



MITCHELTON WINES

MITCHELTON & PET

The launch of the Mitchelton Victorian series wines in the MLP™ PET bottles from Paul Sapin represents a significant development in wine packaging. This is the first major release of a series of wines in which the bottle, label and closure are all fully and easily recyclable. This short document gives some more detail on this groundbreaking launch.

Perspective

In recent years, moves have been made to replace glass for packaging wine, which, while being excellent at protecting wine from the ingress of oxygen, is heavy and has a tendency to break. There has been a shift to bag-in-box for cheaper wines, as well as more radical options such as Tetrapak and cans. The latest development is 75 cl PET (polyethylene terephthalate) bottles with enhanced barrier properties.

Since the late 1970s PET has come to replace glass for most soft drinks. More recently, it has been used widely for beer and spirits. It has been used for wine before, most commonly with small 25 cl bottles, and also with 1 or 1.5 litre bottles of inexpensive wine. But it is only recently that wine in standard sized 75 cl bottles has been presented in PET on supermarket shelves because until now it has allowed high levels of gas transmission, resulting in a shorter shelf-life.

This is the first time that a premium wine has been bottled in PET.

The drive behind this transition is the current interest in environmental issues, coupled with new developments in PET technology. PET has a considerably lower carbon footprint than glass, both in terms of its production, and also in terms of weight and space savings in the logistics chain.

Reliability: preserving wine quality

PET stands for polyethylene terephthalate. It is a linear, transparent thermoplastic polymer with outstanding properties for food packaging, including good strength, light weight, good chemical resistance, elasticity and stability under a wide range of temperatures (from -60 °C to 220 °C). It is widely used in the drinks industry, although until recently its use for wine bottles was restricted to small (25 cl) or large (1–1.5 litre) containers for rapid rotation wines.

There are three potential problems with the use of PET for wine: oxygen ingress, migration and scalping.

Oxygen Ingress - Unlike glass, most plastics allow a degree of oxygen transmission. While the plastic walls of a PET bottle keep the liquid in and air out, oxygen in the air is able to diffuse

through the plastic in small quantities. This is because oxygen dissolves in the polymer at the air interface and diffuses through it by virtue of a concentration gradient to the liquid side, where the oxygen concentration is much lower. This results in a reduced shelf-life for wine in PET because after a certain period the sulphur dioxide that protects the wine is used up and the wine begins to lose freshness, showing signs of oxidation.

A variety of approaches have been taken to improve the oxygen barrier properties of PET. One is to incorporate an oxygen scavenger into the PET bottle material. An example of this would be Constar's Oxbar system. Another approach is the Plasmax technology developed by German company SIG, which involves coating the inside of the bottle with a thin layer of silicon oxide under vacuum.

A different approach is to use multi-layer PET, which involves sandwiching a barrier layer between two layers of PET.

Paul Sapin has developed their own multilayer PET bottles, which they have called MLP. The middle layer consists of nylon, which has better oxygen barrier properties than PET, and which also contains an oxygen scavenger. Tests so far show that these MLP bottles have a longer shelf-life than monolayer PET bottles. So far, Sapin are sure that wine will have a shelf-life of at least one year, and possibly more: tests are ongoing.

Migration – this refers to the leaching of components from the bottle to the liquid inside. PET is molecularly simple, and so relatively few components could migrate. Some concerns have been expressed about the use of PET for alcoholic drinks because of the possibility of alcohol acting as a leaching agent. This is because chemical compounds are generally more soluble in alcohol than they are in water, and thus the worry is that the alcohol in the wine could dissolve some of the chemicals in the PET such that they enter the wine. To offset this concern, Sapin have commissioned French government agency LNE to do analysis of migration from their MLP bottle.

There is some discussion of whether alcoholic beverages stored in PET leach phthalates out of the plastic. However, the phthalates discussed in connection with health, which are used as plasticizers and additives to certain plastics and which can act as endocrine disruptors (i.e. interfering with hormone signalling), are different in terms of their chemistry to the 'phthalate' in PET.

Scalping – this refers to the absorption (or stripping out) of various components of the bottle contents by the plastic. There has been some discussion of scalping of some of the flavour compounds in wine by the plastics used to make synthetic corks. However, this is unlikely to be a major issue with PET, which is a highly inert polymer. The possibility does remain that over time some flavour molecules, which can be quite small in size will be absorbed by the bottle, but so far no one has demonstrated this.

Carbon footprint: caring for the environment

PET is petrochemical in origin, but its manufacture requires fewer natural resources than glass, which is made from super-heated sand, silica and soda ash.

A 75 cl glass bottle weighs around 400 g; the same size in PET weighs 54 g, one-eighth of the weight. This makes transport more efficient.

PET bottles are filled close to source from wine shipped in 25 000 litre flexitanks. The Mitchelton wines are shipped to Paul Sapin's state of the art winery in the Beaujolais region, where their transfer to stainless steel tanks is supervised by trained winemakers. Shipping wine in flexitanks is an extremely efficient way to transport wine, which minimizes its carbon footprint.

Flexitank shipping has the potential for some loss of quality, largely through pick-up of oxygen, which can lead to loss of freshness and in the worst cases oxidation. However, if care is taken during wine movements (the riskiest process) to minimize oxygen pick-up, then this risk is extremely low. Sapin use nitrogen microbublage (pulsing the wine with small bubbles of nitrogen gas) during the transfer process, which prevents oxygen pick-up. Lab tests of the incoming wine are carried out and checks are made to ensure that the dissolved oxygen levels and free sulphur dioxide levels are the same in the bottled wine as they were in the wine that arrived by flexitank.

Because PET bottles are virtually unbreakable, they can be packaged in lighter cardboard boxes that are more cost efficient and have a lower carbon footprint. A typical 9 litre case of wine in PET will weigh 11 kg; with glass this could be 21 kg.

Recyclability

PET is widely recycled. However, the wines bottled in PET so far have been sealed with an aluminium long-skirt screwcap, which is a problem for recycling because of the need to remove this before recycling the PET.

Sapin's MLP bottle is revolutionary in that it is 100% recyclable.

The three layer construction is not a problem, because the bottle can be easily delaminated and separated into the different layers during the recycling process.

The MLP bottle is sealed with Novatwist, the first premium long-skirted plastic screwcap, and a Saranex (plastic) liner is used for these wines. Novatwist is produced by Novembal, a subsidiary of Tetrapak. Its use means that the entire package is fully recyclable – a first.

In addition, Sapin's MLP uses a special polypropylene label material attached by a glue that deforms at 70 °C. This means that the label can be detached easily during the recycling process, and can itself be recycled.

Practicability

Wine in PET bottles is immensely practical for many situations. Beer in PET has been hugely successful for sporting fixtures and outdoor events; wine in PET will be ideal for similar occasions, as well as for use in airline wine service.

Great care has been taken to design the MLP bottle shapes so that they look premium rather than low-budget. Existing PET wine bottles have tended to look short and dumpy when compared with

their glass equivalents; the MLP shapes are much more attractive. This could mean that consumers will consider PET a viable alternative to glass bottles on supermarket shelves, and thus PET may not end up being a situational glass substitute.

PET bottled wines also chill more quickly, so they are perfect for picnics.

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