

**thermo**board

Underfloor heating & cooling solutions by Wavin

**Underfloor Heating**

**Product Guide**



FOR RESIDENTIAL AND LIGHT  
COMMERCIAL APPLICATIONS

## About Thermoboard UFH

## Introduction

### A partnership of experience

Wavin is Europe's largest supplier of plastic pipe systems in terms of product range, innovation, logistical services and geographical presence.

Thermoboard underfloor heating & cooling systems by Wavin offers a range of UFH systems to suit a wide range of project requirements and all types of floor constructions.

### The UK's most advanced UFH technology

Thermoboard UFH technology has been developed to suit all building construction types typically used in the UK – both concrete-based floors and timber floors. It provides innovative, cost-efficient solutions for all types of environment, including residential, light commercial and public buildings.

### UFH range

This Product Guide describes the range of Thermoboard UFH systems that are available for small and large, new build and RMI projects.

For larger complex projects Thermoboard provides a complete warranted system design service with direct-to-site delivery of all materials, installation drawings and instructions.

### What's different about Thermoboard UFH

Thermoboard UFH products have been designed to provide the highest possible heating performance while using materials that will last throughout the life of the building.

The products combine easy installation with consistent performance. They ensure that the power output from the floor is determined by the product.

### Thermoboard innovation

Thermoboard UFH products are as easy to use as conventional radiators. They require little or no previous UFH experience. No specialist tools are needed for successful installation. They enable any installer to work more quickly to achieve a high quality result.

Thermoboard UFH systems for domestic and light commercial applications include plumbed systems for all types of floor constructions, including:

- Sand/cement and liquid screeds
- Timber battens and timber joists
- Fully floating timber floors
- Raised access floors
- Acoustic floors complying with Part E – including Robust Details and a range of electric mat systems.



# UNDERFLOOR HEATING

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### What You Need to Know

Underfloor Heating gently heats the floor by either warm water pipe or electric cable. It is already widely used in other countries, and is now increasingly being recognised in the UK as the most modern energy-efficient option for space heating.

#### Objective and benefits of UFH

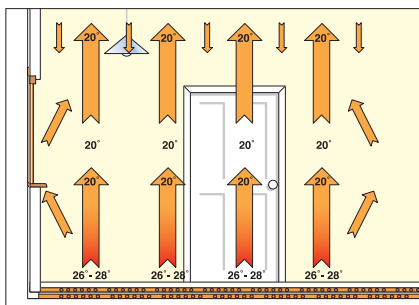
Heat is transferred from a warm area to a colder area in three ways:

- Conduction
- Convection
- Natural radiation

Our bodies find natural radiation to be the most comfortable, because this is how the sun heats us.

UFH emulates this natural heating action of the sun. Energy emitted from the floor is absorbed by other surfaces in the room. These warm up and become secondary emitters. Compared with other forms of heating, the advantages are:

- All-round, comfortable warmth
- Unhindered room layout: no wall-mounted radiators, for example
- Improved energy efficiency: typically saving up to 25% on fuel bills
- Floor only needs heating to 26–28°C (about the same as hand temperature)
- Requires water heated to 45–65°C: significantly less than for other heating types
- Healthier environment: less dust circulates in the air
- Greater safety: very hot surfaces (most radiators, for example) are eliminated

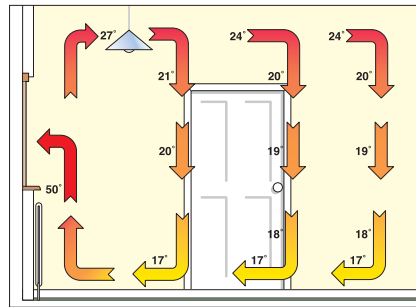


Radiated heat: more even warmth, greater comfort

By contrast, radiators use room air to transfer heat, mostly by convection.

This results in:

- Hot air concentrated at ceiling level: cooler air – and often draughts – at floor level
- Dust carried around the room in convection currents
- Significant heat loss through windows, walls and ceilings
- Water has to be heated to high temperatures: typically 70–80°C
- Higher energy loss from connecting pipes
- Dry, re-heated air: causing a feeling of stuffiness



Convected heat: uneven warmth, significant heat loss

#### UFH heat output

Heat output depends on the difference between floor and air temperature in the room to be heated. This difference is multiplied by 10.6 to provide the Watts per square metre ( $W/m^2$ ) output figure.

EXAMPLE:

$$\begin{aligned} & \text{Floor temperature } 25^\circ\text{C minus Room air} \\ & \text{temperature } 20^\circ\text{C} \\ & = 5^\circ\text{C difference} \\ & = 5 \times 10.6 = 53 \text{ W/m}^2 \end{aligned}$$

Most buildings require heat output between  $35W/m^2$  and  $75W/m^2$  – requiring floor temperatures  $23-28^\circ\text{C}$ . With concrete (screeded) floors, this can be achieved with water at  $40-45^\circ\text{C}$ . With timber floors, water needs to be  $50-65^\circ\text{C}$ .

#### Controls

A room thermostat is used to monitor the air temperature in a heating zone and to turn the flow of water into the floor on or off.

For multiple circuits of plumbed UFH, pre-assembled control units – with extensions as required – and other control components are available.

For more details about control options for plumbed circuits, see pages 18 and 19.

#### Warm-up and responsiveness

Warm-up time of any UFH system is a function of the thermal mass of the floor. Thick floor screeds will take longer to reach the target surface temperature. Thin screeds and timber floors begin emitting heat sooner – and cool down faster.

#### Insulation

In most UFH projects, polystyrene insulation (thickness as per current Building Regulations) is used. Choice of insulation type is important: the lower the conductivity, the less heat is wasted downwards into the understructure.

There are two types of polystyrene:

##### EPS

Expanded polystyrene: This has high conductivity.

##### XPS

Extruded polystyrene: Closed-cell and has a high compressive strength.

# UNDERFLOOR HEATING

## Factors to Consider

### Factors to Consider

Before selecting the right underfloor heating components for a project, the following factors need to be considered:

#### Floor construction

Choice of UFH system is primarily influenced by the type of floor construction – Screeded or Timber.

#### Screeded floors

Traditionally, a sand and cement mix (typically 65–70mm thick) OR a free-flowing liquid screed (typically 40mm thick).

Screeded floors are typically installed over an insulating layer (usually rigid polystyrene) placed over the sub-floor block. UFH pipe or cable is fixed above the insulation before the screed is laid.

The screed is a good conductor of heat and acts as a heat diffuser.

#### Timber floors

There are various forms, including **Joisted, Battened** and **Floating Floors**.

Timber floors have a lower thermal mass but conduct less heat. For effective heating, water temperature is typically needed in the region of 60–65°C with pipe in contact with floor deck.

#### Joisted floors

Softwood joists or manufactured I-beams, typically at 400mm or 600mm centres, support a floor deck of timber panels or planks – and the chosen floor finish. UFH can be installed between the joists. This may be either from above before the floor deck is installed – or from below after the floor deck is in place. The UFH is installed in direct contact with the overlaid floor deck for maximum efficiency.

#### Battened floors

Parallel timber battens are placed at regular intervals across the main structural floor. The UFH system is placed between the battens before the overlying main floor deck is installed in direct contact with the heating panels.

#### Floating floors

A timber floor deck placed over, but not secured to, rigid insulation. Typically, tongued-and-grooved chipboard or plywood panels glued together to create a single entity whose inherent weight is sufficient to keep it in place. A 10mm gap is left around the perimeter to allow for thermal or moisture-content expansion.



Floating Floor panel with integral heat diffuser plate

#### What floor finish can be installed?

Both screeded and timber floors are typically overlaid with a final floor finish including:

- Carpet
- Resilient vinyl, linoleum (or equivalent) sheet or tile
- Stone or ceramics
- Timber or laminate

The thermal resistance of each of these varies (*EXAMPLE: carpet has a greater insulating effect than hard tiles*). This affects heat output – and the energy required to bring the upper floor surface up to the required temperature to enable radiant heating of the room or heating zone to occur.

It is important that the combined resistance of the floor structure and finish does not become, in effect, an insulating barrier which prevents efficient heating performance. (*EXAMPLE: if carpet underlay is to be used, felt or rubber crumb underlay should be avoided because its insulating effect is too great*).

#### What pipe layout?

Recommended pipe centres are typically 200mm but may be smaller where greater heat output is needed. For screeded floor areas, UFH pipework can be laid in a 'serpentine' or 'snail/spiral' pattern (see page 7 for illustrations).

The serpentine pattern can put greater outward pressure on the pipe fixings because tighter turns are needed to achieve close pipe centres. Snail/spiral patterns can generally achieve close centres without turns being too tight.

#### Heat Pumps

##### Ground Source

Extracts the heat from the ground using pipes buried in the garden. Beneath the surface, the ground stays at a constant temperature so a ground source heat pumps can be relied upon all year round.

##### Air Source

Extracts the heat from the air – even when outside temperatures are as low as minus 15°C.

There are two types of air source heat pumps:

- Air-to-water – uses the extracted heat to warm water
- Air-to-air – produces warm air which circulated by fans to heat a home.

As heat pumps heat water to a lower temperature than a standard boiler system they are ideally suited to an underfloor heating system which requires a lower operating temperature than radiators.

Benefits:

- Reduced fuel bills
- Reduces wasted electricity
- Reduces CO<sup>2</sup> emissions (Ground Source)

Factors to Consider continued overleaf

**Factors to Consider** *continued***Pipe centres**

The distance between two parallel runs of heating pipe. Consistent spacing delivers consistent output. In some Thermoboard products, this spacing is predetermined. Other Thermoboard options allow pipe runs to be set closer together in specific areas where higher output may be desirable (*EXAMPLE: near large windows*). Smaller pipe centres are usually necessary close to the manifold.

**Heating zone**

This is any space that has the temperature individually controlled. Typically this is an individual room, but larger rooms or heating spaces can have several heating zones. Each zone must have at least one UFH circuit.

**What size of manifold is required?**

When two or more plumbed circuits are to be supplied from a single heating source, a manifold is used. This has multiple flow and return connections to serve a number of UFH circuits.

The manifold can be configured exactly to suit each individual project.

**What temperature controls can be used?**

A manifold has a mixing valve/pump unit attached to reduce high temperature water to the lower level required by UFH. Each branch can be fitted with a thermo-hydraulic actuator (controlled by a room thermostat) – or the whole manifold can be turned on or off by a motorised valve.

Other controls (wired and wireless) are needed to switch the heating system on and off as necessary (via programmed time control).

**U-values**

Is a measure of the insulating (or non-insulating) property of a wall, window or floor. It is measured in Watts per square metre per degree Centigrade.

**Perimeter insulation**

These are strips of insulating material placed around the edge of a screed. They reduce heat loss into the base of perimeter walls as well as providing for thermal expansion of the floor screed.

**Heat diffuser**

This is the material or device which spreads the heating energy evenly through the floor mass so that the overlying floor surface does not have hot spots or cold spots. Screed acts as a heat diffuser. In Thermoboard timber systems, metal foil (which has high thermal conductivity) is pre-fitted to the insulation panels to lie under and along each side of the heating pipe to help spread the heat evenly to the floor above.

**The Benefits:**

- ▲ **Energy efficient 'invisible' warmth**
  - savings on running costs compared to traditional radiator systems
- ▲ **Uniform heat**
  - Good distribution over the whole room
- ▲ **Greater level of comfort**
  - the temperature profile is very close to ideal human comfort levels
- ▲ **No cold floors**
  - stone and ceramic floors are more pleasant underfoot when warm
- ▲ **Complements the operation of condensing boilers**
  - underfloor heating is designed to operate at lower temperatures than traditional radiator systems
- ▲ **Ideal for modern lifestyles**
  - allows total freedom on furniture layout and room utilisation
- ▲ **Clean interior design**
  - no dusting behind radiators required
- ▲ **Safe for children, elderly and the less able**
  - no exposed hot surfaces to create a burn hazard
- ▲ **Low allergy**
  - convected airbourne dust levels reduced and underfloor heating discourages house dust mite within floor coverings
- ▲ **Low maintenance**
  - no decoration or renewal of radiators, and no radiators to 'drop' to enable redecoration of rooms
- ▲ **No staining of walls**
  - convective air currents above radiators often stain decorations
- ▲ **Less likelihood of insurance leak claims**
  - no risk of leaks from radiators and associated connections
- ▲ **Silent running**
  - no expansion creaking or water flow noise via radiators
- ▲ **Ideal for high ceilings**
  - maintains the heat at the same level as the occupancy

# UNDERFLOOR HEATING

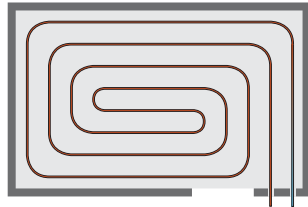
## Typical Layouts

### Typical Pipe Layout

There are two typical patterns for laying UFH pipe:

#### Spiral

This pattern follows the room shape in a spiral to the middle. Pipe is initially laid at 400mm centres, and then reversed out to leave pipe spacing at 200mm centres.



Suitable for these Thermoboard systems:

#### Staples and System Plates

A serpentine pattern may also be used for both systems.

#### Serpentine

This pattern takes a route up and down the length of the room with loop turns at each end. The parallel pipe runs should be at 200mm centres.



Used for these Thermoboard systems:

#### Pocketed Polystyrene (for screeded floors)

**Foiled Polystyrene** (for timber joist or batten floors, and for fully floating floors) and

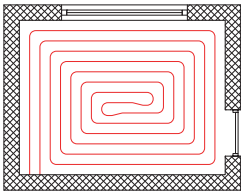
#### Modular Chipboard (for timber joist or batten floors)

May also be used for

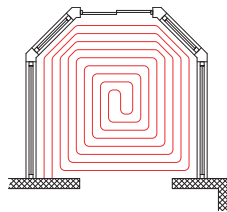
**Staples** (recommended) and possible for **System Plates**

### Typical Room Layout

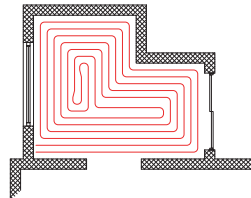
#### Basic Square



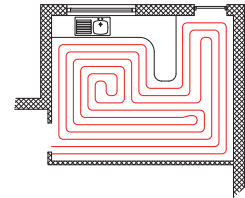
#### Conservatory



#### L Shaped

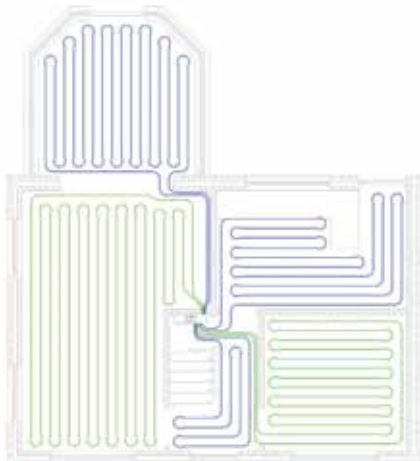


#### Irregular Shape

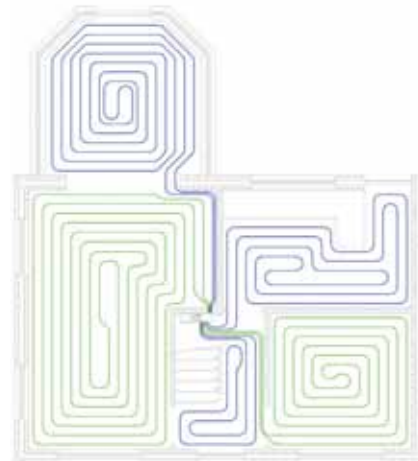


### Typical Multi Room Layout

#### Serpentine Layout



#### Spiral Layout



### Which UFH System is right for your project?

The choice of Underfloor Heating (UFH) system is primarily influenced by the type of floor construction – screeded or timber (see descriptions on page 5). Thermoboard UFH has six systems for screeded and timber floors

#### Screeded

##### Staples



##### System Plates



##### Pocketed Polystyrene

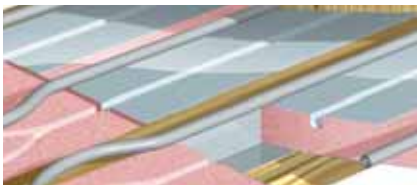


##### Electric Mat 150

See image below

#### Timber

##### Foiled Polystyrene



##### Modular Wood



##### Electric Mat 100



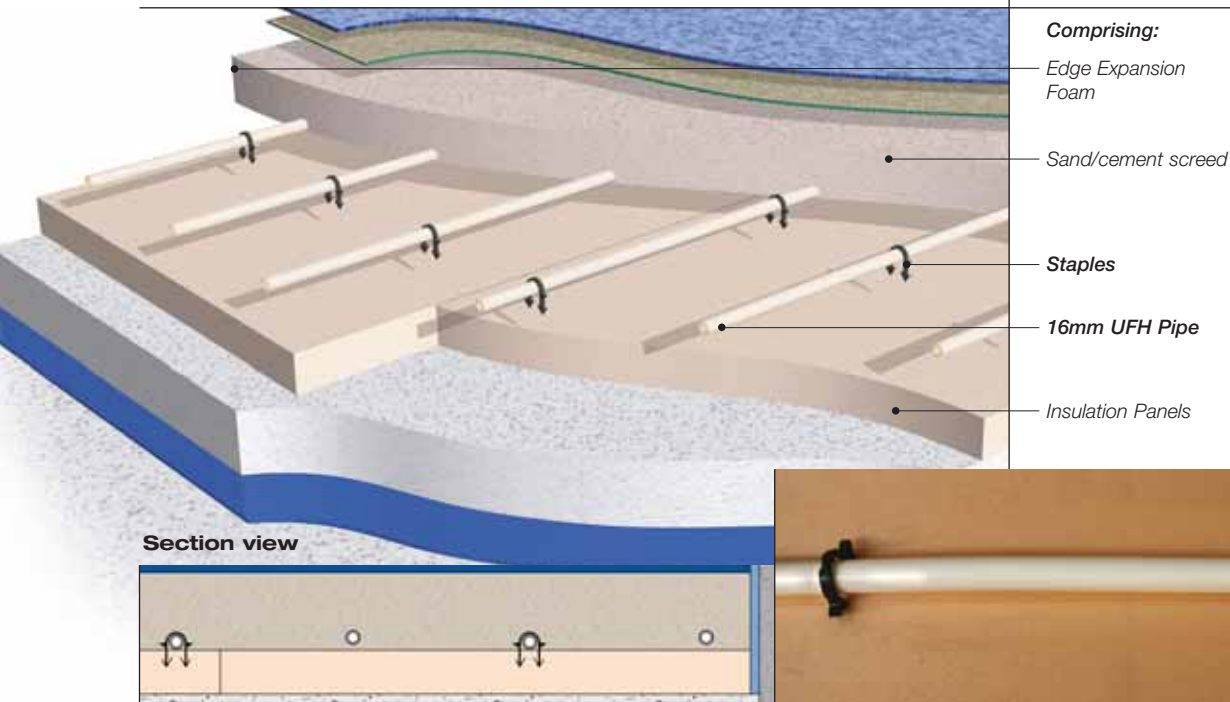
### UFH Compatibility Chart

System Type	Floor Construction			
	Screeded	Timber Joists	Timber Batten	Fully Floating
Staples	✓			
System Plates	✓			
Pocketed Polystyrene	✓			
Foiled Polystyrene		✓	✓	✓
Modular Chipboard		✓	✓	
Electric Mat 100		✓	✓	✓
Electric Mat 150	✓			

# UNDERFLOOR HEATING

## Screeded Floors

### Staples



#### System Construction

##### Comprising:

- Edge Expansion Foam
- Sand/cement screed
- Staples
- 16mm UFH Pipe
- Insulation Panels

#### Pipe Spacing

- Flexible: at installer's discretion
- Recommended: 200mm centres for standard floor area

#### Pipe Layout

- At installer's discretion: can include diagonals if required

#### System Overview

Basic system for placement on rigid insulation panels over a solid floor slab, before screeding.

#### System Features

- Allows independent choice of insulation panels to suit the thermal and acoustic properties and performance required: suitable for any insulation type/thickness.
- Installer marks top of insulation to indicate pipe position and spacing.
- Gaiter from edge insulation overlaps the top of the insulation to prevent screed ingress under panels at the perimeter.
- Use staples with rigid insulation or screw-clips with mineral wool.
- Staple gun available: enables pipe fixing from standing position

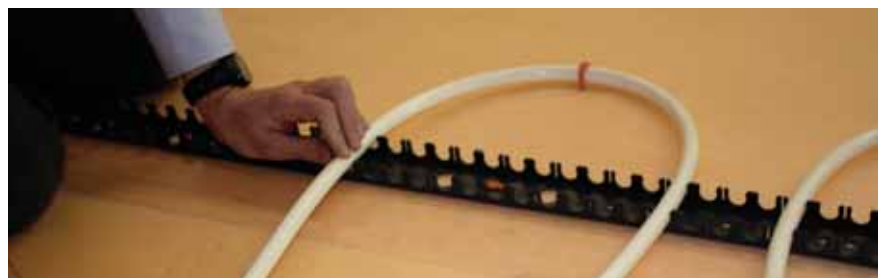
#### Benefits

- Lowest material cost
- Suits irregularly shaped floor areas
- Extreme versatility of pipe layout and spacing

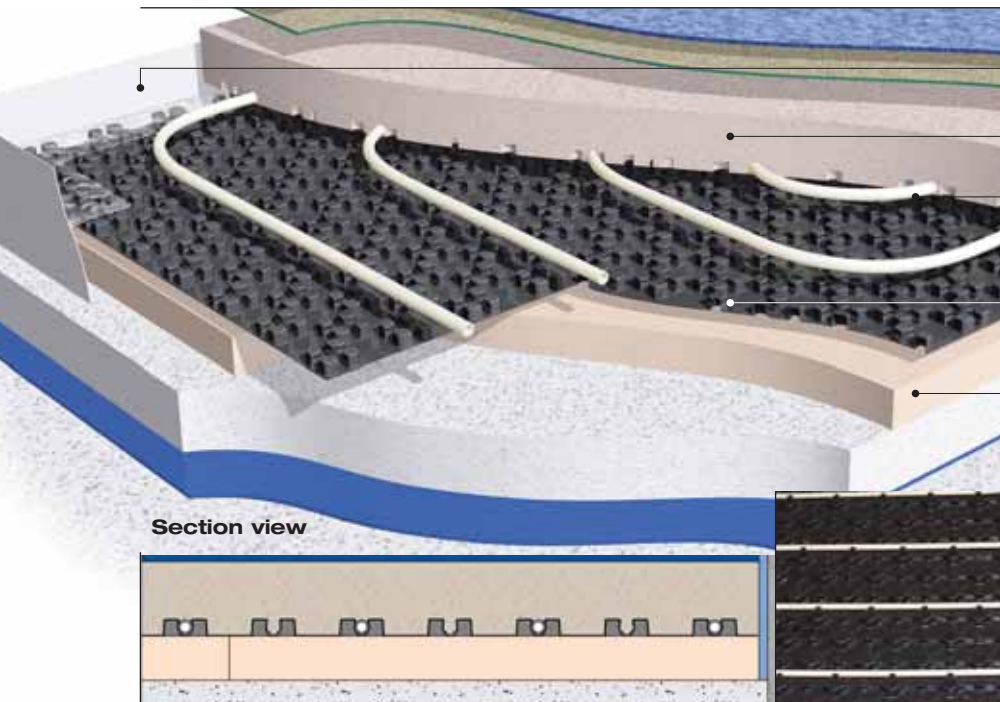
### Clip Rail

#### System Features

- Increases security of pipe to insulation over Staples system
- Faster installation process
- Maintains regular pipe spacings



**System Plates**



**System Construction**

**Comprising:**

- Edge Expansion Foam
- Sand/cement screed
- 16mm UHF Pipe
- System Plates
- Insulation Panels

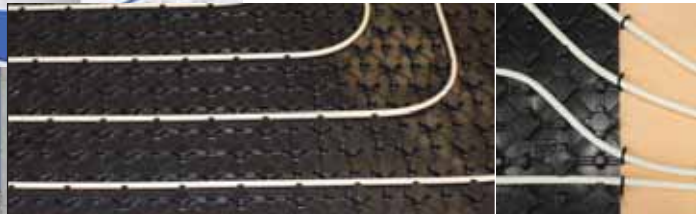
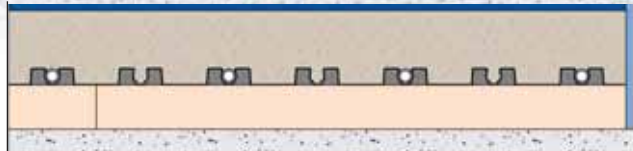
**Pipe Spacing**

- Flexible: at installer's discretion
- Recommended: 225mm centres for standard floor area
- Any variation must be multiples of 75mm

**Pipe Layout**

- At installer's discretion: can include diagonals if required
- Snail pattern recommended: less outward pressure on pipe grip at turns (see page 7)

Section view



**System Overview**

Interlocking sheets of vacuum-formed tough plastic. For placement over rigid insulation panels on a solid floor slab, before pipe installation and screeding.

**System Features**

- System Plates lock together: prevents screed ingress beneath the Plates
- Gaiter from edge insulation overlaps the top of the Plate to prevent screed ingress under Plates at perimeter
- System Plates may be trimmed to size using a utility knife
- No air gaps within or beneath the clip castellations: maximum thermal transfer
- System Plates can be laid over any level sub-floor allowing independent choice of insulation panels to suit the thermal & acoustic properties and performance required.
- Can be used with either traditional or liquid screeds.
- Pipe can be configured to meet specific project requirements.
- Layout options include diagonal pipe placement.
- Plates are sufficiently strong to support foot traffic and wheel barrows.

**Benefits**

- No need to measure for pipe position
- Flexible layout: may be configured to meet specific project requirements
- Easy, fast installation
- Pipe not easily dislodged by foot traffic
- Consistent location of pipe holding ensures regular pipe spacing

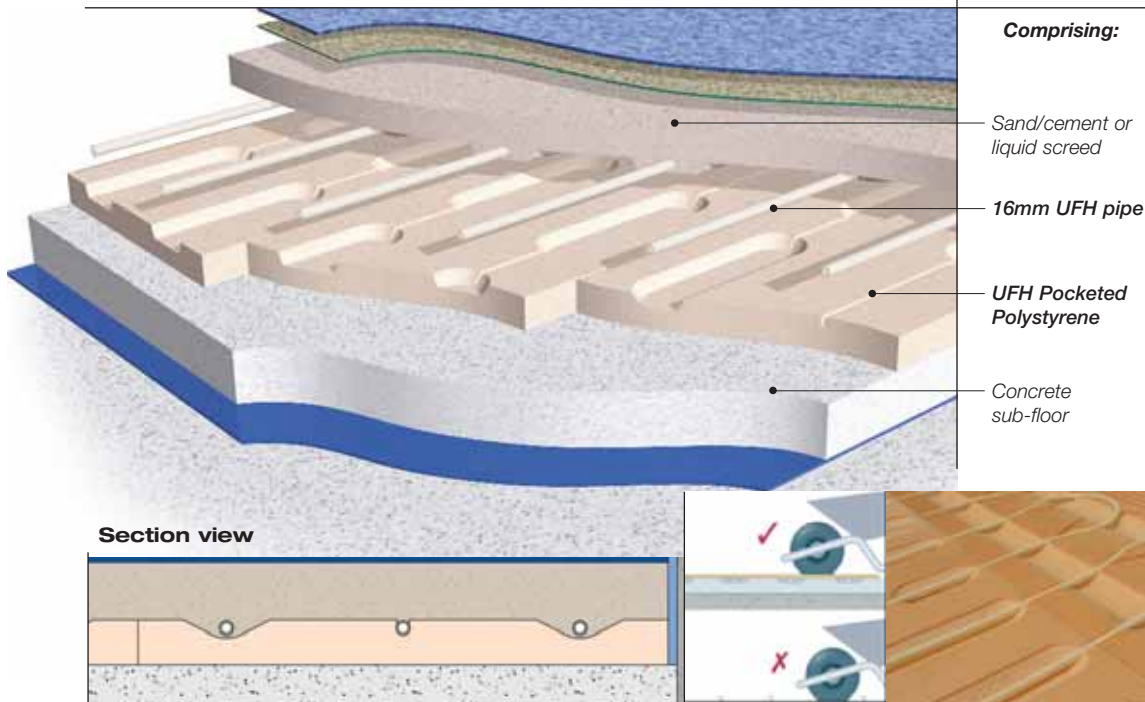
**Transitional areas**

Where Plates are not required or not practicable, and where pipes must be positioned closer together (*EXAMPLE: approach to manifold*), heating pipe may simply be run off the edge of the Plate onto the insulation, and held in place by Staples. Swept Bends and Clamps may also be used to support and secure the pipe in such areas (*EXAMPLE: where the pipe needs to run up the wall to the manifold*).

# UNDERFLOOR HEATING

## Screeded Floor

### Pocketed Polystyrene



#### System Construction

##### Comprising:

Sand/cement or liquid screed

16mm UFH pipe

UFH Pocketed Polystyrene

Concrete sub-floor

#### Pipe Spacing

■ Predetermined (200mm centres): pipe channels cut into top surface of panels

#### Pipe Layout

■ Predetermined serpentine pattern

#### System Overview

Insulation panels with channels for pipe and, at intervals, pockets for screed. For placement over a solid floor slab, before pipe installation and screeding. Output from the floor is determined by the panel product.

#### System Features

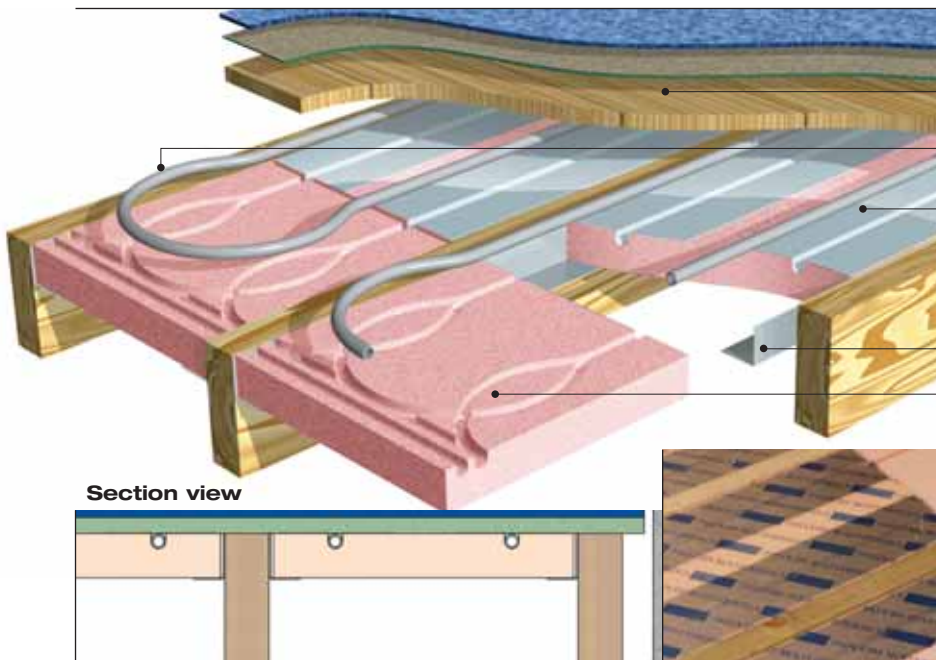
- Machined panels of insulation used in place of plain insulation – no staples, no system plates
- Fixed pipe centres assure thermal performance and consistency
- Insulation and UFH base installed simultaneously – saves time on site
- Pocket design reduces screed volume – reduces cost and drying time
- Complementary new panels insulate Flows and Returns
- Panels protect pipe from wheelbarrows and foot traffic
- Suitable for traditional and liquid screeds

#### Benefits

- Insulation and UFH pipe base installed simultaneously saving labour costs
- Fixed pipe centres ensure consistency of thermal output
- Easy, fast installation and pipe placement
- Can be walked on and holds pipe in place, preventing a tripping hazard
- Pipe protected while screed is being laid
- Pockets at intervals allow screed to wrap round pipe

#### Foiled Polystyrene for Timber Joist & Batten Floors

##### Joisted



##### System Construction

[For joisted floors]  
Comprising:

- Timber floor deck
- 16mm UFH Pipe
- Batten/Joist Panel (insulation) with pre-fitted aluminium diffuser and polyethylene film
- Plastic 'L' Brackets
- End Panel (insulation)

##### Pipe Spacing

- Predetermined (200mm centres): pipe channels cut into top surface of panels

##### Pipe Layout

- Serpentine pattern following joist layout (see page 7)

##### Section view



##### System Overview

Insulation panels with pre-cut channels for pipe, and pre-fitted heat diffusers. For placement over timber joisted or battened floor constructions.

NB – Systems used in Joisted applications can be installed from above and below

##### Installation - Battened

Thermoboard Panels are used as spacers when setting out battens. Pipe is taken to an adjacent space by cutting channel/notch in batten

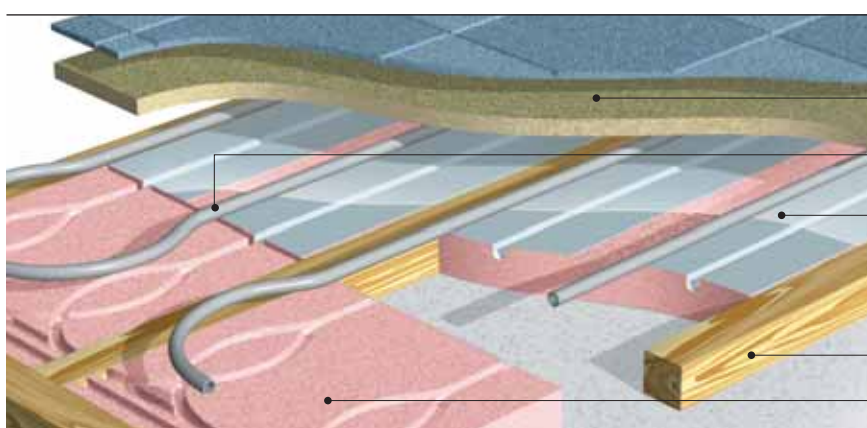
##### System Features

- Pre-fitted heat diffusers
- Pipe integrated *within* the insulation thickness: enables full contact with overlaid floor deck
- No reliance on heating air beneath the floor deck
- No pugging or wet trades required: no delay to laying of floor deck
- Creates floor structure with low thermal mass: fast response to changes in heating demand
- Panels can be neatly trimmed to required length using a Circular Saw Blade

##### Benefits

- Can be installed from above and below
- Easy, fast installation and pipe placement
- Insulation and UFH pipe base installed simultaneously
- Fixed pipe centres ensure consistency of thermal output
- Separate diffuser plates not required
- Pipe in full contact with overlying floor deck
- Polyethylene film helps acoustic performance and prevents floor ticking

##### Battened



##### System Construction

[For battened floors]  
Comprising:

- Chipboard deck
- 16mm UFH Pipe
- Batten/Joist Panel (insulation) with pre-fitted aluminium diffuser and polyethylene film
- Battens
- End Panel (insulation)

##### Pipe Spacing

- Predetermined (200mm centres): pipe channels cut into top surface of panels

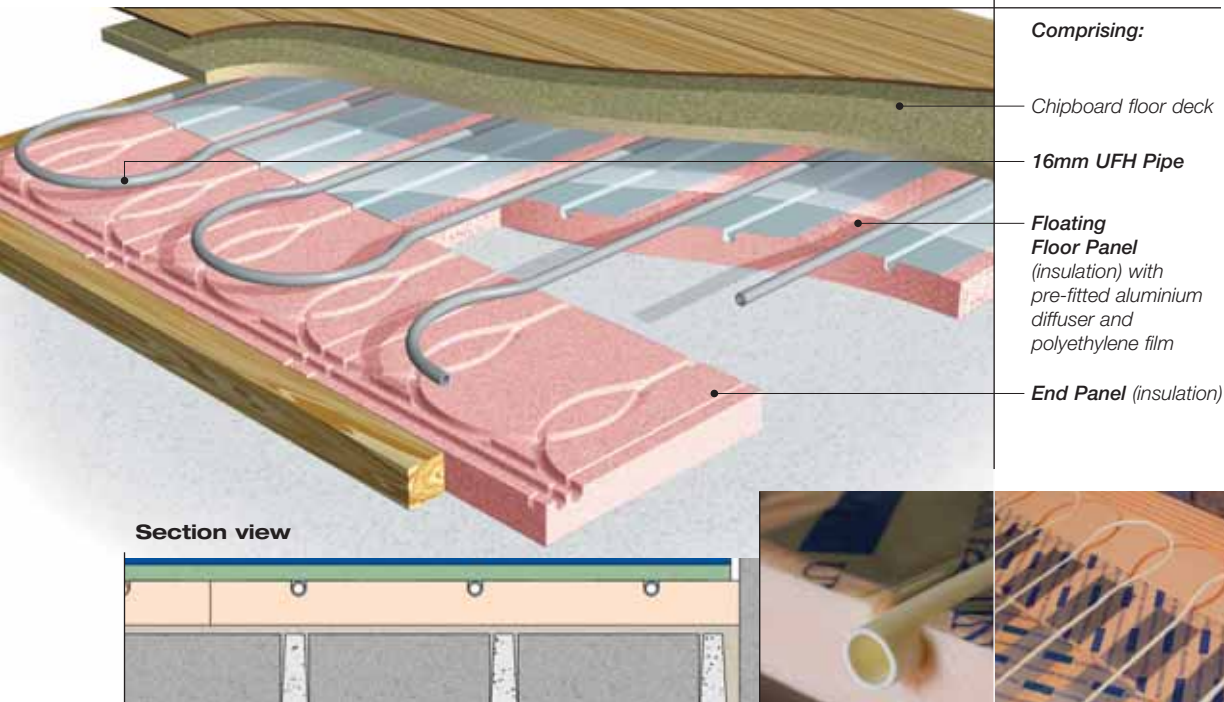
##### Pipe Layout

- Predetermined Serpentine pattern following joist layout (see page 7)

# UNDERFLOOR HEATING

## Dry Construction Floors

### Foiled Polystyrene for Fully Floating Floors



#### System Construction

##### Comprising:

Chipboard floor deck

16mm UHFH Pipe

Floating Floor Panel (insulation) with pre-fitted aluminium diffuser and polyethylene film

End Panel (insulation)

#### Pipe Spacing

■ Predetermined (200mm centres): pipe channels cut into top surface of panels

#### Pipe Layout

■ Predetermined  
■ Serpentine pattern

#### System Overview

Insulation panels with pre-cut channels for pipe, and pre-fitted heat diffusers. For floating floor constructions.

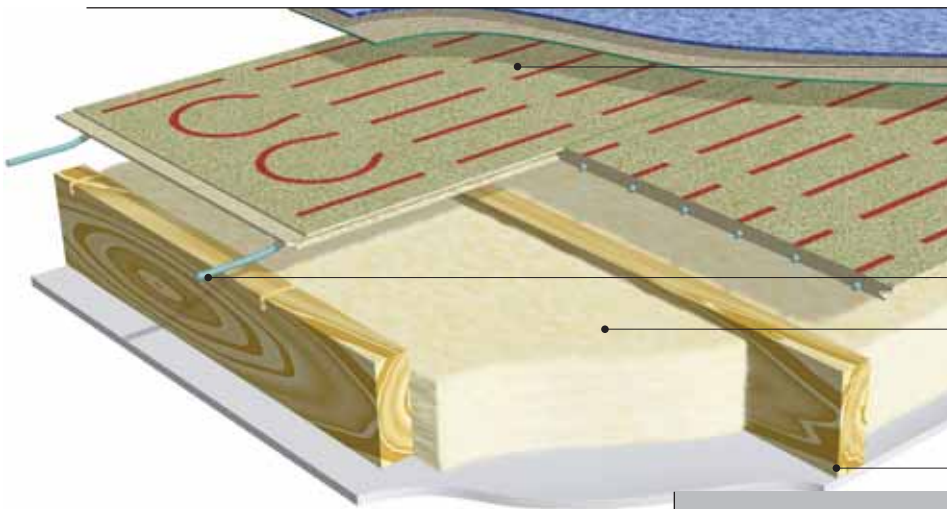
#### System Features

- Pipe integrated within the insulation thickness: enables full contact with overlaid floor deck
- Creates floor structure with low thermal mass: fast response to changes in heating demand
- Panels can be neatly trimmed to required length using a Circular Saw Blade

#### Benefits

- Easy planning and installation: similar timescale for installing unheated floating floor
- No marking out of panels required: pre-set pipe spacing
- No separate diffuser plates to source and fit
- Factory-fitted polyethylene film prevents ticking of floor (caused by differential thermal expansion) and enables better acoustic performance
- Even, consistent heat output
- Pipe at 200mm centres ensures excellent thermal performance

**Modular Wood**



**System Construction**

**Comprising:**

UFH Chipboard/  
Plywood Panel

10mm UFH pipe

Insulation beneath floor either rigid insulation supported on battens, glass fibre or mineral wool

Joists

**Pipe Spacing**

■ Predetermined (200mm centres): pipe combined into modular wood panels

**Pipe Layout**

■ Predetermined serpentine pattern

**Section view**



**System Overview**

Standard sized tongue-and-groove chipboard panels with pre-fitted UFH pipe. For placement over timber joisted or battened floor constructions.

Available with a waterproof slip resistant coating over a standard chipboard panel, enabling the installed deck to be exposed to external weather conditions for up to 42 days.

**System Features**

- Combined floor deck and UFH pipe
- Compatible with standard-sized tongue and groove chipboard floor deck panels
- Chipboard and Plywood modules
- High power output
- Pipe layout within the panel depicted on surface to indicate pipe location to floor finish installer

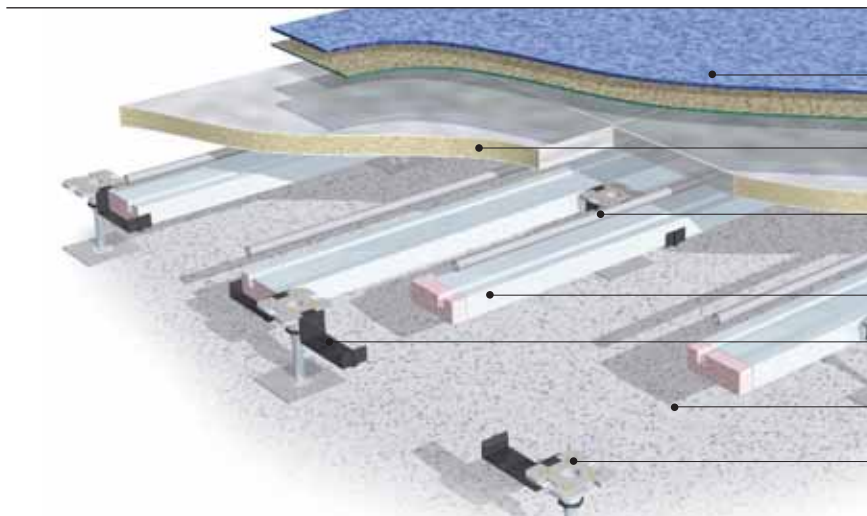
**Benefits**

- Easy, fast installation
- Floor deck and UFH pipe installed simultaneously
- Fixed pipe centres for maximum consistency of thermal output
- Solution for non-standard or inconsistent timber floor constructions
- Low mass means faster heat response
- Panels can be lifted at any time to gain access to the floor void
- Can be installed from above and below
- Suitable for use with softwood and I-Beam timber joists

# UNDERFLOOR HEATING

## Raised Access Floors

### Raised Access Floors



#### System Construction

##### Comprising:

- Floor finish
- RAF Panel
- 16mm UFH pipe
- Heating module
- RAF bracket
- Sub-floor
- Pedestal

#### Pipe Spacing

- Predetermined (300mm centres): Pipe channels cut out of polystyrene raised access module

#### Pipe Layout

- Predetermined serpentine pattern

#### Section view



#### System Overview

Ideal method of incorporating warm water underfloor heating/cooling with standard Raised Access Floors (RAF).

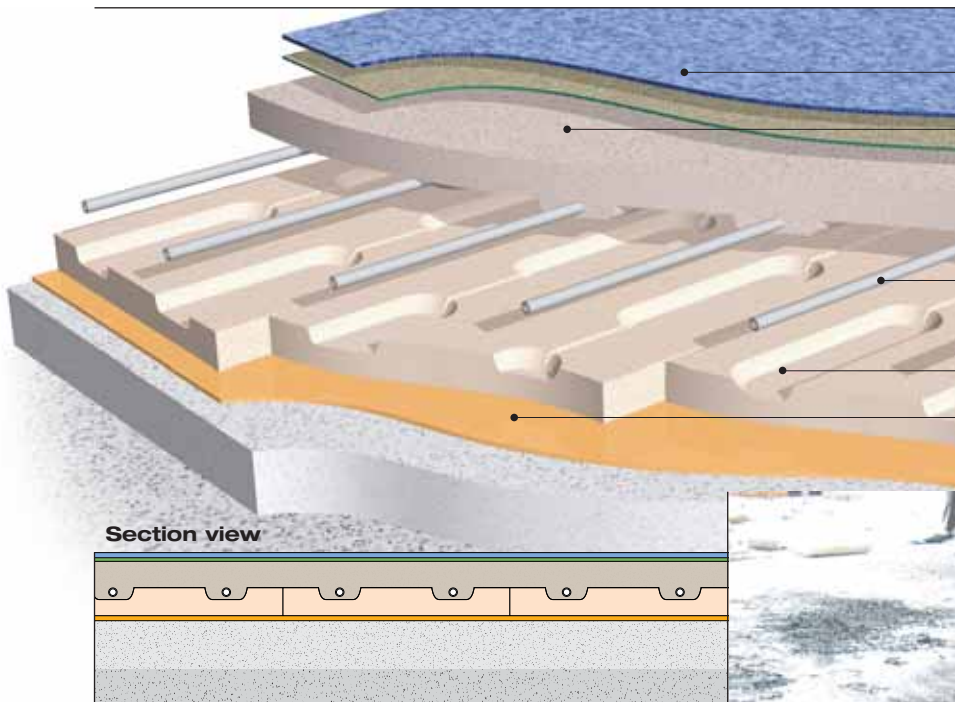
#### System Features

- The modules press into close contact with the galvanised steel surface of the floor panels, which acts as a diffuser
- Brackets and modules can be retro-fitted to older types of RAF
- Modules can be repositioned at any time in the future
- This totally unique system creates a heating & cooling system within a RAF structure
- Brackets plug into the pedestal caps and support Heating & Cooling modules
- Good access to the void beneath the floor is retained

#### Benefits

- Sufficient space remains between the rows of heating modules to allow good access for any services installed within the floor void
- Underfloor void can be accessed at anytime in its life cycle
- The RAF heating system can be moved at anytime in its life cycle – the heating/cooling pipe, modules and brackets can be unclipped and the heating system redesigned
- The plastic brackets, insulation cassettes, aluminium diffusers and polybutylene pipe are recyclable

**Acoustic Construction**



**System Construction**

**Comprising:**

- Floor finish (by others)
- 65mm (min) sand cement screed, or 40mm proprietary screed, nominal 80 kg/m<sup>2</sup> mass per unit area
- 16mm UHF continuous pipe
- UHF Pocketed Polystyrene
- Resilient Layer 1–5mm foamed polythene layer 30–36 kg/m<sup>3</sup>

**System Overview**

Part E of the Building Regulations require that floors separating dwellings achieve stringent sound insulation performance standards. The wide range of systems available from Thermoboard enable underfloor heating to be easily integrated into a wide variety of standard acoustic floor constructions. For installations which utilise Robust Details in place of pre completion testing Thermoboard are able to offer specific details showing how to integrate UFH, so that it contributes to the acoustic performance of the total construction, in conjunction with a suitable structural floor and ceiling treatment.

**Sprung Floors**

For installations where the subfloor is uneven, acoustic cradles and plain battens can be used in place of acoustic battens. The Timber Batten panels then rest on the packers used to level the floor providing a quick and easy installation and a quality finish.

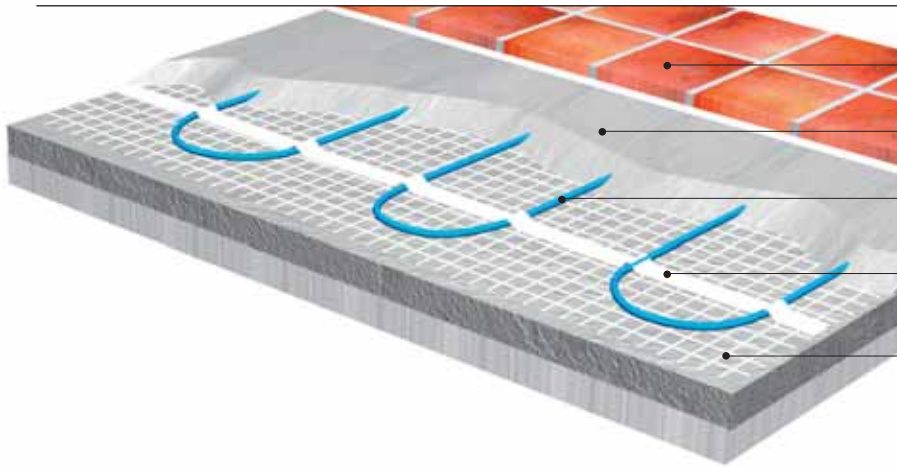
**System Benefits**

- Complete compliance with all Part E RSDs for screed floors
- Can use basic Staples, System Plates or Pocketed Polystyrene panels including bespoke panels

# UNDERFLOOR HEATING

## Electric Underfloor Heating

### Electric Mats



#### System Construction

##### Comprising:

- Floor Finish
- Levelling Screed
- Electric Heating Cable
- Adhesive tape to secure cable turns
- Self adhesive glass fibre mesh

#### System Overview

Electric Mat system, ideal for both renovation and new build projects.

#### System Features

- Adjustable to room shape by cutting the net. **DO NOT** cut cable
- Designed to be embedded into tile adhesive for tiled floors or self levelling compound for other floor coverings
- Can be installed with self levelling compound, concrete or tile adhesive
- 13A/3KW Capacity

#### Electric Mat 100 :

- Can be installed on any type of subfloor (levelled and stable)
- Floor covering can be tiles, stone, vinyl, wood, laminate or carpet

#### Electric Mat 150 :

- Must be installed on a solid subfloor (levelled and stable)
- Suitable for areas where a high output is required
- Floor covering must be non combustible eg. tiles, stone, etc.

#### Benefits

- Low build-up underfloor heating construction
- Easy, fast installation
- Suitable for retrofit/renovation
- Suitable for all floor types
- Easily cut to room shape

### Electric UFH Thermostat

#### System Overview

Dual sensor (air & floor) thermostat, recommended for use with Electric Mat 100 and Electric Mat 150



#### System Features

- Dual Sensor
- Adjustable Modes
- Optimum Start (preheat)
- Frost Protection
- Child Lock
- 5/2 Day Programmable
- Power Back-Up
- Easy Wiring

#### Benefits

- Straightforward connections
- Simple, convenient operation
- Programmable unit
- Easy to create and install control system tailored to individual location/preferences
- Energy Saving Trust recommendation

#### Controls and Thermostats

Wireless Single Zone Kit



14 Zone Control Centre and Wireless Thermostat



#### System Overview

Easy to install programmable and non-programmable wireless temperature control systems for up to 14 underfloor heating zones. For use within renovation projects and new buildings and ideal when temperature controls are being installed in several phases.

#### System Features

- **7 Day Programmable Thermostats**  
Every day can be programmed separately
- **Optimised Start** The thermostat will adjust the start time to achieve the desired temperature at the start of the programmed time
- **Party Mode** Boosts the temperature by 2°C above the comfort setting until the next programmed change
- **Frost and Fire Alarms** Integral frost protection set at 3°C (installer adjustable between -10°C and +10°C) and fire alarm set at +60°C (installer adjustable between +50°C and +70°C)
- Uses a secure digital RF communication
- Utilising 868.5MHz band and encoded data transfer
- Child Lock
- Jog Dial Control

#### Benefits

- No disruption to existing walls during installation as no wiring required between the room thermostat and the boiler (wireless only)
- Modern design
- For placement on walls, tables or shelves for increased room decor flexibility (wireless only)
- Convenient and comfortable temperature control
- No special tools required to install the 14 Zone Control Centre
- Simple to operate

#### Also available Single Zone Kit

Contents:

- 1 x Programmable Thermostat
- 1 x Single Zone Control Centre

Wired versions of the non-programmable and programmable thermostats are now available.

# UNDERFLOOR HEATING

## Controls and Thermostats

### Controls & Thermostats - Networked Systems

#### System Overview

Our 12v Network range of thermostats have been designed to work as part of a network system, and can be used in conjunction with the Network Products and PC Connection program (PCLink).

#### PCLink compatible

Control your heating from your PC with PCLink.

#### Multiroom control

The TouchPad is our master keypad offering the facility of operating up to 32 low voltage thermostats from one central point (see details below).

#### Remote operation

Have complete control over your heating system even whilst you are away!

#### 8 Zone Control Centre

A central wiring switch box for the low voltage thermostats, providing outputs for the boiler, pump and zone valves.

#### Keypad Lock

Locking facility to prevent tampering of the programmed settings.

#### System Features

- Easy wiring: no special tools required
- Control Centres incorporate output control terminals for Boiler, Pump and Domestic Hot Water
- Output available for conventional radiators/towel rail control
- Circuits can be controlled separately or together as preferred
- Wiring Control Centres are safety fused
- Wireless and PC-controlled options also available (details on request)

#### Benefits

- Straightforward connections
- Simple, convenient operation
- Programmable units
- Easy to create and install control system tailored to individual location/preferences
- Low voltage 12V system



### Network Controls - Touch Pad

#### System Overview

This product is designed to work with our 12v Network Thermostats giving you superior control of your heating system. Have multi room control of your home thermostats with the use of our Colour TouchPad.



#### System Features

- **Display Colour Touch Screen** (58 x 77mm)
- **Max Zones** 32 zones
- **Title** Give each zone a unique name
- **Temperature Hold** Use this function to hold a desired temperature for a fixed period. Ideal for unexpected activities
- **Holiday** Use the holiday function to put the heating in to frost mode whilst you are away
- **Hot Water (HW) Boost Facility** Use the HW boost to quickly override the hot water timed settings
- **Quick View** See at a glance the current thermostat status throughout your building
- **Auto Time Sync** Synchronises all of the thermostat clocks on the network
- **Auto GMT** Automatically corrects the time for Summer/ Winter time
- **History** View the Hours Run for the past 4 weeks or the temperature graph for the previous 24 hours

- **Master timeclock** Select which thermostats you want to work from the built in timeclock
- **Key lock** Lock each thermostat to prevent unauthorised tampering of the thermostat setting
- **Password Protect** When enabled, the user must enter a pass code in order to program the network thermostats
- **Frost Setting** Program the frost temperature for each thermostat
- **Floor Limit** Program the floor limit for underfloor heating models

#### Benefits

- Colour touch screen
- Control of up to 32 thermostats
- Individually name thermostats for easy recognition
- Remotely program thermostats
- Copy program settings from one thermostat to another

### Composite Manifold

#### System Overview

Modular composite manifold for up to 12 ports

#### System Features

- Available in packs (Control, Starter, One and Three Port packs) to accommodate all underfloor heating projects
- Packs assemble to create 1–12 port manifolds
- Can supply 250m<sup>2</sup> at 75W/m<sup>2</sup> from a single manifold
- Quick and simple balancing

#### Benefits

- Lightweight and easy to install
- Add additional circuits at any time
- Can be assembled in either left or right handed configurations
- Can supply rooms above and below the manifold as ports can be installed up or down
- Pressure test through manifold using integrated gauges



### Single Room / Zone Controls

#### 1-2 Circuit Control Pack

(Part Number 48UH550)



#### Product description

This pre-assembled unit is installed in the branch of the heating primary and wired in series with a room thermostat. It can be mounted onto a wall either falling left or right. The Water Mixing Control Unit incorporates a standard circulator with advanced mixing valve. This mixes floor return water with the incoming primary flow, to create the correct secondary flow temperature. In addition, the actuator can be closed, thus turning it off when the boiler is inactive.









#### Benefits

- Cost effective and safe
- Optimum use of primary flow during warm-up
- May be used to control any small UFH sub-system
  - Single circuit up to 120m in length
  - With up to 24m<sup>2</sup> total active heating area
- Suitable for any floor type or finish

# UNDERFLOOR HEATING

## Product List

### Product List

Description	Nom Dia mm	Cat No	Pack Qty
<b>Screeded floor systems</b>			
<b>- Staple System</b>			
Staples for 16mm UFH Pipe	16	15UH230	300
Staple Gun		15UH324	1
<b>- System Plate System</b>			
System Plate (1275 x 975mm)	16	16UH196	18
<b>Pipe</b>			
UFH Pipe Coil 16mm x 25m 	16	16UH025	1
UFH Pipe Coil 16mm x 40m 	16	16UH040	1
UFH Pipe Coil 16mm x 50m 	16	16UH050	1
UFH Pipe Coil 16mm x 60m 	16	16UH060	1
UFH Pipe Coil 16mm x 70m 	16	16UH070	1
UFH Pipe Coil 16mm x 80m 	16	16UH080	1
UFH Pipe Coil 16mm x 90m 	16	16UH090	1
UFH Pipe Coil 16mm x 100m 	16	16UH100	1
UFH Pipe Coil 16mm x 110m 	16	16UH110	1
UFH Pipe Coil 16mm x 120m 	16	16UH120	1
<b>System Ancillaries</b>			
Edge Expansion Foam (25m x 150mm)		15UH153	1
16mm Pipe Supports	16	16UH320	50
10mm Socket 16mm Spigot 	10	16UH550	10
16mm Socket 10mm Spigot 	16	16UH560	10
16mm Elbow Connector 	16	16UH530	10
16mm Equal Tee 	16	16UH540	10
16mm Straight Connector 	16	16UH510	10
16 x 10 x 16mm Branch Reduced Tee 	16	16UH001	10
16mm Demountable Stop End 	16	16UH002	10
Fitting Repair Kit	16	16UH245	1
Pressure Test Connection Kit	16	16UH250	1
Air Vent Kit	16	16UH255	1
Manifold Cover (up to 4 ports) 570 x 500 x 220mm		69UH015	1
Manifold Cover (up to 8 ports) 850 x 500 x 220mm		69UH018	1
Manifold Cover (up to 12 ports) 1090 x 500 x 220mm		69UH021	1
<b>Manifolds</b>			
Single Circuit Control Unit	16	48UH551	1
Composite Manifold – Control Pack		88UH211	1
Composite Manifold – Starter Pack 		88UH110	1
Composite Manifold – One Port Pack 	16	88UH111	1
Composite Manifold – Three Port Pack 	16	88UH113	1

Description	Nom Dia mm	Cat No	Pack Qty
<b>Manifold Ancillaries</b>			
Pipe Clamps	16	15UH236	2
Curved Pipe Supports	16	15UH239	2
Composite Manifold 22mm	22	88UH311	2
230V 2 Wire Actuator (for use with 52UH108)		52UH402	1
24V 2 Wire Actuator (for use with 52UH714)		52UH602	1
Clip-On Port Thermometer		47UH750	10
<b>Controls Systems</b>			
<b>- Standard Controls</b>			
Single Zone Kit (c/w Programmable Thermostat)		52UH701	1
14 Zone Control Centre		52UH714	1
Thermostat		52UH772	1
Programmable Thermostat		52UH773	1
Wireless Thermostat		52UH782	1
Wireless Programmable Thermostat		52UH783	1
Remote Sensor Probe		52UH795	1
<b>- Networked Controls</b>			
8 Zone Control Centre		52UH108	1
Programmable LCD Thermostat		52UH873	1
Programmable Thermostat (with Touch Screen)		52UH863	1
Programmable Thermostat (with DHW)		52UH874	1
Remote Sensor Probe		52UH195	1
Remote Sensor Probe Cover		52UH194	1
Master LCD Touch Screen Unit		52UH891	1
Net Monitor		52UH892	1
<b>Electric UFH Matting</b>			
Electric Mat 100 – 2000 x 500mm		53UH101	1
Electric Mat 100 – 4000 x 500mm		53UH102	1
Electric Mat 150 – 6000 x 500mm		53UH153	1
Electric Mat 150 – 10,000 x 500mm		53UH155	1
230V Programmable Thermostat with Dual (air and floor) sensor		52UH278	1

#### Symbols

##### British Standards Kitemark

Identifies pipe and fittings which are manufactured under the BSI Kitemark Certification Scheme.

##### British Board of Agrément

BBA Logo Identifies non-Kitemarked fittings which are covered by a British Board of Agrément Certificate.

### How To Order



#### Screeded Floor Constructions

Most screeded floor projects can be quoted using the simple Thermoboard 'QuickCalc'

#### To use Thermoboard 'QuickCalc', your project must:

- Use a standard boiler (not heat pumps etc)
- Be built to current Building Regulations
- Use a single manifold
- Require a maximum of eight thermostats

#### Your Thermoboard 'QuickCalc' quote will generate:

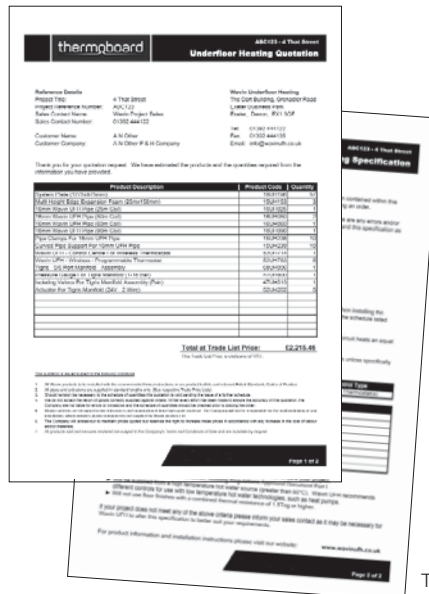
- Project trade list price
- Project list of materials
- Generic room layouts

NB: Thermoboard 'QuickCalc' projects are supported by Thermoboard product guarantees and step-by-step installation guides

#### To obtain your 'QuickCalc' quote:

Call your local merchant stockist and provide:

- Project details
- Choice of UFH system
- Choice of temperature control system
- Each room area in m<sup>2</sup> and its distance from the manifold
- Zone number for every room/group of rooms requiring a single thermostat



#### Other Floor Constructions

For all non-screeded subfloors (dry construction/acoustic/ raised access) or projects involving an alternative heat source, or retrofit into an old building not meeting today's regulations.

These projects require a 'full design' solution, which provides you with:

- Dedicated Project Manager
- Heat loss calculations
- PI insured design
- Full CAD drawings
- Specialist made to measure products
- Bespoke control options

Contact Technical Advice and Assistance on 01392 444122

### General Information and Ordering

#### Health and Safety

The relevant provisions of the following legislation should be adhered to on site:

- Construction (Design and Management) Regulations 1994
- Control of Substances Hazardous to Health Regulations 1988
- Health and Safety At Work Act 1974
- Management of Health and Safety At Work Regulations 1999
- Manual Handling Operations Regulations 1992

#### References

Reference should be made to:

- Building Regulations 2002 (England and Wales): Approved Document 'L' (Thermal)
- Building Regulations 2003 (England and Wales): Approved Document 'E' (Acoustic)

#### Supply

All products described in this Product Guide are supplied through a nationwide network of Merchant Distributors. For details of your nearest stockist, contact Thermoboard.

#### Conditions of sale

The Company will not accept responsibility for the malfunction of any installation which includes components not supplied by Thermoboard. Goods are sold subject to Company conditions of sale.

Thermoboard 'QuickCalc' output sheets

# UNDERFLOOR HEATING

## Frequently Asked Questions

### Technical Advice and Assistance

Thermoboard Underfloor Heating products are backed by a comprehensive technical advisory service. This is available to provide expert assistance at every stage of a project, from planning and product selection to installation and maintenance.

Services include:

- CAD product and application details on disk
- Computer aided project design, for more complex projects
- Call-off service for efficient product scheduling
- Bill of Materials Calculator for PC or Lap-top

For prompt assistance, please contact Wavin:

#### Sales & Technical Enquiries

Tel: 01392 444122

Fax: 01392 444135

Email: [info@thermoboard.co.uk](mailto:info@thermoboard.co.uk)

### Frequently Asked Questions

#### How does underfloor heating work?

Warm water is circulated through a series of pipes laid into the floor of a room.

These pipes form a continuous loop and act to create a large radiant surface that will heat the room to a comfortable temperature.

#### Can underfloor heating be installed in an existing building?

Yes, in many cases this is possible, it depends upon the building's current insulation levels and whether there is sufficient space to install the system within the floor to ensure that the correct temperatures can be achieved and current Building Regulations are met.

#### Can underfloor heating be installed on Timber sub floors?

Yes, by using Thermoboard's Foiled Polystyrene (see pages 12 and 13) or Modular Wood (see page 14) systems underfloor heating can be installed above or below a Timber sub floor.

#### Can timber floor coverings be used with an underfloor heating system?

Yes, if the moisture content of the timber flooring and building is nominal and stable, a correctly designed, installed and commissioned underfloor heating system will not cause any damage to a timber floor covering. Laying kiln dried timber in

a damp building will cause it to swell. If in doubt, please contact the flooring manufacturer.

#### Will underfloor heating heat through a carpet?

Yes, underfloor heating will work with carpeted floors, provided that the design takes this into account and, that thick carpets and underlays (> 1.5 Tog combined) are avoided.

#### Can I use underfloor heating as a cooling system?

Yes, incorporating a cold water (<15°C) source allows the floor to operate as a cooling system in the warm weather. The system must incorporate a dew point sensor to avoid condensation forming on the finished floor. A cooled floor is capable of absorbing up to 40W/m<sup>2</sup>, depending upon design.

#### Will a room heated by underfloor heating be warm enough?

Yes, provided that the room meets the minimum insulation requirements of the current Building Regulations, and the system is designed and installed correctly.

#### What is the heat output from an underfloor heating system?

As a guide, a screeded floor system will provide up to 100W/m<sup>2</sup>, and a timber suspended floor up to 70W/m<sup>2</sup>.

#### Do I need a special boiler to support underfloor heating?

No, generally any type of boiler using any fuel can be used. Condensing boilers are particularly well suited to underfloor heating because the low return temperature means that the boiler will frequently operate in condensing mode when the system is running.

#### Is underfloor heating more efficient than a radiator system?

It is widely accepted that systems incorporating UFH enable energy savings in comparison to those using radiators. The radiant heating effect of underfloor heating means that the air temperature can be set 1–2°C lower and still maintain the same comfort level provided by radiators, reducing heat lost through essential air changes by approximately 10–20% over a year. In addition heat sources (condensing boilers and green technologies such as heat pumps etc) are able to operate much more efficiently at the low water temperatures required by underfloor heating systems.

#### Can underfloor heating be installed in a conservatory?

Yes, Thermoboard offer the Underfloor Heating Conservatory Pack for conservatories with solid sub floors and up to 15 m<sup>2</sup>. Alternatively a Bill of Materials can be calculated using the Thermoboard 'QuickCalc' project calculator for conservatories of any size

### Underfloor Heating

### Product Guide

#### For screeded and timber floors

*This Product Guide describes Thermoboard Underfloor Heating [UFH] products which are suitable for residential and light commercial applications.*

This Thermoboard UFH product range:

- ▲ Is designed for time-saving, easy installation – without requiring special tools or experience
- ▲ Provides consistent, controllable heat output and performance
- ▲ Enables achievement of a high quality result every time

Thermoboard also provide design and production of bespoke systems to meet specific application requirements or to suit specialised construction projects. These include acoustic and sprung floors, specialist screeds, high strength floating floors, and industrial floors – or for multiple unit projects requiring large numbers of identical installations (housing or flats).

Thermoboard UFH technology can also be used for cooling. *For information, contact Thermoboard.*



ISO 9001:2000



Wavin is a member of the Underfloor Heating Manufacturers Association

Wavin operates a programme of continual product development, and therefore reserves the right to modify or amend the specification of their products without notice. All information in this publication is given in good faith, and believed to be correct at the time of going to press. However, no responsibility can be accepted for any errors, omissions or incorrect assumptions. Users should satisfy themselves that products are suitable for the purpose and application intended.



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