

This information sheet is one of a series based on installation systems we have tailored to meet our needs and rigid performance requirements and have used over the past five years. This information is designed to assist Architects in specifications where timber flooring is required.

*As a solid timber and timber veneer flooring supplier and installation company we can be contacted regarding the **supply of any specified product**. And, we would appreciate the opportunity of **quoting for your timber flooring work** New Zealand wide.*

SOLID TIMBER OVER UNDERFLOOR HEATING

GENERAL

Timber flooring will experience significantly more stress over underfloor heating and more movement than usual can be expected. Nevertheless, timber can be installed and perform well so long as the heating is controlled within strict criteria.

It is not suitable to fix tongue & groove flooring directly to a heated subfloor. The presence of a 12 mm underlay board provides some insulation for the tongue & groove flooring from the higher temperature of the slab and provides a means to fix the tongue & groove flooring to the floor without the mechanical fixing piercing the slab. It is important the underfloor heating system, whether 'Florad' or similar piped water design or electrical wiring, is not pierced by mechanical fixing. For this reason, glue (adhesive) only is used to fix the underlay board to the slab.

The timber to be laid over an underfloor heated floor will be kiln dried to **10-11%** moisture content. The normal level is 12-13% for timber flooring without underfloor heating. This ensures optimal performance and minimises shrinkage once heat is applied.

The underfloor heating should be turned on preferably 3 weeks prior to the timber flooring being installed to assist with warming to temperature and drying out the concrete slab.

From the time of timber flooring installation, the heating should be turned on with a maximum **SLAB** temperature (**not** room temperature or timber floor temperature) of 27 degrees Celsius. Ideally, the slab temperature should sit around 24 or 25 degrees Celsius. For optimal performance, the heating system should be operating at all times, all year round to avoid the floor cooling and taking on moisture from the environment. If the underfloor heating does not run at a constant temperature all year round, more movement should be expected in the timber flooring, with gaps appearing and closing up from season to season.

HEATED CONCRETE SUBFLOOR

The concrete slab must be well dried prior to the installation of timber flooring. The industry standard measure is a reading of less than 75% relative humidity when measured with surface mounted hydrometer installed for 24 hours. This will take at least four to six months of natural drying in good drying conditions and much longer (up to 2 years), in poor drying conditions. Alternatively, an effective moisture barrier (such as Selleys VBS Moisture Barrier), must be

applied to the concrete slab to prevent moisture transfer from the still damp slab to the timber flooring.

HEATED TIMBER SUBFLOOR

Timber subfloor systems should be designed to comply with an Architects or Engineers recommendations. Joists must be kiln dried to a moisture content appropriate with an underfloor heated environment to prevent shrinkage and warping.

Typically, kiln dried joists are supplied and installed at **14-18%** moisture content and can be expected to dry to **10-12%** in a finished house with underfloor heating. This will result in a dimensional change in the joists which could be as much as 3-4 mm in a 250 mm joist. This can have little or no effect where the change is uniform across the subfloor. However, provision must be made where a joist system interfaces with fixed concrete or steel components which will not change dimensionally.

The joists, usually with hot water in pipes between these joists, should be overlaid with 15mm or greater plywood.

Air spaces (eg spaces between joists) are not an effective means of conducting the heat from a heated subfloor. Also air spaces form a potential "ponding" area if there is flooding or a moisture related problem. It is recommended cavities be filled with polystyrene or other insulating material.

PARQUET BLOCK TIMBER FLOORING

Parquet is the ideal solid timber flooring for installation over subfloor heating as it can be directly glued to both concrete and plywood subfloors without the need for nailing or other mechanical fixing.

Parquet, being small square blocks of timber is particularly stable and much more able to resist the stresses underfloor heating places on a timber floor. In addition, the smaller blocks allow for small amounts of movement all around the block so gaps, although they may still appear, may be less noticeable.

Large block parquet is available in both 12 mm and 19 mm thicknesses and a wide range of block sizes and species. Smaller parquet (eg 7mm finger parquet), is also available but is less stable so is not so suitable for use over underfloor heating unless the heating is carefully controlled and the blocks kiln dried to a low moisture content prior to installing.

UNDERLAY BOARD

Over concrete a 12mm Ply, is used as an underlay between the tongue & groove and subfloor. For an even stronger system over concrete, or for over joists, a 19 mm underlay can be used. Cutting the underlay board into 400 x 400 mm squares enables boards to sit flat on a slightly undulating subfloor without the need for mechanical fixing. An expansion space of 2-3 mm must be left between the boards.

TONGUE & GROOVE

19 mm hardwood tongue & groove flooring is preferable to 12mm tongue & groove as it will offer better performance and stability and allow for a stronger fixing system. The wider the tongue & groove board (eg 130 mm rather than 85 mm), the less stable the profile becomes and the

wider the gaps which will develop between boards if the underfloor heating system is not controlled appropriately.

Prior to machining, the timber should be kiln dried down to approximately 10–11% moisture content and plastic wrapped to avoid it taking on moisture prior to being laid. The timber should be fixed to the underlay board using a double fixing system which does not pierce the slab.

FINISHING

The unfinished but installed tongue & groove flooring should be left to acclimatise (without being covered by a sealer coat of polyurethane) for at least 3 weeks prior to sanding and coating with the heating turned on, to enable it to warm and dry to the appropriate moisture content. Once acclimatised, the flooring should be sanded, trowel filled, fine sanded then 3 coats of polyurethane applied. The total height of this system is approximately 2 mm adhesive, 12 mm underlay, 19 mm T&G, less 1 mm - 1.5 mm sand.