VARME
Floor Heating Systems

Instructions for installation of Electric Underfloor Heating Cable Mat

Before you begin installing read through these instructions carefully and check that you have all the components required.

The system is designed for installation below tiles, stone or marble flooring, it may also be installed below vinyl, laminate and thin carpets but in these cases must be first covered with a suitable latex based levelling compound.

Contents of heating kit

- 3mm twin-core heating cable on mesh mat
- Neoprene floor primer 750ml
- Disposable roller for application of primer
- Digital thermostat and separate floor sensor
- Guarantee Certificate

Installation Notes:

- The system requires a mains voltage 230/240v and must be connected in compliance with building regulations Part 'P' approved document
- The system is intended for heating tiled or stone floors and the mat output/wattage is given on the box and label.
- The 'cold' cable connected to the mat is double insulated and the first outer sheath (coloured black) carries an earth screen (the silver coloured braid). The cable also contains a built in return meaning that the cable only has to be connected to the thermostat from one end. Inside the outer sheath there are 2 wires, these are the live and neutral.
- For larger areas, if two or more mats are supplied, these can usually be connected together at the thermostat or by using a small blank fronted connection box.
- The system is suitable for installing on any sub-floor which is sound and suitable for tiling, in the main this will be concrete, plywood or cement faced tile-backer boards. Some water resistant composite boards may also be suitable, but it is not recommended to tile directly onto hardboard, MDF or standard grade chipboard as these substances absorb moisture and subsequent swelling could cause tiles to crack or dislodge. **Note**; if installing on a newly finished concrete screed the required minimum drying out or 'curing' period should be followed before installing (this is typically 1mm per day in good conditions).

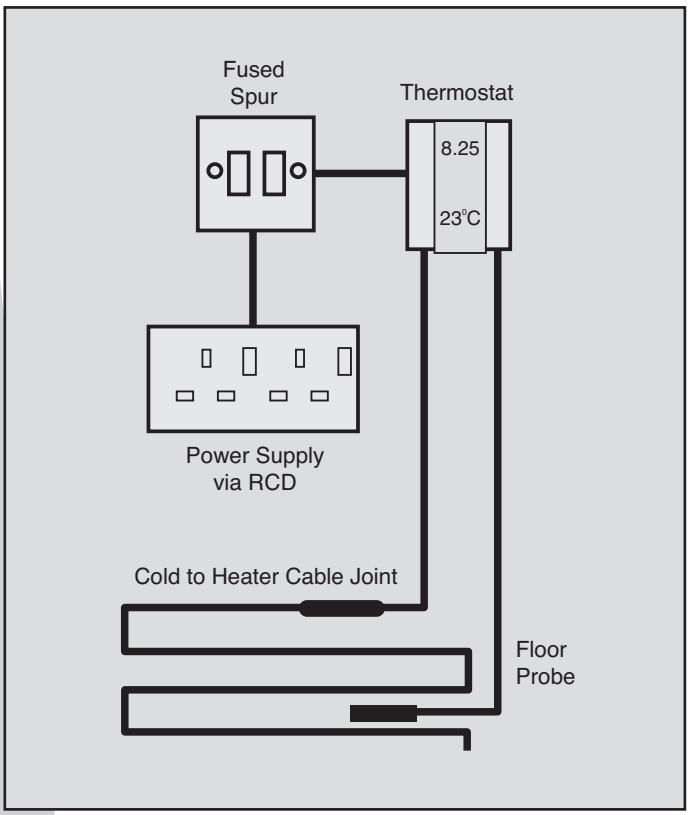
- The electrical and electromagnetic fields generated are negligible and well within all recommended European and International guidelines.
- The mesh matting can be cut, but the heater cable **MUST NOT** be cut.

Electrical Provision:

Before starting the installation you should make provision for the electrical connections. For smaller areas this should be possible by means of a fused spur or combined RCD spur from an existing circuit- see diagram below. However, for larger areas a separate circuit from the distribution board is recommended. **When planning the installation you should always consult with your electrician concerning your requirements.**

Note - if installing in a bathroom or other 'wet' room the thermostat must be located **OUTSIDE** of the room on the opposite side of the wall, for example in a bedroom or hallway/landing.

Fig 1



Important Notes:

*The system **MUST** incorporate a 30mA RCD protection either at the distribution board or by replacing the fused spur with a combined fused spur/RCD.*

*The yellow heater cable **MUST NOT** be cut or cross at any point – only the black 'cold' cable and the probe can be cut or lengthened.*

*The joint between the yellow heater cable and the black cold cable **MUST** be located under the final floor covering.*

For larger areas a separate circuit will be required – always consult your electrician concerning your individual requirements.

*The thermostat has a rating of **15amps** – loads in excess of 15amps (3.45kw approx) will either, require further thermostats or need to be connected via a suitable switched contactor – consult your electrician on this.*

*The thermostat is rated to IP20 and **MUST NOT** be located in a bathroom.*

Preparation

Ensure that the sub-floor is solid and suitable for tiling, free from dust and debris. Wood flooring with more than 30cms between the joists should ideally be reinforced to prevent flexing and the possibility of tiles dislodging. Wood flooring can be reinforced using 18mm WBP plywood or Marine plywood or insulated tile-backer boards such as **Marmox™** or **Aquapanel Thermal™**.

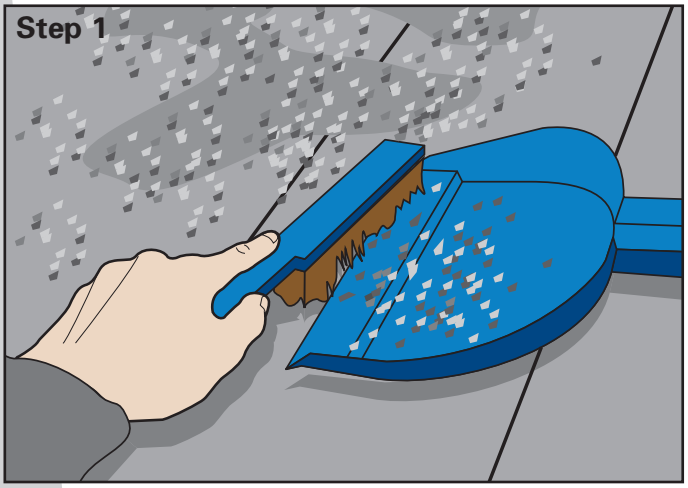
Insulation

The insulation levels of a floor will affect both the performance and running costs of an underfloor heating system and although not essential in many cases, it is recommended wherever possible. For example it would not be considered necessary to insulate small areas where the requirement is simply to 'take the chill off the floor', however in cases where the heating is being installed over large areas, particularly as the primary heating source in a ground floor room or conservatory, insulation boards will greatly reduce warm-up times and running costs. Suitable insulation boards are available from your underfloor heating retailer/supplier.

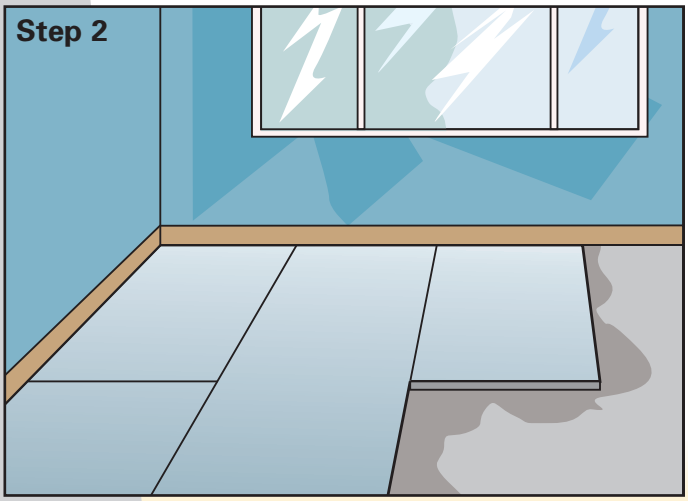
Installation

Step 1
First prepare the sub-floor ensuring that it is clean and free from grease, dirt or debris.

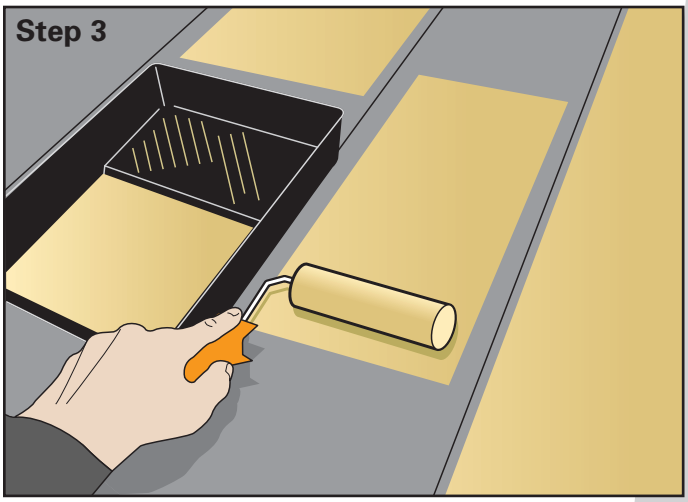
Note - If installing on a bitumen base, this must either be removed or covered with a suitable insulation board or thin levelling screed before proceeding. The most suitable sub-floors are: concrete, tile-backer boards, existing tiles, water-resistant timber e.g. WBP Ply.



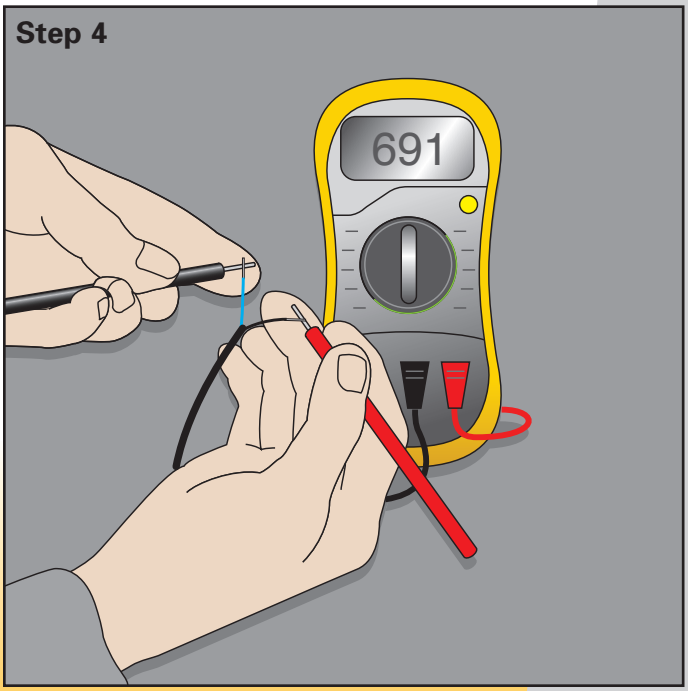
Step 2
If fixing tile-backer boards, do so in accordance with the separate instructions provided, using tile adhesive on a concrete sub-floor and galvanised screws with washers/fixings on timber sub-floors.



Step 3
Prime the floor or the tile backer boards using the Neoprene primer contained in the kit. If installing over a large area or on an absorbent surface the primer may need to be diluted with water to a maximum of two parts water to one part primer. Once primed leave to dry (typically 1-3 hours) and avoid foot traffic over this area. The purpose of priming is to promote greater adhesion of the mat and reduce the amount of moisture absorbed into the sub-floor. If installing directly onto existing tiles do not use the primer, instead ensure the floor surface is clean, dry and free from debris.



Step 4
Test the resistance of the cable on the mat prior to installing and ensure that the reading is as per manufactures design reading. This can be found on the silver label on the packaging or printed on the PVC sheath (± 10%) Make a note of the reading. **Do not** tile over the cable without first testing it.

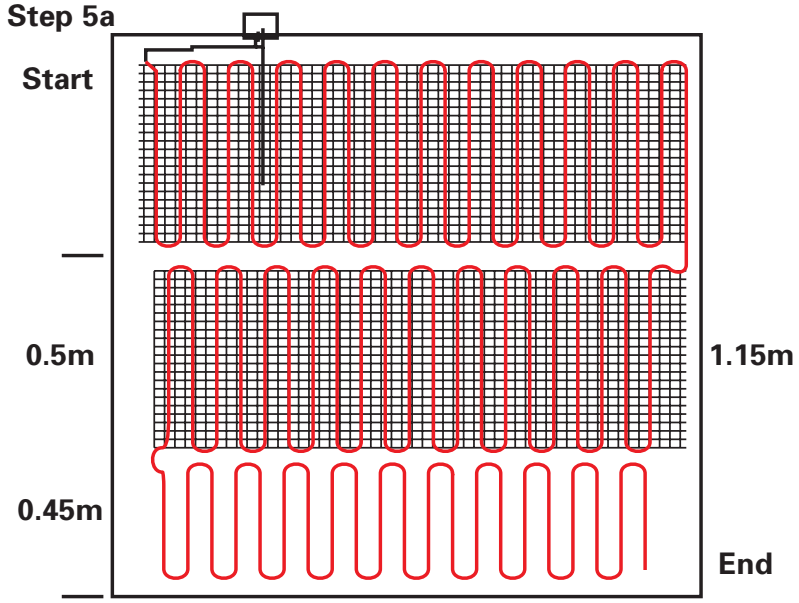


Installation- continued

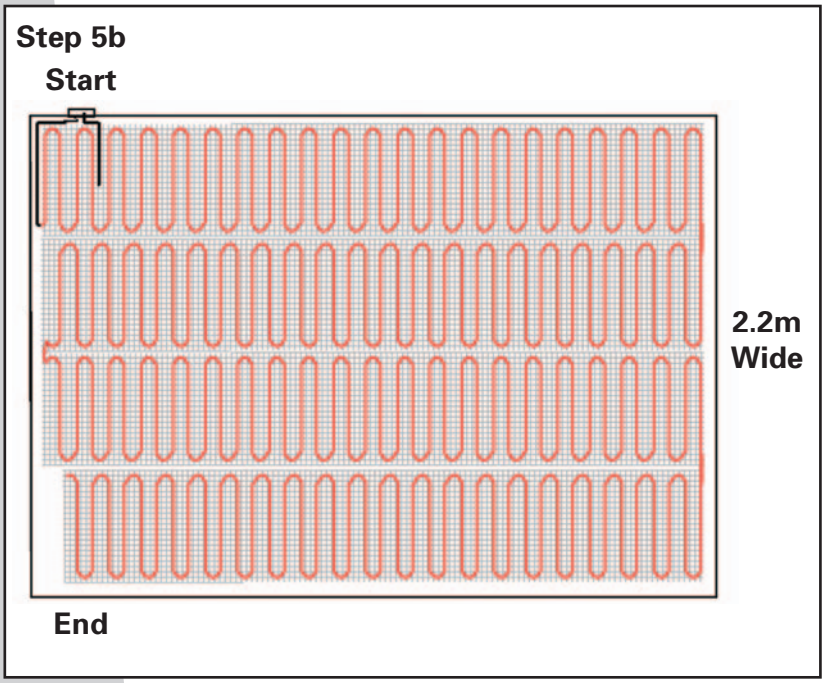
Step 5

Plan the mat layout. This is a very important step and **MUST** be done correctly to ensure all the mat is used up. **Once it has been unrolled and cut the mat cannot be returned.**

Step 5a

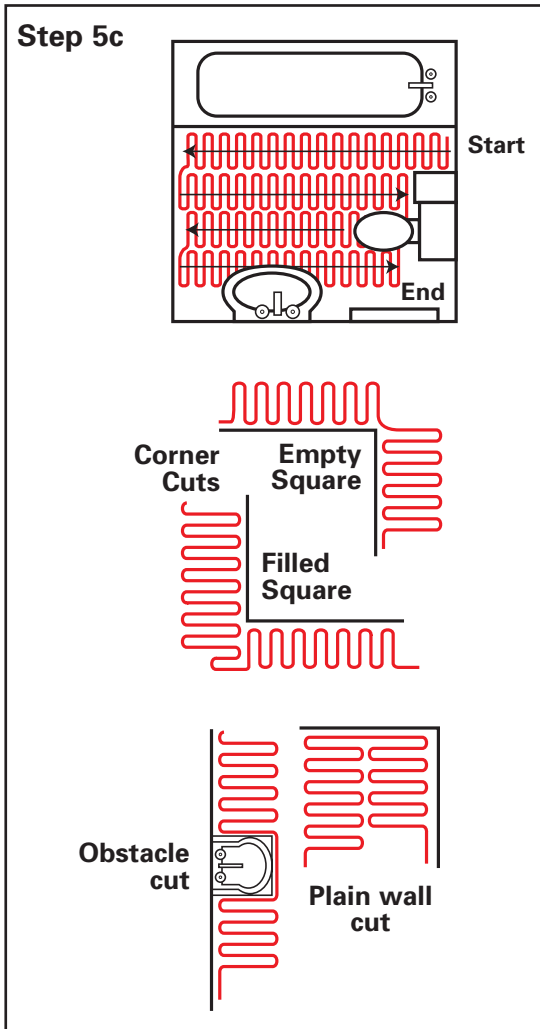


Step 5b



Measure the area to be heated in sqm (do not include the area taken up by fixed objects such as baths/showers and kitchen units). If the heated area is smaller than the chosen mat size **STOP** and return or exchange for the correct size. The mat width is 50cm. You should mark out the layout plan on a drawing - see example.

Step 5c

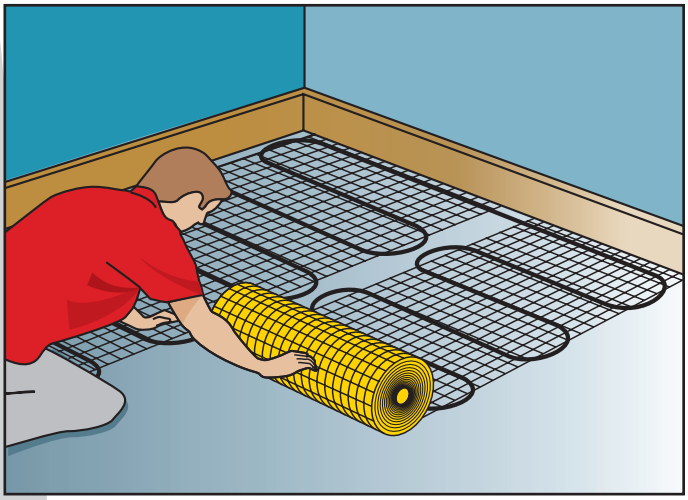


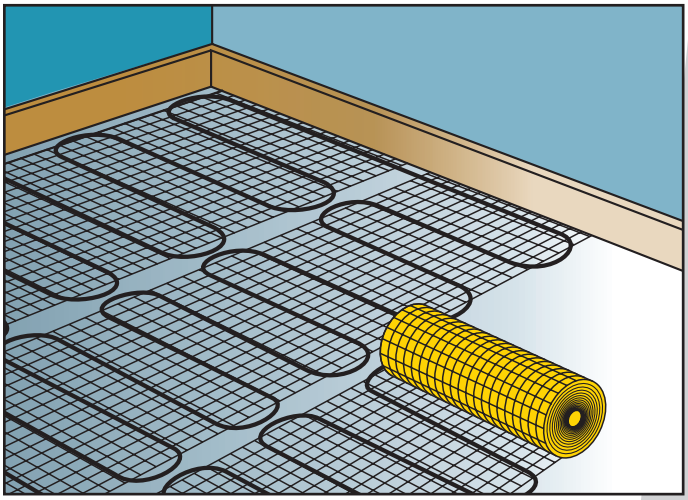
Step 6

Only when you have calculated that the mat will fit into the room should you begin to lay. Beginning at the corner closest to where you have located the thermostat, position the mat ready to start rolling out. **Important:** Before rolling out, check that the black cold lead will reach the location of the thermostat. If it does not, you should either change the starting point, or remove some of the cable from the starting end of the mat and run this along the edge of the room to allow the cold cable to reach the thermostat. **Important Note:** The joint between the black 'cold' cable and heater cable must be located under the final floor covering.

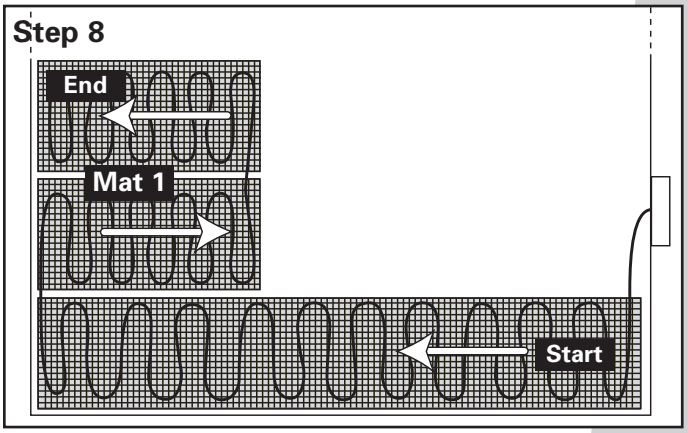
Installation- continued

Step 7
From the start point roll out the mat. When you reach the opposite corner of the room cut through the mesh. **DO NOT CUT THE CABLE.** Turn the mat through 180 degrees and roll back the other way. Continue this process until all of the mat is used up. If you are using two or more mats, try to finish off at the opposite wall so that the second mat is easier to lay see below:

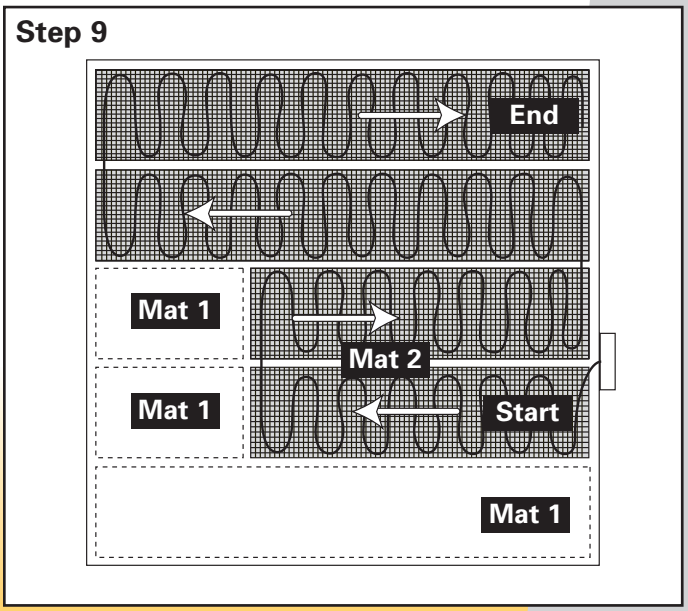




Step 8
Test the resistance of the floor probe. Refer to the label on the floor probe wrapper for desired resistance readings. Make a note of the reading. Position the sensor between two runs of mat and tape into position. The sensor wire can be shortened or if necessary, lengthened with 2 core flex cable. If you need to cut the sensor wire you must only cut the cable end. **DO NOT** cut the end which contains the plastic floor sensor. The connections to the thermostat can now be made. (see separate thermostat instructions). Final connections to the thermostat must be performed by a competent person. Refer to Electrical Industry standards regulations and Building Regulation Part 'P' Approved Document.
DO NOT turn the system on until the floor covering has been laid and allowed time to set.



Step 9
Test the resistance of the cable and floor probe immediately prior to covering to ensure that neither have been damaged. Compare readings with those recorded previously. **UNDER NO CIRCUMSTANCES** should power be supplied to the mats when still fully or partially rolled up.



Step 10
If possible cover the mat with a latex based levelling screed (3-4mm). This will help protect the mat when tiling. If you do not wish to use a latex levelling screed, you may tile directly over the mat in a single operation. Tile the floor using a flexible tile adhesive and grout as per industry standards and the manufacturer's instructions. Wait at least **ONE WEEK** before turning the heating system on to allow time to dry. If you are using a suitable vinyl or thin carpet as the final flooring, you will need to cover the mat with a suitable latex levelling compound - we recommend a minimum of a 6mm covering over the cables to ensure even heat distribution.

Step 11
After the floor covering has been laid, test the Cable and Floor Probe one last time to ensure that neither have been damaged. Record final readings and complete the Guarantee Certificate. If this is not done the Guarantee is invalid. Retain the certificate for your records. Once the floor covering has been allowed time to set, the system can be turned on. **NOTE: The heating may be slow to react at first** especially if installed on a new screed floor or in a new building. Start by setting the floor temperature at around 20-22 Deg C and build up by 1 degree per day until your desired temperature is reached. **Please see separate instructions for connection and operation of the digital thermostat.**

DO'S and DONT'S

DO – Read through these instructions carefully before beginning work
DO – Use flexible adhesives and grouts
DO – Test the cable mat and floor probe BEFORE tiling See steps 4, 8, 9 and 11
DO – Be careful not to damage or dislodge the cable during tiling
DO – Try to protect the cable mat with cardboard or carpet during tiling
DO – Try to protect the cable with cardboard or carpet during tiling
DO – Wait at least 7 days before turning on the system
DO – Read the separate installation and operating instructions for the thermostat
DO – Ensure that the joint between the Cold Cable and Heater Cable is beneath the final floor covering.

DON'T – Attempt to cut the yellow heater cable at any point
DON'T – Allow the wires to cross or touch
DON'T – Allow excessive foot traffic over the wire before tiling
DON'T – Cut tiles directly over the cable
DON'T – Place tools or stacks of tiles on top of the cable

Recommended adhesives and levelling compounds

Manufacturer	Products
F Ball and Co - Tel: 01538 361633 web: www.f-ball.co.uk e-mail: sales@f-ball.co.uk	Stopgap Red Bag mix with water Stopgap Green Bag mix with latex additive
Granfix - Tel: +44 (0) 1773 607778 web: www.tileadhesive.co.uk e-mail: info@granfix.co.uk	1 Part Rapid Set Flex Adhesive (2 hr set) 1 Part Standard Set Flex Adhesive (24 hr set)
For further help and advise please call our help line on 01159 632314	

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