



## Wine Preservation in the 21st Century

### The changing face of the wine industry

During the global pandemic, the wine industry proved its versatility in finding flexible solutions. From a largely on-premise distribution model to creating more accessible e-commerce and convenience retail options, quick moving suppliers enabled the wine industry to demonstrate its resilience. However, with change now the only constant in the wine industry, how are producers continuing to adapt?

Five trends transforming the world of wine<sup>1</sup>:

- Supply chain issues and price inflation are creating challenges for cost management and margin structure. This is leading buyers to look beyond tried-and-tested purchasing routes
- Colour boundaries are being pushed as more experimental wines defy genre classification (Eg. macerated whites and multiple red and white grape variety fermentations)
- Natural wines are moving from niche to the mainstream
- Sparkling wine is becoming a staple for consumers, moving it from being a treat to a mid-week drink
- Ecommerce is becoming even more creative so as to keep Covid-acquired customers.

Despite the impact climate change is having on wine production that is being felt across the world, the wine industry is still predicted to grow by a CAGR of 4.28% until 2026<sup>2</sup>. The fastest growing market is Asia Pacific; however, Europe is still the largest market. Key factors expected to fuel growth over the coming years are product premiumisation and the demand for wine due to its health benefits. At present, the five biggest wine consuming countries drink half of the world's wine (49%)<sup>3</sup>.

### Wine – the biggest consumers and producers

The top wine consuming countries are (in million hectolitres (Mhl))<sup>i</sup>



The five biggest wine consuming countries drink half of the world's wine (49%)<sup>ii</sup>

<sup>i</sup> International Organisation of Vine and Wine, 2021

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### Wine packaging predictions

Although the wine industry is facing significant change, an area that has been slower to embrace adaptation is wine packaging. However, according to industry predictions, change is on the horizon for wine packaging and includes:

- Increased sustainability – a growing interest in the light weighting of glass packaging in non-sparkling wines, to help major retailers meet their carbon reduction targets<sup>4</sup>, particularly as up to half of a wine's carbon footprint comes from its glass bottle<sup>5</sup>
- On the go consumption - Canned wine popularity continues to grow, particularly when paired with low-alcohol formulation RTD options<sup>6</sup>
- Plastics bottles – ecommerce and sustainability concerns are driving niche development of 100% recyclable, 750ml, flat Polyethylene Terephthalate wine bottles<sup>7</sup>
- Biodegradable bottles - Bacardi is setting an example in the spirits arena. By 2023 it will be using plastic-free, biodegradable spirits bottles made from palm-, soy- and canola-based oils
- Bag-in-box – this continues to grow in popularity, particularly as the traditional aluminium-lined bags are replaced by malleable polymer alternatives that don't trigger wine oxidation<sup>8</sup>.

### Evolutions in wine sealing

Since the earliest vintners began producing wine on a large scale in 6,000BC, the challenge has been how to store and serve this precious commodity. For many years the glass bottle and cork have seemed like a match made in heaven. However, over recent years, issues with cork taint have led to wine providers exploring other options.

The challenge of using cork:

- Pressure changes in the bottle can cause movement and/or wine creep
- Cork shows a wide variation in oxygen transfer characteristics<sup>9</sup>
- Synthetic corks have high gas permeability and are only suitable for wines destined for early drinking<sup>10</sup>
- If insertion machinery is faulty it can lead to the compression of air into the wine
- Cork can harbour chloranisole-producing microbes that can lead to 2,4,6-trichloroanisole (TCA) and other taint causing compounds that can spoil the wine.

### Impact of cork taint

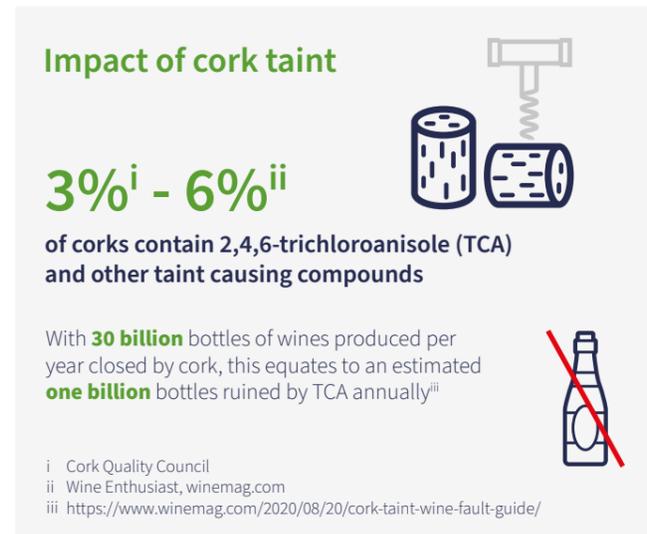
**Impact of cork taint**

**3%<sup>i</sup> - 6%<sup>ii</sup>**

**of corks contain 2,4,6-trichloroanisole (TCA) and other taint causing compounds**

With **30 billion** bottles of wines produced per year closed by cork, this equates to an estimated **one billion** bottles ruined by TCA annually<sup>iii</sup>

i Cork Quality Council  
ii Wine Enthusiast, winemag.com  
iii <https://www.winemag.com/2020/08/20/cork-taint-wine-fault-guide/>



**The issues with cork have led to a growth in popularity of alternative wine sealing methods, particularly that of screw caps, amongst wine producers. Following the results of extensive screw cap testing by The Australian Wine Research Institute<sup>14</sup>, 90% of New Zealand and Australian wine is now sealed with screwcaps.**



### A maturing relationship?

Over the years the question of maturation has been raised when it comes to screwcaps. After all isn't a cork needed for the wine to breathe, to develop and to age properly? The answer to this is a simple 'no'. "Oxygen is not the agent of normal bottle maturation<sup>16</sup>". In fact, bottle maturation is the opposite of oxidation and it is via 'a process of reduction or asphyxia, by which wine develops in the bottle.<sup>17</sup>" To summarise, "When a wine ages in the bottle, the oxidation – reduction potential -decreases regularly until it reaches a minimum value, depending on how well the bottle is sealed. Reactions that take place in bottled wine do not require oxygen.<sup>18</sup>"

### The screw cap and liner – a match made in heaven

Screwcap closures differ greatly from cylindrical stoppers made of cork or synthetic materials in their mode of sealing. The main difference is that they seal around the rim of the bottle, rather than along the internal surface of the bottle's neck. The screwcap is traditionally formed of a malleable aluminium alloy that is rolled onto the bottle. This is then combined with a wine liner that creates a seal between the closure and the bottle:

- The screwcap and liner exclude oxygen from the bottle, and thereby promote the development of bottle bouquet
- Screwcaps are guaranteed against failure for 10 years, but realistically can be expected to last at least 20 years
- The liner is compressed onto the surface of the bottle rim (120 kg) and held in place by the aluminium outer
- The high pressure hermetic seal is capable of withstanding relatively large pressure and temperature increases
- A total gas barrier is created, offering perfect inclusion/exclusion.

Screwcaps and liners are proven wine sealing technology. Using a specialised liner, such as Selig's oenoseal®, ensures excellent oxygen barrier performance, no negative impact on wines prone to reductive notes and a reduction and prevention of volatile sulphur compounds (VSCs)...all from a technology that is cheaper than a cork.

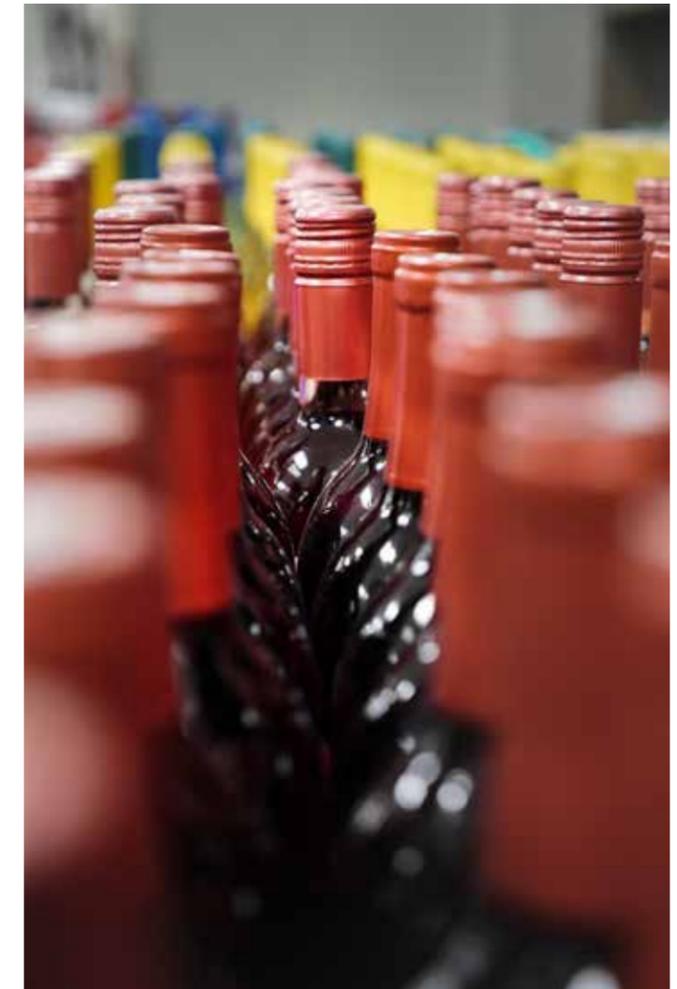
▶ The issues with cork have led to a growth in popularity of alternative wine sealing methods, particularly that of screw caps, amongst wine producers.



### Screw caps – tried and tested

Following a 20-month trial comparing the performance of a range of closures<sup>15</sup> The Australian Wine Research Institute concluded that screwcaps offer:

- The lowest reduction in free and total sulphur dioxide (SO<sub>2</sub>)
- The highest retained free SO<sub>2</sub>
- The highest retained ascorbic acid
- The lowest incidence of browning (OD<sub>420</sub>)
- The least variation between bottles for **all** compositional variables
- The highest in overall fruit
- The lowest in developed and oxidised characters
- Effectively zero TCA.



## oenoSeal® – Wine preservation at its best



oenoSeal® Tin S

oenoSeal® S

Much development work has gone into creating the perfect match between the wine, liner and screwcap, and the result is the industry leading wine liner - oenoSeal®. It is made up of different barrier level layers and unlike cork, an organoleptically neutral liner is in direct contact with the wine, eradicating any risk of taint.

oenoSeal® liners are available with varying levels of oxygen permeability to suit different wines. As well as eradicating wine taint, they deliver high quality ageing and preservation performance, more cheaply than a cork.

It is no surprise therefore that hundreds of millions of wine caps are now wadded with oenoSeal® liners worldwide.



### Customer quote

*Michael Brajkovich MW, Winemaker, Kumeu River Wines*

*After studying Oenology in South Australia, Michael returned to the family vineyard and winery in Kumeu, and subsequently became New Zealand's first member of the prestigious Institute of Masters of Wine in 1989. As a Master of Wine (MW) he has invested his time and energy in building the Kumeu River label and becoming a founding member in the New Zealand Screwcap Wine Seal initiative (of which he was Chairman in 2001-2003). As an accomplished wine judge, he served for 5 years as Chair of Judges at the Air New Zealand Wine Awards, and for 3 years as Chair of the Royal Adelaide Wine Show in South Australia.*

On the subject of 'cork versus screwcap', Michael says: "We started using roll-on pilfer-proof (ROPP) screwcaps with Saran-tin liners in our wine production in September 2001. The reason we introduced them was due to the poor quality of cork closures we were experiencing. In fact, we had instances of as much as 30% cork taint, and similar problems with oxidation. We tested a great deal of the batches of cork that we purchased, and most were well over 5% tainted. We actually had to set a limit of 4% taint for acceptance, as any tighter standard than that would have meant we would not have been able to buy any corks at all. Obviously, this situation was not ideal and when we got the opportunity to trial screwcaps and liners, we jumped at the chance.

"The transition from cork to 100% screwcap sealing was very rapid once we had the appropriate application equipment. We have used ROPP screwcaps for all our wines since 2001, combined with a multiple layered liner. The PVDC layer of the liner is in contact with the wine, a tin foil layer - as an oxygen barrier and for improved ductility - and a compressible PE foam layer to ensure compression is maintained between the bottle and the cap. We thought we might be able to reduce our SO<sub>2</sub> levels, but further experimentation showed that we in fact needed more to prevent oxidation over the long-term, and that under cork we should have been using much higher levels of free SO<sub>2</sub> than we actually had been!

"Our wines have improved dramatically as a direct result of using screwcaps with Saran-Tin liners. There is now no cork taint or oxidation. The wines age beautifully and consistently, and there is virtually no bottle variation. To prove the quality of our wines, we have done extensive vertical tastings of our Chardonnays around the world, and they have been very well received".



American wine critic James Suckling's Wine of the Year for 2021



## About Selig

Selig is a leading worldwide manufacturer of tamper evident cap and closure lining materials for use across a broad range of applications, such as food and beverage, pharmaceutical, agrochemical, cosmetics and healthcare. Selig's comprehensive range of both one- and two-piece structures means that they can manage even the most challenging applications with one of their customised aluminium foil/heat seal combination products. In addition, Selig offers a range of easy open products, which offer greatest convenience and product freshness to the consumer as well as product differentiation to the brand owner.

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2 [www.mordorintelligence.com/industry-reports/wine-market](http://www.mordorintelligence.com/industry-reports/wine-market)  
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