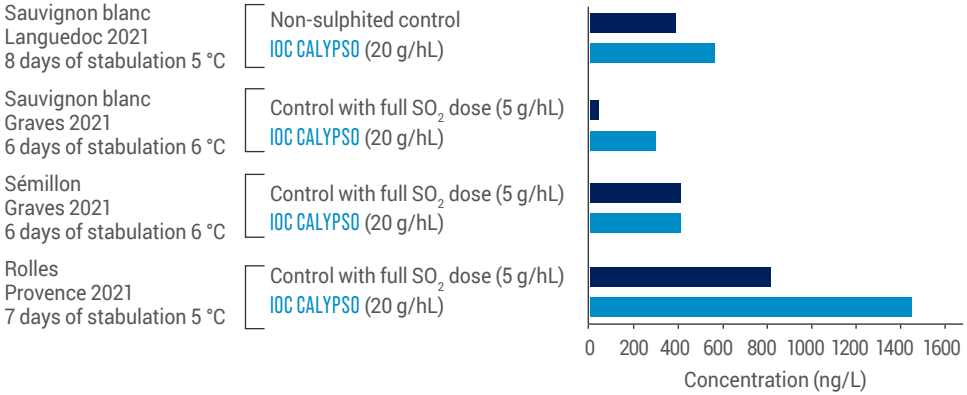
| IOC CALYPSO

Enhancing and protecting of aromas against oxidation during juice stabulation on grape lees.

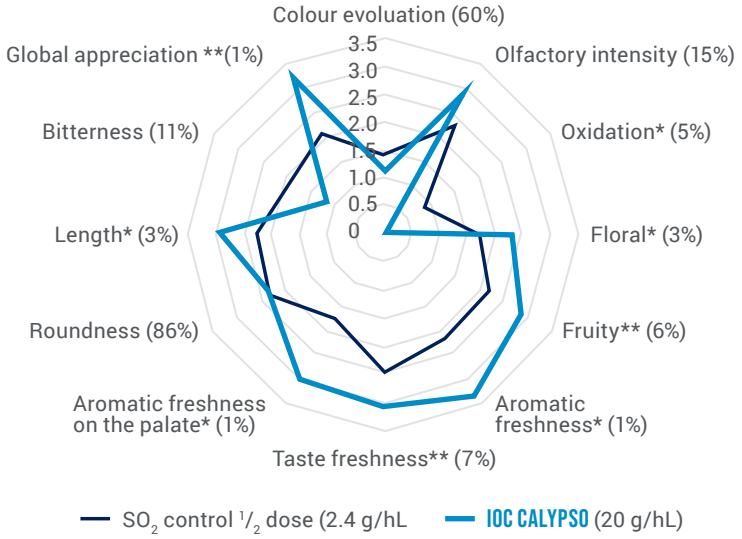
- *Metschinikowia pulcherrima.*
- Application: All base wine varieties. Release and protection of aroma compounds; protection against oxidation; limit/reduce SO_2 usage
- Notes: Add ICO Calypso as early as possible in the press, exiting the press or when filling the tank; follow with *S. cerevisiae* inoculation for alcoholic fermentation; more efficient at low temperatures (<12 °C).
- Dosage: 5-20 g/hL
- SKU: 500 g

IOC CALYPSO revealing varietal fruity thiols during cold stabulation of white or rosé juices.

Experiments carried out on different wineries; results obtained for 3MH acetate (passion fruit) and 4MMP (boxwood) are similar to those noted here for 3MH (citrus).



Sensory profile of **IOC CALYPSO**.
Sémillon Craves 2021; 6 days of stabulation; 6 °C.



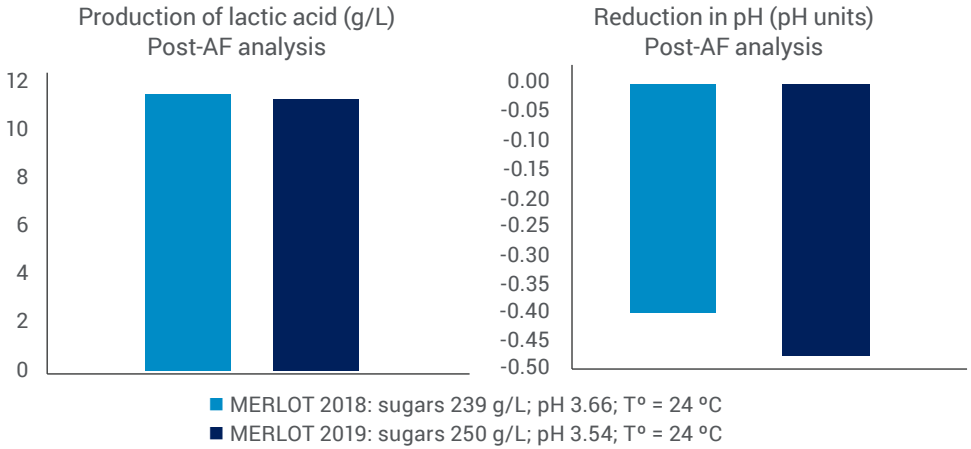
IOC BOREAL

Contributes to aromatic complexity and increased freshness via bio-acidification.

- *Lachancea thermotolerans*.
- Sensory: Balance and freshness; greater roundness; aromatic complexity.
- Application: All base wine varieties. Acidification; microbial stability and bioprotection.
- Notes: Inoculate 24 hours before selected *S. cerevisiae*; ensure temperature of 18-25 °C; consider co-inoculation of bacteria in wines that require MLF.
- Dosage: 25 g/hL
- SKU: 500 g

A significant impact on must acidification.

20 g/hL of **IOC BOREAL** at T_0, then 25 g/hL of **IOC 18-2007** after 48 hours; yeast fed at T_0 and $^1/_3$ AF.



Traditional and neutral

IOC 18-2007

Reference strain for base wine production.

- *S. cerevisiae*.
- Sensory: Traditional, neutral and elegant.
- Application: All base wine varieties.
- Notes: Isolated by IOC in Epernay; well adapted to fermentation under difficult conditions (low temperature and pH; high alcohol); respects varietal character; good glycerol production; producer of low volatile acidity, SO_2 and foam quantities; good implantation, complete breakdown of sugars and low nutrient requirements; ideally suited to making wines with the Traditional Method and Charmat Method.
- Dosage: 20 g/hL
- SKU: 500 g

Neutral

ANCHOR LEGACY N 96

Strong fermenting, all-purpose wine yeast.

- *S. cerevisiae* subsp. *bayanus*.
- Sensory: Neutral sensory contribution allows varietal character to dominate.
- Application: All base wine varieties.
- Notes: Robust and respects varietal character.
- Dosage: 20 g/hL
- SKU: 1 kg; available on pre-order: 5 kg

FERMIVIN CHAMPION

Robust yeast for respecting varietal characters.

- *S. cerevisiae* subsp. *bayanus*.
- Sensory: Neutral.
- Application: All base wine varieties.
- Notes: Respects varietal character; adapted for fermentation under extreme fermentation conditions of low pH and temperatures.
- Dosage: 20 - 30 g/hL
- SKU: 500 g

Aromatic

ANCHOR ALCHEMY I

White base wines with fruity and floral esters.

- Yeast blend.
- Sensory: Fruity and floral esters, tropical fruit and citrus aromas and some volatile thiols add to complexity.
- Application: Aromatic base wine production of white varieties.
- Notes: Cold fermentation; high alcohol tolerance; enhanced ester production.
- Dosage: 20 g/hL
- SKU: 1 kg

ANCHOR ALCHEMY II

White base wines with volatile thiols.

- Yeast blend.
- Sensory: Enhanced thiol aromas.
- Application: Base wine fermentations of white, thiolic varieties.
- Notes: Cold fermentation; high alcohol tolerance.
- Dosage: 20 g/hL
- SKU: 1 kg

ANCHOR LEGACY NT 116

Crisp, aromatic white and fruity rosé base wines.

- *S. cerevisiae* x *S. cerevisiae* hybrid.
- Sensory: Tropical, fresh and volatile thiols, like guava and gooseberry aromas, enhances neutral varieties.
- Application: Enhanced neutral base wine varieties; rosé base wines.
- Notes: High sugar, alcohol and cold tolerance; intense ester production.
- Dosage: 20 g/hL
- SKU: 1 kg; available on pre-order: 5 & 10 kg

ANCHOR LEGACY VIN 13

Aromatic white and fruity rosé base wines.

- *S. cerevisiae* subsp. *cerevisiae* x *S. cerevisiae* subsp. *bayanus* hybrid.
- Sensory: Fresh, fruity and floral in white base wines; red fruit in rosé base wines.
- Application: All white base wine varieties; rosé base wines.
- Notes: Robust and aromatic; fast fermentation rate; extremely sugar, alcohol and cold tolerant; good mouthfeel at low fermentation temperatures.
- Dosage: 20 g/hL
- SKU: 1 kg; available on pre-order: 5 & 10 kg

IOC BE THIOLS

White and rosé base wines with fruity thiols.

- *S. cerevisiae*.
- Sensory: Citrus, exotic fruits and pineapple.
- Application: All white base wine thiol varieties, as well as Chenin Blanc; rosé base wines.
- Notes: Reduced formation of ethanal; none to low SO_2 production.
- Dosage: 20 g/hL
- SKU: 500 g

Rosé

IOC FRESH ROSÉ

Complex and round rosé base wines.

- *S. cerevisiae*.
- Sensory: Floral, citrus, spice and varietal characters.
- Application: Rosé base wines from red varietals.
- Notes: Contribute to mouthfeel; reduce aggressive sensations like acidity, dryness and bitterness; express the varietal notes; enhance floral notes.
- Dosage: 20 g/hL
- SKU: 500 g

YEAST SUMMARY

APPLICATION	YEAST STRAIN	BASE WINE VARIETALS								BASE WINE STYLE						Relative nitrogen requirement	Temperature range °C	Fermentation speed	Sensory effect
		Chardonnay	Chenin Blanc	Sauvignon Blanc	Pinot Blanc	Pinot Gris	Pinot Meunier	Pinot Noir	Other red varietals	Rosé	Classic fermenter	Enhances structure	Fruit forward	Neutral whites	Aromatic whites				
TRADITIONAL & NEUTRAL	IOC 18-2007	●	●	●	●	●	●	●	●	●	●			●		Low	10 - 25	Fast	Neutral; mouthfeel
NEUTRAL	ANCHOR LEGACY N 96	●	●		●									●		Low	12 - 25	Moderate	Neutral
	FERMIVIN CHAMPION	●	●		●									●		Medium	15 - 25	Moderate	Neutral
AROMATIC	ANCHOR ALCHEMY I	●	●	●		●									●	Medium	13 - 16	Fast	Enhanced varietal character; esters
	ANCHOR ALCHEMY II			●								●	●			Medium	13 - 16	Fast	Enhanced varietal character; thiols
	ANCHOR LEGACY NT 116		●		●	●						●	●		●	Medium	12 - 16	Fast	Esters
	ANCHOR LEGACY VIN 13	●	●	●						●			●		●	Low	12 - 16	Fast	Enhanced varietal character; esters
	IOC BE THIOLS			●						●			●			Medium	15 - 18	Fast	Enhanced varietal character; thiols
ROSÉ	IOC FRESH ROSÉ						●	●	●	●						High	14 - 24	Moderate	Enhanced varietal character; floral notes

MLF compatibility of all yeast strains: good.

NUTRIENTS

It is imperative to understand the nutritional requirements of the yeast in order to ensure successful fermentations and prevent sluggish or stuck fermentations. Being aware of and managing the nutrient requirements of the yeast will:

- Ensure regular and complete fermentations.
- Enhance sensory profiles.
- Reduce the risks for off-flavour production like sulphur compounds.

During the preparation of the starter culture, the yeast requires amino acids (organic nitrogen) and micronutrients to ensure strong, robust and resistant yeast cells, whilst inorganic nitrogen sources, together with survival factors, are required to complete the fermentation without the risks of off-flavour formation.

The completion of the alcoholic fermentation in sparkling base wines can be challenging due to the acidic environment. Initially, during the growth phase, the yeast requires amino acids, vitamins and minerals to build sufficient biomass and sufficient stress resistance. The presence of ethanol and a high concentration of inorganic nitrogen inhibit the assimilation of amino acids. Therefore the optimal time of addition for organic nitrogen is during the preparation of the starter culture. The optimal use of a rehydration agent will shorten the lag phase and prevent the production of H_2S and volatile acidity. Due to the challenging conditions during fermentation, it is important to ensure that the yeast has access to essential vitamins, minerals, sterols and nitrogen. This can be ensured with the use of complex nutrients during the fermentation.

The optimal use of rehydration and nutritional products will minimise the impact of stress factors on the yeast performance.

Glutathione solution

Glutathione addition to the must results in greater oxidative protection, while a lower phenolic concentration can be observed in the corresponding wines. Results indicate that glutathione has a promising role in the future of sparkling wine production, particularly due to the possible reduction of SO_2 usage.

IOC GLUTAROM

Early preservation and protection of wines with low sulphur levels.

- Glutarom is an inactivated yeast product rich in glutathione, protecting the wine against browning and oxidation.
- Composition: Inactivated yeast.
- Application: Oxidative protection of the wine; protect aroma compounds; the preservation of fruitier aromas and increased mouthfeel in white and rosé base wines; add as early as possible before or at the start of alcoholic fermentation.
- Dosage: 15 - 30 g/hL
- SKU: 1 kg

Rehydration

ANCHOR REVIVE

Enhanced yeast viability, stress resistance and wine quality.

- A 100% yeast-derived formulation that provides high levels of essential growth factors like vitamins (pantothenate and biotin) and minerals that act as enzymatic co-factors (magnesium, manganese and zinc).
- Composition: Inactivated and autolysed yeast.
- Application: Improve yeast acclimatisation, implantation, viability and metabolism; increased stress resistance to challenging fermentation conditions; reduced risk of off-flavour formation.
- Dosage: 30 g/hL
- SKU: 1 & 5 kg

Complex

ANCHOR NOURISH

Complete fermentation and quality yeast performance.

- Nourish is a formulation that provides a complex source of organic and inorganic nitrogen during fermentation. It also delivers essential vitamins, minerals, trace elements, amino acids and stress resistance factors like sterols and unsaturated fatty acids.
- Composition: Inactivated yeast, DAP and thiamine.
- Application: Regulated yeast growth, maintain membrane permeability and improve alcohol tolerance; compensate for nitrogen deficient must; reduce the risk of sluggish or stuck fermentations; ensure efficient, balanced and complete alcoholic fermentation; provide optimal nutrition that allow for greater aroma intensity, balance and complexity; result in fresher, fruitier and less vegetal wine aromas; improve overall wine quality.
- Dosage: 20 - 40 g/hL
- SKU: 1 & 5 kg

ANCHOR CONQUER

Secure fermentation under challenging conditions.

- Conquer is a complete and complex nutrient formulation that ensures optimal yeast nutrition, especially for more challenging fermentation conditions.
- Composition: Inactivated and autolysed yeast, DAP and thiamine.
- Application: Survival factors ensure the optimal functionality of the cell, especially under stressful fermentation conditions; ensure a balanced and complete fermentation; avoid sluggish or stuck fermentations; provide essential elements that reduce stress responses from the yeast; prevent the formation of undesirable metabolic by-products.
- Dosage: 20 - 40 g/hL
- SKU: 1 & 5 kg

MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) is dependent upon winemaker preference. Conducting MLF in the base wine helps to soften high-acid wines and reduce the malic acid for better microbial stability. It is common to put a portion of the base wine through MLF and then blend it with wine that has not undergone MLF in order to achieve a balance of acidity, freshness, rounded mouthfeel and fruity aromas. Stylistically, some winemakers prefer not to have the base wine go through MLF to maintain the freshness and fruity aromas in the wine.

There are various options in terms of the timing of inoculation, each with its own benefits and considerations.

When to inoculate for MLF

The unfavourable conditions in base wines can make MLF very difficult. Temperature, pH, alcohol, SO_2, polyphenols, medium chain fatty acids and nutritional levels all affect malolactic bacteria growth and activity. Low temperatures can inhibit malolactic bacteria. High temperatures (above 25 °C) and high levels of alcohol or SO_2, can kill malolactic bacteria.

If MLF is desired, co-inoculation is generally recommended. The low pH and alcohol of a base wine can be inhibitory to MLF. With co-inoculation, not only does the heat of the primary fermentation help the MLF to complete at a faster rate, but the active yeast also metabolise the diacetyl and diminish or eliminate it completely, resulting in fresher and more fruity wine styles. If the pH is lower than 3.1, a standard 7 - 10 day build-up bacteria culture is recommended.

Stuck or sluggish MLF may be caused by difficult conditions in the wine or by the malolactic bacteria not being able to multiply and reach the minimum population required for fermentation. A selected bacteria starter culture will ensure a faster start to the MLF, increase survival rates and lower the risk of problems from undesirable bacteria (biogenic amines, VA, off-flavours and aromas, etc.).

Options for the timing of MLF:

TIMING	Good for:	Requirements:
CO-INOCULATION (at start of AF)	· Fruity wines · Early release wines · Protection against microbial spoilage	· Temperature control · Potential alcohol level below 15% · A yeast suited for co-inoculation
EARLY INOCULATION (⅔ through AF)	· Roundness & intensity · Early release wines · Protection against microbial spoilage	· Temperature control · A yeast suited for co-inoculation
SEQUENTIAL INOCULATION	· Complex & structured wines · Preservation of aromas	· Robust MLF strain depending on the conditions
DELAYED INOCULATION (during month after AF)	· Adjust oxygenation levels · Stabilise colour	· Monitor & stabilise potential contaminants · Potentially increase the temperature

Recommendations for successful MLF

- Moderate use of sulphites:
  - Free SO_2 <10 mg/L.
  - Total SO_2 <50 mg/L.
  - Where the SO_2 is higher, alternative measures must be considered.
- Temperatures that are optimal for the selected bacteria culture:
  - Temperatures between 17 and 24 °C maximum, ideally: 18 - 20 °C.
- Alcoholic fermentation:
  - Use a yeast that is compatible with MLF, especially with early or co-inoculation.
- Nutrition can be key to successful MLF.
- MLF should be completed (malic acid <0.2 g/L) before the second fermentation commences as bacteria do not settle well during riddling.

BACTERIA

IOC INOBACTER

Low pH must and wine.

- *Oenococcus oeni*.
- The strain was isolated by the Le Comité Interprofessionnel du vin de Champagne and is the strain of choice for many sparkling wine producers when MLF is desired. Contributes a neutral sensory effect, especially in lower pH wines. It is able to conduct MLF in the most difficult wine conditions.
- Application: Tolerant of very low pH conditions (>2.9); ensure MLF under challenging conditions; requires three steps: reactivation, starter culture and inoculation.
- Dosage: 0.72 g/hL (bacteria) with 4 g/L (reactivation medium).
- SKU: 25, 100 & 1 000 hL kits

PROTECTION

SULPHUR DIOXIDE

IOC INODOSE 5

Sulphur adjustment in barrels.

- Inodose 5 contains effervescent potassium metabisulphite tablets that release sulphur dioxide when added to must or wine.
- Application: For the easy adjustment of the sulphur in wines being aged in barrel; useful when low dosages of sulphur dioxide is required; allow gradual, uniform release of the required dosage of SO_2.
- Dosage: One tablet of Inodose 5 releases 5 g of SO_2.
- SKU: 42 tablets

FINING THE WINE

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 colour.
- Removal of undesirable elements from wine.

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

Fining base wines is a safer and more manageable practice than fining finished wines:

- It is especially important in the case of rosé base wines.
- It is necessary to reduce the polyphenolic and colloidal charges.
- A lack of fining could result in some very light sediment (colouring matter) that can appear with time.
- It avoids future issues that cannot be rectified with the use of riddling aids and adjuvants.

IOC BENT'UP

Bentonite for protein stabilisation.

- High-performance, active sodium bentonite granules for stabilisation. Proteins are also involved in bubble formation, therefore over-fining with bentonite should be avoided.
- Application: Clarification and improved stability; protein elimination in white wines prevent potential cloudiness; removal of reactive polyphenolic fractions reduce the precipitation of colour in the bottle; reduce percentage loss.
- When sending your wine samples to Vinlab to determine protein stability, you can request the analysis to be performed with IOC Bent'Up. This ensures true, reliable and accurate results when determining the correct product dosage.
- Dosage: 30 - 80 g/hL
- SKU: 15 kg

IOC QI NO[OX]

Treat oxidised wines and improve the sensory profile.

- Consists of pea protein, chitosan and bentonite that assist with rapid sedimentation. It is an alternative to casein. It has been developed for its anti-oxidative properties, to be used in wine.
- Application: Efficient removal of oxidised compounds while preserving the intrinsic qualities; restore freshness and fruitiness, as well as reviving the colour of oxidised wines; lessen organoleptic defects by eliminating bitter notes and oxidative aromas, while preserving aroma and taste properties.
- Dosage: 20 - 60 g/hL (white and rosé wine).
- SKU: 1 kg

IOC FYNEO

Reduce bitterness and astringency.

- An innovative, granulated yeast protein extract for fining white and rosé base wines. Can be used as an alternative to isinglass, gelatine and albumin.
- Application: Refine wines by eliminating harsh and bitter back palate notes; reduce astringency and bitterness; preserve aromatic profile.
- Dosage: 1 - 15 g/hL
- SKU: 1 kg

IOC QI FINE

Improve colloidal stability.

- A natural, biodegradable, non-allergenic product for fining wine. Qi Fine is a blend of chitosan and pea protein, specifically selected for its strong reactivity to phenolic compounds.
- Application: Correct colour and reduce bitterness and astringency; improve filterability and colloidal stability.
- Dosage: 10 - 30 g/hL
- SKU: 1 kg

MCC PRODUCTION | WHOLE BUNCH PRESS AND FLOTATION

CHARDONNAY		PINOT NOIR
	HARVEST	
Add to juice bin while grapes are loading. **SULFITANIN** 30 mL/hL Time lapse: 60 min		Add to juice bin while grapes are loading. **SULFITANIN** 30 mL/hL Time lapse: 60 min
	PRESS	
RAPIDASE CLEAR EXTREME Cuvée: 2 g/hL | Tailles: 3 g/hL Pectin test. **SULFITANIN** 20 mL/hL		**RAPIDASE CLEAR EXTREME** Cuvée: 2 g/hL | Tailles: 3 g/hL Pectin test. **ACTICARBONE** (if necessary) Cuvée: 10 - 40 g/hL Tailles: 30 - 80 g/hL **SULFITANIN** 20 mL/hL
	FLOTATION	
COLORPROTECT V 20 - 80 g/hL **QI'UP XC** 5 g/hL	**OR** (if using charcoal) **BENT'UP** 10 - 20 g/hL (prepare 3 h in advance) Time lapse: 90 min	**INOFINE V MES** 70 mL/hL
	RACKING	
	ALCOHOLIC FERMENTATION	
ALCHEMY I OR **18-2007** 20 g/hL		**FRESH ROSÉ** OR **18-2007** 20 g/hL
	1/3 Fermentation: **NUTRITION**	
CONQUER 30 g/hL		**CONQUER** 30 g/hL

TO BUBBLES

The secondary fermentation (*prise de mousse*) is done in the bottle, which are then left to rest on their side, allowing for completion of the fermentation. It can take anywhere from weeks to months to complete (average time of 6 - 8 weeks), after which it is up to the discretion of the winemaker to decide the length of time the wine will age on the lees, depending on the style of wine desired (or prescribed legislation).

The main aim of the secondary fermentation is to obtain a sparkling wine with about six bar of pressure at 10 °C. At the start of the fermentation, an initial concentration of 1-2 x 10^6 cells/mL must break down approximately 24 g/L of sugar. This consumption of sugar is accompanied by an increase in alcohol of 1.0 - 1.5%, with a final concentration of carbon dioxide of about 10 - 12 g/L.

Base wine parameters

There are various parameters that should be considered. Not just for the impact they will have on the success of the secondary fermentation, but also the role they will play in determining the processing of the wine, downstream decision making and final wine quality.

- pH 3 - 3.2. It is important to avoid a pH above 3.3 and below 2.9. Below this value, yeast activity is negatively impacted.
- High total acidity of more than 7 g/L.
- Free SO_2 of 10 - 15 mg/L. SO_2 strongly influences the yeast activity.
- Temperature >10 °C.
- Alcohol of below 11.5%. During the second fermentation, the alcoholic percentage will increase by 1.0 - 1.5%.
- Dissolved CO_2. It is estimated that 0.4 g/L of dissolved CO_2 can inhibit yeast activity by as much as 40%.
- Microbiological stability. MLF will de-acidify the wine and stabilise it in terms of microbiological contamination. In the absence of MLF, careful work in the winery and impeccable filtration will be necessary to guarantee the absence of any spontaneous MLF in the bottle.
- Tartrate stability. In the case of potentially unstable wines, suitable fining, followed by tartrate stabilisation in order to prevent the crystallisation of potassium bitartrate or calcium tartrate is important, as these may cause serious problems later during disgorgement. In the great majority of cases, careful filtration may be carried out after stabilisation in order to ensure the wine's clarity. During the stabilisation-filtration stages, it is important to minimise oxygen exposure.

Considerations for the second fermentation

In bottle

- **Temperature.** The minimum temperature for tirage to ensure a good second fermentation in bottle is 11 °C. The ideal temperature is 15 °C. It helps with the survival capabilities of the yeast (tolerating molecular SO_2, the assimilation of toxins and better viability). Ideally, the temperature must not exceed 18 °C. Above this temperature, there can be a higher production of biomass, which can result in riddling and disgorging issues. When preparing the tirage mixture (blend of base wine, starter culture and adjuvant), ensure that the temperature difference between the starter culture and the base wine is less than 10 °C. When tirage is complete, it is imperative that bottles be stored horizontally to maximize the surface area of the yeast to the wine and thus to the sugar, for a complete alcoholic fermentation.
- **Tartaric stabilisation.** Tartaric stabilisation must be completed prior to tirage. Several tartaric stabilisation techniques exist (e.g. cold stabilisation or electro-dialysis) and it is important that the wine is tartrate stable (avoid gushing).
- **Protein stability.** Proteins may contribute to bubble finesse, but conversely could cause haze formation in the bottle by flocculating when their concentration is too high. It is important to use a suitable bentonite to remove proteins from the base wine to avoid issues such as haze or gushing.
- **Fining/filtration.** These processes must be carefully completed prior to tirage to help with the riddling stage and avoid potential issues. In the case of base wine without complete MLF, sterile filtration is imperative.

In tank

If the base wine is not protein and/or tartrate stable, it is still possible to stabilise the wine in the pressure tank. It is preferable to make these stabilisation operations prior to the second fermentation in order to have the flexibility to mature the sparkling wine on lees for a longer period.

- **Temperature.** The choice of temperature is determined according to the desired wine profile and the required release date of the sparkling wine. For early release, it is recommended to increase the temperature to around 20 °C to boost the fermentation kinetics. At high temperatures, the fermentation is faster and produces extra biomass that can be easily eliminated by filtration prior to the final bottling.
- **Inoculation rate.** For a faster fermentation, you could increase the inoculation rate of the starter culture by 10%.

Factors that increase the risk of sluggish or stuck fermentations

- Base wine alcohol >12.5%.
- Base wine free SO_2 >15 - 20 mg/L (a lower pH will also influence the SO_2 effect).
- Yeast have not been prepared or acclimatised adequately and sufficiently.
- Insufficient yeast nutrition.
- Temperature of the cuvée is too low.
- Temperature fluctuations occur during the secondary fermentation.
- Too high CO_2 levels.

FERMENTATION

Tirage is the addition of yeast to the bottle for secondary fermentation. Care must be taken to have a clarified base wine and a healthy yeast starter culture. The tirage addition is a mixture of yeast, sugar, nutrients and an adjuvant/riddling aid (*liqueur de tirage*) that is added to the base wine and kept in suspension by mixing. This is then added to each bottle for the secondary fermentation.

YEAST AND REHYDRATION

The characteristics of a base wine are extremely unfavourable when it comes to fermentation, in comparison to the optimum conditions for yeast growth:

BASE WINE PARAMETERS	
Temperature: 11 - 15 °C	**Free SO_2:** 5 - 15 mg/L
Alcohol content: 11 - 11.5%	**pH:** 3.0 - 3.2

As a result, the selection of the yeast strain has to take into consideration the following:

- Suitability to the process and challenges of the second fermentation. Ideally the yeast should have the following characteristics: alcohol, cold, SO_2 and pressure tolerance, minimum SO_2 production, ability to ferment to dryness, autolysis after fermentation completion, not stain the wall of the bottle, desirable flocculating ability (efficient riddling), produce no off-odours and have a desirable effect on carbonation.

- Meeting the specific requirements of sparkling wines in terms of the required sensory profile. The autolytic capability of the yeast plays a vital role. Some yeast strains are selected for their autolytic capacity, i.e. their ability to fragment rapidly and completely at the end of their life cycle, and in so doing release compounds that contribute to full-bodied and aromatic complexity. In a sparkling wine, contact between the wine and lees is vital for product quality and a yeast with a high autolytic potential can prove to be a powerful tool in balancing sensations of acidity and roundness, while at the same time contributing to length on the palate.

Creating the starter culture *(prise de mousse)*

The aim of this step is to gradually acclimatise the yeast to the difficult fermentation conditions the yeast will encounter in the base wine. Therefore, this is considered to be a key step in the success of the secondary fermentation. The choice of yeast strain is also essential.

Three essential stages in preparing a starter culture:

1. Protection and rehydration of the yeast. The use of a rehydration agent, naturally rich in vitamins, minerals and sterols, reinforces the yeast membrane and helps intra-cellular exchanges. It increases the robustness of the yeast and enhances the ability to resist difficult conditions (pressure) at the end of alcoholic fermentation.
2. Yeast starter culture acclimatisation to alcohol. During this stage, the yeast metabolise sugar and adapt, due to a gradual increase in alcohol content. It is important to add a nitrogen source to optimise the fermentation and increase biomass production in the final stage.
3. Multiplication (production of biomass). This step allows the starter culture to multiply in order to achieve, at the addition of the tirage mixture, an active fermentative culture with a high cell concentration. To maintain sufficient activity and increase effectiveness of the biomass, it is strongly recommended to add a second dose of organic nutrition. It is essential to follow recommendations in terms of temperature and aeration for a good starter culture.

IOC 18-2007

Reference strain for secondary fermentation.

- *S. cerevisiae.*
- Sensory: Traditional, neutral and elegant, with enhanced mouthfeel.
- Application: All base wine varieties.
- Notes: Isolated by IOC in Epernay; well adapted to fermentation under difficult conditions (low temperature and pH; high alcohol); respects varietal character; good glycerol production; producer of low volatile acidity, SO_2 and foam quantities; good implantation, complete breakdown of sugars and low nutrient requirements; ideally suited to making wines with the Traditional Method and Charmat Method.
- Dosage: 20 g/hL
- SKU: 500 g

ANCHOR REVIVE

Ensuring enhanced yeast viability and wine quality during rehydration.

- A 100% yeast-derived formulation that provides high levels of essential growth factors like vitamins (pantothenate and biotin) and minerals that act as enzymatic co-factors (magnesium, manganese and zinc).
- Composition: Inactivated and autolysed yeast.
- Application: Improve yeast acclimatisation, implantation, viability and metabolism; increased stress resistance to challenging fermentation conditions; reduce risk of off-flavour formation.
- Dosage: 30 g/hL
- SKU: 1 & 5 kg

BOTTLING

NUTRITION

Alcohol present in the base wine is a stressor that negatively impacts the yeast, reducing fermentation and nitrogen assimilation ability. In order to complete the fermentation and increase their resistance to alcohol, the yeast requires survival factors, oxygen, detoxifying agents and ammonium ions.

Due to the depletion of nutrients during the primary fermentation, this must be addressed in the secondary fermentation to minimise the risk of a stuck fermentation. Due to the adverse conditions (low temperature, low pH and alcohol), providing sterols is essential during the yeast acclimatisation and tirage stage. During the fermentation process, the yeast should, at a minimum, be supplied with ammonia salts and thiamine.

IOC EXTRA PM

Optimise bottle fermentation and enhance the sensory profile.

- Extra PM is a fermentation activator specifically intended for bottle fermentation and contains inactivated yeast that is naturally rich in glutathione.
- Application: Guarantee optimal yeast activity; retain membrane exchange capacity, especially in the case of continuous yeast starter cultures; guarantee the optimal physiological state of the yeast, especially after 2.5 kg pressure; improve wine ageing potential; limit reduction phenomena during bottle fermentation; conserve varietal and fruity aromas; enhance roundness, elegance and length in sparkling wines.
- Dosage: 10 - 30 g/hL
- SKU: 1 kg

IOC PHOSPHATES TITRES

Promote significant yeast biomass.

- Phosphates Titres is a blend of DAP and thiamine (vitamin B1) for nutrient supplementation of deficient must/juice. Wine yeast requires a supply of thiamine for cell growth. Phosphates Titres can help ensure regular yeast multiplication and sugar utilisation. For secondary fermentation, add Phosphates Titres to the wine being used for the starter culture.
- Application: Thiamine is an essential growth factor and helps to maintain yeast viability and vitality; encourage fast start to fermentation activation; ensure an even supply of nitrogen right to the end of fermentation; optimise fermentation efficiency.
- Dosage: 5 g/hL
- SKU: 1 kg

ADJUVANTS AND RIDDLING AIDS

Riddling is the movement of the bottles after the secondary fermentation. The bottles are gently moved to an inverted position over a period of time either manually or by machine. This brings the yeast lees down into the bottle necks making them ready for disgorging. Riddling is initiated after the secondary fermentation is complete and can take anything from a couple of days (gyropalette) to three weeks (manually). Riddling agents are used to help move the yeast and sediment from the secondary fermentation smoothly into the neck of the bottle without sticking to the glass.

IOC CLARIFIANT S

[ORGANIC]

Clarification during riddling.

- Clarifiant S is a liquid preparation of sodium bentonite specifically selected for riddling. This product helps to create compact sediment in bottle and assist its movement during riddling. It has a gentle mode of action producing brilliantly clear wine. Robust and multi-purpose, it is suitable for all types of wine and various riddling methods. It perfectly respects the profile of base wines. It is suitable for bio-certified wines.
- Application: A high degree of clarification and sedimentation during riddling; suitable for manual and automated riddling; Clarifiant S can be added directly to the wine after the yeast and sugar have been added.
- Dosage: 70 - 80 mL/hL
- SKU: 1 L

IOC CLARIFIANT XL

Clarification during riddling.

- Clarifiant XL is an optimised riddling agent, consisting of pure bentonite and silicate, which results in excellent compaction of the sediment. This is a liquid riddling additive offering excellent fining properties. This product gives a high degree of clarification and sedimentation, which is particularly effective for difficult riddling operations. No other additives are required for riddling operations. Clarifiant XL provides compact deposits that are non-adherent and easy to remove.
- Application: A high degree of clarification and sedimentation during riddling; suitable for manual and automated riddling; no other co-adjuvant is required for the riddling operation; forms compact, easy to remove sediment.
- Dosage: 60 - 80 mL/hL (sparkling white wines) or 80 - 100 mL/hL (sparkling rosé or red wines).
- SKU: 1, 5 & 10 L

IOC SOLUTION ST

Add structure during ageing on lees.

- Solution ST is a liquid preparation comprising of gallic tannins and copper sulphate, stabilised with SO_2. It prevents off-odours and enhances clarification during riddling. Solution ST enables the preservation of the sensory qualities in wines destined for bottle fermentation. It also improves the wine's potential for ageing and makes riddling easier. Solution ST also helps to prevent oxidation and acts as a preventative and curative treatment for reductive odours. For full-bodied sparkling wines, it increases the structure
- Application: Prevents oxidation; acts as preventative and curative treatment for reductive odours; assists clarification during riddling; reinforces the ageing potential of the wine; adds structure.
- Dosage: 20 - 40 mL/hL
- SKU: 1 & 10 L

Product summary for tirage mixture

CATEGORY	PRODUCT	APPLICATION	DOSAGE
YEAST	IOC 18-2007	Traditional yeast for Champagne Extremely high fermentation capacity	20 - 30 g/hL
NUTRIENTS	IOC EXTRA PM	Inactivated yeast rich in glutathione Limits reduction & protects aroma Adds roundness, elegance & length	10 - 30 g/hL
TANNINS	IOC SOLUTION ST	Essential for clarification during riddling Prevents oxidation	20 - 40 mL/hL
RIDDLING AGENTS	IOC CLARIFIANT XL	Ensures high degree of clarification & compact sedimentation Assists sediment movement down the bottle Produces brilliant & clear wines	60 - 90 mL/hL
	or		
	IOC CLARIFIANT S	Assists with the riddling process for organic wine production	70 - 90 mL/hL

Ageing on lees and riddling

- Adequate ageing sur-lie is one of the most important production steps.
- It is required to develop roundness, body, general flavour and complexity of the wine.
- 'Yeasty' characters develop during this stage and result in increased levels of amino acids, esters, fatty acids, amides and terpenoids, that alter flavour and complexity and may also enhance bubble formation.
- Higher pH and temperatures increase the rate of autolysis, but it might have negative effects on the bubble retention and sensory attributes. The optimal temperature for proteolysis has been reported to be around 12 ˚C.
- Yeast strains vary in their autolytic capacity, influence on foaming properties and therefore their impact during lees ageing.
- The sediment collected during riddling consists of yeast cells, protein material, tartrate deposits and riddling aids. The longer the ageing period, the more homogenous the sediment will be and less separation of the insoluble particles will take place. Therefore, wines that have spent longer periods on the lees are usually easier to riddle. Other factors that affect successful riddling includes yeast strain, sediment volume, fermentation rate, storing conditions, the use of riddling aids and riddling method.

PROTOCOL FOR YEAST REHYDRATION AND BOTTLING

(Please contact your Technical Sales Manager for a personalised protocol)

DAY BEFORE YEAST REHYDRATION

Volume for this step	100 hL of base wine for 2nd fermentation
Add sugar to the wine tank	23 - 25 g (dependent on RS)

DAY 1

Morning

Volume for this step	100 L
Add 2 kg of 18-2007	(20 g/hL)
Add 3 kg of Revive	(30 g/hL)
To 20 L of water at 37 °C	(10 x volume of yeast)
Leave for 20 minutes Mix very well	
Add 2.5 kg sugar to yeast tank Mix until dissolved	
Add 50 L of wine and aerate for 20 min	
Add 25 L of water	

Afternoon

Volume for this step	100 L
Add 5 kg of sugar to yeast tank Mix until dissolved	
Add 50 L of wine and aerate for 20 min	
Add 50 L of water	

Total volume of yeast tank after day 1: 200 L

DAY 2

Morning

Volume for this step	100 L
Add 7.5 kg of sugar to yeast tank Mix until dissolved	
Add 50 L of wine and aerate for 20 min	
Add 50 L of water	

Afternoon

Volume for this step	100 L
Add 10 kg of sugar to yeast tank Mix until dissolved	
Add 50 L of wine and aerate for 20 min	
Add 50 L of water	

Total volume of yeast tank after day 2: 400 L

DAY 3 | 1 HOUR BEFORE BOTTLING

Step 1

Dissolve 2 kg of Extra PM in 20 L of wine	(20 g/hL in 10 x the amount of wine)
Add to wine tank	

Step 2

Add 400 L of yeast tank to bottling wine tank Mix for 10 minutes	
Add 3 L of Solution ST Mix of 10 min	(30 mL/hL)
Add 9 L of Clarifiant XL Mix for at last 30 minutes before bottling Continue mixing for duration of bottling	(90 mL/hL)

DISGORGEMENT

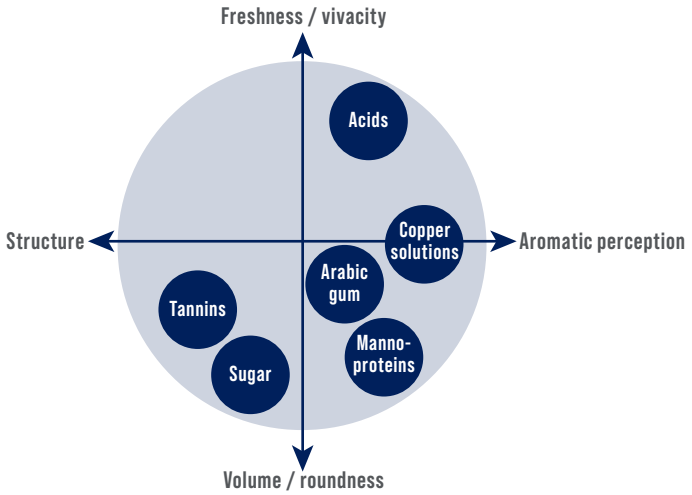
After the wine has gone through the secondary fermentation, ageing, and riddling, the bidule stopper, which now holds the yeast plug in the neck of the bottle, is removed via disgorgement (if done mechanically). Prior to removing the crown cap the bottles, on point, are cooled (4 - 10 °C) and the top 2.5 cm of the neck is frozen in a glycol solution (-27 °C). This allows the crown cap to be removed and the bidule containing the yeast plug to be expelled. Disgorging may take place manually or by machine and should be done at lower temperatures to reduce CO_2 loss. If done correctly, disgorging should not decrease the pressure by more than 2 bar and volume loss is normally about 2%.

DOSAGE

The dosage is the final opportunity to add a distinctive element to the wine. The dosage may include a mixture of sugars, wines, distilled spirits, etc. It also helps determine the sugar level in the finished wine that relates to the dosage classification from brut nature to doux. The dosage solution should be filtered and stable before addition to the bottles.

Aim of dosage

- Preserve quality.
- Mask defects.
- Adjust deficiencies.
- Adapt to market tastes:
  - Supermarket: 12 - 14 g/L.
  - Amateurs: 5 - 8 g/L.
  - Trend: zero dosage.
  - Differences according to countries and time of consumption.
- Create a house style.



- The millilitres of dosage required: $mL = \frac{\text{(Bottle volume in mL) (Desired sugar level in g/L)}}{\text{(Sugar concentration of stock solution in g/L)}}$

Optional products for the dosage liqueur

SO_2

- Make prior trials to validate the best dosage.
- Potassium bisulphite gives between 30 and 60% of the free SO_2 dose, according to the disgorging conditions.

ASCORBIC ACID

- Maximum dosage: 15 g/hL.
- Make prior trials to validate the best dosage.
- Usual dosage is between 2.5 - 7 g/hL.
- Long-term effect.
- Always use ascorbic acid in a mixture with solution in order to preserve the anti-oxidant action.

CITRIC ACID

- Maximum dosage: addition up to 0.5 g/L, provided that the final concentration is less than 1 g/L.
- Make lab trials to determine the best dosage.
- Always use in conjunction with SO_2 to avoid potential degradation by lactic bacteria and volatile acidity increase.
- Usual dosages are between 2 - 7 g/hL.

METATARTARIC ACID OR CMC

- Crystallisation inhibitors that block nucleation and crystal growth.
- Metatartaric acid maximum legal dosage: 10 g/L.
- CMC is a synthetic cellulose-based polysaccharide.
- CMC prevents crystal growth by altering the crystal face.
- CMC maximum legal dosage: 100 mL/hL.

LACTIC ACID

- Make lab trials to determine the best dosage.
- Usual dosages are between 2.5 - 20 mL/hL.
- Application: light acidification without the aggressive acidic taste of citric acid.

ARABIC GUM

- Arabic gum is polysaccharides rich in D-Galactose, L-Arabinose, L-Rhamnose and proteins.
- Application: to give roundness, softness and balance acidity.
- Maximum dosage: 30 g/hL.
- Dosage: 25 - 100 mL/hL according to the gum and the level of softness required.
- Also stabilise colour in rosé.

COPPER CITRATE OR SULPHATE

- Application: to remove reductive characters.
- Maximum addition of 1 g/hL of copper sulphate or citrate allowed, provided that the residual concentration of copper is not more than 1 mg/L.

TANNINS

- Impact of tannins: structure, eliminate reduction, aromatic persistency.
- Make lab trials to determine the best dosage.
- To improve structure, use 0.7 - 2.7 g/hL of ellagitannin (oak, chestnut) or grape tannins.

BRANDY

- The addition must not increase the alcohol percentage by more than 0.5%.
- Impact on the taste: gives complexity and ageing notes; contribution to the balance on the palate; gives volume in the mid-palate.
- Make lab trials to determinate the best dosage.
- Cognac spirit is used between 25 - 70 mL/hL.

MANNOPROTEINS

- Soluble proteins extracted from yeast cell walls.
- Primary aim: tartaric stabilisation.
- Secondary impact: interaction with aromas (increase or decrease perception and impact the length on the palate); impact on astringency, bitterness and saltiness.
- Make lab trials to determine the best dosage.
- Dosage range from 5 - 15 g/hL according to the mannoproteins used.

Tools for dosage liqueur

Classical dosage liqueur:

- Mix of wine and sugar.
- Different concentrations (500 - 750 g/L).
- Cane or beet sugar.

Liqueur from wine:

- Choice of wine and sugar source important.
- Young and neutral wine: neutral liqueur.
- Young and aromatic wine: aromatic contribution of the liqueur.
- Aged wine: ageing flavours and softness contribution.
- Barrel-aged wine: oak flavours and roundness contribution.

FINISHING TOOLS

Arabic gums

Due to their viscosity, arabic gums are recommended to enhance sparkle consistency in the glass, as well as the finesse and persistence of bubbles, by slowing down the dissolving of the film which separates the bubbles. Some arabic gums are known to contain surface-active molecules in the form of protein fractions. Consequently, these proteins can directly contribute towards stabilising bubbles.

From another angle, the polysaccharide fractions of arabic gums are capable of bonding with proteins at bubble interfaces. The gum's polysaccharides enhance the stability of the film, which separates the bubbles through viscosity, thereby slowing down the draining and future bursting of the bubbles. Consequently, the combination of proteins at wine/gas interface and polysaccharides within the film extend bubble life.

Arabic gums will increase bubble finesse at the surface (collar) while enhancing stability over time. Two bubbles only combine if the film separating them is fine and unstable. The size and structure of arabic gums prevent bubbles from approaching each other and slow down draining, thereby reducing the probability of the bubbles bursting.

IOC FLASHGUM R MF

Improve mouthfeel, volume and fullness.

- A micro-filtered arabic gum in liquid solution, from Seyal acacia. It is a solution of 20% arabic gum, filtered, sulfured at 0.5% and selected for its stabilising and organoleptic properties
- Application: Harmonise the structure of thinner wines and increase the impression of volume and fullness in the mouth; provide wines with protection against various forms of chemical and physical instability; used as protective colloid to stabilise phenol compounds; a solution with a high level of clarity and stability and therefore recommended for treating wines whenever it is necessary to avoid clogging, flocculation or precipitation after bottling.
- Dosage: 20 - 80 mL/hL (white and rosé wines).
- SKU: 1 L

Mannoproteins

FINAL TOUCH POP

Improve the quality of sparkling wines.

- This is a unique mannoprotein-based solution that enhances the organoleptic qualities of sparkling wines, while also preserving their elegance, freshness and balance. The fermentation aromas and minerality of wines treated with Final touch Pop remain predominant during ageing and storage. The development of oxidative aromas (hints of ripe fruit, nuts and honey) is attenuated and tannins are less astringent.
- Application: Improve the wine's structure and bubble quality; provide a refined aromatic profile and persistence; aid in elegance, freshness and balance; provides smooth and round mouthfeel; limit oxidation to increase longevity; reduce astringency of rosé and tannic sparkling wines; can also refresh base wines.
- Dosage: 20 - 40 mL/hL
- SKU: 1 L

SECOND FERMENTATION PROCESS

TRADITIONAL METHOD

01 | BASE WINE

Base wines intended for secondary fermentation must be high-quality and respect many physical, chemical and flavour criteria. It is important to also consider the impact of the blending, stabilisation and filtration steps.

02 | BOTTLING

The wine is bottled together with the racking solution consisting of the yeast culture, sugar, riddling aids and fermentation starters. Secondary fermentation takes place at 12 - 15 °C over 6 - 8 weeks.

03 | AGEING

During this stage, the lees consist mainly of yeasts in the form of a deposit. Autolysis of the yeast helps improve the wine's sensorial features (aroma, volume, etc).

04 | RIDDLING

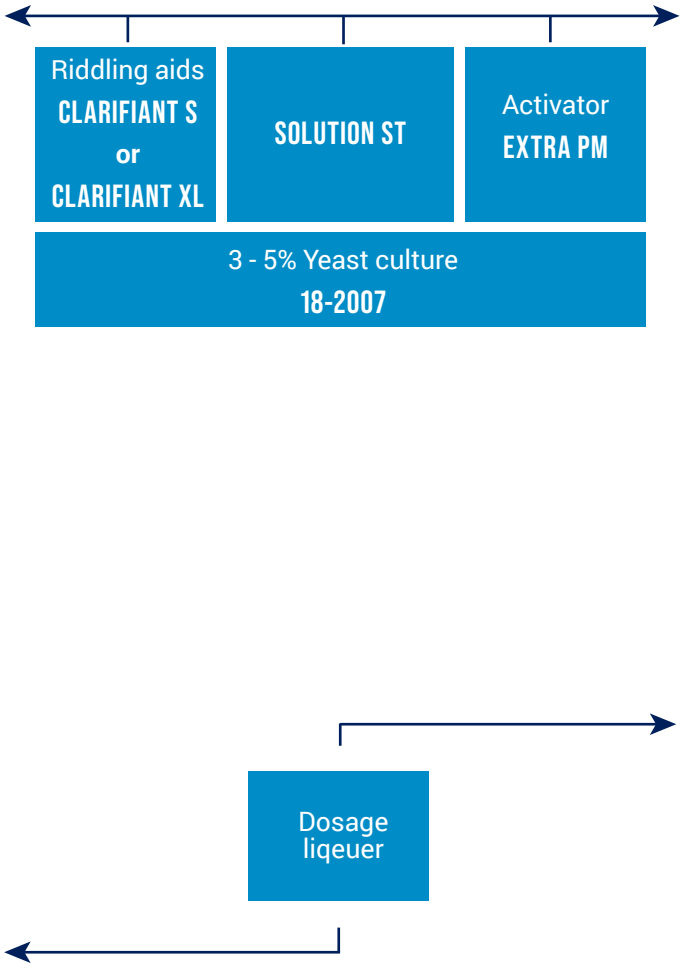
Riddling helps to collect the sediments in the neck of the bottle. This stage affects the quality of the finished product by helping to obtain a brilliant clear wine, perfectly separated from its lees. Ideally, plan for testing before riddling.

05 | DISGORGING

The neck of the bottle is plunged into a -25 to -30 °C glycol solution in order to form an ice plug. On opening, internal pressure helps eject this plug. This process is done mechanically.

06 | DOSAGE

A dosage liqueur is now added to the wine. The amount of liqueur depends on the desired wine type. It is essential to carry out tests for dosage. This stage plays a major part in the quality of the blend. The bottles are then corked, caged and labelled.



CHARMAT METHOD

01 | BASE WINE

Base wines intended for secondary fermentation must be high-quality and respect many physical, chemical and flavour criteria.

02 | BOTTLING

Secondary fermentation is achieved by adding yeast culture, sugar and a fermentation starter within a pressure resistant tank. It generally takes place at 12 - 25 °C over approximately 10 days.

03 | AGEING

Ageing is not always practised. Where it is, it takes place in a tank fitted with an agitator and the duration depends on the character of the sparkling wine desired.

04 | STABILISATION & FILTRATION

Stabilisation by refrigeration at -2 °C, where carried out, may either be on the base wine or at this stage. The wine is filtered at low temperatures.

05 | DOSAGE

The wine is transferred, under pressure, to a buffer tank, thus preserving the dissolved carbon dioxide. The dosage liqueur is now added to the tank. Its nature and quantities need to be evaluated to match the type of wine desired.

06 | BOTTLING

Bottling is carried out at the same pressure. The bottles are then corked, caged and labelled.

3 | CATALOGUE SUMMARY

SPARKLING WINE | CATALOGUE SUMMARY

BASE WINE

PRESS & DOWNSTREAM PROCESSING

Enzyme

Aroma extraction

Rapidase Expression Aroma

Clarification

Rapidase Clear
Rapidase Clear Extreme
Rapidase Flotation

Protection

IOC Tanin Cristallin
IOC Sulfitanin

CLARIFICATION & JUICE FINING

Settling

IOC Colorprotect V
IOC Inofine V

Flotation

IOC Qi'UP XC
IOC Bent'Up
IOC Acticarbone

Fining the juice

IOC Qi Fine
IOC Qi No[Ox]

PRIMARY FERMENTATION

Yeast

IOC Calypso
IOC BoreAL

Traditional & neutral

IOC 18-2007

Neutral

Anchor Legacy N 96
Fermivin Champion

Aromatic

Anchor Alchemy I
Anchor Alchemy II
Anchor Legacy NT 116
Anchor Legacy VIN 13
IOC Be Thiols

Rosé

IOC Fresh Rosé

Nutrients

Glutathione solution

IOC Glutarom

Rehydration

Anchor Revive

Complex

Anchor Nourish
Anchor Conquer

MALOLACTIC FERMENTATION

Bacteria

IOC Inobacter

PROTECTION

Sulphur dioxide

IOC Inodose 5

FINING THE WINE

IOC Bent'Up
IOC Qi No[Ox]
IOC Fyneo
IOC Qi Fine

TO BUBBLES

FERMENTATION

Yeast & rehydration

IOC 18-2007
Anchor Revive

Bottling

Nutrition

IOC Extra PM
IOC Phosphates Titres

Adjuvants & riddling aids

IOC Clarifiant S
IOC Clarifiant XL
IOC Solution ST

DISGORGEMENT

Finishing tools

Arabic gum

IOC Flashgum R MF

Mannoprotein

Final touch POP