



The moment
Peter Lehmann Wines
challenged the industry,
and transformed
wine barrel storage
cooling.



As the wine industry was suffering in the midst of one of the worst economic situations on record, Peter Lehmann Wines decided to adopt a new barrel storage cooling technology in 2011.

The new system, Climate Wizard, an indirect evaporative cooling system, developed by Adelaide based, global brand Seeley International, was presented to Peter Lehmann Wines by industrial refrigeration specialists, and long term refrigeration supplier, Cold Logic.

At a time when capital investment was extremely tight, the Climate Wizard system was still considered to have strong commercial merits, which included raising wine quality, reducing Angel's Share and improving energy efficiency.

Cold Logic Partner, Eddie Lane recalls the business climate at the time, vividly.

“Back in 2011, it was really tough to get new projects off the ground. But when we saw the performance of Climate Wizard, we had to make the approach to Peter Lehmann Wines because the business case stacked up.”



Essentially, Climate Wizard puts wine barrel hall temperature and humidity control into the hands of the Winemaker.

Three years planning. Twelve units.

Compounding the extremely tight business environment, the scope of the project was significant, in size and ambition. The brief for the Peter Lehmann Wines project required 12 units. Further more, the timeline would ultimately extend to over 3 years, covering required technical due diligence, testing and planning to get the go ahead with the large project.

From well insulated sheds... to hyper-efficient temperature & humidity controlled barrel halls.

With a starting point of what many barrel hall storage facilities are - well insulated sheds - Climate Wizard now, for the first time, gives the winemaker the key controlling factor of barrel hall storage enjoyed consistent temperature while maintaining an effective temperature and humidity range.

It was this performance feature of Climate Wizard that effectively created a new commercial advantage for Peter Lehmann Wines.

Cold Logic's Eddie Lane was equally impressed, as results were realised instantly.

“We have a 30 year relationship with Peter Lehmann Wines, so we were ecstatic with the feedback we received, from the wine maker and the data logs. During the first summer, the feedback from the winery was that there was a noticeable difference with improvement in colour and flavour intensity.”



Angel's Share - reduced. Less topping up.

Another unique benefit Climate Wizard delivered was to decrease Angel's Share. In Peter Lehmann Wines' case, a notable decrease in wine evaporation during the barrel maturation stages, also resulted in a dramatically lower need for topping up the wine barrels.

In Peter Lehmann's case, the amount of topping up saved across 2,000 barrels was significant. With production costs a critical concern for higher end wine makers, these improvements in productivity and quality are proving to impact wine makers' bottom line results.

Bottom line savings impact the top line.

Less topping up means minimised disturbance of the wine, which ultimately equates to a higher yield of quality wines. And, with improved quality, comes better marketability of the product, maintaining a premium value while protecting the shelf price from erosion.

Climate Wizard brings top line revenue earnings into play, evening the playing field against European competitors who enjoy natural advantages, with underground storage facilities dating back hundreds of years and the use of caves.

Hyper-efficient cooling. Super low energy use.

For harsh, dry conditions like Australia, the technology's consistency in environmental control vastly improves the consistency of the storage, with a focus on quality and minimised losses.

Another key benefit from Climate Wizard is its ultra-low power use.

Reducing wine cooling energy costs by up to 80% compared to refrigerated systems is a significant saving for any winemaking operation. For wineries nearing their limits for energy, or being geographically positioned at the edge of local supply grids, Climate Wizard avoids the need to invest in new power infrastructure.

Organic, permaculture-focused and eco-friendly Wineries who wish to present carbon-neutral or similar environmental credentials, can point to minimal power use for cooling and producing fresh air, free of chemicals, to keep their barrel hall at a consistent temperature.

In light of Peter Lehmann Wines' ongoing performance results, Cold Logic's Eddie Lane sees a very positive impact across the wine industry, going forward.

"We have a number of clients now really keen to install Climate Wizard. From other installations, the results are the consistently positive so I'm excited to see the impact this technology has. I honestly believe Climate Wizard will help our industry raise the quality of wine, while making wineries stronger financially, by generating higher quality wine at a lower cost."



Climate Wizard Indirect – Direct Evaporative Cooling

In the example shown in *Figure 3*, outside air starting at 36.6°C dry bulb and 17.7% relative humidity is processed by Climate Wizard, resulting in air being delivered at 16.6°C dry bulb and 58.9% RH. This temperature, while lower than the desired maximum of (say) 19°C, is generally not low enough to maintain the barrel storage room below the required 19°C.

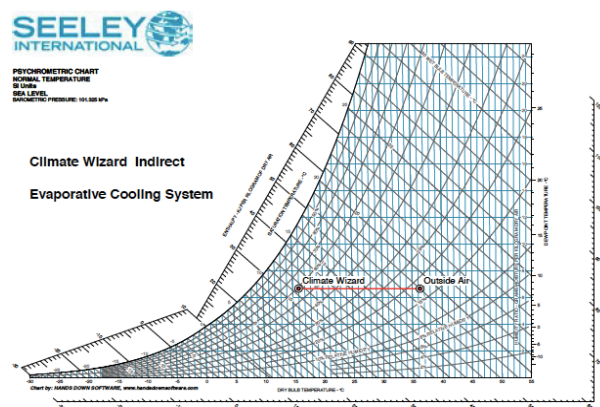


Figure 3. Psychrometric chart showing the temperature change due to the indirect evaporative cooling as seen with the Climate Wizard

Therefore, a further stage of cooling can be applied to super-cool the air to a lower temperature that will be generally be sufficient to overcome the heat gain and thus keep the barrel storage room cool.

This stage is a direct evaporative cooler that will further reduce the temperature and add moisture to the storage room (*Figure 4*).

The psychrometric chart above shows the two stages of cooling, with the resultant air being at 12.4°C dry bulb and 11.5°C wet bulb, while the humidity ratio has increased to 8.1 g/kg and 90% RH.

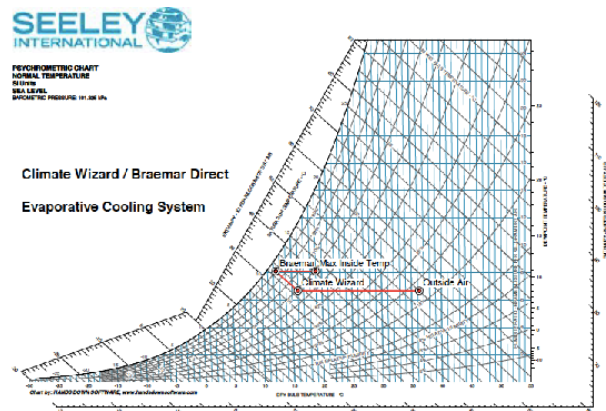


Figure 4. Psychrometric chart showing the temperature change with a combination of indirect and direct evaporative cooling.

This two stage process has resulted in very cool air that can act to keep the barrel storage within the required temperature range, but it has also increased the relative humidity to the quite high level of 90%. As the cold moist air takes up the heat within the barrel storage room, its temperature increases and its relative humidity drops. The resulting maximum temperature shown above is 19°C DB and 60% RH.

This is indicated as the horizontal line from the point identified as ‘Braemar’ to that shown as ‘Max Inside Temp’ (*Figure 4*).

It is then the application engineer’s job to design a suitable system with the required cooling capacity, to meet the heat load that results from the building design and insulation and any solar or mechanical loads, based upon the process temperature changes shown above.

For more Climate Wizard white papers or technical details, contact Michael Hamilton, Commercial Sales General Manager, Seeley Commercial at: commercial@seeleyinternational.com or on 0416 222 460.