

Timber Flooring and Underfloor Heating

Underfloor Hydronic Heating with Timber Flooring

Timber floor coverings are used extensively with hydronic underfloor heating throughout Europe, Asia, USA and New Zealand without problems provided simple guidelines are followed.

Some wood floor suppliers in New Zealand have an aversion to heated floors while other suppliers embrace the technology and will offer assistance to customers who are looking at underfloor heating for their homes. The fact is, timber floors have movement whether there is underfloor heating or not and in most houses the sun will periodically heat the timber flooring to a higher temperature than hydronic underfloor heating.

There are two main questions people often ask:

- How much heat will get through the floor?
- Will the timber floor crack or deform when heated?

How much heat will get through the floor?

Thick timber floors will reduce the amount of heat passing from the heated slab to the room above. Flooring of more than 20mm thick is not recommended as from a heating point of view, the thinner the better. Ideally the R-value of the timber floor covering should be less than 0.15, which is that of 16mm engineered hardwood on a 3mm floating floor pad membrane as shown below.

This does not mean that underfloor heating is not suitable for thicker/higher R-value timber floors however the selection of these types of flooring should be considered.

Example: R Value of engineered hardwood	Thickness (mm)	R Value
Floating floor pad membrane	3	0.04
Engineered hardwood	16	0.11
Total	19mm	0.15

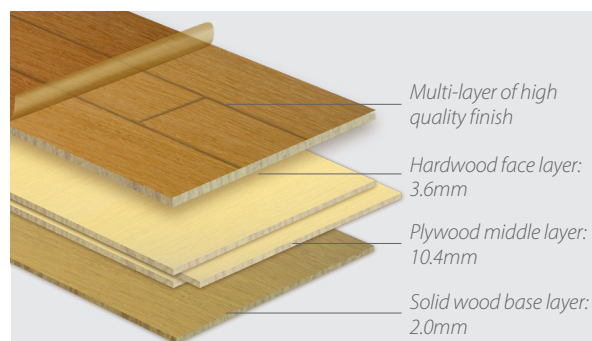
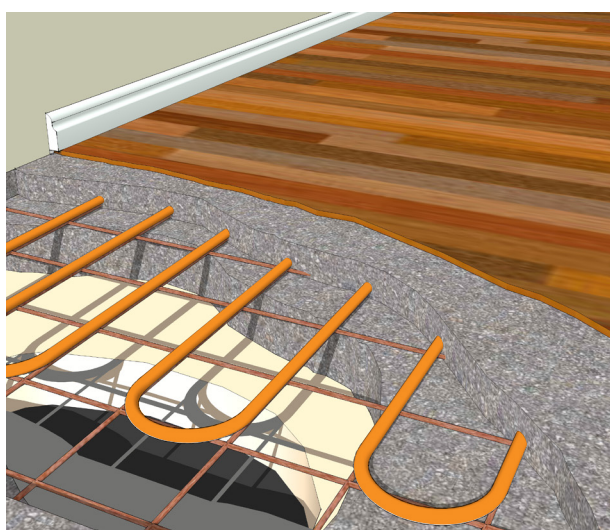
Will the wooden flooring crack or deform when heated?

No, as long as the right type of material is used, and it has been properly treated.

The warping and splitting of timber floors is usually caused by the reduction in moisture content of the timber when it is in a heated room. The reduced moisture content causes the timber to shrink.

Uneven shrinkage of the timber can cause crowning or cupping. Solid wood flooring is more likely to deform than engineered hardwood flooring because of the variations in density and moisture content due to the natural grain of the timber. Cupping or crowning is also dependent on the direction of the grain and uneven drying of the timber, resulting in different levels of moisture content within a single piece of timber.

Kiln-dried timber is usually around 12% moisture content and processed timber products such as MDF or plywood around 10%, whereas the timber on a heated floor will be around 6 to 8%. Engineered hardwood is often around 6%.



Types of Flooring

Engineered Hardwood

- It is most suitable for use with underfloor heating
- Plywood core with hardwood face layer (see diagram above)
- Alternate direction of the grain in individual layers means more resistant to movement
- Planks typically 14-18mm thick

Laminate

- Performs well with underfloor heating
- High Density Fibre (HDF) core
- Photographic top layer mimics the look of wood
- Planks typically 5-8mm thick

Hardwood

- 100% wood
- Planks typically 18-25mm thick
- Greater risk of movement
- Lower heat output

Bamboo

- Similar to Engineered Hardwood
- Good performance with underfloor heating
- Planks typically 10-15mm thick