



# Nu-Deck®

## Installation manual



UNDERFLOOR  
HEATING



HEAT  
PUMPS



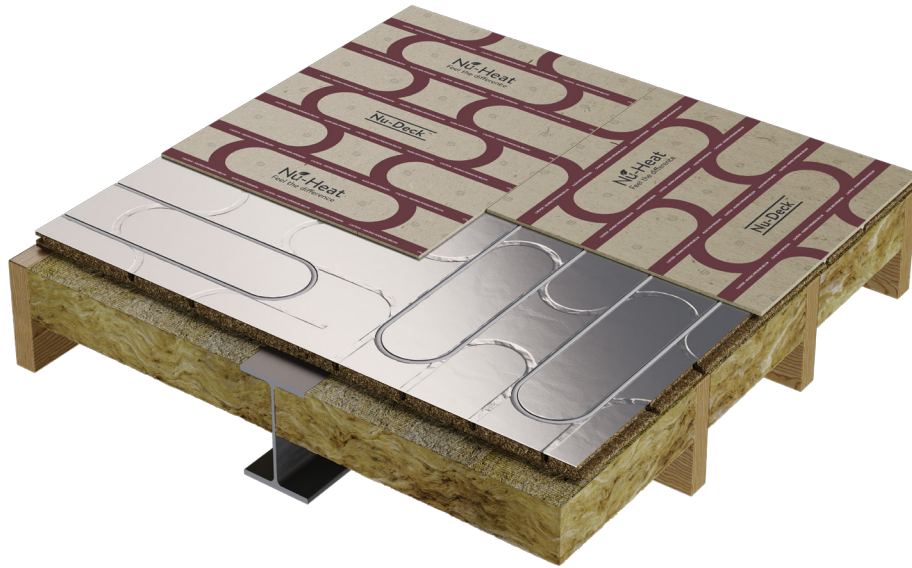
SOLAR  
THERMAL

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# Nu-Deck® Installation Manual

## System Overview



### Nu-Deck® overview:

Nu-Deck® is an integrated structural underfloor heating system exclusively for suspended timber floors. Because Nu-Deck® replaces the existing floor deck, there is virtually no additional height build-up compared to traditional floorboards and other floor deck panels.

Designed to meet the complex requirements of modern home construction, Nu-Deck® is suitable for new builds and retrofit/renovation scenarios in either ground floor or multi-storey (first floor, second floor) applications.

Nu-Deck® comprises of 22mm routed P5 chipboard with foil coating, a 14mm underfloor heating pipe, and 6mm moisture-resistant printed MDF cover board with a total thickness of 28mm. Suitable for any suspended timber floor, Nu-Deck can be installed directly to floor joists with a maximum span of 600mm centres.

Nu-Deck's® unique design delivers full design and installation flexibility. The bi-directional pre-routed boards can be fitted either side-by-side or at 90° angles to allow for changes in joist direction, whilst still maintaining an uninterrupted route for the pipework for quick and easy fitting.

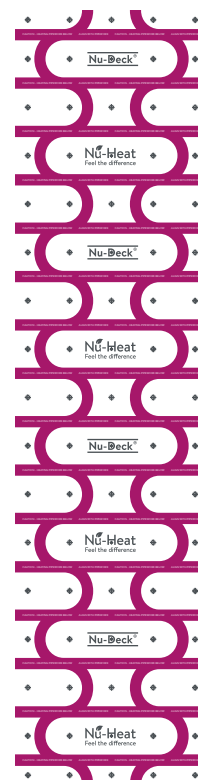
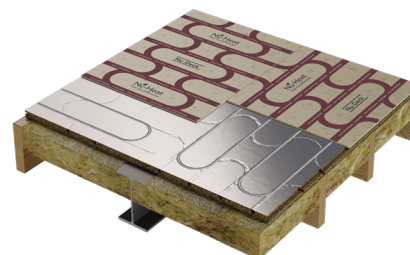


HEAT OUTPUT*	AVAILABLE HEAT FLOW W/m <sup>2</sup>			
FLOW WATER TEMPERATURE	40 °C	45 °C	50 °C	55 °C
No floor covering - Cover sheet only	54	73	92	112
Carpet	32	44	55	66
2mm Vinyl	45	61	77	93
14mm engineered board + 2mm underlay	35	48	60	73
10mm ceramic tile + DM (inc tile adhesive)	40	54	68	82

\*Nominal value; output values vary depending on specific floor finish.

## MAIN FEATURES

- Suspended timber flooring with fully integrated 14mm heat emitter pipework
- Tested and safe to install on joists up to 600mm centres in accordance with BS EN 1195:1998 and BS EN 12871:2013 for Impact, Stiffness and Strength Testing achieving a result of 6.53 kN
- No joints in the pipework under the floor
- 28mm total thickness, replaces standard floorboards or other structural decking
- Only 6mm additional thickness compared to typical standard flooring materials
- Fully foiled boards, improved heat output and also provides some extra protection from water/moisture
- Moisture resistant MDF cover panel, printed with fixing indicators and pipe-work locations to help prevent accidental fixing through the UFH pipework.
- Complete design and installation flexibility, board and pipe channel designed to allow for changes in joist direction
- Excellent heat output at lower flow temperature, suitable for use with heat pumps
- Completely dry installation, no wet trades or drying times
- Industry standard sheet sizes 2400mm x 600mm, with tongue and groove jointing
- Full design, cad drawings, heat loss calculations, OEM handover manual and lifetime telephone technical support

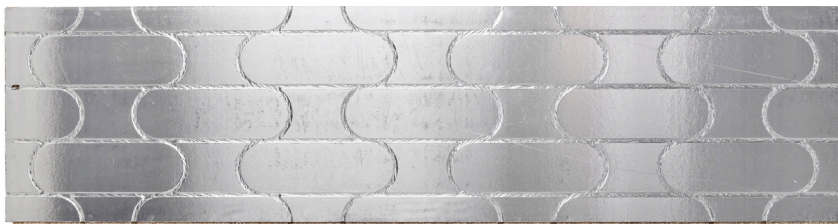




# Nu-Deck<sup>®</sup> components

## Supplied by Nu-Heat

Please ensure you have read all of this guide before starting the installation



### Nu-Deck<sup>®</sup> pre-routed chipboard floor panels

2400 x 600 x 22mm pre-routed chipboard floor panels with foil covering designed to carry 14mm Fastflo<sup>®</sup> floor heating pipe in room zones.



### 6mm Printed, Moisture resistant MDF cover boards

2400 x 600 x 6mm moisture resistant MDF.



### 5mm x 70mm chipboard screws

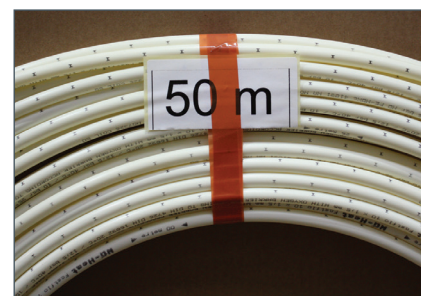
Used to fix the chipboard to the joists.

Minimum qty: 3 per joist per board.



### PU foam D4 adhesive for wood

Required to apply on top of the joist and to the tongue and groove joints.



### 14mm Fastflo<sup>®</sup> floor heating pipe

Carries warm water from Optiflo manifolds to heat room zones.

## Additional items (Not supplied by Nu-Heat)

- Insulation - Essential on Ground floors and above Un-heated areas (check building regulations for current requirements)
- Pipe insulation - to protect against freezing and reduce heat losses. (check building and water regulations for current requirements)
- Fixings for cover board is generally considered to be installers preference. However we would recommend 2mm x 20mm annular ringshank nail. Guidance on minimum and maximum fixings, minimum of Nail gun with 20mm Brad nail, maximum 4x20mm countersunk woodscrew. For floors that will be tiled or have levelling compound applied we recommend screw fixing only.  
**Important** – If screws are used ensure care is taken not to overdrive the screw heads through the coverboard. This can cause the back of the board to break out, weakening the hold of the screw and damaging the board. In extreme cases the board can be pushed away from the surface of the Chipboard deck below and cause the cover board to distort.
- Timber for noggins, trimmers etc

# General Information and Guidance

## SUGGESTED TOOLS REQUIRED FOR INSTALLATION

- Tape measure
- General tools, screwdrivers, pliers, adjustable spanners, hammer, chisels etc
- Glue spreader
- Large builders square
- Cordless drills/impact driver
- Circular saw
- Jigsaw
- Oscillating Multitool
- Plastic pipe cutter
- Selection of drill bits, including 25mm spade, auger bit, or hole saw with extension
- Chalk line
- Spirit level/straight edge
- Crowbar(s)
- Handsaws
- Pressure pump or hose pipe and connection to mains pressure water
- $\frac{3}{4}$ " BSP Hozelock or similar connections for connection to manifolds for fill, flush, and test

## NOTE

- Nu-Heat can only give advice on specific details related to the installation of our system components, we are unable to offer advice or guidance of general plumbing, electrical, carpentry or building practices, acoustic performance, structural design of floor joist arrangement or preparation and application of final floor coverings.
- Before the Nu-Deck® panels are installed, please check the condition of the joists for structural integrity, level and flatness. Correct any defects as deemed necessary.
- For the purposes of this installation guide it is assumed that the installer has the requisite skills, knowledge and experience to safely carry out work for all aspects of the installation.

## Health and Safety

- Ensure you have carried out the relevant risk assessments and have the appropriate experience, knowledge and PPE for carrying out the works.
- The installation will require working from heights over exposed joists and the use of various power tools, heavy materials, adhesives and fixings, and exposure to wood chip and dust from power tools etc.

## Protection from Frost

- Do not install the system in temperatures less than 5°C and protect from frost, if freezing conditions are likely during the installation, prior to the heating being switched on, please ensure all water is drained and purged from the pipework.

## Storage and Handling

- Always store the boards flat and level and in dry conditions. Handle the boards with care, taking care not to damage the edges, tongue, and groove joints, foil coating, or printing.
- The boards must be stored indoors in a dry environment and on a flat surface and be protected against exposure to water or high levels of humidity or moisture.

### Moisture Resistance

- Please note that the Floor Deck and Cover Boards are both manufactured from moisture resistant materials, however this does not mean that they are waterproof and cannot be assumed to be exterior grade. Because of this they cannot be installed into buildings that are not fully weatherproof.
- The boards are timber based products and therefore sensitive to moisture content and may expand in areas of high humidity such as exposed or not fully weather tight, unheated properties.
- We strongly recommend that the boards are acclimatised to the environment where they will be installed for at least 48 hours prior to fitting. The humidity and temperature levels need to be stable and at a point that would be normal for habitation.
- When laying the cover boards it is important to cut and loose lay all of the boards in each room prior to fixing them, if possible leave to acclimatise for at least 24 hours prior to fixing.
- When laying the cover boards it is acceptable to have a small gap of approximately 1-2mm, between each cover board. Do not fit the board too tightly together, this may cause the boards to distort in buildings with a high moisture content.

### Fixings

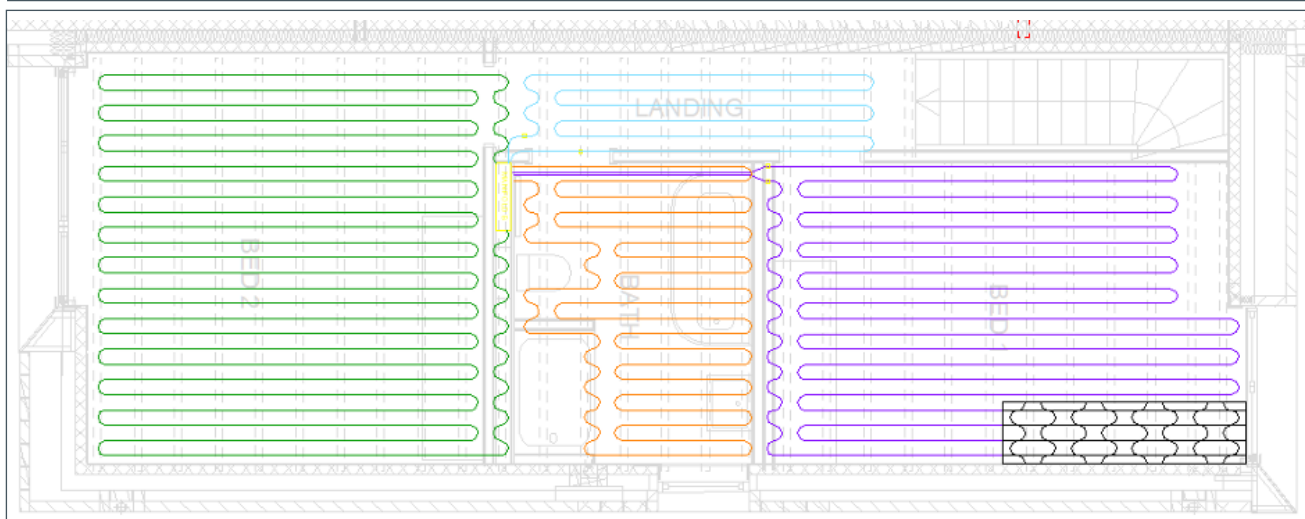
- Fixings for cover board is generally considered to be installers preference. However we would recommend 2mm x 20mm annular ringshank nail. Guidance on minimum and maximum fixings, minimum of Nail gun with 20mm Brad nail, maximum 4x20mm countersunk woodscrew. For floors that will be tiled or have levelling compound applied we recommend screw fixing only.
- Important – If screws are used ensure care is taken not to overdrive the screw heads through the coverboard. This can cause the back of the board to break out, weakening the hold of the screw and damaging the board. In extreme cases the board can be pushed away from the surface of the Chipboard deck below and cause the cover board to distort..
- Screw heads and nail heads should be flush with the top surface of the board.

# Installation guidance notes

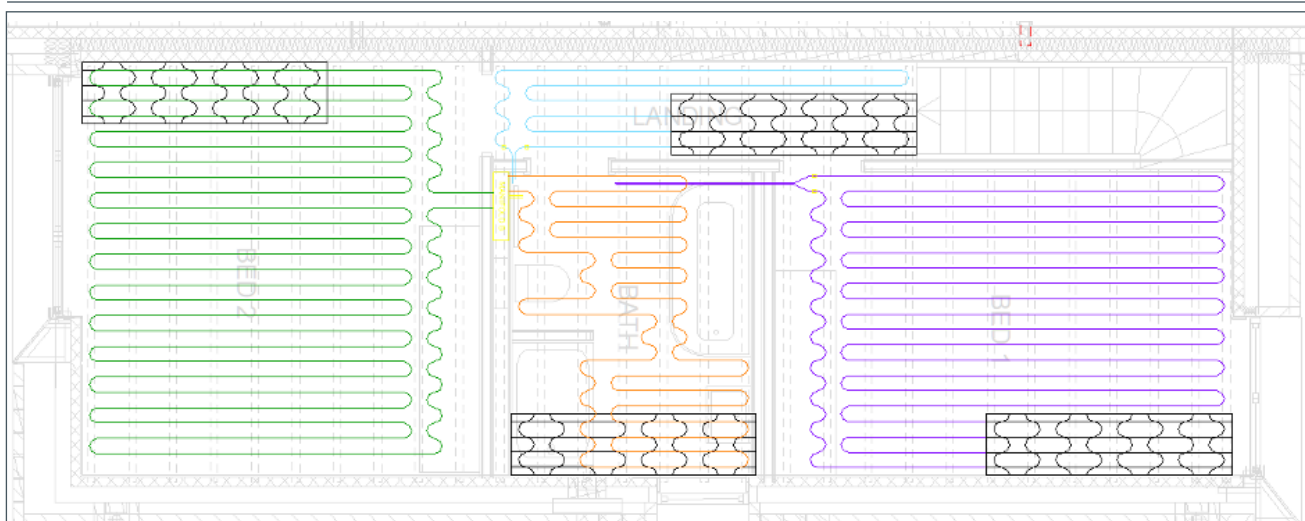
## New Build

- There are two general options that can be used to install the system in a new build application.
- The retrofit method is a room-by-room approach but this is generally considered unnecessary in a new build application due to construction sequence and time-saving. The one possible exception to this may be suspended timber ground floors, see separate notes.
- The preferred method is to install the entire floor deck before any internal stud walls are constructed and before the ceilings have been installed. Nu-Heat will generally apply this method to the system design for all new builds unless agreed otherwise. For the purposes of this section of the guide, this is referred to as the new build approach.
- Check and plan the run-back route, ensure that there is a clear route from the room, back to the manifold location, and always refer to the system drawings supplied by Nu-Heat, these will not only show the pipe layout and suggested flow and return run-back, they will also suggest the preferred first board position to use as a datum for the rest of the installation.

### New build example drawing:



### Retro-fit example drawing:



The boards have tongue and groove jointed edges to create strong joints, it is important to ensure correct and full engagement of the tongue and groove joints. Where joints do not coincide with a joist, they must be supported by a separate noggin, in accordance with NHBC standards.

## Retrofit/Renovation

- It is assumed that the installer has prepared for the works by removing all existing flooring boards or floor panels, nails etc. and the area is clean and ready for the installation of the new floor panels.
- Any rooms over an unheated space such as a ground floor void or garage must be insulated between the joists, the insulation needs to be installed in advance of the boards and in room by room sequence as to not block any flow and return run back routes to the manifold.
- The system must be installed sequentially, starting in the rooms farthest away from the manifold. This will allow pipework to be installed and tested prior to moving onto the next room. It is vitally important that pipework is not concealed under the floor until it has been fully pressure tested with water, this applies to ground and upper level floors.
- Using this method will require some boards to be temporarily lifted in any rooms where the flow and return pipework passes through to get to the manifold.

## Suspended Timber Ground floors – New Build and Retrofit

- Due to limited access under the floor we recommend that the retrofit installation method (room by room) is used in these installations. It would not normally be practical to install the entire floor deck as there would not be access from below to install the flow and return pipework. If there is sufficient access the new build approach to installation can be applied, but this is considered to be unusual.

## Flow and Return run back pipework

- In ground floor installations the flow and return pipework can be run through the space under the joists, holes may need to be formed in the dwarf walls to allow pipe to pass through. Any pipework in the ground floor and any unheated spaces must be thermally insulated in line with current building regulations to reduce heat loss and protect from frost.
- In upper floor installations the joists may need to be drilled to allow pipework to pass through, please refer to building regulations and industry requirements when notching or drilling joists and only drill where appropriate to do so.

## General Installation Guidance

- After cutting the boards, clear away any residual sawdust from the pipe channels by lifting them onto their ends and tapping to clear the sawdust from the channels.
- Allow a 10mm expansion gap around the perimeter.
- Only use PU foam adhesive, D4 classification (supplied) for tongue and groove joints and tops of joists.
- Avoid applying too much adhesive or too close to pipe channels, overspill will need to be cleaned out before installing the pipework.
- Floor temperature sensors will be required for certain floor coverings, these can be let into the surface of the cover sheet with a router or by chiseling a channel to receive the probe and wire. Ensure the probe is fitted centrally between pipes.
- It is possible to repair the UFH pipework if it becomes necessary, Nu-Heat is able to supply repair couplings for this purpose, please contact Nu-Heat technical support (Tel. 01404 540745) for further information.



## Boards joint details

The boards have tongue and groove jointed edges to create strong joints, it is important to ensure correct and full engagement of the tongue and groove joints, boards must be arranged in brick bond type, staggered pattern. Where joints do not coincide with a joist, they must be supported by a separate noggin, in accordance with NHBC standards.



- In circumstances similar to this, the tongues may need to be cut off to allow the boards to join fully
- Fixings at no greater than 275mm centres along joist (3 screws per joist, per board minimum)
- Do not subject the floor to excessively heavy loads until the top cover sheet has been fully fixed down.

When laying the cover boards, ensure correct alignment as shown below:

**Correct:**



**Incorrect:**





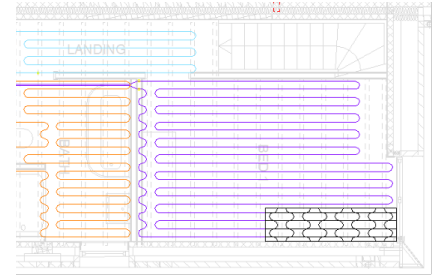
# Installation sequence



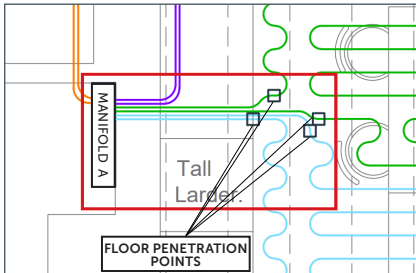
**1.** Loosely place temporary boards to walk on and work from.



**2.** Insulate any ground floor voids and areas above unheated spaces with PIR or mineral wool insulation to ensure the best performance of the underfloor heating and minimize heat loss.



**3.** Check the CAD drawings and confirm the design is correct to the actual room space and dimensions.



**4.** Referring to the drawings supplied, fit the manifold in the correct position.

**5.** Investigate/confirm flow and return pipe run back route from room to manifold, checking if floor penetration point is correct on the drawings. It may be necessary to temporarily remove floorboards in any rooms that the flow and return pipework runs through to provide access to install the pipework.



**6.** Referring to the CAD drawing and paying particular attention to the tongue and groove joining relationships and starting point. Measure and cut the first board if required, leaving a 10mm gap at the walls. The first board in each area will be marked on the system design drawings.



**7.** Position the first board and ensure it is aligned correctly to the wall/joists as necessary, use a straight edge, builders square, and tape measure to assist with setting out. Remember to leave a 10mm gap at the outer edges.



**8.** Mark the position of the board and place it to one side.



**9.** Apply PU adhesive (supplied) to the top surface of the joist and replace the board in the previously marked position.



**10.** Fix the board using the screws provided, as shown.



**11.** Measure and mark the next board ensuring the joints are arranged in brick bond type, staggered pattern. (See page 8)

**TIP:** Use a straight edge to ensure all boards are properly aligned with each other.



**12.** Cut the board to the required length.

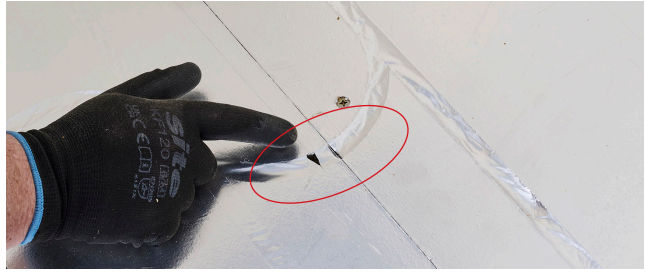


**13.** Shake/tap the board to help clear the sawdust from the channels.





**14.** Place the board to check correct size and alignment, paying close attention the alignment of the channels.



**15.** Apply PU adhesive to the tongue and groove joint only when the boards will join. Be careful not to apply the glue too close to the pipe channels, overspills will need to be cleaned out prior to installing the pipe.



**16.** Apply PU adhesive to the top of each joist, where the board will be laid.



**17.** Replace the board and ensure the tongue and groove joints are fully closed, use a scrap block of timber and a mallet to tap the board to assist if required, take care not to damage the tongue or groove.



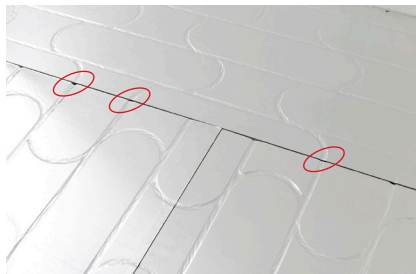
**18.** Fix the board down as previously done and remember to leave a 10mm gap at the wall edges.



**19.** Continue to install the boards as shown until the next row is complete.



**20.** When starting each of the subsequent rows it is important to ensure that the board end joints are staggered as shown, preferably as a half-lap brick bond pattern.

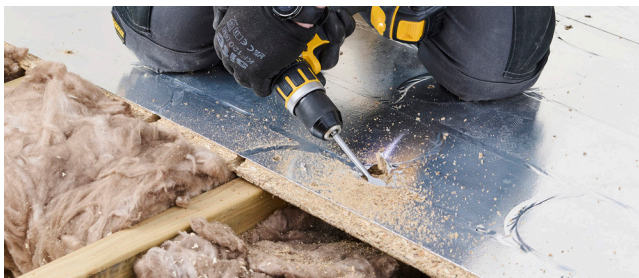


**21.** If the joists change direction, the boards can be rotated and aligned to allow pipework to run from one board to another without the need to route the boards, this will be shown in the system design drawings if relevant.



**22.** At the point where the flow and return pipework penetrates the floor an access point will need to be left, either in the room or just outside in the adjacent room or via the floor below. This is to facilitate the installation of the flow and return pipe-work through the floor void.





**23.** The floor will need to be drilled at the point where the pipework penetrates the floor. Drill the floor panel using a 20mm-25mm drill bit or hole saw drill at an angle of 20° to 30° in the routed pipe channels and ensure there are no sharp edges that could damage the pipe, the pipework must have a smooth transition into the floor void.



**24.** Referring to the drawings in the handover pack, select the correct coil of pipe and cap or place some tape over the ends to prevent the ingress of debris.

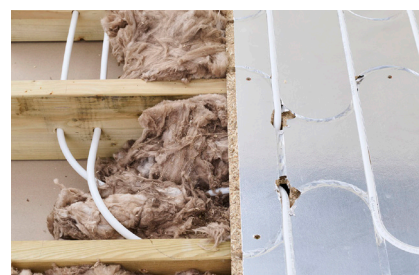
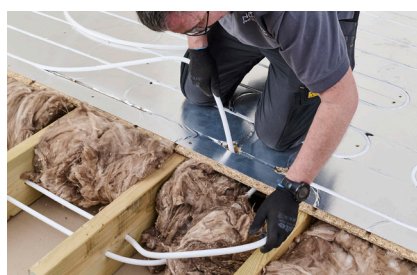
**25.** Working with one end of the coil, push the pipe through one of the previously drilled holes into the floor void, carefully feed the pipe through the hole, and continue until there is sufficient pipe length at the manifold to make a connection allowing at least 1m spare.



**26.** Ensure the entire floor area is clean and free from any loose debris or dust, paying particular attention to the pipe channels and cleaning out any excess glue.



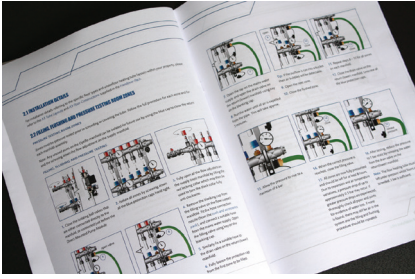
**27.** With reference to the drawings, begin laying the pipe in the channels, the pipe should easily push through the foil into the channels, there is no need to cut the foil or use excessive force. Do not force the pipe as this can lead to kinks that may damage the pipe. A good tip is to uncoil the pipe as it is pushed into the channels as shown. Ensure the pipe is pushed fully into the channel and is flush with the top face of the board.



**28.** The pipe may have "wiggles" in the route, exercise care when pushing the pipe in to wiggle pattern, and do not force the pipe into the channels.

**29.** When the pipe has been laid, the remaining pipe can be fed through the hole previously drilled for the return to the manifold in a similar way to the flow pipe, being careful not to damage or kink the pipe.





**30.** Connect pipework to the manifold. (See separate UFH plumbing installation guide).

**31.** Fill, flush, and pressurize the system and check for leaks.

**32.** Insulate any pipework that passes through a ground floor void or other unheated areas.

**33.** Pressure testing must be carried out before the cover board is fixed down. With the system full, set the static pressure to 3 bar and leave for 8 hours (See separate UFH plumbing installation guide).



**34.** Sweep/vacuum the entire floor area and ensure it is completely free of dirt and dust. All screw heads should be flush or below the top surface of the floor panel and any excess glue scraped off being careful not to damage the foil coating of the board. Ensure the area is kept clean until the cover boards have been installed.



**35.** The cover board is printed to show the pipe route, it is important that the printing corresponds with the pipe and channels routed in the floor panels. The cover sheets are designed to be laid at 90 degrees to the floor panels and in a staggered joint arrangement as shown. If the structural boards change direction, rotate the cover board to suit.



**36.** Measure and cut the cover boards.

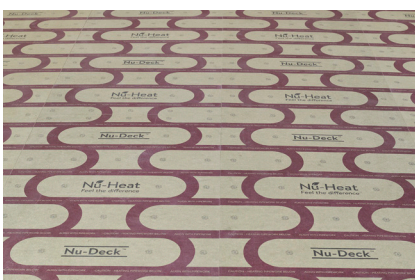
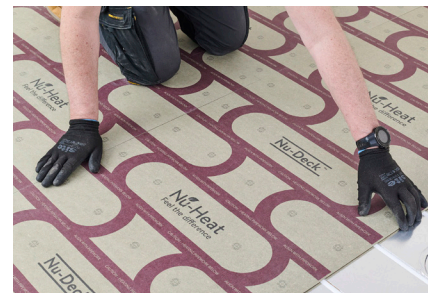
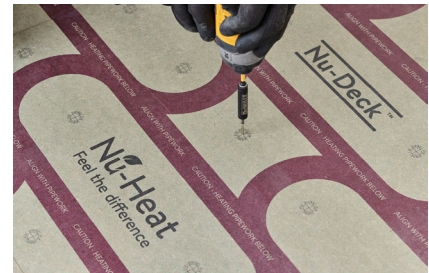


**37.** Take time to carefully position them corresponding to the pipe routing, if the boards are not aligned correctly there is a high risk that the pipe may be nailed when fixing the cover boards.



**38.** The fixing points are marked on the cover board, the pipe route is clearly marked to help avoid nailing of the pipe. Use all of the marked fixing points using your preference of nails or screws.

**Note:** Please refer to page 4 (Additional items section) of the installation guide referring to fixing types.



**39.** Repeat this process for all areas/rooms until the floor is complete.

**40.** When all the rooms/areas have been completed, the system can be fully filled, flushed tested, and commissioned.

# Installation notes:

# Nu-Heat

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