



The 10 most frequently asked questions regarding micro-oxygenation

« Is micro-oxygenation a means to accelerate the aging of wine? »

No. On the contrary, well managed, micro-oxygenation applied to red wine actually **reinforces and stabilizes its tannic structure and color**. This effect affords a wine a greater aptitude for aging and allows a more prolonged period of élevage. If, on the other hand, micro-oxygenation is applied at high doses, high temperatures or over an excessive period of time on finished wine, then yes, there is a potential for early aging, however this is *inappropriate* usage of the process that could produce undesirable results.

« The concept of micro-oxygenation was conceived in the Madiran region around the varietal Tannat. Is this technique reserved for very tannic and "rustic" red wines? »

No. Micro-oxygenation is a tool used to control the supply of oxygen, and resulting red-ox reactions, in your wine. The provisions of O₂ can be regulated at extremely low doses, allowing this tool to be **perfectly adapted to all types of wine**. It is important to remember, however, that the doses and applications are not systematic, but instead are to be devised by you and your support team, based on your specific fruit. In our research, we have already observed very interesting and exciting results when using low-dose conditions on classically fragile varietals such as Gamay, Pinot Noir or Grenache, and of course on white wines and rosés (on the lees in particular).



« Micro-oxygenation sounds interesting, but is this technique dangerous? »

Relative to the dangers present in other potentially oxidative, and still widely used, winemaking techniques (ex. – racking, mixing, even barrel storing), the danger of micro-oxygenation is quite low. In the case of micro-ox, the amount of oxygen applied is precisely devised and understood in advance, making it a progressive resource in winemaking. For example, set at 3ml/l/month, the device provides roughly the same amount of oxygen over the span of a month as a short aerated racking provides in a few minutes, allowing for **an overall gentler and safer application**. If you ever decide that the dose being applied is inadequate, it is also possible with micro-ox to react long

before the quality of the wine is compromised. As with any technique, variability occurs, yet to this date, for more than 10,000 micro-oxygenation units in circulation, there has never been any loss of quality which led to the declassification of a tank. On the contrary, the opposite scenario (i.e. increase in quality/classification) was often true.

« What dose of oxygen should I use? »

Oxygenation is not a cooking recipe. The dose is never defined 'once and for all', but instead is a starting point with the capacity for alteration. More important than knowing the dose, it is essential to understand the sought-after effects and likely developments in order to have good reactions and be able to make necessary decisions. Through directly following the process, or through training provided by consulting enologists, **OENODEV can assist you with these concepts and propose effective work procedures and initial doses specific to your wine.** In all cases, the dose must be precise and it is imperative to record and track all oxygen additions made on each wine in order to gain proficiency.

« Why one diffuser per tank? Why not one dispenser that distributes to multiple tanks? »

The diffuser is the centerpiece of the entire system. The technique used makes it so that the flow can vary greatly with even the smallest change in pressure. If two diffusers are employed by the same regulatory system/dispenser, the distribution between the two tanks is unlikely to be balanced. This situation only gets worse because the ceramic that receives less flow has a tendency to clog and require cleaning much faster than the other.

« I wish to micro-oxygenate my barrels – how do I do that? »

Micro-oxygenation was not designed for barrels! The barrel, by virtue of their small size and headspace, and resulting surface area for gas exchange, is the original 'micro-oxygenation' system. Moreover, the low level of wine would not allow a sufficient transfer of injected oxygen. Concerning the flow of gas to control, the process would require specific equipment whose cost would be incompatible with the volume handled. Instead, **the tool that is adapted to élevage in barrel is the Cliqueur®.** While not the only source of micro-oxygenation, this tool acts as an interesting complement to the natural oxygen supply of the barrel. Thanks to its ease of implementation, the Cliqueur permits fractional oxygen addition and therefore is a more precise answer to the needs of the wine than traditional systematic racking.

« Why invest in micro-oxygenation if it is so easy to oxygenate via racking, sparging and/or the use of the Cliqueur? »

Micro-oxygenation is the only technique that guarantees an oxygen addition that is continuous at very low and specific levels and that allows complete transfer of a distinct dose. Besides the fact that this technique does not lead to any movement of the wine, potential loss of aromatic qualities via degassing, or additional cellar work, **the quality difference resides in the way oxygen is allocated and, in turn, the resulting advancements in the wine.** Unlike all other techniques, micro-oxygenation maintains a constant level of oxygen measured extremely low (input < consumption, dissolved O₂ < 30µg/L) and thus promotes only the most rapid reactions. The wine is therefore protected from oxidation. These processes are further developed in the in-depth presentation of the technique.

« My flagship free run wine is already good and is aged in barrel no matter what. Should I reserve micro-oxygenation only for overly tannic press wines? »

Indeed, the best wines of the estate are usually those that are put in barrel. This phenomenon is proof alone that these **flagship wines more than others deserve an élevage with oxygen provision**, otherwise they would be kept in inert, air-tight containers. As it turns out, when it can be justified financially, micro-oxygenation before moving the wine to barrel – just after alcoholic fermentation – proves to be very interesting from a technical standpoint.

As for press wines, although micro-oxygenation can help significantly reduce their harshness and herbaceous characters, it can in no case correct their imbalances. In effect, press wines are often too concentrated in tannin structures relative to present anthocyanins. The micro-oxygenation of such compounds often leads to dryness and an accentuation of this imbalance.

« If low temperatures inhibit the micro-oxygenation, is it wise to heat the tank before treatment ? »

Indeed, it is true that at low temperatures the reactions of oxygen-consuming compounds are slowed. In this case, the risk of oxygen accumulation and resulting oxidation of the wine appears, and therefore the dose needs to be diminished. Maintaining the entire cellar at élevage temperature (14-18°C) is obviously ideal, but not always achievable. In this case, **light warming of the oxygenated tanks may be a solution** to this problem, provided that hot spots and extreme heterogeneity in the tank are avoided. For this reason, heating rods should never be used.

«Did you say the doses are in 'ml/l/month or mg/l/month?»

Since its inception, Oenodev has always taken the utmost care to give all of their tools the following essential characteristics: repeatability, reliability and accuracy. Since the beginning of this particular invention, the flow rates of micro-oxygenation have been expressed in ml/l/month and not in mg/l/month. This choice has been guided simply by gas merchants historically selling O₂ (or other gases) in volumetric measurements (cubic meters, m³). **The most important thing, however, in choosing a dosage unit is the precision of its measurement!**

First of all, remember that temperature slightly affects the volume of gas contained in the cylinder. Thus at 15°C, average operating temperature, there can be a temperature variation of plus or minus 10°C, which theoretically leads to a change in the volume of the O₂ dose by 3.5%! In other words, we have an over-dosage of 3.5% when using the device at 5°C and an under-dosage of 3.5% when using the device at 25°C. The accuracy of the measured dose is therefore closely related to the selection of pressure sensors (<10% error).

Thus, it is worth underlining a recent study on Oenodev material, conducted partly in the process engineering laboratory at the University of Bordeaux, where two conclusions arose: under the conditions of use of micro-oxygenation proscribed by Oenodev (volume and dose), the actual flow rate is very close to the theoretical rate (< 5% error) and the diffusion coefficient is close to 100. The quality of material used is therefore inextricably linked to the accuracy of the dose determination!

On the other hand, it is important to remember that a user who applies a dose of 2 ml/l/month when the wine only requires 1 ml/l/month has an error rate of 100%. That is why we always emphasize the following three things: **reliability of the dosage, enological analysis, and supervisory support of the user.**