

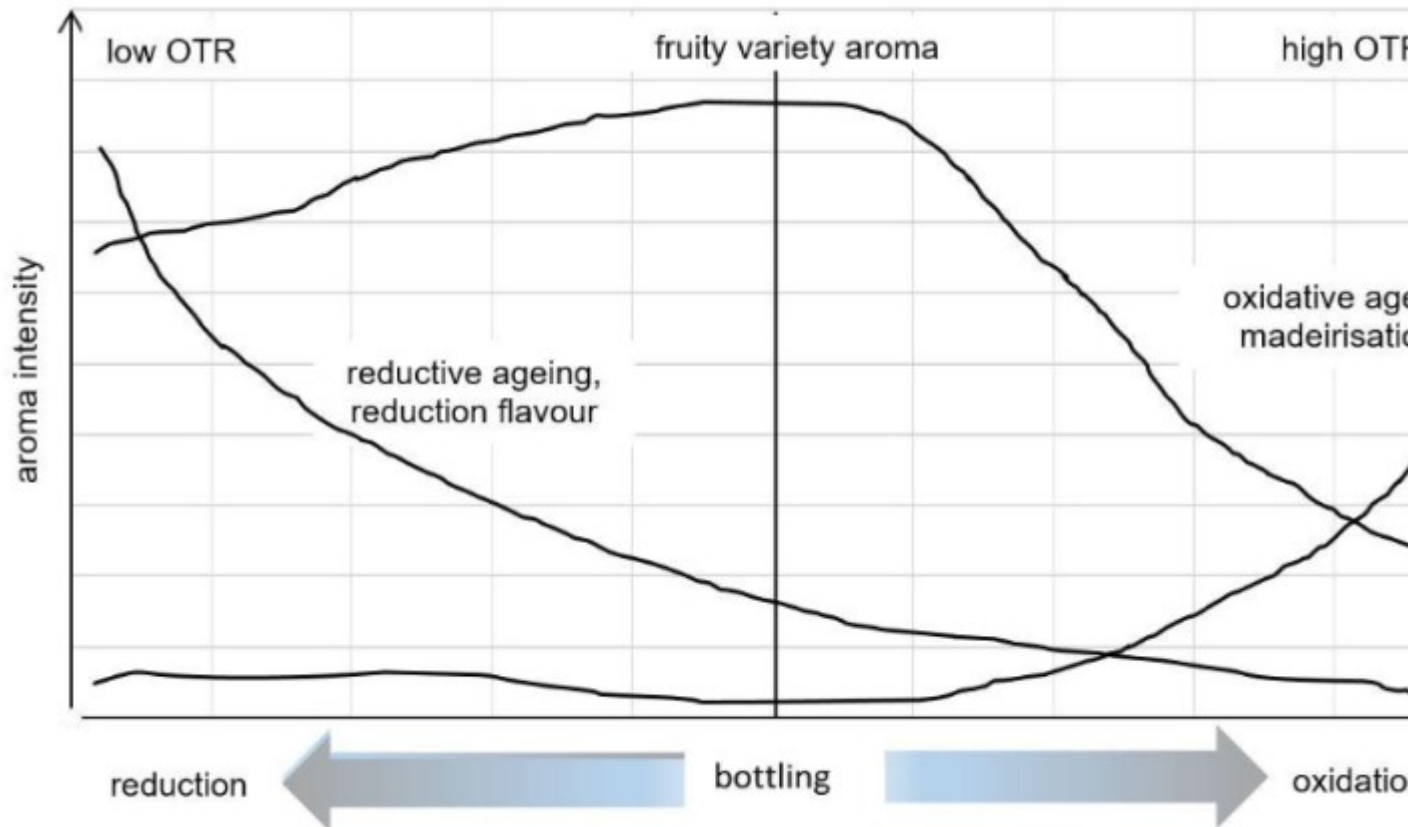


More Than Just a Cork: Engineering the Perfect Wine Closure to Shape a Wine’s Evolution

Description

By Mukul Manku

Long after the grapes have been harvested and the wine has been bottled, one small component continues to influence its future – the closure. While we often think of a cork as nothing more than a seal, however it actually regulates the tiny amount of oxygen that permeates into the bottle, which keeps affecting the wine character.



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Today, advances in closure technology allow this oxygen exchange to be managed with a remarkable precision, giving winemakers a way to influence how their wines evolve in the bottle. This precision is based on two key concepts: Initial Oxygen Release (OIR) and Oxygen Transmission Rate (OTR).

Initial Oxygen Release

OIR

Initial Oxygen Release

The oxygen already in the cork that is released into the wine soon after bottling, usually in the first few weeks to months.



Think of it like a sponge

The cork contains tiny pockets of oxygen. Once in the bottle, that oxygen slowly moves into the wine.



Why it matters

Even a small amount can oxidize delicate aromas, change color, and age the wine prematurely.



Most critical for

Aromatic white wines, rosés, low-sulphite wines, and sparkling wines.



When it happens

Immediately after bottling, mostly over the first few weeks to months.



OIR is the amount of oxygen released into the bottle soon after bottling, mainly during the first few months. This early oxygen exposure is particularly important for aromatic white wines, ros  s and wines with lower sulphite levels, where too much oxygen can reduce freshness, mute aromas, accelerate ageing and even affect colour.

Oxygen Transmission Rate

OTR

Oxygen Transmission Rate (OTR)

The rate at which oxygen from outside the bottle passes through the closure over many years.



Think of it like a tiny window
Oxygen from the outside air slowly passes through the cork, little by little, year after year.



Why it matters
It influences how the wine ages—preserving freshness or helping develop complexity and softer tannins.



Different OTR, different impact

Low OTR
Slower ageing, more freshness

Moderate OTR
Balanced ageing, more complexity

High OTR
Faster ageing, risk of oxidation



When it happens
Continuously, over many years of the wine’s life in the bottle.

YearsDecades



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OTR on the other hand, refers to the minute amount of oxygen that slowly passes through the closure throughout the wine's life. This gradual oxygen supply has a major influence on bottle ageing. If the transmission rate is too high, the wine may oxidise more quickly and lose its ageing potential. However if carefully controlled, the wine can mature steadily, developing greater complexity while maintaining balance.

The real innovation lies in controlling both OIR and OTR together. By selecting closures with precisely defined oxygen characteristics, winemakers can improve consistency, preserve freshness, and fine tune the style and ageing trajectory of each wine. In effect, the closure becomes an extension of the winemaking process rather than merely the final step.

Among the pioneers in this field is *DIAM Bouchage*, a company which has transformed the wine closure from a simple stopper into an oenological tool.



enotecnica.it

By developing closures with calibrated oxygen permeability, it enables winemakers to better control how their wines mature in bottle, from preserving youthful freshness to supporting long-term ageing.

Further, by adopting innovative processes that eliminate the compounds responsible for cork taint (TCA) while enabling precise oxygen management, DIAM helps winemakers achieve greater bottle-to-bottle consistency and better control over how their wines evolve in bottle.

As Eric Feunteun, CEO of DIAM Bouchage, aptly puts it:

“A cork stopper is definitely not just packaging; it’s a vital component of the wine’s evolution.”

That single statement perfectly captures the essence of modern closure technology. Far from being an afterthought, the choice of closure has become a strategic decision, helping winemakers preserve freshness, improve consistency, and guide the ageing potential of their wines with a remarkable precision.

Sources: Terre de Vins (France), DIAM Bouchage.