



DATA SHEET Ver. 1.00

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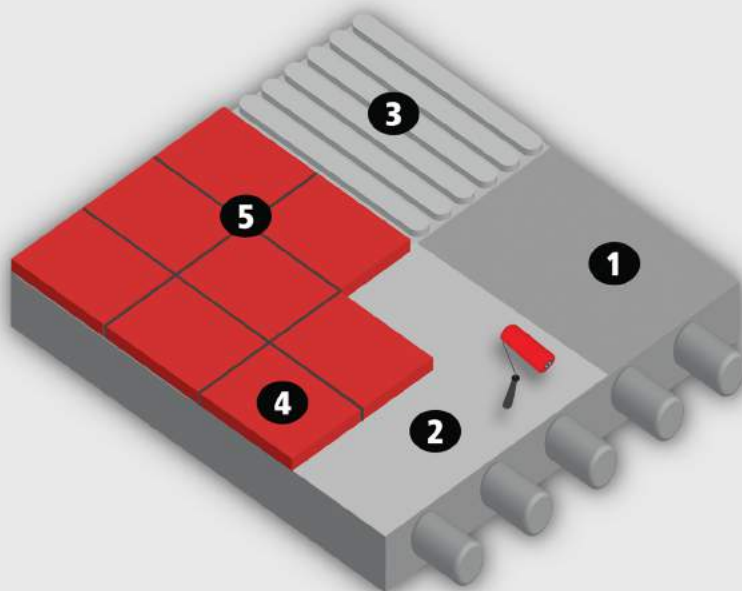
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UNDERFLOOR HEATING SYSTEMS

HOT WATER PIPE SYSTEM - Encased in screed

Heated pipe based heating consists of a run of pipes embedded within a pre-laid screed, often calcium sulphate based due to its flowing characteristics. The surface preparation and priming required before laying tiles is the same as for screeds without under floor heating.



1. Pipes Encased in Underfloor Heating Screed
2. Primed with BritPrimer
3. BritFlex S1 Tile Adhesive or BritFlex S2 Tile Adhesive
4. Tiles
5. Grouted with BritFlexi Grout

Before any tiling is carried out, the following criteria must be met:

I. The screed must have been left for the minimum cure time before the heating is switched on (this is generally 21 days for sand / cement screeds, and 7 days for calcium sulphate screeds).

II. The underfloor heating must have been fully commissioned and tested. This is not a simple pressure test but must be a full heat up and cool down of the system. This is normally a 7 day cycle. Only by doing this can any screed weaknesses be identified.

III. All movement joints must be identified and followed through in the tiling. Screed movement under temperature change is a major cause of tiled floor failure so the need for movement joints is extremely important. Movement joints should be present between all different heating zones, door thresholds, upstands and perimeters.

IV. Traditional cement based subfloors and calcium sulphate screeds must be tested for moisture levels and confirmed to be 75% RH or less using a hair hygrometer. Proprietary cement based screeds may cure and dry at different rates so always check with the manufacturer.



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Tile Installation:

- I. Prior to tile /flooring installation do not run the heating at high temperatures as this will force dry the adhesive and grout, causing cracking and lifting. Have the heating on at a 'cutback' temperature whilst tiling – this means a floor temperature of max 15°C.
- II. Remove all traces of dust/ dirt/ laitance and prime using Brit Primer and allow to dry.
- III. Always ensure the correct flexible tile adhesives and grouts are selected for the installation, we recommend you use Britflex S1 Rapidset. Mix the recommended tile adhesive in a mixing bucket as per the instructions on the bag and to use a minimum of 3mm grout joint.
- IV. Mix a flexible grout, we recommend Britflexi Premium Grout, as per manufacturer's instructions. Making sure to add the flexible grout to the water in your mixing bucket and not the other way around, this will ensure a lump free consistency once mixed. Allow mixed grout to stand for 2-3 minutes before re-mixing for 30 seconds.
- V. Avoid drawing in too much air to the mixture by mixing at too high a speed or by over mixing. Bear in mind not to mix too much at one time as it will harden quickly creating wastage.
- VI. Once the tiling and grouting has been carried out the heating temperature must remain at no higher than 15°C for a minimum of 7 days. After this time, the underfloor heating can be brought up to full working temperature slowly. A maximum water temperature increase of 5°C per day is advised.

HOT WATER PIPE SYSTEMS – Fixed within pre-formed insulation panels

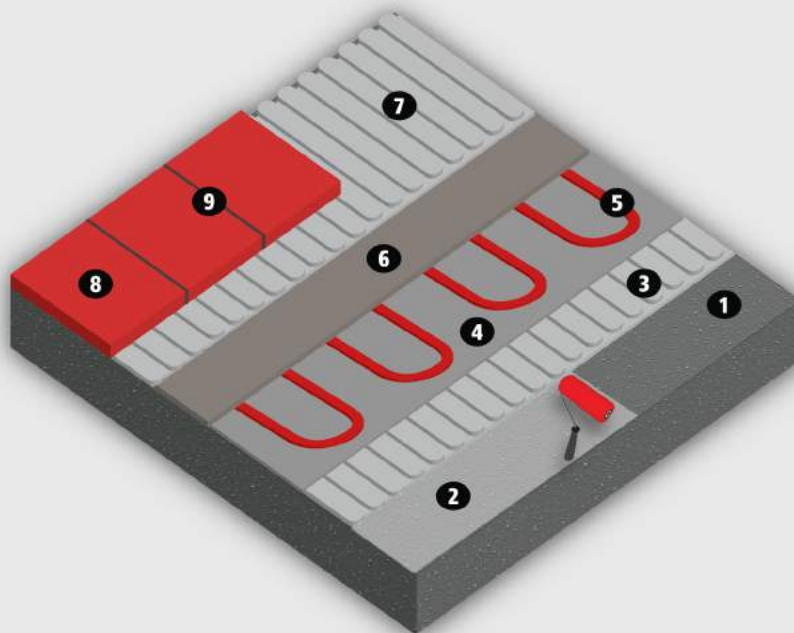
This popular alternative system removes the need for a screed by using pre-cut channels in the insulation panel to house the warm water pipes. This system provides a lightweight base option, which can be tiled onto directly. Often the surface of the insulation panel can be faced with an aluminium foil to help spread the heat.

Prior to commencing tiling the following must be met:

- I. All underfloor pre-formed panels must be secured firmly to the substrate and be sound and solid, free from movement. Always consult the manufacturer's installation instructions.
- II. The underfloor heating must be fully commissioned and pressure tested before tiles are installed to ensure there are no leaks.
- III. Once water pipes have been positioned and within 24 hours prior to applying the tiles, it is advised that all panels are cleaned and ensured dust free. We recommend priming the entire surface of the panels with a neat coat of Brit Primer including the installed heating pipes and cavities that do not have pipe work in them.
- IV. Prior to tile /flooring installation do not run the heating at high temperatures as this will force dry the adhesive and grout, causing cracking and lifting. Have the heating on at a 'cutback' temperature whilst tiling – this means a floor temperature of max 15°C.
- V. Once Brit Primer has fully cured, tiling can commence using either Britflex S1 Rapidset or Britflex S2 Rapidset tile adhesive. Ensure all cavities within the panels are first filled with the adhesive using a smooth edged trowel. This will provide a level surface to the panel before finally applying the same chosen adhesive with a notched trowel to the bed thickness required.
- VI. Once the tiling and grouting has been carried out the heating temperature must remain at no higher than 15°C for a minimum of 7 days. After this time, the underfloor heating can be brought up to full working temperature slowly. A maximum water temperature increase of 5°C per day is advised.

WIRE CABLE AND MATTING SYSTEMS

There are numerous manufacturers of 'radiant mat' electric underfloor heating so always contact them directly for specific advice. The systems consist of electric cables or mats which need to be fixed to the substrate in a prescribed pattern to ensure even heat throughout the floor.



1. Solid Substrate
2. Primed with BritPrimer
3. BritFlex S1 Tile Adhesive or BritFlex S2 Tile Adhesive
4. Thermal Construction Board
5. Under Tile Heating
6. BritLevel Flexible
7. BritFlex S1 Tile Adhesive
8. Tiles
9. Grouted with BritFlexi Grout

The subfloor must be sound, strong, stable and suitable to receive a cementitious self-levelling compound. Any expansion joints in the floor design must be followed through into the finished tile installation and must not be covered over. This is most often between different heated areas and/or substrates. Once the heating has been laid onto the insulation boards, care should be taken to avoid snagging (therefore damaging the cables when applying adhesive).

There are two options which can be used when installing tiles onto these systems:

1. Applying a flexible self-levelling compound, we recommend Britlevel Flexible Self Leveller, to embed the matting or loose wire
2. Tiling directly onto the matting or loose wire

Before any preparation or tiling work is carried out, the system must be tested by a fully qualified electrician to confirm it is fitted correctly and functioning. This should also be done during and after installation to ensure no damage has occurred. Select the most appropriate self-levelling compound for the substrate. BritLevel Flexible self-levelling compound is suitable for difficult to bond to, dense surfaces such as ceramic tiles or where the substrate is mechanically fixed only e.g. backer boards. It's also perfect for laying over the mat/wired heating system, the high polymer content bonds to the matting, preventing potential movement within the substrate which could cause the tiling to crack or de-bond from the surface.

Apply the selected compound by pouring onto the floor and gently smooth with the straight edge of a metal trowel. Either cover the highest point of the cables by a minimum 3mm or fill in between the cables without applying compound over the surface (this will enable the tile adhesive to be applied without snagging the cables). Allow the smoothing compound to cure. Time for this will depend on the thickness, substrate and atmospheric conditions.



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You can then proceed to lay your tiles in the same way as a heated screed (hot water pipe system) however it's recommended that both products are left to cure for a minimum of 14 days before gradually bringing the temperature up by 5° C per day. We recommend that you always refer to the manufacturer's instructions when installing underfloor heating.

Common Issues;

Movement due to thermal expansion and contraction

The screed and the adhesive, being of a similar material, expand at a similar rate to each other. However, the tiles usually have a slightly lower coefficient of thermal expansion - so for a given temperature rise they will grow proportionately less. The result on the tile-fixing products is twofold: Stresses build at the interface between the tile and the adhesive. At some point this will be too great and the weakest part of the system will yield - usually the bond between the tile and the adhesive. As the base expands in relation to the tiles they try to move slightly further apart stretching the grout joints. Cementitious products are inherently weak in tension and the bond onto the tile edge can fail.

Damage to wires from the trowel

One of the most common reasons for problems with the installation of an undertile warming system is damage made during fitting. When covering the wires with adhesive it is quite easy to accidentally cut a wire with the trowel. Best practice embed matting wires in self-levelling compound.

Switching on too soon weakens the adhesive & grout

Cement-based adhesives and grouts set hydraulically as water is involved in the hardening reaction. If the adhesive is allowed to dry out before it has properly hardened it will tend to be weak and crumbly. It is important that the heating system is off when tiles are fixed and remains off until the adhesive and grout have fully cured.



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