

# The Complete Guide to Electric Underfloor Heating



# Because warmth and comfort should be easy, cost-effective and beautiful

Bring simple, effortless luxury and comfort to any living space with the flexibility of an Underfloor Heating solution.

Underfloor Heating not only removes the chill off floors, but it is a system that lasts for years so you can enjoy the efficient, on-demand heating you deserve in your home.

## Contents

Benefits over Hydronic Heating Systems .....	3
Benefits.....	4
System Components.....	6
Different Types of Systems.....	8
Typical Floor Heating Build Up Examples.....	10
Working out the Size Required.....	12
Installation Process.....	13
Important Aspects to consider when comparing Underfloor Heating Systems.....	14
Contact Support.....	15



## **Benefits over Hydronic Heating Systems**

Electric Underfloor Heating has significant benefits over a hydronic system.

It is easier to install than a hydronic system, and hence cheaper due to minimal labour costs.

In remodelling instances where you have an existing slab an Inslab hydronic system is not an option. An above slab hydronic system tends to be even more expensive and adds additional height build up. Electric Underfloor Heating systems are available in as thin as 3-4mm making it ideal for retro fit options as well as new builds.

As hydronic systems are typically in slab the heat up times are greater than that of an electric system. The Inslab system will heat the slab creating a heat bank which then radiates upwards in the dwelling. To fully heat up a slab and create a heat bank it can take up to 3 days and it will take the same for the slab to cool back down when the heating is switched off.

With the typical Australian climate being cold nights and warmer days hydronic is not recommended, as the Inslab heat bank continues to generate heat during the day when it is not required, often resulting in the need for a cooling system to be used making it extremely inefficient and costly.

Electric systems can run for shorter heating periods due to rapid heat up times. They are also maintenance free as there are no boilers or valves and have no risk of leaks, making them a reliable source of heating.

## Benefits of Electric Underfloor Heating



**Energy efficient:** Electric Underfloor Heating can be powered by renewable energy providing a greener approach to heating. Zoning can be used to heat certain areas, reducing energy wastage by only heating areas used in your home. As hot air rises it is efficient to heat from the lowest point in the room and let the hot air rise.



**Comfortable Heat:** An even climate is provided by Underfloor Heating, with no cold or hot spots. As hot air rises, having heat coming up from the floor makes it the most comfortable form of heating. Underfloor Heating systems are silent, providing that additional comfort.



**Interior Design Freedom:** Underfloor Heating allows interior design freedom, due to the unit being invisible once installed. It is unobtrusive providing a streamlined finish, a welcome alternative to ugly radiators that take up wall space.



**Maintenance free:** Electric Underfloor Heating provides an easy heating option with a rapid heat up time, and there is nothing to pack away in the summer. It is a safe and clean method of heating with no moving parts and does not require annual servicing, providing you with peace of mind.



**Allergy Friendly** There are no drafts emitted by Underfloor Heating systems, hence it is recommended for allergy and Asthma sufferers due to the reduced number of pollens in the air.



**Warm Floors** With any form of heating it is common that the room can be warm and the floor and air just above it are still cold. This is especially noticeable with tiles which are one of the most common floor coverings. Underfloor Heating ensures warm floors and warm feet.



**Accurate Control** With Underfloor Heating you can use intelligent thermostats allowing complete control over the heating time and temperatures making the system more efficient.



**Rapid Heat Up Times** With the rapid heat up time of Electric Floor Heating you can have almost instant heat in any room. It also dries bathroom floors quickly, hence preventing damp, mould, mildew and slip hazards.

## System Components

Electric Underfloor Heating systems have three typical components: The Heating System, a Thermostat and Insulation.

### Heating System



There are various different Underfloor Heating systems so it is important to select the system suitable for your floor covering. There are some important aspects to consider when selecting your heating system. Refer to page 8.

### Controllers



A wide range of controllers are available to allow complete control of Underfloor Heating systems. Both manual and programmable thermostats are available, allowing greater flexibility with programming the heating around daily schedules, hence helping to reduce running costs by allowing the heating to run only when necessary. Wifi controllers are now emerging on the market, allowing the heating to be controlled via an iOS or Android device.

Equally as important as the controller is the floor sensor probe. This is installed in the same floor layer as the floor heating and the sensor is positioned in proximity to the heating cable to ensure it makes an accurate reading of the floor temperature.

## Insulation



Insulation is not always necessary, however it allows the heating to be more energy efficient, and hence cost effective. Insulating a floor can reduce running costs by up to 40%. Heat travels equally in all directions until stopped by a barrier, so insulation can be used to stop downward heat loss by reflecting the heat upwards. This minimises the heat lost, hence reducing running times and using less energy.

## Other considerations:

### Adhesives and levelling compounds



To cover an electric floor heating system you may need to consider a layer of self-levelling compound. The advantage of placing a screed over the floor heating is that it provides a clean flat surface for the tiler to work on, however the more screed layers on top of the floor heating the longer it will take for the floor to heat up.

## Different Types of Systems

There is a range of different types of Electric Underfloor Heating systems, which can be used for different floor coverings and in different room applications.

### In-Slab Systems

In slab systems are a heating cable which is usually attached to the concrete mesh and heats up the whole slab similar to a hydronic system. These are suitable for heating polished concrete floors. With an Inslab system you do not have the fast response times of heating directly below your floor covering. When selecting an Inslab heating system there are three important aspects to consider:

- 1) The thickness and durability of the cable. This cable is going in a slab with concrete poured around it. A thin cable is likely to get damaged and hence is not desirable. 7mm thickness is recommended.
- 2) The wattage of the cable. Make sure the cable has a high enough heat output to heat the slab. 30W/Lm is recommended.
- 3) Ensure that you can run the system on off peak power. This will provide dramatic cost savings.

### In Screed Systems

In screed systems consist of both mats and cables and go below a screed layer of usually 30-75mm. By using an in-screed heating system you can use any floor covering on top of the screed layer. The system is also suitable for heating 2 pour polished concrete floors. In a tiling application it also ensures that the tiler has a smooth clean surface on which to work from. When using an in screed system consider the following:

- 1) The thicker the screed the longer it will take for the floor to heat up. Allow around 1 hour per 25mm of screed for the heat to penetrate.
- 2) If using a cable system you will need to consider the method for fixing it to the floor. There are fixing profiles and fixing mesh available on the market.
- 3) Ensure the cable has a high enough wattage output to heat the screed layer of the floor. 18W/Lm is recommended for a screed layer.



## Directly Below the Substrate

The most common type of floor heating system sits directly below your substrate whether it is tiles, timber, carpet or vinyl.

Any cable system that is available on the market is required to be surrounded by a cement compound. The cement compound is critical as this is how the cable spreads the heat. If the system is not in a cement layer it will overheat and burn out. The only exception to this is a foil system which uses the foil layer to spread the heat, however these systems are not designed for a substrate to be glued onto.

### **Systems to be covered with cement compounds**

Both mat systems and loose wire systems need to be in a cement layer which could be a thin screed, self-levelling compound or in the tile adhesive. The advantage is that once the system is covered in a 10mm cement compound it can be covered with any floor covering.

This system is the one most advertised on the market and there are various levels of products across the market. The two most common styles are a loose wire and mat system. The mat systems consist of a cable attached to a mesh. Other important aspects to consider:

- 1) When looking at the system on a quote ensure you check if it is a mat or loose cable. Whilst loose cable is often cheaper it takes a lot longer to install, especially in large areas.
- 2) Check the supplier's product specs and measure it against the features on page 14 to see how good the system actually is.
- 3) This type of system will give you the fastest response times in both heating up and cooling down.
- 4) To use as a primary heat source, 70% for the room floor area needs to be covered with a 150 watt per m<sup>2</sup> system.

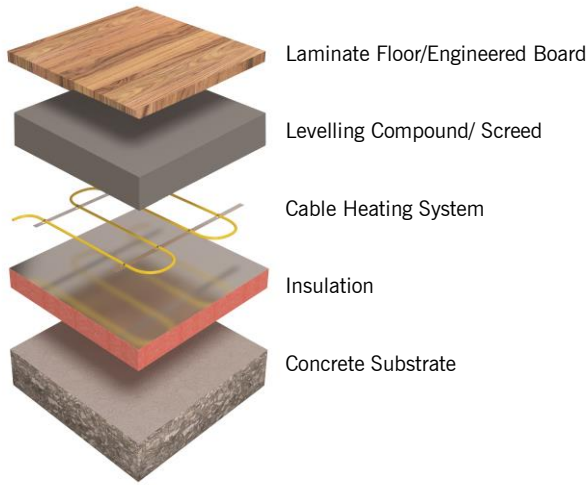
### **Foil Systems**

Foil systems consist of a cable enclosed inside a foil sheet which helps to spread the heat. This means that a foil system can be used directly under carpet or under a floating timber floor.

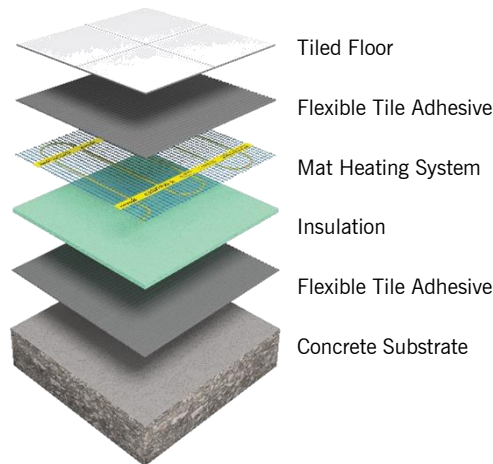
There are also components available which supplement the system to allow it to be used under vinyl or under a glued timber floor. The following are important aspects to remember:

- 1) Check with your floor heating manufacturer that the floor covering is suitable for use with floor heating, especially for timber flooring.
- 2) Consider the floor build-up and where the floor heating will fit into it. Ensure the foil is suitable or check if you will need any other components.
- 3) It is not recommended to be installed below any known fixtures in a room such as large lounges, beds or shelves.

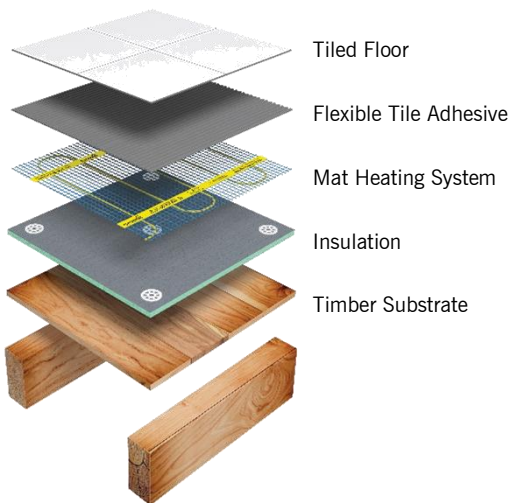
# Typical Floor Heating Build up Examples



This is a typical build-up for an in-screed system showing insulation. In this instance, the cable is being fixed down with galvanised fixing profile. Consider where the water proofing will go in the build-up as this will influence the fixing method used.

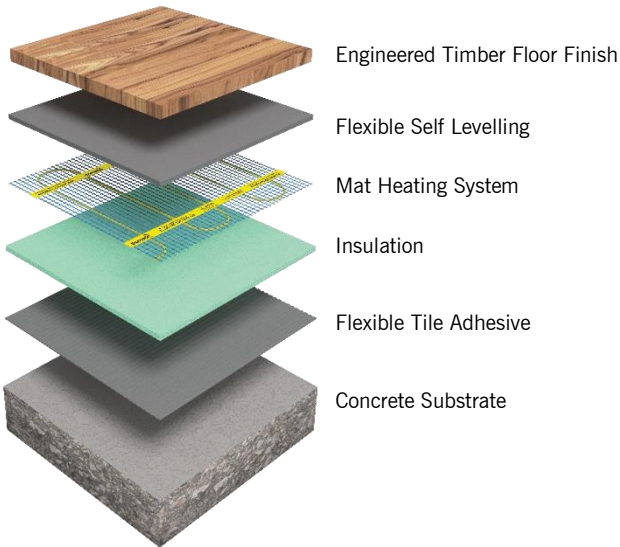


This is a typical build-up of a mat system under tiles with insulation below the floor heating on a concrete substrate. The insulation is glued down using the layer of tile adhesive and the tiles are glued down directly using the tile adhesive.

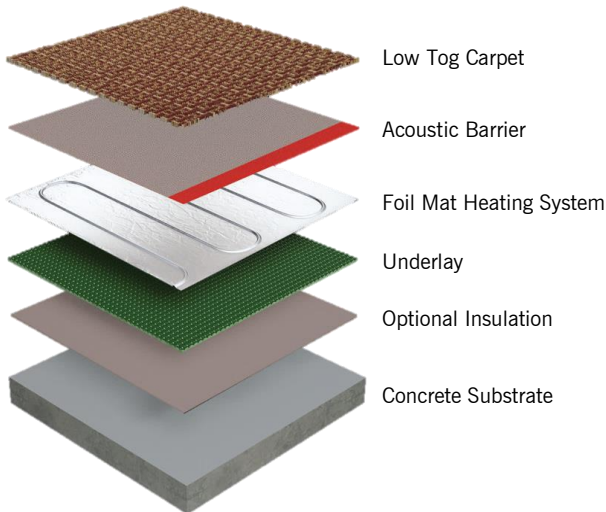


This is a typical build-up of a mat system under tiles with insulation below the floor heating on a timber substrate. The insulation is fixed down using fixing washers and screws and the tiles are glued down directly using the tile adhesive.

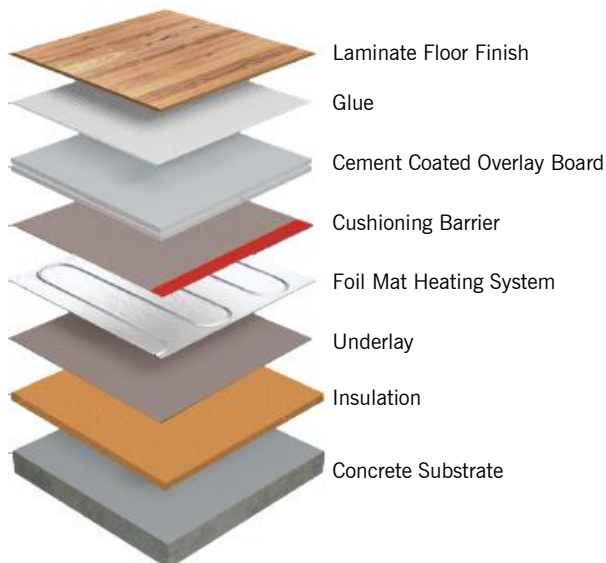
## The Complete Guide to Underfloor Heating



In an instance where you wish to use a standard mat system with a floor covering which wouldn't usually require a screed layer such as timber, vinyl or carpet, you will need to add a self-levelling compound across the heating before laying flooring.



Alternatively, a foil system can go directly below a floating floor finish such as carpet or timber as seen in the build-up image. In this build-up the foil is on top of the carpet underlay with a layer of cushioning above it.



In more complex build-ups where a cement layer isn't being used this is how a floor build up would appear. This shows the timber layer which is glued down to floating cement boards on top of the heating layers with insulation below.

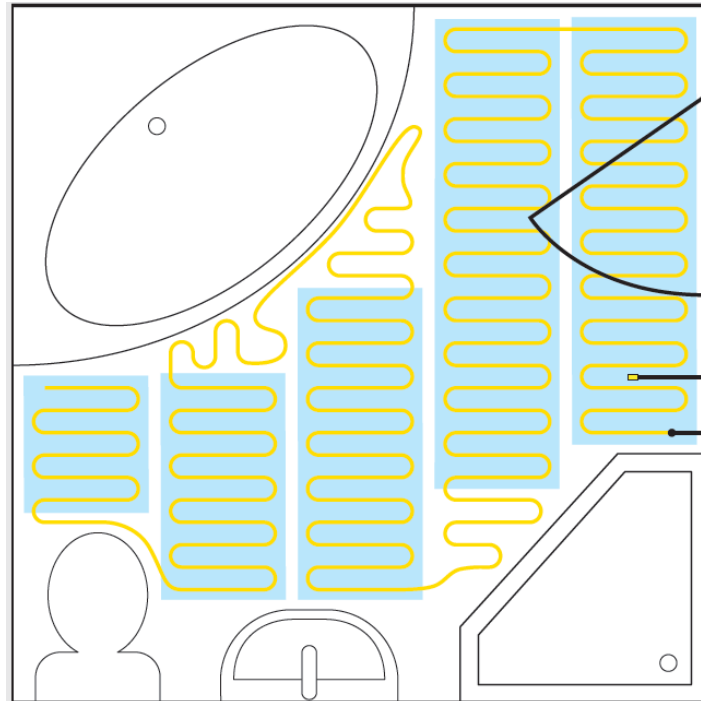
For build-ups of this complexity, you need to find a trusted company who can assist designing the most suitable build-up.

## What size to install

When calculating the amount of floor heating to install the total floor area is calculated, less fixtures such as baths, toilets or kitchen cabinets. In a bedroom situation where the bed or cupboards are to be in a fixed spot we recommend not running heating under these areas.

In a bathroom you can also consider running the heating into the shower provided it is a tiled shower base. This helps to dry the shower preventing mould and mildew.

A typical bathroom example is shown below.



## Installation Process

Electric Underfloor Heating is easy to install, and is available for DIY Installation in Australia (excluding Victoria which requires a qualified electrician). The thermostats must be wired up by a qualified electrician.

Mat systems are the easiest to install, with the heating cable being rolled out on the floor, held in place by adhesive mats on the mat and then linked up to the thermostat and mains power supply.

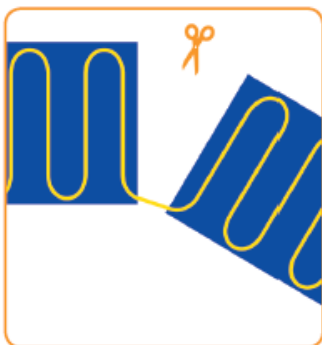
Foil systems are installed using the same cut and return process as the mats, however are not self-adhesive. If they need to be fixed down it can be done using the foil tape to pin it down along the edges.

Loose wire systems usually come with a cloth tape or there are systems available with various fixing profiles.

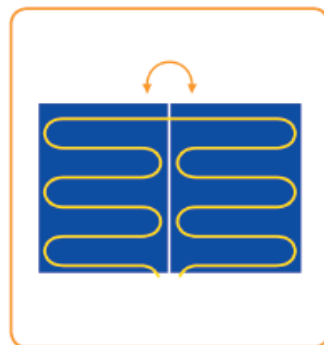
Installation occurs once the floor is ready for tiling. This means the room is clean and the floors dust free.

It is highly advisable that the waterproofing is complete and inspected before the floor heating is laid to prevent additional foot traffic on the heating system. There will also be difficulties applying the waterproofing once the floor heating has been laid.

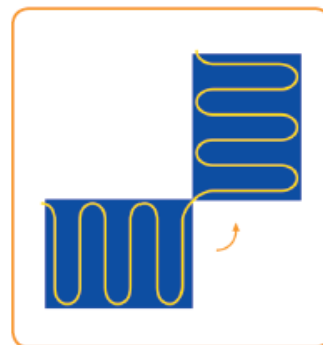
Cutting the mesh



Turn 180°



Turn 90°



Alternative 90°



# Important Aspects to consider when comparing Underfloor Heating Systems

## Warranty

Once Underfloor Heating is installed it is not easily accessible, so it is recommended to choose quality products which will last as long as the floor finish. A 10 Year warranty is considered the absolute baseline for warranty with systems available with lifetime warranties, to allow peace of mind that the system won't fail.

## Some important features of the system

With an Underfloor Heating system look at what install benefits are advertised as this will help to reduce you installation costs.

- Features like self-adhesive mesh on a mat system.
- A single ended system which means only one cold tail goes back to the thermostat
- The thickness of the cable as this will affect the floor height build up.
- The durability of the cable. Features such as twisted twin cable represents a high quality cable.
- For loose wire systems consider what fixings methods are available such as fixing tapes or fixing mesh.

## Country of origin

The product you are looking at may have the country it is manufactured in advertised. This helps give an idea of the quality of the system, as if it is made in Europe or America you are likely to find this is a much better heating system.

## **Contact Support**

Underfloor Heating is no longer a luxury. It is fast proving to be the most efficient and certainly the most comfortable form of heating in all homes. Underfloor Heating has certainly developed majorly since being originally utilised by the Romans in the form of a fire below concrete floors.

Electric Underfloor Heating has played the biggest part in this advancement with a process of continuous improvements resulting in the ever-increasing floor heating demand today.

Thermogroup is one of Australia's and Europe's leading Underfloor Heating specialists with a wide range of some of the very best Underfloor heating systems available. We believe in bringing a unique level of comfort to consumers backed with superior customer service and Underfloor Heating allows us to do just that.

For all enquires, specifying and quoting contact Thermogroup.

1300 368 631

[sales@thermogroup.com.au](mailto:sales@thermogroup.com.au)

[www.thermogroup.com.au](http://www.thermogroup.com.au)

