



Radiant Heating

Part of the Periwarm range

HCP



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HCP

HCP, a division of SAS International, has for the last 30 years specialised in convective and radiant heating solutions.

The HCP range of heating products offers an efficient, low maintenance and fully recyclable solution to your space heating requirements.

Our portfolio of heating products can be broken down into three broad segments, all of which can be customised to meet your specific needs:

- Trench heating
- Perimeter heating
- Radiant heating



RADIANT HEATING

Radiant heating products are an alternative space heating solution to traditional wall-mounted radiators, air-conditioning systems and underfloor heating.

Heat is radiated downwards, warming a space's occupants and surfaces, not the air. This can be compared to the increase in temperature felt when the sun comes out from behind a cloud.

Wall and floor space is freed up with the installation of ceiling mounted radiant heating panels, leading to an increase in the net usable floor area.

HCP systems operate without significant air movement, leading to

less air-borne particles, such as dust. Unlike air-conditioning systems, which are used to heat as well as cool, radiant heating panels have not been linked to outbreaks of diseases, such as Legionnaire's disease. A healthier option, radiant heating can also help to increase productivity by improving occupant comfort.

Radiant heating systems offer value and work using small quantities of water, facilitating rapid warm-up times and low energy consumption. Panels are also easy to clean with flat surfaces featuring no moving parts, resulting in low service and maintenance requirements, and whole life costs.



HOW RADIANT HEATING WORKS

Electromagnetic radiation increases the temperature of objects and people rather than the temperature of the air.

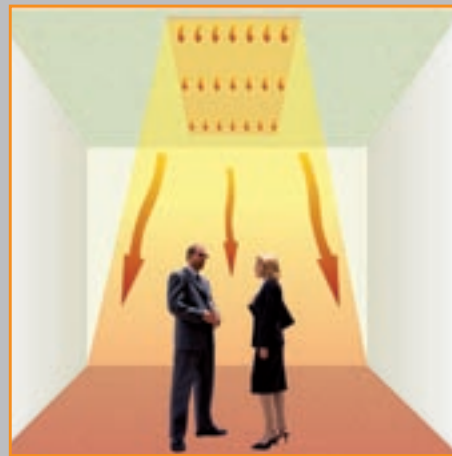
Radiation

The heat generated by radiant heating panels gently warms occupants and objects, rather than the air itself. Integration into a suspended ceiling or suspension from a soffit means radiant heating panels do not reduce the net floor space available to the occupier.

Radiant heating panels enjoy rapid heat-up times, ensuring their warming effects are felt quickly and directly by the room's occupants. Further energy efficiencies can be achieved with room zoning, resulting in only occupied areas being warmed.



Traditional convection heating



Radiant heating

Approximately one seventh of the amount of water used in a traditional radiator system is used in a radiant heating system, resulting in quicker heat up times and smaller plant demands. Demands on central plants and energy, are further reduced by the lower friction levels experienced by water as it passes through the pipe-work. The surface area that water passes over as it flows through a traditional radiator system is larger, creating greater drag and requiring higher water pressures.

Due to the inherent efficiencies of the system, spaces utilising radiant heating panels operate with an average room temperature of 2°C to 4°C lower than spaces using traditional convection heating methods, which saves energy without compromising thermal comfort levels.

ENVIRONMENTAL DEMANDS FOR RADIANT HEATING

With buildings accounting for 40% of the EU's energy requirements, improvements to this area offer the single greatest potential for energy and carbon saving. Legislation has changed to reflect energy and environmental concerns e.g. the European Performance of Buildings Directive (2003), and changes to Building Regulation – Part J in Scotland (2003) and Part L in England and Wales (2006).

Improving the energy performance of buildings and achieving a cut in carbon dioxide by 60% by 2050 is key, and industry professionals need to focus on how services perform at an integrated level. Those involved in the initial design or refurbishment of a building have to seriously consider the overall energy

efficiency of heating, cooling and ventilation systems.

Because of their low water content, low pressure requirements and low energy usage, HCP's radiant heating products can contribute to meeting these targets. Coupled with technologies such as ground sourcing and utilising area zoning, the energy efficiencies of radiant heating systems can be improved even further.

Radiant heating panels are durable with long life cycles and due to the lack of moving parts, require minimal maintenance. Panels are manufactured from aluminium and copper, have a residual value at the end of their life cycle and don't require disposal in land-fill sites.

SECTOR DEMANDS FOR RADIANT HEATING

Radiant Ceiling Tiles (RCTs) and Radiant Ceiling Modules (RCMs) are suitable for use in a wide variety of sectors, including:

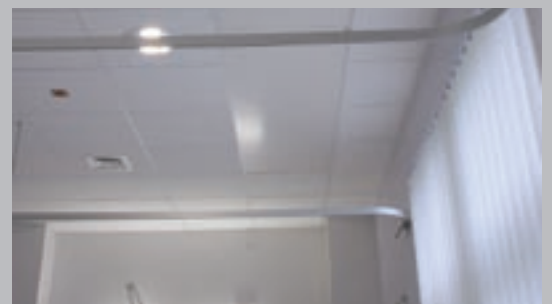
EDUCATION

Removing radiators from ground level creates valuable teaching space and reduces the risk of accidental burning. Radiant heating panels provide a high level of room comfort, are durable and robust, an ideal solution for both learning and working environments. Acoustic absorption pads can be incorporated in order to meet specific acoustic requirements e.g. Building Bulletin 93 (BB93).



HEALTHCARE

Longer runs of radiant heating panels are ideal for long corridors and hospital wards. They are also suitable for recovery and public environments; particularly when specified with an Anti-Bacterial (AB) coating as this inhibits bacterial growth such as E. coli and MRSA on the coating surface. Durable, flat and smooth faced, radiant heating panels can be easily cleaned in accordance with a specified cleaning regime.



COMMERCIAL

The monolithic appearance of radiant heating panels is popular in commercial offices. They increase the amount of usable floor space and fit within office planning grids, enabling future office and partitioning needs to be met. Panels are energy efficient, helping to meet building regulations and increasing occupant comfort, which can help to improve productivity and decrease absenteeism.



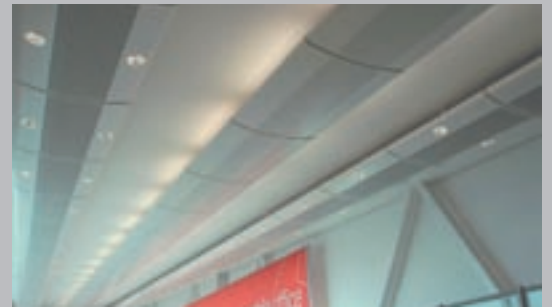
PUBLIC BUILDINGS

Low running costs, increased value for money, durability and long life cycles are key concerns for the public sector. Radiant heating panels are flexible, and suitable for a wide variety of public building types e.g. libraries, hospitals, offices and schools, and offer long term value and comfort for users.



TRANSPORT

Key considerations in the transport sector include durability, rapid warm-up times and the ability to increase efficiencies by system zoning. The lack of moving parts in radiant heating products means maintenance disruptions are kept to a minimum, which is another significant consideration in any busy transport building.



INDUSTRIAL

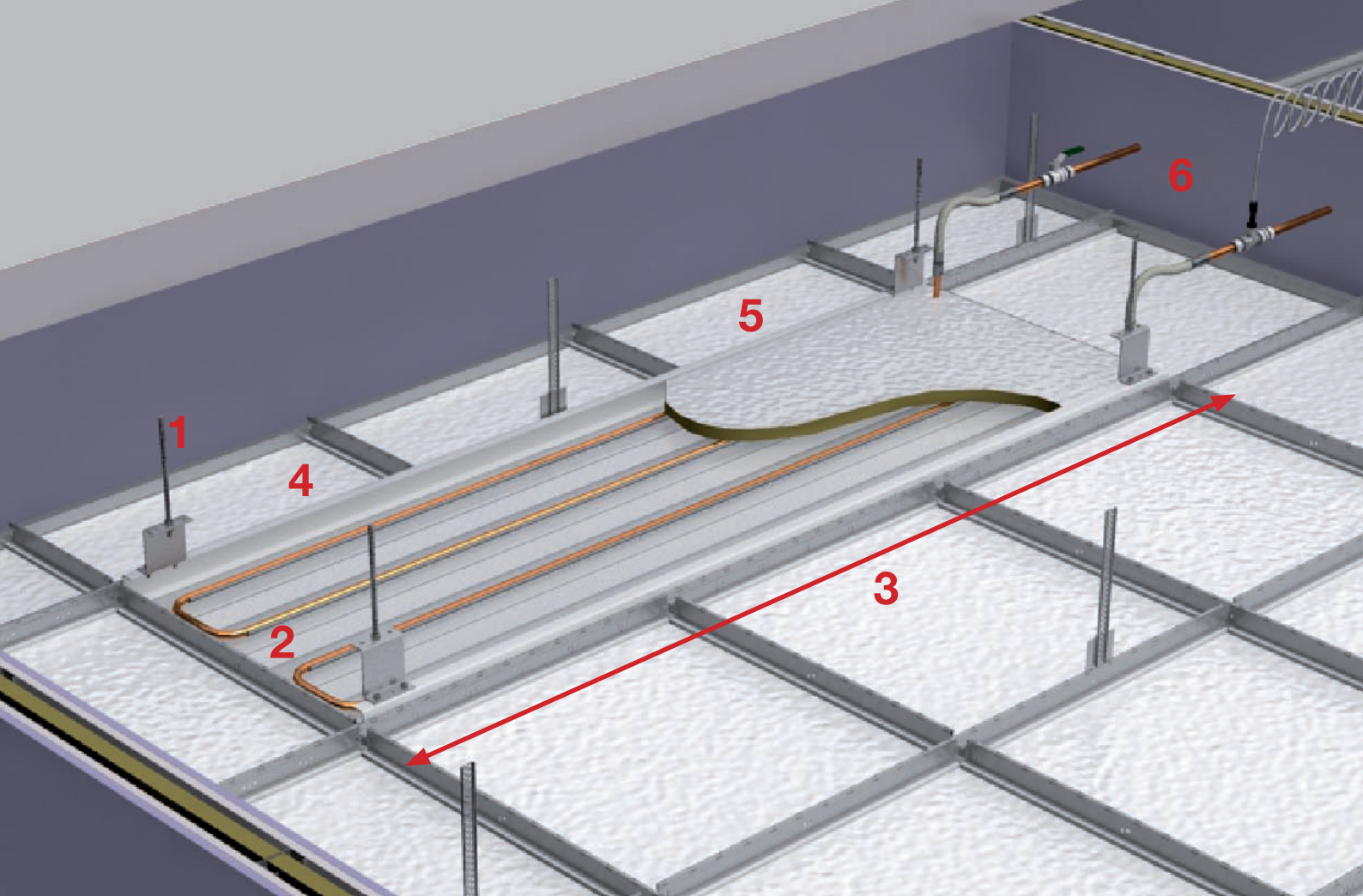
In warehouses and large buildings, radiant heating panels can be used effectively to increase working temperatures in a particular area, without heating the entire space. This results in efficient heating, reduced energy consumption and carbon emissions.



LEISURE

Sports and leisure venues, which may only be used sporadically, can quickly and efficiently heat their premises using radiant heating. Due to a lack of moving parts, radiant heating systems require minimal maintenance and their smooth surfaces enable easy cleaning, perfect for busy leisure facilities.



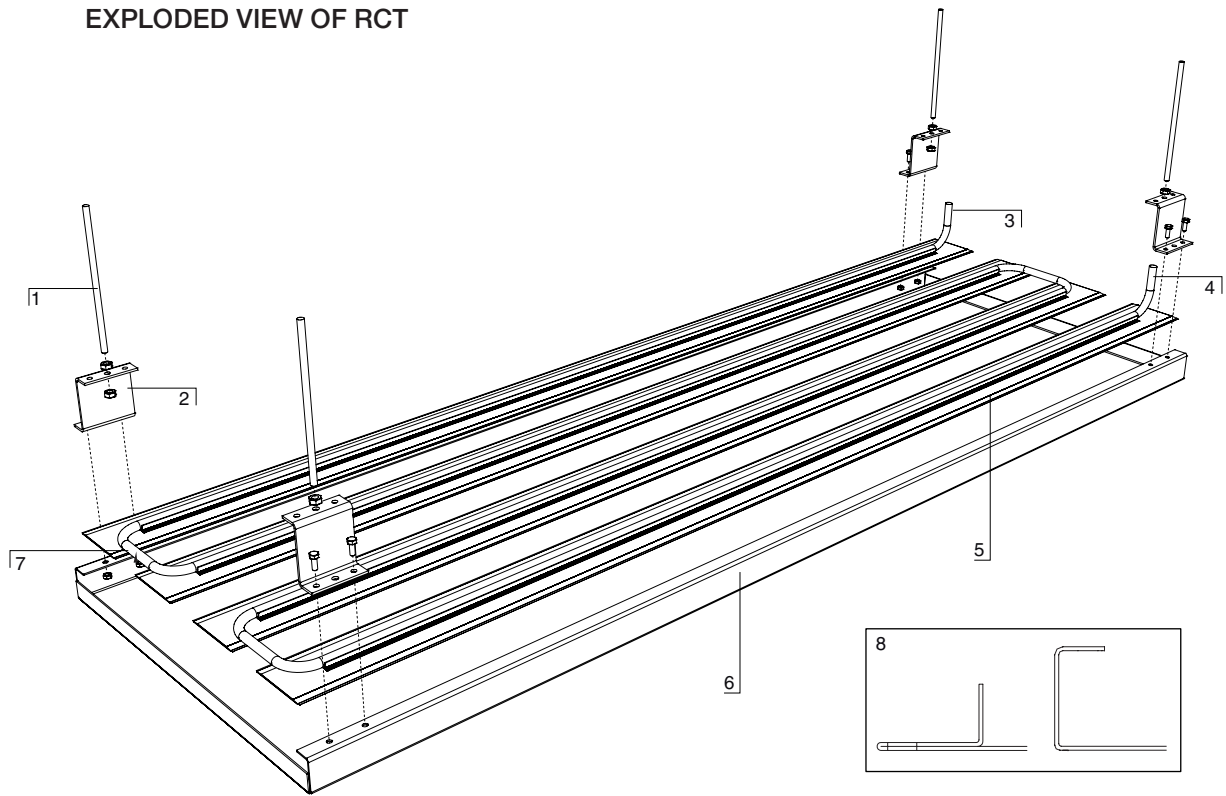


RADIANT CEILING TILE (RCT)

Individual RCTs are available in a variety of lengths and are best suited for use in defined spaces such as offices, operating theatres, laboratories and classrooms. The choice to use RCTs will depend on a number of factors, including the building's planning module, the window configuration and the location of the primary pipework. There are two different designs of flat RCTs available, details of which can be found on page 13.

- 1 RCTs can be surface mounted or freely suspended and are ideal for integrating within a suspended ceiling. RCTs can be positioned near windows to combat cooling effects.
- 2 RCTs contain a one-piece serpentine copper element bonded to the rear of an aluminium panel via aluminium pipe saddles. The panel design and manufacturing process ensures optimum thermal transfer between the metals.
- 3 RCTs are available in a range of sizes starting from 600mm in length. RCTs are available in widths ranging from 300mm to 1200mm.

EXPLODED VIEW OF RCT

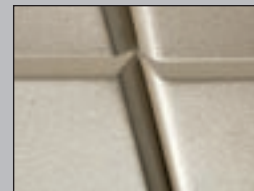


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|-------------------|-----------------------|----------------------|--------------------|--------------------------|
| 1] Suspension rod | 2] Suspension bracket | 3] Flow pipework | 4] Return pipework | 5] Aluminium pipe saddle |
| 6] Metal tile | 7] Copper element | 8] Tile edge options | | |

- 4 RCTs offer flat smooth-faced radiant heating surfaces, with an optional anti-bacterial coating. AB is a polyester powder anti-bacterial paint, which is both durable and inhibits the growth of bacteria such as MRSA and E. coli on the coating surface (e.g. in healthcare and catering environments). There are two types of profiles available for standard flat RCTs – see page 13 for further details.

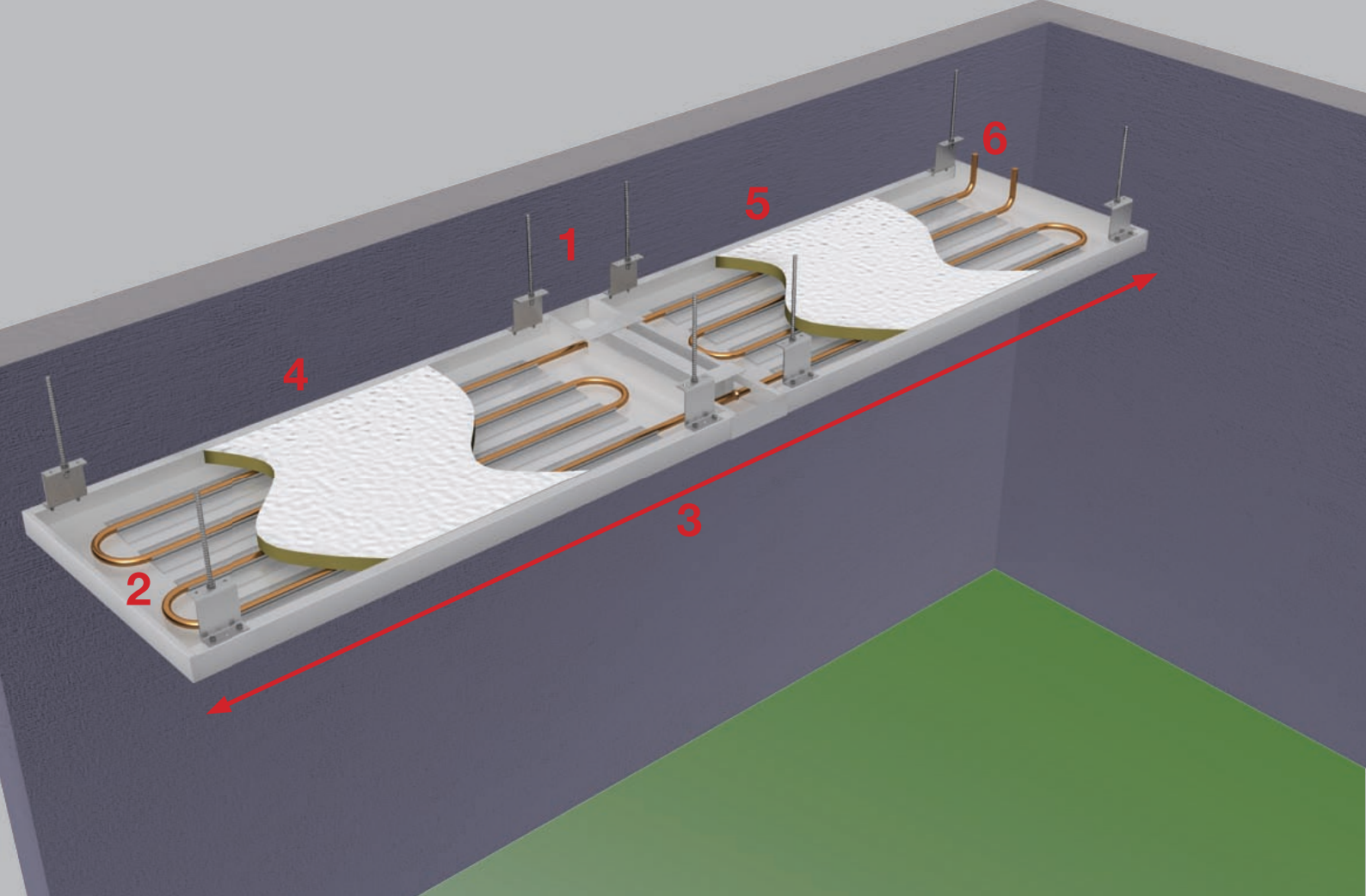


- 5 The standard colour is RAL 9010, but a wide range of RAL colours are available to specify. An additional Fine Textured (FT) finish is also available, which helps to negate the chance of lighting 'hotspots' and glare occurring, and allows light to be controlled across the ceiling plane.



- 6 Each RCT element has 15mm (outside diameter) plain copper flow-and-return pipework connections, as opposed to an RCM which shares pipework. Water enters each panel through the 'flow' end of the pipework and exits through the 'return' of the pipework.

Depending on the type of ceiling system and the connection method used, access panel and draincocks can be incorporated into RCTs. Access panels are discreet and are normally used in conjunction with plasterboard ceilings, where access above the panel is limited.

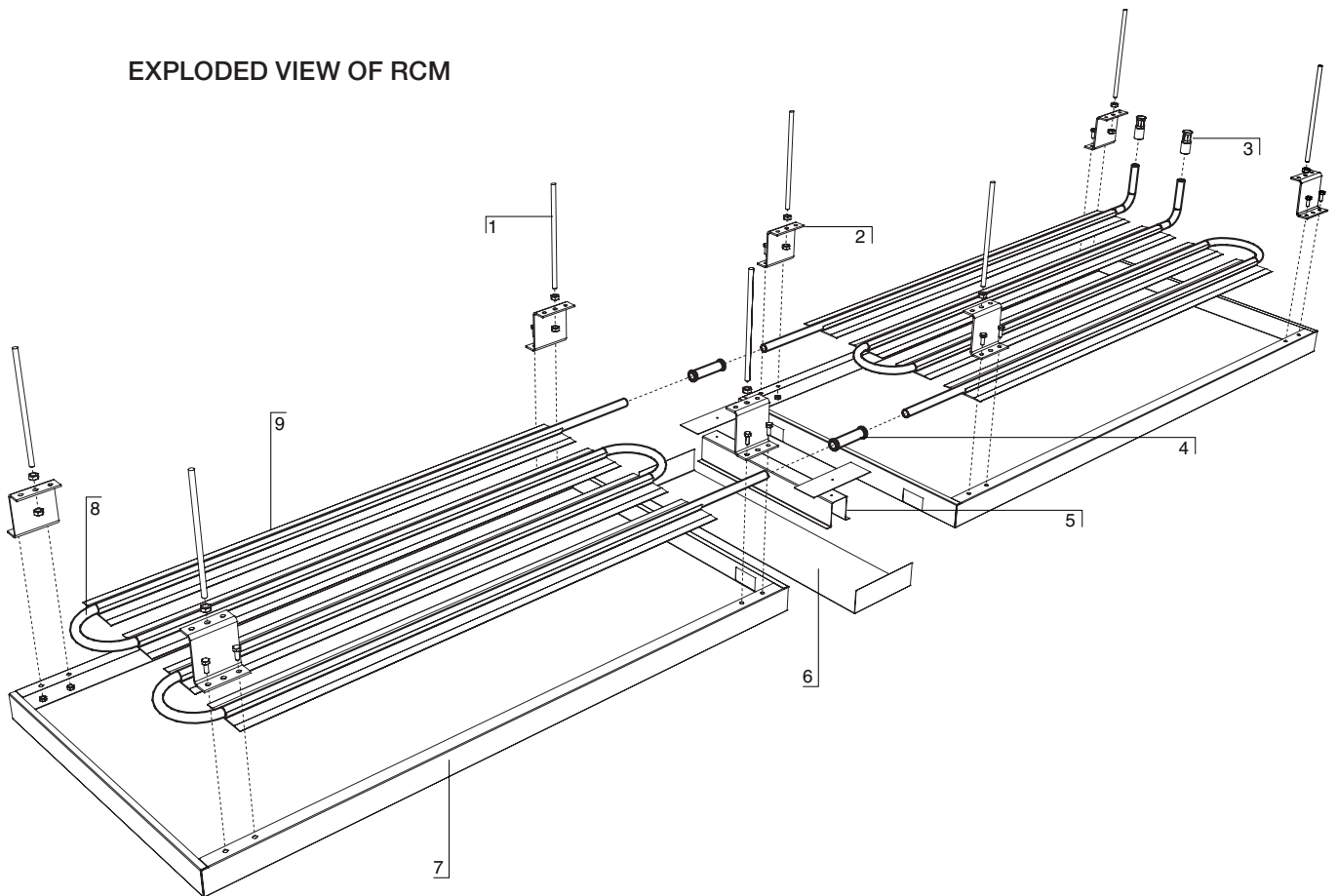


RADIANT CEILING MODULE (RCM)

RCMs consist of a number of radiant heating panels, which are linked together in modules to form longer runs. Importantly, they share a single set of flow-and-return pipework connections. The number of panels that can be joined together is dependant on design considerations. The greater the number of connections, the greater the temperature decay and pressure required to pump the water around the system.

- 1 RCMs can be freely suspended or surface mounted and are ideal where longer runs or continuous lengths of radiant heating panels are required (e.g. hospital wards, industrial settings and corridors). The exact choice of RCM will be a result of the building design, the heat output required, the area concerned and the location of the primary pipework.
- 2 RCM elements are formed from a series of copper pipes, which are bonded via aluminium pipe saddles to the rear of the aluminium panels and to each other with copper couplings. This process ensures maximum thermal transfer between the metals.
- 3 RCMs are available in a range of lengths and are made from two or three panels joined together to span the required length (e.g. a 5000mm module would be made from two 2500mm panels, while a 7500mm metre module would consist of three 2500mm panels). This means long RCM designs can be achieved without additional pipework, valves etc.

EXPLODED VIEW OF RCM

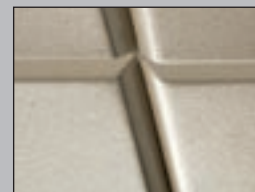


- | | | | | |
|-------------------|-----------------------|---------------------------|--------------------------|------------------------|
| 1] Suspension rod | 2] Suspension bracket | 3] Flow & return pipework | 4] Connection pipework | 5] Cover strip bracket |
| 6] Cover strip | 7] Metal panel | 8] Copper element | 9] Aluminium pipe saddle | |

4 RCMs offer flat smooth faced radiant heating surfaces, with an optional anti-bacterial coating. AB is a polyester powder anti-bacterial paint, which is both durable and inhibits the growth of bacteria such as MRSA and E. coli on the coating surface (e.g. in healthcare and catering environments).



5 The standard colour is RAL 9010, but a wide range of RAL colours are available to specify. An additional Fine Textured (FT) finish is also available, which helps to negate the chance of lighting 'hotspots' and glare occurring, and allows light to be controlled across the ceiling plane.



6 RCMs require only one set of flow-and-return pipework connectors, and element components are joined at the panel connection points with press-fit couplings. The complete element spans the length of the RCM and is designed to meet each module's specific size and heat output requirements.

Cover strips are manufactured to span the gaps between panels and they are manufactured to match the colour of the panels either side of it. Access for drainage is via the cover strips and this is particularly important if the panels are incorporated into a plasterboard ceiling or when freely suspended from the soffit (if access to the primary pipework is limited).

DESIGN SERVICES

HCP's manufacturing strength allows radiant heating panels to be developed to meet specific project demands.

Alongside flat panels, angled & curved designs can be manufactured without the long lead-times associated with third party suppliers.

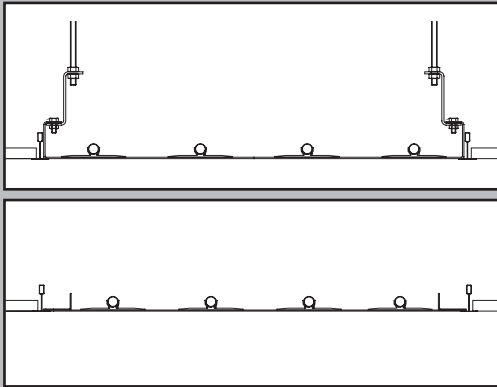
HCP's in-house design team have the knowledge to project manage such tasks and have many years of experience of dealing with project teams, ensuring success from the outset.

Advice for specific design requirements, such as an anti-ligature flange for secure units or flush access panels, can be drawn upon at an early stage.

To meet specific acoustic requirements, acoustic absorption pads can be integrated within the design of certain radiant heating panels, as can anti-debris panels to stop debris build-up.

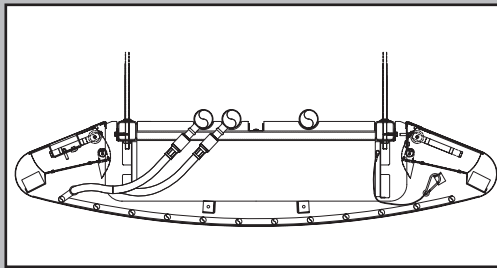
Some of the various designs which are available are listed opposite.





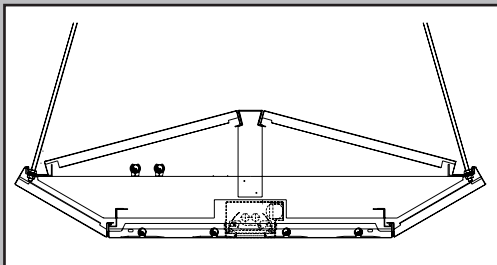
FLAT

Panels ranging from 600mm in length are manufactured in a range of finishes and colours. There are two types of flat panel available, flat and flanged – see drawings.



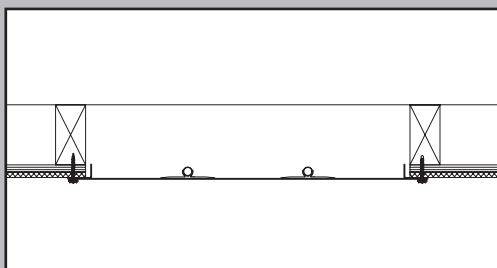
CURVED

Curved panels are designed to offer the same flexibility and functionality as flat panels, and achieve the same levels of radiant heating output as a flat panel. The model pictured incorporates up-lighting and a perforated face panel.



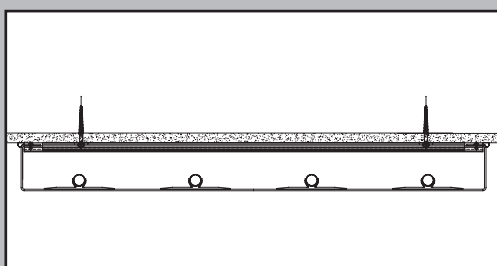
PROFILED

The model shown features additional anti-debris protection, which stops the collection of rubbish on top of the unit – useful in public and educational buildings.



ANTI-LIGATURE PANEL – FLANGED

Radiant heated panels featuring a flanged fold are used as an anti-ligature measure in secure facilities. The panels are flush mounted and secured from below ensuring a tamper-proof fixing and are suitable for low to medium security facilities.



ANTI-LIGATURE PANEL – SURFACE MOUNTED

Surface mounted anti-ligature radiant heating panels are secured via gravity batons to the ceiling. Anti-pick sealant ensures a tamper-proof seal, which is suitable for high security facilities.

PERFORMANCE DATA

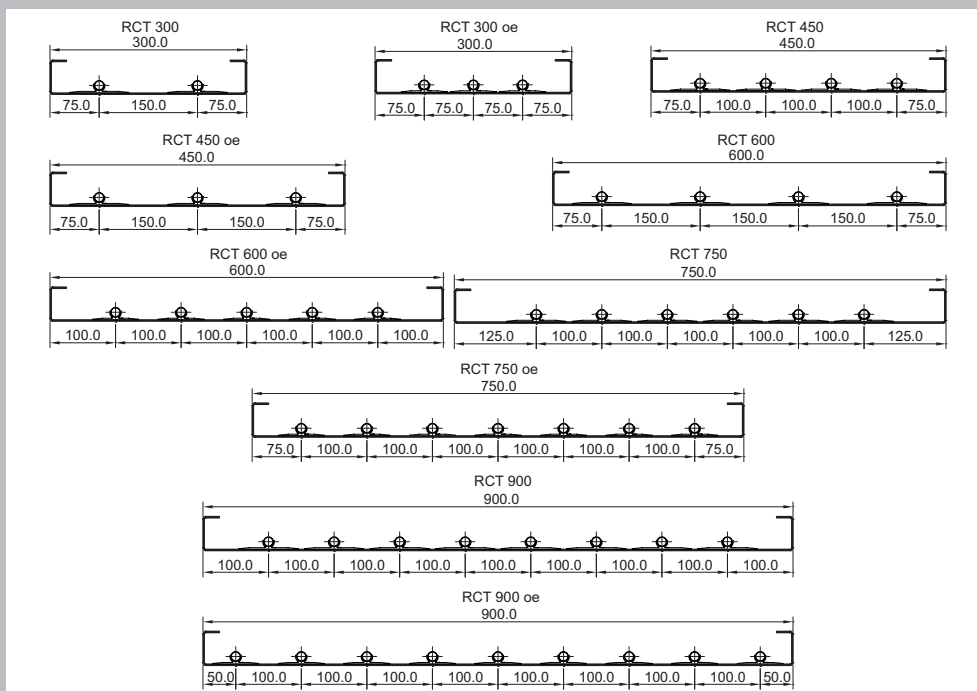
In the manufacturing process, copper elements are bonded to the rear of an aluminium panel via aluminium pipe saddles. This process ensures maximum heat transfer between the metals and through panels. Information below relates to both RCTs & RCMs.

HEAT OUTPUT				CORRECTION FACTORS			
Recessed into Suspended Ceiling				Variations in ΔT			
Panel Ref.	Nominal Width (mm)	Pipe Conns.	Heat Output per linear metre of panel (watts)	ΔT m.w.t.-e.a.t. K	Correction Factor	ΔT m.w.t.-e.a.t. K	Correction Factor
RCT300	300	s/e	213	30	0.48	57	1.02
RCT300	300	o/e	222	35	0.57	58	1.05
RCT450	450	s/e	283	40	0.67	59	1.07
RCT450	450	o/e	285	45	0.77	60	1.08
RCT600	600	s/e	348	50	0.87	61	1.10
RCT600	600	o/e	356	51	0.89	62	1.13
RCT750	750	s/e	443	52	0.91	63	1.16
RCT750	750	o/e	445	53	0.93	64	1.18
RCT900	900	s/e	499	54	0.96	65	1.19
RCT900	900	o/e	504	55	0.98	70	1.29
				56	1.00	75	1.40
				56.5	1.01	80	1.51

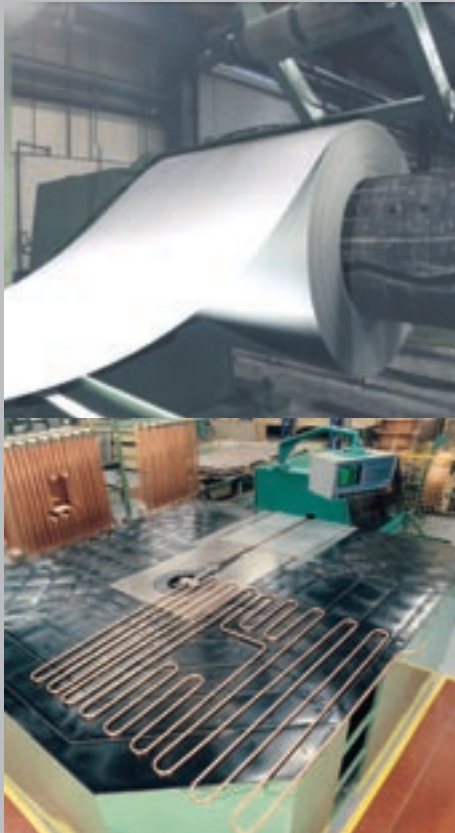
All outputs in watts/metre and based on LTHW 76°C mean water temperature, 20°C room temperature and a flow rate above 0.010 kg/s.
(KEY: s/e = same end connection o/e = opposite end connection m.w.t. = mean water temperature e.a.t. = entering air temperature)

DIMENSIONS

Along with the standard dimensions listed below, HCP can manufacture radiant heating panels to match specific requirements.



TECHNICAL SPECIFICATIONS



Tile/Module	Manufactured from 1.2 or 2.0mm smooth-faced aluminium; a choice of polyester powder paint finishes, (normally RAL 9010), are available. Panel edges are returned for containment of insulation and increased rigidity.
Pipe work	A single length of 15 mm copper, tested to BS EN 442, is the standard tubing used in HCP radiant heating products.
Drain Points	Can be supplied as requested.
Suspension	RCT and RCM panel hangers are made from electro-zinc plated mild steel and are suitable for installation with 6mm drop rods. Two carriers are required for lengths of 1800mm or less and three are required for lengths of up to 2500mm.
Insulation	Mineral Wool 30mm to 50mm thickness, which is sealed in tissue paper with a foil face. A non-fibrous option is also available.
Performance	Panel performance can be supported by independent test certification.
Panel mass	Between 15 and 17 kg/m ² based on a filled panel with a 50mm insulation pad.

All information contained in this brochure is correct at the time of going to press.
HCP has the right to change product specifications without prior notice.

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