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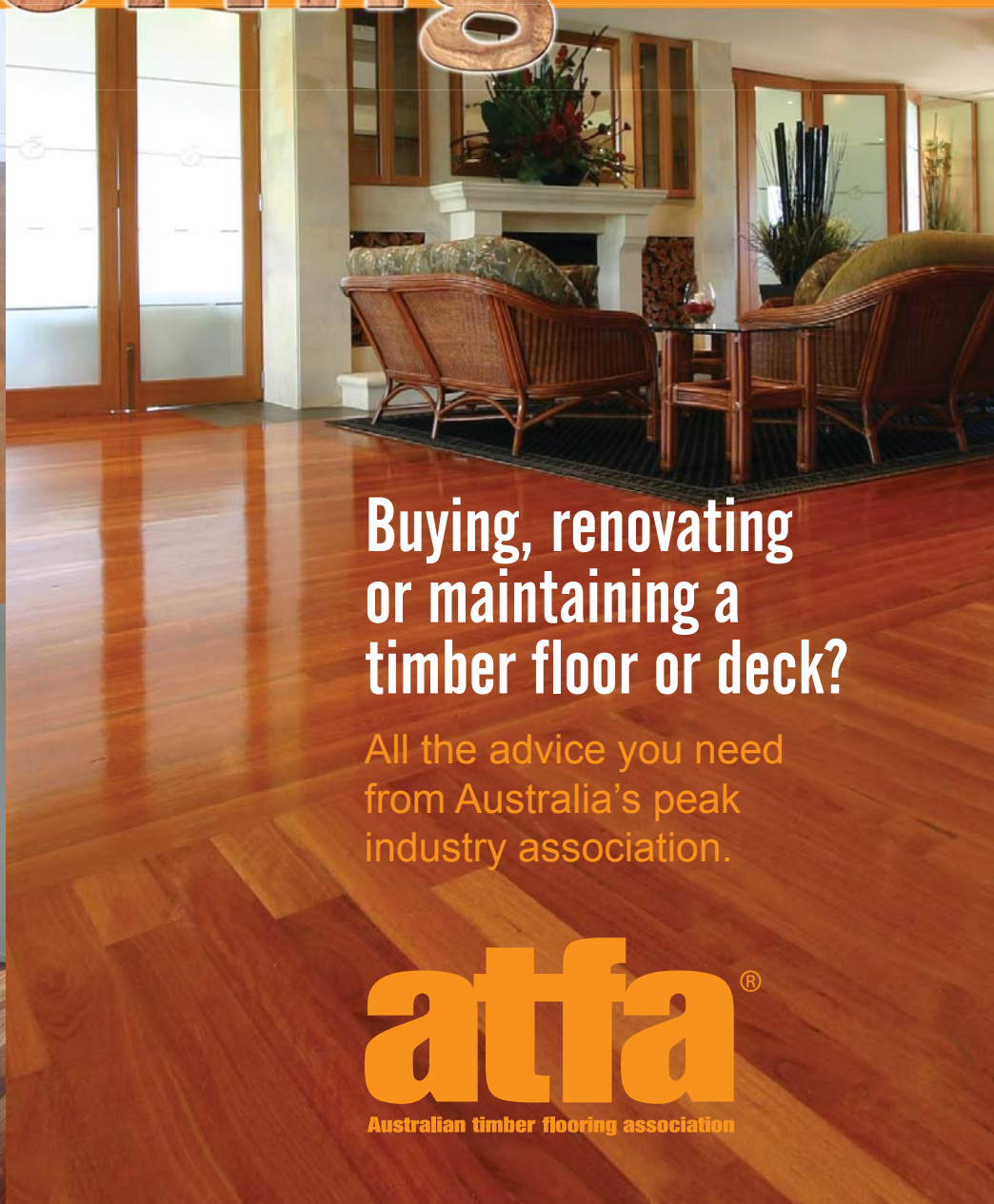
e-book

Consumer Guide to Timber Flooring



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Consumer Guide to Timber Flooring
Version 1 – September 2010

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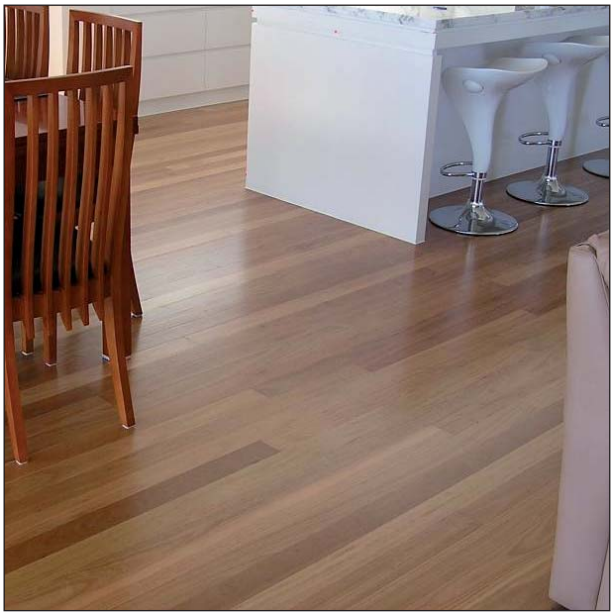
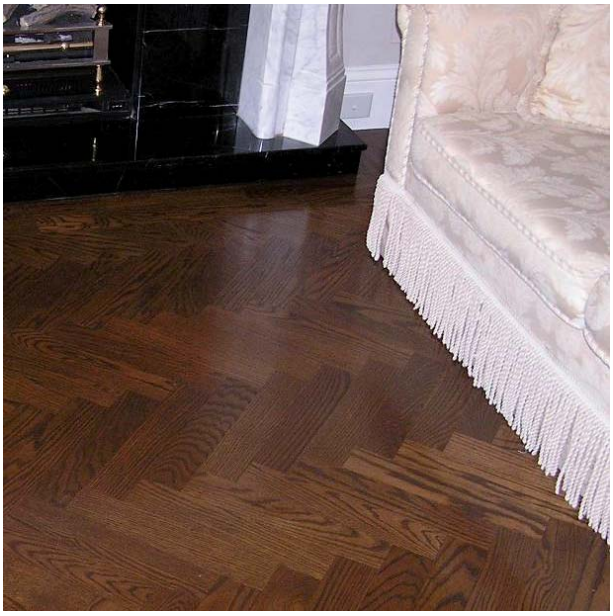
Why choose a timber floor?

Timber flooring is sometimes considered a more expensive option than other floor finishes. However, there are many long term and intrinsic benefits to timber which outweigh the initial additional cost:



Solid timber flooring

- Good quality timber floors last for decades. A timber floor of standard thickness (19mm) has a service life of approximately 100 years. The largest competitor to timber flooring – carpet – is regarded as having a service life of approximately 10 – 15 years due to the accumulation of stains, holes or shabbiness from everyday wear and tear. With a minimal maintenance program, timber floors will not only last longer but actually look better as the years go by.
- Timber floors are easier to clean than carpets. A simple brush or light vacuum keeps timber floors looking great. If household pets or children have dragged mud through the house a damp mop removes the grime with ease. At a comparable age, carpets will typically exhibit more wear and tear, and take progressively longer to maintain.
- Timber floors are more hygienic than carpets. Nearly 100,000 dust mites can live in one square yard of carpet according to US research. Allergen producing dust mites, fleas or dust can adversely affect allergy and asthma sufferers, a problem which timber floors eliminate. Carpets can also trap unpleasant odours from domestic animals or spilt substances.
- If after a few years a timber floor has become scratched or been subject to heavy wear and tear, a simple sand and seal can bring it back to new again – and at a lot less than the cost of a new carpet.
- One of the most important advantages of a hardwood floor is the timeless character of timber. Carpet, linoleum, tile patterns and colours go in and out of fashion – just consider what was in vogue in the 70s and 80s. Timber has an enduring appeal that has lasted centuries and is more popular now than ever – it will run alongside personal shifts in taste and furnishings, be they classic, retro or contemporary.
- Timber floors are often considered to be an option only available to those with large budgets. Modern production methods mean that certain types of timber flooring can now be produced cost effectively and enable timber floors to be an option for all budgets.
- Stone and tile floors although as hygienic and easy to maintain as wood, do not have the same warmth and feel of timber floors. Nor do they hold the same



Oak parquetry

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attractiveness if it comes to resale of a home. A study by ATFA of Real Estate agents has established that houses with timber floors sell more easily and at a better price compared to houses with other floor finishes.

- Despite many misconceptions, timber floors also carry superior environmental credentials over the rest. Timber actually stores carbon and will continue to do so for its life as a floor. Timber flooring produces five times less carbon emissions than ceramic tiles (source: CRC for Greenhouse Accounting).

While some timber flooring options may be more expensive upfront, they carry more additional benefits than the other options, and with minimal maintenance, will look better for longer and be more economical in the long term.

This book aims to provide you with enough knowledge to ask the right questions of your timber flooring contractor, give you ideas on the possibilities and various options available for your home, and ultimately weigh up whether a timber floor is for you.

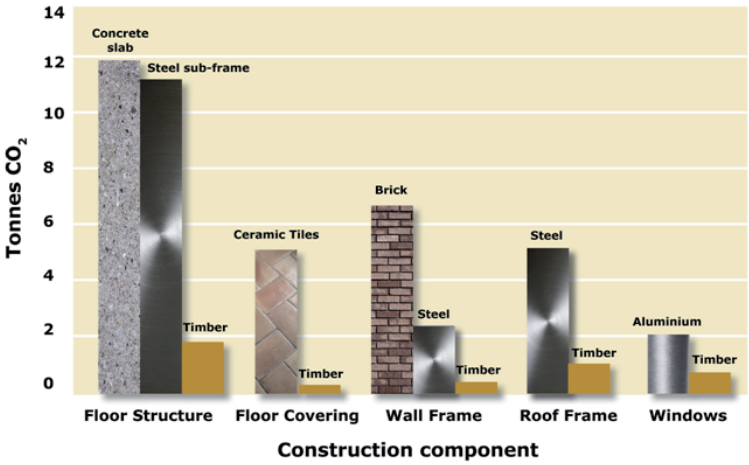
If at the end of reading you have additional questions, feel free to call ATFA and we'll be happy to help you further. If on the other hand, you would like to pursue getting a timber floor, visit the ATFA website www.atfa.com.au and our 'Find a Member' section to secure a local contractor.

Environmental credentials for timber flooring

Timber floors actually sequester (store) carbon. Up to 50 per cent of the weight of dried timber is carbon that has been absorbed from the atmosphere by the tree as its growing. Lowering the amount of carbon dioxide in the atmosphere is one of the most important things we can do to reduce the damage associated with climate change.

According to the Cooperative Research Centre for Greenhouse Accounting (2007), the carbon footprint of a framed structure for a timber floor is approximately 10 times less than a concrete slab or steel sub frame. Similarly, the carbon footprint of a timber floor surface is five times less than a ceramic tile floor. This is in addition to the fact that in 2005, Australian forestry was measured as being the only carbon positive industry in Australia.

Greenhouse gas emissions in the manufacture of building materials used in the average family home



Cooperative Research Centre for Greenhouse Accounting (2007).

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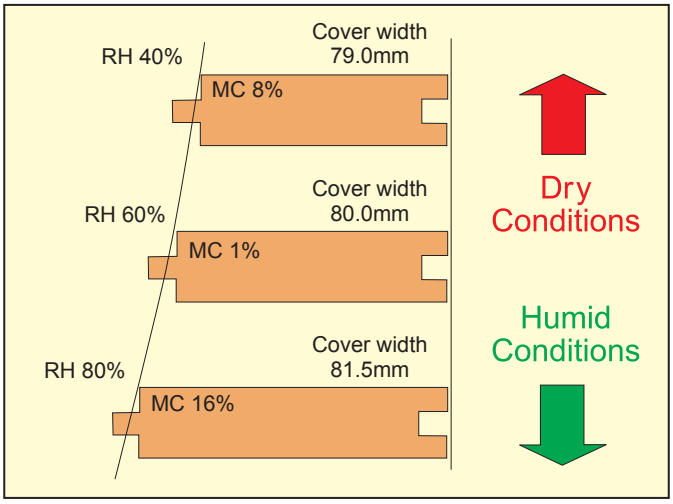
Understanding the basics – natural expansion and contraction of timber

Prior to discussing timber flooring products, it is important to have an understanding of the relationship between timber, humidity in the surrounding air and the dimensional changes that occur as a result of changes in humidity.

During weather conditions of consistently high humidity, timber will absorb moisture from the surrounding air causing it to swell or increase in size. Conversely, during drier times when humidity is low, timber will shrink, reducing in size. Timber flooring, if not placed in a permanently controlled environment, will always move in response to changing environmental conditions.



RH = Relative Humidity MC = Moisture Content
Cover width variation with changing relative humidity

In solid timber flooring, gaps between individual boards will occur as the floor shrinks in dry weather. Similarly, during either persistent wet weather or times of the year of naturally high humidity, solid timber floors will tend to be tighter and show fewer and smaller gaps.

Other flooring products such as parquetry, engineered and laminate flooring exhibit less seasonal movement than solid timber flooring products, however, even with these products some movement is experienced and needs to be accommodated in the installation process.

Timber decks experience greater movement due to firsthand exposure to the weather. It is why decking always has gaps between the boards and why tongue and groove flooring is not used externally.

Ultimately consumers should understand that as a natural product, timber will continue to respond to its environment throughout its life.

In wet humid conditions floors expand

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Understanding your own home environment

Because timber is a natural product, and for the reasons outlined previously will react to its environment, it's critical to speak with your contractor ahead of any installation and discuss the unique conditions of your home environment. The following key questions should be considered as part of that initial conversation:

Seaside locality

Is your home in a high humidity area?

- In areas of high humidity such as the tropics, or close to bodies of water, the atmospheric humidity in the air causes the floor to take up additional moisture. As such, care is needed to install timber flooring. This may necessitate acclimatisation depending on the product and additional expansion allowance may be needed. It is not an option to instruct an installer that you do not want expansion allowance.

Is your home situated in thick bushland, lush farmland or surrounded by dense gardens?

- As with the previous point, dense bush, gardens or even thick grasses directly around a home may attract more moisture in or under your floor, particularly if watering systems are being used. As such, additional care may be required to protect your floor from greater moisture uptake – just what this involves for your location needs to be discussed with your contractor.

Do you have underfloor heating?

- If your home has underfloor heating or in-slab heating, special considerations must be followed for the installation of a timber floor and it may impact on the types of timber flooring and related products that are suitable. Ensure the flooring contractor is well experienced with the installation of flooring over heated floors.

Do heating systems, refrigerative air conditioning and evaporative coolers alter the conditions in your home?

- Any of these products can have an adverse effect on your floor if they are used for extended periods. You must advise the flooring contractor of your normal usage habits when choosing your timber floor and ahead of installation as these will dictate the product's suitability and installation method.

Do you have a concrete slab home or joist construction home with ground beneath?

- Timber floors are commonly laid in both circumstances, however, the build of your home will determine what preparation needs to occur prior to installation of the floor. A slab may need to be protected with a plastic moisture barrier or applied moisture vapour barrier. With joist construction, protection from ground moisture may be necessary. Note that floors are not to be laid over wet sub-floor conditions.

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Do you have large expansive windows or skylights that face the sun for extended periods?

- If a timber floor is constantly in direct sunlight this may cause unwanted shrinkage and even some cupping. All efforts should be made to protect timber floors from harsh direct sunlight using window coverings, window tinting or other shade methods.

Is your home in an area which experiences high winds?

- If your home is in an area of constant high winds, it may have a drying effect on your timber floor and could cause excess shrinkage. Your flooring contractor should take this into account, though be sure to advise the contractor of the issue as it may not be noticable on the day they visit.

Does rain/storm water ever collect around your home or lie under it for days at a time?

- As with earlier points, if water resulting from heavy rains or storms sits around or under your home, your floor may be vulnerable to moisture uptake. Suitable precautions should be taken to counteract this with additional moisture controls and improving drainage.

Does your home have suitable ventilation and drainage?

- Airflow under and/or around a timber floor is essential, normally brick homes have suitable ventilation slots around the brickwork, but its important to ensure these have not been filled in over the years or become overgrown by garden beds. Preferably water should not be present beneath a dwelling at any time. Drainage is also essential to ensure water is not trapped around or under your home.

Key tips

Using the points above:

- Look objectively inside and outside your home at the environmental conditions that your timber floor will be subjected to. Write these down along with the typical weather conditions your floor will endure throughout the seasons – not just the weather you have this week. Be clear on what your expectations and usage of the floor will be.
- Provide all this information to your contractor upfront as part of your initial discussion. It will help to ensure you have a targeted conversation around your circumstances and needs, make an informed choice and ensure that installation takes into account all the likely conditions.

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What you need to consider in choosing a timber floor for your home

Once you have ascertained the environmental conditions for the floor, you will need to consider the look of the floor. This is not as simple as picking a timber species, it involves five key and interrelated points:

1. Flooring product
2. Board colour/ species of the timber
3. Grade/ feature content of the timber
4. Hardness rating of the timber
5. Selection of board width

Solid timber flooring

1. Selecting your 'flooring product'

There are several types of 'timber flooring product' each of which have their own characteristics and attributes. The main options are:

- Solid strip timber flooring
- Engineered flooring
- Prefinished solid
- Parquetry

There are also a series of related products, namely:

- Laminate flooring
- Cork
- Bamboo

The following section provides guidance on the various flooring options, their characteristics and application.

Timber Flooring

Solid strip timber flooring (sometimes referred to as 'tongue and groove') is fixed to sheet subfloors of particleboard or plywood over joists or battens or direct onto a concrete slab. The traditional timber floor is renowned for its strength, durability and character. Throughout its life, solid strip timber flooring can be rejuvenated to near new condition by sanding and re-finishing. It is ideal for new houses or to match existing floors in renovations and can be top (face) nailed, secretly fixed or glued to concrete slabs.

Engineered flooring is manufactured with a decorative layer of timber bonded over layers of other timber beneath. This not only provides some additional stability but also maintains all the appearance and characteristics associated with solid timber flooring.

Engineered flooring

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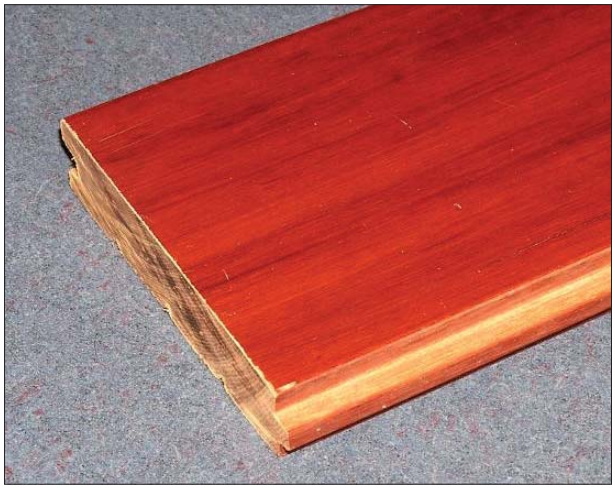
Some engineered floors are pre-finished[1] while others are designed to be sanded and finished after installation. Engineered floors may be laid as floating floors[2], glued to a sub-floor as an overlay and in some cases fixed as a structural floor. Pre-finished engineered floors are ready to walk on once installed.

Prefinished solid timber floors combine natural solid timber flooring with a factory finish. Similar to engineered products there is no sanding and finishing after installation. Boards may be square edged or may be arrised[3] to a fine rounded edge. Prefinished solid timber floors are usually installed as an overlay floor.[4]



Prefinished

Parquetry comes in two forms, block parquetry and the mosaic parquetry sheet. Parquetry provides many options of combining block orientation, size and species to transform floors into an outstanding feature. They can be laid to various sub-floors and similar to strip timber floors, can easily be rejuvenated throughout their life.

Parquetry

Related Products

Laminate flooring typically consists of a timber look finish comprising high density fibreboard, topped with a faux timber-look film. Laminate floors can be laid over most surfaces utilising an underlay and in most instances can be as quick to lay as a floating floor.

Cork tiles provide a different look to timber boards or parquetry by utilising natural cork in tile form which is then adhered directly to a sub-floor or level underlay. Cork as with timber is lightly sanded and finished to provide a natural looking highly durable surface that is soft underfoot.

Laminate

[1] Prefinished – flooring products already coated and ready to lay when they arrive at site.
[2] Floating floor – a floor that is not nailed or glued to the joists or slab beneath. Rather it floats freely on an underlay of rubber or similar.
[3] Arrised – a process which takes off or smoothes the sharp board edges.
[4] Overlay floor – any timber floor that goes over a sub-floor/substrate or direct to a concrete slab.

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Bamboo is a grass as opposed to a timber. In many respects it acts similar to solid timber floors. Some flooring is manufactured to provide an even appearance while other products are of laminated construction and can provide a greater blend of colours. The flooring is pre-finished and is generally adhesive fixed to the sub-floor.

Bamboo flooring

2. Selecting your board colour/ species of timber

The choice of species influences the colour of a floor

The many timber species used in timber floors provide you with a rich array of colours and grain patterns to choose from. In some species, the natural colours will be fairly consistent while others can involve a blend of several colours and tones. This is particularly the case where the sapwood (the outer layer of timber beneath the bark) is often much lighter in colour than the heartwood. Even within a single species and within individual trees, large colour variations of the heartwood can occur. In addition, the age of the tree also has a significant bearing on the colour with timber from younger trees often being lighter in colour than more mature trees.

When choosing a timber species you therefore need to consider the following:

- Are you looking for a timber species or a timber colour? If you are more concerned with colour then ensure that you are accepting of the colour variations that may occur in that species. You may instead wish to consider another similar coloured species which is more consistent or whether mixed species of similar colour are available and would be more suited to the look you are seeking.
- Photos in magazines or off computer screens will not give you a realistic representation of species colour. Even a sample flooring board provides just one representation of the colour in that species. Due to this, larger panels in showrooms should be viewed although even these are unlikely to be able to cover the full range of potential colour variation.

Colour variation in Spotted Gum

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- If you like the colours in a species from one supplier, should you expect that the colours in that species will be the same from another supplier? No, there is no assurance that this will be the case due to differences in growing region and tree age.

It is important to remember that when choosing a timber floor, no matter how large the showroom sample is that you have seen, it is only indicative of the species colour and natural variation that may be expected. Remember, you are choosing a natural product where each tree is unique and forms an intrinsic part of its beauty and character.

Australia is blessed with many colour variations and characteristics in its timbers, however, depending on harvesting schedules and milling, not all types are always available – be sure to check with your timber flooring professional to find out what's available and the price variations.

Australian species you can choose from for solid, prefinished, parquetry and engineered timber floors may include:

Victoria, Southern NSW and Tasmania

Blackwood	light golden to deep brown, moderately hard
Messmate	pale straw to light brown, moderate to hard
Tasmanian Oak	a species mix of pale straw to light brown, moderate to hard
Victorian Ash	a species mix of pale pink to yellow brown, moderate to hard
Yellow Stringybark	even yellow brown, hard
Manna Gum	pale straw pinks, moderately hard

Queensland and Northern NSW

Blackbutt	golden yellow to pale brown, very hard
Brush box	even mid red-brown, hard
Grey Ironbark	dark brown or dark red brown, very hard
Red Ironbark	dark brown or dark red brown, very hard
Rose Gum	straw pink to light red-brown, hard
Spotted Gum	brown to dark brown, very hard
Sydney Blue Gum	straw pink to light red-brown, hard
Tallowwood	greyish yellow to olive green, hard

Western Australia

Jarrah	rich reddish browns to soft salmon pinks, hard
Karri	rich reddish browns to pale pinks, hard
Marri	pale brown with lighter sapwood, hard

Bamboo's natural colour is present in laminated products and some stained products may also be available.

The strand woven, horizontal and vertical products are available in coffee and natural colours and can be mixed for a striking appearance.

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3. Selecting the grade/ feature content of the timber

In addition to the colour of the timber, your choice of grade will also influence the character of a floor.

Grading rules do not cover colour or colour variation but significantly influence the appearance of timber, with some grades including more of the character of the tree's history with larger gum veins, knots and other features present.

In other grades, the cleaner natural lines and figure of the timber will dominate with fewer and smaller features present.

When deciding on a timber grade ensure that you consider the following:

- All trees contain natural features such as gum veins, knots and past borer activity. For many species these features add to the character and charm of the floor so when choosing a grade, you are simply deciding on how much feature you desire.
- The grade has no influence on a floor's fitness for purpose in terms of its manufactured moisture content range or machining tolerance. These aspects are the same for each grade.
- All grades permit some feature and even though it may be named 'Select Grade' some gum veins, knots and past borer activity is permitted.
- How the boards are mixed into the floor both in terms of colour and feature is up to the installer, so if you have any specific views on this, make sure you discuss these with your installer prior to installation.
- Because different features tend to dominate different species, two floors of the same grade may appear quite different.
- There are grade names associated with Australian Standards grading rules. In other instances, flooring manufacturers may have their own grades and grade names. Because a manufacturer's grade of timber may not be exactly the same as that in an Australian Standard, be absolutely sure from the outset what grade you are getting.

If choosing an alternative species from the one originally considered, not only will the overall colour differ but the dominant type of feature may also change. It is important to work closely with your supplier and installer so that they are absolutely clear about the look that you desire.

Solid timber Australian Standard Hardwood Grades (AS 2976)

Blackbutt – Select Grade

Blackbutt – Medium Feature/ Standard Grade

Blackbutt – High Feature Grade

Select Grade — Contains features of a limited number and size. The features may include gum veins, past borer activity and small knots. The effect in a floor is that features are observable but they do not dominate the overall appearance.

Medium Feature / Standard Grade — The number, type and size of features present is greater than for Select Grade and the effect on the character of the floor is in many instances much more dominant. Gum veins that are present may extend across the face of the board, greater natural discolouration is also present. Knots and past borer activity can also be more pronounced. Such features add to the character of the floor. It should, however, be noted that the features present and resulting character is very much dependent on the species chosen.

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High Feature Grade — Boards with a high degree of feature are permitted in this grade and this can add a lot of character to the floor creating a more rustic look. The number and size of features included are greater than for Medium Feature/ Standard Grade but again the choice of species will have an overriding influence on the character present.

Solid timber Australian Standard Softwood Grades (AS 4785 and AS1810 for Cypress)

The standard AS 4785 includes a range of softwoods, although some softwoods have their own industry grading rules. Cypress, although a softwood, differs in nature to many of the other softwoods and has its own grading standard. Cypress flooring has a predominance of knots whereas in other softwoods both knotty and clearer grades can generally be obtained.

4. Selecting the hardness of solid timber, prefinished and engineered floors

Hardness indicates a specie's resistance to indentation. Damage to timber floors may occur due to continual movement of furniture, heavy foot traffic and in particular "stiletto-heel" type pressure. The selection of a hard timber species ensures improved resistance to indentation and abrasion. Soft timber species, if used in feature floors, can be expected to indent.

Floor finishes will not significantly improve the hardness of timber flooring. In some species the hardness of younger growth material can also be much lower than mature timber of the same species, but this varies from species to species.

Softwood floors are more prone to indentation as are moderately dense hardwoods. The higher density hardwoods are less prone to indentation. If using timbers that are less hard, soft footware will prevent damage from foot traffic.

The Janka hardness rating is used to measure the hardness of a timber. The lower the hardness rating, the softer the timber. Most commercially available flooring species ranges from around 3 to 15.

Hardness figures are often published in data relating to flooring and either specific Janka hardness figures are provided or hardness is categorized based on the Janka values. The classification used in the Australian Hardwood and Cypress Manual is as follows:

Janka Rating	Hardness category
< 5.5	Soft
5.5 to 7	Moderately hard
7 to 10	Hard
> 10	Very hard

The following Australian species fall into these categories:

Blackwood	moderately hard
Messmate	moderately hard
Tasmanian Oak	moderately hard
Victorian Ash	moderately hard
Yellow Stringybark	hard
Blackbutt	very hard
Brush Box	hard
Grey Ironbark	very hard
Manna Gum	moderately hard
Red Ironbark	very hard
Rose Gum	hard
Spotted Gum	very hard
Sydney Blue Gum	hard
Tallowwood	hard
Jarrah	hard
Karri	hard
Marri	hard
Cypress moderately	hard
Bamboo	(an imported grass species) moderately hard to very hard (strandwoven).

Please Note:
Hardness is just one criteria and many of the other criteria are often more important. Moderately hard and above are well suited to domestic floors. Soft is also fine if greater propensity to indentation is not a concern.

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5. Selecting the board widths of solid timber, prefinished and engineered floors

In recent years wider profile boards have increased in popularity, although the standard width of 80 to 85mm remains popular. Over time, many methods of board fixing have been developed ranging from traditional top nail fixing to secret nailing – but it's important to remember the greater the width of the board, the greater the pressure on fixings (whether nail or adhesive) and this will need to be factored in when selecting the overall appearance.

Solid timber board widths over 85mm and up to 135mm can be secret nailed[5], though its recommended that a full bed adhesive is used in conjunction with this method. Board widths over 135mm should generally be top nailed to accommodate increased movement.

Parquetry can be provided in a range of sizes and many patterns can be developed. Sizes range from the smaller finger parquetry, through to blocks and wider longer sections.

With engineered flooring, the pieces laid may have between 1 and 3 strips of lamella[6] side by side on the board to be laid. This then gives the appearance in the floor of narrower or wider boards. Board widths with a single strip lamella up to about 180 mm wide can be achieved.

Board widths of related products

When considering products such as laminate flooring, the appearance of board width is often similar to that of engineered flooring as outlined above. Bamboo flooring is generally available in product widths of around 90mm and 130mm. Actual sizes differ between manufacturer and joining system.

Board widths of decking

Due to greater movement from weather exposure, board widths for decking are generally about 90mm wide. Some wider material is also available, though when using the standard 19mm thickness in the wider boards, they can be prone to greater cupping.

[6] Secret nailing – timber flooring nailed at an angle above the floorboard tongue so not visible when the floor is complete.
[7] Lamella – a thicker layer of veneer (the top layer of the selected species) that is exposed to view in a completed engineered floor.

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Protecting the timber flooring prior to installation

Selecting and purchasing the timber flooring is one aspect, the other considerations are its transport, delivery, onsite storage and the need (or not) for acclimatisation prior to installation will would be assessed by your floor installer.

Laminated, cork, engineered flooring and bamboo are usually pre-produced and supplied direct packed in boxes for convenient carrying.

For the solid timber products the following considerations should be taken into account:

Transport

Where possible, try to ensure your flooring is delivered in dry conditions as it is important that the flooring product does not get wet.

Delivery

When delivered to your site, flooring must be stored in dry undercover storage.

Storage

If your flooring needs to be kept on site for any length of time (more than 2 days for example), it needs to be kept in a well ventilated area and the possible effects of slab moisture or moist condition beneath must be avoided (a hot garage or shed with no ventilation or insulation is not suitable).

Acclimatisation

The need to acclimatise internal flooring will be decided by the floor installer. The installer will take into consideration the product being used, manufacturer supplied moisture content of the flooring, the locality where the floor is being installed, any current or future heating or cooling systems and most importantly the current weather conditions. If the flooring is to be acclimatised then it needs to be stacked in layers to enable air movement past both surfaces of each board. Acclimatisation periods of two weeks are common but can be longer.

Flooring acclimatising

Pack Variation

Packs of timber flooring and related products will often contain a range of lengths from short to long and depending on the species, may also contain considerable colour variation. Your flooring contractor will blend in the varying lengths as well as any colour variations into the overall floor.

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Methods of installing your timber floor

Several options exist for the installation of an internal timber floor.

Your contractor should discuss the following options with you to identify the method that best suits your use and preferences, your budget and the property's structure:

- Direct stick to concrete slabs
- On ply or particleboard
- Over joists
- On battens
- Floating floors
- Over other surfaces (tiles or an existing timber floor)

Direct stick to concrete slabs

This method has been used for many years with parquetry. It's also used with solid timber flooring and is becoming more commonly used with engineered flooring and bamboo. It is considered more cost effective than other methods, although due to greater requirements in assessing the concrete slab, it is more difficult and should be done by professional installers.

Direct stick to slab

The method requires the concrete slab to be relatively even, as unevenness (highs and lows) in the slab will show in the final floor and potentially cause other difficulties. Therefore concrete grinding or levelling may be necessary to make sure the slab is sufficiently level.

An applied moisture vapour barrier[7] is also recommended. While not always required, a moisture barrier offers good insurance against the moisture found in concrete slabs, which if too high, can cause problems for the timber floor. Be aware that a moisture barrier is not totally waterproof, rather it prevents vapour transmission, which is ultimately what will react with the timber. If you choose a Bamboo floor, it is recommended that two applications of moisture vapour barrier be applied.

Following the application of the moisture vapour barrier, the flooring product is then laid using a full bed adhesive and may be weighted, temporarily nailed or permanently nailed to the slab to assist in good bonding of the boards to the slab.

[7] Moisture barriers come in two forms: strong plastic sheeting and an applied coating. Their purpose is to reduce to an acceptable level, the transmission of vapor from the concrete slab to the flooring product.

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On structural plywood or particleboard

Plywood can be utilised as a substrate[8] over concrete or tiles and both structural plywood and particleboard are used as sub-floors[9] on joists. This enables any timber or related flooring product to be installed on top. Substrates or sub-floors provide a better laying environment and an extra layer of protection from moisture uptake.

In the case of installation over concrete, a plastic sheet moisture barrier is recommended or alternatively an applied moisture vapour barrier may be used.

In the case of floor joists, the plywood or particleboard is glued and either nailed or screwed to the joists. Where there is space under the joists, suitable ventilation and drainage are necessary and the ground beneath must be dry. If ventilation is limited, plastic sheeting can also be used as a ground moisture barrier.

Cork expansion joint

Installation of the flooring product is then laid using beads or a full bed adhesive and either secretly fixed or top nailed depending on product width and the desired look.

Expansion allowance is required around the perimeter of the floor and with wider floors (usually exceeding 6 metres), intermediate expansion allowance is also required.

Over joists

Installation direct to joists requires a structural floor and in some states, requires the installer to be licensed. This is the more traditional method generally used with solid timber flooring and is being performed less and less – the preference being for overlay floors. Solid timber flooring comes in mixed lengths with smaller lengths no shorter than 900mm so they can be supported by two joists. Flooring is generally end-matched[10] which enables the boards to be joined at any point on the floor, not just over joists.

Floor fixed to joists

Installation of the flooring product is laid using adhesive and nailed (either top nailed or secret nailed depending on the product width) directly into the joists. The distance between the centre of joists is normally 450mm, wider spans than this may first require a structural plywood or particleboard sub-floor.

Expansion allowance is required at the perimeter of the floor and with wider floors, intermediate expansion allowance is also required.

On battens

Fixing solid timber flooring onto battens[11] installed over a concrete slab is an option where there is sufficient ceiling height. This method gives the floor a softer feel than when installation is direct onto concrete or ply.

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[8] Substrate – an intermediate layer between the floor and sub-floor, to provide a better laying platform for the timber flooring laid.
[9] Subfloor – the sub-floor is simply what the floor is fixed into or over. This may be joists, battens, plywood, particleboard or a concrete slab.
[10] End matched – the ends of boards (as well as the sides), have the tongue and groove.
[11] Battens – These are timber members fixed to the slab into which the flooring is fixed. Battens are often spaced 450 mm apart or may be at closer spacing and may be either pine or hardwood.

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It also produces a floor that when walked on gives a sound similar to that of a timber floor laid onto joists.

The battens will require mechanical fixings such as spikes or masonry anchors and it is recommended that plastic sheeting be laid or a moisture vapour barrier be applied to the concrete slab.

Installation of the flooring product is laid using adhesive and nailed (either top nailed or secret nailed depending on the product width) directly into the battens.

Batten size and spacing will depend on the product being used.

Expansion allowance is required around the perimeter of the floor and with wider floors (usually exceeding 6 metres), intermediate expansion allowance is also required.

Floor fixed to battens

Floating floors

Floating floors are installed very differently from the methods above as they are not physically secured to the surface below, instead they are laid over an underlay and left to 'float'. This method involves foam or rubber underlay that allows a softer feeling underfoot as the surface flexes.

As with the direct stick method, evenness of the concrete slab beneath is essential. If there is too much movement with a floating floor, damage such as cracking of click together fittings may occur or floors may squeak excessively. As such, concrete grinding or levelling may initially be required.

Floating floors are beneficial where people seek minimal time out of the property during installation as the product installed is usually prefinished (either engineered or laminate). The concrete slab may be treated with a moisture vapour barrier or the underlay may also act as the barrier (for certain brands).

With a good quality sound absorbing underlay, floating floors can also be effective in apartments and units.

Installation of the flooring product is then simple, with boards laid in place and 'clicked' together or with adhesive applied at board joints (depending on brand and system). The skirting boards cover a necessary expansion gap at the edges and the floor is successfully floating.

Expansion allowance is required around the entire perimeter and may also be required within both the width and length of larger floors and at some doorways.

Over other surfaces

There is always some level of risk when installing new flooring over an existing flooring surface such as tiles or an old timber floor. This process does occur and is generally successful, however some factors need to be considered up front.

If the floor is tiled and the tiles are quite old, it's likely that the adhesive used for the tiles has weakened over time. If the bond under the tiles is not secure, the forces holding down the floor will let go at the weakest point – the tile adhesive. Ideally, the tiles should be pulled up and the concrete surface should be cleaned of all possible contaminants and made sufficiently level.

There are also risks with installing a new timber floor over a pre-existing timber floor. As previously outlined, timber floors move naturally in response to changes in the climate. If an old floor moves this can exacerbate any movement of the new floor installed over the top. Additional care is therefore required. Any issues such as squeaks must be eliminated from the old floor, levelness checked and the old floor rough sanded prior to the new floor being laid.

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Adhesives

Adhesives are now used extensively with timber flooring products and may range from PVA type adhesives used in the tongue and groove joint of some engineered and laminate products when floated, through to the polyurethane adhesives commonly used when fixing floors to the sub-floor. A full bed of adhesive is used with products such as parquetry, engineered flooring and prefinished solid, bamboo and cork.

Solid flooring may rely solely on mechanical fixing or a combination of mechanical fixing and adhesives. The adhesive may be beaded beneath boards or a full bed may be used depending on the product. The polyurethane adhesives generally contain solvents, however formulations are continually being updated to reduce levels of solvent, and solvent free products are now being introduced.

Adhesives are now used more extensively with timber flooring products than in the past. This is largely due to the fact that timber flooring is now often laid over a supporting surface like concrete, or sub-floor of plywood or particle board (rather than nailed directly on to timber joists). This allows options to use adhesives, or nails and adhesives together.

There are a number of types of adhesives:

Water based/wash-up adhesives – The biggest use is a special water resistant liquid PVA (white glue) to bond the edges of boards when laid as a floating floor. There are thicker water based types for spreading over surfaces and gluing down parquetry and cork floors.

Solvent based adhesives – The most common type now used are construction adhesives (paste consistency in cartridges) which can be applied to the subfloor surface before nailing tongue and groove timber flooring. This approach reduces hollow sounds and squeaking in the nailed floor and can also be applied to the 'groove' of tongue and groove flooring during installation over joists to reduce squeaking. These adhesives are also applied to joists when nailing/screw fixing sheet flooring (particle board and plywood) onto joists.

Curing or reactive adhesives – These are now the most widely used for adhering tongue and groove timber, parquetry and bamboo to all types of flat surfaces. They cure/change to form a tough rubbery material by (slowly) absorbing moisture from the timber and air. The most common type is polyurethane, though other types are becoming more widely available. These substances may contain solvents and some may contain hazardous chemicals so need to be handled with some care.

Always consult the label and if necessary, the manufacturer if possible, and use the products safely.

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What happens during installation, sanding and finishing?

During the installation process

Regardless of product, it will mean spending some time out of the home. If only part of your home is having flooring installed, it's still best to take some time out as the noise, dust and odour of products can be of concern for some people.

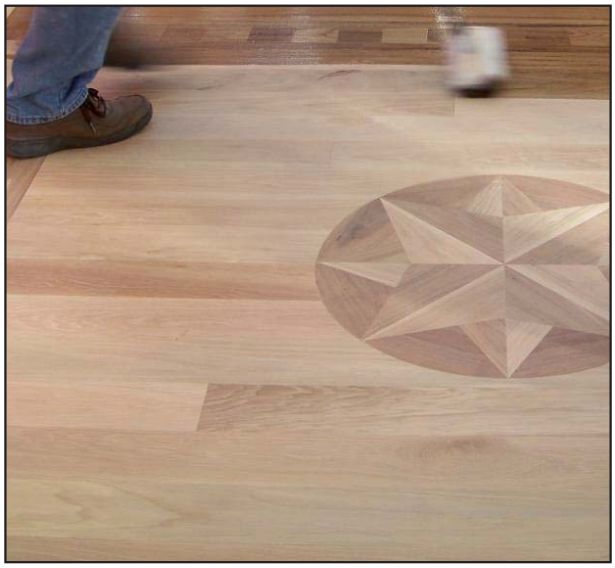
It is also recommended to have the installation of the floor occur after all other trades have completed their work (with the exception of cabinetmakers installing kitchen components on top of a finished floor). This is to avoid contamination of the flooring which creates potential problems for the coating process later or moisture from wet trades.

During the sanding and finishing process

For timber floors sanded and finished on site it will be necessary to be out of the home when this process occurs as you may inadvertently add to the possibility of contaminants getting on a wet floor. When solvent based coatings are being used, these can also have a strong odour and have been known to make some people feel unwell.

The need to be away from the home for finite period does not apply to prefinished products such as laminates, most bamboo products, most engineered flooring and prefinished solid flooring. These are generally factory finished and designed to minimise time away from the home.

For solid strip timber flooring, parquetry, cork and engineered or bamboo products that are not factory coated, it is essential that the contractor be left to undertake the process without disruption or additional trades to prevent unwanted dust particles entering the area.



During this process entry to the dwelling should ONLY occur with the consent of the floor sander and finisher.

Operator Protocols

ATFA has established a set of protocols (recommended guidelines and duty of care) when using coatings and adhesives, regardless if these are solvent or water based products, being mindful that some water and oil based products still contain harmful Volatile Organic Compounds (VOCs). The operator(s) is the one most susceptible to the odours and emissions of VOCs.

Protocols:

- Operators should inform clients of the nature of solvent based products, that they release organic compounds into the air and will release strong unpleasant odours. Similarly, operators should ascertain if any householders have any allergy issues or protective conditions (such as pregnancy), which may necessitate the use of a water based or very low VOC products.
- Operators should advise clients to remove food stuffs (including in cupboards, pantries, fridges and/or freezers) from the vicinity of the gluing or coating work as well as any pets, fish, birds and the like.

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- Operators should recommend occupiers of the coated space to find alternate accommodation for a period of time prior to commencement and (dependent on the coating type used, ventilation of the home and sensitivity of the home occupants) after completion of the coating operation. This also aids the hardening of the coated surface.
- In the case of floor installation where solvent based adhesives are applied, the first two points above apply, however, when the floor is fully enclosed over the adhesive and odours are not recognisable occupancy is again viable in most cases. Some variables apply in this regard such as the thickness of the timber being installed and taking into account that some solvents are not necessarily able to be smelt – yet still present. Regardless it is advisable that people with chemical sensitivities should remain out of the environment for a longer period of time.
- Operators should work in a well ventilated area when using adhesives, opening doors, windows and the like.
- Operators, where practical, should also ventilate the working area when coating, noting this is not practical when applying final coats due to dust attraction.
- Operators should utilise respirator masks at all times when anywhere in the vicinity of the gluing or coating area and during the process of application. Organic respirator cartridges should be replaced daily and while isocyanates can breach the effect of the cartridge long before they can be smelt, obviously if they can be smelt before the day is up, replace the cartridges immediately. While wearing masks can become uncomfortable and hot, they are for the health and safety of the operator. Note: respirator cartridges are not 100% effective, for full protection use full air respiration systems.
- Operators should utilise full length clothing and enclosed footwear, VOCs may be transmittable through the skin. Again, in some circumstances (warmer climates for example) this may feel uncomfortable for a period of time.
- Operators should not eat or drink near the gluing or coating surfaces.
- The public and operators alike should avail themselves of the ATFA Coatings information sheet available at www.atfa.com.au

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Coatings

Timber floor coatings are YOUR CHOICE ... take care to choose the coating that suits your needs!

In the not too distant past the sanding and finishing of a timber floor was a relatively straight forward task with a three coat system of gloss polyurethane being used in most instances.

This approach still dominates the Australian market however, with the advent of new technologies, the choices of coating have greatly diversified.

A search on the internet quickly reveals the wide range of coatings available with many manufacturers able to supply a full range of coating types. You will find brand names that are quite familiar to you and others that you may not have heard of before. While having such a choice is a positive, it can also be somewhat bewildering to those with limited knowledge about coatings and coating types.

With new products continuing to arrive on the market, not all contractors will be familiar with all the options available and may tend to favour the range of coatings they more frequently use and know. Today's reputable coating contractors are constantly involved in updating their knowledge to keep abreast of the frequent changes in this developing industry.

Most contractors will have the skills to use any coating type, however each coating will have its specific requirements and due to this some time in research and support from the product supplier may be necessary and is important. This is particularly so if the coating system to be used differs from that more commonly used or recoating over an existing finish system is being requested. When choice is available for any product there is also varying quality and price differences between products. This too is true for floor finishes and due to the nature of some coating systems there can be a significant variation in overall project costs depending on the option chosen. Similarly, those products of lower quality can be more prone to problems at time of application or in ongoing performance.

In this section we are specifically concerned with the regular levels of confusion and potential disappointment expressed by flooring contractors, architects, building managers, and the general public alike, regarding issues that often stem from coating selection. This aspect should not be treated lightly. Although the process of preparing and coating a floor is relatively "inexpensive", especially when compared to the purchase and installation costs of timber flooring, an unsuitable coating choice can result in expectations not being realised with short lived enjoyment of a new or rejuvenated timber floor. For the consumer, appearance, durability and cost are generally the key factors.

A poor choice of coating will ultimately result in disappointment and often additional expense in extra work necessitating possible re-sanding or recoating. It cannot be over emphasised that choosing the right coating for your requirements will greatly reduce the likelihood of any potential problem down the track.

As the owner, specifier or recipient of a new floor, the most important fact to be recognised when considering the coating type is 'does it fit' your project? All floor coating types are suitable for specific applications. The

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difficulty lies in balancing up the attributes of each coating type to ensure that you select one that is going to be highly suitable. Good coatings in wrong applications result in poor performance – not bad coatings!

For the contractor, the most important information is provided by the product manufacturer. That information needs to be followed, enquired about, even debated, but never ignored. Coatings can be complex and you can be sure significant time has been spent in research and development before the product enters the market. The product information is what enables the contractor to both apply coatings correctly and advise clients accurately as to the suitability of a coating system for a particular project (appearance, durability, cost, application considerations and environmental considerations).

When researching products, always consider that with the variety of timber floor coating technologies available, each will have its benefits and limitations and that the balance of these will differ from project to project. It is also necessary to ensure that coating decisions relative to your requirements are made based on accurate and complete information.

It is generally the owner's choice as to what coating or coating type is applied to the floor and the contractor is often called upon for advice. So what steps are involved in selecting a coating system that needs to be considered by both the recipient of the floor and the contractor for a particular project?

Firstly, a selection of suitable floor coating type alternatives should be presented that are most appropriate to the project.

Considering the broad coating groups, the visual effects they provide should be considered and ones selected that fit preferences.

The benefits and limitations of this selection should then be assessed for the type that will best meet the requirements of the project.

From this, particular manufacturer products within the range can be assessed and an informed choice made. However the basis for selection does not end there! Of equal or greater importance is what the recipient of the floor is prepared to do to keep the floor looking good! No matter what angle you take, 'MAINTENANCE' is the key aspect that ensures the ongoing appearance of a floor. It must be stressed that all coated timber floors will require some level of activity to keep them clean and to prolong their original aesthetic qualities for as long as possible.

This includes:-

- regular sweeping
- dust catching mats at external doorways
- prompt cleaning of spills
- occasional damp mopping with a recommended cleaning product
- felt pads on chair legs and other moving furniture
- sealing paved/concrete area's abutting entrances
- regular monitoring of wear to plan for any remedial coating requirements
- not wearing street shoes on the floor where possible and avoiding leather soled shoes and stilettos as damage is accelerated by the combination of dust, grit, and aggressive foot traffic.

These tasks should be regarded as the minimum requirement of owning a timber floor. However, the frequency with which these tasks are carried out, as well as additional maintenance activities, is what sets different floor coating technologies apart. Put simply a lot depends on what the recipient of the floor is prepared to do 'for their floor'. Aspects such as traffic type and level of traffic, flooring environment (e.g. residential or commercial) is what will greatly influence the coating decision.

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If as an owner or specifier you are unable to determine a suitable coating using these considerations, then an industry professional should be consulted to assist. Though remember, although a contractor or similar professional can assist with technical information, the owner, or person specifying on behalf of the owner, should be the one choosing the finish, as they are the ones also determining the acceptable degree of ongoing maintenance.

Assuming as an owner that you have made your choice and ultimately, prolonging of the 'original' appearance of your floor is the ideal, maintenance is accepted as reality. Start with this understanding and it is more likely that you will be satisfied with your floor coating choice.

Coatings are made to protect and beautify timber flooring, but from day one the various degrees of foot traffic will begin the deterioration process that can only be managed and replenished by the "owner" or caretaker of the floor. If that happens to be you, then it is important that you make your coating choice carefully, as it is your floor and your choice that will be on display, now, in twelve months, in five years, a decade; so choose wisely.

Coating types

Timber Floor Finishes

Timber floor finishes can be grouped into four main categories. Penetrating oils and waxes, curing oils and alkyds, oil modified urethanes, and polyurethane's, the latter three categories being available in solvent borne and waterborne . Performance parameters such as durability or resistance to wear can vary significantly within a category as well as between categories. All categories can be recoated with refurbishment coats.

Penetrating Oils and Waxes

These are blends of natural oils and waxes which penetrate the timber surface to provide a rich colour, enhancing the timber grain and natural characteristics. It is the natural subdued look of the coated timber that is often the basis of selection and these finishes are generally recognised as the traditional or natural finishes. Curing in cold weather is slow and this may require consideration. Regular application of metallised acrylic polishes are used as part of the maintenance requirements to prolong an attractive appearance that darkens with age. Hard waxes differ in that they not only penetrate but also leave a hard film of wax on the surface, thereby reducing maintenance requirements. Currently these types of finish do not form a large part of the floor finish market.

Hard wax finish

Oil-Based Finishes – Curing Oils and Alkyds

Curing oils such as 'Tung' or 'linseed' are usually selected because of their lower cost and ability to produce a rich timber colour. Gloss levels vary from high gloss to satin and they are not prone to edge bonding. Similar to penetrating oils these finishes are slow curing in cold weather, will darken with age and metallised acrylic polishes are a necessary part of ongoing maintenance activities. Alkyds are produced from reacting curing oils with a synthetic resin and this results in improved durability and reduced maintenance activities. Curing oils and alkyds are also not as frequently used as those outlined below.

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Oil Modified Urethanes (UMO's)

These spirit based solvent borne coatings combine an oil with a smaller amount of a urethane. The higher the urethane proportion, the less the oil properties such as flexibility but the higher the durability. Gloss levels vary from high gloss to satin and in recent times higher cost waterborne UMO's providing lower emissions have appeared on the market. All UMO's darken with age and their slow curing in cold weather needs to be considered. These mid range cost coatings are often selected as they are of intermediate durability, are not prone to edge bonding and are isocyanate free. As such they hold a moderate share of the market.

Polyurethane – Solvent borne

This coating type in the 1 pack moisture cure and 2 pack varieties provide the highest durability and film build of all coating types as well as the highest gloss levels. Gloss levels range from ultra high gloss to matt and some darken less with age. However, there is a strong solvent smell on application and due to the isocyanates present additional precautions are necessary until the coating has cured. These intermediate cost coatings are often selected as they provide the best durability resulting in low maintenance, can provide a very high gloss and generally provide trouble free application. Care is however necessary regarding their edge bonding potential which can cause irregular gapping or split boards in floors. Currently, this type of finish is commonly used in Australia.

Solventborne Polyurethane

Polyurethane – Waterborne

This has the widest selection of sub-categories resulting in a spread of properties with durability from poor to arguably as good as solvent borne polyurethane. Greater care is therefore necessary in selection noting that those without acrylic provide higher durability. They are available in one and two pack options, provide a finish from matt through to gloss and generally darken little with age. These coatings are often selected due to the absence of any strong solvent smells on application and because they are not prone to edge bonding. Product cost is however high and they can provide a lighter timber appearance depending on the sealer and coating used. Rapid shrinkage can also result in light coloured lines at board joints. These finishes have developed significantly over recent years and as such their market share is moderate and increasing.

Waterborne Polyurethane

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The following table outlines the types of finish available and lists various properties of each.

COATING SELECTION CHART

Timber Floor Coatings							
Property	Penetrating oil / wax & hard wax	Oil based finishes	Oil Modified Urethane	Polyurethane			
				Solventborne		Waterborne	
				1 pack	2 pack	1 pack	2 pack
Durability (Ability to resist wear)	Low-Med	Low-Med	Medium	Very High	Very High	Med-High	Med-VH
Ability to accept careful foot traffic 3 days after coating. (Ave. temperature 20°C)	Low	Low	Medium	Medium	High	Medium	High
Timber colour 'richness'	Low-High	High	High	High	High	Low-Med	Low-Med
Darkening with age	High	High	High	Low-High	Low-High	Low-Med	Low-Med
Ability to cure in cold & dry weather	Low	Low	Medium	Medium	High	Medium	High
Ability to cure in cold and damp weather	Low	Low	Low	Medium	High	Low	Low
Edge bonding resistance	High	High	Med-High	Low-Med	Low	High	Med-High
Rejection resistance	High	Medium	Medium	Low-Med	Low-Med	Medium	Medium
VOC emission at application	Low-High	High	Med-High	High	High	Low	Low-Med
Inhalation hazard when coating is applied	Low	Medium	Medium	High	Very High	Low	Medium
Odour on application	Low-Med	Medium	Medium	High	Very High	Low	Low-Med
General product cost	Med-High	Low-Med	Medium	Medium	Medium	High	Very High

If you would like to know more about the VOC content of coatings, please contact the ATFA office at admin@atfa.com.au

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Performance expectations of sanded and finished solid timber floors

Although an imperfection free floor is the desire of any tradesperson, it is the process of installation and finishing where the environment and other conditions cannot be fully controlled, that moves the completed job to one that is 'normal' and of an industry accepted standard. This however, is not to say that the completed floor won't be of a high standard and well suited to its purpose as a floor which is to be walked on, but it does acknowledge that the finished product will not be the same as fine furniture and that due to seasonal influences and heating and cooling, that some movement reflecting the nature of timber will occur.

Floor performance

Even board surface

There are some conditions that affect the surface of the boards and these should not generally occur in timber floors. However, floors exposed to heat sources after occupancy (e.g. no curtains, fireplaces, vents from appliances, houses closed up for extended periods) may cause movement in the flooring resulting in effects such as gapping. Similarly, changes that affect the conditions beneath a floor can also result in board movement and shape changes resulting in cupping. It should be noted that the actions or inaction of owners and builders can contribute or even cause these effects to occur. Therefore it is beneficial for flooring contractors to make builders and owners aware of aspects that could affect their floor and that any concerns that the builder or owner has, be brought to the attention of the flooring contractor at an early stage.

Product choice, particularly in terms of board width will also influence movement after installation, with wider or thin boards often being more prone to some cupping and gapping in a dry internal environment. The conditions defined below should however, not normally occur in a floor and if they do, remedial work is often necessary.

Cupping – boards with their edges higher than the centre of the board. Moist conditions beneath a floor can cause cupping and heat in a specific location or a very dry environment above the floor can also cause boards to cup. Cupping is more likely to be observed in overlay flooring and in wide standard thickness boards. To some degree a small amount of observable cupping may occur in some locations where these types of flooring are used (e.g. sun exposed floor).

Peaking – This has the appearance of cupping but is the result of expansion pressure in the floor. Again it is generally expected that a floor would be free of observable peaking.

Tenting – This is not acceptable and occurs when the adjoining edge of two boards has lifted above the level of the adjacent flooring. This is often associated with high moisture beneath the floor and can be from a number of other causes.

Observable peaking

Buckling – This is not acceptable in a floor and occurs when a section of flooring containing a number of boards has risen above an adjacent section of floor.

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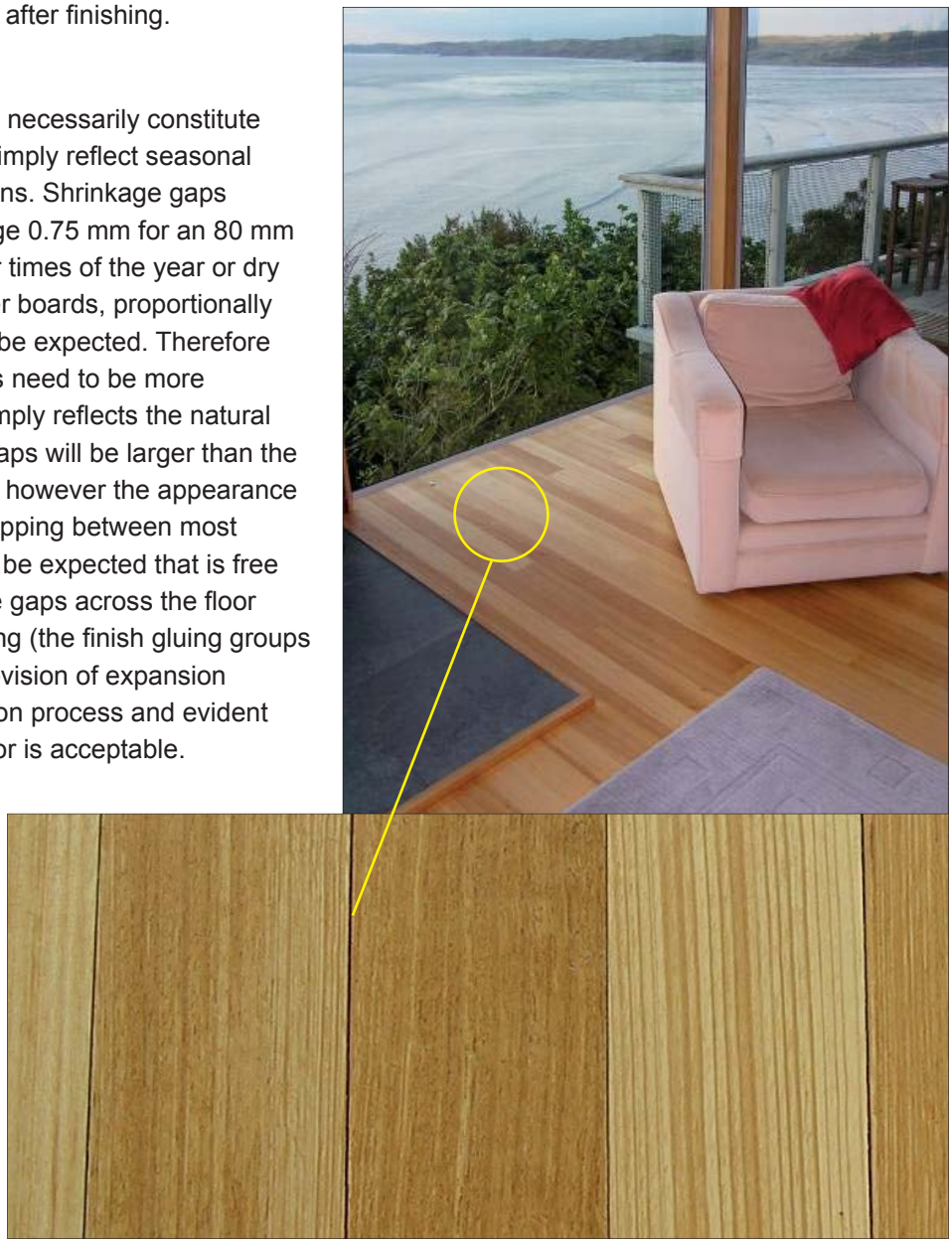
Crowning – boards with their edges lower than the centre of the board. This is not acceptable and occurs when a cupped floor from moisture effects has been prematurely sanded. Crowning may not become apparent until some months after finishing.

Gapping at board edges

Gaps at board edges do not necessarily constitute a problem with a floor and simply reflect seasonal changes in weather conditions. Shrinkage gaps between boards may average 0.75 mm for an 80 mm wide board floor during drier times of the year or dry internal conditions. For wider boards, proportionally wider average gapping can be expected. Therefore owners of wider board floors need to be more accepting of gaps as this simply reflects the natural response of timber. Some gaps will be larger than the average and others smaller, however the appearance should generally indicate gapping between most boards. An appearance can be expected that is free from irregularly spaced wide gaps across the floor associated with edge-bonding (the finish gluing groups of boards together). The provision of expansion gaps as part of the installation process and evident throughout the life of the floor is acceptable.



Gapping is common in front of windows

Vertical movement at tongue and groove joints

Flooring is manufactured with the board tongue narrower than the groove. This is necessary so that boards will fit together during installation. When floor boards are laid over joists or battens, some differential vertical movement may occur between adjacent boards when there is foot pressure on an individual board. This is due to the clearance between the tongue and the groove. The clearance should not exceed 0.6 mm to comply with AS2796 Timber – Hardwood – Sawn and milled products, but with this tolerance movement will be observable.

Squeaking

A small amount of noise can be expected from most timber floors when walked on. Noises can occur from movement of one board edge against another or from boards moving on nails. A floor is often more noisy during drier weather due to loosening at the joints. A floor that squeaks excessively requires remedial action.

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Indentations

Timber strip floors can be expected to show some indentations depending on the hardness of the species used, variation in density, volume of traffic and type of foot ware worn. Softer timber will indent more readily than harder timbers.

Drummy spots

When timber floors are laid direct to concrete slabs, drummy sounds can occur under some boards. When there are a limited number of instances associated with one or two boards in some areas of the floor, and no vertical movement when pressure is applied, remedial work is unlikely to be required. Refer to ATFA Information Sheet No. 6 Hollow Sounds available at www.atfa.com.au.

Acceptable floor appearance

Timber colour, grade and species

Within a single species the colours and colour variation can be quite pronounced and can differ markedly from one floor to another. It is also possible that a limited number of boards of different species but similar in colour and character will be present in some floors and this should not be cause for concern. Through grading errors or when a floor is sanded, it is also likely that some features will appear or be a little larger than the grade description. There is however generally a clear difference between a floor that is of the incorrect grade and a floor where grade limits have been exceeded in some boards.

Such floors where the grade description is exceeded in some boards should also not be a reason for concern. Refer to ATFA Information Sheet No. 5 Floor Colour and Grade available at www.atfa.com.au.

Board lengths and distribution in the floor

Board lengths are generally a minimum of 900 mm long when laid on joists or battens. When laying over a structural sub-floor the minimum length may be shorter. Where possible end joints should not cluster together or align. Generally, only one end join should occur in a group of three boards between floor joists. In the case of glue fixed flooring, it is preferred that end joints be a minimum of 300mm from end joints in adjacent boards.

Sanding

The sanding process involves hand controlled equipment and due to this there will be some evidence of the sanding process in the floor. It can be expected that the floor will be fine sanded and that edging will not result in scalloping. Similarly it can be expected that corners will be scraped to an even surface and sanded to provide a fine surface. As such sanding marks in the timber should not be visible from a standing position. Generally, the viewing angle for assessment should be 45° from the eye to the floor.

At times there can be vibration that occurs which may be induced by the sanding machine or the sub-floor framing. Although this vibration can lead to chatter marks in the floor, it would be usual to expect a floor free of chatter marks.

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With the re-sanding of an older floor it must also be recognised that the sanding process will not remove existing deep cuts or damage and that stains may also not be removed if they have penetrated deep into the timber.

Nail holes and filling

Unless otherwise requested, all flooring nails are to be punched below the surface and the nail holes are to be filled. With solid tongue and groove flooring it can also be expected that any gaps at board ends will also be filled. Filling at board edges is generally not recommended except for parquetry where flood filling is to be undertaken and in some instances with direct adhesive fixed floors. When one colour of filler is used, that colour should match the darker tone in the boards as with time the contrast generally becomes less.

Coating and finishing

A floor is subject to much heavier wear than furniture and although a good quality finish can be expected, the same finish quality to furniture should not be expected. There are a number of imperfections that are likely to be present to some degree in a finished floor and the degree to which they occur, where they occur and the presence of other imperfections, will determine their acceptability. When assessing the appearance of a floor it is to be done from a standing position and the floor should be viewed at an angle of about 45°.

Dust and debris – A degree of contamination in the final coat is unavoidable and will vary from one site to another being dependent on a number of factors such as draughts, heating and ventilation systems, insects and the like. It can be expected that the contractor will take reasonable measures to minimise the risk of contamination and that at job completion there will not be heavily contaminated areas in the floor that are obvious when assessing the floor.

Swirl marks – Swirl marks are caused by rotary sanders and to some degree will be present in all floors. Down lights will highlight sanding imperfections due to light refraction through the coating and as such this is not controllable by the contractor. Fine swirl marks that are not obvious under natural light when assessing a floor should not be a concern.

Coat levelling – Rejection, orange peel and quilting all relate to unevenness in the coating resulting in either a mottled effect or in the case of quilting discontinuity across joints. If instances are isolated, minimal in nature and not in areas frequently viewed then remedial work is unlikely to be necessary.

Delamination – Separation of one coating from another or from the coating to the board should not generally occur in a floor and in such instances remedial work is necessary. Minor delamination due to movement at board joints or ends can occur and provided it does not progress, remedial work is unlikely to be necessary.

Gloss variation – Differing conditions in the dwelling at the time of curing can result in gloss variation. Although consistency can be expected at the time of a particular application, some variation may be apparent between areas when finished at a different time. Gloss variation within a room particularly with satin finishes usually requires remedial work.

White lining – When gaps appear at board edges the stretching of the bridged coating can cause a white line to appear at board joints. Unless severe this conditions requires no remedial work.

Lap and roller marks – Some finish systems are more prone than others and should lap or roller marks occur, they need to be minimal in number and not able to be observed from all directions, to be acceptable.

Edge bonding – Some finish systems can act as an adhesive and bond board edges together. With shrinkage in the floor, wide irregular spaced gapping and splits in boards can occur. Only minor edge-bonding resulting in small gaps at board edges is acceptable. Frequent splits and wide gaps are not acceptable.

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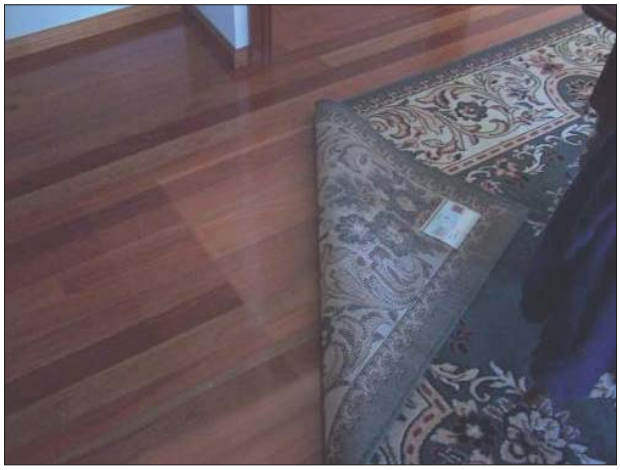
Ghosting – Lighter toned boot and foot prints can occur in floors 6 to 18 months after the floor has been finished. In most instances the source of the mark cannot be identified and in most instances not likely to be associated with the sander and finisher. Re-sanding and finishing may correct the problem and a compromise between parties is often necessary to resolve the problem.

Colour changes to timber and coating

Over the course of time colour changes occur in timber floors from the effects of ultra violet light. Therefore it is usually more pronounced in sun exposed areas of the floor. This is partly associated with the changes in the timber and partly with the coating that is applied. Some coatings darken with time more than others and some timbers are more prone to colour changes than others. This process is natural and gradual but can result in distinct colour differences where rugs have been put on the floor. Some of this change can be minimised by not putting rugs down till six or so months after the floor has been completed. To avoid severe effects it is beneficial for flooring contractors to make clients aware of how the coating used may result in colour differences. From there it is up to the owner to manage how rugs are used.



Colour variation under rugs

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How to maintain your timber floor

Timber floors vary in ease of maintenance depending on the type of coating used and the traffic/usage of the floor. Regular care will greatly enhance both the appearance of your floor and its lifespan.

At some stage, the floor will need to be rejuvenated which typically involves buffing back and re-coating. Some of the softer floor finishes can also benefit from application of metallised polish which provides an additional wear surface.

It is important that maintenance requirements are understood by customers to ensure ongoing satisfaction – make sure your upfront conversations with your flooring contractor are not just about installation of a timber floor but extend to how you need to maintain the floor in the short and long term.

Do not use rubber mats

A newly finished floor

Although a floor may be walked on after initial curing, some precautions are necessary with a newly finished floor until the coating system has fully hardened and this may take in the order of two weeks.

Use of the floor before the full cure has been realised can result in increased tendency for scuffing and scratching. It is recommended that rugs are not laid until after the floor finish has fully hardened. Rugs with rubber backings should never be used as these may tend to stain the applied coatings.

While light furniture can be replaced and used during this period, attach furniture protection felt pads to the feet of tables and chairs. Heavy items such as fridges should be moved carefully into position and at no time should they be dragged over either newly finished or fully cured floors. Consideration should also be given to chairs with castors as they can indent softer timbers and also cause premature wear of the coatings. Again these should not be used until the finish has hardened and barrel type castors are less likely to damage a floor than ball castors.

Ongoing care and maintenance

Ingress of grit and direct sunlight

Traditional enemies of timber floor finishes are the sand and grit brought into the house with footwear. These small particles act like sandpaper resulting in scratches in the floor. Mats placed both outside and inside external doors provide a simple and effective means of significantly reducing grit from entering the house. Similarly, in high wear areas, runners and rugs can be effective and can also add to the décor of the house. The kitchen floor generally experiences high wear and therefore a floor rug in this area can be particularly beneficial.

Another aspect that should be considered is the amount of direct sunlight on floors. Direct intense sunlight can contribute to gapping and possible cupping of boards. It will also cause the colour of both boards and finish to change with time. Some floor finishes are more prone to darken with age and direct sunlight accelerates this process. Filtered sunlight through sheer curtains or blinds provides an effective means of

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slowing the colour change processes and is also effective in controlling gap size and possible cupping. In some instances it may be decided that window coverings will not be used, and if the sunlight has not been controlled by patio roofs or awnings then floors rugs can be used.

Maintenance plan

Establishing a regular cleaning program will greatly assist in keeping floors in pristine condition. There are many aspects that affect how often the floor requires cleaning and these include the degree of grit present (particularly from children and pets), type of exterior and interior matting used, the level of traffic, type of footwear and general conditions of the area outside the house.

Floor cleaning products

Spills should be mopped up when they occur and any leaks attended to immediately. Failure to attend to leaking pipe work can result in severe problems with a floor particularly when laid over sheet flooring or directly adhered to a slab. Scuff marks or stubborn stains may be removed with light rubbing using a wood floor cleaner. As some cleaners can attack certain types of coating, use where possible the cleaning regime specified by the coatings manufacturer – alternatively always test rub an isolated area of floor to verify compatibility of the cleaner used to the coating.

For regular cleaning of domestic floors an anti-static mop provides an effective means of collecting dust and grit. Continual walking on a dirty floor will quickly damage the finish. If a vacuum cleaner is used then the condition of the brushes should be regularly checked. If they have worn thin, contact of the metal head on the floor can result in scratching. Do not use hard head vacuum cleaners as they will invariably cause fine scratches on the floor. Steam mops are not recommended on polished floors as they can cause damage to certain types of coatings. They may also cause 'lipping' on floating floors.

On a monthly basis floors can benefit from damp mopping. Providing the mop is only damp and the finish is in good condition, mopping carried out correctly will not affect either the finish or the timber. Damp mopping provides an effective deep clean and should be undertaken with a neutral pH wood floor cleaner or product recommended by the finish manufacturer. Harsh detergents or abrasive cleaners are to be avoided as are use of methylated spirits and vinegar as they can chemically attack some types of coatings e.g. waterborne polyurethanes and penetrating oils. After wetting the mop it should be wrung out until it is moist and the floor can be mopped in this condition. Using clean water, a final mopping with a mop wrung out till it is 'dry' may be used to further remove excess moisture on the boards. Periodically the protective pads on furniture legs should also be check to ensure that they are clean of grit or in need of replacement.

Re-coating

Timber floors are subject to different wear patterns and it is in areas of higher wear that there will initially be signs that the floor requires re-coating. It is important to ensure that excessive wear has not occurred if a total re-sand and re-finish is to be avoided. The finish should be inspected in the high wear areas and if a few drops of water bead on the surface then the finish is still intact and may require cleaning rather than re-coating. If however, after a few minutes the water begins to soak in and the timber colour darkens, then the finish is partially worn and re-coating should be undertaken. It is important that the details of the original coating system can be made available to the sander and finisher to ensure compatibility between coats.

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Decking for outside your home

Decking boards are designed for external floors and do not have the tongue and groove of internal floors. Boards are laid with small gaps between to permit the boards to shrink and swell freely under sun and rain. Many Australian and some imported hardwoods are used as well as preservative treated pines.

A wide range of species are available for external use and some for termite resistance which is also important. Some hardwoods are not durable and not used for external use. Hardwoods and softwoods that are used externally have had their sapwood treated with preservative to ensure long term durability.

Australian hardwoods for decking include the following or may be a mix of species under names such 'Forest Reds':

Blackbutt
Forest Red Gum
Grey Gum
Ironbark
Jarrah
Karri
Red and White Mahogany
Spotted Gum
Stringybark
Tallowwood
Turpentine

There are many imported hardwoods for decking including:

Belian
Kwila (Merbau)
Yellow Balau

Treated pine is also common in decking

Installation of decking

Decking installation is generally direct to joists with the boards usually nailed or screwed into place. However, more recently other systems have been introduced which enable the secret fixing of boards. Decking boards come in mixed length packs with smaller lengths no shorter than 900mm so they can be supported by two joists and board ends are butt- joined over the joists.

Installation of the decking is then by two nails or screws through the top of the boards at each joist crossing. Some of the newer secret fixing systems utilise adhesive on the joists prior to board fixing. The distance between the centre of joists is normally up to 450mm.

If decks are close to the ground then materials need to be of higher durability and boards need to be spaced a little further apart to accommodate the reduced ventilation. In such instances it is also necessary to have good drainage and to ensure no pooling of water beneath the deck.

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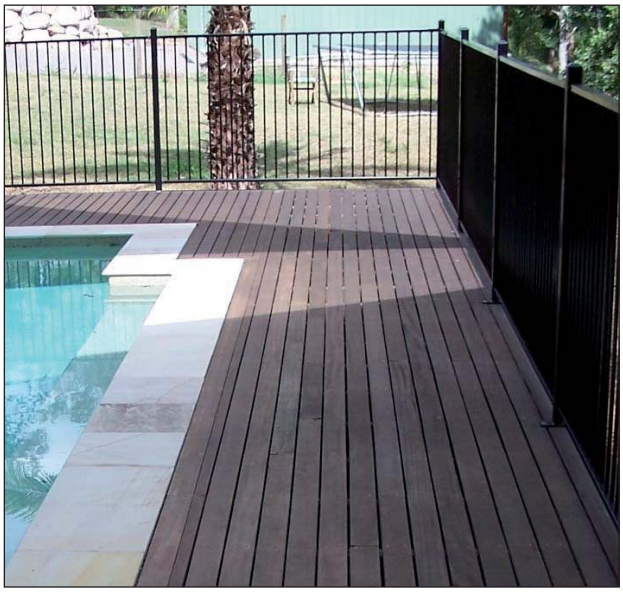
Coatings for decking



Coatings used for external purposes differ from those used internally. It is advised that all decks have a finish applied to reduce the effects of exposure to sun and rain and general weathering. The finish also assists in reducing swelling and shrinking that can lead to a higher degree of distortion and surface splits known as checking.

For best results in decks, one coat of a water repellent preservative or an oil based primer followed by one coat of the desired finish to all board surfaces is recommended. This is done prior to installation and is to include board ends.
Once the decking is installed, further coats of the desired finish should be applied.

It is also recommended that the tops of joists be primed or capped with rubber products specifically made to protect from adverse conditions.

Coating types

Water repellent preservatives

A water repellent preservative should be considered as a base coat rather than for final coat application. The product contains various waxes, resins and products that inhibit decay that are dissolved in a light organic solvent. It therefore has the consistency of mineral turpentine and will soak into the timber and particularly cut ends. It enhances the durability of the decking and being water repellent the decking is less susceptible to swelling and shrinkage from rain. Compatibility with other finishes needs to be checked and other finishes should generally not be applied over it within two weeks of application.

Decking oils

Decking oils are a penetrating finish that soak in and provide a natural look to the decking with both the texture and grain showing. Oils may be solvent or water based with that penetrate and serve as a protective coating. It is easy to apply and re-apply, only requiring the deck to be cleaned off prior to re-application. However, these products are generally not long lasting, after initial application, additional coats may be required six months later and then at yearly intervals. The decking will usually darken with time.

Decking stains

Solvent or water based stains are available and these can be considered as very thin paints that contain a pigment or colour that tone in with the colour of the timber or provide a distinct colour to the timber. They often contain mould inhibiting additives. The pigment in these products tends to hide the grain to some extent, although the texture is not masked. The benefit of the pigment or colour is that it absorbs ultra violet light and therefore provides added protection against weathering. Consequently, stained decks generally require less frequent maintenance than oiled decks. Again preparation for re-coating is relatively easy with the deck only needing cleaning prior to re-application.

Paints

To provide an even longer lasting finish paints can be used. In this instance oil based primers should be used for both oil and water based paints. The oil based primer enhances the durability of the decking. Although a

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painted surface will provide the best protection against weathering the colour, grain and texture of the timber will be obscured. The paints used are specific for decks in order for them to cater for the added traffic and light colours should be used as dark colours are very hot underfoot and the heat can also promote timber shrinkage. With such systems recoating may only be necessary every five to seven years although the preparation in terms of sanding and repriming areas is also a consideration.

Maintaining your decking

Although timber decks are subject to sun and rain, it is recommended that general cleaning be done by blower or sweeping rather than hosing down as this will reduce the swelling and shrinking cycles and the amount of moisture entering end joints. Similarly if pot plants are present on the deck, the pots should be in elevated saucers and care should be taken not to let the water overflow onto the deck. It is also necessary to ensure that adequate ventilation is provided beneath decks to maintain moisture content at normal levels.

The finish will need to be re-applied at regular intervals with the frequency will depend on the finish system chosen. Those that generally require more frequent maintenance such as oils and to a lesser degree stains only require the deck to be cleaned prior to reapplication. If the decking has not weathered (become a silvery grey colour or looking 'hungry' for more coating) it can be simply swept prior to reapplication. However, if weathered, cleaning products are available from deck coating manufacturers that will assist in rejuvenating the deck prior to finish application. If a paint system is used, greater preparation with some sanding will be required.

Many nailed down decks have the nail heads proud as this aids with the durability, however this generally makes the re-sanding of the deck too difficult. Punching the nails can cause boards to split particularly at the ends. Though, if countersunk screwed below the surface, or if secret fixing methods are used the deck can be sanded back to near new condition.

In all instances of recoating and particularly if an alternative system is being considered, finish manufacturer instructions need to be followed. It may not be possible to re-finish with a different system without a full re-sand.

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Selecting your timber flooring contractor

When it comes to having your new timber floor installed or your existing floor sanded and polished, we recommend that you look for an ATFA member first. Whether it's a strip timber floor, floating or engineered timber floor, parquetry or cork floor we strongly advise that its installed and/or sanded and finished by an ATFA member.

ATFA members are part of the national peak association in Australia which sets benchmarks for its members and expects the highest level of quality.

The benefits of using an ATFA member business are many and include:

- ATFA members are bound by a professional code of conduct and ethics (see next page);
- ATFA members are scrutinised prior to their approval as a member of the association;
- ATFA members have a dedication to the industry and an interest in serving clients well;
- ATFA members are dedicated to training people for the future;
- ATFA members are dedicated to improving business arrangements and recognition as a quality service to the community;
- ATFA members are supplied with the latest industry guidelines for installation, sanding and finishing;
- ATFA members participate in a range of training and industry networking activities;
- ATFA members are able to participate in continuing professional development to increase through levels of expertise;
- ATFA members have access to professional contracts which provide you with peace of mind;
- ATFA members receive regular industry news and technical advice;
- You have access to the ATFA website to find out about timber floor performance and expectations;
- Using an ATFA business provides you with direct access to the association's professional staff and an informative website;
- When something goes wrong you have access to ATFA accredited floor inspectors;
- ATFA members have access to national hotlines for those tricky issues when advice is necessary; and
- ATFA members benefit directly from ongoing research and development conducted by ATFA and its partners.

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ATFA Member – Code of Professional Conduct and Ethics

As a member of ATFA, the member agrees to uphold the Code of Professional Conduct and Ethics, including the following conditions:

- Conducts business with customers and provide products and services with honesty, integrity, fairness, value and competence;
- Promotes the merits of the products used and the services provided without degrading competitors;
- Ensures that all the products and services provided are delivered as advertised and that all claims made are genuine;
- Provides all the facts about the materials used so that the truth about products and services may be fully understood;
- Ensures that the standard of product or service delivered to the customer is provided as promised and in accordance with industry practice and in a manner which shall enhance the reputation of the industry;
- Abides by all Governmental legislation, regulations, codes, standards and by-laws;
- Supports the ATFA and its goals and purposes towards advancing the Timber Flooring Industry;
- Ensures compliance with this Code by all other members of the organisation, to the extent that this Code applies to them;
- Abides by this Code of Professional Conduct and Ethics and recognise the ATFA as the authority in all matters relating to the interpretation and enforcement of this Code, within prevailing legal limits; and
- Avoids any action which may bring the ATFA and its members into disrepute.

Finding an ATFA member in your area is as simple as going to the ATFA website www.atfa.com.au and accessing the 'Find a Member' section from the home page.

In finalising arrangements with a contractor insist on a contract or written agreement and be sure to specify the products and installation method in detail.

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Consumer Guide to Timber Flooring

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