



**More life
to your wine!**



ExperTi
RICERCHE

MEASURING UNWANTED OXYGEN ENRICHMENT IN WINE

Why is it essential to measure dissolved oxygen?

Free oxygen tends to combine very quickly with the compounds in wine. Consequently current wine-making practice involves the monitoring of free SO₂ on a fairly regular basis and restoring it to safe values, when necessary. A significant part of these additions could usefully be avoided by preventing the SO₂ combining with the oxygen that is dissolved during the various processing stages. This is only possible by implementing working methods that prevent the dissolution of oxygen, or by removing it immediately when its introduction actually cannot be avoided. For this reason it is essential to measure the oxygen enrichment to identify the most critical points and then to implement all possible precautions (rendering pipes, pumps and containers inert; proper sizing of pipes, especially in suction pumps to avoid cavitation, the positioning of pumps, replacement of hoses with fixed piping, checks on fittings and seals).

Indirect Measurements

- **Free SO₂** : evaluation of its combination over time.
- **Ethanol** : can combine to form acetaldehyde.
- **Reading at 420/520/620 nm** : evolution of colour.
- **Acetaldehyde** : evaluation of the combination of oxygen with ethanol.
- **Polyphenolics**
- **POM Test** : method of estimating chemical oxidation. Compared to the standard method, this maderisation test, which essentially allows you to evaluate oxidation according to the change in colour intensity (determined by means of a spectrometer or in extreme cases, with the naked eye), allows you to assess whether or not to submit a wine to ageing. It is therefore an index to be used to evaluate the oxidative instability of the initial product. The result of the POM Test gradually goes up as the wine susceptibility to oxidation increases.
- **Index of combinable SO₂**: is determined through various laboratory reaction and titration tests and represents the level of oxidative acceptors. The index is used to calculate the level of free sulphur dioxide that one intends to achieve and maintain stable:
$$X = (\text{required free SO}_2 - \text{current free SO}_2) \times \text{Index of combinable SO}_2$$

X: mg of SO₂ that must be added.

When the required level of SO₂ and free SO₂ in the wine are the same, a higher index of combinable sulphur dioxide indicates a higher quantity of oxidative acceptors in the wine.

Direct measurements

There are various instruments for the measurement of dissolved oxygen, including some very simple and very sophisticated ones.

However, for a functional diagnosis of enrichments during work processes, some of the portable appliances of the latest generation are more than sufficient and can take measurements in both static environments (tanks) or dynamic ones (passage flows), thanks to their featured robustness, ease of use and reduced maintenance levels. They are reliable instruments as demonstrated by their accuracy of about 0.01 mg/l.

Their cost is highly affordable and the service they provide in budget terms is excellent.

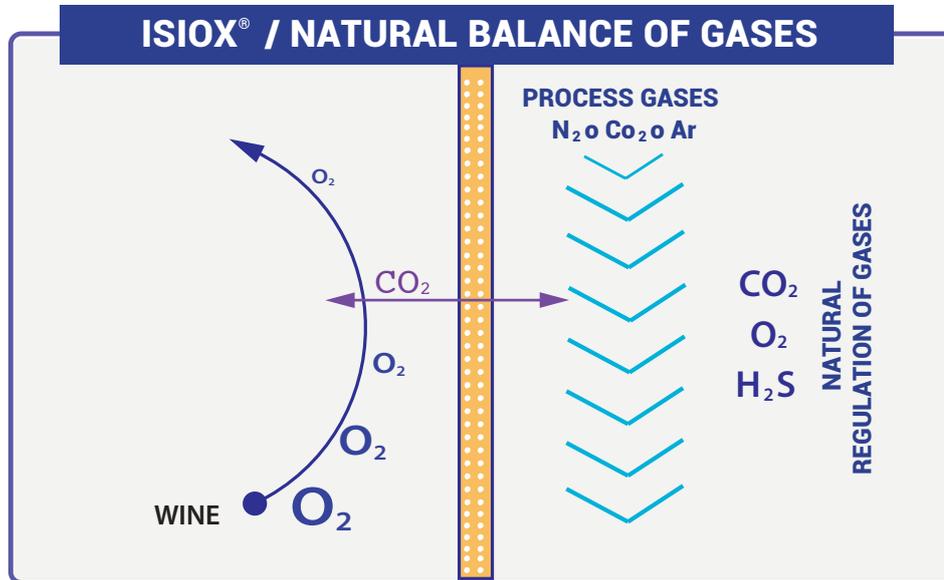


Portable measurer to 1 or 2 channels, with laboratory probes and/or probes also strengthened with impermeable (5m) cable for the measurement in the tank of:

- Dissolved oxygen
- Redox Potential
- pH
- Conductibility

Oxygen is an essential component in wine life: accurate management of micro-doses (micro-oxygenation) helps the activity of essential microorganisms and guarantees tannin polymerization.

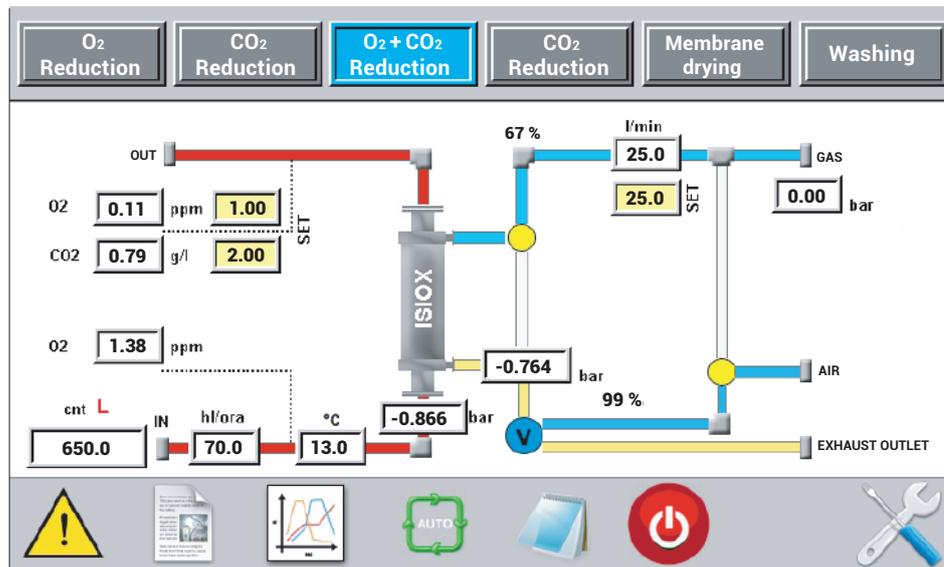
Therefore sometimes we must change the dissolved gases concentration in wine at the last steps of the production process (racking, transportation, cold stabilization, filtration, ect) and especially during the bottling process; this



kind of control is even more important when we aim to **reduce or eliminate the addition of sulfur dioxide**, very "unpopular" additive, in order to obtain healthier wines. **ISIOX®** is a simple equipment that allows optimizing all low-molecular weight gases dissolved in wines, with applications able to **modify both O₂ and CO₂ concentration**. It is also possible to remove the **hydrogen sulphide**.

Moreover, **ISIOX®** permits to continuously **adjust gas concentration during the bottling process** maintaining wine structure and

aromas. **ISIOX®** special technology is able to reduce most of the dissolved oxygen up to 97% according to flow rate and use patterns. The process control is carried out by a PLC with a very simple and intuitive software. The management software can be commanded through monitor



However, oxygen is the **main enemy for the ageing potential of wines once bottled**:

- 1) every milligram of dissolved oxygen can oxidise 4 mg of SO₂ decreasing its preservative effect;
- 2) low SO₂ wines can suffer undesirable oxidation effects;
- 3) oxygen increases the risk for off flavors and oxidized aromas
- 4) it can also negatively modify the color of red, white and rosé wines.

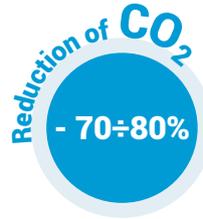
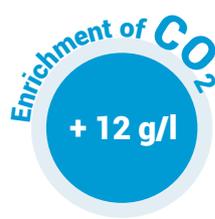
touch screen or by remote pc. Trial variables are measured in continuous and specific sensors can be inserted to control O₂ and/or CO₂ content before and after the trial.

ISIOX® is easily transportable on wheels, completely careened with IP55 degree of protection. **ISIOX®** is an innovative technology, conforming to the International Code of Oenological Practices and allowed by (EU) COMMISSION IMPLEMENTING REGULATION No 1251/2013 December 3rd 2013.

The main practical applications of ISIOX®

- ✓ **Remove oxygen** during racking, unloading of road tanks, after tartaric stabilization or after a filtration (also before the bottling) **to improve the shelf life of wines.**
- ✓ **Remove, maintain or add CO₂** until 12 g/l (6 bars) to modify the gustative impact according to the customers preferences or the typical tastes of markets
(- CO₂ = + sweetness; + CO₂ = + liveliness).
- ✓ **Remove the hydrogen sulphide** (even if it is under the olfactive threshold) to prevent or eliminate the reduction phenomena and have a better olfactive cleanliness, also after the prise de mousse.
- ✓ **Regulate CO₂** pressure of sparkling wines up to 6 bars either to have a precise and homogeneous datum for all bottles, or to avoid the bottle explosion.
- ✓ **Remove CO₂** before the filling of flexible containers (BiB and Tetra Pack) **to avoid deformation.**

Performances



ISIOX® range

	ISIOX 1 TECH	ISIOX 2 TECH	ISIOX 500 TECH	ISIOX 1 LOGIC	ISIOX 2 LOGIC	ISIOX 500 LOGIC
MAXIMAL FLOW	60 HI/h	120 HI/h	500 HI/h	60 HI/h	120 HI/h	500 HI/h
PROCESS MANAGEMENT SOFTWARE	✓	✓	✓	✓	✓	✓
AUTOMATIC O₂ MANAGEMENT	/	/	/	✓	✓	✓
MEASURE OF THE DISSOLVED OXYGEN	OPTIONAL			✓		
AUTOMATIC CO₂ MANAGEMENT	OPTIONAL			OPTIONAL		
ENCUMBRANCES	L 820 x l 650 h 1150	L 1010 x l 650 h 1150	L 1000 x l 600 h 1800	L 1010 x l 650 h 1150	L 1010 x l 650 h 1150	L 1000 x l 600 h 1800

ISIOX®

is a product of **ExperTi Ricerche - Tebaldi Group**

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**Freewine®
inspired**

