



UNDERFLOOR HEATING IN JOISTED FLOORS

There are three main types of floor joists:

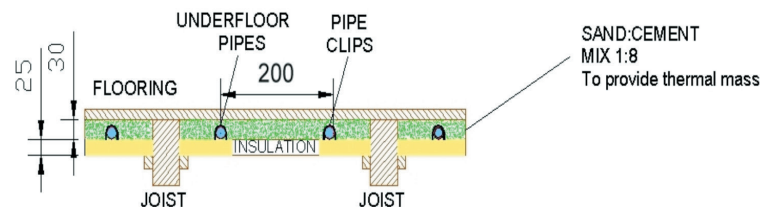
1. STANDARD TIMBER JOISTS

This type of pipe is the most commonly used in mainland Europe for UFH systems. RT denotes raised temperature which means that it is suitable for UFH system that can run constantly at higher than normal temperatures (if required). PE-RT is designed and manufactured specifically for UFH systems and is made with either 3 layers or 5 layers – the middle layer is always an oxygen barrier. PE-RT pipe is an excellent compromise between PE-x/Pb and 'al' pipe for installing – not 'springy' and less likely to kink.

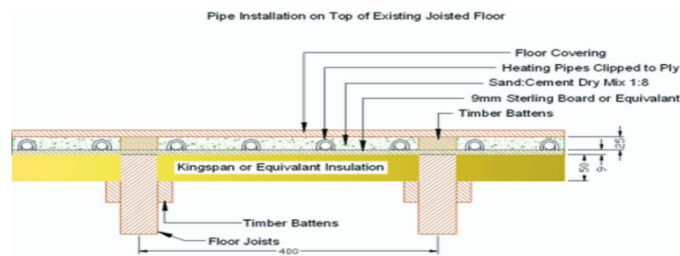
Usually 9" x 2" at 400mm centres in homes built since 2000 but often smaller in older homes. Chipboard or planked flooring is usually nailed or screwed to them.

Installing UFH –

Option a) Wooden battens are fixed down the lengths of each joist 100mm/75mm from the top of the joist and 75/50mm foil backed insulation (such as Kingspan, Celotex etc.) is fitted in between the joists and supported by the battens. A 25mm gap is needed from the top of the insulation to the top of the joist. The pipes are stapled to the insulation and then, depending on the size of the joists, a sand/cement mix can be fitted to create thermal mass. The biscuit mix adds 20kg/m² so the suitability of this should be checked with your building surveyor.



Option b) 'Cross Battening'. 2" x 1" battens are fitted at 400mm spacing to create a fake joist floor leaving a 100mm gap at each end for routing the pipe into the next bay and manifold returns. The pipes are nail clipped down to the floor and then an 8:1 sand and cement mix is installed if possible. Chipboard flooring can then be laid and fixed to the battens with the floor covering on top or solid / engineered floor can be laid at 90 deg to the battens. The floor would be raised 25mm + flooring from the original level. Ideally insulation is fitted below the original level.



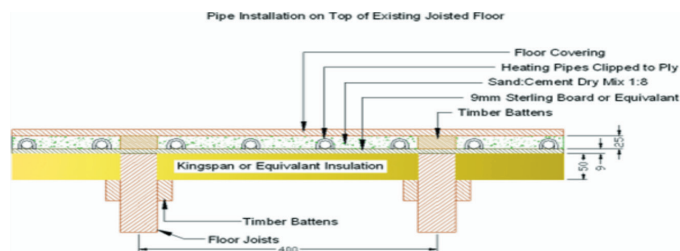
Option c) Aluminium Spreader Plates. Double groove aluminium spreader plates are fitted to the top of the joists and pipe is fixed to them. This method does not offer the same levels of thermal mass as the methods described previously and the plates can expand and contract in some cases creating unwanted expansion noises. In addition, as the pipes are spaced at 200mm centres and we cannot endorse their use with heat pumps.

2. I-BEAMS JOISTS

The cross section of these look like an 'I' hence their name. These are common in timber frames homes built in recent years and the wooden flooring is sealed and screwed to the joists for rigidity as the home is built up. The I beam joists can not be notched although they usually have 'knock out' holes in the vertical part for pipes.

Installing UFH –

Option a) 'Cross Battening'. 2" x 1" battens are fitted at 400mm spacing to create a fake joist floor leaving a 100mm gap at each end for routing the pipe into the next bay and manifold returns. The pipes are nail clipped down to the floor and then a 8:1 sand and cement mix is installed if possible. Chipboard flooring can then be laid and fixed to the battens with the floor covering on top or solid / engineered floor can be laid at 90 deg to the battens. The floor would be raised 25mm + flooring from the original level. Ideally insulation is fitted below the original level.



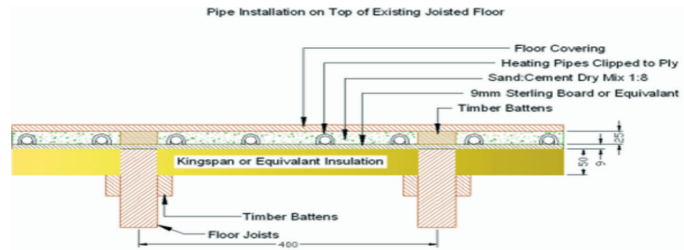
Option b) Fit UFH from below. Installing UFH from below is time consuming but can be done. Holes would be drilled into the I-beams or pipe threaded through the 'knock out' sections and the pipe loop would be pulled into the length of each bay. The pipe is the nail clipped to the flooring above. Foil backed insulation is then fitted underneath the pipes and held up using wooden blocks or equivalent. There are also single aluminium spreader plates available for fitting from below.

3. ECO JOISTS

These are 'webbed' almost 'meccano' like joists. Their webbing is ideal for routing plumbing pipes and cabling so are common in new build blocked construction homes. Eco beam joists can not be notched and it is difficult to fit insulation in between them because of their webbing.

Installing UFH –

Option a) 'Cross Battening'. 2" x 1" battens are fitted at 400mm spacing to create a fake joist floor leaving a 100mm gap at each end for routing the pipe into the next bay and manifold returns. The pipes are nail clipped down to the floor and then a 8:1 sand and cement mix is installed if possible. Chipboard flooring can then be laid and fixed to the battens with the floor covering on top or solid / engineered floor can be laid at 90 deg to the battens. The floor would be raised 25mm + flooring from the original level. Ideally insulation is fitted below the original level.



Option b) Fit UFH from below. Installing UFH from below is time consuming but can be done. Holes would be drilled into the I-beams or pipe threaded through the webbing sections and the pipe loop would be pulled into the length of each bay. The pipe is the nail clipped to the flooring above. Ideally, foil backed insulation is then fitted underneath the pipes and held up using wooden blocks, straps or equivalent. There are also single aluminium spreader plates available for fitting from below.

SUMMARY

Installing the cross batten method is the easiest way to fit on any type of joists but the floor would be raised 25mm + flooring. Alternatively our styrene overlay system can be installed instead of the battens and sand/cement mix.

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