



# memstar

Wine • Membrane • Technology

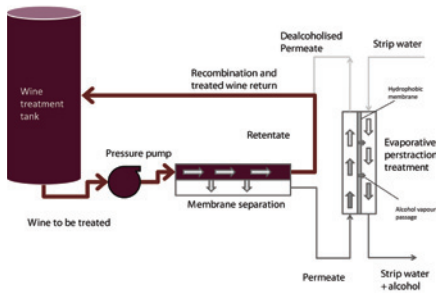
## Make Your Wine Shine

Memstar offers a range of processes for concentrating grape juice and wine, removing taints, adjusting wine alcohol, reducing volatile acidity and heat treatment to inactivate laccase. These are available by way of mobile services, equipment rental or sale.

Memstar's services include:

- Alcohol Adjustment
- Volatile Acidity Reduction
- Taint Reduction
- Juice and Wine Concentration
- Heat Treatment for Laccase Inactivation (Pasteurisation)





## THE MEMSTAR AA PROCESS

Wine is separated by reverse osmosis into concentrate and permeate streams. The alcohol rich permeate is degassed, heated and passed through a proprietary perstractive membrane array on the other side of which is a counter-flow of filtered, deoxygenated strip water.

Alcohol passes through the membrane from the permeate into the strip water at a rate which depends on the alcohol concentration gradient across the membrane and the temperature. The dealcoholised permeate is then cooled and recombined with the wine from which it was separated, resulting in a lower alcohol blend.



## SYSTEM NOMINAL CAPACITIES

Memstar offers a range of equipment and capacities:

**Series** Equivalent wine treatment rate (litres per hour @ 1% reduction)

- Mini** 180 - 1,500 Litres
- Midi** 2,400 - 5,700 Litres
- Maxi** 9,100 - 21,000 Litres

## ALCOHOL ADJUSTMENT

### Getting your alcohol right.

Winemakers and consumers have watched wine alcohol levels steadily increase in vintages over the past 20 years. They now understand the profound negative effect this has on wine flavour and balance.

Winemakers work hard to perfect their wines but high alcohol masks their best efforts. All know it's time for a change.

When winemakers do a sweet spot tasting on a wine, they find that even small reductions in alcohol can make the difference between a good wine and a great. Reducing a wine's alcohol to the right level 'liberates' it.

Memstar's unique, patented\* alcohol adjustment process reduces wine alcohol:

- Without any water addition
- Without heating of the wine
- Entirely on-site
- With complete control
- With minimal losses
- Without distillation
- Rapid, cost effective and flexible

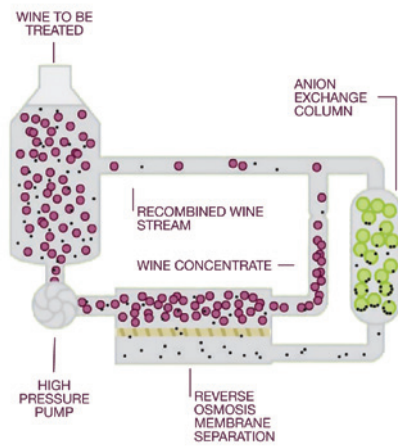
(\* Australian and International patent applications granted and pending)

No water is added to the wine from any source. Adding water dilutes wine flavour and is a practice which is not permitted in most wine producing countries.

The wine itself is not heated, so reducing the risk of damage to heat sensitive and volatile components. Wine doesn't leave the winery. Memstar's unique mobile equipment is used entirely on-site by skilled personnel. There is no need for any portion of the wine to be shipped away for further processing. This means no extra freight costs and less risk of contamination or loss. The winemaker can observe, participate and have ultimate control.

The process does not involve distillation (high temperature or vacuum) with its substantial infrastructure and energy costs. It avoids the OH&S and other regulatory issues associated with distillation and the production and handling of high strength alcoholic spirit.

Subject to ATO licensing requirements, wineries can store the alcoholic strip water by-product and recover the alcohol by later sending it away for distillation into high quality spirit. If the winery does not wish to be involved in the licensing process, Memstar will manage all the appropriate documentation under its own excise arrangements with the ATO.



Memstar is an Australian company dedicated to the research, development and commercialisation of membrane separation technologies for wine applications.

## VOLATILE ACIDITY REDUCTION

Memstar has been successfully treating wine to reduce volatile acidity (acetic acid and ethyl acetate) for over 16 years. Since 1997, Memstar has used its patented VA reduction process to treat many millions of litres of clients' wines. Its process is highly selective for removing volatile acidity and little else - flavour elements and other wine constituents remain substantially unchanged.

Despite all the advances in winemaking technology and practice, excess volatile acidity is a difficult problem that just doesn't seem to go away. Wines with VA levels greater than about 0.6 g/l are less appealing to consumers, often displaying estery, glue-like aromas, diminished fruit flavour, and a sour, 'spiky' acid finish. High VA can lead to stuck or sluggish fermentations and a product that is in many cases unsaleable, particularly at levels in excess of 1.5 g/l, when the wine may not be sold legally.

In Memstar's process, the wine to be treated is circulated at pressure through a reverse osmosis plant to separate a flow of permeate which contains water, alcohol and some of the acetic acid and ethyl acetate to be removed. This permeate is then treated in an anion exchange column where the acetic acid is adsorbed on the charged resin. The treated permeate with the volatile acidity removed is recombined with the bulk of the wine concentrate and returned to tank.

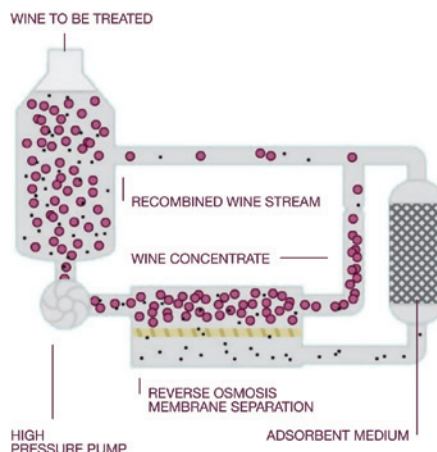
Virtually none of the desirable wine components (the other acids, anions, sugars, tannins, flavour and colour) pass through the membrane but are retained in the concentrate. They do not come into contact with the ion exchange resin so they cannot be absorbed or contaminated. Very little other acid is lost. Nothing is added to the wine and the volume and alcohol content are not affected.

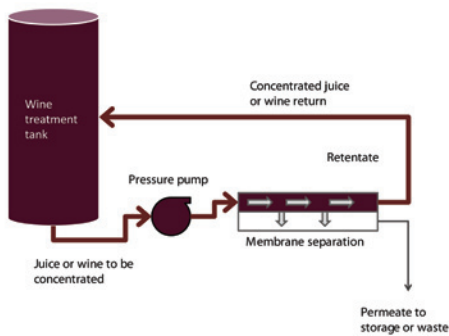
## SMOKE & BRETT TAIN T REMOVAL

Taints from bushfire smoke and Brettanomyces infection can make a wine unpleasant or even unsaleable. Wines made from smoke tainted grapes have a wet ashtray / campfire aroma and a bitter, acrid palate. Similarly, wines severely tainted by Brettanomyces infection are extremely unpleasant, with aromas variously described as horsey and medicinal and a finish on the palate that is hard and metallic.

Since 2003, Memstar's taint removal technology has been able to remove much, if not all, of the offensive taint character without stripping the wine of its essential character.

The major indicator compounds associated with both these types of taint belong to the chemical group called volatile phenols. In the case of Brettanomyces, the responsible compounds are 4-ethylphenol and 4-ethylguaiacol; and in the case of smoke taint: cresols, guaiacol and 4-methylguaiacol. Memstar has done extensive R&D to find a means of selectively removing these offending compounds while leaving desirable wine components intact. Memstar's use of special membranes and selective adsorbent resins has allowed it to turn many batches of tainted wine into palatable, saleable products that would otherwise be sent to waste and their value lost. Since its introduction, millions of litres of smoke- and Brett-tainted wine have been successfully recovered in Australia and overseas.





## FLAVOUR CONCENTRATION

The Memstar concentration process treats grape juice or wine to increase flavour intensity, colour and body. It does this by using reverse osmosis to remove a portion of the grape juice or wine as permeate.

Of all Memstar's service offerings, this is the most straightforward but for many of its clients, flavour concentration is a very valuable technique.

By removing 5% to 15% of the wine volume as permeate, the flavours, colour and tannins in the remaining wine become concentrated. The wines become richer and more full bodied, giving them that little bit extra in a very competitive environment.

The winemaker has the choice of treating grape juice prior to fermentation or wine after. Juice (must) concentration by reverse osmosis has been used for many years for the removal of water to increase sugar and flavour concentration. It is ideal for treating juices and musts that have become heavily diluted as a result of rain just before harvest. It is a superior technique for alcohol augmentation compared to the addition of sugar (chaptalisation) but has more limited benefits where the grapes are green and under-ripe.

Wine concentration after fermentation is the preferred option when sugar levels are already high but the concentration of flavour, colour and other quality components is low. Concentrating the juice in this situation, results in increased sugar levels. These in turn lead to excessive alcohol levels in the fermented wine. Concentrating the wine instead does not increase the alcoholic strength significantly because alcohol passes through the membrane into the permeate and is not concentrated.

## MEMSTAR MICRO

Memstar's Micro adds a significant capability to its equipment range. It combines flavour concentration, alcohol adjustment and taint removal capabilities in a single bench-top unit.

Using as little as 5 litres of wine, it takes the guess work out of winemakers' decision making process. It provides a great level of comfort in this great technology.

## HEAT TREATMENT

### For laccase inactivation (pasteurisation).

In recent difficult seasons many winemakers confronted a problem they may never have experienced previously – dealing with Botrytis infected grapes.

Memstar offers a heat treatment process which effectively inactivates the Botrytis derived laccase enzyme which can rapidly oxidise wines.

Memstar's efficient and mobile system warms wine from ambient up to 60 - 65° C and holds it at that temperature for up to 30 seconds before cooling it back to ambient plus about 6° C. (In at 15° C, back at 21° C.) This allows the winemaker to be confident that laccase activity will be substantially or entirely eliminated.

Phone: 1300 MEMSTAR

37 Old Mill Court, McLaren Vale, SA 5171 Australia  
PO Box 792, Nurioopta, SA 5355 Australia

T: +61 (0)8 8323 7990

F: +61 (0)8 8323 9935

E: [info@memstar.com.au](mailto:info@memstar.com.au)

W: [www.memstar.com.au](http://www.memstar.com.au)