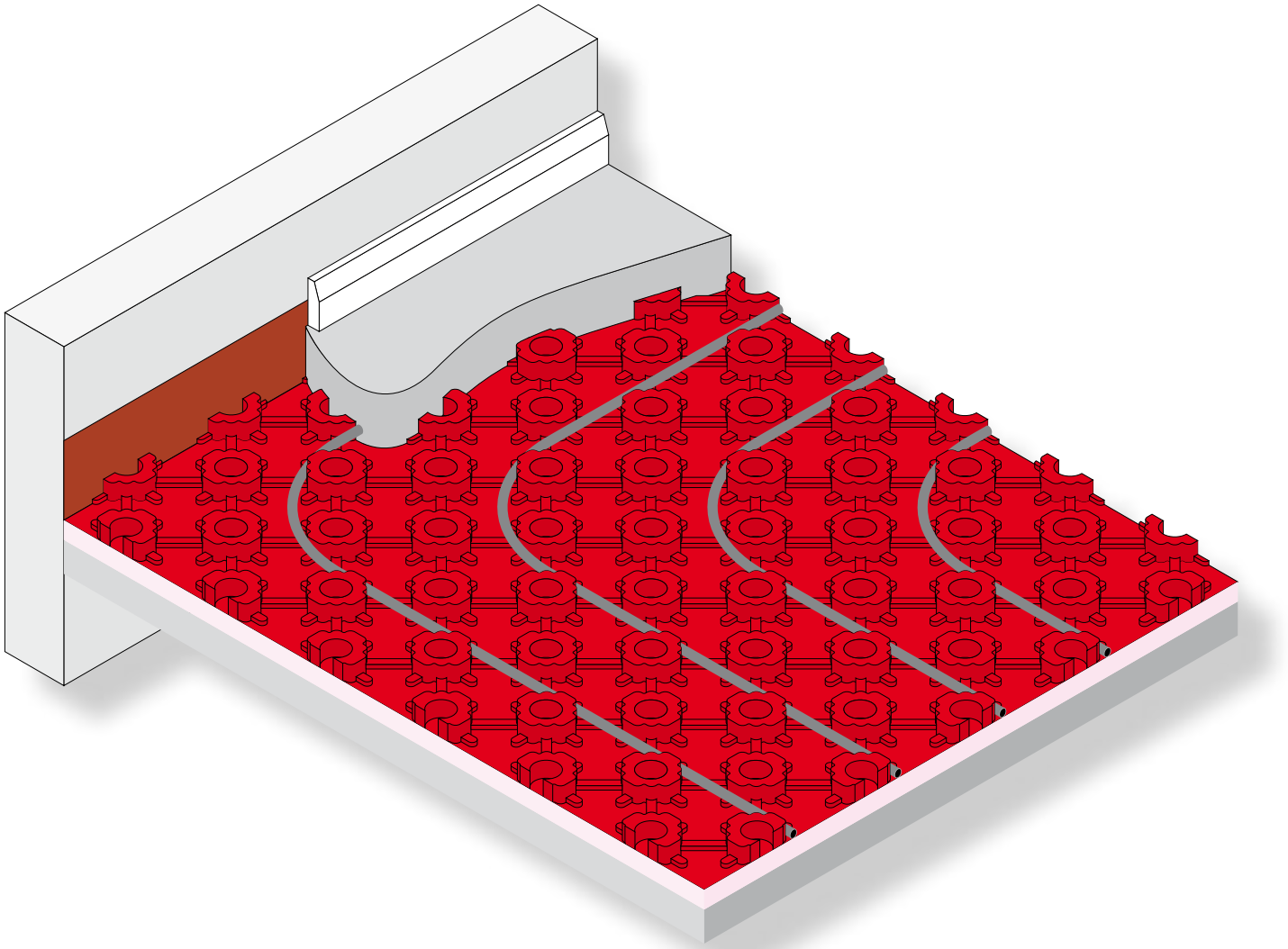
SOLID FLOOR



Polypipe underfloor heating in solid or screeded floors incorporates the unique Polypipe screeded floor panel. The lightweight plastic floor panels nest for easy storage and carrying.

Polypipe has the perfect solution for installing underfloor heating into solid or screeded floors. Utilising our unique lightweight plastic floor panels, which are quick and easy to cut to size, it is possible to fit Polypipe underfloor heating into any shaped room.

Polypipe solid floor panels form a simple grid to ensure the fastest possible pipe laying and also provide a precise guide for the pipe, ensuring that the minimum pipe bending radius is achieved.

The panels are laid above pre-installed insulation and the system includes edging insulation strip to ensure maximum performance and efficiency.

Polypipe underfloor heating systems can be used with the following solid floor constructions:

- Sand & cement screed (4:1 mix)
- Pumped screed systems (anhydrite, etc)
- Fine or heavy concrete
- Polymer modified screeds

Pre-installation requirements

The sub floor must be swept clean and be free from mortar residues.

Key design and installation information	
Maximum heat output	Approx. 100W/m²
Recommended design flow temp	50°C
Maximum circuit length	100m (15mm pipe) 120m (18mm pipe)
Maximum coverage per circuit	12m² at 100mm centres 22m² at 200mm centres 30m² at 300mm centres* *(18mm pipe only)
Material requirements (approx)	
Pipe	8.2m/m² at 100mm centres 4.5m/m² at 200mm centres 3.3m/m² at 300mm spacing* *(18mm pipe only)
Floor plate usage	1 plate/m² allowing for cutting (Actual 1·2m²/plate)
Edging insulation strip	1.1m/m²
Conduit pipe	2m/circuit

Installation

Fitting insulation

Step 1:

In accordance with Part 'L' of the current Building Regulations, a suitable layer of insulation material should be included within the floor construction. It is the responsibility of the Architect or Builder to ensure compliance. However, in all instances insulation must be installed beneath the underfloor heating system in order to ensure that any downward heat loss does not exceed 10W/m², in accordance with BS EN 1264.

Fitting the edge insulation strips

Step 2:

Using edge insulation strip allows the free expansion of the floor screed. The insulation strip should be installed around all perimeter walls and fixed constructions such as columns, steps and access doors.

Edge insulation strip is bent at 90° near to the base to form a double sided self-adhesive strip which bonds the floor plates to the floor insulation. Edge insulation strip should be fitted in addition to perimeter insulation required by Building Regulations.

Fitting the floor panels

Step 3:

The floor panels are laid over the pre-installed insulation and should be overlapped at the edges.

NOTE: The ½ castellation should overlap the ¾ castellation. The first panel should be laid with the ½ castellation edge against the wall.

Panels can be cut by simply using a saw or snips or it can be overlapped to the nearest castellation fit.

Floor panels should not be used at the base of the manifold as pipes need to be closer together than the floor panels allow. Pipes around this area should be secured using pipe clips which can also be used intermittently to secure the clip plate to the insulation.

When a pumped (liquid) screed is to be used it is essential that all of the panel joints are made correctly and that no panels are allowed to simply 'butt-up' as this may allow the screed to penetrate below the underfloor heating system and cause the panels to rise up. Similarly the panels should be firmly secured around the perimeter of the room using staples so as to prevent possible risk of the panels lifting.

Preparing the pipe

Step 4:

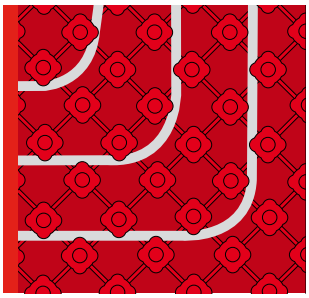
You will need to remove the coil from the bag, leaving the shrink wrap on, uncoiling from centre of the coil.

Laying the pipe

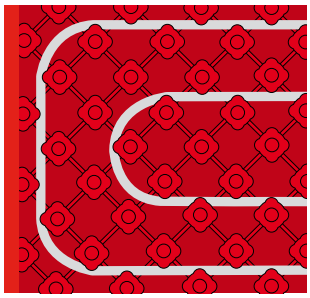
Step 5:

Once you have completed laying the solid floor panels the pipe can be fitted starting at the manifold position in line with the pre-designed centres. 15mm and 18mm pipe can be laid at 100mm or 200mm centres as required, 18mm pipe can also be laid at 300mm centres.

The minimum bend radius is achieved by encircling two castellations for a 90° bend or three castellations for a 180° bend (see diagrams on next page).



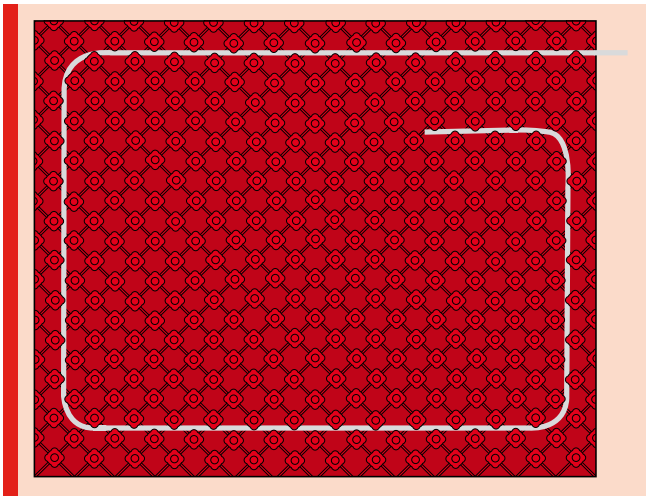
90°



180°

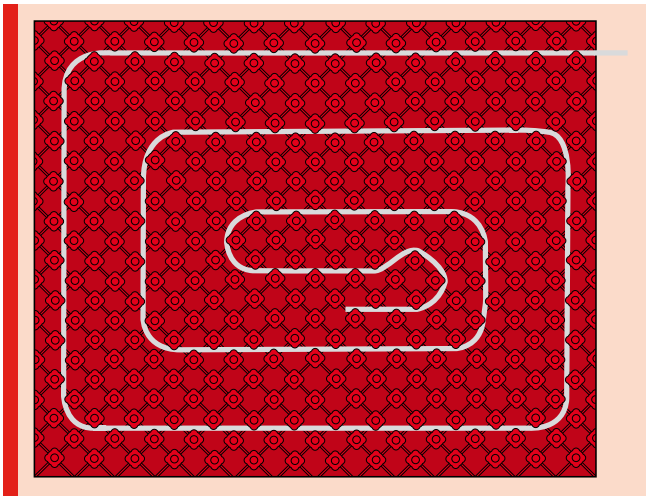
Step 6:

Circuits being laid at 100mm or 200mm centres must be laid in a spiral configuration. The first loop of pipe should be laid around the perimeter of the area to be covered by that circuit. The next loop of this circuit should be laid either 200mm from the first loop of pipe for 100mm centres or 400mm from the first loop of pipe for 200mm centres.



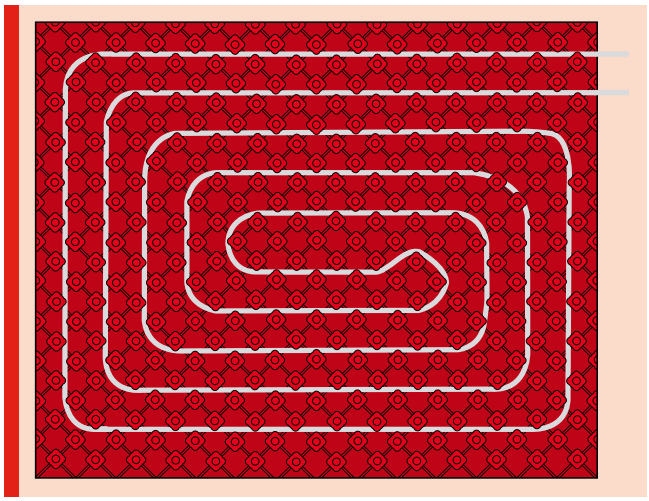
Step 7:

Continue to loop the pipe into the centre of the panels leaving enough space to form a double return ('S' shape in the centre of the loop).



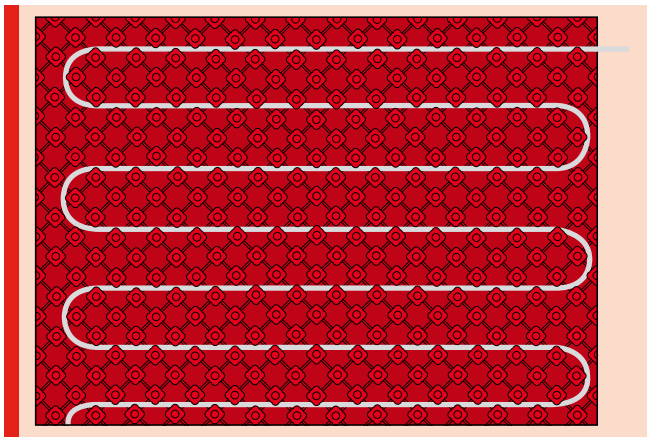
Step 8:

Now work back out from the centre by filling the space between the inwardly spiralling loop of the primary circuit ensuring the pipe is laid at the correct spacing centres.



18mm pipe installation formation

Where 300mm centre spacing is require (18mm pipe systems only) a meander pattern can be used. The pipe simply crosses the room from one side to the other encapsulating 3 castellations at each return bend.

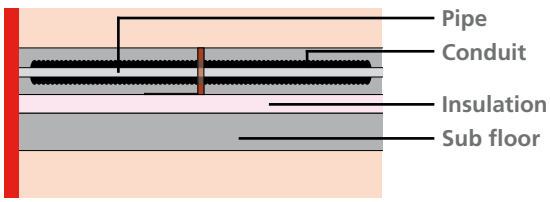


Conduit pipe

A 400mm length of conduit pipe should be fitted over the underfloor heating pipe in any situation where damage may be caused to the pipe i.e. where the pipe passes through internal walls or doorways, where the pipe emerges through the floor up to the manifold or where the pipe passes through either an expansion or day joint. Preformed long radius bends can also be used to provide a neater solution if required.

A section of conduit pipe 400mm long should be fitted around the heating pipe where the pipe passes through the edge insulation strip, e.g. room to room, or through expansion joints within the floor.

Conduit pipe should also be used where the pipe leaves the floor adjacent to the manifold. This can be threaded down the pipe after the pipework has been installed.



Expansion joint

BS EN 1264-4 recommends that an expansion joint is constructed in stone and ceramic finished screeds for every 40m² of floor area at a maximum length of 8m and an aspect ratio of 2:1.
An expansion joint is also required in long narrow areas such as corridors, etc.

The image below shows a typical arrangement where the pipes pass through either an expansion or a day joint. A strip of edge insulation is used to provide the expansion capacity.

For further information regarding floor screeding requirements for underfloor heating systems please refer to BS8204-1 or the BISRIA Guide: Screeds with underfloor heating.

Testing

Step 9:

Once the pipes circuits have been installed and pressure tested the screed cover can be applied. Care should be taken to ensure that the screed is tightly compacted around the pipe to ensure that no voids are present. The system should remain under pressure (6 bar) in order to prevent the risk of any damage being caused to the walls of the pipe whilst the screed is being applied.

Laying the screed

Step 10:

The overall quality and thickness of a sand and cement screed should meet the requirements of BS8204-1 which stipulates that in domestic or light commercial applications a minimum thickness of 65mm should be used. The thickness of alternative coverings, such as anhydrite or polymer modified screeds, may differ depending on construction requirements. This information should therefore be provided by the specialist screed manufacturer/supplier.

After the screed has been laid the floor should be covered with a membrane to retard the drying out process, particularly in warm weather. The floor should be allowed to cure and dry naturally until full strength is reached in accordance with relevant British Standards and manufacturers' instructions (approx 30 days for sand and cement and concrete floors). Under no circumstances should the underfloor heating system be used to artificially dry/cure the screed as this could cause the screed to crack and seriously undermine the integrity of the floor construction. Once the screed has fully cured the underfloor heating system can be switched on and the manifold flow temperature slowly increased up to the calculated design temperature.

Finishing

Timber floors

Many people are concerned by the effect of heat on a timber floor, but this concern is misplaced. The important factor is the floor moisture content.

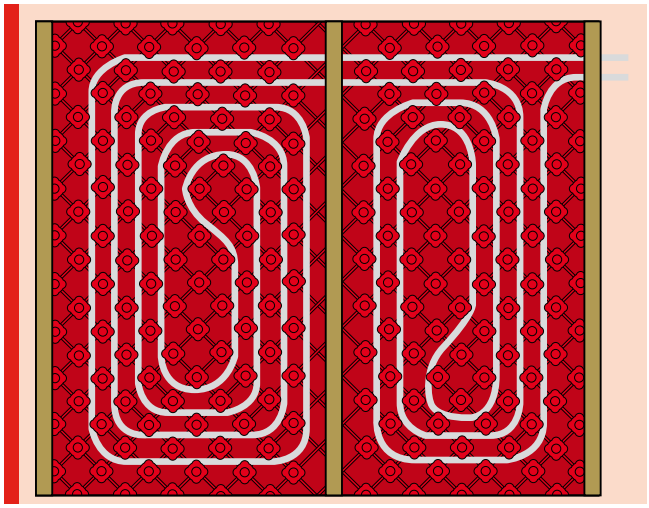
Timber floors can be laid directly over the screed at a moisture content of 10-11% which during the heating season will reduce to 8-9% and may cause a small amount shrinkage.

The floor will re-absorb some moisture when the heating is not operating and the moisture content will increase to 12-13%.

Application of timber floors over solid floor systems

Where solid oak flooring is to be laid on a solid floor, joists can be fitted at 1m centres to provide a fixing point for the boards.

Insulation, solid floor panels and pipe can be laid between the joists and screed laid level with the top of the joists (see diagram below).



Individual circuits of pipe are then laid between each set of joists with care being taken to ensure the screed is completely dry prior to fitting the solid oak covering (see diagram below).