

PRODUCT MATRIX

CHILLED BEAMS

This month's Product Matrix focuses on chilled beams, looking at the different types available, the way they operate and products available from chilled beam manufacturers. The matrix documents products from a range of manufacturers but it has not been possible to include all manufacturers whose products are available in Britain

Frenger Active Chilled Beam

Modular chilled beam designed to fit within a false ceiling system to provide cooling, heating and ventilation. Patented air distribution control ensures optimum user comfort whilst providing energy efficient climate control in commercial, healthcare and educational facilities.

www.frenger.co.uk

Frenger Carat Passive Chilled Beam

Lightweight radiant/convective passive chilled beam provides high levels of cooling with 35% radiant and 65% convective air distribution resulting in low air velocities, aimed at high levels of user comfort with energy efficient cooling. Suitable for exposed mounting or installation behind perforated ceiling.

www.frenger.co.uk

Chilled beams should not be confused with chilled ceilings. According to the Chilled Beams and Ceilings Association, 'Chilled ceilings principally cool through the process of radiant exchange – a heat transfer between surfaces of differing temperatures. Chilled beams, on the other hand, provide cooling through convection, using finned elements through which water is passed at 15-18C.

Passive chilled beams use natural convection, while active beams provide cooling capacity using a primary air supply to induce convection over the elements. This primary air is then supplied to the room through diffusers built into the beam. Chilled beams can be installed flush with most false ceilings or fully exposed. More recently there has evolved a third type, the multiservice chilled beam, which combines cooling, heating or both with a range of other services, including lighting, sprinklers and smoke detectors.

The principle at work in passive chilled beams is that warm air settling at ceiling level comes in contact with the cool surfaces of the heat exchanger and loses its energy, thus reducing its temperature, increasing its density

and causing it to fall. This heat exchanging process forms a natural current around the coils, drawing warm air into its path and cooling the air below the passive beam.

The main features common to active and passive chilled beam systems are:

- They use water to provide cooling
- They use a large surface cooling area in a compact space
- They are energy efficient, with low operating temperatures
- They are compatible with ground-sourcing and free cooling technologies
- Off-site prefabrication, testing and commissioning are available
- Their lack of moving parts reduces maintenance costs.

'A chilled beam's energy efficiency comes from its ability to recirculate air within a space, since only sufficient fresh air is provided to meet occupancy requirements,' says David Leatherbarrow, non-executive director of SAS International. 'Chilled beams use a higher chilled water temperature of between 14°C to 17°C and high chilled water temperatures provide the option of using ground water for cooling for much of the year.'

Manufacturer	steel with polyester powder coated finish
Frenger	
Cooling capacity	Dimensions
Up to 200 W/m ²	Nominally 600mm wide, lengths from 1.2m to 3.6m as single section,
Heating capacity	100mm increments
Up to 100 W/m ²	Weight 21kg/m
Fresh air volume	
Minimum typically 1.2 l/s/m ² , maximum 5 l/s/m ²	
Construction and finishes	Pressed



Manufacturer	580mm, 710mm, 840mm. Lengths: 1.2m up to 6.0m in 100mm increments
Frenger	
Cooling capacity	Weight 5kg/m
Up to 150 W/m ²	Accessories Can be supplied with integral controls
Construction and finishes	
Cold rolled copper tube encapsulated within twin aluminium heat absorbing sheets	
Dimensions	Widths: 310mm, 440mm,



Frenger Multi-service Active Chilled Beam

Architecturally designed active or passive chilled beams suitable for all building needs. Made using extruded aluminium sections, the shape of the unit can be tailored for individual projects whilst providing energy efficient climate control within a bespoke casing.

www.frenger.co.uk

Manufacturer Frenger
Cooling capacity Up to 200 W/m²
Heating capacity Up to 100 W/m²
Fresh air volume Minimum typically 1.2 l/s/m², maximum up to 5 l/s/m²
Construction and finishes Extruded aluminium profiles
Dimensions Nominally 900mm wide, lengths from 1.2m to 3.6m as single section
Weight 45kg/m of product



Halton CDC Active Chilled Beams

These beams are designed to be installed flush with suspended ceilings. Air enters the beam through a series of diffusers and flows through a heat exchanger where it is either cooled or heated to provide an ambient climate. The air jet is directed along the ceiling surface and is diffused around the room.

www.halton.co.uk

Manufacturer Halton
Cooling capacity 250 - 450 W/m²
Heating capacity 150 - 250 W/m²
Fresh air volume: 5 - 12 l/s/m²
Construction and finishes As Halton CPA Passive Chilled Beam
Dimensions 1,000 - 4,800mm (one piece)
Weight 14 - 16kg m² (incl. water)

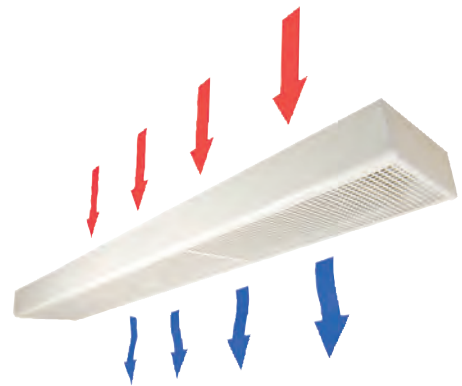


Halton CPA Passive Chilled Beams

The beam operates through natural convection, taking heat from the surrounding area and replacing it with a cooling airflow. Convective airflow varies according to the temperature of the room and is regulated by a flow of cool water through the beam heat exchanger.

www.halton.co.uk

Manufacturer Halton
Cooling capacity 150 - 350 W/m²
Construction and finishes Front, side and end panels: polyester powder coated galvanised steel. Cable trays, supply air plenum and coil fins: aluminium. Coil pipes: copper
Weight 10 - 18kg/m (including water)
Output/capacity 80 - 500 W/m²
Standard length 1 - 5m in 100mm increments
Width 315, 465, 615mm
Casing height 130mm

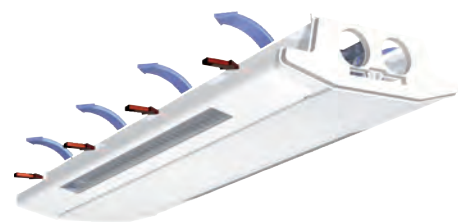


Halton CBQ Active Multi-Service Chilled Beam

The beams offer a more effective use of the room by allowing higher spaces without suspended ceilings. They are designed for exposed installation, with the primary air supply diffused into the room through nozzles and supply slots on the top of the beam.

www.halton.co.uk

Manufacturer Halton
Construction and finishes As Halton CPA Passive Chilled Beam
Dimensions 1,000 - 4,200mm (single module), multiple modules to suit building layout
Weight Multi-service Passive 20-25kg/m (incl. water). Multi-service Active 30-35kg/m (incl. water). Both dependent on accessories
Features Reduced installation lead time at site (ready to install units)



SAS Active Chilled Beams

Introduce fresh air into a room through a series of high velocity nozzles, which use air and water to deliver cooling. The option of using directional vanes within linear slots improve comfort further. These are available as units mounted flush to the ceiling or exposed in bespoke casing designs.

www.sasint.co.uk

Manufacturer SAS International
Cooling capacity Typically 500W/m up to 650 W/m, equating to 200 W/m² (at 3m centres)
Dimensions Grid ceiling units typically 300mm, 450mm or, 600mm wide, 230mm high, in 1.2m-3m lengths. Exposed units range from 800mm wide linear units to 2m wide Integrated Service Modules, typically 350mm high in 1.2m to 4.5m module lengths



SAS Passive Chilled Beams

Ceiling mounted heat exchangers driven by natural convection, comprising an encased copper tube and aluminium finned heat exchanger. Cooled by water at temperatures one degree above maximum dew point, the units can be built behind perforated metal ceilings or exposed in metal casing.

www.sasint.co.uk

Manufacturer SAS International
Cooling capacity At maximum velocity of 0.25 m/s, typically 300 w/m of coil equating to 100 W/m² with beams at 3m centres. Can have outputs above 500 w/m
Construction and finishes Heat exchanger available in natural finish or black
Dimensions Typically 260mm – 660mm wide, 200mm- 300mm high, in lengths up to 4.5m



SAS Integrated Service Module

The beams are able to accommodate ventilation, heating, cooling, lighting, fire detection, lighting control, acoustic, sprinkler and various other building services within the unit. Generally suspended from soffit, they can remain exposed to make use of additional cooling from thermal mass of the structure.

Manufacturer SAS International
Cooling capacity 150 - 200W/m²
Construction and finishes Natural finish copper and aluminium heat exchangers, powder coated steel casings
Dimensions Designed according to specification
Weight Designed according to specification
Accessories Building services such as lighting, fire alarms, lighting control and detection, acoustic control and sprinklers



Trox TROX DID 600

Intended for multi service chilled beam designs. The engines are complemented by various architectural casings, designs and services, including lights, sprinklers, PIR sensors, smoke detectors and speakers. These are bespoke products where design tends be subject to project specific requirements.

www.troxuk.co.uk

Manufacturer Trox UK
Cooling capacity 500 W/m in typical conditions, requiring 2.3 l/s/m² (1.3 l/s/m² for top discharge engine)
Heating capacity Around 750 W/m
Construction and finishes Casing mainly folded sheet steel, with aluminium extrusions for discharge slots
Weight 30kg/m (dry)



TROX UK

TROX Top Discharge MSCB

Primary air induction engines absorb heat energy via the heat exchanger coil housed in an architectural casing. The design of the beam is subject to architectural requirements but they have been specifically developed to achieve high levels of cooling while limiting the amount of fresh air required. Further cooling occurs along exposed soffit.

www.troxuk.co.uk

Manufacturer Trox UK
Cooling capacity 500 W/m in typical conditions, typically requiring 2.3 l/s/m² (1.3 l/s/m² for top discharge engine)
Heating capacity Around 750 W/m
Construction and finishes Casing mainly folded sheet steel, with aluminium extrusions for discharge slots
Weight 30kg/m



TROX UK

Trox TROX DID 632

This is a high capacity unit like Top Discharge (above), but designed as a commodity, tile replacement type unit for non-multi service applications. The unit is based on a nozzle configuration system and can operate as a conventional DID 600-type unit or as a high induction unit like the Top Discharge.

www.troxuk.co.uk

Manufacturer Trox UK
Cooling capacity Up to 2.5 kW for 3m length
Fresh air volume Up to 70 l/s of fresh air given the 3m active length for the biggest unit, without causing high velocities or discomfort on typically installed height and centres for active chilled beams
Weight 15kg/m



TROX UK

Trox Passive

The typical cooling output is a function of the comfort criteria and the type of installation. This TCB unit can be recessed or exposed but the exposed design is usually the bespoke MSCB. No air is supplied through the beam, so ventilation rates are not applicable.

www.troxuk.co.uk

Manufacturer Trox UK
Cooling capacity In the UK by adhering to general practise for space comfort conditions, it is possible to achieve up to 100 W/m² sensible cooling
Construction and finishes Galvanised steel casing and perforated metal facing, copper cooling coil tubes Standard surface finish for units without frames is black, standard surface finish of units with frames white powder coating



TROX UK

Waterloo ABM Series Active Chilled Beams

Compact ceiling or surface mounted unit for heating and cooling. Primary air is sent through nozzles, with secondary room air inducted through the heat exchanger, which is then supplied with cold or hot water, for chilling, or warming.

www.waterloo.co.uk

Manufacturer Waterloo Air Products
Air cooling 186-411W subject to size
Water cooling 460-751W subject to size
Air flow rate 19.4-41.7 l/s subject to size
Construction and finishes Zintec plenum box, copper/aluminium heat exchanger
Dimensions ABM 300 1200mm up to 3000mm, widths from 300 to 600mm
Weight 14-37kg subject to size

