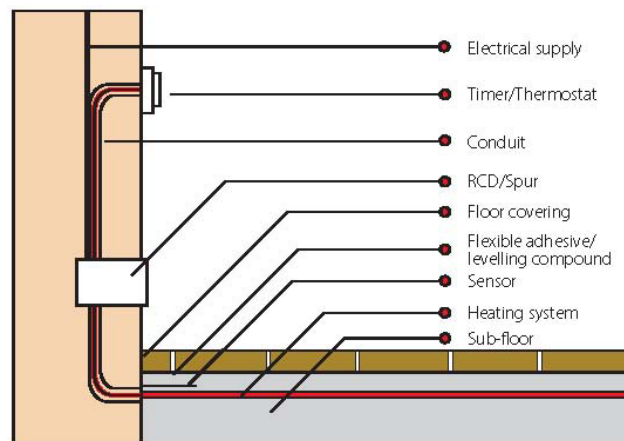


Installing your Underfloor Heating System



Making it easy

At Floorell we believe installing your underfloor heating system should be as easy as possible. That's why we have put together this guide to help you along the way.

Floorell Mat Systems

Floorell's Mat Systems have all been designed to meet Class 2 Standards with an earth braid. This means they can be used on any sub-floor and in any room. Unlike other systems on the market, our cables have three layers of insulation around them, making them the finest systems available. All our systems have been tested, and with an output of 10 watts per linear metre, surpass all European and International standards for use on timber or solid sub-floors.

The heating systems are made up of fixed lengths of heating cable stitched into fabric mats with 4m long, Class 2 connection cables for easy installation. These systems are designed specifically for use under tiled floors, but can, with the correct guidance, also be installed under other floor coverings. If you would like to install your underfloor heating under another floor finish please contact our customer helpline on: 01895 825288 for advice on our range of systems. We'll be happy to discuss your needs.

How do I calculate the correct sized heating system?

It's simple. Just allow for a 10cm margin around the perimeter of the room and then calculate the remaining floor area in m², from this total you should deduct fixed furniture such as kitchen/bathroom units. It's important that the cable is only laid in open areas so the floor can radiate heat freely.

What heating output should I have?

It depends on the amount of heat you want or need. We've put together a table so you can see how much heating output we recommend for different sub-floors and scenarios.

| 200 watt | 160 watt | 120 watt |
|---|---|--|
| Maximum heat can be used as a sole source of heating* | Excellent for floor warming. Use on any subfloor for fantastic results. | Floor warming on insulated or wooden subfloors. Very effective for large areas but may not give enough heat on uninsulated concrete subfloors. |

* To use any underfloor heating system as the sole source of heating it is essential to have floor insulation. If there is no insulation in the floor we can supply tile-backer insulation boards that can be installed on top of your existing sub-floor. The depth of these boards ranges from 10mm-50mm. It is also important to be able to carry out a heat loss calculation to ensure that your underfloor heating can provide sufficient heat, contact us for details.

So what do I need to fit my electrical underfloor heating mat?

- Correct size mat
- Installation kit (recommended)
- Control device
- RCD (Residual Current Device)
- Adhesive or latex (with flexible additive)

We do not guarantee systems that have not been fitted in accordance with the following installation instructions or those that endure accidental damage.

The 9 point safety check-list

To us, your safety and the safety of your families are of the uttermost importance, so once you have fitted your underfloor heating system- here's a 9 point checklist to ensure your heating system is fitted correctly.

1. Never cut the heating element wire.
2. Heating elements must be protected by an R.C.D at all times.
3. Never leave excess heating mat rolled up under units or fixtures (if the mat is too long, return it to your place of purchase and replace it with a smaller size).
4. Never run the cold leads (connection leads) underneath or across the heating element wires.
5. Never cross or overlap the heating wires.
6. Do not switch the system on for at least 2 weeks after fitting the floor finish; you need to wait for the adhesives/latex/grout to dry naturally.
7. Do not cut or prepare tiles on top of the fitted heating system. When other work is going on in the room, avoid damage by keeping the heating covered until you are ready for the final floor finish to be put down.
8. The cables should never be spaced at intervals closer than 5cm or further than 10cm apart.
9. Only a qualified electrician should connect the heating element to the mains.

The 7 steps installation system

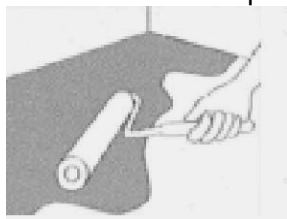
Now you're ready to begin installing your system. Follows these 7 easy steps and make sure you keep the above safety points in mind.

General Instructions

Step 1. Start by preparing the sub-floor and electrics

a. Surface Preparation

Prepare the floor as if you are laying ordinary floor tiles. Ensure that the floor surface is completely smooth, flat and that there are no loose floorboards. If



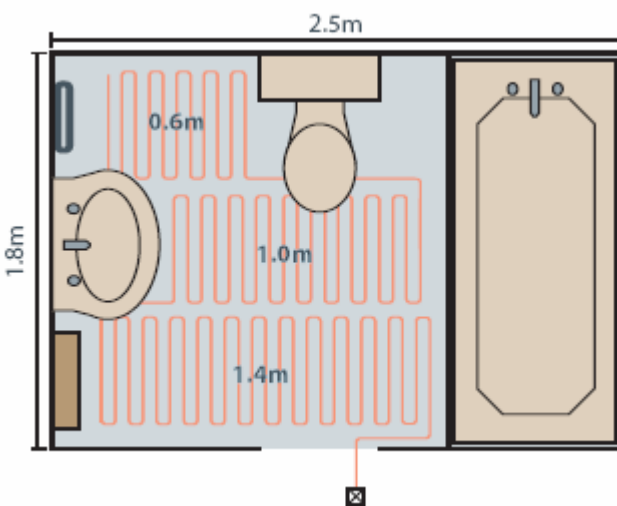
necessary, a layer of plywood can be used to ensure a completely smooth surface. You will need to make a groove in the sub-floor for the cold lead connection joint, as this is slightly thicker than the heating cables. But only do this once the position of the mat has been chosen. We recommend that you apply a primer over the sub-floor, especially if installing

with self-adhesive mats or tape. This ensures that the system sticks well.

b. Electrical preparation

Before laying the heating system, a flush mounted deep electrical box should be installed; this is where the cold leads from the heating mat and the wiring from the controls can be connected. If installing the system in a bathroom, the regulations stipulate that the connections/controls must not be sited within the room. Usually it is possible to place them on a wall outside the room (as with a light switch). All wiring should be chased into the wall and protected by conduit or trunking.

Step 2. Positioning the heating mats



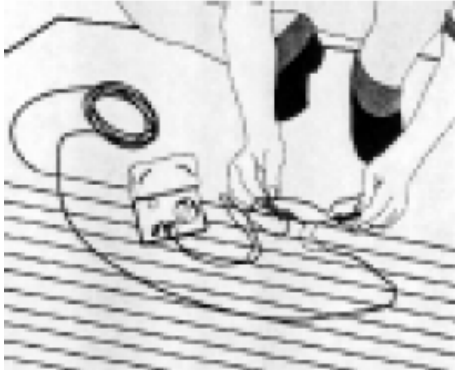
Never lay the mats beneath permanent furniture (cupboards or bathroom fixtures). It helps to draw up a detailed plan of the areas where the mats will be before you start the installation. Decide where you would like the mats to be and mark them out on the sub-floor. If using a two lead connection mat you need to pre-plan to bring the 2nd cold/connection lead back to the main control.

To help you understand a little better, take a look at the diagram (left). It shows the typical area the underfloor heating should cover. Don't forget to plan where to put the floor sensor. It's usually installed about 3-4 cm from the heating cable. You need to make sure that the temperature sensor does not touch the heating elements. This can be achieved by working out the placement of the heating cable before fitting the sensor (you will only need a floor sensor if you are fitting a floor thermostat). When positioning the sensor try to avoid hot water pipes in the floor or any draughty places such as external doorways as this may affect the thermostat. If necessary the sensor lead can be extended using bell wire or 1.0mm twin and earth cable. If more than one mat is used they must be connected in parallel (all cables brought back to the control) and not connected to each other end to end in series.

Step 3. Now test the system resistance

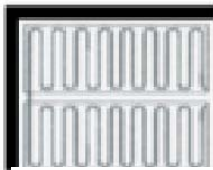
It's a good idea to test the system resistance before you start the installation. Then once again as you finish the installation/before the tiles are put down. To take a reading set your meter to the ohms position on the lowest setting (normally 200 or 2000 ohms). Hold one of the probes on the blue centre cable and one on the black centre cable. You have now completed the continuity test. There is a

possibility of a degree of variance in the readings that you may take in the course of the installation, as long as this is not too significant you should not worry too much as it can be affected by moisture and other factors.



In the unlikely event that accidental damage has occurred during the installation of the mat this will show up when you put the meter at its highest ohms setting (20 or 200 million ohms), place one probe on either the black or blue centre cable and the other probe on the earth screen, making sure that the cables at the other end of the system are not touching each other. Do not hold the probes on with your fingers during this test, as this could affect the result. The reading for this test should be infinity or a blank screen. Fill in your test readings at the back of this booklet.

Step 4. Installing the heating mat



plain wall cut



obstacle cut

It's important that you have the correct size system. So before you complete the installation, lay the mat down without securing it. Take care not to cut or damage the mat with sharp tools and wear soft-soled shoes at all times.

Never join the heating element wires or cross the cold leads underneath or on top of the mats. We supply an extra strong double-sided tape which can be used to stick any of our mats to the sub-floor. If using this method, simply put strips of tape at the beginning and end of each mat run and every 70-80 cm if required.

Wooden sub-floors

We recommend that you prime the floor first (installation kit). After this, we recommend using 3.5mm cable clips to hold the mat in place. Put these in quite frequently to make sure no loose ends are sticking up. Be careful not to put a pin through the cable as this will damage the system. You may be able to use a heavy staple gun to fix the mats, but with this method only staple the matting not the cable. Another effective, but slower method, is to put a thin layer of flexible tile adhesive down, bed the mat into it and then put another thin layer on top. Always use good quality flexible adhesives and check with the supplier that they are suitable for use on wooden sub-floors.

Concrete/Screeded sub-floors

Again, it's a good idea to prime the floor. Depending on how hard the

screed/concrete is you may be able to install it using the 3.5mm cable clips. If the concrete is too hard, we can supply plastic screw fixings that, with a pre-drilled 5mm hole, can be used to fix the mats down. If installing on Detra matting, put a layer of flexible tile adhesive on top of the Detra matting. Put the mat down and put flexible tile adhesive on top.

Insulation/Tile backer boards

Use the same installation process as on wooden sub-floors, but you do not need to prime the floor. Individual fitting guidelines are available for Matt Stretchy, RHE Parkett and WTBC (budget cable).

a. Single lead connection mats

Start with the cold lead (connection lead) as near to the electrical spur as possible. Roll the mat away from you to the end of the area making any cuts necessary to avoid furniture. Once you reach the end of the room, cut across the fabric backing, making a wall cut and roll the mat back towards you. Keep a space between the runs of mat of no less than 3cm apart. Continue until the desired area is covered

b. Dual lead connection mats

These mats are fitted in the same way as the single lead mats, but they have two cold leads (connection leads) at opposite ends of the roll of matting, so when planning how to position the mat(s) take into consideration that you must get both connection leads (on each end of the mat) back to the same electrical point.

c. Equipotential mat - for wet bathrooms with external earth braid

This mat has been designed to meet new wet bathroom wiring guidelines and regulations, it has an external earth braid, which needs to be linked to the secondary earth bonding in the bathroom (taps, pipe work etc). The laying of the mat is carried out in exactly the same way as the dual lead connection mats above. The silver earth strands that weave through the fabric may be cut in the same way as the fabric when fixing.

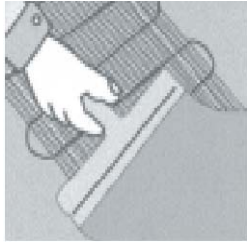
d. Sticky backed mats

The sub-floor must be clean and free from any dust or debris. We recommend that floor primer is applied to ensure the adhesive works effectively. Cut and fit the mat in the usual manner then peel off the protective covering and firmly adhere the mat to the sub-floor.

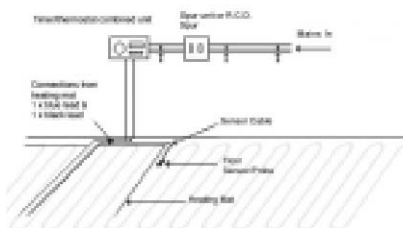
Step 5. Now cover the cables

Your mat should now be firmly fixed to the sub-floor, so it's time to cover the cable with a thin layer of levelling compound or flexible adhesive. Other underfloor heating

companies do not suggest this but we feel it is essential to avoid the possibility of damage occurring to the heating elements. Around 97% of damage caused to heating systems is due to the lack of any protection and cutting this out can cause problems later. We suggest testing the system again at this stage. And don't forget to check with your supplier that the adhesive is suitable for use with the sub-floor.



Step 6. Connecting the system



On this part it is important that a qualified electrician makes the final connections in accordance with IECC guidelines. We also suggest that you use a connection box if more than one system is being connected to the device. The cold leads on the heating cables are not polarised so either can be used as positive/live, however, normal practice is to make blue positive and black negative. The cables are of co-axial construction and so have a braided earth screen running all the way through. This is a safety feature and the earth screen must be linked together and connected to the earthing point. All of our control units (timer/thermostats) have their own manufacturers wiring diagrams/instructions enclosed in the packaging.

Step 7. Tiling



Now simply lay the floor tiles as normal. Don't forget to leave all adhesives to dry naturally. It usually takes up to two weeks before turning the heating system on. If you find that tiles need to be taken up for any reason, please be careful not to damage the heating system.

Congratulations!

You've done it. You have installed your Mat System. Simply fill in the test cards at the back of this booklet and attach your receipt. This will now act as your 10 year guarantee and can be used for reference in the unlikely event of the system malfunctioning.

If you experience any problems, please refer to the troubleshooting guide below before you contact our customer help-line.

Got problems?

If the readings were accurate during your testing the system itself should always be okay, however, should you experience any problems we recommend you check the following.

1. The circuit breaker or fuse is functioning and delivers the power through the thermostat to the heating element.
2. Make sure the R.C.D has not tripped. If it is a dedicated RCD and it has tripped there is a possibility there could be damage to the cable. Re-set the RCD (using the reset button) and, if it trips again contact the customer help-line. NEVER BYPASS THE RCD.
3. Check the thermostat is programmed correctly and is switching on. There should be a light on your control to indicate that it is functioning. If the light is on and it is still not functioning, check you have allowed enough time for the floor to heat up. To the left is a chart showing how long it usually takes to heat the floor up.

| Subfloor construction | Heat-up time |
|---------------------------|--------------|
| Marine ply | 0.5 hrs |
| Tile backer board | 0.5 hrs |
| Insulated screed/concrete | 1-2 hrs |
| Un-insulated concrete | 2-5 hours |

Please note: These are only approximate times and they depend on the thickness of the tiles, concrete and insulation that has been put down. If it is the first time you are turning the heating on it can take up to 24 hours for the heat to come through.

If your floor is still not warming up, call the customer helpline and you can speak to one of our engineers.

Warranty

Now the hard parts over, you can sit back and relax in your warm home. Best of all, you don't even have to worry about the system breaking down as Floorell guarantees all of their electrical underfloor heating systems for 10 years from date of purchase against any manufacturing defects. This warranty covers the repair/replacement of the underfloor heating systems and any associated costs at the discretion of the manufacturer. The ancillary products that we offer to compliment our underfloor heating range are covered by a separate manufacturer warranty (timer/thermostats/RCD's).

Warranty conditions:

- The warranty is dependant on the ohms readings on the back of this booklet being completed fully and properly.
- We require proof of purchase in order to validate the warranty. Therefore, we ask that you retain your invoice, however, if there has been any default in payment for the goods or installation then the warranty is automatically null and void.
- The heating system must be covered by an RCD (Residual Current Device) at all times.
- The system must be fitted in accordance with our installation instructions; failure to install the heating mats in accordance with our installation instructions will invalidate the warranty.
- The warranty does not guarantee mats that endure accidental damage before, during or after installation. If Floorell or any of our agents are required to attend site to carry out inspections and subsequent repairs to heating systems and the faults are found to be caused by anything other than a manufacturing defect then Floorell has the right to charge a reasonable sum for all works carried out.
- The warranty does not cover installations where a qualified electrician has not carried out the electrical connection.

A good idea...

We've found that it's always a good idea to draw the layout of the heating element directly after you've installed it. Use the space below to accurately indicate on the drawing where the mat is laid and where you have placed the cold leads/ connection cables and floor sensor. Or, you could just take a photograph of the installation.

Test report

This card is for your reference, please fill in the guarantee card and return it to us if you experience problems.

- Do not install the cable if the temperature is less than +5°C
- Pay attention to the installation instructions.
- Take care not to damage the cable.

| |
|--|
| BEFORE installing the heating element |
| Resistance of the heating wire ohm |
| Insulation test element/earth braid Ohm |
| Signature date |

| |
|---|
| BEFORE putting the heating element into operation |
| Resistance of the heating wire ohm |
| Insulation test element/earth braid Ohm |
| Signature date |

| |
|--|
| IMMEDIATELY AFTER installing the heating element |
| Resistance of the heating wire ohm |
| Insulation test element/earth braid Ohm |
| Heating wire against metal sheath min. 500 kohm |
| Signature date |