WARMA FLOOR
UNDERFLOOR HEATING & COOLING

Underfloor heating and cooling

sustainable solutions for commercial, public and residential buildings

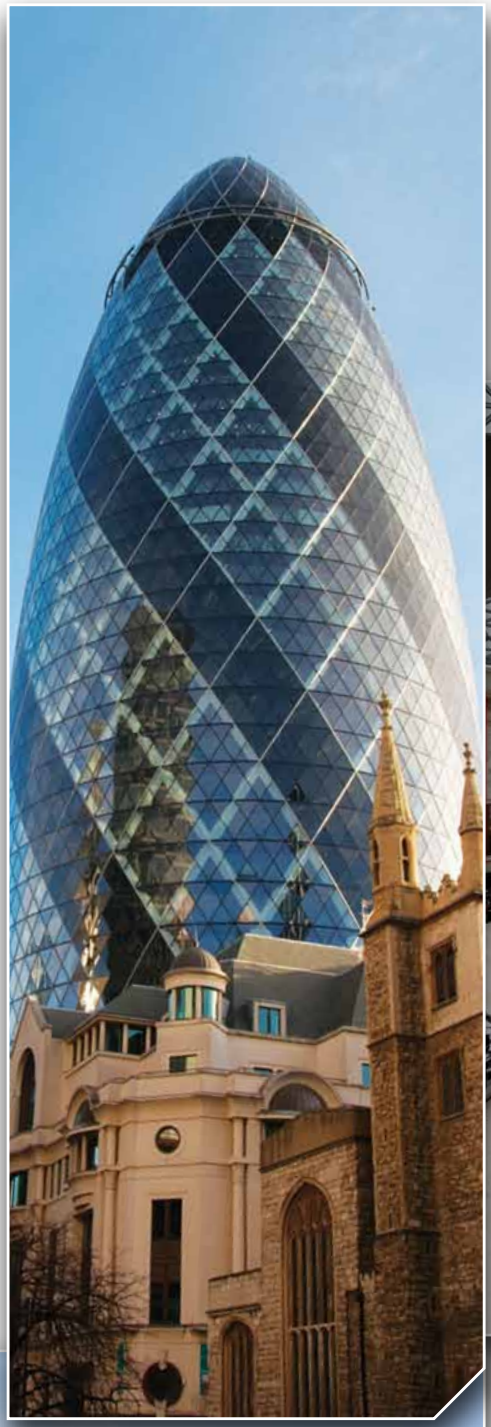

Image courtesy of London 2012

Education

Healthcare

Leisure

Front cover pictures,
left to right:

- Athletes Village, London
- Swiss Re building, London
- British Museum, London

This page,
top to bottom:

- Castle Rock School, Leicester
- St Thomas and Evelina Hospital, London
- Pool, University of East Anglia, Norwich

Opposite page,
top to bottom:

- Westfield Shopping Centre - Stratford, London
- Swiss Re building, London
- Scottish Parliament building, Edinburgh
- MOD Residential Housing

Warmafloor is at the leading edge of designing, manufacturing and installing underfloor heating/cooling systems.

We are an authoritative organisation, with a proven track record of success, spanning 25 years in delivering reliable, cost effective solutions that reflect today's demand for sustainable construction.

Underfloor heating provides the most efficient and comfortable all-round warmth of any heating system, suitable for every type of building, large or small, new build or refurbishment.

Warmafloor is spearheading the continuing development of the UK's radiant floor heating industry. Its unique design and installation expertise has led to Warmafloor systems being installed in some of the UK's most prestigious and award winning buildings, including landmark projects such as the British Museum, Athletes Village, the A380 and A350 Airbus factories, and the Scottish Parliament building.

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Commercial

Public Buildings

Residential

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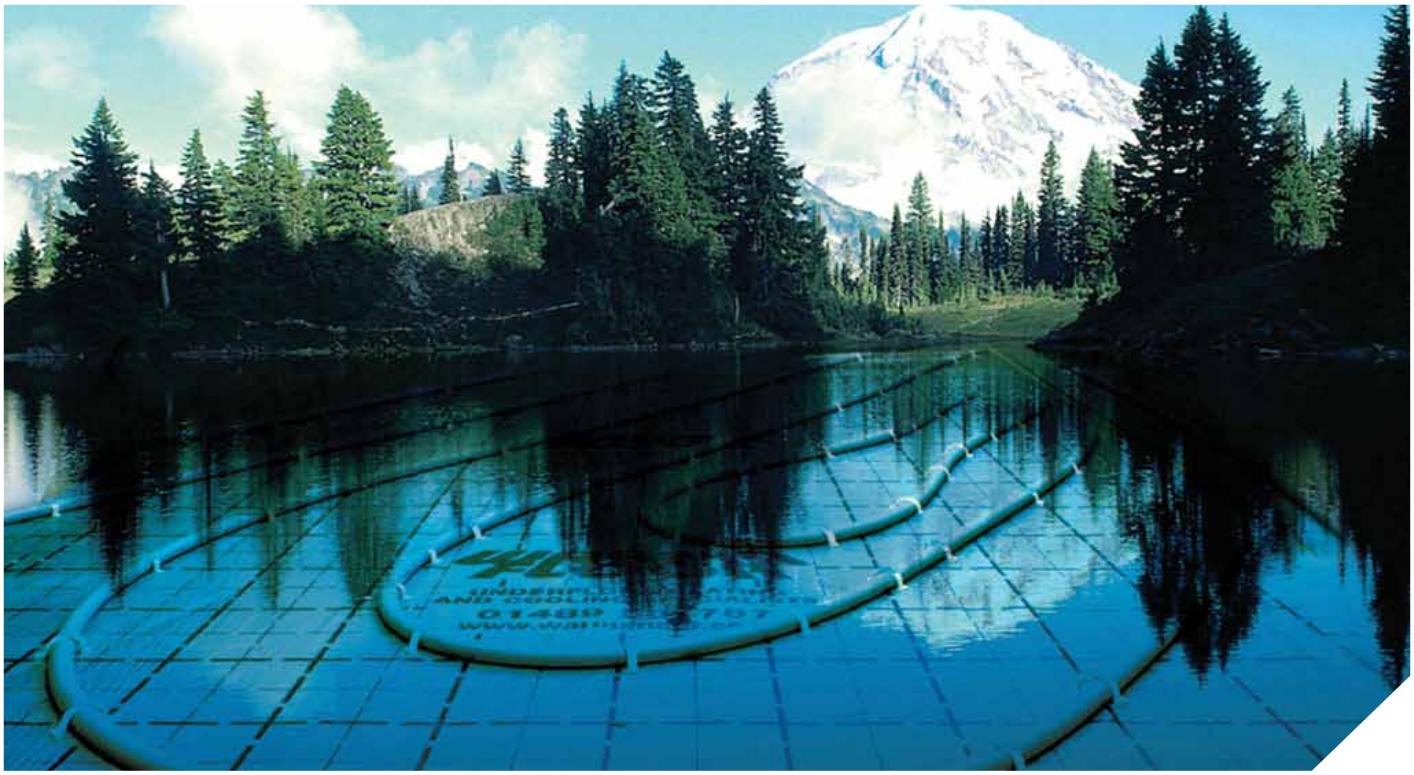
Warmafloor

capability • responsibility • sustainability



Track record of sustainability and success

Welcome to Warmafloor!

We pride ourselves in providing a unique total solution for the British building industry. With a strong foundation of more than two decades of knowledge and expertise, Warmafloor heating and cooling systems provide total assurance for clients in the commercial, public and private sectors.

Our capability is second to none, offering a complete engineering service at every stage, from project design and product manufacture, to system installation and commissioning.

Aware of the industry's enormous growth potential – underfloor heating is the fastest growing sector of the heating industry – we ensure that Warmafloor continues to lead the way through investing in technical developments and training programmes for the specifiers and installers of the future.

Warmafloor

- team of skilled people
- qualifications in every element of the building industry
- focus on developing and training our own people (rather than using subcontractors) to complete every job on time and on budget

In our quest to be the best, we have showcased all the Warmafloor heating and cooling systems at our own Head Office building.

Come and visit – a warm welcome awaits you!

Mike Lamb
M.D. of Warmafloor and past Chairman
of UHMA (The Underfloor Heating Manufacturers Association). Member of CIBSE.

Tel: 01489 581787 www.warmafloor.co.uk

Image courtesy of London 2012

Athletes Village

Heating solutions

Warmafloor provides the complete underfloor heating solution – design, supply and installation – for the entire project. We believe we have more experience and capability in large and complex projects than any other company in the UK.

Most of the systems we install are powered by modern HE (High Efficiency) condensing boilers and controls, and we have substantial expertise in ensuring optimum system operation and energy efficiency. We have also developed considerable expertise in working with systems powered by heat pumps and other forms of renewable energy.

Imperial War Museum

Cooling option

Underfloor systems used to provide heating during winter months can also be used to cool buildings in the summer.

By circulating cool, rather than warm water, the floor can be cooled so as to offset high ambient temperatures and solar gains.

At Warmafloor, we have the expertise to design and install cool water systems that can utilise river water or ground water as a cooling source, where convenient. By reducing the demand for air conditioning, we can further cut your energy costs and carbon footprint.

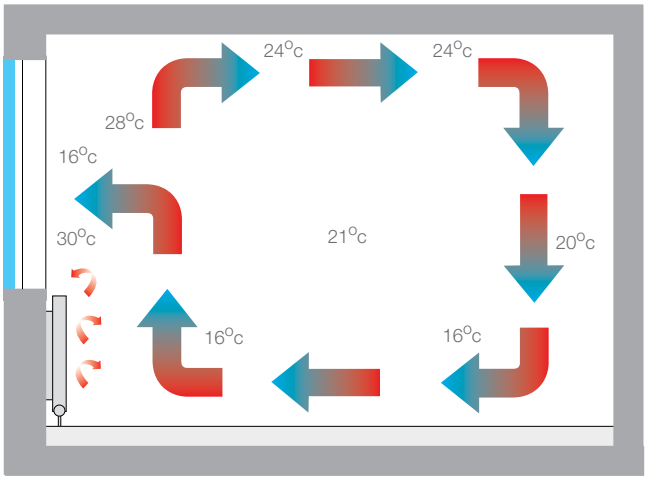
Gloucester Police HQ

Geothermal, solar and heat pump options

At Warmafloor, we have developed expertise in designing and installing systems that can harness geothermal energy and heat pump systems for heating or cooling. Less expensive to operate than other heating systems – because they tap into heat in the outdoor air, ground or water supply – they provide a high CoP (Coefficient of Performance) factor – more heat than the equivalent amount of electrical energy.

Banks of solar thermal panels may be installed to convert the sun's radiant energy into hot water, even on the greyest winter's day. A traditional fossil fuelled boiler can then be used to "top up" the heating as required. Warmafloor's systems have the capability to harness renewable energy sources, cut heating bills, and reduce the carbon footprint.

How underfloor heating works

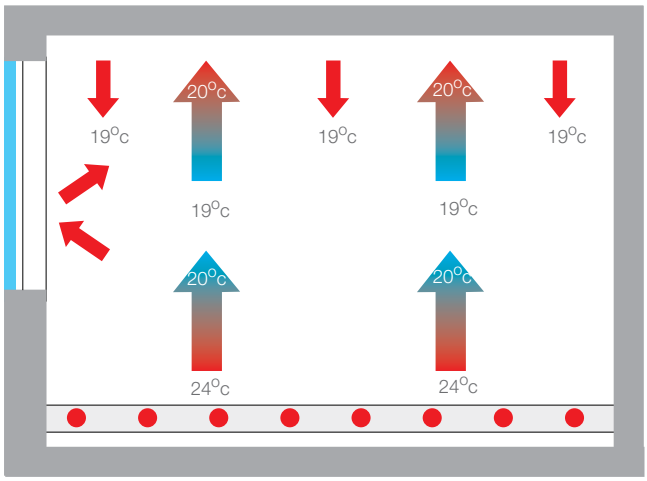


Systems with radiators

Radiators distribute heat by convection currents, which can result in draughts and hot spots. The floor will be the coldest zone of the room, as hot air rises, and the space above your head will be the warmest part of the room.

Radiators transfer heat into a room largely by convection from a hot metal surface. Because the surface of the radiator is small, in comparison to the volume of the room, it needs a high heat input and doesn't spread the heat evenly.

Convection currents circulate allergens, dust particles, fumes and germs which are then distributed around the building, contributing to an unhealthy atmosphere.



Underfloor heating

Underfloor heating systems are simple to install, low maintenance and cost-effective to run. The room is heated mostly by radiation, the most natural and comfortable form of heating, creating an even, comfortable environment with no hot or cold draughts.

Rooms with high ceilings such as churches, sports halls or industrial units gain even greater benefits. With radiator systems, some of the heat is immediately wasted as it rises to the ceiling. With an underfloor heating system, the heat is concentrated at floor level where it is most needed.

In rooms with large areas, underfloor heating is the only way to heat the centre of the floor area effectively.

Floor surface temperatures

Floor surface temperatures should not exceed certain levels – otherwise discomfort and damage to the floor can occur. The maximum recommended temperatures are: occupied areas, 29°C; peripheral areas, 35°C; bathrooms, 33°C.

The floor surface temperature will vary according to the heat output requirements of the room or building.

Floor coverings

Floor coverings such as carpet, underlay and timber reduce the floor heat output. Please check with us to confirm suitability. Some floor coverings, especially timber and vinyl floors, have a recommended maximum floor surface or sub floor temperature that they can operate at; if a higher temperature is used it can damage the floor covering. Manufacturers' data sheets should be checked to confirm the covering's suitability.

Benefits of underfloor heating

Energy efficiency

- Underfloor heating is the most energy efficient way of transferring heat into a room and can consistently deliver substantial energy savings compared to radiator systems.
- Because underfloor heating systems benefit from the use of lower water temperatures throughout the system (rather than hot water in radiator systems), condensing boilers can generally run at greater efficiency, saving even more energy costs.
- By providing a constant heat, underfloor heating allows occupants to feel more comfortable at a lower temperature.

Sustainability

- Warmafloor has been part of the project team for many buildings that have won architectural and energy saving awards.
- The Warmafloor underfloor heating pipe, made from Polybutylene (PB), is designed to last for the life of the building and is then fully recyclable.
- The manufacture of Warmafloor PB pipe is less energy consuming than the production of components for any alternative heating system.

Interior design

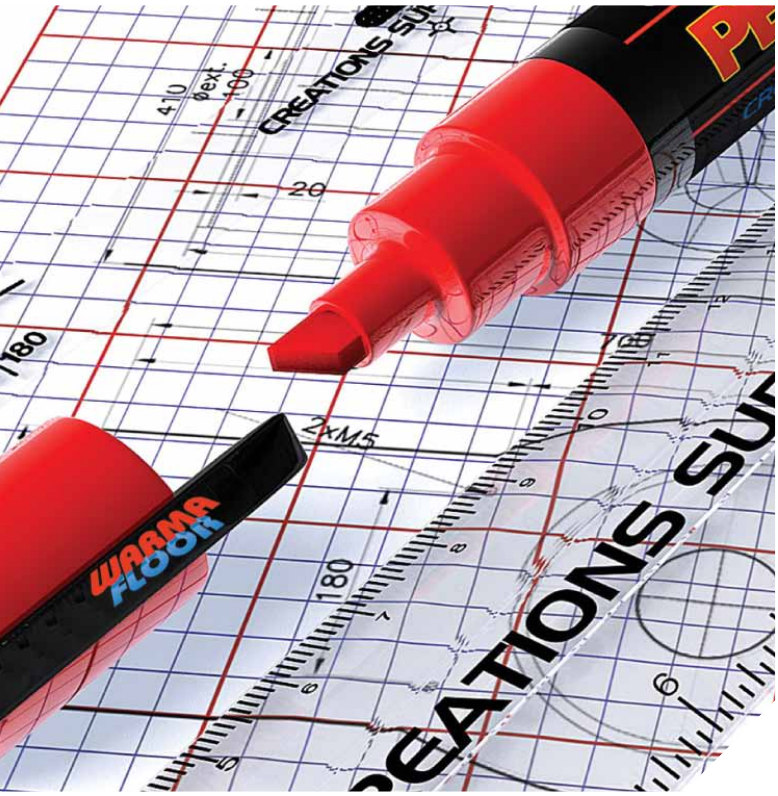
- Out of sight, underfloor heating gives a totally flexible layout, with no radiators to limit interior designs and furniture arrangement.
- Underfloor heating is compatible with most types of floor covering. The interior designer has more freedom to specify most types of floor covering whether it be tiles, wood, laminates or carpets.
- Even though it can't be seen, underfloor heating adds perceived value to the property.

Health & safety

- Underfloor heating systems eliminate radiators (which can potentially be a health and safety risk because of their high surface temperatures and sharp edges).
- Moisture levels in floor coverings are reduced, which reduces microbiological growth and the risk of slipping. In carpets it virtually eliminates dust mites.
- As there is no convection driven airflow, and the circulation of bacteria and pollen is reduced, the indoor air quality is cleaner and healthier.

Underfloor heating provides the most comfortable all round warmth of any heating system, suitable for every type of building, whether it is new build construction or refurbishment.

Bespoke designs



At Warmafloor we pioneered the use of full colour AutoCAD for designing and preparing underfloor heating drawings which set the industry standard.

In every project we generate four levels of drawings, starting at the very conception of a project and finishing with record drawings. These form part of the operation and maintenance manuals upon completion of each project.

Our design process begins with a design meeting with the consultant or design engineer. From this we will provide a zone drawing indicating the manifold positions, floor sections and number of circuits, as an initial design concept. We will then estimate the total cost of the installation and draw up a bespoke specification for the project.

As the project evolves it moves into the detailed planning stage. We produce a full design for approval, incorporating all the details which will be necessary to complete the installation.

Once that drawing has been considered and any modifications made, we produce construction drawings which are issued to our clients and, of course, to our fitters.

During the construction phase, if there are any changes on site, our fitters amend the construction drawings. When the project is complete, a set of record drawings are provided which accurately reflect the underfloor heating installation.

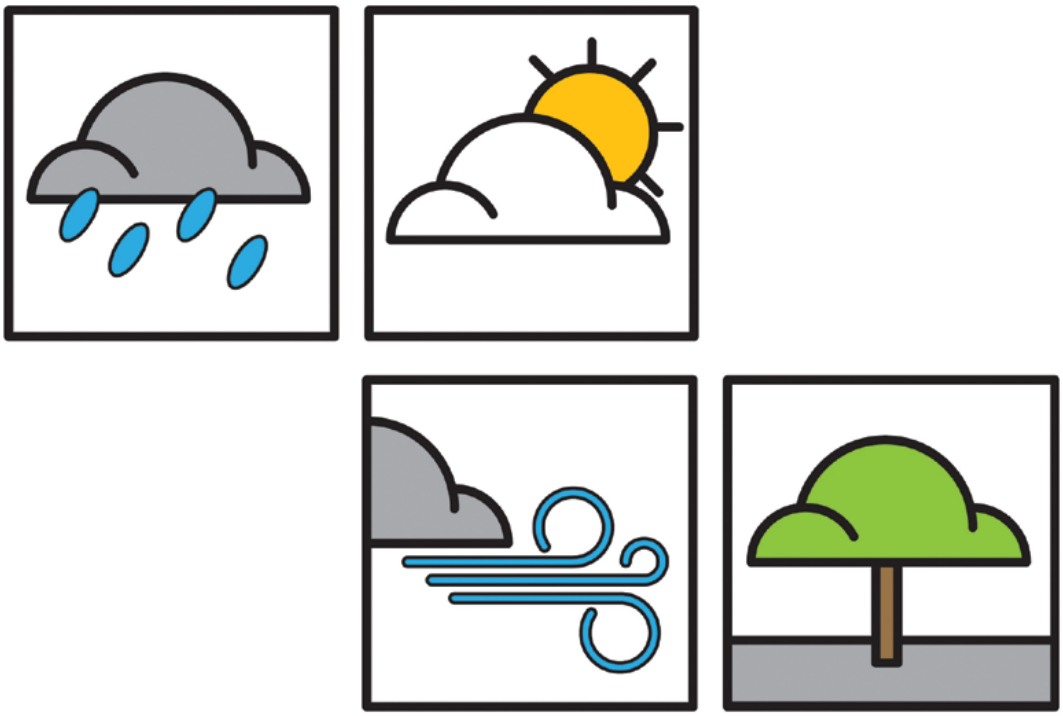
Whilst this process may appear long-winded, we believe this attention to detail at each stage is vital to the smooth running of the site.

Energy source

Warmafloor underfloor heating and cooling systems may be powered by any boiler or energy source.

For every installation we believe that the specifier should consider the most sustainable energy source, both to reduce energy costs and to minimise environmental impact.

As a minimum, the specifier should consider using a condensing boiler. Other forms of energy efficiency are now commercially viable, which offer significant cost reductions and environmental benefits.



Biomass boilers consume wood pellets produced using the waste products of commercial wood working processes.

Solar thermal systems may be used to provide a significant portion of the energy requirement for domestic hot water and for underfloor central heating.

Air-to-water heat pumps are relatively low cost and simple to install, yet can convert "free" heat from the outside atmosphere into useful low temperature warm water, which is ideal for underfloor heating systems. Such heat pumps have an efficiency of 350% or more, i.e. they can convert 1kW of electrical energy into 3.5kW of heating energy, even when the outdoor temperature is as low as 0°C.

Ground source heat pumps are more expensive to install, but deliver significantly greater energy savings by taking "free" heating or cooling from the ground which is at a constant temperature all year round.

Optimum solution

Generally, for the most efficient and most sustainable solution, we recommend a multi-valent approach, where a combination of solar panels and air-to-water or ground source heat pumps deliver most of the energy for most of the year, with a condensing gas boiler being used for thermal top-up in times of peak demand.

Our environmental credentials

We demonstrate ongoing leadership in eco-concern through our own environmental policy. Our centre and manufacturing facility at Fareham is proof that we do far more than merely reduce our own carbon footprint. Through careful selection of materials and thoughtful operation on site, we have ensured that we minimise our impact on the environment, whilst delivering some of the most sustainable heating and cost-effective systems.

Pipework

Our pipework is manufactured in accordance with the standards laid out in the 'Environmental and Performance Characteristics of Polybutylene Pipe' document (C1/SFB 53/In6) June 2005.

Insulation

Warmafloor has for many years selected insulation products that have an Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) of zero. Our expanded polystyrene (EPS) is manufactured using pentane which contains no CFCs , HFCs or HCFCs . We encourage the use of insulation throughout in accordance with Part L. of the building regulations.

Adhesives

In our manufacturing operations we have attempted to minimise damage to the environment. Solvent based adhesives have, where possible, been replaced by hot-melt and water-based glues, to limit emissions. All new processes will be subject to a strict environmental examination.

Packaging

When packing we limit the environmental impact by keeping label size to a minimum and by wrapping packs in lightweight stretch wrap film. All boxes used in our packaging are made from recycled cardboard. We endeavour to use biodegradable packaging throughout.

Clipping systems

We also use reworked material in the production of our clipping systems. The staples used in the Cliprail and Tacker systems are all made from reworked PVC as part of our commitment to eco-friendly manufacturing. When the system reaches the end of its useful life, it can be recycled to reduce waste and save energy.

Manifolds

Our manifolds are manufactured from composite materials selected for their specific function in the manifold. We assemble all components for our manifolds at our Head Office warehouse in the UK.

On site waste

The products and materials used on our installations are selected so they can be recycled and can therefore be removed from site in the normal way and dealt with in the appropriate manner.

Warmafloor is an environmentally committed organisation dedicated to world welfare and the best future for our children.

Our sustainability mission

We believe every individual and organisation should take responsibility for sustainability in their buildings – in construction, in the on-going use of building services, and in creating an attractive environment.

At Warmafloor, we have planned our own office and warehouse facilities to deliver optimum sustainability by an intelligent combination of 12 simple and cost-effective elements. It requires only 20% of the operating energy consumed by a similar sized conventional building.

1 Low energy underfloor heating and cooling, and chilled ceiling.

2 Thermal mass. Substantial volumes of concrete in the building's floors and core act as a thermal store to minimise day/night temperature swings.

3 Ground source heat pump. Coils of water - filled plastic pipe, laid in trenches beneath the car park, provide a year - round source of "free" energy.

4 Solar hot water. Solar collector panels on the building provide up to 100% of hot water needs in the summer months and up to 25% of hot water heating energy even during dull winter days.

5 Gas fired condensing boiler. A relatively small, high efficiency boiler provides thermal top-up for underfloor heating and District Hot Water (DHW), when required.

6 Building envelope. Insulated cladding panels and reflective glass minimise heat loss or gain through the building envelope. Specially planted Silver Birch trees provide solar screening during summer, yet allow maximum light in winter.

7 Ventilation. Natural ventilation through an air handling unit with efficient heat exchanger and high efficiency filter, ensures air quantity and increases employee productivity.

8 Lighting. Maximum use of natural daylight, plus low energy lighting controlled by PIR sensors (which automatically turn lights off when a room is not in use), minimise lighting costs.

9 Integrated control. A simple building energy management system ensures all the various energy-demanding elements operate in harmony, to reduce energy demand.

10 Rainwater harvesting. Underground rainwater storage tanks provide water for vehicle cleaning and gardening.

11 Carbon offset. Well designed planting of trees around the car park perimeter provides carbon offset for the energy that the building uses.

12 Wind turbine. A simple wind turbine generates more than enough electricity to match the building's needs and allows for excess capacity to be sold back to the National Grid. (At the time of going to press installation of our wind turbine is delayed. We are awaiting planning permission by the local authority).

Airbus factory

Warmafloor designed and installed the underfloor heating system for the Airbus A380 wing assembly factory in 2004. Some 60,000 metres of 20mm polybutylene pipework was installed directly into the structural slab of the building. More recently, Warmafloor were awarded the contract for the latest wing factory for the new A350 Airbus airliner. Cost has always been a key element in securing major contracts. Another key element was Warmafloor's ability to deliver the project in a record 2 week programme, along with a 50% energy saving.

British Museum

A prestigious project in The Great Court at The British Museum specified a Warmafloor heating/cooling system throughout the main public areas, covering 4,000 sq metres.

A castellated panel system was installed. It provides a steady state environment by switching from heating, to cooling served by chilled water from the central plant room.

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Sports academy

A custom built, state of the art sports complex for the University of East Anglia. The facility was the largest of its kind in the UK. The pool, surrounding seating areas and changing rooms feature a Warmafloor underfloor heating system; providing warmth underfoot and quick-drying surfaces that reduce the possibility of bacteria growth.

Crown Lane School, London

Warmafloor delivered the complete underfloor package; including design, supply and installation at Crown Lane Primary School, South West London.

This complex shaped building comprises a new 420 place primary school and a 25 place nursery.

The site also has a floodlit games court and various external play areas.

Aspire Defence contracts

Warmafloor are designing and installing underfloor heating systems for Aspire Defence, who are delivering the MoD's largest infrastructure project, Allenby/Connaught. The project is providing fully serviced new and refurbished living and working accommodation; training, leisure and storage facilities for nearly 19,000 military personnel across four Army Garrisons at Aldershot and on the Salisbury Plain. The work is believed to include the largest underfloor heating project ever awarded anywhere in the world.

The underfloor heating systems are being installed in various building types; such as stores, secure units, technical buildings, office accommodation and leisure facilities. Five years after it started, the project is positively affecting the lives of nearly 20 per cent of the trained soldiers in the British Army.

Whilst some early designs for the project utilised conventional radiator systems, it was quickly realised that, for this project, they would not provide the best option and a specialist contractor was required to install a system capable of providing long term energy savings.

It was clear that only Warmafloor offered the practical, capable and financial performance needed for such a large scale ongoing project. We are one of the only specialist heating contractors with a large enough team of designers, engineers and installers and with the expertise to deliver such a major scheme in a cost-effective manner.

Warmafloor were able to effectively work across multiple mechanical and electrical contracts, providing a total underfloor heating system design from concept to completion.

Recreational Training Centre, Tidworth

Aldershot Garrison

Triple Mess, Bulford

Community Centre, Warminster

Bulford Garrison, Accommodation

Junior Rating Diner, Warminster

Images credited to: Project Allenby/Connaught

Solid floor screeded systems

Warmafloor systems can be fitted to any type of concrete floor construction which has a screed topping.

The elements of the system; floor insulation, edge insulation, moisture barrier, fixing system and pipework are installed utilising one of the Warmafloor systems as detailed, then covered with the appropriate screed and final floor finish.

The system can be selected according to constructional requirements and we will specify what we consider the most appropriate for the project.

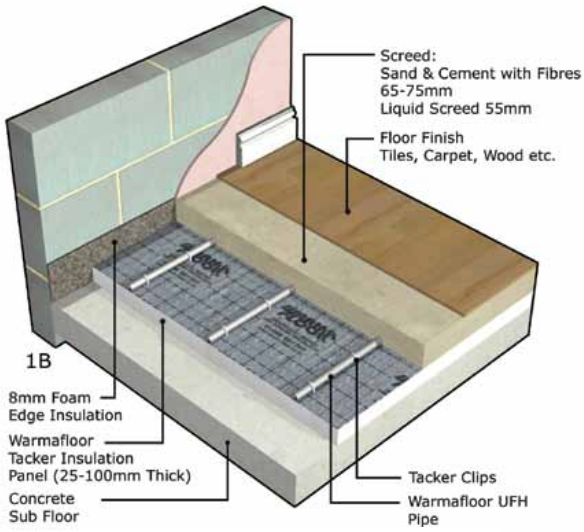
We will also advise on the most suitable depth and screed type to be used. Warmafloor screeded systems are available to suit all types of commercial, industrial, public sector and housing applications.

Once installation is complete and the screed installed and dried out to suitable moisture content, almost any kind of floor covering (including marble, tile, carpet, stone and timber) can be fitted to the floor surface.

Tacker system

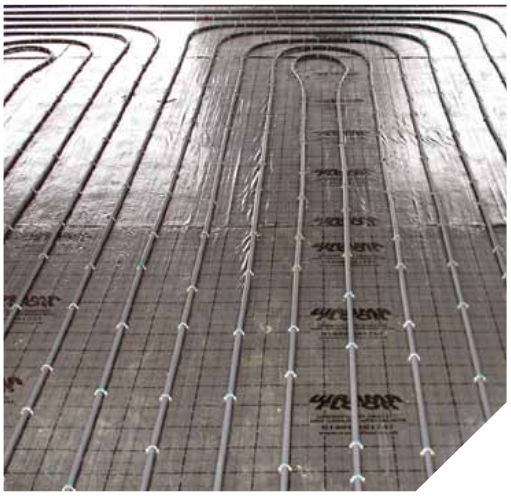
The Warmafloor Tacker system is the most widely used for screeded floors because of its versatility and ease of installation.

Warmafloor Tacker floor insulation panels are available in any thickness and various insulation materials, providing solutions for any floor requirement.



Tacker System

The floor insulation panels, whilst generally supplied in expanded polystyrene EPS, are also available in polyisocyanurate (PIR) (eg Celotex) or in extruded polystyrene, providing extra strength or greater "U" values.

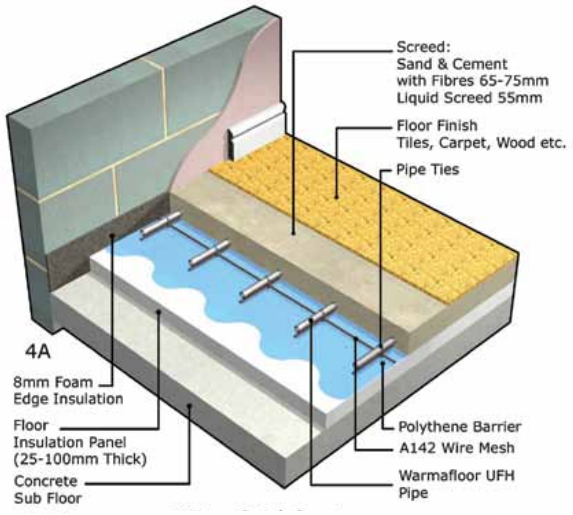


Warmafloor Tacker floor insulation panels have a hessian-based polyethylene foil laminated to the surface of the panel. The foil provides a gridded reference for correct pipe spacing and fixing and is also water resistant.

Edge insulation is laid around the area to be heated; this provides a barrier against perimeter heat loss and for screed expansion. The Warmafloor Tacker insulation panels are then laid over the complete floor area. Warmafloor PB pipework is then laid out in circuits and secured into the Tacker panel by specially designed staples, installed with a Tacker gun. These staples are fully retained by the fabric thereby preventing the pipe lifting during screeding. The underfloor pipework is connected to the Warmafloor manifold, filled with water, and pressurised to check for watertightness.

As soon as practical after the installation is completed, the screed should be laid over the system to the required depth.

Solid floor screeded systems (continued)



Wire Grid System

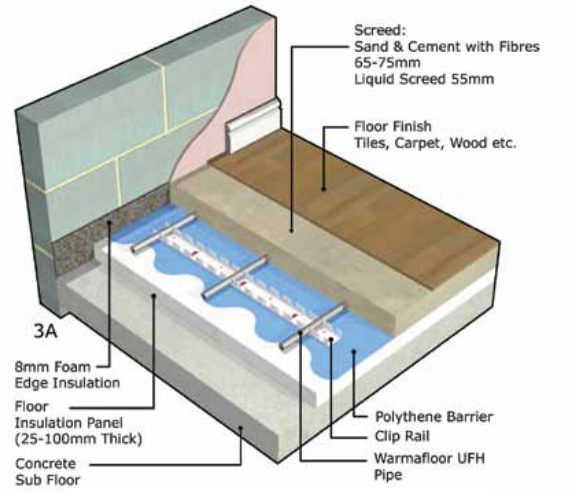
Wire Grid system

The Warmafloor Wire Grid system is a simple to install approach that provides a robust fixing system where Warmafloor Tacker floor insulation panels are not used.

The floor is fitted with suitable floor insulation, overlaid with a vapour barrier, with edge insulation to all walls in preparation for the installation. An A142 wire grid, which has a 200mm square mesh pattern, is laid butt jointed onto the floor insulation.

Warmafloor PB pipework is then laid out on the grid in the required configuration and secured to the grid with plastic securing ties. The pipework is circulated back to the manifold and is pressure tested, before screed laying is carried out.

The Warmafloor Wire Grid system is suitable for sand/cement or concrete screed coverings but is not suitable for liquid screed applications.



Clip Rail System

Warmafloor Clip Rail system

The Warmafloor Clip Rail system comprises plastic pipe-locating rails, fitted to the floor insulation, into which Warmafloor PB pipework is clipped.

The rails are available for both 16mm and 20mm pipe.

Edge insulation and floor insulation is overlaid with a plastic moisture barrier to cover the floor area. The Warmafloor Clip Rails are then located according to the system design and secured into the floor insulation with fixing pins.

Once the Clip Rails are fixed, Warmafloor PB pipework is laid out in the required system configuration for the building and is connected to the manifold.

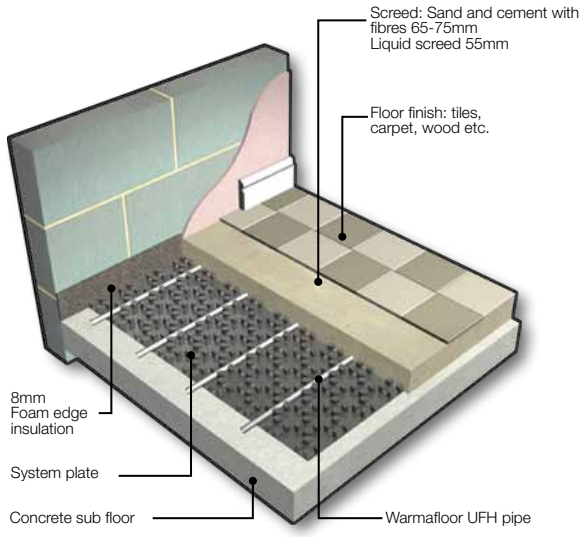
The underfloor system is then filled with water and pressure tested to confirm the system's integrity prior to the floor screed being laid.

System Plate panels

Warmafloor system plates are interlocking vacuum formed sheets of recycled plastic which incorporate pipe-locating castles. Sheets are laid over the sub floor, thermally insulated in accordance with Building Regulations, overlapping the edges by 75mm and interlocking them to form a continuous layer.

Warmafloor 16mm PB pipework is clipped into the panels and the installation is complete.

The system panels are better than pocketed systems as the screed can surround the pipe providing a greater output.



System Plate Panels

Note: System plates are useful where there is a restricted floor depth.

Structural concrete floor systems

Warmafloor systems can be incorporated within load bearing structural floors, in a variety of applications, from factories and warehouses to sports complexes.

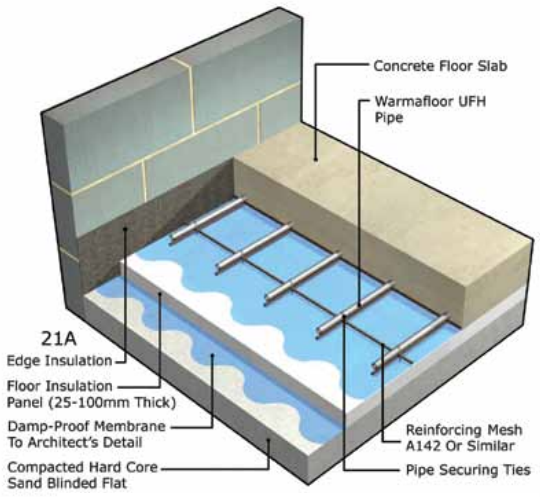
There are generally two types of floor construction, those of a simple concrete slab construction and those which incorporate a reinforcing wire mesh grid at mid level in the floor. The floor construction generally comprises a compacted and level hardcore bed, which is sand blinded flat. Onto this, suitable insulation panels of the required density and thickness are laid and covered with vapour barrier, with edge insulation to the perimeter of the building.

Wire mesh is then installed either on the floor insulation – in the case of simple concrete slab floors – or in the case of structural floors, at the required level in the slab.

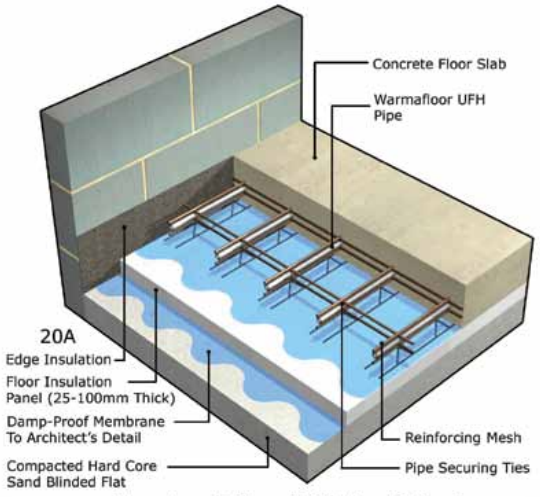
The Warmafloor PB pipework is secured to the mesh with pipe ties in the required configuration and spacing.

The Warmafloor PB pipework is circuited to the Warmafloor manifolds, filled with water and tested. Concrete is then laid to the required depth and strength, dependent upon the design criteria of the slab.

Floor finishes both with screeded concrete and structural floors can include tile, wood, paving slabs, marble etc.



Concrete Slab Floor Wire Mesh System



Structural Floor With Reinforcing Mesh System

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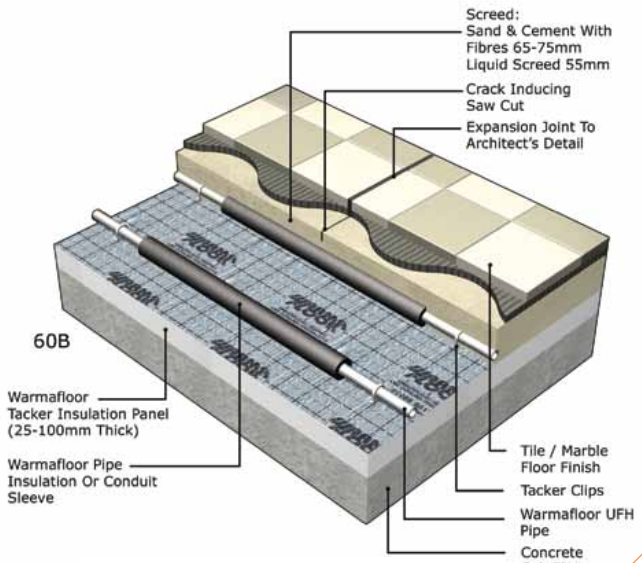
Floor expansion/movement joints

Heated screed or concrete floors will expand and contract slightly during use; the edge insulation is normally sufficient to take up this movement. However, in certain situations and especially with floor finishes such as tile, marble or stone, screed expansion joints will be required. Whilst the Warmafloor pipe characteristics enable it to be stretched by 50% plus without damage, pipes passing through joints should be sleeved for safety.



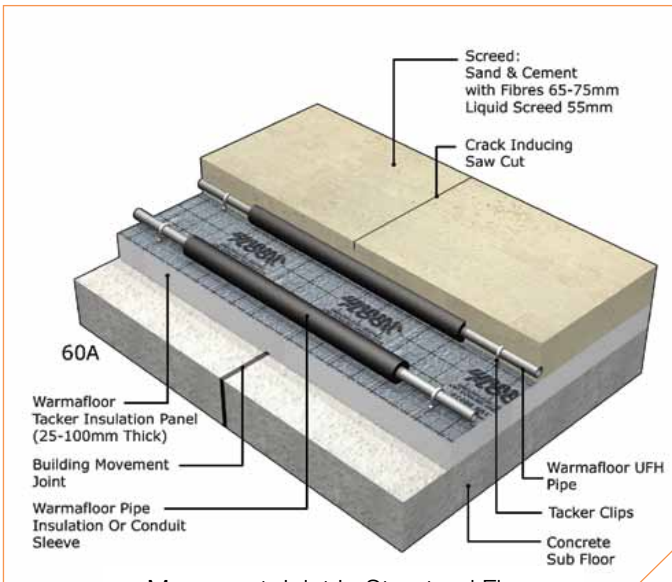
Expansion Joint - Screeded Floor

Screeded floors

Very large rooms or areas may need to be sub-divided by expansion joints or crack inducers, which can then be sealed after screeding with flexible filler. Where these joints occur, the pipework circuits crossing them should be kept to a minimum and where pipes do cross the joints, they should be sleeved as detailed. In addition to this, screed expansion joints will be required in larger floors finished with tile, marble or stone to suit the floor layer's requirements.

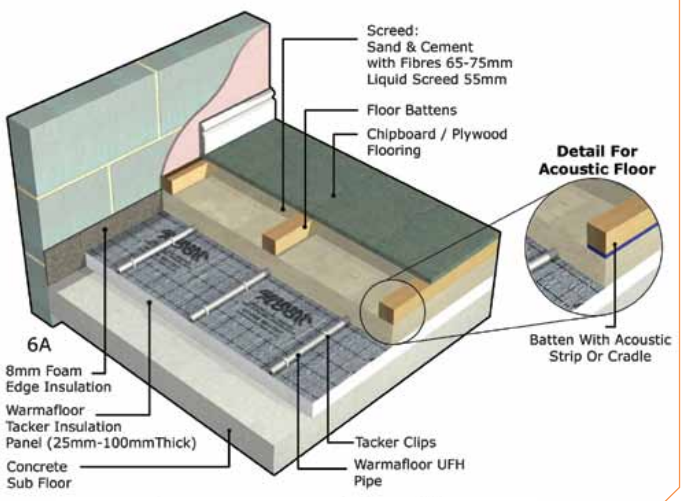
Structural floors

Occasionally the underfloor heating pipework may have to run across movement joints in a structural floor slab. Where this occurs, provision has to be made for movement in the screed and floor finish above. Whilst crossing movement joints with piping should be avoided if possible, where they do cross over, a pipe sleeve of a minimum of 600mm long must be fitted to allow sufficient movement. For specific advice on movement requirements, always refer to the screeding contractor or architect.



Movement Joint In Structural Floor

Batten/Sprung floor systems



Batten Floor - On Heated Screed System

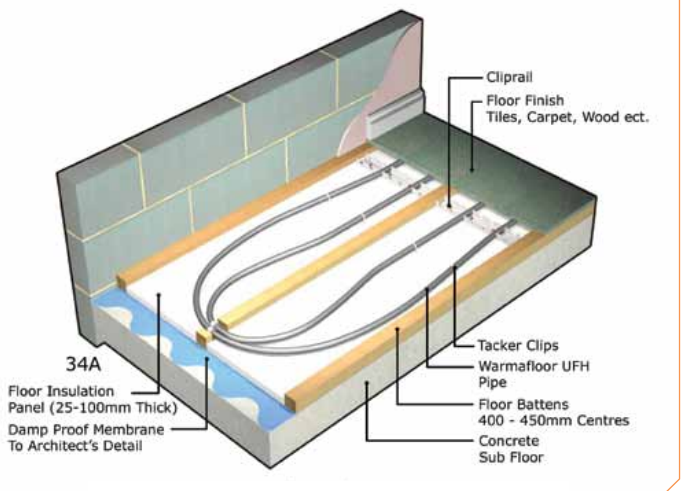
Warmafloor has a number of systems to suit different applications of batten and sprung floors.

These can be split into four categories:

- Systems for use over heated screeds
- Systems for fitting over concrete or timber floors
- Systems for fitting over engineered timber floors
- Systems for fitting over concrete floors with adjustable height battens

Batten floor on heated screeds

Batten floors can easily be installed over floors which have a Warmafloor heating system already embedded in the floor screed itself. This screed provides a level floor, so that the battened floor system can easily be installed on top of the heated screed without further builder's work being required. This system is now widely used, particularly in sports and assembly halls and can be used with batten depths up to 50mm. The heated screed provides a very uniform heat to the timber floor, avoiding peaks of temperature that can occur with other methods fitted between battens.



Batten Floor System

Over concrete or timber deck

In this application suitable floor insulation is laid between the floor battens and the underfloor pipework is installed using a Clip Rail fixing, or secured into the insulation using Tacker pipe clips.

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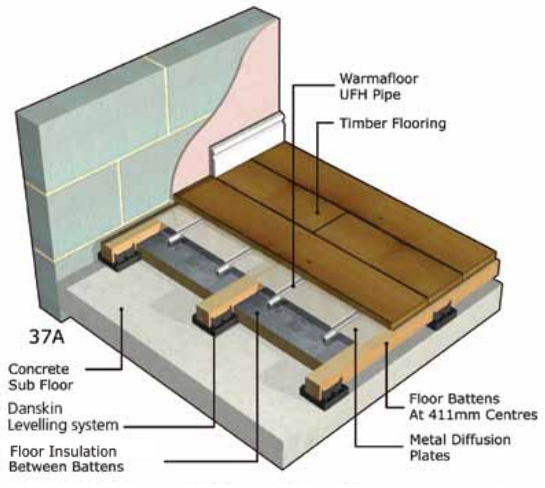
Batten Diffusion Plate system

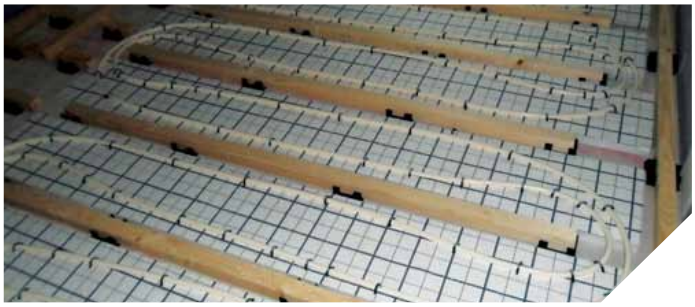
In the case of sports halls and similar applications, battened floors are sometimes installed. Where adjustable height floor battens are used, this provides a variable floor void of 50 - 100mm. In these situations a Warmafloor Diffusion Plate system is required if the standard applications are not suitable. Rigid floor insulation should be installed between battens by the flooring contractor to the required depth and Warmafloor metal diffusion plates with inset pipe grooves installed to the floor battens. After installation of the diffusion plates, Warmafloor PB pipework is slotted into the pipe grooves in the plates and circuited back to the manifold. Flooring is then installed over the completed system. Where this system is used on ground floors, the thermal value of the insulation used must meet the requirements of Part L of the building regulations.

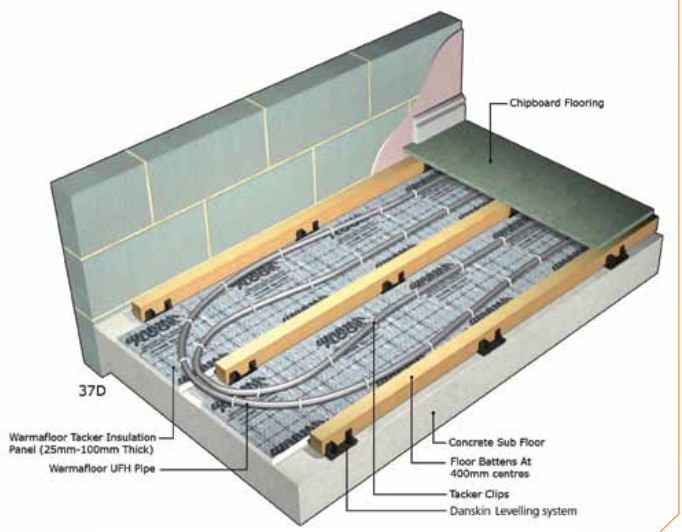


Batten Diffusion Plate System

Acoustic floors to Part E Regulations

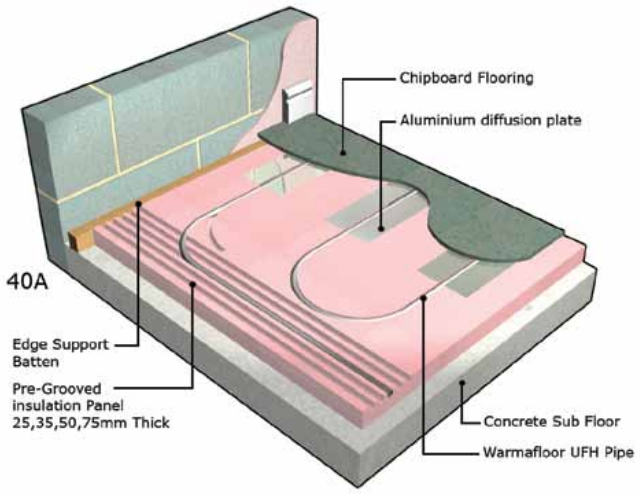
If the flooring is being installed to the 'Sound Transmission in the Building Regulations' Part E, floor battens are fitted with acoustic foam strips or cradles, often with acoustic mineral wool insulation below the floor. When installed in acoustic floors the underfloor system construction will need to be confirmed for each individual application.





Acoustic Batten Flooring System

Floating Floor system



Floating Floor Panel

Panels available in:
25mm, 35mm, 50mm and 75mm thick

The Warmafloor Floating Floor system is for use when underfloor heating is to be installed on concrete floors where a dry finish to the floor is required, not a screed topping.

The maximum heat output of 75 W/m^2 is less than for a screeded floor system, so the Floating Floor system is predominantly for use in new buildings, where the heat requirements of the building are less.

This system relies on the floor being flat and level.

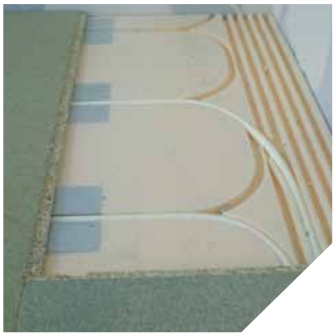
The Floating Floor system involves pre-grooved polystyrene floor insulation panels, fitted with pre-grooved metal diffusion plates into which the underfloor pipework is fitted.

The installation involves laying the Floating Floor panels to cover the complete floor area.

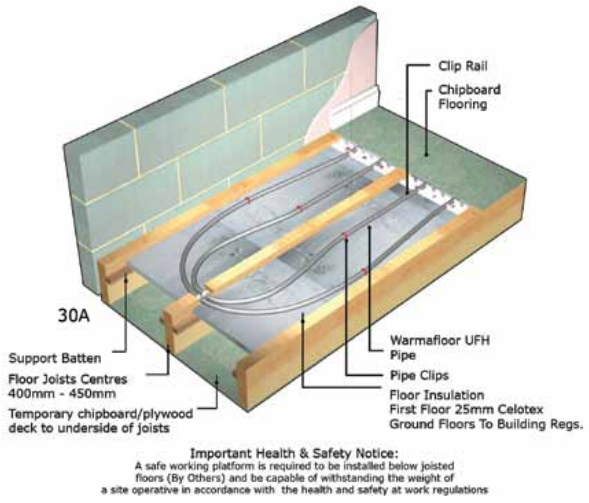
At door openings, floor support battens will need to be fitted as in a normal Floating Floor. Warmafloor PB pipe is then clipped into the diffusion plates, circuited to design requirements and run back to the manifold.

Finally the flooring is laid on the system – chipboard, plywood or dry screeding flooring panels such as Fermacell – and then the final floor covering is laid.

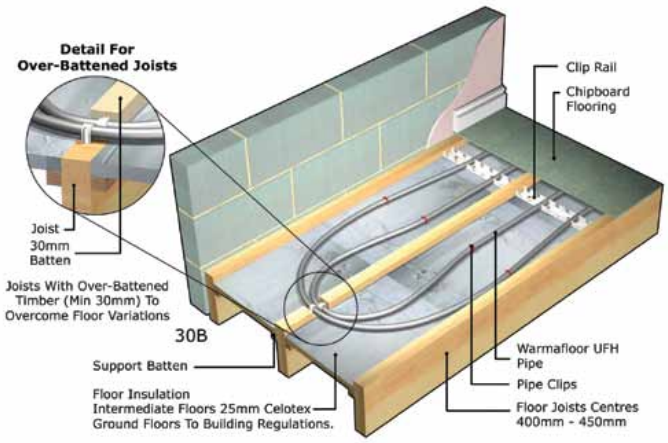
Warmafloor's Floating Floor system offers complete access to the installation for any component repair or replacement, by lifting the flooring.



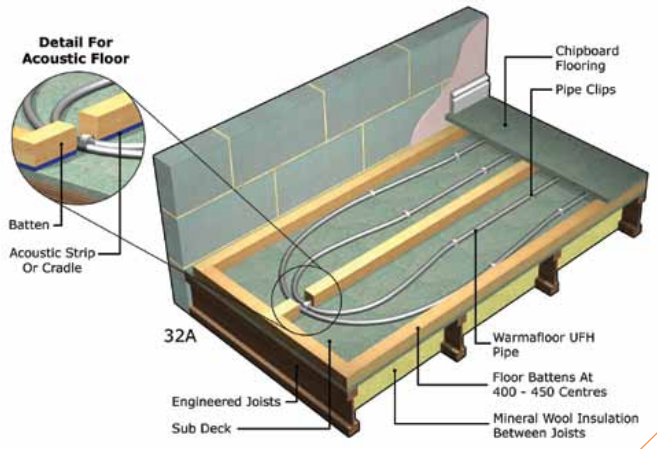
Suspended Floor systems



Standard Joist Floor System



Standard Joist System - Over Batten Detail



Engineered Joist Floor System

There are generally two types of suspended timber floors: standard timber joists and engineered timber joists.

Warmafloor can provide a system for both applications.

Standard joists

Supporting battens are fitted between joists upon which rigid insulation is installed. Pipework is installed on the insulation and circuited via joist notching, back to the manifold.

Should the joists be interspaced with steel beams or other obstacles, it is recommended to over-batten the joists. This provides a clear space in which the underfloor circuits can run without joist notching or other structural clashes. Rigid floor insulation is installed as normal between the joists and the Warmafloor underfloor system is fitted easily within the batten height. The flooring is then finally fitted.

For ground floor applications the insulation between joists must be compliant to Part L of the Building Regulations and the insulation must be tightly fitted, to stop any air ingress from below. On upper floors 25mm Celotex or similar insulation should be used.

Engineered joists

With Engineered joist systems the joists should be decked out with a sub-deck. Batten positions are marked out on the sub-deck, then Warmafloor pipework is laid out and pinned to the sub-deck.

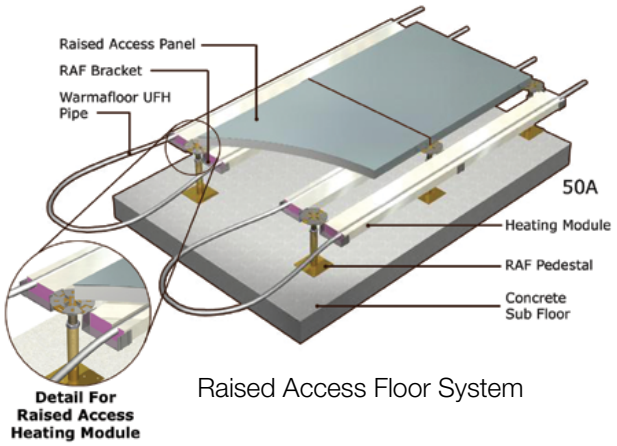
Floor battens are fitted and then the final chipboard or plywood flooring is laid to provide a complete installation. Insulation should be installed between the joists. This type of floor is generally only used on upper floor levels.

Raised Access Floor system

The Warmafloor Raised Access Floor (RAF) system provides warm water underfloor heating/cooling into standard Raised Access Floor. The system can be used with many Kingspan and Propaflor RAF systems.

The RAF floor pedestals are installed and the special Warmafloor RAF brackets are attached to the pedestals. Warmafloor 35mm thick, 1.2m long heating modules are then quickly and simply clipped into the brackets.

Once these are all fitted, continuous lengths of Warmafloor 16mm underfloor heating pipework is inserted into the Warmafloor Raised Access Floor modules, connecting to underfloor manifolds as necessary. Floor panels are then laid as normal.



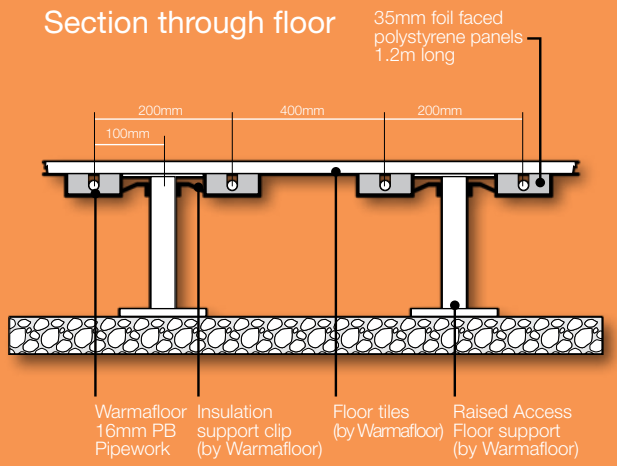
Raised Access Floor System

Cross section through floor

Heating - The Warmafloor RAF system can provide radiant heating from 50 - 60 W/m^2 at a flow temperature of 45 - 60°C.

Cooling – Using a flow temperature of 13°C the system can provide up to 25 W/m^2 from the floor surface. If used in conjunction with plenum ventilation and standard grilled floor panels, this can be increased to 35 - 40 W/m^2.

The Warmafloor Raised Access Floor System makes it possible to install heating/cooling within raised floors, providing a way for large, open plan offices to be heated evenly and comfortably. Areas can be zoned and independently controlled in multiple offices. Should layouts change, the heating modules can be repositioned as required providing a very flexible system.



System benefits

- A very cost-effective solution compared with other alternatives.
- Fast efficient installation.
- Heating modules provide good access to floor void.
- Can be retro-fitted to suitable floors.
- The system is future proof, as it can be dismounted and repositioned.

Patent Nº: GB-2375 815 B

Bespoke systems

Warmafloor underfloor heating solutions are bespoke; designed to meet each project's specifications. They are also ideally suited for use in a growing range of non-standard projects and applications.

The increasing popularity of underfloor heating solutions in traditional applications – such as residential and commercial buildings – reflects widening acceptance of the real comfort and efficiency benefits that these systems offer. They also permit greater flexibility of design, giving architects and interior designers more freedom of expression.

As a result, architects and specifiers are also turning to Warmafloor solutions to provide the same benefits for the developers and occupants of all types of buildings. In addition, they are combining our heating solutions with innovative construction detailing, such as incorporation in access flooring or sports halls.

This surging demand for bespoke systems enables our designers to push the boundaries of underfloor heating technology for the benefit of future users.

With our proven standard design process and our already extensive wealth of expertise in underfloor heating, we are able to adapt basic principles and standard component configurations to provide long lasting effective solutions.

Warmafloor underfloor heating systems can be incorporated into buildings of all types and sizes – in a virtually unlimited range of possible applications.

Bespoke solution within structural ceiling at Gloscat (Gloucester College of Arts and Technology).

A unique and specific solution for in-situ cast slab as used in SGI Brighton.

A unique sports floor underfloor heating solution is used in four West Kent colleges.

Special heating solution built into the walls at the RSPCA Kennels in Bath.

Nursing homes

Warmafloor were strongly involved in a concept to provide 10 care centres in close collaboration with Hampshire County Council. The brief was to provide a bespoke design for each project, to ensure the most effective and environmentally efficient heating system; giving maximum comfort conditions to Hampshire's ageing population.

The initiative was developed in partnership with the County Council and Hampshire and Isle of Wight Strategic Health Authority, at a cost of around £60 million.

The nursing homes were built on 15 sites spread across the county to best serve Hampshire's elderly residents. The ground breaking £60 million project initiative called 'Enhance' was thought to be the first of its kind in the country.

Care apartments

Milton Village Extra Care facility in Portsmouth was constructed in a timber frame using a screed floor finish incorporating underfloor heating. This was only achievable by using a liquid screed with a shallow depth of 55mm, (much less than standard sand/cement floor finishes of 75mm), allowing for a more lightweight construction. Separate underfloor heating zones were created for each bedroom unit and were arranged to allow independent control, taking into account different temperature and timing requirements for different areas.

Ledborough Gate

A distinctive Charles Church housing development of 31 individual homes is designed to the highest specifications.

Each property has a Warmafloor underfloor heating system installed to provide luxurious comfort and warmth throughout.

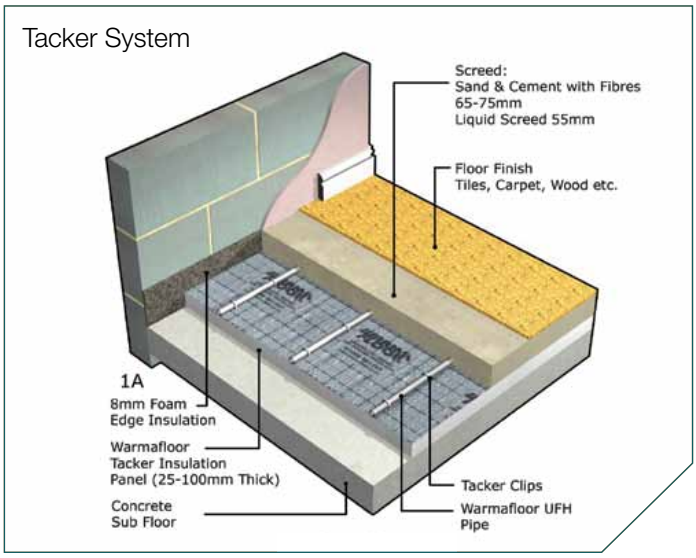
Out of sight underfloor heating, also allows a totally flexible room layout, without radiators to limit sophisticated interior designs.

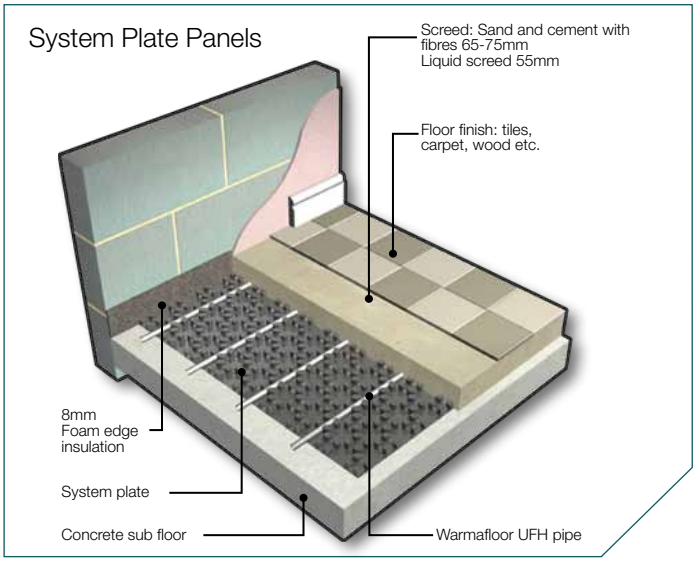
The client wanted total internal flexibility and luxurious warmth, a mixture of floor finishes, and a totally silent operation.

Wembley Apartments

A high density and mixed use block comprising 286 residential apartments forming part of the city's regeneration. This sustainable approach to high rise development incorporates Warmafloor underfloor heating in each of the residential units.

Solid floor system



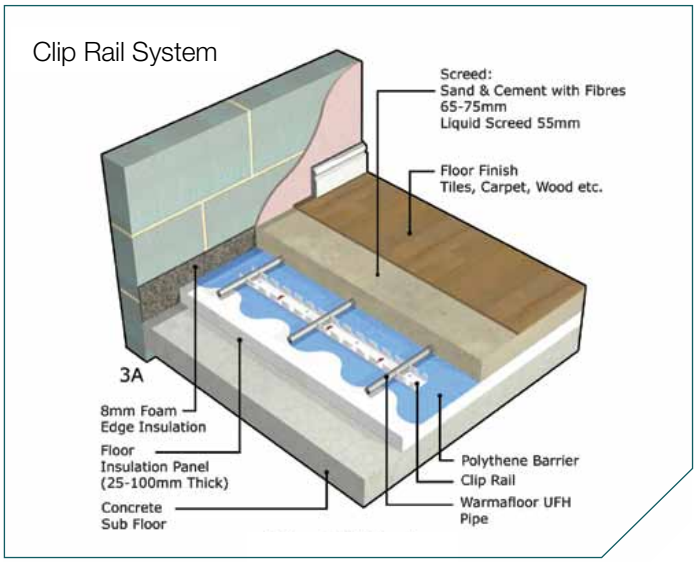


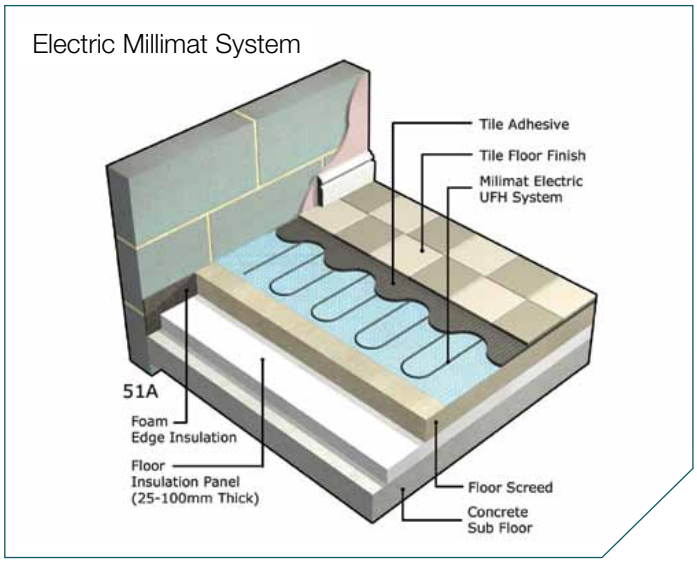
Solid floor screeded system

Many house buyers now appreciate the benefits of underfloor heating and see it as a premium feature when choosing a new home.

Many new developments today use screeded concrete floor systems, which are ideal for incorporating an underfloor heating system as part of the fabric of the building.

Warmafloor offers several types of solid floor heating system – those optimised for use with screeded floors, and those designed for applications where the heating can be cast into the structural concrete floor element.





On the screeded systems, a choice of fixing methods – including Tacker insulation panels, Castellated modular panels, flexible Wire Grid and Clip Rail systems – ensures that the right solution can be found for any application.

Solid floor systems can be combined with almost any kind of floor finish – allowing specification flexibility in standard designs.

Electric Millimat and controls can be provided on a supply only bases for tilers, builders or D.I.Y. installation.

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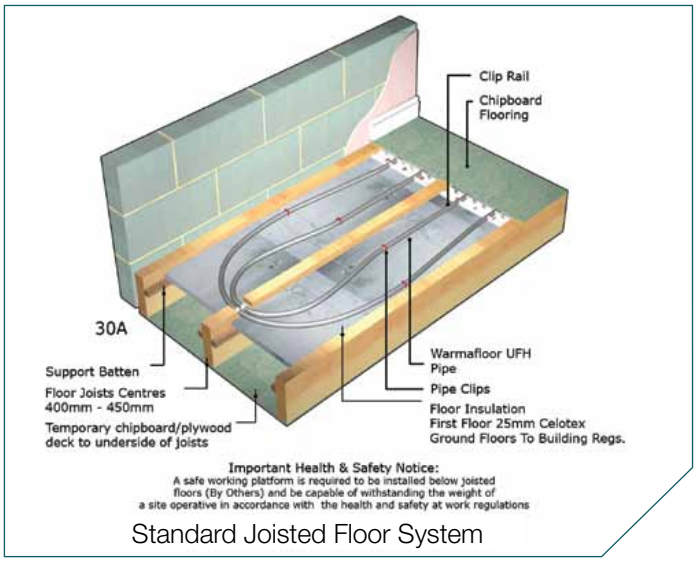
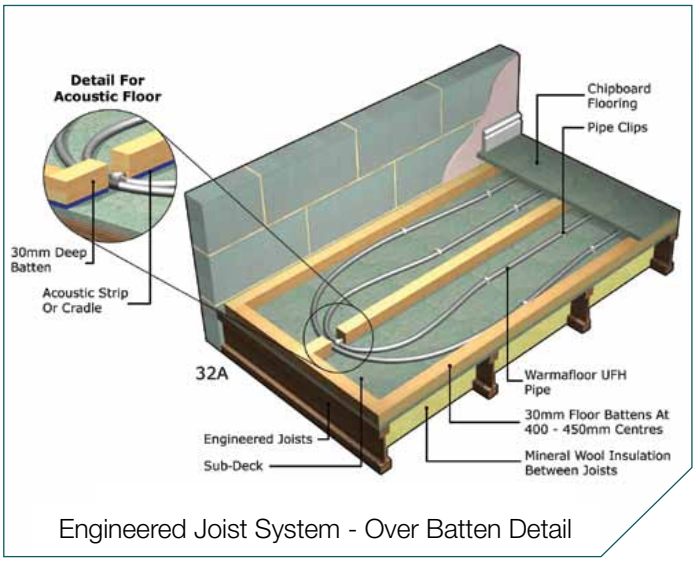
Floating and suspended floor systems



Standard Joisted Floor System



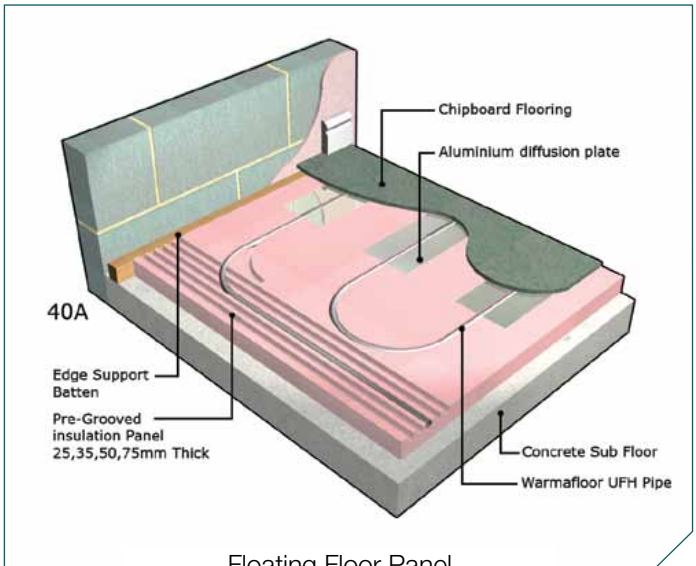
Engineered Joist System - Over Batten Detail

With floating and suspended floor systems the heating system does not need to be incorporated into the fabric of the building. As it is a dry trade installation, there is no need to wait until a screed has dried before fit-out can continue.

Joisted floors in domestic applications are generally found in first or second floor applications. A solution can be found to provide a system appropriate to most types of joist system. The floor is finished with a layer of timber flooring strips or chipboard as required.

For example, where timber suspended floors are specified, the Warmafloor insulated elements can simply be positioned between the joists and held in place with battens.

This is a straightforward system to install, offering lasting benefits.



Floating Floor Panel

Pre-grooved insulation boards incorporating aluminium diffusion plates which are suitable for concrete slab, screeded and below chipboard floors, where a dry floor finish is required. The insulation panels are machined from high performance extruded polystyrene with a high compressive strength of 200kN/m^2.

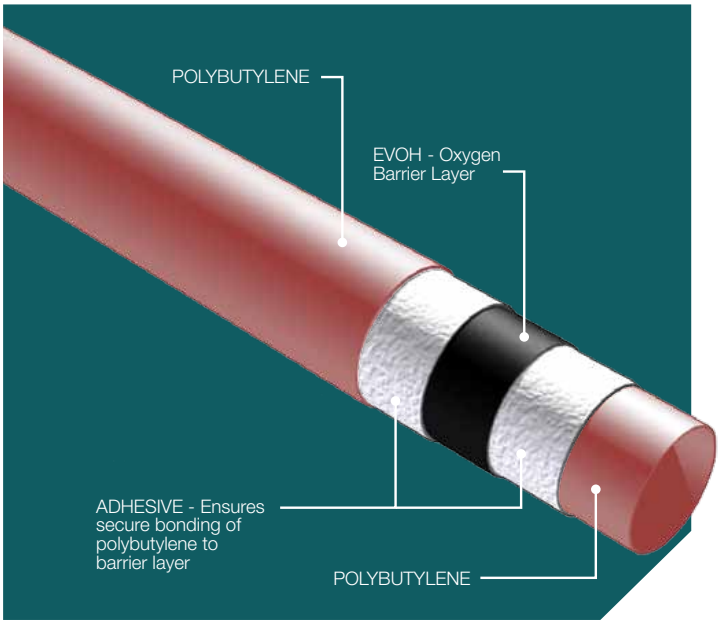
The low thermal mass allows faster response times when compared with screeded floors.

Polybutylene pipe

Pipe usage

Warmafloor uses Polybutylene barrier pipe to circulate warming or cooling water through the floor (or wall or ceiling). The EVOH (ethanol vinyl alcohol) barrier layer is embedded within the pipe wall, using a 5 layer co-extrusion process to ensure that oxygen cannot permeate through the pipe wall over time, to enter the water circuit.

The introduction of oxygen into the system could potentially contribute to corrosion in the boiler or metal pipework in the rest of the system.



Performance

Polybutylene has an unrivalled balance of properties to satisfy the demands of the hot and cold pressurised water pipe market. The main aspects which distinguish it from other candidate materials are its flexibility and superior resistance to stress over long periods of time at high temperatures.

Flexibility is a key factor because it eases installation across a broad range of internal temperature conditions. The relative flexibility of different plastics is indicated by the table (right) showing typical flexural elasticity values for different polyolefin pipe materials.

Polybutylene is non-corrosive, resists frost damage, and is unaffected by hard, soft or aggressive water conditions. It is creep-resistant and offers high impact strength meaning that if it is distorted on site, it will return to original shape.

Material Properties	Methos	Unit	Performance
Physical Properties Density	ISO 1183	g/cm^3	0.937
Mechanical Properties Wall Roughness		mm	0.007
Tensile Strength at Yield	ISO R 527	MPa	18
Tensile Strength at Break	ISO R 528	MPa	40
Elongation at Break	ISO R 529	%	350%
Flexural Elastic Modulus	ISO 178	MPa	350
Notched Impact Strength at 20°C	ISO 180	kJ/m^2	65
Notched Impact Strength at 0°C	ISO 180	kJ/m^2	25
Thermal Properties Melting Point Range	DSC[a]	°C	124 - 126
Vicat Softening Temperature	ISO 306	°C	116
Co-efficient of Linear Thermal Expansion	ASTM D696	-	1.3x10^{-4}
Thermal Conductivity (20°C)	ASTM C177	-	0.19
Specific Characteristics Wet Abrasion (sand slurry test, 23°C, 100h)		%	1

Guarantee

Warmafloor Polybutylene pipe is designed to last for the life of the building and is guaranteed for 100 years. This guarantee period is longer than other credible warranties being offered.

The pipe is manufactured to, and performs to, all known European quality and performance standards, including:

BS EN 9001:2008
BS EN ISO 21003 BSI Kitemarked

Environmental manufacturing

Polybutylene is produced from crude oil by refining and polymerisation – the polymer is extruded to create the finished product. Polybutylene has markedly less embodied energy than almost all competing materials by virtue of the ease with which raw materials can be transported and the manufacturing process.

The manufacturing of Polybutylene pipe has significantly less environmental impact in terms of energy usage and emissions, than is the case for metal pipe systems and other plastic pipes.

Finally, because Warmafloor uses UK manufactured pipe there is minimum environmental impact in transporting the finished product to site.

Recycling and re-use

Recycling of Polybutylene is possible because the molecular structure of the material is not altered by the production process. Any 'clean' production waste during the manufacturing process is reworked and added back to the production process in accordance with ISO 15876 and BS 7291.

Polybutylene pipe used in underfloor heating applications will almost always out-live the building. Pipe is installed within the fabric of the building in unjointed pipe-runs. Where Polybutylene pipe is damaged, eg by building refurbishment, it may be repaired by a simple push fit repair connector, which maintains the molecular integrity and all the performance characteristics of the undamaged pipe.

Features and Benefits of Polybutylene
Standard and barrier pipes available
High flexibility even at very low temperatures
Resistant to stress
Non-corrosive
Resistant to frost damage
Inert to water hardness/softness
Unaffected by chemical inhibitors
Pipework does not encourage micro-biological growth
High impact strength
Creep resistant
Fully protected internal barrier
Low energy consumption in manufacture
Produced in compliance with ISO 14001
Low environmental impact in terms of soil, water and air pollution
Physiologically safe – will not taint water
Minimal internal resistance reducing hydraulic pumping head
Safe installation procedures – no requirement for pre-tempering of pipe
Pipes can be fusion welded, if required
No flame, specialist tools or chemicals required during installation therefore no risk to installers
100 year warranty
Readily recycled
Recycled material has same recoverable heat energy as heating oil
Does not produce toxic or corrosive gases when burned
Proven in installations since the 1970s and on many high profile construction projects
Suitable for heating and cooling applications
No intrinsic resale value
Multitude of coil lengths for economical installation with minimal waste
Size and type of coil specifically engineered for embedded coil technology
UK manufacture, reducing whole life cost including transportation

Underfloor manifolds and actuators

Standard Modular and Blending Manifolds

Warmafloor Standard modular manifolds are used where the water supply temperature to the manifold is provided at the correct temperature and flow rate for the underfloor system.

Warmafloor Blending manifolds are for use where the LPHW supply to the manifold is at a higher temperature than required for the underfloor system.

Standard manifold dimensions											
Circuits	2	3	4	5	6	7	8	9	10	11	12
Manifold width (mm)	330	380	430	480	530	580	630	680	730	780	830

Manifold Height 440mm - **Depth** 120mm
Fitting clearance - manifold width 100mm, height 250mm, depth 175mm manifolds should be fixed at a height of 300mm from finished floor to bottom of manifold. Access is required to front of the manifold for maintenance purposes.

Electric actuator 24v or 240v

These are available for automatic circuit control via a room thermostat or sensor

Voltage	240v AC	24v AC/DC
Power consumption	2w	2w
Running current (max)	300mA	250mA
Maximum current	0.15 amp	0.25 amp
Time to fully open	4 minutes	3 minutes
Power ON	Circuit Open	
Power OFF	Circuit Shut	

Composite Manifold

Our composite manifolds utilise the most appropriate materials for the specific function they are intended. Therefore the body of the barrels is manufactured from Glass Fibre Reinforced Black Polyamide (GRBP). The material is not adversely affected by accidental contact with linseed oil sealing compounds and will be unaffected by soft, hard or aggressive water or inhibitors.

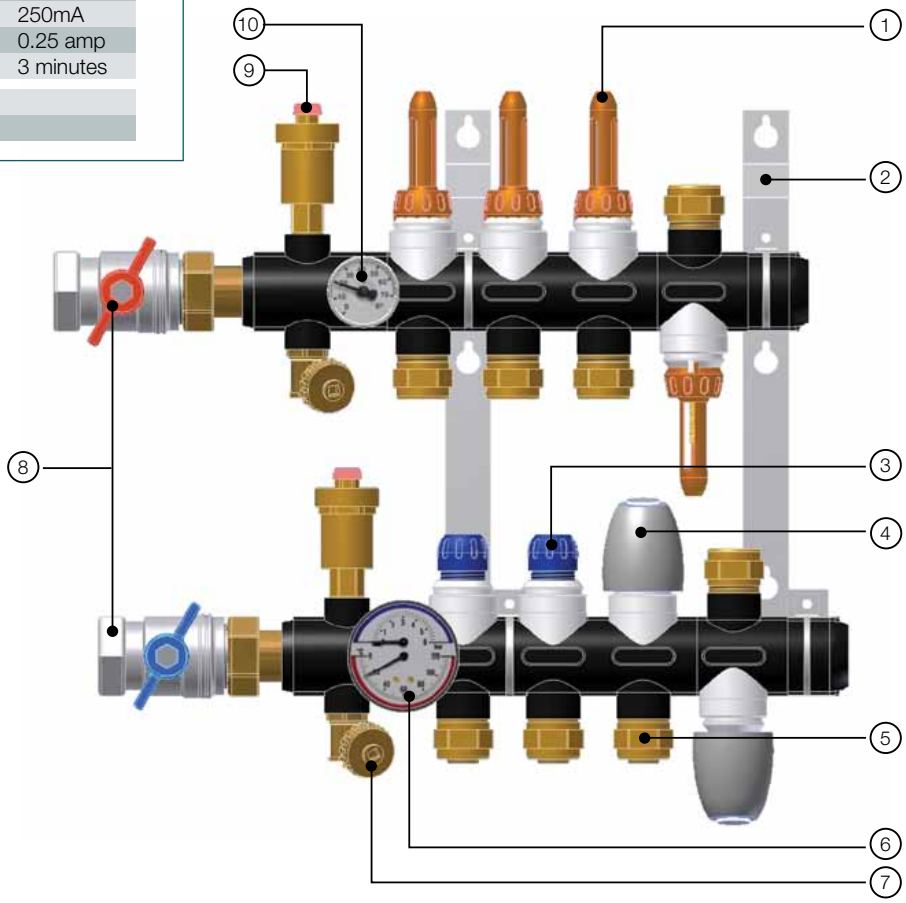
The circuit flow rate adjusters and indicators are manufactured in ABS known, for its wide use in plumbing materials and its operating temperature range.

Gauges are industry standard giving reliable and accurate readings.

Sealing rings are manufactured from EPDM rubber. Again this is used for long term secure durability.

Industry standard brassware is used for compression connections for both 16mm and 20mm polybutylene pipe, drain cocks, AAV, blending valve assembly and pump connections.

High grade stainless steel ball valves are used to isolate/shut-off the manifold.



1. Flow rate adjuster/indicator
2. Wall mounting bracket
3. Manual head
4. Thermoelectric actuator head
5. Pipe connectors 16-20mm
6. Combined pressure & temperature gauge
7. Fill/drain valve
8. Isolating valve
9. Automatic air vent
10. Flow temperature gauge

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Special stainless steel brackets are used to secure the manifold and offset the barrels to allow the flow pipework to be routed behind and adjacent to the return connection.

Warmafloor use a Grundfos Alpha standard 25/60 pump with a 3 speed setting with a EPC “B” rating.

Warmafloor also provide the composite Blending manifold with a Grundfos Alpha 2 inverter drive 15/50 pump with an EPC “A” rating. This provides superior energy/system performance if required.

The Blending manifold set utilises a full bypass valve which is unique in that it can be used in both heating and cooling mode. The advantage of this is that it can be used with heat pumps and future/ alternative energy sources.

The standard manifold also provides this capability.

Blending manifold dimensions											
Circuits	2	3	4	5	6	7	8	9	10	11	12
Manifold width (mm)	470	520	570	620	670	720	770	820	870	920	970

Manifold Height 490mm - **Depth** 130mm
Fitting clearance - manifold width 100mm, height 250mm, depth 215mm manifolds should be fixed at a height of 300mm from finished floor to bottom of manifold. Access is required to front of the manifold for maintenance purposes.

Thermostatic control head settings		
Screeded floor	Position	Temperature °C
	1	10
	2	20
	3	30
	4	40
Timber floors	Position	Temperature °C
	5	50
	6	60

1. Flow rate adjuster/indicator
2. Wall mounting bracket
3. Manual head
4. Thermoelectric actuator head
5. Pipe connectors 16-20mm
6. Combined pressure & temperature gauge
7. Fill/drain valve
8. Isolating valve
9. Thermostatic control head
10. Circulating pump
11. Flow water temperature sensor
12. Automatic air vent
13. Flow temperature gauge

Both types of manifold now have 1” single side flow and return primary connections which can be handed to satisfy specific requirements. This also enables primary pipework to be routed horizontally or vertically, to one point of connection.

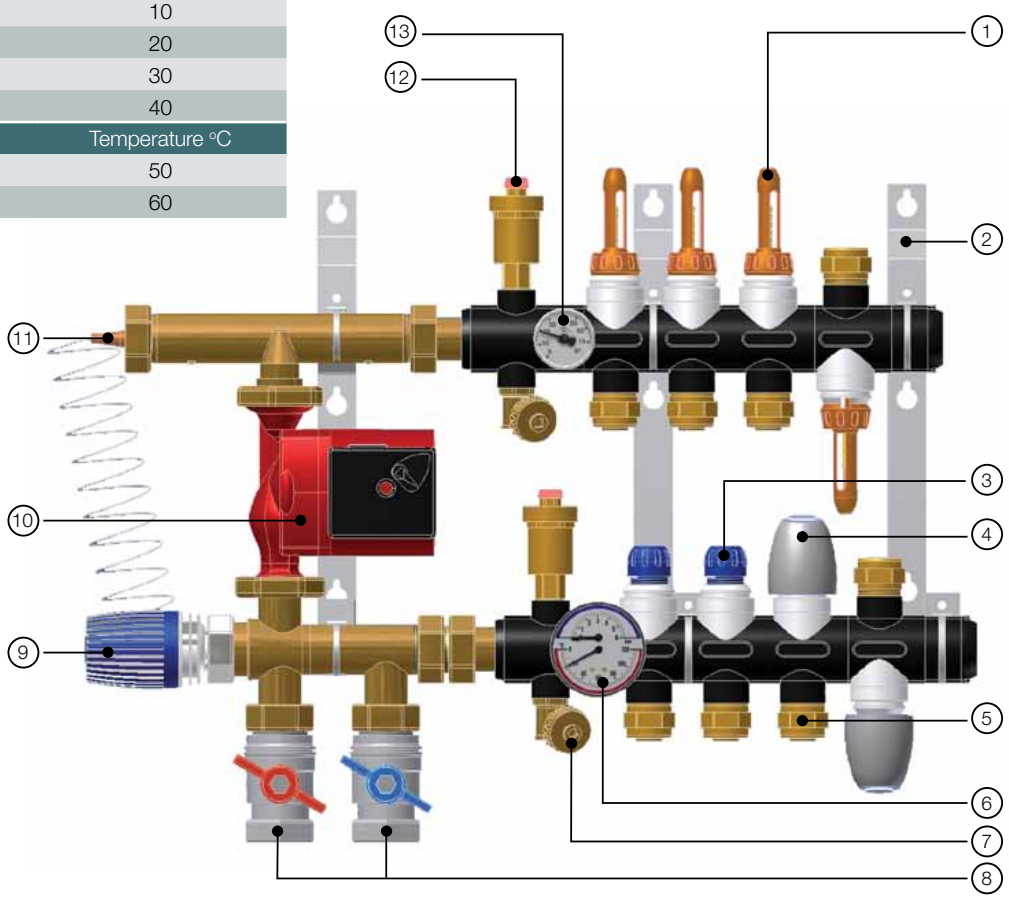
The ports on the barrels are threaded and lock in position in both vertical planes allowing for a 180 degree rotation. This allows Warmafloor to serve circuits both above and below from one manifold.

The sealed actuator units also allow safe operation when ports are serving circuits above the manifold.

All configurations of the manifold have been tested rigorously by the British Board of Agreement (BBA CERT.10-4738). This has resulted in the BBA certifying the manifold to a minimum life expectancy of 25 years under normal operating parameters. Typically this is a maximum temperature of 70°C and a minimum of 4°C. The maximum working pressure is 4 bar and maximum test pressure is 8 bar. Maximum primary flow rate for a standard composite manifold is 60 litres per minute whilst the Blending manifold is 30 litres per minute.

The manifold is a modular manifold made up with single or 3 port pieces for maximum flexibility. A 12 port manifold is the maximum size. (sizes/dimensions are given in the table).

The manifold incorporates a simple lift balance cap and memory ring which facilitates easy flow rate calibration.



Screeds over underfloor heating

Except for buildings where the concrete slab is left exposed, (such as a warehouse), all concrete floors are covered with a screed layer, which provides a final level finish, onto which is installed the floor covering; tiles, carpet, wood etc.

When underfloor heating is installed, perimeter wall insulation and floor insulation panels with a fitted moisture barrier are installed on the floor slab and the underfloor pipework secured to the panels. This is then covered with the final screed layer.

The screed has to be of suitable depth both for strength and to provide sufficient cover over the underfloor heating pipework to avoid the screed cracking. When installed over floor insulation the screed is called a floating screed.

There are four main types of screed that are used:

Sand and Cement (with added fibres)

Sand and cement screeds are a mixture of sand and cement generally in a 4 to 1 ratio mixed with water. Sand and cement screeds are either mixed on site or can be obtained ready mixed from the plant. We recommend the use of added fibres which reduce micro cracking to the screed surface.

Sand and Cement Enhanced Screeds

Enhanced screeds are sand and cement screeds with added chemicals that improve the properties of the standard screed. The improved properties included faster drying times and/or extra strength. The additives are made by various manufacturers and are sold under their own trade name, eg Flexidry F1. The screeds can be obtained for site mixing.

Anhydrite (Calcium Sulphate) Screeds

Anhydrite screeds are a different type of screed from sand and cement. The screed is made from calcium sulphate, sand, water and other chemicals to form a liquid screed. Unlike sand and cement screeds (which are spread, compacted and levelled), the screed is poured onto the floor through a delivery hose and levelled with a dappling bar. Large areas can be covered much more quickly with this screed type. It is essential, however, that the floor and edge insulation must be fully waterproofed, by taping and sealing all joints in the floor and edge insulation.

These screeds are sold under manufacturers' trade names and delivered to site ready mixed.

Whilst a large area of this screed can be installed quickly, it has the disadvantage of a long drying time and it cannot be laid in wet areas, or laid to falls.

Liquid Cementitious Screeds

This type of screed is similar to an anhydrite screed but uses cement instead of calcium sulphate. It is generally much stronger and can be rapid drying. Although available, it is less common in use.

Expansion Joints/Crack Inducers

All screeds expand and contract to some degree, so allowance has to be made for this. The perimeter insulation fitted with underfloor heating allows for some of this, however large areas will need to have expansion joints or crack inducer cuts in the screed itself to allow movement and avoid screed cracking. Expansion joints will also be required to mirror any expansion joints in the floor slab. These should be as recommended by the screeder or architect.

Day Joints

Day joints are positions where the screed has been finished on one day and will be carried on the next day. In these positions, to avoid cracking, the joint needs to be reinforced with mesh to bond the screed together. Alternatively an expansion joint should be fitted in this position.

Floor Tiles, Marble Floors, Stone Floors

Where the screed is to be finished with a rigid tile, marble or stone topping, the expansion provisions are very important as screed movement can crack the floor finish. The flooring should be designed by the floor installer detailing expansion provision in the floor tiles themselves. This can then be mirrored with a separate bedding layer with expansion joints, or in the screed below. Alternatively, a de-bonded bedding layer for the floor finishes can be installed above the screed.

Screed Level and Surface Flatness

All screeds have to be installed to a British Standard of level and flatness.

Flatness – the variation in gap under a straightedge placed anywhere on the surface, to be not more than the following:
- 10 mm under a 2m straightedge – SR3
- 5 mm under a 2m straightedge – SR2*
- 3 mm under a 2m straightedge – SR1

* In general use.
Permitted level tolerance from floor datum +/– 10 mm.

Reinforcing Mesh

In sand and cement type screeds the use of D49 mesh can be used to reinforce the screed to avoid cracking. In areas where a number of underfloor circuits can come together such as some manifold locations, or where the screed is below the recommended thickness, the screed should be reinforced by the installation of D49 mesh, at mid point in the screed, over the underfloor pipework. We recommend PP fibres as a minimum reinforcement.

Screed Treatment for Finishes

If an adhesive or other finish is to be applied to the screed, it may not be able to be applied directly; a sealer may be required first. Always check with adhesive/finish manufacturer.

Remember

No concrete floor will be flat and level on a building site, so it is best to do a level floor survey to ensure enough depth above the floor slab is available for the underfloor heating and screed. When specifying screed depths, it is important to ensure the minimum specified depth allows for some intolerance in the floor slab. Always contact the screed manufacturer for specific requirements.

Screed over underfloor heating (floating screeds)

Screed types **Trade Names**		Sand and cement with added fibres Site or plant mix	Enhanced sand and cement with added fibres - Flexidry - Tarmac Truscreed - K-Screed	Enhanced sand and cement with added fibres - Flexidry etc.	Anhydrate (calcium sulphate) - Tarmac Truflow - RMC Supaflo - Lafarge Gyvlon	Flowing cementitious - Ecoscreed
Installation rate m^2 per day		100-250	100-250	100-250	500-1000	600
Screed strength		18Nmm^2	25Nmm^2	30Nmm^2	30Nmm^2	30Nmm^2
Recommended minimum screed thickness over insulation*	Domestic*	65mm	65mm*	65mm	55mm	55mm
	Commercial*	75mm	75mm*	75mm	55mm	55mm
Minimum cover over pipework		40	40	40	30	25
Light foot traffic		24-48 hours	12 hours	12 hours	24-48 hours	4 hours
Site traffic		5 days	5 days	5 days	5 days	2 days
Suitable for wet areas		Yes	Yes	Yes	No	Yes
Approx screed drying times @20°c ambient		-	refer to manufacturers data sheets	-	1mm per day up to 40mm the 0.5mm per day	-
55mm thick		-	-	-	70 days	70 days
60mm thick		80 days	18 days	7 days	80 days	80 days
65mm thick		90 days	20 days	7 days	90 days	90 days
75mm thick		110 days	22 days	7 days	110 days	110 days

Notes:

Drying times - Exact drying times for screed to completely dry are dependent upon temperature, humidity and air movement in building.

*Cover over pipes - Screed depths stated above allow sufficient cover over underfloor pipework, allowing for some level of intolerance in floor slab.

Floor coverings - Before application of floor coverings, moisture content of screed must be checked.

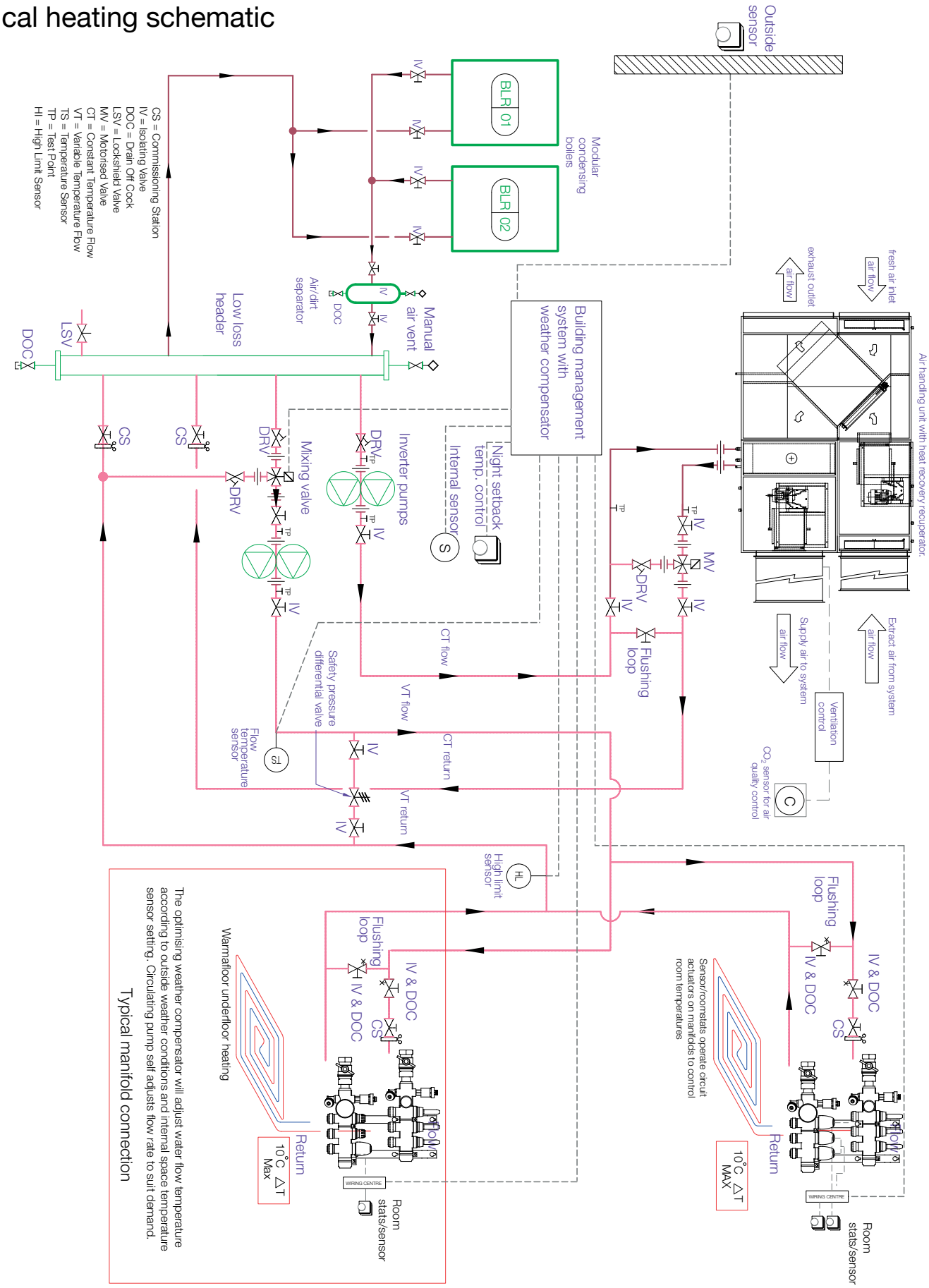
Lower screed thickness - Some enhanced sand cement screeds can be installed at a depth less than those shown in the table, when used with reinforcement - however in all cases this must be checked and confirmed by the screed manufacturer.

Useful telephone numbers

Flexi Dry	0845 555 5656
Tarmac	01298 768555
Ecoscreed	01372 842102
Lafarge Gyvlon	01925 428780

Flexidry drying times:
F0 - 3 days
F1 - 7 days
F2 - 14 days
F3 - 21 days

Typical heating schematic



Control systems

Basic Control

Each underfloor heating system will require thermostatic controls. This can range from the simplistic to very sophisticated systems or integration to a full BMS (Building Management System) to ensure operation is compatible with the building use and occupant comfort.

Basic controls are thermostats mounted on to a wall surface or on a standard wallbox.

Warmafloor controls - thermostats and sensors

Standard thermostat	
230v	24v
Size - 85(w) x 85(h) x 31(d) (mm)	

Tamperproof thermostat	
230v	24v
Size - 85(w) x 85(h) x 31(d) (mm)	

Wiring Centres

240V/24V

Wiring centres can be provided to interface between the room thermostats and the manifold circuit actuators. The wiring centres can also operate the manifold circulation pump (if fitted). The wiring centres have a volt free contact for remote boiler demand or BMS interface/signal.

- Supply to all wiring centres is 240 volt.
- 24 volt wiring centres have an inbuilt transformer.

Remote sensors

Nipple sensor

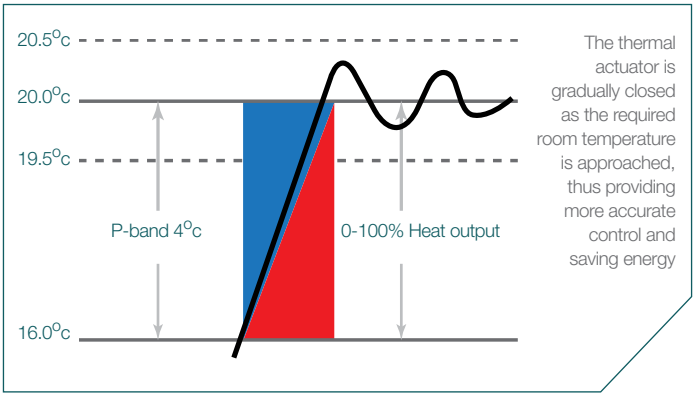
Remote sensor

Thimble sensor

Total Integrated Control Strategy (TICS).

Touch screen technology has enabled system development that can control up to 32 zones, providing management of temperature, scheduling, boost, system prioritisation, weather compensation and multiple heat sources.

Operation of the system is via a central control unit that is located where the specifier/user wishes. A simple intuitive menu system enables operation of the underfloor heating to be easily configured.



Installation of the 12 volt system is straightforward, using a single cable bus wiring network system. In essence this eliminates more elaborate wiring associated with standard 240v cabling. The system is low voltage and therefore safe using 12v to illuminate the room sensors.

Should a building be altered or extended in the future, the system is flexible to include additions of room sensors, as each has its own unique identification code and the single wiring system can be extended into the new areas.

Underfloor heating systems require minimal maintenance. The pump and actuators on the manifold require exercising during extended periods of inactivity. The control system has a built in exercise programme to help eliminate costly maintenance call outs.

Underfloor heating is the most energy efficient form of heating a space available. To further maximise these efficiencies our TICS utilises P.I. (Proportional Integration) control. P.I. control ensures rapid and stable control of room temperature eliminating over or undershoot. The result is an additional and substantial energy saving and subsequent cost reduction.

At your service

System design

With our complete portfolio of systems, we can assist you in selecting the most effective solution for your project. Our design teams will produce scheme layouts and CAD detailed drawings showing full pipework layouts, pipe lengths, thermostat and manifold positions, controls, wiring diagrams, and attendant building details.

System installation

We provide a complete comprehensive design, manufacture and installation service, using the expertise of our own fully trained workforce. In addition, systems are available on a supply-only or a design and supply basis; for those qualified to carry out the installation work themselves.

System commissioning

Once the underfloor installation and the rest of the building programme is completed, our specialist teams can return to site during the commissioning process and undertake responsibility for system balancing and system operation testing. We can provide full record drawings together with testing and balancing certificates and O&M documents for the whole building.

System after care

Once the system is commissioned and the building is occupied, we can offer a bespoke aftercare service to carry out routine inspection and maintenance; to ensure optimum performance. We can assist in rebalancing the system when parts of the building undergo a change of use.

CPD Seminars
and training
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