



# Indirect Evaporative Air Conditioning Reference Book



## World leading climate control solutions

Seeley International is Australia's largest air conditioning manufacturer and a global leader in developing ingenious, energy-efficient cooling and heating products.

### Award Winning Company

Seeley International consistently wins awards each year for new product design, innovation and the environment.

Recent awards include:



Hyper-efficient indirect evaporative air conditioners



High performance evaporative air conditioning. Unbelievable value.



The world's coolest, quietest and most energy efficient evaporative air conditioners



Compact, modular indirect evaporative air conditioners

# Indirect evaporative air conditioning

Thanks to a patented heat exchanger, Coolerado and Climate Wizard deliver 100% fresh, cool, outside air, with no added moisture.



The fresh cold air produced by these units can be similar to that produced by refrigerated systems, with temperatures that approach the ambient dew-point temperature.



Climate Wizard and Coolerado products use as little as 20% of the energy required by the most efficient conventional systems# — using only water as a refrigerant.

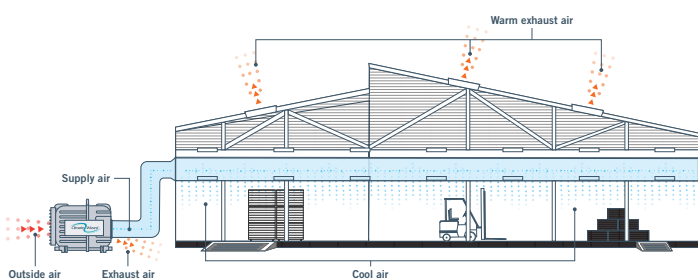


These units dramatically reduce carbon emissions, while creating a healthier environment by improving indoor air quality and flushing out stale air.

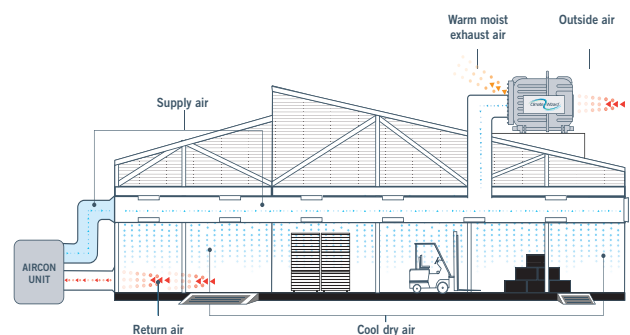


Climate Wizard and Coolerado cover an exceptionally large range of flexible configurations in a wide range of industries.

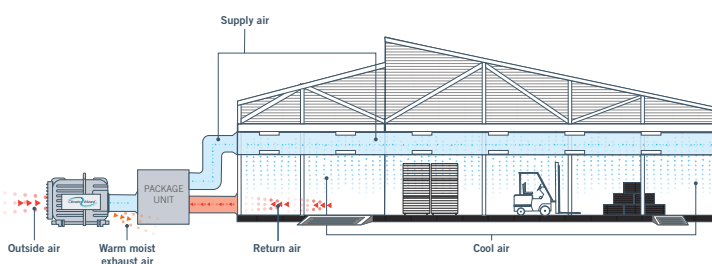
## Stand-alone cooling



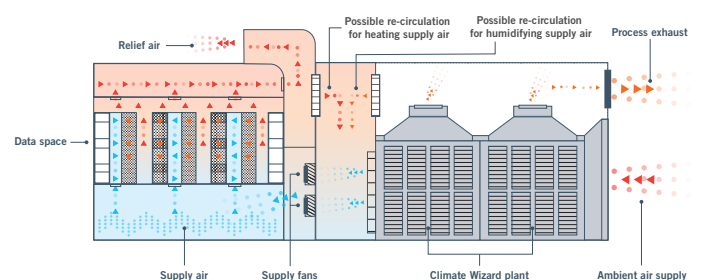
## Supplementary cooling



## Pre-cooling



## Data centre cooling



# Compared to refrigerated systems performing the same duty. Less energy is based on Coolerado and Climate Wizard products when compared to compressor-based cooling technologies, intended to cool an equivalent amount of square footage/meterage. Typical energy savings results will vary based on application type, heat load and climate and range from 50% to 80%.

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# Industrial & Manufacturing

Working conditions can be challenging inside an industrial building. High temperatures mixed with production fumes and contaminants can lead to unpleasant and unhealthy working conditions. In these environments, temperatures can be even higher than outdoors because of production equipment, commercial ovens or a lack of building insulation. For this reason, heat can be an issue not only in summer, but throughout the year.

In cases where buildings have reverse cycle air conditioning systems installed, air is recirculated within the indoor space. Drawing fresh air from outside, Indirect Evaporative Cooling (IEC) units are healthier than traditional air conditioning units, by filtering the incoming air, removing most airborne dust and pollen particles and delivering 100% fresh, cool, outside air.



**Kelloggs Cereal Processing Plant**  
United States | Coolerado | Pre-Cooling



**Tsuchiya Manufacturing**  
Indonesia | Climate Wizard | Stand-alone Cooling



**Fazion Pasta Factory**  
Italy | Climate Wizard | Stand-alone Cooling

**Challenge:**

To provide localised cooling to employees working in very hot areas within the food production facility.

**Solution:**

Climate Wizard as localised stand-alone cooling.

The factory has many large continuous baking ovens for pasta, operating 24 hours a day with a very high heat load within the building. Climate Wizard was applied as spot cooling to the area immediately around the common work areas.

# Industrial & Manufacturing

## What about humidity?

Seeley International indirect evaporative coolers normally don't add humidity to the air. There are however specific industries where humidity is an important requirement, and not a limitation.

Seeley International's IDEC technology features our patented **Supercool™ technology** that can add a specified amount of moisture to the air, meeting Relative Humidity (RH) set points for specific manufacturing requirements.

Some examples of industries taking advantage of higher humidity:

- Yarn and textiles are very sensitive to air humidity. In cases where humidity is too low, it can often lead to tearing of the yarn, causing timely and costly disruption of production.
- In electronics manufacturing high humidity minimises electrical discharge, lessening components failure during assembly.
- Printing facilities require high levels of humidity to reduce evaporation of solvents, resulting in cost savings for companies.



### Baxter Pharmaceutical

Colombia | Climate Wizard | Pre-Cooling



### Mitolo Olive Oil Processing Plant

Australia | Climate Wizard | Stand-alone Cooling



### Bolivar Pump Station

Australia | Climate Wizard | Stand-alone Cooling

## AIMIA Foods

UK | Climate Wizard | Stand-alone Cooling

Aimia Foods needed an energy-efficient air conditioning solution that didn't add moisture, with the aim of minimising moisture content in its packaged goods.

### Solution:

The chosen approach saw Aimia Foods replacing its existing air conditioning system with Climate Wizard. The new Climate Wizard system supplies air at near refrigerated temperatures, but with no refrigerant gases and no compressors. This type of highly-specialised solution is critical to moisture sensitive areas, as well as delivering big reductions in energy use.







**Grundfos Manufacturing**  
United States | Climate Wizard |  
Stand-alone Cooling



**Kurogane Kosakusho**  
Japan | Climate Wizard |  
Supplementary Cooling



**Michelin Tigar Tyres Factory**  
Serbia | Coolerado | Stand-alone Cooling

Michelin required an air conditioning solution for their 56,000 square metre factory in Serbia.

The system would need to maintain a constant and comfortable temperature and environment for 500 employees.

This installation was completed in three stages over 2014-2015, with a total of 102 Coolerado M50 units being installed.



**Hutamaki**  
United Arab Emirates | Climate Wizard Stand-alone & Pre-cooling

This fully automated plant producing finished cylinder/rollers, uses large amounts of energy, operating in arduous ambient conditions. The client needed to reduce the energy consumption and increase the fresh air volume due to treatment process that includes Chromic acid.

After initially installing four Climate Wizard H-15's in a pre-cooling application, Hutamaki decided to adopt the same solution for more factories in the UAE. Now the company has 43 Climate Wizard units installed, both in Pre-cooling and Stand-alone applications.

# Industrial & Manufacturing

## Cooling a specific space: Spot Cooling

Often industrial buildings have small spaces that are hot and uncomfortable to work in. These hot spots can be caused by heat from machines, manufacturing processes, large numbers of people or trapped hot air behind large glass windows. Often these spaces are hotter than the surrounding interior areas of the building and hotter than external conditions as well. A better, more intelligent solution is to use IEC to blanket the “hot spot” with a flow of cool, high velocity, fresh air, designed to impact workers whenever they are in that hot location: this is called “Spot Cooling”.



### Kelloggs Cereal Processing

Mexico | Climate Wizard | Pre-cooling for Makeup Air



### Bimbo

Mexico | Coolerado | Stand-alone Cooling



### Tri-Tool Machine Shop

United States | Climate Wizard | Stand-alone Cooling

## Yonex Tennis Raquet Factory

Japan | Climate Wizard | Pre-Cooling

Due to the harsh resin fumes emitted during the racquet manufacturing process, the need for a ventilation solution was recognised. To counteract the fumes, a high quantity of outside air is required to be flushed through the facility. This can create a large load on a conventional air conditioning system.

Two of our CW-80 units were installed to provide fresh air into a pair of chilled water air handling units. With very little input power the CW-80 units can pre-cool the outside air to a neutral temperature so the air handling units are not burdened with high outside air temperatures.





# Data Centres

## A brilliant way to slash data centre cooling costs

Data centres are a significant contributor to global energy use, and with more demand for data centres, this trend looks set to continue. In the USA alone, global data centres use about three percent of total electricity which is nearly 40% more than the entire UK. This consumption is set to double every 4 years.\*

There is a clever way to improve power usage effectiveness (PUE) by reducing the energy spent on cooling data centres with Seeley International's IEC technology. Using these specialised and highly tuned products, energy use can be cut by up to 80%, depending on the conditions. This is based on a coefficient of performance (COP) of 3 (EER10) for a refrigerated system and a COP of 9 (EER30) for Climate Wizard.

\*(Source: Forbes Technology Council, Dec 2017)



### Broadcast Australia

Australia | Climate Wizard | Supplementary Cooling



### National Snow & Ice Data Center

United States | Coolerado | Supplementary Cooling



### ETB Data Center

Colombia | Coolerado | Stand-alone Cooling

The ETB Data Center required an energy saving cooling solution that could supply a Design Cold Isle set point of 22°C (72°F).

Huawei (Project designer/builder) put forward 24 Coolerado M50's as the perfect solution as it was able to provide 100% outside air as well as 100% circulated air from the hot aisles, no down time, 80% energy and CO2 emission reduction, PUE of 1.1 and is fully integrated to EBMS.

Along with the above, providing free cooling in the shoulder season and a huge saving on electrical infrastructure upgrade (CAPEX avoided \$350K) proved that Coolerado was the ideal solution.

# Data Centres



## AIO

United States | Coolerado | Stand-alone Cooling



## Aerojet Rocketdyne

United States | Climate Wizard | Mobile Cooling



## Datacate Data Center

United States | Climate Wizard | Stand-alone Cooling



## Flinders University Data Centre

Australia | Climate Wizard | Supplementary Cooling

## Telstra Corporation

Australia | Climate Wizard | Pre-Cooling

Telstra is Australia's leading telecom provider and as part of that service, they have many thousands of telephone exchanges that require cooling during summer. With the advent of fast communications and data transfer for commerce and national security, these systems are required to be extremely reliable and this is now reflected in the design of the support infrastructure.

Climate Wizard provides the first stage of cooling as the summer heat builds. The refrigerated second cooling stage will then come on line as required, while the Climate Wizard continues to provide its full cooling capacity.





## Energy Efficient Configurations

There are two main types of applications for indirect evaporative air conditioning in data centres, although our engineers can work with almost any configuration to deliver superb results:

- No recirculation of return air from the data centre
- Appropriate recirculation of return air from the data centre – either using dry air to reduce water use, or moist exhaust air to adjust humidity

Where you can cut energy use, you can significantly reduce running costs. Climate Wizard and Coolerado air conditioners are natural, reliable and flexible – and perfect for data centres because they don't remove moisture from the air that enters the building.



### Broadcast Australia

Australia | Climate Wizard | Supplementary Cooling

Climate Wizard was installed as supplementary cooling to reduce the A/C energy consumption. The concept was for the Climate Wizard to carry the base load of the equipment heat gain and the solar load, while the refrigerated systems would be retained to provide extreme heat-event cooling capacity and as a backup system for safety. With the introduction of Climate Wizard, the refrigerated systems are rarely called upon and for most of the time, they remain idle.



### Green House Data Center

United States | Coolerado | Stand-alone Cooling

Green House Data required an efficient cooling solution for their 5,000 square foot building.

Like most data centers, Green House Data's biggest concerns are reliability and uptime. Its facility requires server-room cooling 24 hours a day, seven days a week. Traditional cooling methods would have taken an enormous amount of energy throughout the year.

By using Coolerado's patented technology, Green House Data dramatically reduced its energy usage. Cooling bills were reduced by 90%, with an overall energy consumption reduction of 40%.







# Retail & Supermarket



## Excessive energy demands

Supermarkets use five times more energy than any other commercial building and are considered complex applications for heating, ventilating and air conditioning systems. If the conditions inside are extremely hot, cold, dry or wet, the products are prone to damage and the store open to customer dissatisfaction. Having a unique mix of applications housed under one roof, supermarkets have many different areas that require different air treatments.

Indirect evaporative cooling cuts energy costs, ensures food safety, customer and staff well-being, and provides the required amount of fresh, healthy air at precise temperatures and humidity necessary for the space. Climate Wizard or Coolerado provide a total solution, assisting businesses in realising lower operating costs and better indoor air quality for all occupants.



### Ferrari Dealership

Australia | Climate Wizard | Supplementary Cooling



### Action Ford

South Africa | Climate Wizard | Stand-alone Cooling

### Porsche Dealership

Malaysia | Climate Wizard | Stand-alone Cooling

Although an indirect evaporative cooling system of this type had never been installed in Malaysia, the management decided to install this innovative cooling concept.

After a few surveys, the experts calculated that an indirect evaporative cooling system based on a counter flow heat exchanger (like Climate Wizard) would grant an estimated supply air temperature of 25-26°C into the workshop. 5 Climate Wizard H15S (Supercool™ series), were installed, achieving a supply air temperature of 23.5°C, well below the 28 ±1 required by the customer.





# Retail & Supermarket



**Caroma Showroom**  
Australia | Climate Wizard | Stand-alone Cooling



**Foodland Supermarket Store Room**  
Australia | Climate Wizard | Stand-alone Cooling



**Walmart**  
United States | Climate Wizard | Pre-Cooling



**Office Depot**  
United States | Coolerado | Stand-alone Cooling



**Sullivan Auto Group**  
United States | Climate Wizard | Stand-alone & Pre-Cooling

In 2017 the John L Sullivan Auto Group in Roseville, California, completed a \$5.7 million energy efficiency retrofit and solar installation that will foster an estimated \$2.9 million in energy savings over the next 25 years.

This project used 2,300 solar panels, 1,800 LED lights and 51 Seeley International CW-H15 air conditioning units to achieve the energy savings.

This energy retrofit project was able to achieve an 86% energy savings as compared to before the retrofit.



# Educational Facilities & Offices

## Supporting student and staff well-being

Research has been undertaken to determine the importance and impact of fresh air in learning or work environments has on performance and wellbeing. When the concentration of carbon dioxide falls, in an educational environment students achieve better test results and in an office, productivity increases, showing a direct correlation between air quality and performance.

Meeting fresh air requirements in an enclosed space also has a positive impact on dealing with factors associated with sick building syndrome.



### Charles Sturt University

Australia | Climate Wizard | Stand-alone Cooling



### Regis Jesuit High School Gymnasium

United states | Climate Wizard | Stand-alone Cooling

### Colegio Antonio Gala

Spain | Climate Wizard | Stand-alone Cooling

Antonio Gala School is an educational centre situated in Seville consisting of 3 buildings of 1000 m<sup>2</sup> each, hosting classrooms, gyms & extracurricular activities.

The school was looking for an energy efficient and water wise solution with minimal electricity use. Installation of a Climate Wizard CW-H15 in conjunction with Breezair evaporative units was the perfect solution. Installed as a stand-alone cooling application, the units have delivered an optimal and healthy learning and working environment.







## Educational Facilities & Offices



**Australian National University**  
Australia | Climate Wizard | Stand-alone Cooling

### Optimal environment

Temperature control and improved IAQ (Indoor Air Quality) are the two factors that play a key role when it comes to creating an optimal and healthy learning and working environment.

Indirect evaporative cooling technology can play a key role in the wellbeing and health improvement, as both Coolerado and Climate Wizard units only draw fresh air from outside, thus significantly improving IAQ.



**Porterville School Gymnasium**  
United States | Climate Wizard | Stand-alone Cooling



**Los Angeles United School District**  
United States | Climate Wizard | Stand-alone Cooling



**Adelaide University Student Hub**  
Australia | Climate Wizard | Stand-alone Cooling

Adelaide Universities central learning environment has the ability to cater to approximately 25,000 students per year. The University required a climate control solution that was both energy efficient and provided the highest level of comfort for all students and staff members.

For a facility of this size, 35,000 L/s (74,160 cfm) of conditioned air was needed to provide a comfortable environment during summer. To provide this quantity of conditioned air a pressurised air handling room was built above the learning hub. 11 purpose built Climate Wizard modules were designed and built to meet the requirements of this application.



## Educational Facilities & Offices



### Greenhill Road Offices

Australia | Climate Wizard | Supplementary Cooling



### Paradise Valley School

United States | Climate Wizard | Stand-alone Cooling



### Roxby Downs Council Offices

Australia | Climate Wizard | Supplementary Cooling



### Stellenbosch University

South Africa | Coolerado | Stand-alone Cooling

### Aveley Secondary College

Australia | Climate Wizard | Supplementary Cooling

The air conditioning plant specification required energy efficiency, a proprietary switch plate (reducing supply and install costs) and variable speed control.

The information resource centre and staff common rooms are cooled by 7 Climate Wizard CW-P15 units which improved the absolute humidity of the space in comparison with a standard evaporative cooling solution. Seeley International was also able to provide a total solution including 59 evaporative units and a HCV unit throughout the remaining buildings of the school.





# Warehouse & Logistics



Warehouse complexes can be notoriously hot in summer, particularly when mezzanine floors are present, heat can become a real issue. An inadequately air conditioned warehouse can pose serious threat to the wellbeing of staff, equipment functionality and quality of produced goods. Dependent on industry, these spaces can often have specific requirements for temperature or climate control, especially when dealing with food, fresh produce and pharmaceutical products.

Cooling with traditional air conditioning can be challenging and extremely expensive. Indirect evaporative cooling can be the right solution because it cools large buildings at a fraction of the cost compared to traditional reverse cycle systems\*. Therefore it makes sense to employ Indirect Evaporative Cooling, a hyper-efficient air conditioning system. This will create a satisfactory environment for workers to maximise productivity whilst at the same time minimising energy costs.



## **Pattersons Logistics**

United States | Coolerado | Stand-alone Cooling



## **Mayne Pharmaceutical Warehouse**

Australia | Climate Wizard | Stand-alone Cooling

\*Compared to refrigerated systems performing the same duty.



## **Alpha Pharmaceutical**

South Africa | Climate Wizard | Stand-alone Cooling

Alpha Pharm has a 4,500m<sup>2</sup> facility in Pretoria, and gave the following brief:

The facility's temperature was not to exceed 25°C, the system had to have a low running cost, low cost of ownership, the facility was to have a positive pressure to prevent dust ingress with filtered air and no increase in the moisture content of the air, as this would have a negative effect on the packaging materials.

The contracting team did their research, identifying Seeley's Climate Wizard indirect evaporative cooling system as the perfect solution, installing twenty CW-H15 units as stand-alone cooling.





# Health & Aged Care

Health and aged care facilities are under increasing pressure to deliver more with less, whilst also complying with stringent regulations, health and safety measures and ever changing technologies.

With patient welfare and staff comfort one of the highest priorities in health and aged care facilities, providing an outstanding air conditioning solution is vital.

The greatest benefit to any facility is the Indoor Air Quality (IAQ) within and for aged care and health care facilities. Fresh air is vital for the prevention and control of infection, as well as delivering many other health benefits to these facilities, including:

- Prevention and control of infection and contamination
- Assist in the prevention of sleep disorders and other health conditions
- Improves cognitive function and physical mobility
- Preserves a sterile and healthy, positive atmosphere for patients and staff



**Centra Medica Imbanco Hospital**  
Colombia | Coolerado | Stand-alone Cooling

## Retirement Home

Belgium | Climate Wizard | Pre-Cooling

The management of this retirement home decided to install one Climate Wizard CW-H15 to pre-cool the air entering the air handling unit that was already installed.

The Climate Wizard installation provides savings in running costs, when compared to installation of traditional air conditioning units. Moreover, while the air is cooled, residents can still enjoy healthy fresh air from outside, instead of stale recycled air.





## Health & Aged Care

Indirect Evaporative Cooling addresses current industry priorities including improved IAQ, resilience extreme weather events, sick building syndrome, peak power demand, low noise levels and providing a positive and comfortable environment.

### Banner Estrella Medical Center

United States | Climate Wizard | Pre-Cooling

Banner Estrella Hospital is a busy medium sized hospital that provides 24 / 7 care for the community. Part of the facility includes extensive kitchens that provide meals for patients and staff. Large kitchens have large amounts of air exhausted from cooling appliances and make-up air is often drawn from areas that are cooled by refrigerated plant. The hospital wanted to improve the quality of air introduced to the kitchens but to limit the operating costs of any new equipment required.

Two Climate Wizard model CW-H15 air conditioners were installed to pre-cool the air that was introduced into the existing air conditioning system. By using Climate Wizard in this way the total cooling capacity was substantially increased at a very modest operating cost while improving the air quality in the building.



### Logan Regional Hospital

United States | Coolerado | Stand-alone Cooling

The facility is now enjoying a comfortably cool and fresh surgical room and a 90% saving on energy costs. That translates to a return on investment in less than three years.

The installation of 8 Coolerado units equated to 40 tons of cooling to their operating rooms. Under full load, the units are only using around 10kWh, whereas with the previous pre-cooling DX required 140kWh under full load.



# Hospitality & Food Service

Maintaining constant and comfortable conditions in a restaurant, kitchens or function spaces is challenging due to the nature of the operation. Factors to consider include:

- Exhaust canopies in the kitchen drawing out air that has already been treated by an air conditioning system
- Doors frequently opening and closing as patrons constantly enter and leave the building
- Volume of patrons in the space

All provide challenges for business owners/operators to deliver a satisfactory environment for customers and staff, in what is a fast moving and intense workplace.



**Fortune 100 Company Cafeteria**  
United States | Coolerado | Stand-alone Cooling



**Venita Rhea's Restaurant**  
United States | Climate Wizard | Pre-Cooling

## Exki Restaurant

Belgium | Climate Wizard | Stand-alone Cooling

### Challenge

A new organic food restaurant chain in Belgium had their own mandatory fresh air requirements.

### Solution

Climate Wizard stand alone cooling two Climate Wizard model CW-H10 air conditioners were installed on the roof with a long duct diffusing the fresh air all along the restaurant and the mezzanine. Installing the Climate Wizard air conditioning was in line with the environmental ethics of the restaurant. Customers now enjoy the fresh cool air delivered by the Climate Wizard units during the hot summer days.





## Hospitality & Food Service

There are fresh air requirements in conference rooms, foyers, dining rooms and the like to ensure sufficient CO<sub>2</sub> levels are expelled, supporting a healthy environment for customer comfort and optimal staff productivity.

All these factors affect the performance and efficiency of the air conditioning system and contribute to operational costs and profit for any hospitality or food service business. The ability to improve efficiency in climate control offers a sustainable competitive advantage and can be achieved with Seeley International's IEC technologies.

### McDonalds

Australia | Climate Wizard | Pre-Cooling

The McDonalds franchisee at Pimpama was looking for an energy-efficient solution for their store operating 24/7. The design brief stated that the ambient design temperatures at Pimpama could reach 33.5°C dry bulb/26°C wet bulb, with roof temperatures exceeding 45°C dry bulb, as the client required consistent cooling for a pleasant indoor environment.

Two Climate Wizard model CW-P15 air conditioners were installed; one servicing the kitchen work stations while the other serviced the burger bar and front of house area. Comfortable temperatures were maintained with fresh air supplied directly to the required areas.

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### Machine Zone Cafeteria

United States | Coolerado | Stand-alone Cooling

Machine Zone (MZ) is a Silicon Valley tech company and a global leader in mobile gaming. MZ has developed 3 of the mobile gaming industry's all-time top performing games.

A Coolerado 10,000 cfm custom Indirect Air Side Economizer (IASE) unit has been operational on MZ's data center since early 2018.

A Coolerado 22,000 cfm custom Makeup Air Unit (MAU) has been operational on MZ's cafeteria since early 2018. MZ is very happy with Coolerado's cooling performance and reliability on both the data center and the cafeteria.





# Government & Public Facilities

## Public and Government facilities are leaders in sustainability and energy efficiency.

These facilities encompass a wide variety of building types and uses and as such require a broad range of applications. Including:

- Prisons
- Defence facilities
- Quarantine facilities
- Law enforcement
- Natural resource facilities
- Power stations

Government and publicly owned facilities are constantly challenged by strict guidelines in regards to providing a high level of IAQ (Indoor Air Quality) and a comfortable environment for all occupants and visitors; while maintaining a high level of energy efficiency with minimal greenhouse gas emissions.

As world leaders in energy efficiency, Climate Wizard and Coolerado's indirect evaporative technology goes above and beyond to provide the environmental benefits required within this sector.

### Shimoji Island International Airport Japan | Climate Wizard | Supplementary Cooling

Shimoji Island International Airport is the first airport in Japan to achieve Zero Energy Building certification (ZEB). Having a ZEB ready status means that the Shimoji Airport will consume over 50% less energy than a comparable airport built to the minimum building standards.

The airport installed four CW-80 Climate Wizard units - providing fresh air into the check in and departure lobbies and one CW-H15 providing make-up air into a commercial kitchen. The Climate Wizards provide over 26,000 L/s of conditioned air into the airport and offset up to 170 kW of cooling load from the chiller system.



## Government & Public Facilities



### Eyman Prison

United States | Climate Wizard | Stand-alone Cooling



### Edwards Air Force Base, Joint Strike Fighter Trailer

United States | Coolerado | Mobile Cooling



### Montbello Public Library

United States | Coolerado | Supplementary Cooling



### Fort Bliss Army Base

United States | Coolerado | Stand-alone Cooling



### Burbank Power & Water

United States | Coolerado | Stand-alone Cooling



### Fort Carson Army Base

United States | Coolerado | Stand-alone Cooling



# Sport & Leisure Centres

Cooling large open spaces, typical of gymnasiums, movie theatres, casinos, stadiums, tourist complexes and entertainment centres draws a large amount of energy which translates into excessive energy costs, particularly in periods of extremely hot weather.

Such facilities consistently have large volumes of people entering the space within a short timeframe which rapidly changes the temperature within the space, putting large loads on electrical infrastructure to keep air conditioning plant running during periods of peak demand.

In addition, Indoor Air Quality (IAQ) is a critical factor for customer and staff well-being.



## Azatlan Recreation Center

United States | Coolerado | Stand-alone Cooling

## Palace Nova Cinema

Australia | Climate Wizard | Pre-Cooling

A major redevelopment of Adelaide's Palace Nova cinema complex included renovating four large cinemas into eight new smaller cinemas.

The project design focused on the use of two Climate Wizard CW-H15 units to pre-cool outside air. The units were used in conjunction with split ducted units, BMS control and the use of theatre air to pre-cool the foyer area. A new building management system (BMS) was also installed.

This cinema was redeveloped only months after another cinema only a few kilometres away (Palace Nova Prospect). Both cinemas are very similar in floor area, number of theatres and number of patrons per month. The Prospect cinema installed an air to air heat exchanger, at the conclusion of summer, the power bill between the two sites showed a significant difference.

By installing Climate Wizard as a pre-cooling solution, the Rundle Street cinema is now reaping the rewards of substantial energy savings.



	Prospect Cinema (Heat Recovery Unit)	Rundle St Cinema (Climate Wizard)
No. of Theatres	14	11
Total Seats	678	38
Patrons per month	24,790	25,470
Floor Area (m <sup>2</sup> )	2,000	1,600
Capital Cost	\$680,000	\$520,000
Capital Cost per m <sup>2</sup>	\$340	\$325
Dec. Power Bill	\$12,656	\$5,589
Jan. Power Bill	\$15,658	\$10,723



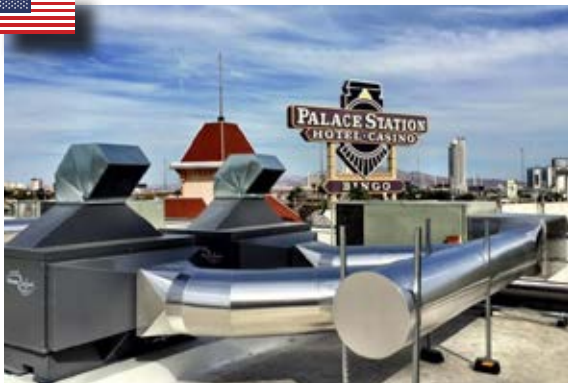
## Sport & Leisure Centres



**Willis Case Course Clubhouse**  
United States | Coolerado | Stand-alone Cooling



**Sam's Town Casino Las Vegas**  
United States | Climate Wizard | Supplementary Cooling



**Palace Station Casino**  
United States | Climate Wizard | Pre-Cooling



**Werribee Sports Complex**  
Australia | Climate Wizard | Stand-alone Cooling



**The Spot Climbing Gym**  
United States | Climate Wizard | Stand-alone Cooling

The Spot opened the world's first bouldering gym in Boulder, CO. Upon opening their second bouldering gym in Denver, CO, five Climate Wizard CW-P15's were installed.

The consulting engineer selected Climate Wizard for its hyper-efficient cooling, as well as being the only cooling technology that would meet the Denver Green Buildings Ordinance ("Green Roof") requirements for their older, re-purposed building.

Climbers can now ascend in comfort.



# Wineries



There are many challenges faced in 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, these factors affect operational costs, return on investment and bottom line profit.



## Bosman Wines

South Africa | Climate Wizard | Stand-Alone Cooling

## Boschendal Wines - Function Venue

South Africa | Climate Wizard | Stand-Alone Cooling

With Africa's sizzling summer conditions, the owners were looking for a cost-effective air-conditioning system that could cool their venue as efficiently as possible.

After various systems were investigated, Climate Wizard was deemed the perfect solution and six units were installed. Climate Wizard was selected as it is capable of cooling large open spaces, delivers the legislated fresh air requirement for the venue in a cost-effective way and supplies 100% outside air.





**Peter Lehman Wines**  
Australia | Climate Wizard | Stand-alone Cooling



**Torresan Estate Wine Storage**  
Australia | Climate Wizard | Stand-alone Cooling



**Barossa Valley Estate - Barrel Store**  
Australia | Climate Wizard | Stand-alone Cooling

## What is “Angel’s share”?

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 (known as Angel’s Share) 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.

Climate Wizard 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.

Climate Wizard’s ability to provide the necessary cooling performance at a very low operating cost is due to the fact that it uses no mechanical compressors or harmful refrigerants. This in turn makes it the natural choice for cooling winery barrel halls, bottling facilities, tasting rooms and other spaces related to the production process.

Barossa Valley Estate required a HVAC solution for their barrel storage hall that consumed minimal energy, maintained the wine temperature within the barrel at or near the target storage temperature of 16°C and the ambient relative humidity within the barrel hall maintained at between 65-75%.

Two Climate Wizard CW-80 Supercool units were installed, together with well-designed duct work that evenly distributes the cool air throughout the barrel hall, addressing stratification of the air.





### **BREEZAIR**

Direct Evaporative Air Conditioning

### **CLIMATE WIZARD**

Indirect Evaporative Air Conditioning

### **COOLAIR**

Direct Evaporative Air Conditioning

### **COOLERADO**

Indirect Evaporative Air Conditioning

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Information in this brochure was correct at the time of preparation. E & OE

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