

Providing a superior indoor environment
using the latest air conditioning
technology...

Frenger Systems Corporate Overview

FRENGER[®]
systems



Company Overview

Frenger Systems is a world-renowned specialist manufacturer of space conditioning products for indoor climate / environments. Frenger has extensive experience dating back some 70 years and is at the forefront of the design, development and manufacture of water driven cooling and heating technologies.

Frenger employs professionally qualified Mechanical Engineers, Electrical Engineers, Lighting Designers, Building Services Engineers and Project Managers to give customers an unrivalled level of in house expertise for Chilled Beam and Multiservice Chilled Beam (MSCB) technologies. Frenger builds sound business relationships with clients and has won many accolades to this extent which has warranted Frenger a justifiable reputation for delivering complex projects on time, within budget and to specification, every time. All aspects of Frengers business are accredited to BS EN ISO9001 and are regularly audited by the British Standards Institution (BSI).

Due to Frenger's continuing success, the shareholders of its parent company, the FTF Group, provided Frenger in 2009 with one of their fully owned multi million GBP buildings for fit out as a new Technical Facility. The building is situated in the East Midlands, UK and holds a prominent position on the prestigious Pride Park corporate business centre. Frenger have equipped this building to support all technical aspects of the companies' world wide operations.

The new headquarters are fully space conditioned with various different types of Chilled Beam, MSCB and Chilled Ceiling technologies each controlled by a full building management system (BMS) which can demonstrate exactly how well each chilled system is functioning and their efficiencies. This building also houses Frenger's specialist manufacturing, state-of-the-art Climatic Test facilities, Photometric test laboratories along with lighting design and 2D & 3D CAD operations.

Frenger has earned an enviable reputation as a dependable supply partner capable of developing effective space conditioning solutions for the most complex of projects.



With Frenger's manufacturing capabilities, bespoke products can be delivered to suit different requirements, all backed up through Frenger's impressive array of performance testing facilities and after care technical support to give the client complete piece of mind the solution will work from the out set.

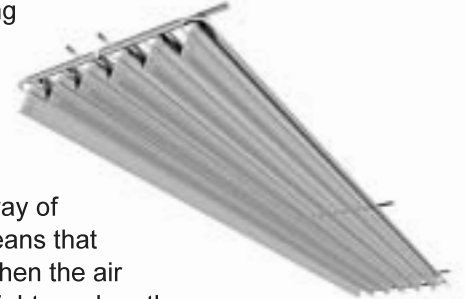
Passive Chilled Beams

- For more information & downloadable literature visit www.frenger.org.au

Frenger's passive chilled beams represent the very best in beam technology by employing convective "**Radiant**" cooling principles and are designed to deliver high cooling duties (up to 150 w/m²) with no noise and minimal air movement.



The efficiency of the cooling for the building can also be enhanced by the ability of the Frenger's "Radiant Beam" product to exchange energy by way of long-wave radiation as well as convection, this means that the beams can retain a high cooling effect even when the air temperature in the room is relatively low (e.g. at night or when the building is unoccupied). In this way large amounts of cold energy can be stored in the building structure during low load periods, and used to offset heat gains when the need arises.

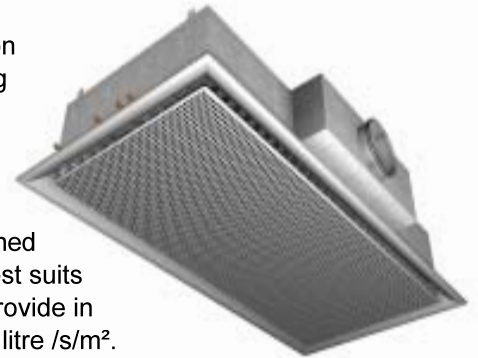
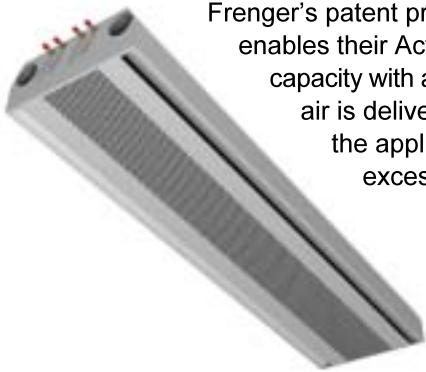


Active Chilled Beams

- For more information & downloadable literature visit www.frenger.org.au

Frenger manufactures and supplies a range of active chilled beams. Frenger draw upon high performance technologies and patented design features to deliver efficient cooling to commercial, educational and healthcare environments.

Frenger's patent protected battery and air chamber geometry enables their Active Beams to deliver unrivalled levels of cooling capacity with a given air volume and ensuring that the reconditioned air is delivered into the space in a controlled manner that best suits the application. The units are so efficient that they can provide in excess of 200w/m² with fresh air supply of as little as 1litre /s/m².

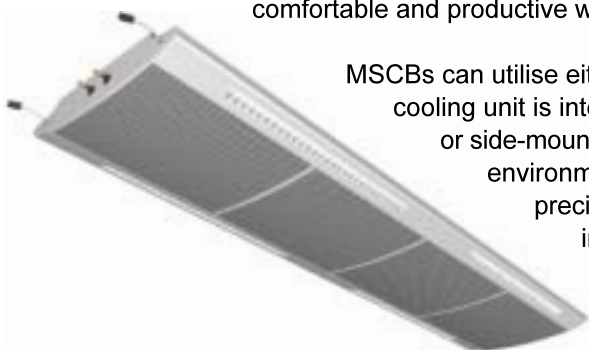


Multiservice Chilled Beams

- For more information & downloadable literature visit www.frenger.org.au

Frenger designs, manufactures and supplies "Multi Service Chilled Beams" (MSCBs). These units facilitate energy efficient water driven cooling, heating, fresh air supply, lighting and pretty much what ever else you want to integrate to provide flexible space conditioning that can be tailored in terms of appearance (to make an Architectural Feature) and the services provided. In this way MSCB's can help to create attractive, comfortable and productive working environments.

MSCBs can utilise either active or passive chilled beam technologies. The cooling unit is integrated into a perforated architectural casing with central or side-mounted lighting. All services are prefabricated off site in a controlled environment and factory tested for both mechanical and electrical disciplines; saving precious time on site as these MSCB units are delivered for simple "Plug and Play" installation.



Testing Facility

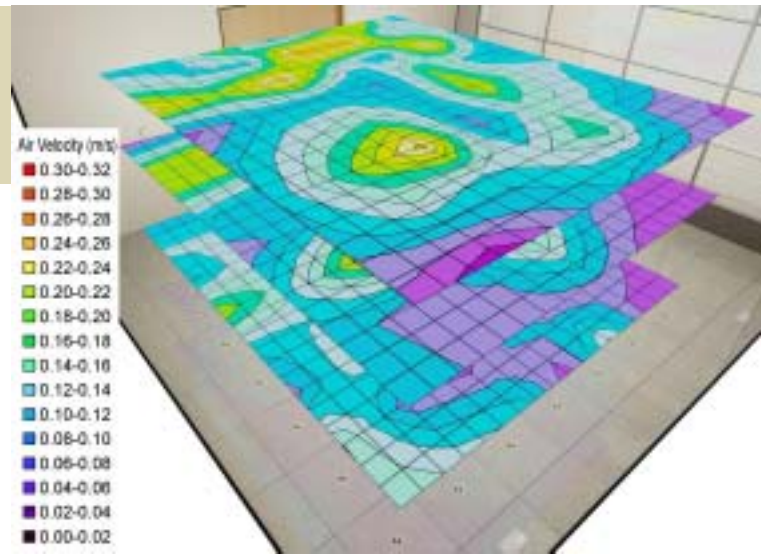
The 3 number state-of-the-art Climatic Testing Laboratories at Frenger's technical centre have internal dimensions of 6.3 x 5.7 x 3.3 m high and each includes a thermal wall so that both core and perimeter zones can be modelled.

The Frenger facilities combine the most advanced and accurate measuring equipment, skilled technical personnel with over 10 years experience in project specific testing and in house 3D visualization software to enable test results to be analysed and presented in an easily understood 3D graphical format.

Project specific mock-up testing is a valuable tool which allows the Client to fully assess the proposed system and determines the resulting indoor quality and comfort conditions; the physical modelling is achieved by installing a full scale representation of a building zone complete with internal & external heat gains (Lighting, Small Power, Occupancy & Solar Gains).

The installed mock-up enables the client to verify the following:

- product performance under project specific conditions
- spatial air temperature distribution
- spatial air velocities
- experience thermal comfort
- project specific aesthetics
- experience lighting levels (where relevant)
- investigate the specific design and allow the system to be enhanced.



The project-specific installation and test is normally conducted to verify:

- Product capacity under design conditions
- Comfort levels - air temperature distribution
 - thermal stratification
 - draft risk
 - radiant temperature analysis
- Smoke test video illustrating air movement

Photometric Labs

Frenger's latest addition to its new purpose built Technical Centre includes Photometric testing capabilities, lighting design and manufacture. The new Photometric testing laboratories and manufacturing department compliments Frenger's already impressive array of in-house project specific testing and manufacturing facilities.

The new lighting facility includes two separate photometric testing studios; the 'Goniphotometer Room' is a 9.8m (L) x 3.35m (W) x 2.9m (H) sealed blacked-out room which is used for plotting luminaire intensity distribution (the "Polar Curve" or otherwise know as a "Photometric Data"). While the 'Integrator Room' is a 3.4m (L) x 2.4m (W) x 2.4m (H) studio finished in a special white paint used to measure the LOR ("Light Output Ratio") of the luminaire. Calibrated traceable light sources are used for absolute testing.

Both the testing and manufacturing facilities house state-of-the-art photometric equipment with a dedicated 'Lighting Team' consisting of designers and lighting engineers.



Project References

Frenger designed, supplied and installed the World's first chilled ceiling system in 1962; the 175,000 square meter, 27 stories high, Shell Oil headquarters, situated on the river Thames in London. This was revolutionary at its time as this Frenger Chilled Ceiling used the River Thames water to cool the building down by pumping in cool water from upstream to a secondary heat exchanger which in turn cooled (took heat out of the building by "Radiant" absorption) the building down, then depositing the warmer return water from the secondary heat exchanger downstream. This installation is still operating after nearly 50 years and is a testament to the integrity of the product and to Frenger's design capabilities.

Frenger also supplied Australia's First ever 5 Star Energy Rated project in 2003 ("**The Bond**" Sydney) which was Australia's first ever "**Radiant**" Chilled Beam Ceiling. Since then Frenger has successfully supplied tens of thousands of their chilled beam technology to some of Australia's most iconic projects. Below is a selection of some of the projects which have benefited through the use of Frenger's chilled beam technology to achieve 5 Star and now even 6 Star energy ratings for the buildings :-

Darling Walk, Sydney - 2011

7 Park View, Sydney - 2011

ANU Fenner House, Canberra - 2011

Google Head Office, Sydney - 2010

123 Albert Street, Brisbane - 2010

500 Collins Street, Melbourne - 2010

Sudima Hotel, Auckland - 2010

Royal Hobart Hospital, Tasmania - 2010

RMIT 9, Melbourne - 2010

CIT, Canberra - 2010

1 Shelly Street, Sydney - 2009

South Australia Police, Adelaide - 2009

Kingston Aged Care, Melbourne - 2009

MCEM, Melbourne - 2009

Warrnambool Hospital, Victoria - 2009

115 Batman Street, Melbourne - 2009

Transport House, Sydney - 2008

Edmund Barton Building, Canberra - 2009

Sydney Water House, Sydney - 2008

Wesley House, Brisbane - 2008

University of Sydney - 2007

413 George Street, Sydney - 2007

Sydney Olympic Park, Sydney - 2007

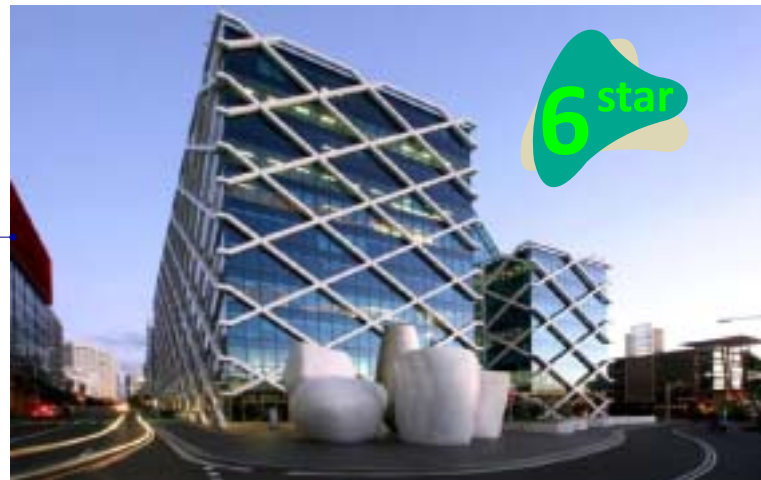
London Circuit, Canberra - 2006

Parramatta Justice Precinct - 2006

500 Collins Street, Melbourne - 2005

City Central Tower, Adelaide - 2005

The Bond, Sydney - 2003



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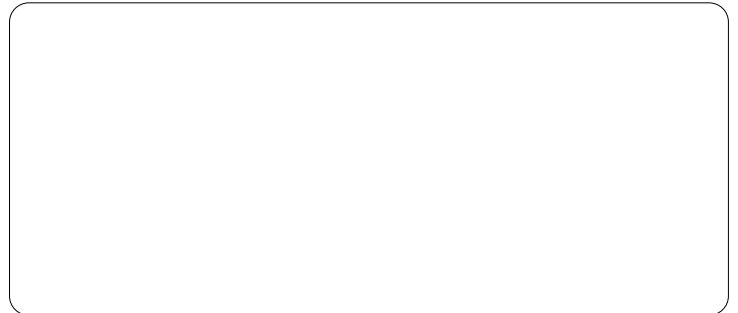


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Local Agent



World-renowned specialist manufacturer of space conditioning products



Frenger Systems Limited is an **FTF Group** Company