

## **INFORMATION SHEET**

*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 supply and installation company we can be contacted re the **supply of any specified product**. And, we would appreciate the opportunity of **quoting for your timber flooring work** NZ wide.*

## **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 T&G flooring direct to a heated subfloor. The presence of a 12mm underlay board provides some insulation for the T&G from the higher temperature of the slab and provides a means to fix the T&G to the floor without the mechanical fixing piercing the slab. Its 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 only is used to fix the underlay board to the slab.

The timber to be layed 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 2 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 max **SLAB** temperature (**not** room temperature or timber floor temperature) of 27 deg C. Ideally the slab temperature should sit around 24 or 25 deg C. For best 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 3-4mm in a 250mm 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 hotwater 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 12mm and 19mm 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 High Density Moisture Resistant Board (or 12mm Marine Grade Ply) is used as an underlay between the T&G and subfloor. For an even stronger system over concrete, or for over joists, a 19mm underlay can be used.

Cutting the underlay board into 400x400mm squares enables boards to sit flat on a slightly undulating subfloor without the need for mechanical fixing. An expansion space of 2-3mm must be left between the boards.

### **TONGUE & GROOVE**

19mm Hardwood T&G flooring is preferable to 12mm T&G as it will offer better performance and stability and allow for a stronger fixing system.

The wider the T&G board (eg 130mm rather than 85mm), 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 layed.

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 T&G flooring should be left to acclimatise (without being covered by a sealer coat of polyurethane) for at least 2 weeks prior to sanding & 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 moisture cured polyurethane applied.

The total height of this system is approximately 2mm adhesive, 12mm underlay, 19mm T&G, less 1mm - 1.5mm sand.

**“enduring timber flooring solutions”**