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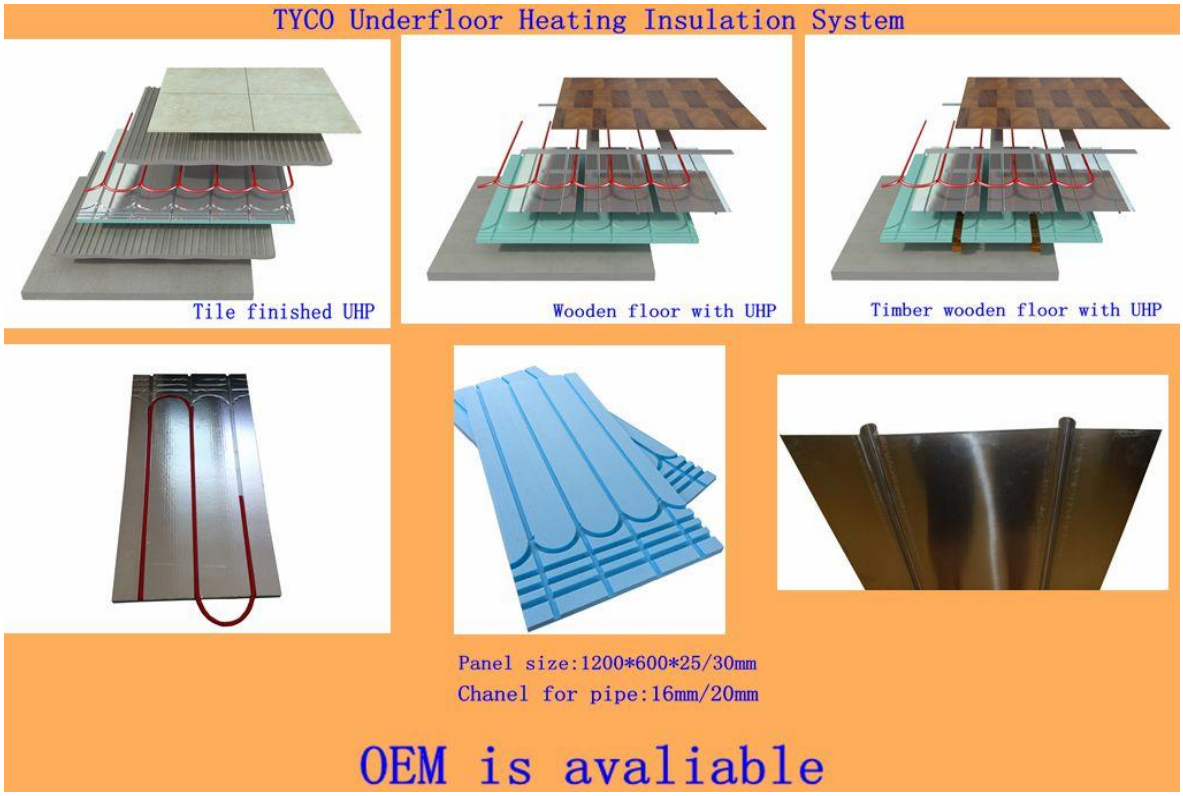
TYCO UNDERFLOOR HEATING INSULATION PANEL



1. Description of the TYCO underfloor heating insulation PANEL (TYCO UHP)

1.1Specification & components

TYCO UHP consists of grooved extruded polystyrene (XPS) and aluminum foil. The aluminum foil is laminated in the grooved side of XPS.

1.2Applications

TYCO UHP is used as an alternative to a screed type system when using water under floor heating systems. It is only 25/30mm thick and come with the pipework grooves cut out ready to fit the pipe inside, an 12/16/20mm floating chipboard sub floor can then be laid directly on top of the panels ready for floor covering such as carpets, tiles etc, or an 12/16/20mm engineered click wood flooring can be installed straight on top of the panels.

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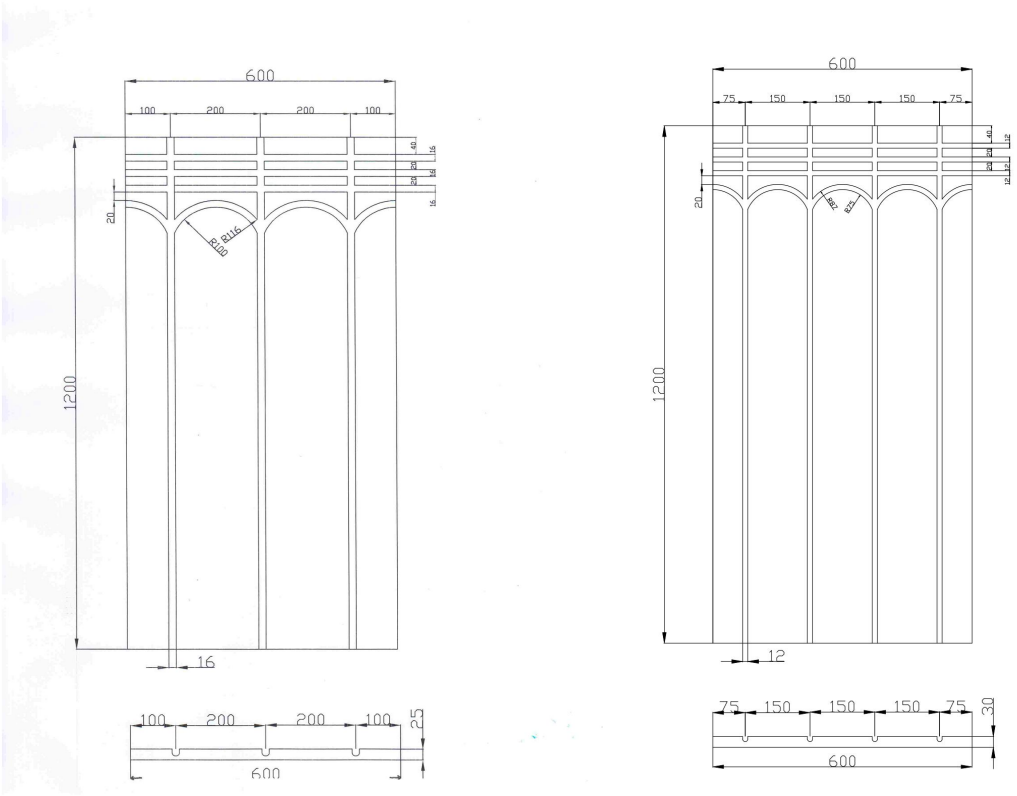
1.3drawing



1.4Sizes

Panel size	Distance between grooves	Suit to pipe
1200*600*25mm	20/15cm	OD 12/16/20mm
1200*600*30mm	20/15cm	OD 12/16/20mm

Density tolerance: 32±3kg/m3
Tyco UHP has dimension tolerance as follow:
Length: ±2mm
Width: ±2mm
Thickness: ±1mm

2. Technical performance of the TYCO UHP

		XPS
Density of core board	Kg/m3	32±3kg/m3
Thermal conductivity, 90 days, 10°C	W/mK	0.034
Compressive strength at 10% deflection or yield, (vertical)	kPa	≥250

Tensile strength	kPa	≥300
Water absorption	Vol-%	<=1.00%
Capillarity	nil	nil
Coefficient of linear thermal expansion	mm/mK	0.07
Temperature limits	°C	-50°C, +75°C

3. Maintains and installation of the TYCO UHP

3. 1 Maintains of the TYCO UHP

3.1.1Handling

General Handling: Provide adequate ventilation, and local exhaust as needed.
Avoid generation of dust.
Wear suitable protective clothing and gloves.
For mechanical processing: dust formation. The use of local exhaust ventilation is recommended. Do not breathe dust.
Precautions against fire and explosion, avoid open flames. Keep away from heat.

3.1.2Storage

Avoid contact with, such as Oxidizing agents, aldehydes, amines, ester, organic solvents, Fuel (liquid)
Requirements for storerooms and containers:
Provide adequate ventilation.
Protect against direct sunlight.
Protect from moisture.
The product should be stored flat.

3. 2 Installation of the TYCO UHP

Underlay Installation board with aluminum foil apply to water heating system under tile use, The tile finished installing underlay insulation system as fig 2,

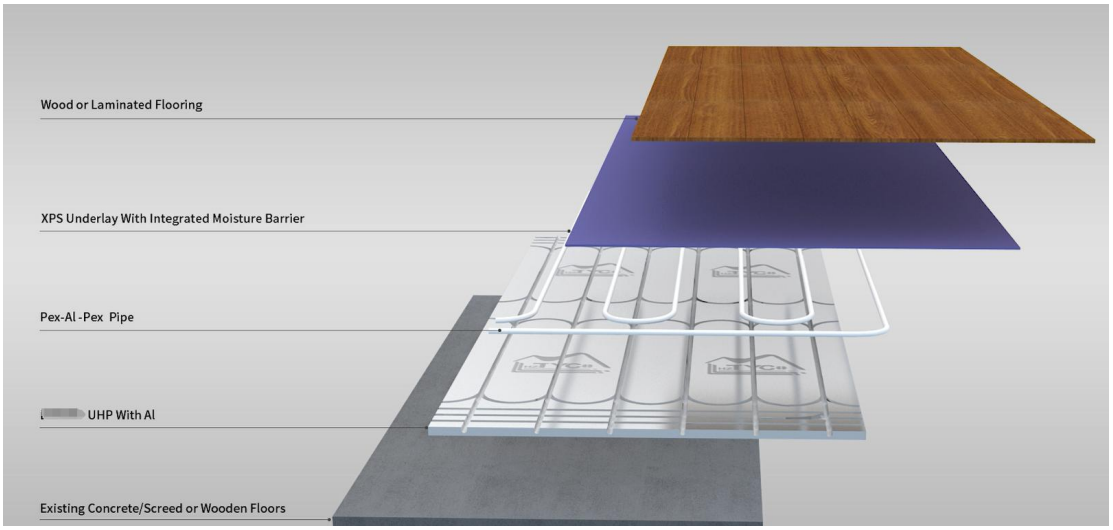


Fig 2

3.2.1 Preparation before install of the TYCO UHP

TYCO UHP can be fixed to new or existing concrete/screed or wooden floors which must be dry and level, remove any loose paint or coverings. Floors must be free from oil, grease, damp, dust and debris or any other substances that will prevent the adhesive from adhering. When fixing TYCO UHP boards to a concrete or screed floor, ensure a damp proof membrane has been installed, if not or unsure then apply a liquid damp proof membrane and allow to cure fully before fixing any boards.

When fixing TYCO UHP boards onto a wooden/timber floor ensure any loose flooring is secured, replace any missing or damaged boards. Ensure the floor is firm and level, allow any adhesives to dry fully before fixing TYCO UHP .

If fixing TYCO UHP to a non-porous substrate such as existing tiles, they will need thorough cleaning with a de-greasing agent, such as scrubbing with a combination of methylated spirits and wire wool. Coat the tiles with spray adhesive first and then coat the back of the TYCO UHP with spray adhesive, allow both to become tacky and then bring the two surfaces together. (Test a small patch first to ensure compatibility)

3.2.2 Installation:

Before laying the TYCO UHP, remove skirting boards and any doors that will require trimming to accommodate the TYCO UHP and final floor finish. Fit edge strip around the outside edges of the area to be heated using the sticky tape on the back or a hand staple gun. This will help reduce heat loss and allow for expansion. Any height excess can be trimmed off once the final floor finish has been laid.

If intending to lay carpets with edge grippers fix a suitably sized batten up to same height as the TYCO UHP around the room perimeter. Lay the TYCO UHP flush

against the batten when installing, this will allow fitment of carpet gripper at a late stage.

3.2.21.Before lay any TYCO UHP, familiarise yourself with the system layout drawing, noting manifold position. The drawing will detail the orientation and position of boards (Step 1) Plan the routes for transitional pipe runs and transitional boards. Some cutting of boards will be required this is easily achieved with a fine toothed saw or craft knife. We advise wearing gloves as the aluminium edges can be sharp.

3.2.2.1. Lay adhesive and grout in existing floor, then lay the TYCO UHP on the adhesive and grout coating. Make sure you have selected the correct board and orientation, apply an even and firm pressure to make sure the board is in full contact with the adhesive and floor below.(a good tip is to insert a small off cut of pipe into the pipe channel where the boards meet.)After finish all heating areas TYCO UHP sticking, allow sufficient time for the flexible adhesive drying. wait for about 48hours to make sure that the TYCO UHP are stable as step 3.

3.2.2.2. Installing heating pipe according with preplanned design. Each insulation board have three horizontal lines and three/four vertical lines, horizontal lines for different pipe branches walks to different target areas, vertical for pipe walk through the target area. Grooved curve for pipe walks to change its direction. In horizontal line to change pipe direction you can cut the aluminum foil by knife as step 4 and step 5.

3.2.2.3. After finish pipe installing, fix the pipe with adhesive tape as step 6(this step can leave out if necessary). Please we have to pay attention to the pipe installation and test the heating effect, in this step we must make sure the pipe installing in good condition, heating system works well, because it is different to find problem and maintenance after tiles finishing.

3.2.2.4. When pipe checking well installed, then put the adhesive and grout layer and stick tiles as usual.
3.2.2.4 For floating Wooden and Laminate floors it is advisable to use XPS Underlay, allowing the floor to move freely when expanding and contracting and to help improve step noise reduction.

Wood is a material that is extremely influenced by its environment, specifically by moisture content of the air above and below. Depending on the relative humidity of the air, moisture content of the wood will naturally vary over the seasons – and so will its volume. Floor heating will escalate the expansion and contraction of wood. It is therefore extremely important to install wood flooring with care, following the manufactures guidelines.

Flooring manufacturers often give instructions on how wood flooring should be laid, with a maximum surface temperature of 27°C. This can be monitored and set using a thermostat and floor probe which will protect the floor.

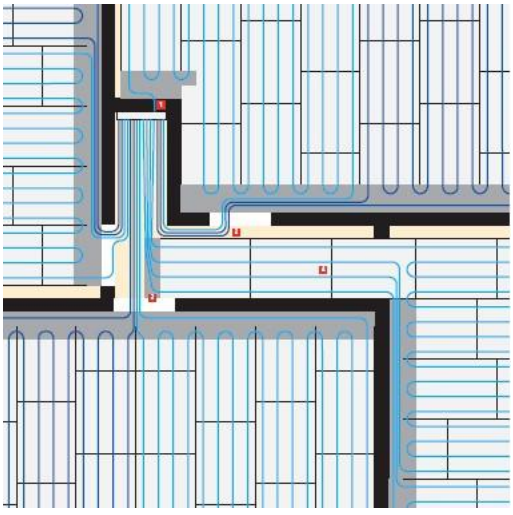
The easiest means of installing wooden flooring is by the 'floating floor' method, special attention must be taken to follow manufactures instructions on expansion joints. With Floor heating wood will dry and shrink more during the winter season than if floor heating was not installed.

So it is important to keep the supply temperature of the floor heating system as low as possible and to increase the size of the expansion joint by approximately 50% in the case of large floorboards, Underfloor heating will give rise to larger gaps between boards during winter months.

Generally for wood floating floors, it is important to have some form of vapour barrier underneath. Some wood flooring manufactures require a polythene vapour barrier (0.2mm thick and age tested) to prevent vapour moisture potentially coming from below which could damage the wood flooring.

It is important for wood flooring which has been kept in cold conditions to be taken into the room in which it will be fitted so that it can acclimatise to the new environment and this may take several weeks. Some large wood products unless kiln dried may need a longer acclimatisation period in order to dry to a sufficiently low moisture content before it can be fixed.

- PLEASE make sure with wood flooring manufacture, the item you choose is OK for the floor heating system.

STEP 1. Planning the installation will save time later and make installation easier. The main considerationis the amount of runs and the route those pipes will take from the manifold. There are a number of parallel grooves at either end of the boards. Ifmore transit grooves are needed then the grooves at the opposite ends can be cut off and used. Wherepossible route pipes through rather than around walls and doorways to cut down on pipework congestion. When lining up panels use a short lengthof pipe placed in the grooves to align them together	

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STEP 2. Plates need to be supported so that they sit level and make a good contact with the floor placed on them from above. Maintaining this contact is essential in producing good heat transfer performance.	
STEP 3. After placing the boards and ensuring they are fl at and level and the joints are butted up firmly, tape the joints using aluminum self adhesive tape.	
STEP 4. Start laying the pipework by pressingit firmly into the grooves. Where the pipeworkis connected to the manifold there will be aneed to use plain insulation and pipe staples toaccommodate the closer pipe centres	

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STEP 5. Where the pipe changes direction cut the foil in the return loops using a craft knife to prevent damage to the board. This will ensure a tight fit for the pipework.	
STEP 6. After installing the pipework , Aluminum self-adhesive tape can be placed over the end loops to prevent thepipework from becoming dislodged during the installation of the finished floor.