

## Austrian wide-plank timber floors

Whilst underfloor heating is considered somewhat new in the Australia, it has in fact been widely used for decades in Europe and North America. We have been supplying and installing wide-plank wood floors successfully over underfloor heating systems throughout Europe and the United Kingdom for over 30 years.

### Understanding wood and heat

Because of its inherent characteristics, any type of wood flooring, wherever it is to be used, must be very carefully specified, selected and installed. This is never more critical than when fitted over an underfloor heating system.

The close proximity of the heating source and the use of the floor as a large area radiator can be the cause of post installation problems - unless the correct type of wood floor is specified and the flooring is installed by experienced and skilled fitters. To be successfully installed over underfloor heating, wood flooring should be of an exceptionally strong and stable construction and manufactured to the highest wood engineering standards.

Because floor planks and strips physically expand and contract dramatically across their grain direction with corresponding increases and decreases in moisture content, they are liable to distortion and can generate enormous compressive forces. Wood floors have been known to expand to such an extent and with sufficient force, in extreme cases, as to crack or dislodge the perimeter walls.

These distortion effects are most evident in non-engineered solid wood floors. The planks or strips can also expand and contract to cause both costly and unsightly effects including, debonding from the sub-floor, excessive gapping and a pronounced cupping effect.

If attempts are made to correct cupping (concave curving) by sanding the floor, here is the real danger of ending up with planks suffering from crowning as the floor, due to a further change in temperature and humidity, regains its initial form.

For the above reasons wide-plank non-engineered solid wood fails to meet the stability requirements for underfloor heating applications. With wide-plank wood flooring, the potential distorting effects of changing temperature and humidity on the plank are proportionally greater, thus it is essential to select an exceptionally well engineered wide plank wood floor. Expansion and contraction along the grain or length of a plank is minimal and generally only due to thermal changes affecting the fibres that form the structure and grain of the wood. It is this characteristic of wood that can be used to create precision-engineered planks that are far more dimensionally stable than a single solid wood board.

### Achieving wood floor stability on underfloor heating

To achieve a stronger and more stable type of wood floor the planks should be constructed of three layers of wood, with the core or inner layer of the 'sandwich' having its grain oriented at right angles to the outer two layers and, ideally, made up of blocks whose grain directions are alternately opposed. The three layers of wood are then pressure-bonded together to form an exceptionally strong and dimensionally stable plank. Any tendency for an outer layer to expand or contract across its grain width is resisted by the core that remains rigid along its length.

Unlike mafi, many manufacturers of engineered wood flooring reduce costs by using an inferior timber for the bottom layer, in the mistaken belief that it is not seen and therefore can be of a low-grade material.

The top and bottom layers of the engineered flooring must be of the same wood species, having identical expansion and contraction characteristics, to allow any stress or strain forces to be cancelled out through the core layer. In other words the lower, unseen layer should be exactly the same as the top finished wearing surface. Only this type of engineered construction provides the dimensional integrity to withstand the more extreme humidity and temperature changes that underfloor heating subjects a wood floor to, without warping or distortion.

It should be borne in mind that inferior engineered planks using different wood species or unproven materials for the outer layers will suffer warping and distortion in a similar manner to a non-engineered solid wood floor plank.

Wood floors installed above underfloor heating must be fixed by bonding with specialist glues to the sub-floor; this allows for effective heat transfer. Floating the floor renders the heating system inefficient. The air gap beneath a floating floor considerably reduces heat transfer.

Whilst there are various recent claims regarding the type of plank construction needed for underfloor heating, mafi's plank has an enviable track record of over 30 years; this is reassuring given that many construction-related theories can take a few years to manifest their problems.