

# MICROSAFE O<sub>2</sub>

ADVANCED EQUIPMENT FOR DOSING  
OXYGEN IN WINES AND MUSTS



## BENEFITS

DOSING O<sub>2</sub>  
USING ABSOLUTE  
VALUE

AUTOMATIC CONTROL  
THROUGH A  
MICROPROCESSOR

DIFFERENT OXYGEN  
DOSING METHODS:  
MICRO, MACRO  
AND SINGLE DOSE

CONTROL  
OF WINE  
TEMPERATURE

ADJUVANT DOSING  
SYSTEM MANAGED  
DIRECTLY BY THE  
MICRO-OXYGENATOR

NO NEED FOR SPECIAL  
CALCULATIONS OR  
ERROR COMPENSATION  
TABLES



## MICRO-OXYGENATION AND MACRO-OXYGENATION OF WINE

Wine, from a redox prospective, is an unstable beverage susceptible to reduction, which hides the full richness of its varietal aromas and often releases unpleasant odours. This phenomenon is due to the proanthocyanidinic tannins of grapes, which have the property of binding together, subtracting oxygen from other compounds present in the wine, in particular the aromas, which are consequently reduced.

In order to counter this phenomenon, wines must be micro-oxygenated, which means supplied with a precise and constant quantity of oxygen correlated to the proanthocyanidins content of the wine. This technique enables the **stabilisation of colour and reduces the harshness of the tannins**, thus softening them. Moreover, studies on the evolution of barrel-aged wine showed how ellagic tannins and micro oxygenation allows perfect development during the maturation process, preventing the oxygen from damaging the wine. In light of these observations, AEB has developed **Microsafe O<sub>2</sub>**.

## RANGE

MICROSAFE O<sub>2</sub> IS AVAILABLE IN 3 DIFFERENT MODELS:

MODELLO	
<b>MICROSAFE O<sub>2</sub> SINGLE UNIT</b>	A single dosing unit to <b>CONTROL A SINGLE TANK</b> , featuring entirely digital settings: it allows easy, simple and safe selection of the oxygen dose to be added. It comes with all the alarm systems (e.g. temperature, clogged cartridge, etc.) included in the advanced Microsafe range.
<b>MICROSAFE O<sub>2</sub> 5X5</b>	This equipment allows to manage <b>UP TO 5 TANKS</b> , with just one system. Compact and easy to mount, it allows rapid connection of the diffusers and the feed system. All of the alarms and control systems are included and indicate, on the displays located below, the progress of the micro-oxygenation processes of all the active tanks.
<b>MICROSAFE O<sub>2</sub> 15X15</b>	The most advanced <b>MICRO-OXYGENATION SYSTEM</b> , allowing to control up to 15 tanks. It manages all the oxygen dosing, but also allows control over temperature (refrigeration systems), fermentation kinetics, pumping over or punching down and sprinkler.

## BENEFITS

# 1 DOSING OF O<sub>2</sub> IN ABSOLUTE VALUE

With Microsafe O<sub>2</sub> oxygen is dosed using mass (mg/L) and not volume (mL/L). Using mg/L is the only way to precisely dose the O<sub>2</sub> in wine. This because gases are compressed, and the quantity of oxygen contained in a certain volume depends on the pressure and temperature.

### Example:

If we dose 2 mL of oxygen at a constant temperature of 20°C, at 1.0 bar, we released 2.6 mg, with a ratio mL/mg equal to 1.33. If the pressure is raised to 2 bar, the oxygen dose in 2 ml is equal to 5.32 mg, almost double.

This data is obtained by simply applying the gas equation:

<p><b><math>pV = nRT</math></b></p> <p>from which the following is derived: <b><math>n = pV/RT</math></b></p>	<p><b>n</b> = mass of gas  <b>T</b> = absolute temperature  <b>p</b> = pressure of gas  <b>R</b> = constant of gases (=0.08205)  <b>V</b> = volume</p>
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**In order to precisely dose the oxygen mass in the wine, and therefore in mg/L, the effective quantity of gas released must be known.**

 **BENEFITS**

## 2 AUTOMATIC CONTROL THROUGH A MICROPROCESSOR

**Microsafe O<sub>2</sub> allows the exact dosing of oxygen into wine** thanks to a gas expansion chamber which measure constantly internal temperature and pressure using two dedicated sensors positioned inside:

- Counter-pressure caused by a possible obstruction of the microporous cartridge
- Counter-pressure generated by the wine inside the tank
- Variations in the atmospheric pressure
- Variations in the feed pressure

These variables are monitored through an automatic control and diagnostic system regulated by a specially engineered microprocessor.

The dosing unit continuously measures the quantity of oxygen and monitors the ratio between the gas introduced and expelled from the chamber during dosing.

## 3 OXYGEN DOSING METHODS

Microsafe O<sub>2</sub> can dose in:

- **Micro-oxygenation** (milligrams/liter/month)
- **Macro-oxygenation** (milligrams/ liter/day)
- **Single dose** within a certain time

These functions are easy to select using a dedicated button located on the control panel and scrolling down menu.

## 4 CONTROL OF WINE TEMPERATURE

Numerous studies have shown that the ideal conditions for micro-oxygenation are satisfied at temperatures between 14° and 24°C. For this reason, Microsafe O<sub>2</sub> is equipped with a system for continuous control of the wine temperature. The micro-oxygenation process is suspended when the temperature exceeds 22°C or drops below 14°C.

 **BENEFITS**

## **5 ADJUVANT DOSING SYSTEM MANAGED DIRECTLY BY THE MICRO-OXYGENATOR**

Microsafe O<sub>2</sub> can be equipped with a remote tannin dosing system, which can be managed through the control panel. By scrolling the menu, a special window appears where it is possible to set the quantity of adjuvant to dose: in the case of micro-oxygenation, dosing will occur over the course of a month, whereas in the case of macro-oxygenation, it will take place within a day.

## **6 NO NEED FOR SPECIAL CALCULATIONS OR ERROR COMPENSATION TABLES**

The two microprocessors inside the equipment are dedicated to the dosing system and machine management respectively. Microsafe O<sub>2</sub> therefore doesn't require any manual calculations or compensation tables to carry out dosing.

## INCLUDED ACCESSORIES

### DOSING SYSTEMS

Microsafe O<sub>2</sub> is supplied with the following types of diffusers:



#### **LARGE STAINLESS STEEL DIFFUSER**

For dosing in tanks up to a maximum of 3000 hL in macro mode and with unlimited capacity in micro mode.



#### **SMALL STAINLESS STEEL DIFFUSER**

For dosing in tanks up to a maximum of 500 hL in macro mode and 3000 hL in micro mode.



#### **CERAMIC CYLINDRICAL DIFFUSER**

For dosing in tanks up to a maximum of 500 hL in macro mode and 3000 hL in micro mode.



#### **CERAMIC FLAT DISC DIFFUSER**

For dosing in tanks up to a maximum of 100 hL in macro mode and 500 hL in micro mode.

#### **BARRIQUE FLAT DISC DIFFUSER**

For dosing in tanks up to a maximum of 30 hL in macro mode and 200 hL in micro mode.

## INCLUDED ACCESSORIES

### IN WINE, THE CYLINDRICAL AND FLAT DISC DIFFUSERS NEED DIFFERENT MINIMUM HEIGHTS:

- Stainless steel diffusers 180 cm
- Ceramic diffusers 140 cm
- Ceramic flat disc and barrique flat disc diffusers 60 cm

CHARACTERISTIC	STEEL	CERAMIC
Porosity	Approx. 5 micron	Approx. 0.5 micron
Resistance	High	Sensitive
Cleanliness	Easy	Average difficulty

## OXYGEN INTRODUCTION SYSTEMS

### EXTRACTABLE INJECTION BAR

Two systems for oxygen introduction:

#### FIXED BAR

Introduction of oxygen from below using a 1 meter bar with Garolla 50 fitting to be inserted when the tank is empty.



#### OPERATING PRINCIPLE

The bar must be assembled by inserting the closure first, then an O-ring, the Teflon shim, the second O-ring, and then the cup with Garolla 50 fitting, screwing it onto the closure.

#### BAR WITH CUP

Introduction of oxygen using a 1 meter bar, with cup, equipped with a sensor that detects the temperature of the wine with the entry of the tannin. This system, unlike the previous one, can also be used in full tanks.