

Your guide to underfloor systems and floor types



warmafloor
we know a touch more

Contents

Solid Floor Screeded Systems	4
Structural Concrete Floor Systems	7
Floating Floor Systems	9
Batten / Sprung Floor Systems	10
Suspended Floor Systems	11
Raised Access Floor System	13
Bespoke Systems	14
Screeds over underfloor heating	15
Next steps with Warmafloor	16

If you have the floor, we have the system

Underfloor heating and cooling can be installed in any type of floor construction and with most floor coverings.

From offices, schools and residential blocks, to sports academies, churches, museums and factories, we have extensive experience, and have gained invaluable knowledge, in meeting the challenges of even the most demanding projects.

Because we provide an end-to-end solution, we also have the ability to

tailor systems and components to meet bespoke needs, which have included installations in walls and ceilings as well as floors. We can also project manage the screed installation.

Over the following pages, we detail the systems we can provide for common floor types, but do get in touch directly if you have a project requirement not covered in this brochure.

Call: 01489 581787

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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.

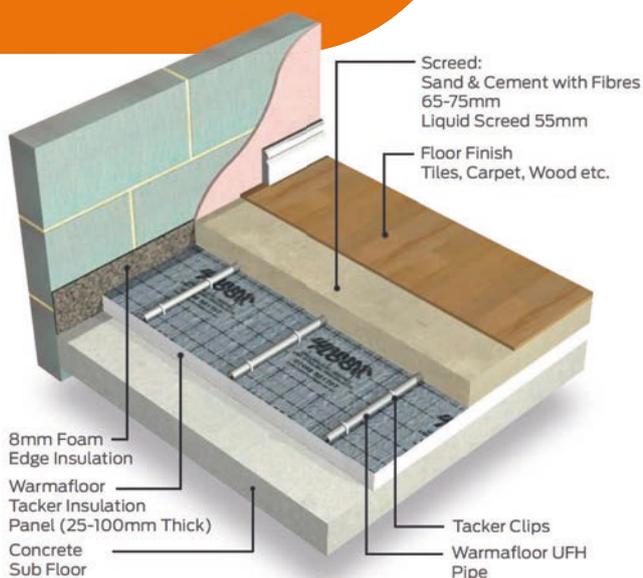
Warmafloor Tacker floor insulation panels are available in any thickness and various insulation materials, providing solutions for any floor requirement.

The floor insulation panels, whilst generally supplied in expanded polystyrene EPS, are also available in polyisocyanurate (PIR) 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.



Wire Grid System

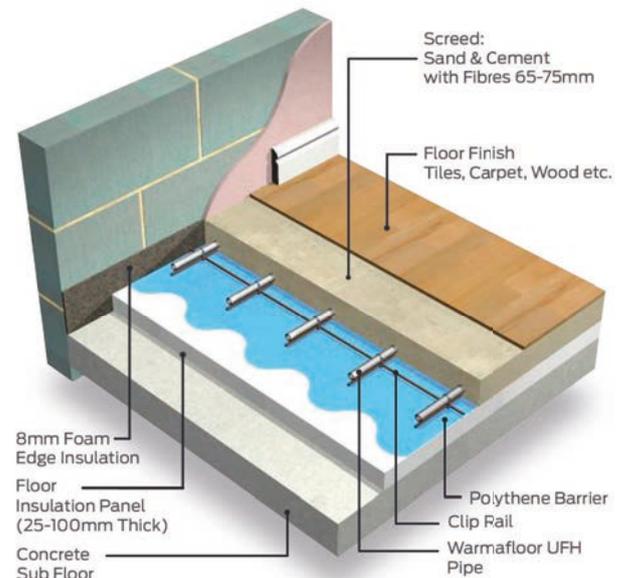
The Warmafloor Wire Grid system is a simple to install approach that provides a robust fixing system where Warmafloor Tacker floor insulation panels are not used.

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

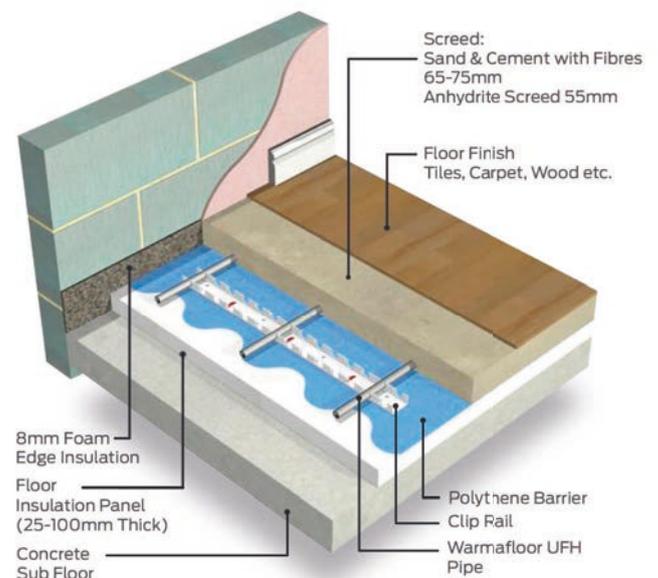
The Warmafloor Clip Rail system comprises plastic pipe-locating rails, fitted to the floor insulation, into which Warmafloor PB pipework is clipped.

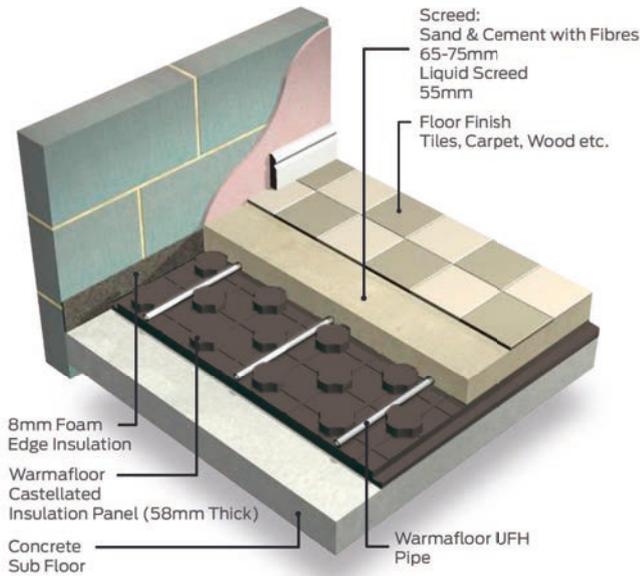
The rails are available for both 16mm and 20mm pipe.

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.





Castellated Plate Panels

Warmafloor castellated 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. Castellated plates are useful where there is a restricted floor depth.

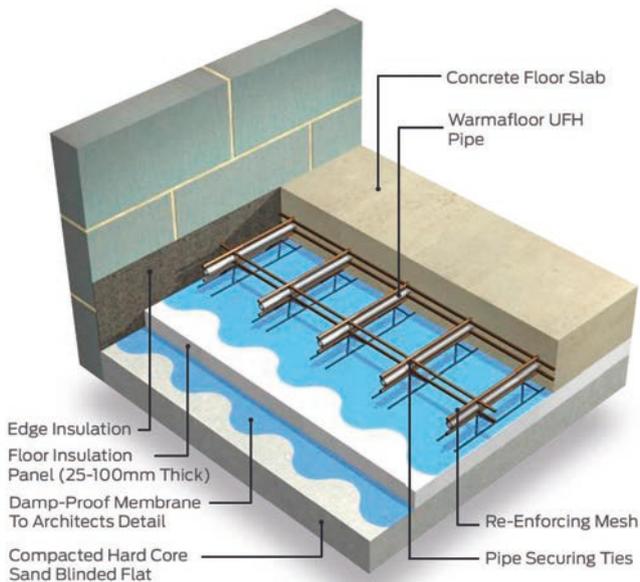
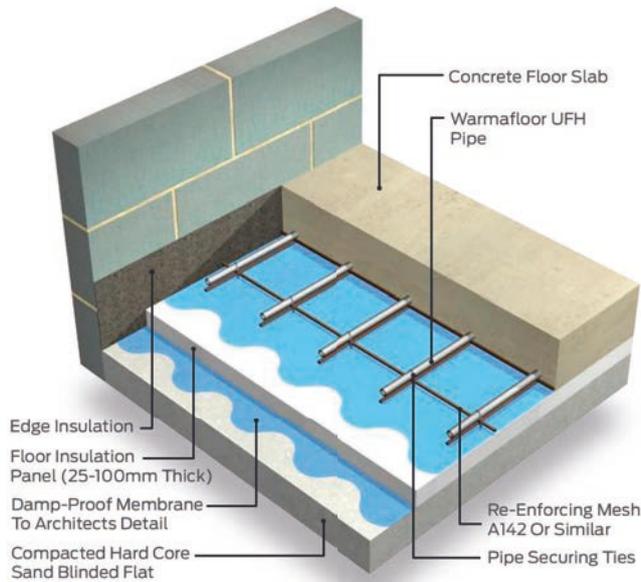
Warmafloor 16mm PB pipework is clipped into the panels and the installation is complete and ready for the specified screed to be laid.



Surface heating has a 40% shorter installation period

1-2 weeks' preliminary savings over other heating options.





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.

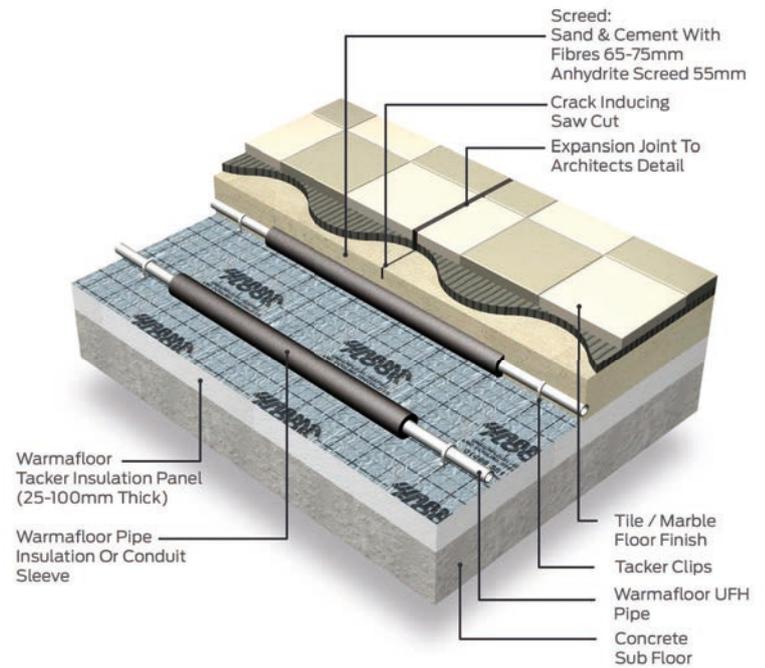
The Warmafloor PB pipework is circuited to the Warmafloor manifolds, filled with water and tested. Concrete is then laid to the required depth and strength, dependent upon the design criteria of the slab.

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

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.

All expansion joint layouts should be co-ordinated with screeder/floor finish company and confirmed by the architect.

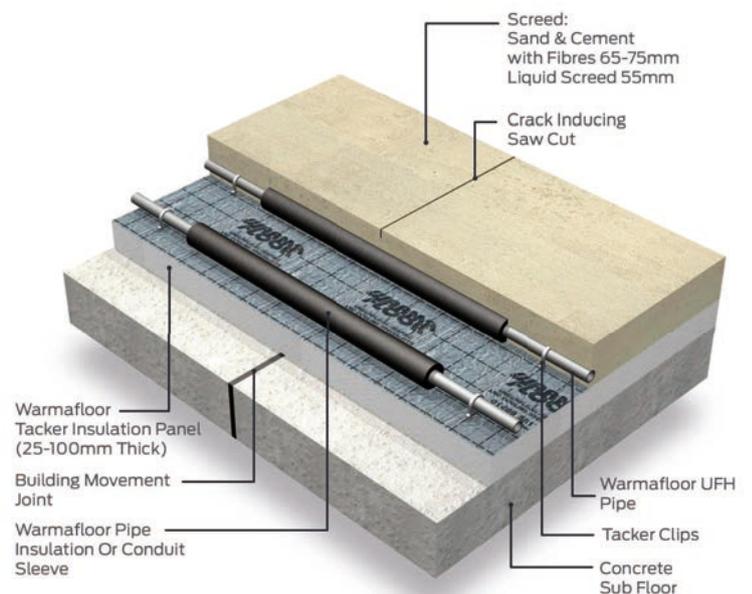


Screeded Floors

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.



Mojave

A ground breaking system utilising award-winning screed board to deliver greater efficiency, significant cost savings and with extensive logistical, structural and engineering benefits over traditional wet screeds.

Routed high density extruded polystyrene thermal insulation boards provide significant strength and water resistant benefits over traditional EPS panels. Available in thicknesses between 25mm and 100mm, the boards can be supplied to meet specific floor heights.

Heat diffuser plates are bonded to the insulation boards during the design process and 16mm pipework is installed between the routing above the diffuser plates, PB 100 Year guarantee.

ScreedBoard®s are installed on top of the pipework and diffuser plates. The boards physical properties allow room heating and cooling to be achieved more cost effectively than traditional floor treatments including chipboard. ScreedBoard®s also accept ceramic tiles directly making them ideal for wet areas such as kitchens and bathrooms.



Floating Floor System

This system relies on the floor being flat and level and involves pre-grooved polystyrene floor insulation panels, fitted with pre-grooved metal diffusion plates into which the underfloor pipework is fitted.

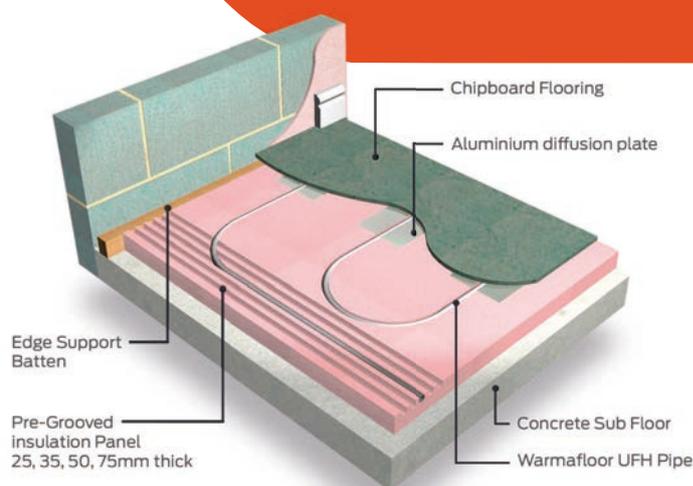
The installation involves laying the Floating Floor panels to cover the complete floor area.

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

Floating Floor Systems

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/m² 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.



to design requirements and run back to the manifold. Flooring is then laid on the system – chipboard, plywood or dry screeding flooring panels such as Fermacell – and then the final floor covering is laid.

This system offers complete access to the installation for any component repair or replacement, by lifting the flooring.

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

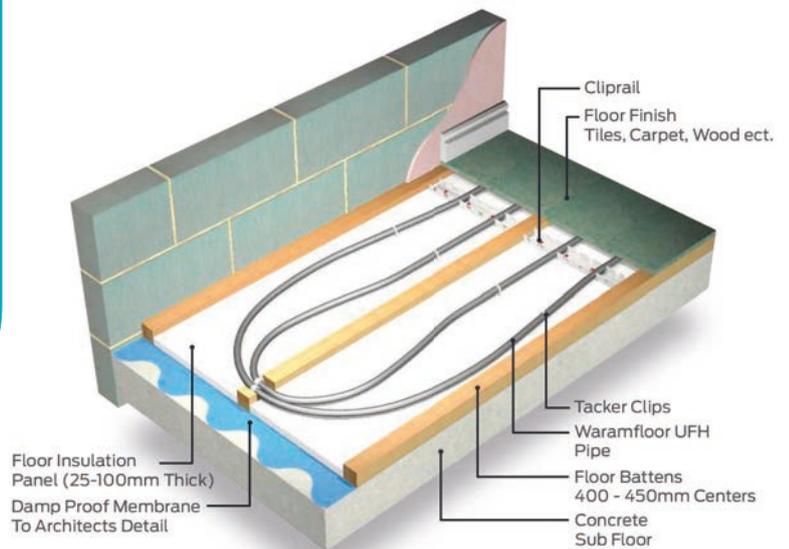
Batten / Sprung Floor Systems

Warmafloor has a number of systems to suit different applications of batten and sprung floors. These can be split into three categories:

- 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

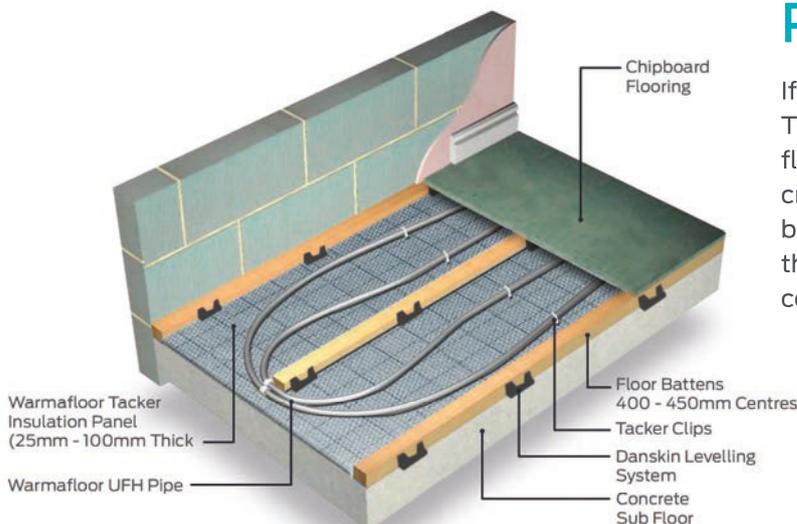
Over concrete or timber deck

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.



Acoustic Floors to Part E Regulations

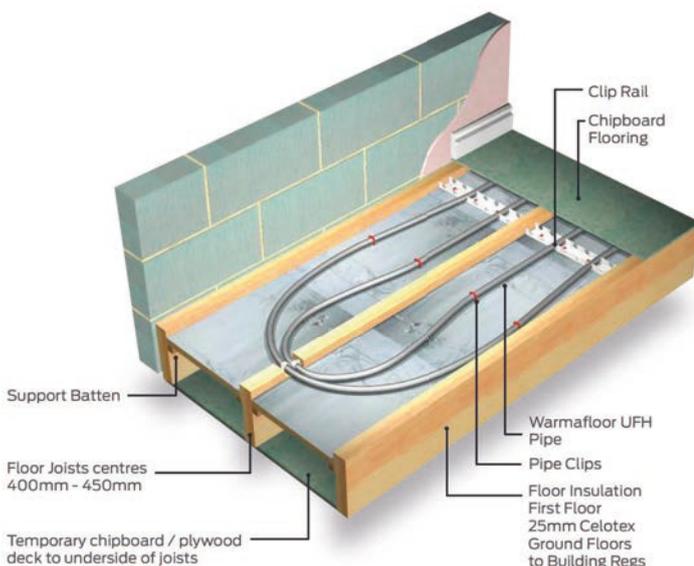
If the flooring is being installed to the 'Sound Transmission in the Building Regulations' Part E, floor battens are fitted with acoustic foam strips or cradles, often with acoustic mineral wool insulation below the floor. When installed in acoustic floors the underfloor system construction will need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



Suspended Floor Systems

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

Warmafloor can provide a system for both applications.

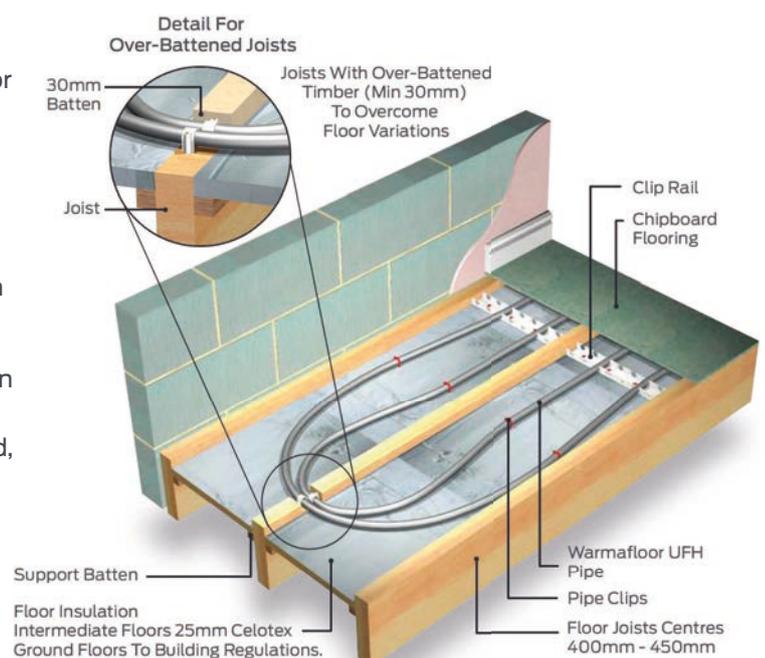


Standard Joists

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.

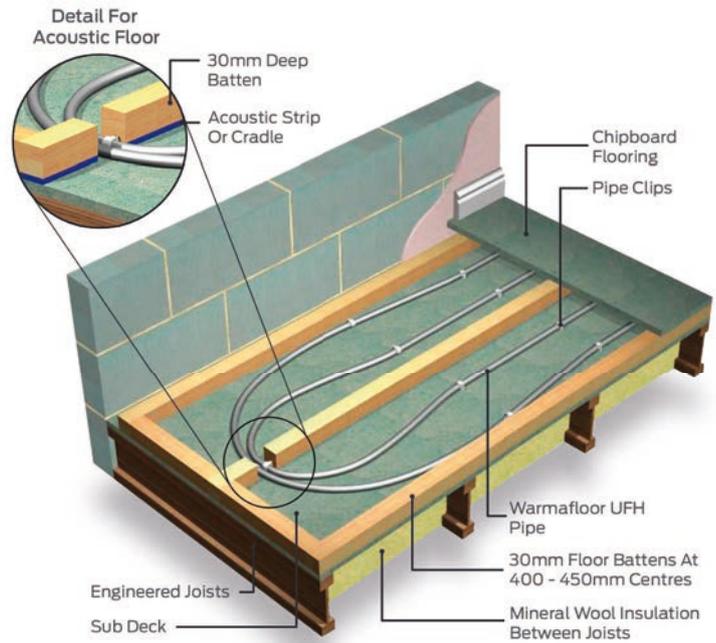
For ground floor applications the insulation between joists must be compliant to Part L of the Building Regulations and the insulation must be tightly fitted, to stop any air ingress from below. On upper floors 25mm PIR or similar insulation should be used.



Engineered Joists

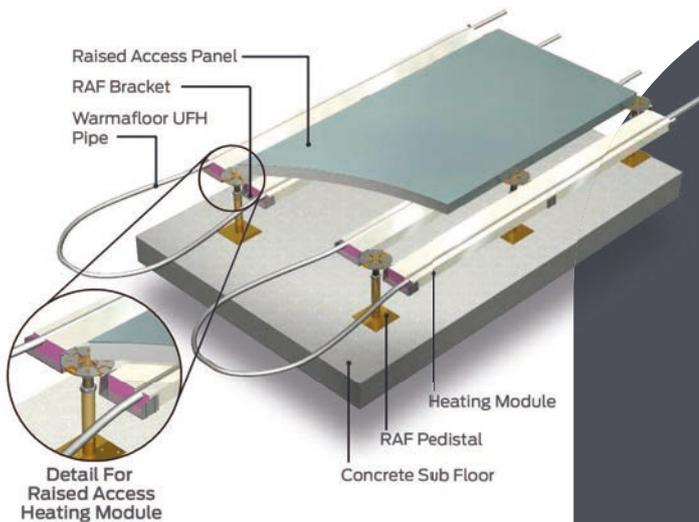
With Engineered joist systems the joists should be decked out with a sub-deck. Batten positions are marked out on the sub-deck, then Warmafloor pipework is laid out and pinned to the sub-deck.

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.



The installation was completed quicker than envisaged and was a good example of collaborative working practice.

Project Manager, Carillon



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.

Cross section through floor

Heating - The Warmafloor RAF system can provide radiant heating from 50 - 60 W/m² at a flow temperature of 45 - 60°C.

Cooling - Using a flow temperature of 13°C the system can provide up to 25 W/m² from the floor surface. If used in conjunction with plenum ventilation and standard gridded floor panels, this can be increased to 35 - 40 W/m².

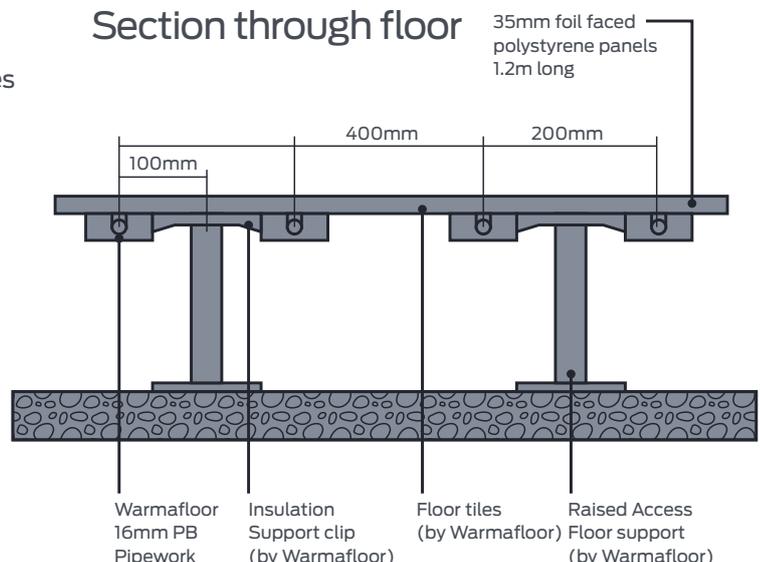
The Warmafloor Raised Access Floor System makes it possible to install heating/cooling within raised floors, providing a way for large, open plan offices to be heated evenly and comfortably. Areas can be zoned and independently controlled in multiple offices. Should layouts change, the heating modules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

Patent No: GB-2375 815 B

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 dismantled and repositioned.

Section through floor



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.



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



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

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, to provide final level finish for the floor covering.

When underfloor heating is installed 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 have added chemicals to improve performance.

The improved properties include faster drying times and/or extra strength. The additives are made by various manufacturers and are sold under their own trade name, e.g. Flexidry F1. The screeds can be obtained for site mixing.

Anhydrite (Calcium Sulphate) Screeds

Anhydrite screeds are 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:

- 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 - SR2

Reinforcing Mesh

In sand and cement type screeds 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 the 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 it is important to ensure the minimum specified depth allows for some tolerance in the floor slab. Always contact the screed manufacturer for specific requirements.

Next steps with Warmafloor

Our promise is to know a little bit more about underfloor and, as a leading authority in surface heating and cooling, we are always available to share our expertise and experience, and provide consultation, advice and designs for commercial new build or refurbishment projects.

We're flexible too, so we can handle everything from conception to completion, or provide a design only service or design and supply.

Simply pick up the phone, email us or, if you'd like to know a little more before getting in touch, explore warmafloor.co.uk

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Simply close the brochure and flip over to continue the Warmafloor story.