



**Australasian timber flooring association**

*Local professionals, world-class standards*

# Specification for Solid Timber Flooring Installation, Sanding and Coating

## Covering:

- Site sanded and coated solid T&G strip flooring
- Site sanded and coated parquetry flooring
- Prefinished solid T&G strip flooring

## ATFA reference materials

- Solid Timber Flooring – Industry Standard (2016)
- ATFA QA Records and Checklists for Solid Timber Flooring

## 1.0 General

### 1.1 Description

This specification covers the installation and sanding and coating (as applicable) of solid timber flooring including parquetry flooring. Included in the specification are product requirements, site evaluation, tolerance and building requirements, as well as details relating to the execution of the works.

### 1.2 Responsibilities

It is required to provide the flooring system to the subfloor as documented and as follows:

- Suitable for the intended installation site
- Adequately fixed to the subfloor
- Structurally adequate
- Sanded flat and smooth, and coated (other than pre-finished product)
- Performing without severe shrinkage or expansion movement.
- Of the appearance expected of the flooring and flooring system installed

### 1.3 Interpretation

#### T&G Solid flooring

Flooring with a tongue to one board edge and a groove to the other. End-match flooring additionally has a T&G profile to board ends. The tongue and groove fit together, enabling boards to join and align. Profiles may be 'standard', usually for top (face) nailing or a 'secret nail profile' for either top nailing or concealed fixing. Structural flooring for laying direct to joists or battens is a minimum of 19mm thick.

#### Prefinished solid timber flooring

This is T&G Solid Flooring where the boards have been factory pre-coated. The flooring is often manufactured 18mm thick and installed as an overlay floor.

#### Parquet

Block parquet is the main type manufactured in Australia with a common block size of 260mm x 65mm. However, larger parquet often with tongued and grooved edges and ends is also available, particularly in Oak. Mosaic finger parquet (small pieces adhered to a backing layer to form a tile) is now less common.

#### Moisture content

Flooring is generally supplied within the moisture content range of hardwood manufacturing standard AS 2796 and at an average moisture content of between 10 and 12%. For very large jobs in specific environments (e.g. art gallery), a different range may be specified. Note that imported timber flooring is often manufactured to a lower average moisture content.

#### Grade

Strip flooring and parquet is to be supplied to the specified AS 2796.2 grade, or a manufacturer's grade. The grade relates to the number and size of features in the flooring. A grade with less natural feature has a cleaner appearance and a grade with higher amounts of feature provides a floor with more character. Imported grading rules generally differ both in concept and board appearance, to that within the Australian grading standard.

#### Feature

Features are the natural characteristics of the wood including gum veins, past borer activity and knots present in the flooring.

#### Subfloor

The subfloor is the structural element that the flooring is fixed to. It includes joists, concrete slabs and sheet flooring of plywood and particleboard over which the flooring is installed.

#### Structural flooring

Floorboards installed direct to joists or battens need to have minimum thickness of 19mm and the joists and batten spacing permitted will depend on the species, grade, profile and fixing method of the flooring.

#### Overlay flooring

Overlay flooring is installed over a continuous structural subfloor (e.g. plywood to joists) and is often non-structural flooring (less than 19mm thick).

## Underlay

Underlay is a non-structural layer between the flooring and a continuous subfloor. It is often a foam for floating floors (and not applicable to solid timber floors), sheet (e.g. thinner plywood) or an acoustic sound absorbing product.

### Acoustic underlay

An underlay designed to provide a floor system with the required acoustic sound performance and is particularly important in multi-level apartments.

## 1.4 Reference materials

Practices, unless otherwise specified are to conform to Solid Timber Flooring Industry Standard (Version 3 – 2016) published by the Australasian Timber Flooring Association (ATFA) and manufacturer instructions. Note that product specific manufacturer instructions take precedence where appropriate and applicable. With regard to sanding and coating practices and requirements, they are generally to AS 4786.2 Timber Flooring - Sanding and finishing and updated practices as outlined in ATFA Solid Timber Flooring Industry Standard

## 1.5 Flooring quality assurance

Australian manufactured timber flooring should be supplied by an ATFA Accredited Timber Flooring manufacturer or otherwise provided with documentation indicating compliance to the requirements of AS 2796 – Timber – Hardwood - Sawn and milled products. Manufacturer records may be provided as documentation. Imported flooring should be provided with documented moisture content and cover width assessment from the supplier or at the time on installation by the installer.

## 1.6 Working conditions

At the time of floor installation:

- The space is to be fully enclosed, weathertight and secure.
- Wet trades work is to be mostly completed.
- The building should be as close as possible to expected in-service conditions.
- During sanding and coating access is to be limited at the discretion of the flooring contractor.

## 1.7 Tolerances and building requirements

**Subfloor flatness** – Flatness relates to undulations in the surface. Slab subfloors are to be made flat through grinding and adding levelling compound to achieve a flat surface required for the flooring system and products used. If not specified, slab flatness is not to exceed 3mm beneath a 3m straight edge. For floors installed direct to new sheet, batten or joist subfloors, the flatness is not to exceed 3mm under a 1.5 m straight edge.

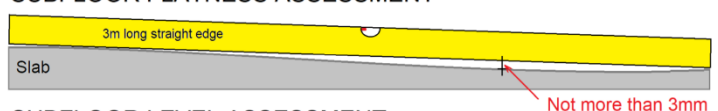
**Subfloor level** – Level relates the slope of the subfloor. The levelness of the subfloor in new buildings provided to a flooring contractor should not to exceed 4mm in 2m. If exceeded, then documented agreement needs to be reached on the laying of the floor over an out of level subfloor.

**Timber moisture content** - All Australian manufactured flooring on delivery shall be within the moisture content requirements of AS2796 and unless otherwise specified, at an average of between 10% and 12%. Imported flooring supplied to a lower moisture content range will need additional attention likely through acclimatisation or additional expansion allowance, in order for it to be suitable for laying. Any floor framing timber is to have moisture contents no greater than 14% at the time of floor installation. It shall be determined that any sheet flooring is dry (within 2% of the average flooring moisture content that is being installed).

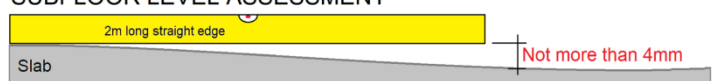
**Concrete moisture assessment** - A 'dry' slab is signified by impedance moisture meter readings of up to 2.0% and in-slab relative humidity (RH) up to 75%. Where floors have been covered by previous floor coverings values are often up to 3.5% and 80% in-slab RH. Higher readings require investigation as to possible moisture sources and may require more than the slab moisture protection outlined in this specification. Moisture assessment does not preclude the need for moisture vapour barrier assessment.

**Fire rating** – Where required, the flooring system is to comply with the Critical Radiant Flux and Smoke Development requirements of the National Construction Code (NCC) Spec C1.10 when

SUBFLOOR FLATNESS ASSESSMENT



SUBFLOOR LEVEL ASSESSMENT



tested to AS ISO 9239.1 - Reaction to fire tests for floor coverings - Determination of the burning behaviour using a radiant heat source

**Slip resistance** – Where required, the coated floor must comply with the slip resistance requirements of the NCC as outlined in AS 4663 – Slip resistance measurement of existing pedestrian surfaces and in line with AS handbook requirements.

## 2.0 Products and inspection

### 2.1 Products used in the installation

#### Flooring

Species - .....

Board width and thickness - .....or Parquet block size - .....

Grade - .....

Percentage of oversupply to cover wastage and spare product - .....

**Coating system** – The coating system to be used is as follows

Sealer.....

Top coats.....

Other system (e.g. applied oil or pre-finished solid) .....

The coating system if site applied should be to the coating manufacturer's instructions.

**Subfloor products** – When subfloor products (battens or sheet flooring) are to be installed, the sizing is to be in accordance with the ATFA Solid Timber Flooring Industry Standard. The subfloor product to be installed is:-

Product -..... Dimensions - .....

**Slab moisture vapour protection** – Slab moisture vapour protection shall be provided by one of two methods and as applicable to the flooring system. These being a 200 µm polyethylene plastic film or an applied moisture vapour retarding barrier to the manufacturers' requirements. No mixed system that voids a warranty shall be used.

**Levelling compound** – Levelling compound shall be compatible with other products used (e.g. primers) and be mixed and applied to the manufacturer's instructions. Note that exposed primer may be incompatible with the adhesive. When the flooring is direct adhesive fixed to the slab the levelling compound must have sufficient tensile strength for this fixing method. No mixed system that voids a warranty shall be used.

**Adhesives** – A polyurethane or polymer timber flooring adhesive is to be used that is compatible with the timber product and/or any underlay or moisture vapour barrier as applicable. No mixed system that voids a warranty shall be used.

**Mechanical floor fixings** – If not standard then this is as documented on the drawings.

**Acoustic underlay** – When acoustic underlay is to be installed, it shall be installed to the installation requirements of both the underlay and flooring product manufacturer. Acoustic performance, when the flooring system is installed correctly, is not the flooring contractor's responsibility. The acoustic underlay to be installed is:- .....

### 2.2 Inspection and records

#### Notice for inspection

This is to be provided at the following stages:

- Subfloor (concrete, sheet or timber) and any subfloor space to consider the contractor's assessment prior to floor installation.
- Delivered flooring prior to installation to confirm moisture contents, profile tolerances and grade.
- Prior to laying to consider intermediate expansion allowance and colour distribution.
- Expansion allowance at the floor perimeter and vertical surfaces before fitting skirting and where intermediate expansion allowance.
- Completed installation before sanding.

- Completed floor after sanding and coating and to undertake slip resistance testing or acoustic testing if required.

**QA records** – Records are to be maintained and provided throughout all stages of the project including both measurement and testing results as well as the products used. This is to be in accordance with ‘ATFA QA Records and Checklists for Solid Timber Flooring’ or an approved alternative.

## 3.0 Execution

### 3.1 Floor system

The floor system shall be generally as outlined in ATFA Solid Timber Flooring Industry Standard and to the details provided on the drawings. Indicate the general system below.

**Top (face) nailed floor system**

to joists  to battens  through a sheet or existing timber floor to joists

**Secret fixing with timber joist framing floor system**

to joists  to a sheet or timber subfloor on joists

**Secret fixing over a concrete slab floor system**

to a sheet subfloor  to timber battens

**Adhesive pattern between flooring and subfloor**

Full trowel bed  beads

**Subfloor**

plywood - 12mm thick  or 15mm thick  particleboard

battens - minimum 19x60mm high density hardwood

- minimum 35x70mm medium density hardwood or softwood

existing timber floor

**Alternate system** – as specified on drawing and/or accompanying documentation

### 3.2 Handling and storage

Transportation and storage practices – Timber flooring is to be transported to site and stored prior to laying in such a manner that board moisture contents are not adversely affected.

### 3.3 Locality and site evaluation

**Locality** – The locality shall be assessed for expected seasonal relative humidity levels and variations, with consideration also given to the expected average in-service floor moisture content in that locality.

**Building external environment** – The localised building environment shall be assessed for its expected effect on in-service moisture content (e.g. moist gully).

**Building internal environment** – The potential effects of heating and cooling systems and influences from the large glassed windows are to be assessed.

**Installation environment** – The internal environment at the time of laying is to be suitable for installation (building enclosed and weathertight, intense sunlight screened, wet trades mainly complete etc.).

**Acclimatisation and expansion allowance** – If necessary, ensure provision has been made for appropriate acclimatisation and that appropriate expansion allowance has been included, particularly in warm humid to hot humid climates. This is achieved through assessment of the expected in-service moisture content (by considering the above environmental influences) and the estimated moisture content of the flooring at the time of installation.

### 3.4 Subfloor assessment and preparation

**Subfloors** – All subfloors are to be assessed for those aspects that could affect the installation and ongoing performance and appearance of the floor. Any areas of concern require addressing by the relevant party before proceeding.

**Slab subfloors** – Slabs shall be sufficiently dry and flat prior to floor installation. For flooring incorporating adhesive fixing or when an applied moisture vapour retarding barrier is used, the slab must have sufficient integrity and cleanliness. Refer section 1.7.

**Slab flatness** – Where the required slab tolerances are not present, the slab shall be made sufficiently flat through grinding and/or use of a suitable levelling compound, to meet the requirements of the flooring system specified. Refer section 1.7.

**Slab moisture vapour protection** – Slab moisture vapour protection, as applicable to the flooring system, shall be provided by either a 200 µm polyethylene plastic barrier or an applied moisture vapour barrier to the manufacturers' requirements.

**Timber and sheet subfloors** – Timber and sheet subfloors need to be sufficiently dry, flat, level and clean, as applicable to suite the flooring system used. Refer section 1.7.

**Floors over enclosed subfloor spaces** – Floors installed over subfloor spaces require the ground beneath to be dry and to remain dry after floor installation. If such conditions are not likely, further assessment and measures may be necessary and need to be implemented before floor installation. This can include sealed drainage systems at the perimeter of and beneath the building, and soil membranes beneath the building (e.g. 200µm builder plastic).

**Ventilation of enclosed subfloor spaces** – Ventilation requirements need to meet National Construction Code (NCC) requirements, however note that increased cross flow ventilation of 7500mm<sup>2</sup>/m length of wall is to be provided, as outlined in Solid Timber Flooring Industry Standard section 2.5. Cross flow ventilation is necessary. If ventilation requirements cannot be provided further assessment and measures, can be necessary, including use of mechanical ventilation systems.

### 3.5 Subfloor, underlay and flooring installation

Installation shall be to manufacturer instructions and ATFA Solid Timber Flooring Industry Standard (Version 3 – 2016).

**Subfloor products** – Where subfloor products (battens or sheet flooring) are to be installed or have been installed, the fixing is to be in accordance with the ATFA Solid Timber Flooring Industry Standard section 3.0. Note that with higher density flooring in moderate to high humidity localities, sheet subfloors to joists need screw fixing. This is in addition to nailed and glued fixed sheet subfloors that have been correctly installed.

**Underlays** – When an acoustic underlay is to be installed it shall be installed to the acoustic manufacturer's requirements, to a system accepted by the flooring manufacturer and in line with recognised practices for acoustic floor installation. When a plywood underlay is to be provided over an existing timber floor it is to be fixed in accordance with the ATFA Solid Timber Flooring Industry Standard section 3.6.4.

**Allowance for expansion** – Due allowance for expansion shall be provided and is dependent on the product and installation environment. Expansion allowance shall be provided as specified in ATFA Solid Timber Flooring Industry Standard, section 3.0 for site sanded solid timber flooring, section 4.0 for flooring direct to slabs, section 5.0 for parquetry and section 6.0 for prefinished solid strip flooring.

**General floor installation practice** – Where strip flooring is top (face) nailed, it is to be undertaken uniformly with respect to edge distances and alignment. When direct to joists, boards are to be mainly supported on at least three joists. When laying over sheet flooring or an existing floor, strip flooring is to be staggered to provide the appearance of a floor installed on joists (end joints a minimum of 300 to 450mm apart) and joints are not to cluster or align. Additional care is needed with prefinished solid flooring that is often provided as nested set length boards, to avoid regular patterns. Consideration is also to be given to how the boards will be distributed in the floor in terms of length, grade, feature and colour. The fixing method used needs to minimise gaps at board edges on installation. Note also that with both site sanded and pre-finished secretly fixed strip flooring, a limited amount of top nailing will likely be necessary with this generally occur near walls, and with nail holes subsequently filled.

**Floor board fixing** – Boards are to be fixed in place as specified in ATFA Solid Timber Flooring Industry Standard, section 3.0 for site sanded solid timber flooring, section 4.0 for flooring direct to slabs, section 5.0 for parquetry and section 6.0 for prefinished solid strip flooring.

### 3.6 Sanding and coating

Where the floor requires sanding and coating to complete, it shall be as outlined in ATFA Solid Timber Flooring Industry Standard and to AS 4786.2 Timber Flooring - Sanding and finishing.

**Access to the floor** – During the process of sanding and coating and through to adequate curing, access to the work area will be restricted or denied at the discretion of the flooring contractor. The flooring contractor is to inform parties.

**Assessing the floor prior to sanding** – Prior to sanding the condition of the floor is to be assessed to ensure that it is in a condition suitable for sanding. Any areas of concern require addressing by the relevant party before proceeding. Assessment shall include the overall condition of the floor and may include moisture assessment.

**Preparation for sanding** – Preparation is to include where applicable, filing of nail holes, cleaning, dust minimisation and protection.

**Sanding** – The sanding process is to provide a flat surface suitable for the specified coating system to be applied over and conducive to minimal coating and appearance imperfections.

**Coating** – The specified coating system is to be applied with due care to achieve the expected appearance in line with the specified system.

**Completion** – When the floor is completed, the acceptability of the final appearance will be assessed. Refer to 2.2. A commercially acceptable floor is to be achieved. This is a floor that presents well but which may contain some sanding and coating imperfections. Note that additional work such as the fitting of skirtings etc often occurs after this.

**Ongoing care** – Appropriate information is to be provided in terms of floor care and maintenance.