A VIABLE ALTERNATIVE TO CHILLED BEAMS

New

THERMABEAM
RADIANT CONDITIONING BEAMS

THERMASAIL
RADIANT CONDITIONING SAILS

COOLING & HEATING INNOVATION WITH STYLE
S & P Coil Products Limited is a UK based specialist manufacturer and supplier of heating and cooling equipment to the public and private sector in the UK.

We have an extensive range of products to meet the needs of our customers including: *Ultraviolet Object & Air Sterilisation*, *Radiant Panels*, *Radiant Conditioning Sails*, *Radiant Conditioning Beams*, *Fan Convectors*, *Trench Heating*, *Heating/Cooling Coils* and *Heat Pipes*.

Our task is straightforward; we improve the comfort of indoor environments for those who live and work in them, whilst ensuring that our expert team is on hand to guide you through the process of specifying and acquiring your bespoke solution. The result is a range of products that are economical to run, robust and aesthetic – with all the sales and technical support that you need.

It’s a winning combination, and after more than 30 years in business, we’ve built a worldwide network of satisfied customers.

**KEY FACTS ABOUT SPC**

- Registered provider of approved CIBSE accredited CPD’s
- Major supplier to local government and commercial sectors
- Free self-selection software packages
- Regional Sales and Technical Support team
- Free site check / survey
- ISO 9001 and Investors in people

**THERMABEAM** and **THERMASAIL** are two of the most innovative, unique, and highly efficient heating and cooling emitters available. Essentially the **THERMABEAM** is a chilled beam added to the **THERMASAIL** platform, retaining the large radiant surface areas, and therefore the energy saving of higher resultant temperature in heating and lower resultant temperature in cooling mode.
S & P Coil Products Limited reserves the right to amend specification without notice, whilst pursuing a policy of continual improvements in performance and design.
THERMABEAM RADIANT CONDITIONING BEAMS
INTRODUCTION AND TECHNOLOGY

THERMABEAM: - An innovative low energy solution for cooling and heating.

THERMABEAM uses the same concept of highly efficient radiant cooling and heating as the Thermasail, but has enhanced cooling capacity, due to an additional cooling coil positioned centrally in the sail.

This gives a unique combination of 3 products in 1
1. High performance cooling beam using higher water temperatures of 16/18 °C
2. Energy efficient heating sail using lower water temperatures of 40 °C
3. Acoustic sound raft

The result is what may be technically termed a “passive radiant chilled beam”. The addition of a coil produces a strong buoyancy driven flow of cool air downwards through the coil fins adding to the radiant cooling effect of the sail. The large radiant surface area is retained ensuring a lower resultant temperature and therefore an energy saving compared to a conventional passive chilled beam.

Acoustic perforations and lining provide noise attenuation, and lights etc may also be integrated.

Cooling

When chilled water is passed through the coils, the large chilled lower surface cools the air against it. It also absorbs radiant gains from the room, lowering the resultant temperature. The air above the panel is also cooled, and either convects downward around the panel edges, or is drawn through the central cooling coil, where it’s density ensures that it descends into the room.

Heating

In heating mode the central coil is normally switched off so the unit works in the same way as a radiant panel, but with a higher convective output due to the uninsulated top surface. As the THERMABEAM is normally sized for cooling only low water temperatures will be required to satisfy heat loads.

With high water temperatures for cooling, and low water temperatures for heating, it allows for the highest efficiencies on reversible heat pumps, or boilers and chillers. Added to lower resultant temperatures in cooling and higher resultant temperatures in heating, THERMABEAM is one of the most efficient cooling and heating emitters available.
THERMABEAM RADIANT CONDITIONING BEAMS

BENEFITS & ADVANTAGES

CEILING MOUNTED
Frees up floor and wall space

AESTHETIC DESIGN
Sail / floating ceiling concept, becomes an architectural ceiling finish

SLIM PROFILE
Just 175mm depth, ensuring maximum use of ceiling height.

LIGHTWEIGHT
Easy and safe to carry, lift and install.

ACOUSTICS
Acoustic perforations and lining. Usually meets room acoustic requirements.

OPTIONAL LIGHTING
Can be supplied with energy efficient LED downlighting, or can be used as a platform for a wide range of lighting systems

SILENT OPERATION
Ideal for quiet rooms, meeting rooms, conference facilities etc.

NO MOVING PARTS
Very low maintenance. Long life expectancy.

EASY TO INSTALL
Lightweight with simple hydraulic connections. Also allows for simple relocation with changing open office layouts.

NO DRAUGHTS
Very low velocity passive air movements. Ensures room comfort.

LOW INERTIA
Rapid heating or cooling response means that the THERMABEAM is very controllable, which saves energy and makes them ideal for zoning controls.

100% RECYCLABLE
Constructed from aluminium and copper, both of which are fully recyclable.

COOLING AND HEATING
Highly efficient Radiant cooling and heating from one emitter. The large radiant surface provides radiant cooling in conjunction with the convective cooling provided by the inbuilt coil. This reduces the resultant temperature and saves at least 10% of the energy used compared with an equivalent traditional passive chilled beam which relies solely on convective cooling. In heating mode the coil is usually switched off. Radiant heating with THERMABEAM saves about 8% of the energy used compared to conventional air heating systems.

IDEAL WATER TEMPERATURES
In cooling the THERMABEAM stays above dewpoint, so the water temperatures are in the 14 - 18 ºC range. This means that the highest efficiencies are obtained from reversible heat pumps or chillers. THERMABEAMs are normally sized for cooling loads, which means that there is a large radiant surface area, and low heating temperatures, typically between 35 and 45 ºC are used. This is ideal for very high efficiencies on heat pumps and condensing boilers.

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THERMABEAM RADIANT CONDITIONING BEAMS

COOLING WITH THERMABEAM

The maximum output of SPC’s THERMABEAM is governed by dew point. The water temperature must be carefully controlled to ensure that condensation does not occur. This means that in the UK the difference between the water flow temperature and the room temperature is likely to be about 8 or 9 degrees.

The cooling load is calculated in the normal way, except that there are no latent loads because the flow temperature is kept above dew point.

As the THERMABEAM utilises a proportion of radiant cooling, the resultant temperature will be around 1 °C lower than conventional fan coils or chilled beam systems. This results in a corresponding 10% reduction in cooling load and energy consumption.

Divide the cooling load by the THERMABEAM cooling output given below to find the length of THERMABEAM required. A standard THERMABEAM is 1200mm x 1800mm long.

Test Certification by WSP Lab

* Excess temperature is room air temperature minus mean chilled water temperature

Typical chilled water temperature are between 16 to 18 °C
THERMABEAM RADIANT CONDITIONING BEAMS

HEATING WITH THERMABEAM

Heat loads are calculated in the normal way, however with radiant heating using THERMABEAMS, comfort temperature is achieved with an air temperature 1 °C lower than conventional heating which significantly reduces the heat load.

Divide the heat load by the output of the THERMABEAM given in the graph below to give the area of THERMABEAM required for heating.

The surface area of the THERMABEAM is normally governed by the cooling requirement, so, given the area of THERMABEAM required for cooling the graph below can be used to calculate the mean water temperature required for heating. This will be low, increasing the efficiency of the boiler or heat pump.

Thermabeam is ideally suited to low grade hot water temperatures, eg 40 °C.
THERMABEAM RADIANT CONDITIONING BEAMS

OPTIONS

STANDARD THERMABEAM
The Standard SPC THERMABEAM is a 1200mm wide x 1800mm long unit finished in 20% gloss RAL 9010 white with acoustic perforations and acoustic lining. Standard units can be linked end to end to form longer Beams.
*Additional widths are available.

All the following can be added as options to suit a range of applications.

COLOUR
Any RAL colour can be provided to match any décor, or to form a special feature.

ACOUSTICS
The standard THERMABEAM has acoustic perforations and lining. The acoustic performance is as per the data shown for Thermasails. The acoustic perforations and lining can be omitted where requested.

HANGING BRACKETS
THERMABEAM is supplied with the appropriate number and type of hanging brackets to suit the suspension method.

COILS AND CONNECTIONS
There are two elements to the coils on THERMABEAM. On the panel there are two 12mm copper serpentines which are machined from a single piece copper tube and terminate in 12mm copper tails. The central coil block is formed from copper tubes expanded into aluminium fins. The connections are usually made with the supplied push fit flexible connectors. Where the THERMABEAM is used for heating, control valves can be supplied to switch off the central coil block when in heating mode. Alternative connections can be allowed for if requested.

MULTI SERVICE
There is the option of having 6 high efficiency LED downlighters built into the standard unit. Other lighting systems, and service systems can be integrated into the units as required.
THERMABEAM RADIANT CONDITIONING BEAMS

STANDARD ENGINEERING SPECIFICATION

THERMABEAM Radiant Conditioning Beams shall be supplied by S & P Coil Products Limited, SPC House, Evington Valley Road, Leicester. THERMABEAM are suitable for all applications as described in the literature. The quantities and model references shall be as indicated in the schedule, with the constructional features complying to the under mentioned specification.

THERMABEAM RADIANT CONDITIONING BEAMS

THERMABEAM shall comprise a rigid composite aluminium high thermal performance sandwich panel, 1200mm wide x 1800 long panel with 12mm O/D copper tubes close fitted into aluminium extrusions which are riveted to the upper surface of the panel. THERMABEAM are simply joined end to end to form longer beams. There shall be aluminium fin block with copper tubes in the centre of the THERMABEAM. Other sizes of THERMABEAM are available on request.

COIL TEST PRESSURE

Each Coil is factory tested with pressurised air, under water up to 10 bar.

COIL WORKING PRESSURE

All THERMABEAM are to be suitable for a maximum working pressure of 7 bar.

THERMABEAM SURFACE FINISH

The THERMABEAM visible surface shall be 20% gloss finish to white RAL 9010. The visible surface shall be perforated, with acoustic lining on the top surface for acoustic sound performance. The visible surface shall be protected by a removable plastic film. Other RAL colours and unperforated finishes are available to order.

HANGING BRACKETS

The THERMABEAM shall be manufactured with fitted hanging brackets suitable for hanging wires or threaded rods as specified.

CONNECTIONS

The THERMABEAM shall be provided with 12mm copper tube tails to the coils for connection to the flow and return pipework. The connections should be made with high quality push fit flexible connectors as supplied by SPC. Additional cut off control of the central coil for heating mode shall be with high quality valves as supplied by SPC.

PACKAGING

Each unit shall be dispatched in a purpose made carton, clearly marked with the model reference and instructions for the specification.

CE MARKING

The THERMABEAM shall comply with all relevant EU directives currently in force.
TYPICAL INSTALLATION

THERMABEAM RADIANT CONDITIONING BEAMS

TYPICAL INSTALLATION
THERMASAIL RADIANT CONDITIONING SAILS

S & P Coil Products Limited reserves the right to amend specification without notice, whilst pursuing a policy of continual improvements in performance and design.
THERMASAILS, a unique concept for Cooling and Heating

THERMASAIL Radiant Conditioning Systems fill the gap between chilled beams and chilled ceilings, opening up an entirely new range of architectural and design possibilities, whilst combining energy efficiency and ease of installation.

THERMASAIL Radiant Conditioning Sails are unobtrusive, and yet provide an effective and energy efficient performance for both cooling and heating applications. THERMASAILS offer a uniquely flexible design providing both architectural and technical appeal in a wide variety of internal spaces, with sails sized, shaped and coloured to suit any internal concept.

THERMASAILS are manufactured from a patented composite aluminium sheet which ensures strength, rigidity and high thermal conductivity, whilst at the same time being light and easy to install. The copper coil is fixed into aluminium extrusions which are in turn mechanically fixed to the topside of the sail, ensuring excellent and reliable heat transfer. The simplicity of the THERMASAIL structure enables the high cooling performance.

For applications where noise control is an issue, the SPC radiant conditioning THERMASAILS can be factory perforated and provided with an acoustic lining to achieve significant noise attenuation in the room.

SPC are able to provide a design service to assist with the design and selection of radiant conditioning THERMASAIL systems.

THERMASAILS are part of a range of specialist heating and cooling products which also includes Thermatile plus radiant heating panels and THERMABEAM Radiant Conditioning Beams.
THERMASAIL RADIANT CONDITIONING SAILS

TECHNOLOGY

At the heart of the THERMASAIL system is a unique, patented composite aluminium sheet panel. Structurally rigid, the panel is used elsewhere in the automotive and marine construction industries, because of its high strength and low weight characteristics. It is a building material in its own right.

The good thermal conductivity of the aluminium panel ensures high efficiency for SPC radiant heating and cooling products.

BASIC OPERATION

Chilled or hot water is introduced into the panel via copper pipes which are mechanically fixed into aluminium extrusions. The extrusions are then bonded and riveted to the upper surface of the panel ensuring excellent and reliable heat transfer.

Cooling

When chilled water is passed through the coil, the large chilled lower surface cools the air against it. It also absorbs radiant gains from the room. The air above the panel is also cooled, and this cooled air convects around the edges of the sail. The unique strength of the panel eliminates the need for any structural sidewall allowing unrestricted cooled air movement and high cooling performance.

Heating

When warm water is passed through the coil, the lower surface of the sail operates as an efficient radiant heater.

The air above the panel is also warmed, and convects into the room space. With a large heated area, low water temperatures can be used which maximises boiler efficiency. The system has a low inertia, reacting very rapidly to heating and cooling demands, ensuring minimum energy consumption.
THERMASAIL RADIANT CONDITIONING SAILS

BENEFITS AND ADVANTAGES

SURFACE FINISH
Attractive, smooth surface finish to almost any size, shape and colour.

LIGHTWEIGHT
Lightweight, easy and safe to carry, lift and install.

SLIM PROFILE
Slim profile, just 25mm, ensuring maximum use of ceiling height.

OPTIONAL LIGHTING
Easy to integrate lighting and other services into the sails.

EFFICIENT
Energy efficient heating and cooling from the same sail system.

LOW INERTIA
Low system inertia, giving excellent controllability and low energy consumption.

CEILING MOUNTED
Ceiling mounted giving unrestricted use of floor and wall space.

ADAPTABLE
Easy to adapt to changes in space usage.

COOLING
- Large chilled THERMASAIL surface utilises radiant cooling effect ensuring energy efficiency.
- All sensible cooling with no energy wasted condensing water.
- Relatively high cooling water temp (16 - 18 °C) allows for efficient chiller operation.
- Also suitable for groundwater source cooling.
- Rigid THERMASAIL panel allows for convective cooling with diffuse dispersal of chilled air; ensuring high cooling output with maximum comfort conditions.

HEATING
- Large heated surface allows for low water temperatures and maximum boiler efficiency.
- Radiant heating effect increases energy efficiency and improves comfort.
- Coil options enable heating and cooling with 3 or 4 pipe systems. Separate heating and cooling coils can be fitted to the sails.
COOLING WITH THERMASAILS

The maximum output of SPC’s THERMASAILS is governed by dew point. The water temperature must be carefully controlled to ensure that condensation does not occur on the THERMASAIL. This means that in the UK the difference between the water flow temperature and the room temperature is likely to be about 8 or 9 °C.

The cooling load is calculated in the normal way, except that there are no latent loads because the flow temperature is kept above dew point.

Remember that because the thermasail utilises radiant cooling, the resultant temperature will be about 2 degrees lower than conventional fan coils or chilled beams, which are air cooling devices. This results in a corresponding 20% reduction in cooling load and energy consumption.

Divide the cooling load by the THERMASAIL cooling output given below to find the area of THERMASAIL required. This area is divided into suitable sail shapes and sizes, (e.g. 1.2m x 3 m sails).

The resultant THERMASAILS should be evenly distributed across the ceiling to provide uniformly comfortable conditions.

Services such as lighting, fire alarms, sprinklers etc, can be fitted to or through the THERMASAILS, so there is no need to compromise on systems layout.

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HEATING WITH THERMASAILS

Heat loads are calculated in the normal way, however with radiant heating using THERMASAILS comfort temperature is achieved with an air temperature 2 degrees lower than conventional heating, which significantly reduces the heat load.

Divide the heat load by the output of the THERMASAIL given in the graph below to give the area of THERMASAIL required for heating.

The surface area of THERMASAILS is likely to be governed by cooling requirements, so given an area of THERMASAIL for cooling, the graph below can be used for calculating the required mean water temperature, which will normally be relatively low; increasing boiler efficiency.

It is possible to put a separate coil on a THERMASAIL for heating.

**HEAT OUTPUT**

**Note:** - a THERMASAIL used for heating provides more heat output than an equivalent THERMATILE radiant panel as there is no upper insulation, which means there is additional convected heat output.

Heating THERMASAILS should be evenly spaced across a room to provide a comfortable even distribution of heat.
THERMASAIL RADIANT CONDITIONING SAILS

OPTIONS

There are a wide range of THERMASAIL options to suit any architectural scheme.

COLOUR

THERMASAILS are finished as standard with a 20% gloss RAL 9010 white. The sails are delivered with a plastic protective layer which should be peeled off after installing.

Any RAL colour can be provided on request to match decor or to form a special feature.

SIZE AND SHAPES

THERMASAILS are manufactured from composite aluminium panels which are up to 1250mm x 3600mm in size. Any shape or size panel can be cut from these sheets. Sails can be joined together to form larger shapes, though this may reduce performance.

ACOUSTIC PERFORATIONS

The THERMASAILS can be factory perforated. This provides excellent acoustic attenuation.

There are a number of perforation size and layout options, which not only gives a different finished appearance, but also varies the acoustic performance.

ACOUSTIC PERFORMANCE

Full details of the acoustic performance relative to specific perforation layouts are available on request.
The coil on a THERMASAIL is made to suit the application.

Coils will be 12mm copper tube which is held tightly in aluminium extrusions, which are in turn bonded and riveted to the top surface of the THERMASAIL. This ensures excellent heat conductivity and reliable performance.

The layout of the coil is also made to suit the application and details of flow rates and pressure drops will be provided at time of order.

If a separate heating and cooling coil is specified this too will be designed to suit the application.

If THERMASAILS are not installed horizontally, the coil must be aligned to ensure there are no possible air traps.

The coils are terminated with 12mm copper tube tails, corresponding to the coil pipe diameter.

Connections are normally made with high quality push fit flexible connectors, as supplied by SPC.

Connections between THERMASAILS in series should be horizontal to avoid air traps, and connections to the supply and return pipe work should be vertical to allow venting from the pipe work system.

**HANGING BRACKETS**

The THERMASAILS are fitted with the appropriate number and type of hanging brackets to suit the sail and the hanging method.
THERMASAIL RADIANT CONDITIONING SAILS
STANDARD ENGINEERING SPECIFICATION

THERMASAIL Radiant Conditioning Sails shall be supplied by S & P Coil Products Limited, SPC House, Evington Valley Road, Leicester. THERMASAILS are suitable for all applications as described in the literature. The quantities and model references shall be as indicated in the schedule, with the constructional features complying to the under mentioned specification.

THERMASAIL RADIANT CONDITIONING

THERMASAILS shall comprise of a rigid composite 6mm aluminium, high thermal performance sandwich panel, with 12mm O/D copper tube close fitted into aluminium extrusions which are bonded and riveted to the upper surface of the THERMASAIL. There shall be no strengthening structure other than the rigid composite aluminium panel.

COIL TEST PRESSURE

Each braised Coil is factory tested with pressurised air, under water up to 10 bar.

COIL WORKING PRESSURE

All THERMASAILS are to suitable for a maximum working pressure of 7 bar.

THERMASAIL RADIANT CONDITIONING SAIL SURFACE FINISH

The THERMASAIL surface is to be completely smooth with a painted 20% white gloss finish to RAL 9010. The top surface shall be primed only. Visible surface shall be protected by removable plastic film. Other RAL colours to special order.

HANGING BRACKETS

The THERMASAILS shall be manufactured with fitted hanging brackets suitable for hanging wires or threaded rod as specified.

CONNECTIONS

The THERMASAILS shall be provided with 12mm copper tube tails to the coil, according to the design specification, for connection to the flow and return pipe work. The connection should be made with high quality push fit flexible connectors as supplied by SPC to the correct diameter to fit the coil tails and the connecting pipe work. Headed panels have 15mm tails.

PACKAGING

Each tile shall be dispatched in a purpose-made carton, clearly marked with the model reference and instructions for the specification.

CE MARKING

The THERMASAIL shall complies with all relevant EU directives currently in force.

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THERMASAIL RADIANT CONDITIONING SAILS

EXAMPLES

THE LAKES, LECHLADE

OFFICE RECEPTION AREA

PRESTIGIOUS OFFICE

THE PEAK, LONDON

WATERHOUSE RESTAURANT, LONDON

BRADFORD COLLEGE
THERMASAIL RADIANT CONDITIONING SAILS

EXAMPLES

ROCKWOOL

ROCKWOOL

FUJITSO-SIEMENS

SSK

HUGO BOSS

CAPITELLUM

S & P Coil Products Limited reserves the right to amend specification without notice, whilst pursuing a policy of continual improvements in performance and design.
The Installation of a THERMASAIL or THERMABEAM is a simple process. Firstly threaded rods or hanging wires should be anchored to the soffit using suitable anchors.

1. **LIFT UP**
   - the sail with a lift truck or manually (weight of sails incl. copper tubes and attaching parts max. 8Kg/sqm)

2. **HANG**
   - the suspenders into the nuts of the threaded rods, or on hanging wires.

3. **ADJUST**
   - the fine adjustment in any direction is possible even after mounting the sail

4. **CONNECT**
   - flexible quick couplers can be plugged onto the sail and the supply. Lights can be fixed directly in or onto the sails.
S&P Coil Products Limited (SPC) has achieved full Building Information Modelling (BIM) compliance with SPC’s Active-BIM objects now available to load into your Revit model using a supplied type catalogue holding all the project specific information configured by SPC’s selection program at the design and quotation stage.

SPC offers Active BIM objects for Radiant Panels, Radiant Conditioning Sails, MINIB Trench Heaters, Belgravia Fan Convectors, Coil Heat Exchangers, Ultraviolet Air and Object Sterilisers and Heat Pipes, with various configurations and specifications included in the modelling.

BIM is a rich 3D experience that enables specifiers and contractors to plan and design buildings using digital simulations, rehearsing all the stages of the design and build process before construction starts.

The modelling can be shared between the various parties involved in the build which streamlines the process, increasing efficiency, saving money and reducing risks. For example, an engineer is able to use information sourced from the architect to prepare energy calculations.

BIM objects can be used at the modelling stage to determine the right specifications of components, the sizes required and, when it comes to such things as heating outputs best suited to the project. This information is then stored in the model and passed onto the facilities management team to help maintain the building during its lifecycle.

SPC’s Active BIM objects are detailed enough for architects, designers and contractors to experiment with various sizes and types of components to make sure they are exactly right before ordering. The data provided with the Active BIM objects also reduces the time spent inserting project specific data into the Revit model saving both time and money.

More detailed information and specifications can be found on the SPC website www.spcoils.co.uk/BIM