

HVAC Case Study Reference Book Wineries

We provide full technical support to ensure optimal design for each application.

Seeley International Pty Ltd 112 O'Sullivan Beach Road Lonsdale, South Australia 5160 seeleyinternational.com





Braemar



Supercool

ABN 23 054 687 035

World leading climate control solutions

Built by Australians, for an Australian climate. Seeley International is proudly a 100% Australian owned company, designing and manufacturing world-leading commercial air conditioning solutions for Australia and the world. As Australia's largest air conditioning manufacturer, we are a global leader in developing ingenious, energy-efficient cooling and heating products.

Being made in Australia, you can rely on consistency of supply, build quality, availability of parts and after sales service. We're dedicated to strengthening the Australian economy, supporting local employment and building on the skills of our workforce.

Braemar

Australian designed, made and <u>owned!</u>

By SEELEY INTERNATIONAL®... Commercial evaporative air conditioners, heaters & HCV

The Climate Wizard ^{By} SEELEY INTERNATIONAL Hyper-efficient indirect evaporative air conditioners Refrigerated air conditioning range including VRF (heat pump and heat recovery) industrial & commercial evaporative air conditioners

Award Winning Company

Seeley International consistently wins awards for new product design, innovation and environmental friendliness. These awards include:



Winery sector Case Studies

Climate Wizard CW-80S "Supercool"

The solution to maintaining a controlled level of temperature and humidity – at very low operating costs

There are many challenges faced in both the Australian and international wine markets. The following can attribute to an increase in cost of production and can have an impact on the quality of the final product:

- Resilience of and ability to respond to extreme weather events
- Energy efficient temperature control in hot climates
- Control of humidity in barrel halls with dry conditions
- Improving product quality and value in markets faced with changing climatic conditions

These issues contribute to product quality and its market value as well as the loss of wine through the production and maturation process. Collectively affecting operational costs, return on investment and bottom line profit.

The loss of wine can be as high as ten percent depending on the conditions in the cellar (temperature and humidity), and the length of time the wine is stored in the barrel.

To manage this evaporation loss and to maintain wine quality by minimising the ullage in the barrel, the lost volume is regularly replaced or topped up with wine of similar quality, which adds a significant cost to production.

> Learn more about the many benefits of Climate Wizard for winery barrel storage. seeleyinternational.com/winemaker

Designed to efficiently cool wine barrel storage rooms

Climate Wizard "Supercool" is the latest evolution of the successful Climate Wizard range. It achieves even greater cooling capacity by adding a specially designed direct evaporative stage after the indirect heat exchanger. By using this technique, the very low supply temperatures achieved by the indirect heat exchanger are further cooled with required moisture being added to the supply air for winery operators' specific needs.

Climate Wizard Supercool provides the necessary cooling performance and climate control at a very low operating cost; up to 80% less compared to equivalent refrigerated systems. Using water as a refrigerant (R718), Climate Wizard operates with low emissions and no mechanical compressors or harmful refrigerants that have high global warming potential (GWP).

These key features support wineries working towards a more sustainable future, making Climate Wizard the natural choice for cooling winery barrel halls.





Target temperature, humidity and energy efficiency achieved

Levantine Hill Estate

Project Address Coldstream, VIC

Consultant & Contractor

Eamon Casey, O'Neill Group Steve Dumigan, Bay City Commercial

Equipment

1x Climate Wizard CW-80S Supercool & Smart Wine Controller



"We also spared no expense in building a winery that will help us make our wines even better. Our new winery is not just about outstanding wine. It is also a symbol of our determination to leave a legacy for the ages – a building of truly stunning form defined by function."

Performance

The table below outlines the cooling performance of Climate Wizard at Levantine Hill Winery.

Yarra Valley			
Model	CW-80S		
Design Conditions (°C)	34.3 / 19.9		
Supply Air Temp. (°C)	16.5		
Standalone Cooling Capacity (kW)	27.6		

Project Background

The Levantine Hill Estate, situated in the Yarra Valley, has built a legacy of pursuing perfection when it comes to winemaking. Inspired by the Yarra Valley, the winery is a triumph of architecture, featuring grand high ceilings, sweeping curves and sparing no expense in building a winery that will create better wines each and every season.

With this pursuit of perfection in mind, the winery needed an uncompromising climate control solution when it came to cooling their 577m² barrel hall which holds 178,000 litres of wine stored in wooden barrels.

Project Requirements

Levantine Hill Estate required a solution that delivered the below requirements:

- Minimal energy consumption
- Maintain the targeted setpoint of 14°C
- Maintain the relative humidity within the barrel hall to 75%
- Control of safe CO₂ levels during fermentation
- The desire to never compromise on quality

Project Deliverables

Seeley International supplied a Climate Wizard CW-80S and Smart Wine Controller with a wireless connection to the support team at our Adelaide factory to facilitate smooth system integration. In addition to the barrel hall, other heating and cooling products were supplied for the back of house areas.

When installed in a barrel hall environment, Climate Wizard has the capability to maintain the target relative humidity and temperature. The model CW-80S Climate Wizard Supercool model supplies 6,400 L/s of 100% fresh outside air which elevated the concerns about CO_2 levels.

Controlled by the proprietary Smart Wine Controller, the system can monitor indoor and outdoor conditions to optimise unit operation. There is a control panel in the barrel hall and a network connection to the in-house BMS.





Hyper-efficient climate control all over the globe

Bosman Family Vineyards

Project Address

Lelienfontein Wellington, South Africa

Contractor

Marius Louw, Director Louwco Cooling Solutions

Equipment 2x Climate Wizard CW-H15S Supercool

The rich history of Bosman Family Vineyards is a testament to the family's commitment to people, the land, and of course, the art of wine-making. The first generation of the Bosman family arrived at Lelienfontein Farm in 1798. Here they produced wine on the estate up until 1957, when the family turned their focus to their vine nursery. In 2007, eighthgeneration Petrus Bosman returned to the long-held family dream and released the first wines from their newly renovated 260-year-old cellar.



Performance

The table below outlines the cooling performance of Climate Wizard in the Wellington region.

Wellington, South Africa	
Model	CW-H15S
DB / WB (°C)	31.2/19.3
Supply Air Temp. (°C)	16
Standalone Cooling Capacity (kW)	5.5
Standalone COP	3.1

Project Background

Bosman have gained a reputation for always seeking out the latest and greatest technology — not only in their agricultural practises but also their winemaking. Petrus Bosman regularly experiments with a range of innovations; in particular those that promote energy-efficiency.

One innovation in particular was a new type of barrel seen in Spain that is an alternative to the traditional wooden oak barrel. The vessel, square in shape, is made of plastic and claims to provide various benefits and cost savings. In order to properly conduct this 'experiment', Bosman needed a controlled environment in terms of temperature and humidity.

Project Requirements

The below requirements were set in the design brief:

- Room temperature requirement of max 20°C inside
- Minimum humidity of 70% (34°C DB and 19°C WB outdoors)
- Energy efficient
- Ability to control and maintain temperatures
- No need for a power upgrade

Project Deliverables

Maintaining their commitment to innovation and energy efficiency, Bosman installed two Climate Wizard Supercool CW-H15S units. Installing Climate Wizard allowed Bosman to reduce their capital expenditure due to eliminating the need for a power upgrade.

The two units installed were able to deliver:

- Supply airflow: 2,200 L/s
- Supply temperature: 15.8°C
- Input power: 3.6kW

Results

The system at Bosman meets all the client's requirements despite a very high ambient temperature, and the room is also positively pressurised with the help of motorised dampers.

Because the room is constantly being supplied with fresh air, the pressure would continue to rise if the pressure is not relieved.

The wine store easily maintains 20°C throughout the year with capacity to maintain temperatures as low as 13°C during 42°C days (as tested on site).



Case Study Treasury Wine Estate



Treasury Wine Estate | Climate Wizard



TREASURY WINE ESTATES

Site Details

Project Address Nuriootpa, SA

Completion Date 2022

Equipment 24 x Climate Wizard CW-80S "Supercool" units



Performance

- Total Airflow: 153,600L/s
- Application: Barrel hall stand-alone cooling
- Supply Temperature: 12.5°C (@ ASHRAE 0.4% Design Conditions 37.2°C DB 17.6°C WB)
- Total stand-alone cooling capacity: 1,060kW
- COP: 4.4

- Saving 2,006,704 kWh per annum and a demand reduction of 225kW in peak input power
- Temperature and humidity-controlled cask hall to promote premium and repeatable wine maturation
- Minimizing "angel's share" evaporation from the barrel less top up and less labor costs
- Does not require skilled refrigeration technician labour to maintain and service, simply clean filters and sump tank





Case Study Taylors Wine



Taylors Wine | Climate Wizard



Site Details

Project Address Clare Valley, SA

Completion Date 2017

Equipment

1 x Climate Wizard CW-80S "Supercool" unit



Performance

- Airflow: 6,400L/s
- Application: Barrel hall stand-alone cooling
- Supply Temperature: 12.6°C (@ ASHRAE 0.4% Design Conditions 36.6°C DB 17.3°C WB)
- Stand-alone cooling capacity: 57.4kW
- COP: 5.7

- Significant reductions in energy consumption as well as a reduction in loss of wine due to evaporation (Angel's Share)
- Maintaining the 65-75% relative humidity specified to ensure consistent premium quality and reduce angel's share
- Full capability to control the environment to precise temperatures and humidity levels allowing for repeatable maturation conditions





Case Study Torresan Estate



Torresan Estate | Climate Wizard



Project Benefits

- Maintaining optimal conditions within the dry store for finished goods all year round
- An annual input energy saving of over 52,936 kWh
- Saving 51.5 kW of peak input power, equivalent to a 72% reduction

Site Details

Project Address McLaren Vale, SA

Completion Date 2019

Equipment

2 x Climate Wizard CW-80S "Supercool" units



Performance

- Total Airflow: 12,800L/s
- Application: Stand-alone cooling for warehouse
- Supply Temperature: 13.5°C (@ ASHRAE 0.4% Design Conditions 36.4°C DB 18.1°C WB)
- Total stand-alone cooling capacity: 105.2kW
- COP: 5.3









Barossa Valley Estate | Climate Wizard

BAROSSA VALLEY

—— E S T A T E ——

AUSTRALIA

Site Details

Project Address Barossa Valley, SA

Completion Date 2015

Equipment

2 x Climate Wizard CW-80S "Supercool" units



Performance

- Total Airflow: 12,800L/s
- Application: Stand-alone cooling for barrel hall
- Supply Temperature: 12.7°C (@ ASHRAE 0.4% Design Conditions 37.2°C DB 17.6°C WB)
- Total stand-alone cooling capacity: 106kW
- COP: 5.3

- Maintaining the target storage temperature of 16°C and ambient relative humidity within the barrel hall at a level between 65% and 75%
- Providing incredible savings of up to 80% compared an equivalent refrigerated system performing the same duty
- Reductions in energy consumption as well as a reduction in loss of wine due to evaporation (Angel's Share)
- Full capability to control the environment to precise temperatures and humidity levels allowing for repeatable maturation conditions





Case Study Bundaberg Brewed Drinks



Bundaberg Brewed Drinks | Climate Wizard



Site Details

Project Address Bundaberg, QLD

Completion Date Estimated February 2023

Equipment 2 x Climate Wizard CW-80S "Supercool" units



Performance

- Total Airflow: 12,800L/s
- Application: Spot cooling for workers
- Supply Temperature: 22.3°C (@ ASHRAE 0.4% Design Conditions 31.7°C DB 23.8°C WB)
- Stand-alone cooling capacity: 146kW
- COP: 6.4

- Very low energy consumption when compared with equivalent capacity rooftop package units
- Comfortable conditions for workers even on hottest and most humid days
- Improved indoor air quality from large outside air quantities
- Minimal servicing required
- Low water consumption compared with direct evaporative units



Installations in the winery sector around the world

The hyper-efficient benefits of Climate Wizard have been realised across numerous installations in the winery sector, delivering seamless climate control solutions around the world including the United States, United Kingdom, Europe, South Africa and Australia.

Climate Wizard technology is used extensively throughout Australia spanning a wide range of temperatures and conditions including New South Wales, Victoria, Western Australia and Southern Australia in various applications including:

- **Barrel Halls** •
- Warehouse Storage
- Bottling facilities •
- Tasting and Function Rooms •

Performance table for different wine regions - stand alone cooling

	DB / WB (°C)	CW-H15S			CW-80S		
Location:		Supply Air Temp. (°C)	Stand alone Cooling* (kW)	Stand alone COP	Supply Air Temp. (°C)	Stand alone Cooling*	Stand alone COP
McLaren Vale	36.4/18.1	12.5	10.0	5.5	13.5	50.7	5.1
Barossa Valley	40.6/17.6	10.2	13.0	7.2	11.5	66.1	6.6
Adelaide Hills	31.1/16.1	11.4	11.5	6.4	12.3	60.1	6.0
Riverland	39.1/18.6	12.4	10.2	5.7	13.4	51.4	5.1
Coonawarra	39.7/18.9	12.6	9.9	5.5	13.6	49.5	4.9
Margaret River	33.6/18.9	14.6	7.2	4.0	15.4	36.1	3.6
Hunter Valley	39.7/21.1	15.9	5.4	3.0	16.7	25.5	2.5
Yarra Valley	37/18.2	12.5	10.0	5.6	13.4	51.0	5.1
Mornington Peninsula	34.4/19.2	14.8	6.9	3.8	15.5	34.6	3.5
Sanoma Valley	32.8/18.8	14.8	7.0	3.9	15.4	35.4	3.5
Napa Valley	40/19.7	13.7	8.4	4.7	14.7	41.4	4.1
Tuscany	37/21.2	16.9	4.1	2.3	17.6	18.8	1.9
Sicily	33.8/16.6	11.2	11.7	6.5	12.2	61.0	6.1
Rioja	37.5/20.9	16.3	4.9	2.7	17.0	23.0	2.3
Stellenbosch	33.9/19.9	16.0	5.4	3.0	16.6	26.1	2.6

*Based on 20°C barrel hall relief air temperature Note : The information for the case studies in this document has been sourced from customer feedback and Seeley International calculations prepared from product performance data, system design, estimated energy costs (based on current market data) and equipment power usage figures.

Visit the website to see how other wineries have benefited from Climate Wizard technology!

Find out more at www.seeleyinternational.com/winemaker















coolair



BREEZAIR

Ducted Evaporative Air Conditioning

BRAEMAR

Ducted Evaporative Air Conditioning | Ducted Gas Heating Reverse Cycle Air Conditioning | Gas Wall Furnaces and Space Heaters

THE CLIMATE WIZARD

Indirect Evaporative Air Conditioning

COOLAIR Ducted Evaporative Air Conditioning

COOLERADO Indirect Evaporative Air Conditioning

AIRA

Direct Evaporative Air Conditioning | Ducted Gas Heating Commercial Gas Space Heating

seeleyinternational.com 1300 475 091 commercial@seeleyinternational.com

Seeley International Pty Ltd ABN 23 054 687 035

112 O'Sullivan Beach Road, Lonsdale, SA 5160 Phone: (08) 8328 3850 Fax: (08) 8328 3950 Email: commercial@seeleyinternational.com www.seeleyinternational.com Information in this brochure was correct at the time of preparation. Specifications subject to change without any notice. E & 0E



Cat No CW103 REV A (0823)