Sparkling Wines

bubble art

Experience that is transformed into Art

products that employ the *Charmat* and *Traditional* methods

Perdomini IOC

Révelons votre différence

Oenological products for

Traditional Method

TABLE 1

Application	Product	Characteristics	Dosage
* PREPARATION OF THE *PIED DE CUVE*	**IOC 18-2007**	A yeast strain that makes for the production of wines of great refinement, maintaining the grape vine's quality as well as the *terroir's characteristics*. This excellent adaptability to meet the most difficult situations leads to avoiding the formation of undesired, secondary compounds.	10 g/hL
	IOC BIO	Certified, biological yeast is recommended in the production of sparkling wine.	10 g/hL
	Hydra PC	Yeast protector to be used in *Tirage*, naturally rich in magnesium. Essential in the case of very low pH (< 3.0).	10 g/hL
	Phosphate Titrès	Fermentation optimiser with a nitrogen and thiamine base.	5 g/hL
PREPARATION OF THE BASE FOR *TIRAGE*	OPTION 1	OPTION 2	OPTION 3
	Phosphate Mazure *Tirage* adjuvant with an aluminium silicate base, which increases the compactness and facilitates the elimination of deposits. **Dosage** 20 – 30 ml/hL	**Inoclair 2** Colloidal complex with an alginate and bentonite base, with clarifying power suitable for automatic *remuage* techniques. **Dosage** 70 – 90 ml/hL	**Clarifiant XL** Sodium bentonite and silicates solution. **Dosage** 70 – 80 ml/hL
	Clarifiant S A preparation based on liquid sodium bentonite that facilitates the *remuage* of sparkling wine. It applies to both traditional *remuage* as well as the automatic one. **Dosage** 60 – 90 ml/hL		
	Solution ST Compound made up of tannins and copper sulphate. To preserve the wines' organoleptic qualities, improves the ageing capacity, and reinforces the SO's antioxidant power. **Dosage** 20 – 40 ml/hL		
	** **Solution 700:** a copper sulphate base solution, citric acid and SO_2 for the prevention and treatment of the notes of flattening in rosé wines. **Dosage** 10 – 20 ml/hL		
LIQUEUR D'EXPEDITION	**Sucraisin MCR liquid**	Microfiltered rectified concentrated must.	–

* Ask your Local Agent or contact the Perdomini-IOC technical services for the *Pied De Cuve* yeast preparations' protocol.

** An alternative to the ST Solution rosé wines.

the sparkling wine process

Charmat Method

TABLE 2

Application	Product	Characteristics	Dosage
* PREPARATION OF THE *PIED DE CUVE*	**IOC 18-2007**	A yeast strain that makes for the production of wines of great refinement, maintaining the grape vine's quality as well as the *terroir's characteristics*. This excellent adaptability to meet the most difficult situations leads to avoiding the formation of undesired, secondary compounds.	20 g/hL
	La Claire SP665 **La Claire CGC62**	Yeast that enhances the organoleptic characteristics that give it its elegance, refinement, structure and aromatic complexity, with fruity and floral notes in compliance with the traditional nature of the original grape variety. Good nitrogen nutrition guarantees the yeast's full expression.	20 g/hL
	La Claire VDP	Yeast strain suitable for the production of high quality sparkling wine.	20 g/hL
	Blastosel P346	Yeast that is capable of developing a high degree of white and exotic fruits aromas, which fits perfectly into the aromatic content. A balanced and mineral flavour.	20 g/hL
	IOC BE FRUITS	A specific yeast aimed at revealing fruit esters (pineapple and citrus fruit) is unable to form SO_2. Furthermore, it can reduce the formation of ethanal, a molecule that can easily be combined with sulphites. An instrument that leads to achieving healthy and clean wine, with fresh fruit aromas. The fine lees in this yeast are not reduced.	20 g/hL
	IOC BIO	Certified, biological yeast that is recommended in the production of sparkling wine.	20 g/hL
	Ecobiol Pied de Cuve Arom	A yeast protector that should be used during the rehydration phase. Inactive yeast that is rich in bioavailable amino acids, which can add vitamins, minerals, fatty acids and sterols. It optimises the yeast's metabolism, thus avoiding the abnormal production of volatile acidity and sulphur flavours, thus enabling the production of the aromatic precursors that are contained in the must.	10 – 20 g/hL
SECOND FERMENTATION	**Activit O**	100% organic nutrient addition of thiamine that enables the regular growth of yeasts and encourages the expression of aromas.	5 – 15 g/hL
	Fosfovit	Activating fermentation that is made up of Diammonium phosphate (DAP) and thiamine to encourage yeast multiplication.	5 – 20 g/hL
	Glutarom Extra	Inactive yeast with a high amount of reduced glutathione (GSH).	5 – 10 g/hL
	Tan flavour FF	Proanthocyanidin tannin. Provides protection from oxidation, both to the colouring and aromatic fraction. When used during the early winemaking phase, it enhances the floral and fruity notes.	1 – 3 g/hL
	NoOx	Technological adjuvant made up of chitin and bentonite derivatives, which avoid the must and wines being oxidised. It provides the sparkling wine with a taste of freshness, by eliminating the vegetable notes and the bitter sensations that are often associated with oxidisation.	5 – 10 g/hL
PRE-BOTTLING	**Sucraisin MCR liquid**	Microfiltered rectified concentrated must.	–

The base wine

In order to achieve a successful second fermentation, it is important for the base wine to comply with the following conditions:

- T > 10°C
- SO_2 free < 15 mg/L
- alcohol 11 – 11.5%
- pH
  - Charmat: 3.10 – 3.25
  - Traditional: 2.90 – 3.20

In the case of wine that is to be used in the production of sparkling wine employing the *Traditional method*, malolactic fermentation can be performed to de-acidify the wine and stabilise it microbiologically (we recommend you use the ***IOC Inobacter*** or, alternatively, for pH>3.25, the use of ***IOC Inoflore*** in co-inoculation). This phase is not obligatory but, without malolactic fermentation, any microbiological alteration must be avoided, in such a way as to avoid spontaneous fermentation occurring in the bottle*. Furthermore, in the case of any wine that is potentially unstable, the base wine must be clarified, followed by tartaric stabilisation, aimed at avoiding the crystallisation of potassium bitartrate or calcium tartrate, since these could cause serious problems during the *dégorgement*.

In the case of sparkling wines that are produced adopting the *Charmat method*, we recommend the base wine undergoing an enzymatic treatment using ***Eno&Zymes Evolution Plus***, an enzyme with a β-glucanase activity that helps to accelerate the yeast autolysis and contributes to the rapid addition of volume, creaminess and lingering in the mouth.

* ***IOC-Sentinel*** - *During the Charmat method, the base wine's conservation requires low SO_2 levels to guarantee the optimal start of re-fermentation.*

The preparation of *Pied de cuve*

The main aspect to take into consideration during this phase concerns yeast acclimatisation in compliance with the real conditions it will incur during re-fermentation. It is in fact necessary that the yeast achieves a physiological state such as to be able to acclimatise gradually and in a way optimal with the wine's composition and the operative conditions it will undergo during re-fermentation.

Some of the parameters present in a base wine, and the relative conditions ideal for the growth of yeast, have been set forth in the following table:

Parameter	Wine	Ideal situation
Temperature °C	12 – 16	25 - 30
SO_2 free	5 – 15	0
Alcohol % vol	11 – 11.5	0
pH	Charmat: 3.10 – 3.25 Classico: 2.90 – 3.20	5 - 6

The preparation of *Pied de cuve* is, therefore, considered to be a very important step in obtaining successful re-fermentation, and the choice of yeast strain is fundamental.

Perdomini-IOC offers a selection of yeast for re-fermentation, which meets the various technological purposes envisaged (see tables 1 and 2).

The preparation of *Pied de cuve* takes place during three main phases: the first phase consists in the yeast's rehydration and protection, the second one, which lasts between 12 – 24 hours, helps the yeast to acclimatise it with the alcohol and, lastly, the phase known as the "growth" one, which lasts approximately three days, helps the *Pied de cuve* to propagate itself, in order to obtain a sufficient amount of yeast to achieve the optimal beginning of re-fermentation.

What is re-fermentation

The main purpose of re-fermentation is that of obtaining a sparkling wine with approximately 6 bar of pressure to the temperature of 15-18°C.

At the beginning of re-fermentation, an initial concentration of 1-2 million living yeast cells per millilitre of wine must make 24 g/L of sugar. This sugar consumption is accompanied by an increase in the alcohol content from 1.2 to 1.4% of the total volume, with final CO_2 concentration from10 to 12 g/L.

*** Theoretic conditions connected to the Saccharomyces Cerevisiae physiology.*

Charmat Method

BASE WINE

The base wines for secondary fermentation must be high quality and comply with the various physical, chemical and organoleptic criteria established (see paragraph: "the base wine").

Pied de cuve:

- IOC 18-2007 / IOC BE FRUITS / IOC BIO / Blastosel P346
- LaClaire SP665 / LaClaire CGC62 / LaClaire VDP
- Ecobiol Pied de Cuve Arom / Ecobiol Pied de Cuve
- Activit O / Fosfovit / Glutarom Extra
- Tan Flavour FF / NoOx

(ADD AFTER 48 HOURS FROM THE BEGINNING OF ALCOHOLIC FERMENTATION)

RE-FERMENTATION

The secondary fermentation begins in the autoclave with the addition of bottom fermentation (sugar and the products required by re-fermentation). Generally, this phase takes place at 12–16°C for approximately 15 - 25 days.

YEAST DERIVATIVES: Sphere Blanc / Sphere Express

AGEING

Ageing is not always carried out.
When it is, it takes place in tanks that are equipped with a stirrer and the duration depends on the type of sparkling wine required.

STABILISATION - FILTRATION

Cold stabilisation, at -4°C / -5°C, can be carried out either on the base wine or after re-fermentation. The sparkling wine is then filtered at a low temperature.

GUMS ARABIC: ReadyGum 20 / ReadyGum Premium

TANNINS: Essential Fresh / Essential PEL

MANNO-PROTEINS: UltiMA Fresh / UltiMA Soft / UltiMA Ready Life / UltiMA Ready Expression / UltiMA Ready Fizz

Sucraisin MCR

PRE-BOTTLING DOSAGES

..and, then, the sparkling wine is transferred to a pre-evacuated bottling tank.
During this phase, oenological products can be added to obtain the sparkling wine's finishing.

BOTTLING AND LABELLING

Bottling takes place at constant pressure and the bottles are then sealed, wire caged and labelled.

Traditional Method

BASE WINE

The base wines for secondary fermentation must be high quality and comply with the various physical, chemical and organoleptic criteria established (see paragraph: "the base wine").

RE-FERMENTATION

The base wine is bottled together with the *liqueur de tirage*, which consists in the bottom fermentation, sugar and products for the *tirage* (see options, 1, 2 and 3). The re-fermentation takes place at 12 – 15°C for a few weeks.
It refers to conducting re-fermentation at low temperatures (which are compatible with the yeast's physiological characteristics) to improve the quality of the bubbles.

Pied de cuve:

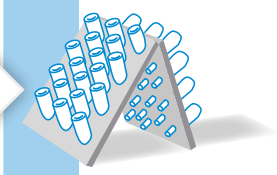
- IOC 18-2007 / IOC BIO
- Phosphate Titrès
- Hydra PC

The three proposals "Tirage Products" are:

- 1: Phosphate Mazure + Clarifiant S + Solution ST
- 2: Inoclair 2 + Solution ST
- 3: Clarifiant XL + Solution ST

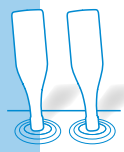
AGEING AND *REMUAGE*

During this phase, the sediment is mainly made up of yeasts, whose autolysis improves the sparkling wine's sensorial characteristics, adding aromas, volume and softness.



DÉGORGEMENT

The neck of the bottle is submerged in monopropylenic glycols at -30°C, in such a way as to freeze the sediment.



DOSAGE (*liqueur d'expédition*)

The composition of the *liqueur* depends on the type of sparkling wine required. This phase is the main one in obtaining a quality end product.

- ReadyGum 20 / ReadyGum Premium — GUMS ARABIC
- Privilege / Essential — TANNINS
- UltiMa Fresh / UltiMa Soft — MANNO-PROTEINS
- Sucraisin MCR

BOTTLING AND LABELLING

The bottles are then sealed, wire caged and labelled.

FAQ

Why prepare bottom fermentation, when simple re-hydration is sufficient to achieve alcohol fermentation?

Re-fermentation is very similar to alcoholic fermentation. There are, however, a few differences. The base wine, with alcohol content of between 10% and 11% vol, low pH and low SO_2 provides a more hostile environment compared to must. Re-fermentation takes place in sealed or autoclave bottles and not in open vats, such as in alcoholic fermentation. The presence of CO_2 and the pressure limit the growth of the yeast. Therefore, it is important to acclimatise the yeast, preparing a *pied de cuve*.

How much yeast must be added to achieve successful re-fermentation?

The *pied de cuve* begins with 1-2 millions of living cells per ml. Yeast multiplication is greatly limited by a number of factors, which characterise the base wine. When these conditions are particularly difficult, we recommend increasing the amount of the *pied de cuve* to more than 3 million living cells per ml, to compensate for the absence of any cellular multiplication, and to avoid any difficulties at the end of re-fermentation. By following our protocol, with a quantity equivalent to 3-5% of the *pied de cuve*, you will be able to obtain cellular concentration sufficient to complete the re-fermentation.

What are the factors that have an effect on re-fermentation?

In addition to the degree of alcohol and pH value, you must also take into consideration the amount of SO_2 present in the base wine or, more precisely, to the free SO_2. Generally, wine is adequately protected with free SO_2 levels of 10 mg/L, with the scarce inhibition of the yeast's activities; once this threshold has been exceeded, there is the potential risk of inhibition (to limit the use of potassium metabisulphite, see the use of IOC Sentinel*). Furthermore, even the temperature plays an important part. Re-fermentation is difficult to begin below 10°C, whilst if the temperature is above 20°C, there is a deposit that is difficult to remove because of the high number of yeast cells. Moreover, the initial CO_2 levels in the base wine decanted may disturb re-fermentation. The initial pressure of 0.2 bar, corresponding to 0.4 g/L of CO_2, shall lead to a reduction in the cellular growth of 40%, compared to a carbon free base wine. When the base wine's conditions are in compliance with the limits of acceptability, but re-fermentation takes place with difficulty, you will have to keep every single factor or the combination of more than one factor under control, which have a negative influence on the process. Other factors, such as pesticide residue, can have a negative effect on re-fermentation.

Why do we have to add Solution ST to the *liqueur de tirage*?

When it is added prior to *tirage*, Solution ST provides the sparkling wine with an abundance of structure. Furthermore, the presence of copper sulphate helps to prevent the reduction defects that are common during the winemaking process. The causes of this kind of reduction are many, and the reduction defects are generally described in terms of sulphur, rubber, rotten eggs, etc.. When these defects are found in the base wine, they can be corrected by using Netarom Extra prior to *tirage*.

Why do we recommend the use of clarifying products for the preparation of the base wine?

The clarifying products added to the base wine are very important to obtaining a quality end product. Perdomini-IOC recommends the use of Cristalline Plus or NoOx (10 – 50 g/hL) on the basis of the sparkling wine you wish to obtain.

Even the filtration process must necessarily be carried out carefully. For this reason, according to the sparkling wine you wish to obtain, the technical assistance provided by Perdomini-IOC or the agent for the territory are at your disposal to supply any information required to manage the process better.

Why use NoOx?

In the case of sparkling wine that is obtained by using the Charmat method, Perdomini-IOC recommend the use of NoOx (5 – 10 g/hL) in order to improve the refinement, bubble persistence, and increase its shelf-life.

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