Breezair

NUMBER ONE IN NATURAL COOLING

Reference Book

World-leading natural cooling technology

SEELEY INTERNATIONAL

Why Breezair?

25 Years
Corrosion-free cabinets guarantee

10 Years
Structural components guarantee

2 Years
Pump, motor & electronic control module guarantee

Why evaporative air conditioning?

Take the natural approach to air conditioning! Seeley International's Breezair range of evaporative air conditioners delivers lots of cool, 100% fresh air, at much lower costs than refrigerated cooling methods.

Evaporative cooling is fast becoming the only viable option for cooling large areas. A Breezair system uses up to 80% less energy than a refrigerated air conditioning system. Doors and windows can be left open, with absolutely no loss of cooling efficiency.

Fresh, clean air

The delivered air is 100% fresh, with no risk of recirculated fumes, germs or odours.

Most importantly, as the outside temperature rises, the more cooling you get inside – the fundamental benefit of the evaporative process.

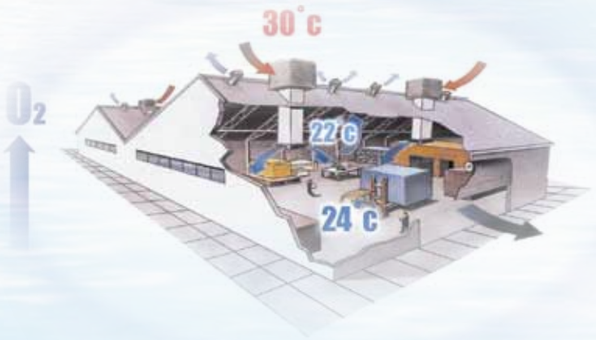
Flexible cooling

If you need to cool small areas within a large space, then evaporative air conditioning gives you the only effective option – spot cooling. With spot cooling, an envelope of cool, high velocity air can be directed to a specific area, irrespective of the surrounding conditions.

Feel it for yourself!

Breezair evaporative air conditioning:

- Is more energy-efficient – cheaper to run
- Delivers cleaner, healthier air
- Is easier and cheaper to install
- Improves productivity through fresh, clean air (less chance of Sick Building Syndrome or other air-borne problems)
- Is healthier for the environment – drastically reduced power use, no harmful emissions and no synthetic refrigerants
- Is easier to maintain



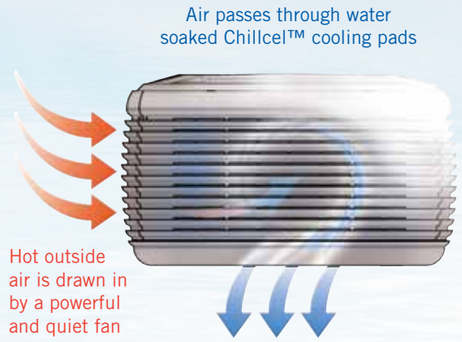
Why Breezair?

For around four decades, Seeley International's brands have been synonymous with leading-edge technology, innovative design and superior cooling performance, in addition to outstanding product reliability and ease of maintenance.

Seeley International's dedication to innovation through the highest standards of research, engineering and manufacture, as well as our commitment to excellence in customer service, all combine to deliver the best possible cooling systems at the best possible price.

Designed and made in Australia to cope with even the harshest conditions, Breezair features a range of benefits exclusive to Seeley International, including:

- Permatuf corrosion-proof cabinets, that won't rust, fade or discolour – no wonder we guarantee them corrosion-free for 25 years!
- Tornado pumps – designed and manufactured by Seeley International, the Tornado pump delivers the highest levels of reliability and safety;
- The AQUAflow non-clogging water distribution system maximizes cooling efficiency;
- Intelligent, electronically controlled water management maintains a clean system;
- Chillcel pads are built strong to last longer and are easy to clean and replace when necessary;
- The WATERManager system ensures optimum machine life with minimum maintenance; and
- The super-efficient HushPower Direct Drive motor, the quietest motor available.



Psychrometric Chart

Normal temperature
SI units, 200 meters
Barometric Pressure 101.3kPa

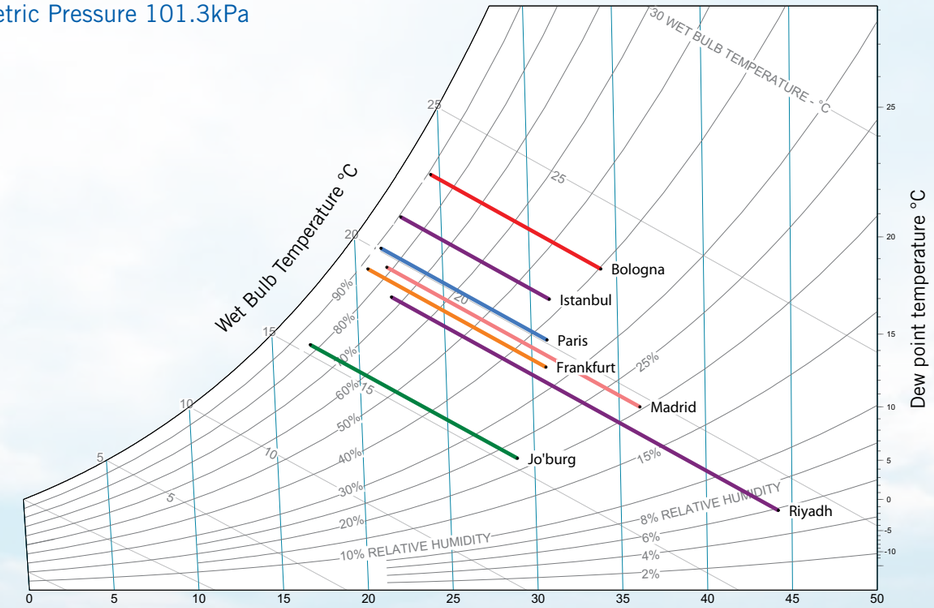


Chart explanation: Consider fresh air entering the cooler at 30°C dry-bulb and about 38% relative humidity. In the case of a direct evaporative air cooler, the fresh air passes directly through the wet cooling pad where it becomes cool and also moist, and emerges at about 21°C dry-bulb and 88% relative humidity. The process has travelled along the wet-bulb (orange) line and the air has gained about 5.5 grams/kg of additional moisture.

The chart also shows direct evaporative cooler process lines using Breezair saturation efficiency of 85% and ASHRAE design condition for each city.

How Breezair compares to refrigerated air conditioning

	Breezair	Refrigerated air conditioning
Temperature of supply air	Cool	Cool → cold
Moisture control	Moisture added	Moisture removed
Moisture control impact	Preserves essential moisture	Removes essential moisture
Fresh air control	100% fresh air	Maximum about 25% fresh air
Fresh air impact	100% fresh air eliminates many causes of Sick Building Syndrome	Recycled air can result in Sick Building Syndrome
Capital costs – installed	Lower	Higher
Running costs	Very low	Very high
Refrigerant type used	Natural - water	Synthetic – Hydrofluorocarbons
Environmental impact of Refrigerant	No synthetic refrigerants	Synthetic refrigerants have very high global warming potential. They damage the environment as they leak into the atmosphere over time

Over quarter of a million commercial/industrial installations worldwide

Breezair installations all around the world

Markings are intended to represent the locations of Breezair installations across the globe and are approximate only. All markings are indicative of completed installations at the time of print.

Industrial applications

Textile industry

Akurun Tekstil
(Turkey)

Menderes Tekstil
(Turkey)

ERKO Tekstil
(Turkey)

GOKHAN Tekstil
(Turkey)

Gucci
(Italy)

Powenall & Hampson
(UK)

Printing & production lines

Small Typographer
(Ukraine)

Laminar (producer of specialised high-tech equipment of protective boxes)
(Russia)

Hammond Press
(UK)

Compass manufacturer services
(New Mexico, USA)

Foxprint
(UK)

MESA Etiket
(Turkey)

Industrial applications

Rubber, glass & laser industry

Polypal
(UK)

Waterford
(UK)

Levine Machine
(USA)

Porite
(Taiwan)

AGA - Cast iron
(UK)

Group Laser Ebro
(Spain)

Bedfords
(UK)

Kingspan insulation
(UK)

Food industry

Heineken
(Spain)
Heineken has more than 110 coolers installed in the bottling area.
One of the biggest installations in Europe.

Drinks manufacturer
(Netherlands)

Granarolo factory
(Italy)

Pepsico, Matutano
(Romania)

Pepsico, Matutano
(Portugal)

Dairy factory
(Netherlands)

Nicholl food packaging
(UK)

Industrial applications

Laboratories & mechanical engineering facilities

Cranden Diamond Products
(UK)

Not only does the Breezair unit provide evaporative cooling to factories, offices and buildings, but it **also helps remove unpleasant odours from the workplace.**

Cranden Diamond Products, a major diamond tool manufacturer, is using the Breezair system to provide a constant flow of fresh air through its cutting area to remove the smell of chemicals from the adjacent laboratory.

ESI Eskanasi
(Switzerland)

Stannah powdercoating
(UK)

ESI Eskanasi manufactures of small metal components for precision gears. Extremely stable humidity and temperature conditions were required in the production area in order to guarantee accurate dimensions of the products.

Automotive industry

General Motors / Mitsubishi
(Venezuela)

Dana
(Spain)

Renault
(Moscow, Russia)

Lamborghini
(Modena, Italy)

Scania
(Netherlands)

Industrial applications

Factories

Venequip
(Venezuela)

Michelin
(Spain)

Schneider Electric factory
(India)

Indian factory temperature drops from 39°C down to 26°C with Breezair

Schneider Electric manufactures electrical automation and control systems, with more than 10,000 employees across 10 countries worldwide. The company's Indian factory, located in Baroda, Gujarat, did not have any air conditioning installed in the factory and often temperatures would soar as high as 39°C during summer inside the factory. Understandably, these hot temperatures were affecting employee efficiency, reducing production speed and creating high attrition rates.

Factories

Honda
(Pakistan)

Opel
(Eindhoven, Netherlands)

Industrial applications

Agricultural & animal facilities

Horse Hall & Stables
(Russia)

Koeman &
Van de Burg Bloembollen
(Netherlands)

Koeman &
Van de Burg Bloembollen
(Netherland)

Animal farming – cows
(Spain)

Animal farming – pigs
(Israel)

Animal & breeding facilities

Animal farming
(Poland)

Animal farming – chicken
(Poland)

Animal farming – ducks
(Poland)

Cherry Valley
(UK)

Pelaw Grange Greyhound Stadium
(UK)

Commercial applications

Car dealers

Car dealer
(France)

Car dealer
(Belgium)

Car dealer
(Belgium)

Mercedes Benz dealer
(Belgium)

Wasel Car testing facility
(Dubai, UAE)

Warehouses

Pharmaceutical warehouse
(Venezuela)

CPG Logistics
(UK)

Warehouse
(Saudi Arabia)

Solver Roof
(Australia)

Bunnings Warehouse
(Australia)

Sonnecken office equipment
(Germany)

Decathlon sports
(Spain)

Commercial applications

Laundries

Celtic linen
(UK)

Johnsons Apparelmaster
(UK)

Bates Laundry
(UK)

Bakeries

Bakery
(France)

Riverside bakery
(UK)

Martin bakery
(UK)

La fornia bakery
(UK)

Commercial applications

Transport, parking & medical

TUSSAM bus station in Seville
(Spain)

TUSSAM, a civic corporation that manages the public transport in the city and suburbs of Seville, Spain, has created a cooler and healthier environment for workshop staff by installing Breezair evaporative cooling. The Breezair coolers have reduced temperatures in the workshops from a stifling 40ºC to a more comfortable 26ºC.

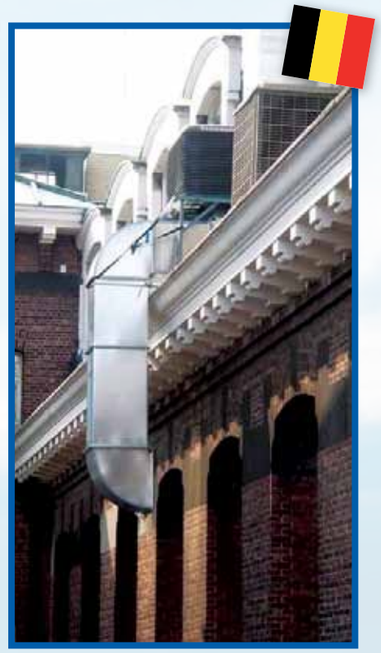
CPG Logistics
(UK)

When CPG Logistics, built a new £1.5 million pound multi-tiered mezzanine floor within it's 100,000m^2 distribution centre in Gosport, it was faced with the dilemma of how to meet MHRA (Medicines and Healthcare Products Regulatory Agency) regulations on storing pharmaceutical products at between 18ºC and 26ºC, when temperatures at the top of the three-storey warehouse were reaching 36ºC. The solution came with the Breezair Evaporative Cooling System, which has reduced inside temperatures to a regulatory 22ºC, even on the hottest day.

Offices, schools & banks

INPRO
(Czech Repulic)

Les Buisses
(France)



Fortis Bank
(Belgium)

University of Managua
(Nicaragua)

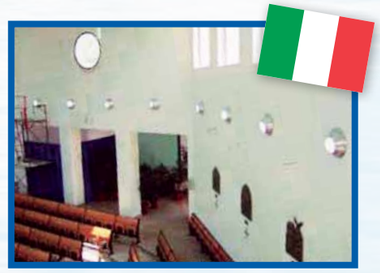
Queen Elisabeth School
(UK)

College
(Hungary)

College, auditorium
(Pakistan)

Commercial applications

Churches



Church
(Italy)

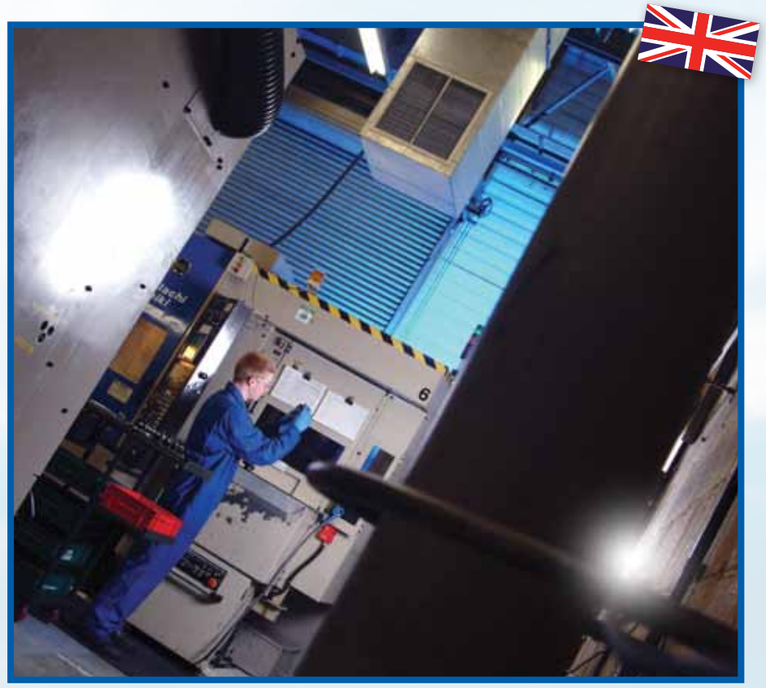
Church in Alexandria
(Egypt)

Evangelican church in Sicily
(Italy)

Conference, engineering & military facilities

Klepperzaal Hardenberg exhibition centre
(Netherlands)

Budpragres exhibition
(Minsk, Belarus)



HPC Engineering PLC
(UK)

Military shipyard
(Turkey)

NATO base in Naples
(Italy)

Commercial applications

Shops & commercial centres

Tom&Co pet store
(Belgium)

Wyerale pet & garden centre
(UK)

Warrington market
(UK)

Pasatiempo Mall in Lourdes
(El Salvador)

Modena indoor market Albinelli
(Italy)

Shops & commercial centres

Widnes Market Hall
(UK)

Fruit market in Sicily
(Italy)

Hypermarket
(Netherlands)

Marketplace in Krasnodar
(Russia)

Large commercial centre, Warner Bros
(Spain)

Hypermarket
(Colombia)

Garden centre in Biella
(Northern Italy)

Kaufhaus Stolz in St. Peter Ording
(Northern Germany)

Commercial applications

Bars & restaurants

Greek restaurant in Valencia
(Spain)

State of the art restaurant
(Netherlands)

Aristocrats restaurant in Bucharest
(Romania)

Restaurant in Modena
(Italy)

Pata Palo restaurant
(Spain)

Sharm restaurant
(Egypt)

Sport centres

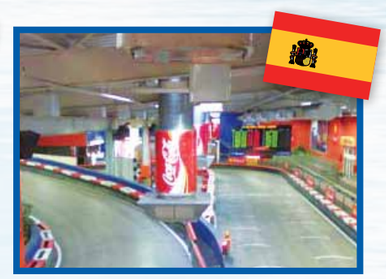
Sport centres in Adelaide
(Australia)

ELIXIA fitness centre
(France)

Fitness centre
(France)

Bowling hall
(France)

Factory fitness centre
(Netherlands)



Karting centre
(Spain)

Residential applications

Chalet on the mountain in Madrid
(Spain)

Cottage
(Ukraine)

Trendy appartment in Malaga
(Spain)

Colorado
(USA)

Villa on the coast
(Spain)

Villa on the coast in Valencia
(Spain)

Outdoor applications

McDonalds
(Australia)

Car races
(Australia)

Vending machines at Tierra Mitica
(Spain)

Marquee
(Italy)

Bio-cooling palm tree
(Spain)

Bio-cooling tower
(East coast of Spain)

Bio-cooling tower at Zaragoza fair/expo
(East coast of Spain)

Warner Bros thematic park
(Spain)

Tents for events
(Italy)

HOW DOES IT WORK?

How does it work?

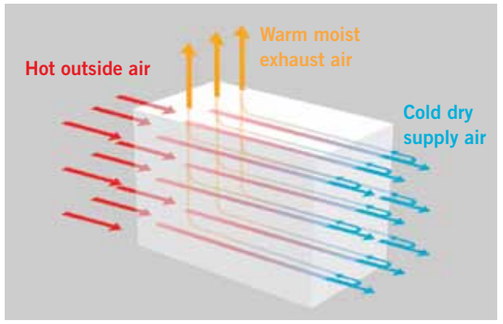
Climate Wizard is an indirect evaporative air conditioner. It works by drawing in hot outside air and passing it through a series of wet and dry channels. This allows natural evaporation to cool the air. Warm, moist air is expelled, while cooled, but otherwise unchanged, air is delivered into the building.

In some ways, this approach is similar to traditional evaporative cooling, because it contains no synthetic refrigerants and uses only water and moving air to cool. Like direct evaporative coolers, Climate Wizard uses a single, electric motor driven fan, water management system and water distribution system.

Where it's radically different, however, is its use of revolutionary new technology – an ultra-high-efficiency counterflow heat exchanger. This means Climate Wizard can use natural evaporation to super-cool the air, but without adding any moisture.

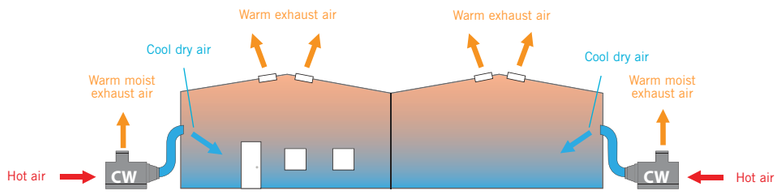
The cold air produced by Climate Wizard can be equivalent to that produced by refrigerated systems, with temperatures that approach the ambient dew-point temperature. The air delivered into the building is cold and has no added moisture. The entering cold air cools the building and is then exhausted to the atmosphere.

The diagram below demonstrates how Climate Wizard works.



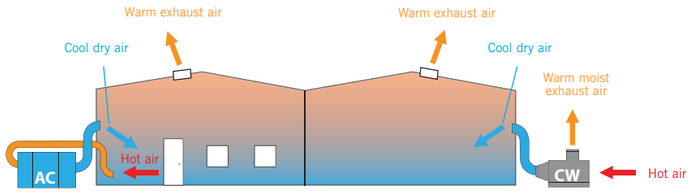
Climate Wizard's counterflow heat exchanger.

Stand Alone Cooling



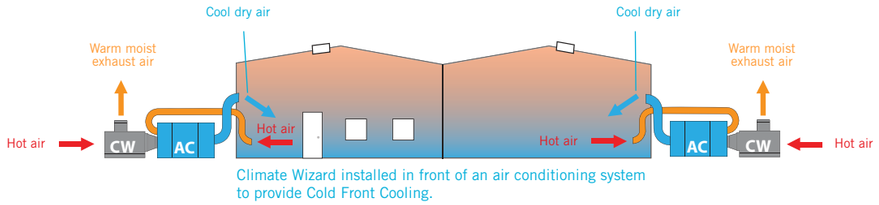
Climate Wizard used to provide Stand Alone Cooling.

Supplementary Cooling



Climate Wizard used with an air cooling system to provide Supplementary Cooling.

Cold Front Cooling



Climate Wizard installed in front of an air conditioning system to provide Cold Front Cooling.

This is how it works

- There are dry channels and wet channels, alternating throughout the heat exchanger core
- All of the air passes along the dry channels and gains no additional moisture
- The portion of the air that returns along the wet channels, does gain moisture, because the channels are continuously soaked with water. This moist air is then exhausted outside of the building
- No moisture is transferred across the membranes between the dry and wet channels; only temperature (heat) is transferred
- The heat passes out of the air in the dry channel through the membrane and into the air passing through the wet channel
- In this way, the dry channel becomes progressively colder but gains no moisture. The dry, cool air then passes into the building.

Psychrometric Chart

Barometric Pressure 101.3kPa

The coloured lines on the psychrometric chart compare Climate Wizard's performance to that of a direct evaporative cooler on a hot day.

- Direct Evaporative Cooling
- Indirect Evaporative Air conditioning

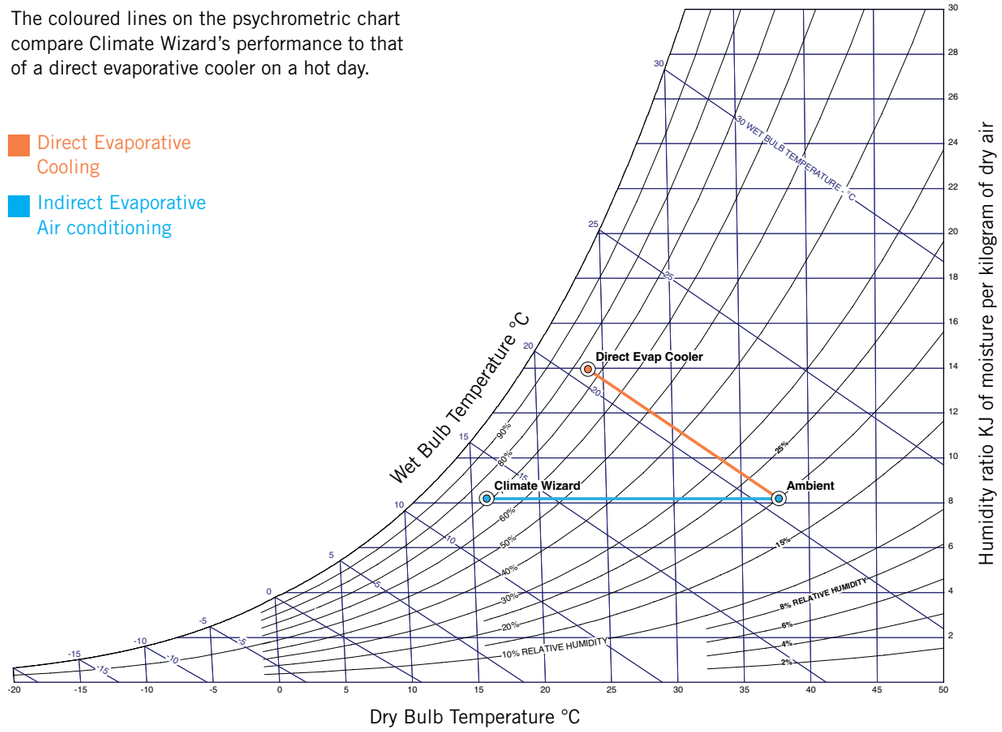


Chart explanation: Consider fresh air entering the cooler at 38°C dry-bulb and about 20% relative humidity. If the cooler is a direct evaporative air cooler, the fresh air passes directly through the wet cooling pad where it becomes cool and also moist, and emerges at about 23°C dry-bulb and 75% relative humidity. The process has travelled along the wet-bulb (orange) line and the air has gained about 5.5 grams/kg of additional moisture.

In the case of an indirect evaporative air cooler, the fresh air passes through the dry channel where it is super-cooled and emerges at about 16°C. But, no moisture has been added as the cooling process has occurred along the constant moisture (blue) line. The 'wet-bulb effectiveness' of Climate Wizard is about 125%, whereas regular direct air coolers have a wet-bulb effectiveness of about 85%.

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NUMBER ONE IN NATURAL COOLING

SEELEY INTERNATIONAL

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

Our vision is to lead the world in creating climate control solutions which continue to be highly innovative, of premium quality and inspirational in their delivery of energy-efficiency.

But it's more than just a vision... it's a way of life!

A commitment to innovation and excellence is at the heart of all that we do. Our success in delivering on that commitment has been recognised by our many awards and our expanding global presence. Seeley International now exports to well over 100 countries. Not bad for a company that started out in 1972 in the garage of its founder and Chairman, Frank Seeley AM FAICD, who was named South Australian of the Year for 2011!

SEELEY INTERNATIONAL

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Seeley International (Europe) Limited
Hucknall Business Centre
5 Papplewick Lane,
Hucknall, Nottingham
UK NG15 7TN
Phone/Fax +44 (0) 115 963 5630

Seeley International Europe (Italy)
Via Rigutino est, 194
52100 Rigutino (AR)
Italy
Phone +39 0575 97189
Fax +39 (0)575 1949971

Seeley International France
320 Avenue Berthelot
69371 Lyon Cedex 08
France
Phone +33 (0)4727847 80
Fax +33 (0)478 7440 74

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Quality
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Cat No B0748 REV A (0713)

Email **eurosales@seeleyinternational.com** Web **seeleyinternational.com**