



Underfloor Heating & Renewables

UltraBoard

Installation Guide

UNDERFLOOR
HEATING

GROUND SOURCE
HEAT PUMPS

AIR SOURCE
HEAT PUMPS

SOLAR
THERMAL PANELS

UltraBoard

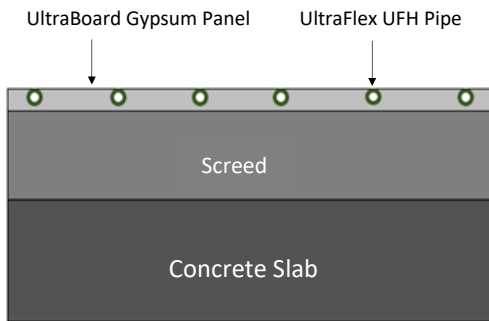
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INSULATION CONSIDERATIONS

FOR EXISTING SOLID CONCRETE FLOORS:

UltraBoard has been specifically designed for existing buildings, renovations, extensions and conservatories. Because the floor build up is only 18mm, for existing solid concrete floors, it makes no economic sense to excavate and introduce insulation, as the costs of doing so would be prohibitively expensive. Unless the floor is not structurally sound, then an overlay system with minimum height build up is a sound and reasonable solution to excavation and relaying of an existing concrete floor.

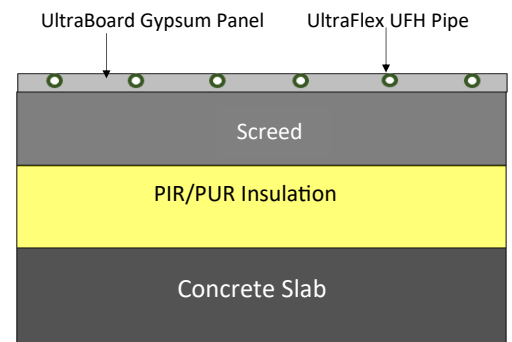


Because of this there is no requirement for insulation to be added to an existing solid floor over solid ground. As the average soil temperature beneath a building is usually constant at 10°C, the downward losses are limited to 6-10% of the total heat output, which represents a small percentage of the total annual heating costs. As the efficiency of UFH is 25% greater than radiators, it is still more cost effective than traditional heating.

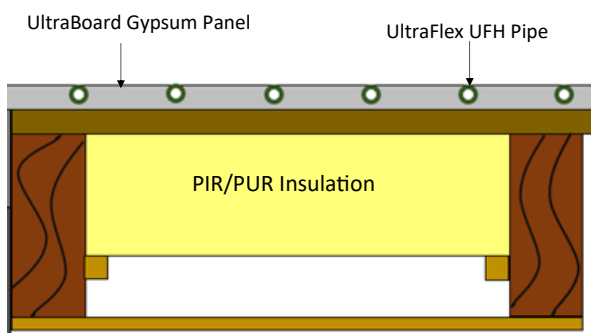
In addition, as the 18mm UltraBoard is relatively thin there is not the mass associated with normal screeded systems of 65mm or greater, therefore the UltraBoard heats up faster, usually within 30-40 minutes, unlike a traditional screeded system. The UltraBoard system, once it reaches temperature and has heated the room, will turn off, therefore further limiting the downward losses.

NEW SOLID CONCRETE FLOORS:

Where a new extension is being added onto an existing older building insulation is added as part of the building regulations, and the screed is laid over the top to a depth of 65mm for a standard sand & cement mix. If a flow screed is used then the depth can be reduced to 50mm. The UltraBoard can then be laid directly over the top of the screed once cured, and therefore downward losses would be eliminated.



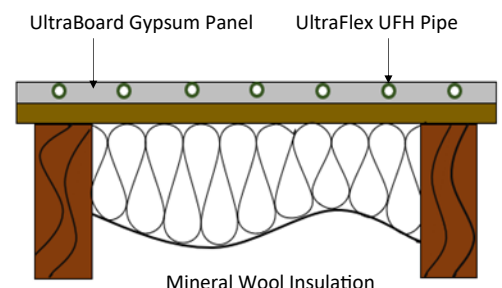
TIMBER SUSPENDED FLOORS:



If there is a ventilated void beneath the ground floor, such as timber suspended or a block and beam construction, then insulation would be required as the temperature within the void would be the same as the external temperature. With this low ambient temperature within the void plus the air movements inherent with this type of floor structure, there is little resistance to downward heat transfer and so must be insulated in order to prevent excessive heat losses. 100mm of PIR/PUR or mineral wool equivalent would be sufficient. No insulation is required on first or second floor applications, except what is required by the building regulations for sound transmission.

For rigid insulation, 25mm x 25mm battens either side of the joists is sufficient to hold the insulation in place. It is important that no air gaps are present between the underside of the chipboard floor boards and the PIR/PUR insulation boards. If the joists are only 100mm deep resting on dwarf walls, then battens attached to the underside of the joists would be acceptable.

For mineral wool insulation, consider using a plastic netting, which can be used to hold the insulation in place. Simply place over the existing joists, and staple to the sides, making sure there is enough space for at least 150-200mm of mineral wool to be placed in the space between.



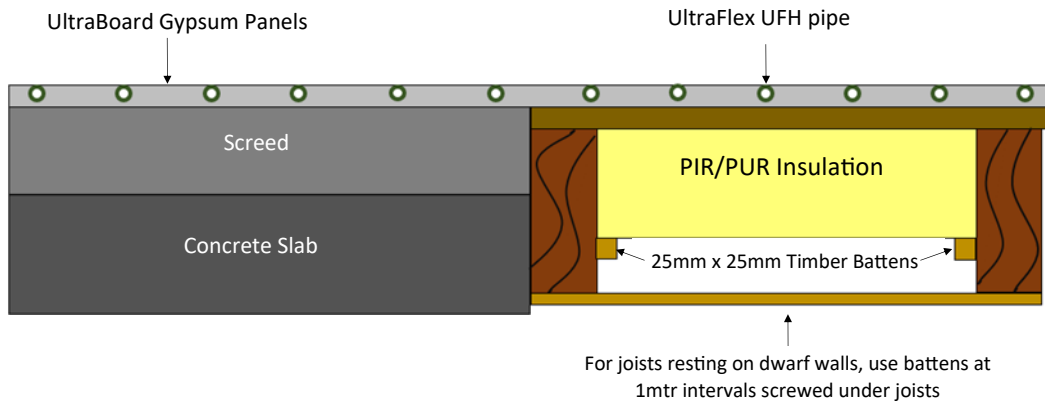
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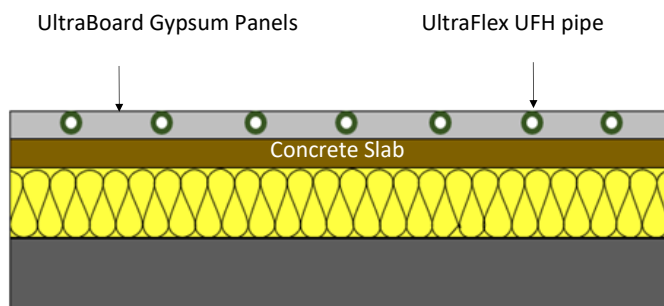


TIMBER SUSPENDED AND NEW EXTENSION:

Where a new extension is being added to an existing timber suspended floor, the UltraBoard can be used to span both sections. An expansion joint between the two sections may be advisable due to settlement, which could crack tiles if these were used on the final floor finish.



FLOATING FLOORS:



Existing floating floors usually consists of an 18mm or 22mm T&G chipboard with an insulation layer of PIR/PUR underneath on a rigid concrete base. As long as the floor is in good repair and condition, UltraBoard may be installed over the top of the chipboard deck, however depending on the condition of the floor, it maybe be necessary to strengthen between the doorways, especially if there is any deflection detected.

Other considerations:

Although the height build-up of UltraBoard is limited to only 18mm its impact should be considered:

Skirting: It is best to remove existing skirting before laying the UltraBoard. A 10mm gap is needed between the edge of the panel and the wall.

Doors: At door thresholds, the extra 18mm height will likely impact on door clearances, so these will need to be trimmed. You will also need to consider the hight of any floor finish on top of the 18mm.

Stairs: For UltraBoard installed on a ground floor, some build up is unavoidable and the bottom step will be shallower, however in a renovation this is not normally a problem. On first and second floor applications the treads may need to be adjusted to reflect the change in levels at the top most step.

Kitchen Units: Where a new kitchen is being installed, it is best to have the UltraBoard laid underneath (without the heating tube) so as to keep the same level throughout. If the kitchen is not being removed, then the UltraBoard can be laid up to the kick boards.

Other Rooms: The impact of other adjoining rooms not having UFH needs to be considered. Using UltraBaord will increase the floor height by 18mm plus any floor finish, so at a threshold of another room a small step will be created. This can be mitigated by over-laying adjoining rooms with a 18mm chiboard flooring, or by using a self-levelling compound, to increase the depth of the floor to match the UltraBoard UFH. Alternatively, a chamferedthreshold can be used in doorways to offset these small changes.

FLOOR PREPERATION

It is extremely important that proper consideration be given to the sub-floor preparation, as this is the key to a successful installation of the whole UltraBaord system. Ignoring these recommendations could lead to much greater time taken in remedial works and costly mistakes being made.

SOLID CONCRETE OR SCREED SUB-FLOORS:

Before installation of the UltraBoard panels the condition of the sub-floor needs to be considered. All defects, such as loose or friable material needs to be removed and any repairs needs to be undertaken. If the floor is uneven or not level, this is the time to get this corrected using a self-levelling compound, which can be purchased via most builder's merchants.

Once the floor has been repaired or levelled or both, and is clean of dust, the panels can be laid over the sub-floor.

SR2 standard is maximum deviation of 5mm over the floor area.

TIMBER SUSPENDED & FLOATING SUB-FLOORS:

Before installation any loose floorboards need to be fixed down or replaced so that there is no movement. Any large gaps in the perimeter walls needs to be filled and sealed to avoid draughts impeding the floor output of the panels.

The sub-floor must be free of dust, loose or friable material and suitably flat and level before laying the UltraBoard or castellated panels. For areas where castellated panel and self-levelling compound are to be used the sub-floor must be sealed using the Mapei EcoPrim T supplied so as to provide a good bond.

The sub-floor must be flat and level to an SR2 standard, which is maximum deviation of 5mm over 3m. Anything outside this can be corrected beforehand with a self-levelling compound.

Extremely important questions you need to consider before laying the castellated panels:

Is the existing floor to SR2 level?

For timber suspended floors, have all loose boards been properly secured?

Have any large gaps or holes in walls or boards where self-levelling compound is required been sealed to avoid escape?

For existing solid floors, has all loose material and dusty or friable material been removed?

Has the timber or concrete floor been properly sealed with the Mapei Eco-Prim T primer for the castellated panels?

Has the floor probe channel in the wall from the NeoStat to the floor been completed?

Has the site been cleared of other trades so that no one is walking over your work?

Is the existing floor to SR2 level?

It is quite common to have a floor that is sloping from a high point in the room to the other side, and although it looks flat, can still be 10-30mm difference in height. SR2 standard is a maximum deviation of 5mm over 3 meters.

INSTALLATION OF THE ULTRABAORD:

Before fixing the panels all thermostat wiring and sensor cables should have been fitted (sensors supplied), please see page 7 for further information.

General building work and plastering should be completed.

Thoroughly clean the floor of debris, ideal would be an industrial or heavy-duty vacuum cleaner.

Fix any loose floorboards and fill any gaps, which included gaps between walls and floor.

Fix the manifold and primary pipework (optional)

You are now ready to fix the UltraBoard panels.

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Methods of laying the UltraBoard:

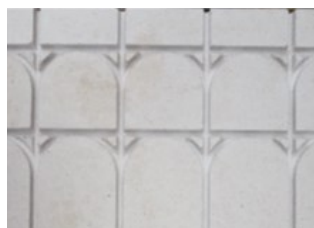
The installation method is determined by the make-up of the sub-floor and the final floor covering. For example, if the sub floor is a timber suspended floor and the floor covering is ceramic tiles, the correct method of laying the UltraBoard panels is to glue the edges of the boards and to screw to the sub-floor. For the same sub-floor but using engineered timber as the floor covering, free floating and gluing the edges of the board would be an acceptable method and screwing to the sub-floor is optional. Please see below for a chart showing the recommended fixing method for each type of sub-floor and chosen floor coverings.

Key	✓ Correct	✗ Incorrect	UltraBoard™ panel fixing method		
Sub-floor	Floor covering		Free Floated	Panel screwed to sub-floor	Covering fixing (always refer to manufacturers guidance)
Solid concrete	Ceramic/stone tiles	✓	✗		Flexible adhesive and de-coupling layer
	Engineered timber	✓	✗		Floated raft or glued to UltraBoard panel
	Carpet & underlay	✓	✗		Spray adhesive or gripper rods
	Vinyl/Lino	✓	✗		On 6-10mm floor leveller
Timber suspended	Ceramic/stone tiles	✗	✓		Flexible adhesive and de-coupling layer
	Engineered timber	✓	✓		Floated raft or glued to UltraBoard panel
	Carpet & underlay	✓	✓		Spray adhesive or gripper rods
	Vinyl/Lino	✓	✓		On 6-10mm floor leveller
Floating (Chipboard over PIR/PUR insulation)	Ceramic/stone tiles	✗	✓		Flexible adhesive and de-coupling layer
	Engineered timber	✓	✗		Floated raft or glued to UltraBoard panel
	Carpet & underlay	✓	✗		Spray adhesive or gripper rods
	Vinyl/Lino	✓	✗		On 6-10mm floor leveller

The MI-Heat UltraBoard™ system is made up of three types of gypsum fibre panels. There are straight runs, return bends and circles for 90 bends. There is also a castellated panel with self-levelling compound, which is mainly used for awkward shaped rooms, as well as an alternative to the circle boards for other than 90 bends and transition pipes for the flow and return pipework back to the manifold. An example would be where a number of flow and return pipes needs to go through a limited space, such as a doorway or along a hallway.



Straight Runs



Return Bends



Circles



Castellated Panel

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The laying of the panels should be in a brick-bond fashion and start with the farthest corner of the room. Lay the first panel, which would be a returns panel, glue the edges with a small bead between the floor and the panel using the adhesive supplied. The next panel will butt up to the first panel and will stick to the sub-floor to make it a solid bond. Make sure that you do not glue too close to the pipe channels. Be sparing with the glue as too much and it will cause it to foam. Cutting around obstacles can easily be achieved by using a hand saw.

The laying of the panels should be in a brick-bond fashion and start with the farthest corner of the room. Lay the first panel, which would be a returns panel, glue the edges with a small bead between the floor and the panel using the liquid PU adhesive supplied. The next panel will butt up to the first panel and will stick to the sub-floor to make it a solid bond. Make sure that you do not glue too close to the pipe channels. Be sparing with the glue as too much and it will cause it to foam. Cutting around obstacles can easily be achieved by using a hand saw.

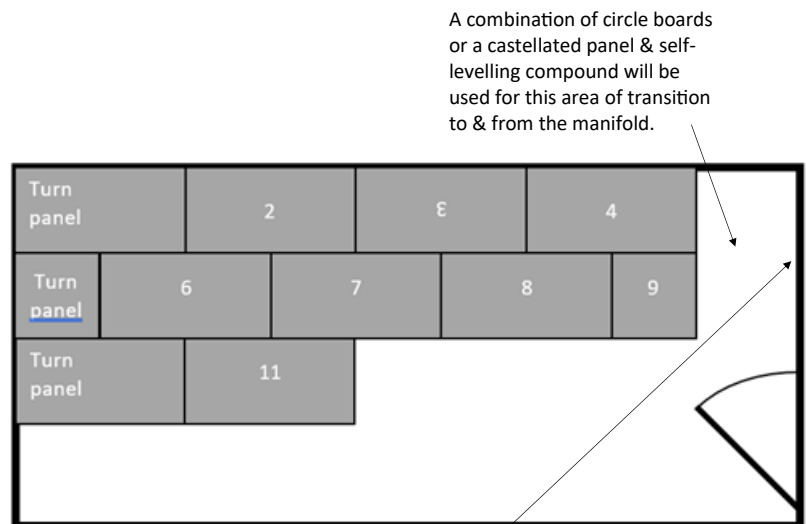
Occasionally the design may call for turns in the middle of the floor. This can be done with a 12mm router cutter, just make sure it 1mm deeper than the pipe so that it does not stick up proud of the surface of the board. It is best to do this when the board has been stuck down. Use the 12mm pipe to mark correct path.

An alternative way is to cut out a small square of the board with a circular saw or an oscillation cutter and a piece of castellated panel can be stuck down and once the pipe is laid, filled with the self-levelling compound.

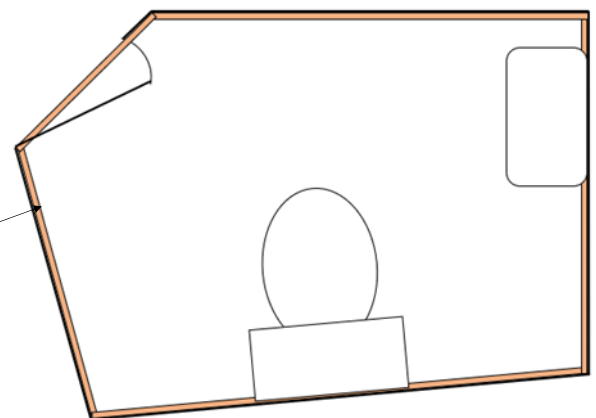
For irregular shaped and small rooms with high heat-losses, Mi-Heat will sometimes use the castellated panels with self-levelling compound to cover the entire room. This will allow for more flexible pipework layouts and will increase the heat output for these areas.

Under these circumstances, fix the perimeter with 18mm x 50mm battens around walls and across doorways.

Prime the floor with EcoPrim T sealant as supplied, then lay the castellated panels in brick-bond fashion, remembering to overlay each panel by one castellation.



Where castellation panels are used for transition pipes to and from the manifold, an 18mm x 50mm batten should be fixed next to the wall.



LAYING OF THE UFH PIPE:

- Please refer to the pipe layout drawing which came with your design. The spacings for each room is critical to ensure the right heat output and should be constant across the whole of the room.
- Start laying pipe from the manifold.
- Unroll the pipe hand over hand and push into the board and castellated panels.
- Be careful not to kink the pipe when turning at the end of straight runs.
- Loose pipes can be secured with nail clips (supplied).
- The manifold should be secured to the wall high enough to accommodate the pipe and the guided bends.

FITTING FLOOR SENSORS:

Because of the low height build-up of the gypsum boards and the characteristics of the self-levelling compound, the UltraBoard has a large output, which can significantly exceed the permitted temperature for some floor coverings, particularly for engineered wood, vinyl or linoleum. The surface temperature should not exceed 27°C, as this could damage them, so floor sensor probes are used to ensure the floor does not exceed this temperature.



The sensor is fitted to the neoStat and should be channelled into the wall within a conduit. The probe must extend into the floor by at least 300mm, but the sensor should be as far away from the UFH pipe as possible, usually between the runs. A router cutting machine with a 12mm router can be used to channel into the gypsum boards. Use off cuts of pipe as a conduit in the floor. The sensor end should be as near to the surface as possible. If the cable must cross the pipe the cable can usually be installed under any pipework it needs to cross but may have to be routed slightly deeper at the point it crosses.

If the floor sensor must be installed through an area of self-levelling compound, then an off piece of 12mm pipe can be used as a conduit. If the wire must cross a pipe, it can usually be installed below it, or if it goes over the pipe, make sure ties hold it down as it could risk floating with the pouring of the self-levelling compound. The end probe itself must terminate at least a 100mm away from the self-levelling compound onto a gypsum board.

Note: In wet areas such as bathrooms and en-suites, for electrical safety, there will be only a remote air sensor instead of a floor sensor. This is fitted in a wet area at light switch height, and the air sensor is contained within a white protective cover.

PRESSURE TESTING OF MANIFOLD & UFH PIPE:

Once the UFH pipework and the floor sensors have been fitted, the whole system should be filled with water and pressure tested. Any leaks should be rectified, and the pressure test carried out again, and once the system is proven to be secure, any areas where castellated panel have been fitted, the self-levelling compound can now be poured to a depth of 18mm to match the UltraBoard panels.

FINAL FLOOR FINISHES:

The self-levelling compound will take about 3 days to fully cure, however the UltraBoard panels can start to have floor finishes fitted as soon as the pressure testing is finished.

GUIDANCE ON FLOOR COVERINGS

Tiles: Virtually any floor covering can be used, however the best is those that have little resistance to heat transference, such as stone, ceramic tiles and laminate flooring solutions. All tiled areas should be fitted over a de-coupling membrane. This is standard practice for a professional finish of ceramic and stone tiles and is used to separate the different layers as they expand and contract at different rates when heated. If not installed it would lead very quickly to cracked and broken tiles.

Engineered Wood: It is recommended that 14-16mm thickness is the best for gypsum panels, however a maximum of 18mm is permitted. There are two main ways to fit engineered wood, using the butt jointed method and as a free-floating raft by gluing panels together, or gluing the boards directly to the floor. A 2mm foam underlay can be used below the engineered floor and is used to soften the noise of the footfall. A floor sensor probe will be required to limit the floor to a maximum of 27°C. The floor sensor is supplied by Mi-Heat once the floor coverings are known.

Vinyl & Linoleum: If the final floor finish is vinyl or lino, then a 6-10mm self-levelling compound needs to be installed over the gypsum panels to protect these sensitive coverings. In all cases, a floor sensor probe will need to be fitted in addition to the extra self-levelling compound. A floor sensor probe will be required to limit the floor to a maximum of 27°C. The floor sensor is supplied by Mi-Heat once the floor coverings are known.

Carpet: Where carpet and underlay are the final floor covering, the pipe channels need to be filled using a feather grout (supplied) to provide a smooth and final finish before they are fitted. If using gripper rods to stretch the carpet, the rods need to be both glued and nailed. Be careful not to pierce any UFH pipes.