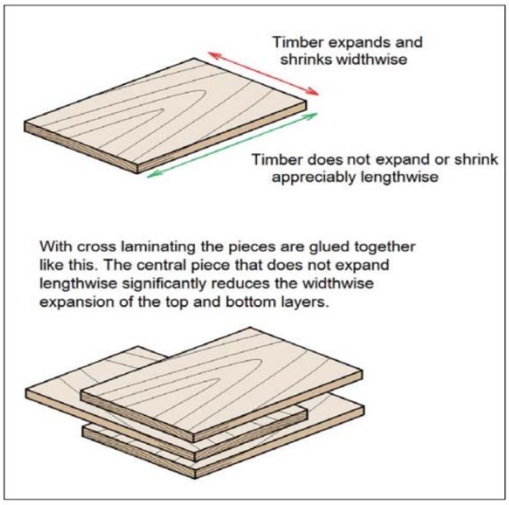
Engineered Flooring Range

Much of the engineered flooring we see in Australia is manufactured in Asia with face veneer or lamella from both Australian species and species from other countries. As product construction can differ significantly between products there are a range of manufacturing practices that are too varied to explain in detail.

However, what is common among all engineered flooring is the veneer or lamella of solid timber on the exposed face of the board. Veneers are typically up to about 2mm thick while a lamella is thicker and often 2.5mm to 6mm in thickness. In producing this decorative layer, it can be peeled, sliced or sawn.

When we consider a solid piece of timber it is said to be hygroscopic. That is, once it has been appropriately dried it will still absorb moisture from the air during times of high humidity and during times of low humidity it will lose moisture to the air. With these changes in moisture content the timber will swell with increased humidity and shrink with reduced humidity. However, another property of timber is that swelling, or shrinkage only occurs in the width of the board and not to any appreciable degree in its length. This property is used to advantage in many engineered floors by cross laminating with the grain direction in each layer alternating at 90 degrees. Through this process the natural width movement of each layer is restrained, and a floorboard is created that is more stable in width movement resulting from moisture content changes. Although the cross laminating does significantly reduce the width movement that often results in gapping at board edges with solid timber flooring in dry weather, it does introduce a small amount of lengthwise movement in the board with changing moisture content. Such movement is accommodated with expansion allowance at installation.



The diagram above courtesy of the ATFA publication 'Engineered Flooring Industry Standard V1- February 2012

Another benefit inherent with engineered flooring is better utilization of resources in that the thin high-quality face veneer or lamella is often adhered to plywood or other timber species that are of a more plentiful resource. This process therefore provides a high-quality board with a solid timber exposed face, with reduced in-service width movement.

Engineered flooring can be supplied stained and pre-finished. The surface exposed to view in the floor is generally a UV cured coating system that may have additives to make the coating tougher. Once board blanks are produced they are machined to provide the tongue and groove on edges and ends of the boards. Boards can also be supplied for site sanding and coating as would be done with traditional solid flooring.

As indicated above engineered flooring is manufactured with a decorative layer of solid timber bonded over layers of other timber or other materials beneath which not only provides some additional stability but also maintains all the appearance and characteristics associated with solid timber flooring. Engineered floors can differ markedly in their construction, may be laid as floating floors, glued to a subfloor as an overlay or in some cases fixed as a structural floor.

RECYCLED TIMBER INNOVATIONS

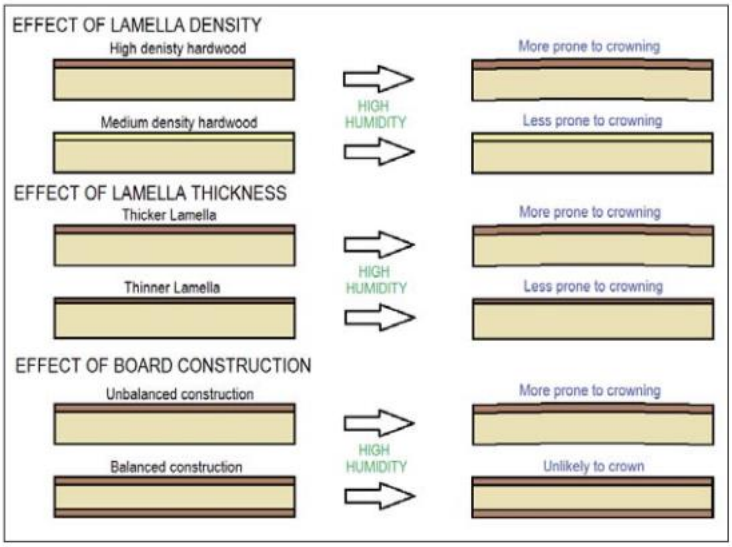
Constructions

Board construction varies significantly between products and a number of product types currently in the market will be considered. Product types that have been in the market for some years are generally of two types; the first type contains a face lamella, core block layer and stabilization layer and the second containing a face lamella over a plywood base (typically referred to as 3 layer).

Below are the different types of construction we currently offer.

The thickness of the veneer or lamella layer also varies from product to product in the market place. All of our products come with a 3.0 mm lamella for stability and responsible use of the resource.

One issue that needs to be considered regarding this is that when it comes time to consider refurbishing a floor, those with thin veneers will not be able to be sanded back to bare timber without risk of penetrating into the base. However, with a thin veneer the stability of the product is much more influenced by the base layer whereas a high-density thicker lamella can influence aspects of product performance (e.g. crowned appearance, checking) due to the strength of the lamella under certain environmental conditions. Concerning the hardness of these products the thicker the face lamella the more it will determine the hardness of the board. When the face timber is a veneer it is the hardness of the base that dictates hardness.

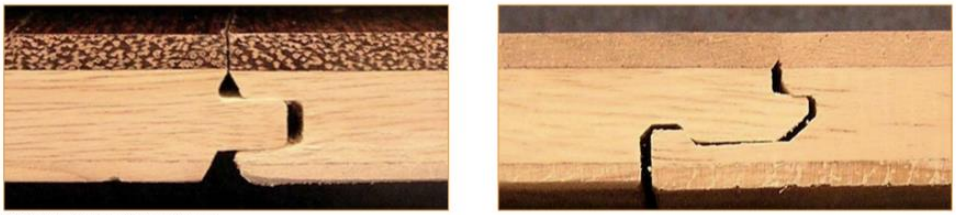


Crowning

The diagram and photo above courtesy of the ATFA publication 'Engineered Flooring Industry Standard V1-February 2012

Although all products can provide good performance in the marketplace there are situations, where product differences occur and where some products are more suited to certain installations and more severe climatic conditions than others.

There are two profile types available in the market. The first is the ‘tongue and groove’ or T&G profile similarly found in traditional solid timber flooring and then there are the interlocking or glue-less joint systems. These two systems are shown in the photos below.



T&G and glueless joining systems

The photos above courtesy of the ATFA publication ‘Engineered Flooring Industry Standard V1-February 2012

The T&G profile is used for direct adhesive fix applications where adhesive is used to bond the lower surface of the boards to the subfloor. This profile is also used for floating installation and in this application, adhesive is applied to specific locations within the T&G joint. The reason for our use of a T&G joint instead of a glue less joint is that these types of systems can be prone to crackling sounds when walked on in many situations as the profile rubs between boards.

Board size and strip construction

A wide range of board widths are available in our engineered flooring with narrower boards down to about 80 mm in width up to 250 mm, it can be supplied in random length nested packaging from 600mm to 2200mm or set length packaging from 600mm to 3000mm depending on product and feedstock. Within the 2200mm packaging range will include a quantity of shorter boards in the form of “nested lengths”. These are normally included in the floor as starting or finishing pieces and will generally not detract from the random appearance of the floor. The quantity of short boards can be up to 25% or more of the stock in square meter terms. If board length is of particular concern to the consumer, then specification regarding short boards should be sought. Reference is at times given to the terms ‘one strip’, ‘two strip’ and ‘three strip’. This refers to the number of widths of lamella covering the base layer.

Direct adhesive fix and floating installation

There are two main methods in which engineered floors are laid. Many floors are direct adhesive fixed to the subfloor which may be concrete or sheet flooring such as particleboard or plywood. A direct adhesive fix floor provides a solid feel under foot and with some products is considered to be more suited to higher humidity environments. Floating floors as the name suggests indicates that there is no fixing of the flooring to the subfloor. The boards are fixed to each other by glue in the T&G or may alternatively some of our range may be joined using metal clips to lock the T&G together and these then rest on an underlay. Correct sub-floor preparation along with careful underlay selection, will ensure a solid foot feel and sound. Note also that some products have been tested for installation and direct fixing to floor joists or battens over concrete slabs.

Coating system and gloss levels

With most engineered flooring prefinished in the factory, a very high standard of finish is achievable. In many products the coating to the exposed upper surface consists of a multi-stage system including fillers, sealers and final coats with additives to provide a tough wear resistant surface. Coloured stains may also be used in the coating system to add different colours or tones to the boards. The coating is done in a controlled environment with UV curing that provides a fully cured finish at the end of the process. Products are available in a low sheen finish.

Some product is available unfinished so that it can be sanded and coated on site. Sanding and coating on site can be beneficial in permitting the final appearance to be achieved at the end of the project when floor installation is required beforehand. It also provides for coating choice. Although a high standard of finish is achievable, site sanded, and finished floors generally contain some imperfections and where such imperfections have a limited effect on the appearance of the floor, the imperfections are considered acceptable.

Timber species in the face lamella

A wide range of species and species mixes are available as the face lamella in Australian species. Often trade names are applied to products when a stained coating is applied and therefore in this instance selection may be on board colour rather than species. A number of Australian species are, however, referred to by their common names due to familiarity of these species in the Australian marketplace. Australian species and species mixes such as Messmate, Wormy Chestnut, Blackbutt, Sydney Blue Gum, Rose Gum, Tasmanian Oak, Red Mahogany, Victorian Ash and Stringybark are available. Similarly, overseas species such as Oak, Maple, Merbau, Hevea may be used in production.

Colour variation

The face lamella or veneer on all engineered flooring is natural and subject to the natural colour variations within the species. Colour or tone variations are less apparent in some species than others, but no two packs of flooring will be identical. This is part of the beauty of choosing a natural product in that it is unique. Purchasers need to be fully aware of the natural colour variations will occur between boards of the same species and also that one pack may contain a different blend of colours to another pack, particularly if they were not manufactured at the same time. It is suggested boards from different packs need to be blended into the floor during installation, careful not to open more than a few packs at a time and only open what can be laid on that day.

The customer needs to be fully aware and accepting of the fact that colour variation occurs. If there are significant concerns regarding the supply of the flooring it must be raised with the supplier prior to laying. Normal colourations between boards do not provide grounds for replacement and any concerns need to be raised prior to laying.

Retailers and consumers should also be aware of the large amount of colour change that can occur in wood due to exposure to natural light. This can often mean that there is a highly contrasting variation in colour between the in-store sample (which may be some years old) and the newly delivered flooring. The adjacent image shows a piece of Jatoba, where the left half of the sample has been exposed to natural light for 3 months and the other half covered. Some species are prone to more intense colour changes than others. As can be seen, the potential for argument and disappointment on inspection of the new flooring is substantial but may be avoided by proper education of the retailer and consumer. Colour changes will also occur after a floor is laid, particularly in rooms receiving greater natural light. When this effect is more pronounced, floor mats and rugs should not be used for up to 6 months, noting that greater care at external doors may be necessary during this period to prevent grit entry from footwear. Similarly, some items of furniture may need to regularly be moved a little if it is desired to minimise this effect. Colour change is natural and does not relate to a product defect.

Grade

In engineered flooring when we refer to the grade of a floor, we are referring to the size and number to features that are present in the boards. These grades are manufacturer specific. Natural features include such things as gum veins, knots and past borer and insect activity, along with man-made features including nail, screw and bolt holes. Aspects relating to board colour or length are not covered by grading. (Solid Australian hardwood flooring has a tradition of being sold with features in it as many like the character that gum veins and the like provide in a floor, considering that it looks more natural. In the adjacent photo, gum veins add natural character to this Blackbutt floor.) When the face lamella or veneer of engineered flooring is of an Australian species a grade name often accompanies the species or common name. Some grades names are associated with flooring where the features are more dominant and others where the features in the floor are less dominant. With some products the same grade descriptions used for solid hardwood flooring in AS 2796 Timber - Hardwood - Sawn and milled products are used. Where products contain grade features, customers need to be familiarized with what may be present and that in different species the type of feature predominating will often differ.

Again, it is prudent to open packs of flooring prior to installation and for the customer to be fully aware and accepting of the grade features at that time and, similarly, that selection and placement of boards to provide an even blend throughout the floor can be achieved by selecting and laying from multiple packs. Boards that are within grade do not provide grounds for replacement and any concerns need to be raised prior to laying.

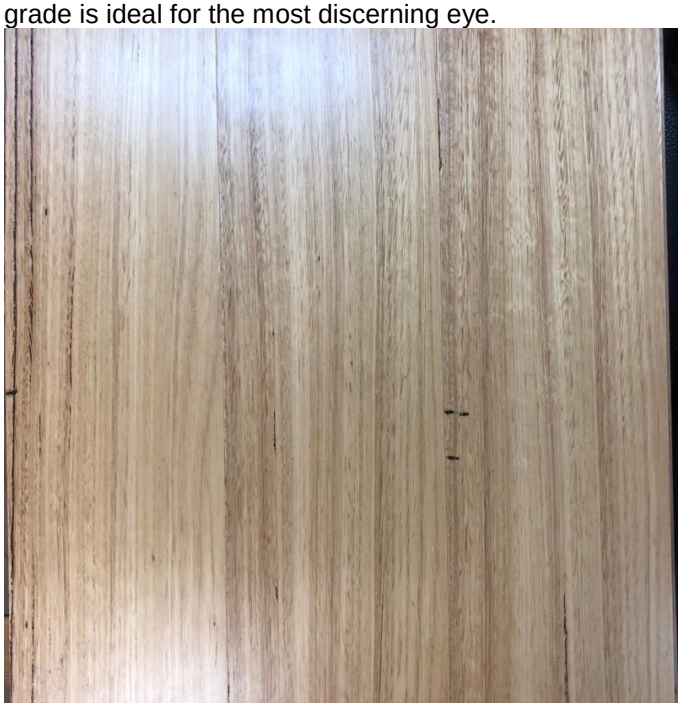
Rough sawn face has virtually no grading and is supplied “as is”.

RECYCLED TIMBER INNOVATIONS

When stock allows for additional grading it may be graded and sold with the following terms for grading or when no grade is specified it will be sold as a mixture of all of the grades.

AB Grade "LIGHT NATURAL FEATURE".

Is our highest grade it can contain a very subtle amount of natural occurring features. This grade of flooring once installed presents a very uniform natural look. As a natural product this grade of timber flooring will contain some degree of feature such as pin holes, gum vein, surface checking, knots, sapwood, natural occurring stains, black specks, burls and hobnails. The premium appearance of this grade is ideal for the most discerning eye.



ABC "MODERATE NATURAL FEATURE".

Is carefully selected to include the most natural and interesting features to enhance the natural appearance of your timber floor. This grade may contain, screw holes, nail holes, saw cuts, large knots, gum vein, pin holes, surface checking, splits, cracks, manmade features and other natural occurring features many are filled during manufacturing to lessen the amount of work required onsite.

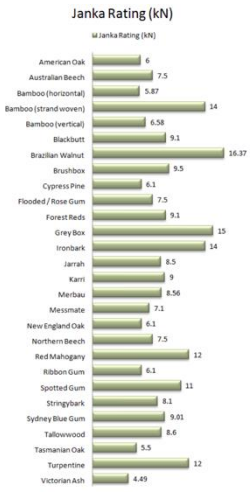
RECYCLED TIMBER INNOVATIONS

CD HIGH NATURAL FEATURE.

Will include the most rustic, natural and interesting features to enhance the natural appearance of your timber floor. This grade may contain, screw holes, nail holes, saw cuts, large knots, gum vein, pin holes, surface checking, splits, cracks, manmade features and other natural occurring features This very Rustic grade presents a timber floor to you the way Mother nature intended with very little done to adjust this natural featured grade appearance. Each one of these character floors will tell its owner its own unique story of its past life.

RECYCLED TIMBER INNOVATIONS

Timber species hardness



Hardness of timber in Australia is a measure of a board's resistance to indentation. The test undertaken is known as the Janka hardness test and it measures the force that it takes to press a steel ball a certain depth into the timber. The test was derived for solid timber and as a force is being measured, the units of measurement are in kN (kilonewtons). Due to this some care is necessary when applying this to engineered flooring as often the hardness being quoted relates to the species of timber in the surface lamella or veneer. As this becomes thinner, it will be more the resistance to indentation of the core layer that governs a product's resistance to indentation. This is not to say that flooring will not indent as stiletto heels will indent most timber floors irrespective of whether engineered or solid. As such it becomes a matter of sensible footwear management and similarly if furniture, appliances or the like are dragged or dropped on the floor it can be expected to indent, bruise or scratch.

Wear

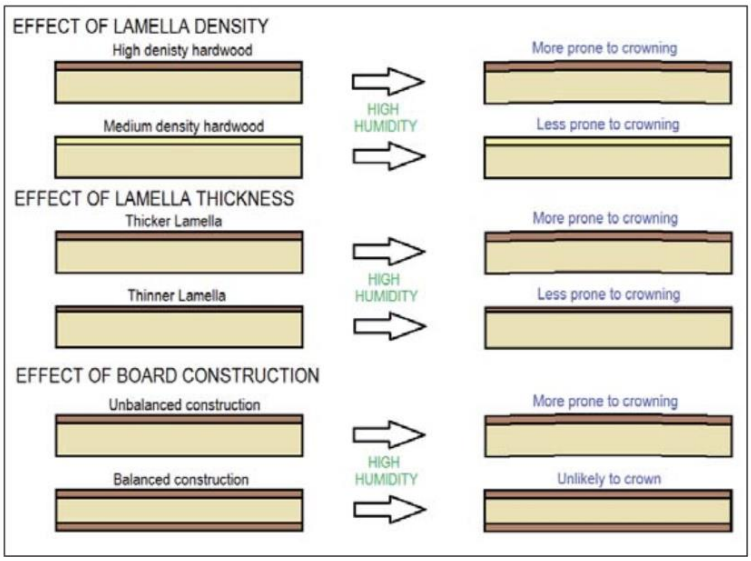
Like all floor coverings, factory coated engineered timber floors will show signs of wear over time depending on the amount of use the floor receives. If floors are site sanded and coated, then wear relates to the products used to coat the floor. By implementing a regular cleaning and maintenance program, you can ensure your floor remains in the best condition possible. Note that coating and surface finish warranties is specific in what it covers. The warranty is more to cover a problem with the manufacture or initial application of the factory coating rather than aspects relating to normal wear in the floor. The warranty requires proper maintenance of the wood flooring for a claim to be valid. Note that guidelines include the re-coating of the floor when it shows signs of wear.

Expansion characteristics

It has been outlined above that one of the main characteristics of engineered flooring is that cross lamination and ply or other cores provide increased stability in the width movement of the board to changes in relative humidity. As a result, with the same change in moisture content to that of a solid timber floor, the width movement in a cross laminated engineered board may be reduced to as little as a tenth of solid flooring. However, whereas a solid timber floor has no appreciable expansion in the length of the board, the cross laminating does introduce a small amount of movement down the length of the board. This movement, therefore, needs to be catered for at installation through expansion allowance. The different core layers will provide a similar increase in stability, the expansion characteristics of such products can also be expected to differ individually from product to product. It is also important to note that floating engineered floors form a very large engineered panel of wood that tends to behave as a panel. This requires certain consideration and anticipation about how this large panel will behave, particularly in regard to how much perimeter gap will be required, and in which direction the panel will tend to expand or contract. Consequently, the positioning of expansion joints between areas of a floor that will expand differently is very important and floors need to be cut around heavier benches and the like to permit free movement of the flooring.

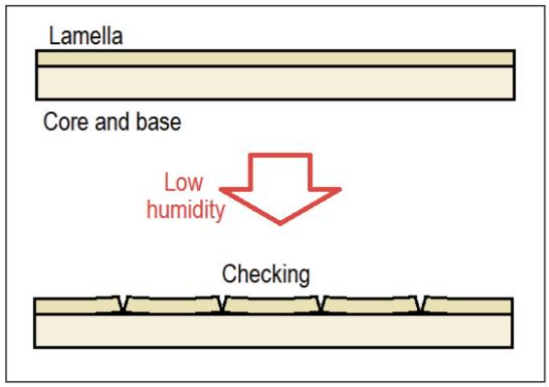
Effect of humidity on products

Engineered flooring performs through a wide humidity range and is generally manufactured at lower moisture contents. When in service in uncontrolled naturally ventilated environments, the flooring can be expected to absorb moisture from the humidity in the air. This will often cause some swelling of the face lamella, but the overall effect on the board will differ depending on the construction of the board, the thickness of the face lamella and also on the strength of the species in the face lamella. Such effects are much less apparent with the thin veneers. These concepts are outlined in the diagram below and slight crowning, due to arching of the boards, is shown in the photo.



Crowning

If the humidity is very low, which can be brought about by the likes of high use of heating in a room or flooring that is too high in moisture content at manufacture, then moisture from the board can be lost to the air resulting in the face lamella shrinking. This can cause checking or splits through the face lamella as shown in the diagram and photo below.



Checking

Also, with direct heat sources such as areas of more intense sun exposure on floors, as shown in the adjacent photo, or with under floor heating there can be small amounts of shrinkage that can result in slight separation of board joints. Generally, this is minor as the floor simply reflects the natural properties of timber. When conditions change and there is more humidity in the air such gaps will often lessen in size or close. In some instances, with T&G floors the glue bond can let go and result in some irregularly spaced wider gaps.

It is evident from the aspects discussed above that different products and different "species" of the same product may behave differently in a particular environment, with some products performing better in more extreme environmental conditions. We recommend a humidity range of between 45-55% Ambient Relative Humidity for all our products are best suited to this range for optimal performance and therefore it is important that these be followed. To prevent complications because of low RH, its recommended that the end-user install a whole-house humidification system if conditions are expected to be dry and have a low RH. At the minimum, small portable humidifiers can also be used. The key is to keep the RH levels constant, even if a bit high or low, to prevent cupping, gapping, cracking and checking of the boards. Dehumidifiers are also recommended in times of high humidity to prevent the flooring from taking up moisture and expanding.

Gapping

Locality, dwelling environment and product choice

As outlined previously it is mainly the relative humidity that influences the moisture content of flooring and different products will be more suited to some localities and internal environments than others. The table below indicates the moisture content that timber will approach under set conditions of relative humidity and temperature. As an example, if the conditions above a floor were maintained at a temperature of 20°C and the relative humidity maintained at 55%, then in time the flooring moisture content would settle to about 10%. At this temperature a rise in relative humidity to say 65% would result in board moisture content rising over a period of time to about 12%, conversely a lowering in relative humidity to a very low 35% would cause the moisture content to reduce to about 7%.

Temperature	Moisture content at various relative humidities																		
°C	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
0	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3
10	1.4	2.6	3.6	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.3	11.2	12.3	13.4	14.8	16.4	18.4	20.9	24.3
20	1.3	2.5	3.6	4.5	5.4	6.2	7.0	7.7	8.5	9.3	10.1	11.0	12.0	13.1	14.5	16.0	18.0	20.5	23.9
30	1.2	2.4	3.4	4.3	5.2	6.0	6.7	7.5	8.2	9.0	9.8	10.6	11.6	12.7	14.0	15.5	17.5	20.0	23.4
40	1.1	2.2	3.2	4.1	5.0	5.7	6.4	7.1	7.9	8.6	9.4	10.2	11.1	12.2	13.4	15.0	16.8	19.3	22.7

Within a dwelling there are many things that influence the relative humidity and a comfortable living environment is not as extreme as the conditions outside the dwelling. In cold climates the internal environment is moderated by heating when cold wet conditions cause high humidity outside and in

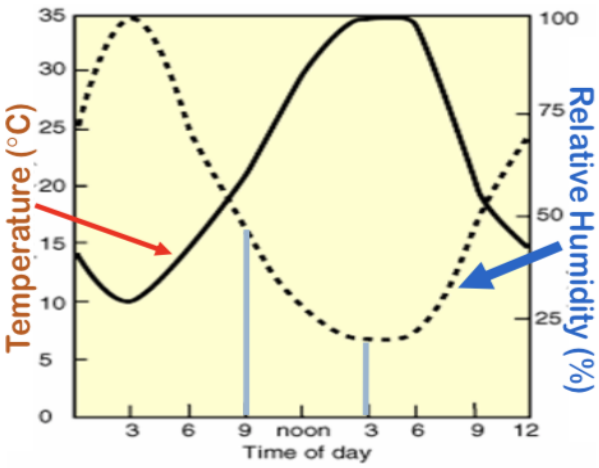
summer months when conditions can be hot and humid, refrigerated air-conditioning is often used which moderates the high external humidity. In places experiencing hot dry summers, evaporative coolers add moisture to the air thereby also moderating the conditions. Furnishing such as curtains and rugs also tend to moderate the internal environment by not only reducing heat gain in the floor but also absorbing and emitting moisture depending on the humidity, similar to the floor. Generally, in the conditions that we feel most comfortable, the engineered floor will also perform the best.

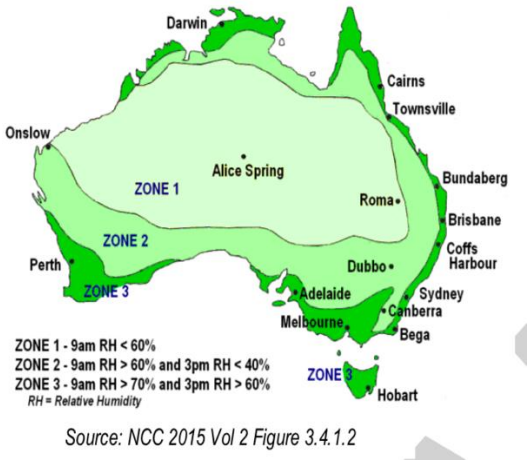
Care is necessary not to create conditions within the dwelling that we would feel particularly uncomfortable in. More extreme use of heating and cooling systems, unfurnished dwellings and permitting hot humid conditions for extended periods inside the dwelling can all have a detrimental effect on engineered floors.

Differences in the construction of engineered products have been outlined above and associated with these there will be differences in the performance of products in particular environments. Most engineered products are well suited to drier conditions with manufacturers and suppliers often indicating suitability down to about 35% relative humidity. For the main populated coastal cities humidity may drop below this for only short periods in very dry conditions such as during bush fire days but the period over which this occurs is not generally sufficient to affect the floor.

However, with higher humidity conditions greater care is necessary. Often during the building phase when the dwelling is not being lived in internal conditions tend to more closely reflect external conditions. Floor installation at the end of the building process, particularly if the building is during a humid time of the year, is therefore necessary. Other humid localities include the tropics, buildings within a few hundred meters of the coast, areas with large expanses of grass around them such as farmland, gullies with tall surrounding trees and where the dwelling is often shaded and often near a watercourse (as indicated in the photo), and elevated hinterland and ranges where conditions are often cooler and cloudier and mistier.

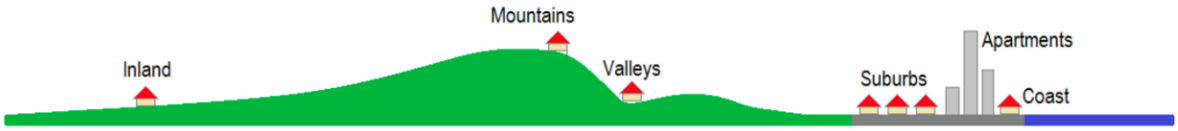
Regarding this some products are only recommended for internal environments up to about 65% relative humidity for floating floor applications and 70% for direct adhesive fix applications. Similarly, although short periods exceeding these values will not affect the floor, even in localities such as Brisbane, and more so in the northern tropical locations, relative humidity in a naturally ventilated dwelling will frequently and consistently exceed 70%.





Source: NCC 2015 Vol 2 Figure 3.4.1.2

It is also important to understand and consider that within a locality there are going to be geographic differences between one dwelling, and dwelling type compared to another. This is best explained with reference to the figure below showing dwellings that are on the coast, through to suburban environments and then valley, mountain and inland areas. This is indicative as it will also be influenced by location within the country, but similar principles can be applied.



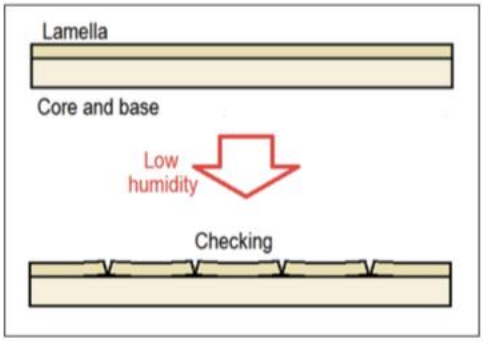
In this example it needs to be considered that the foreshore has cool sea breezes often prevailing, causing lower afternoon temperatures and higher afternoon humidity. In such locations internal EMC may range from 12 to 13% with natural ventilation more likely. Apartments along the coastal fringe may be similar if naturally ventilated although many have controlled cooling systems and internal EMC's may be 9 to 11%. In the suburbs there are many roads and closely spaced houses. Roads heat up and rainwater is quickly drained away from roofs and roads. As such internal conditions are usually drier than on the coastal fringe and may be 10 to 11%. The valley environment often has more open land and trees which hold moisture and there is greater shading of the dwelling. This may result in internal EMC's of 12% to 16%. Houses elevated on the likes of escarpments can be prone to periods of lower temperatures due to the height and higher humidity, more rain and mist, yet at other times of the year subject to dry winds. Houses may also be open beneath. As such quite variable seasonal conditions can occur and internal EMC's could vary from 11% to 16%. Further inland the effects of dry winds and moderate rain may see internal EMC's range from 9% to 12%.

Glossary of commonly used terms

Acclimatisation – Some product suppliers indicate that flooring should not be installed immediately after it is delivered to site. However, with engineered flooring, acclimatisation can have different meanings. In many instances it refers to storing the flooring in the installation environment in its boxes for a period so that it can become accustomed to the temperature within the dwelling. In a few instances acclimatisation may be referring to unpacking and equilibrating the flooring to the internal relative humidity. Also see relative humidity.

Buckling – This refers to a group of boards arching off the subfloor generally due to the expansion allowance provided being exceeded. Also see expansion allowance.

Checking – This refers to fine splits in the surface coating and decorative timber layer beneath. Some species are more prone to this and both very dry and very humid climates can make it more pronounced.



Checking

Construction joint – At times concrete slabs are joined (e.g. house extensions) but if the joint is not properly sealed, moisture vapour or even moisture from capillary action can pass through such a joint and affect the flooring above. Installers need to be aware of the potential risks of construction joints, however work to appropriately seal these joints, unless specified, is the responsibility of others. Subfloor expansion joints and construction joints running parallel to the direction of laying should be mimicked in the engineered floor above.

Cross lamination – When the veneer or lamella and layers beneath are adhesive fixed and each layer alternates 90 degree in grain direction, this is known as cross lamination. This process provides additional stability to board width changes as the relative humidity varies. See also veneer, lamella, stability and relative humidity.

Cross linked PVA – When T&G flooring is laid as a floating floor adhesive is applied to board joints. This is usually PVA adhesive and when cross linked it becomes less susceptible to breaking down under the effects of heat and moisture from a spill or similar. See also tongue and groove and floating floor.

Crowning – This refers to boards that have arched across the width of the board resulting in board edges being lower than the centre of the board.

Cupping – This refers to boards that have a dished appearance across the width of the board resulting in board edges being higher than the centre of the board.

dB – Noise transmission through a floor is measured in decibels with the abbreviation dB. Most of us would notice a change of 3dB and a reduction of 10dB would sound about half as loud. Choice of underlay can affect the noise transmission through a floor but there are also many other factors that contribute, including the likes of the thickness of the slab subfloor. See also underlay and subfloor.

Engineered floor – Flooring manufactured with a decorative layer of timber bonded over layers beneath. This not only provides additional stability but also maintains the appearance and characteristics associated with solid timber flooring. Also see stability.

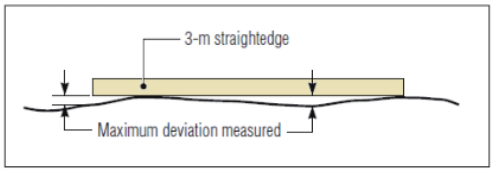
Evaporative cooler – These are generally associated with a rectangular box-like structure fixed to the roof of a dwelling. When water is evaporated off a surface there is a cooling effect and it is on this principal that these units operate. They introduce cool higher humidity air into the dwelling and with high use without appropriate venting can raise the relative humidity in a dwelling, causing a moister internal environment. This type of air-conditioning is more common in drier climates. Also see refrigerated air-conditioner, relative humidity and in-service moisture content.

Expansion allowance – Due to the hygroscopic nature of timber flooring products, all floors require expansion allowance. With small floors this may only be required at the outer edges of the floor and be covered by skirtings or beading. However, many floors will also require intermediate expansion allowance provided at doorways and at times within the floor due to the greater width of length in those floors. See also hygroscopic.

Flatness – It is important that the surfaces on which floors are laid are flat. Flatness differs from how level a floor is. A floor can be flat, not undulate up and down but may not be level in that it slopes from one side of a room to the other.

The puddles indicate low areas in this slab

Subfloor flatness needs to be within the required tolerance



Glue less joint system – This refers the jointing system where the profile machined along the edges and ends of boards enable installation without the need to glue the board joints. At the factory, wax is at times applied to the joint to reduce possible squeaking from rubbing in the joints. Also see tongue and groove.

Grading – This is a process of sorting boards based on the features such as gum veins and knots present in them. Therefore, one grade of a specific name may have fewer and smaller features than another grade of a different name. Grading does not cover board length or colour.

Hardness – In Australia timber hardness is a measure of a board's resistance to indentation. The test undertaken is known as the Janka hardness test and it measures the force that it takes to press a steel ball a certain depth into the timber. In engineered flooring the core layer and veneer or lamella thickness can affect the hardness of the board and it is important to be aware that the hardness quoted is of the timber used in the face veneer or lamella. Also see veneer and lamella.

Hygroscopic – A material that is hygroscopic will absorb water vapour from the air or release water vapour to the air depending on its moisture content and the relative humidity of the air. Both timber and concrete are hygroscopic materials. Also see relative humidity and moisture content.

In-service moisture content – The moisture content that timber attains is dependent on the relative humidity and temperature within a room. In naturally vented houses the average moisture content is generally a little less than if the timber was under cover and outside. However, the likes of heating and air-conditioning can have a significant effect on the average moisture content of a floor. In-service moisture content refers to the range of moisture contents the floor will experience as a result these effects. These include internal conditions that may also be modified by heating and cooling systems. Also see moisture content, relative humidity, refrigerated air- conditioner and evaporative.

In-slab relative humidity – The surface moisture in a slab may be assessed using a moisture meter, however to assess the moisture deeper in a slab and possible future effect on an engineered floor the measurement of relative humidity within the slab can provide additional guidance. This test method is growing in popularity. Also see moisture meter and relative humidity.

Lamella – With engineered flooring this refers to the layer of decorative timber on the face of the board and is often thought of as being thicker than a veneer. A lamella is often up to 2.5 to 6 mm thick. Also see veneer.

Micro climate – All house sites differ, so even though weather patterns may relate to a specific locality, aspects such as whether the house is on a hill or in a gully can affect the performance of the floor. Micro climate refers to the humidity and temperature effects specific to building location.

Moisture content – This is a measure of how much water a material such as timber or concrete contains. At a particular relative humidity the moisture content of two hygroscopic materials will differ. At 60% relative humidity timber attains a moisture content of about 11% whereas concrete attains a moisture content about 2%. Also see hygroscopic and moisture content.

Moisture meter – Due to flooring and subfloor materials being hygroscopic, meters have been developed to assess the moisture content of these materials. Meters have their limitations and the interpretation of readings should be by someone with experience. Also see hygroscopic and moisture content.

Moisture retarding barrier – Where the engineered floor is direct adhesive fixed to a slab, this refers to an applied product over the slab where the purpose is to reduce moisture vapour transmission from the slab to a level that will not affect the flooring. Note that these are not moisture proofing membranes.

Prefinished – Many engineered floors are sold with the coating system already applied. If this is the case and the flooring after installation does not require sanding and coating, then it is a prefinished product. Also see UV cured.

Refrigerated air-conditioner – Often referred to as reverse cycle, split system or ducted air-conditioning, this type of air-conditioning extracts water vapour from the air inside the building and drains this away outside. High usage can reduce the relative humidity inside and cause a drier internal environment. This type of air-conditioning is more common in more humid climates. Also see evaporative cooler, relative humidity and in-service moisture content.

Relative Humidity – This is a measure of the capacity of the air to hold invisible water vapour at a particular temperature. Under high relative humidity conditions some of this water vapour can be absorbed by the flooring causing board expansion and under low relative humidity conditions water vapour can be released from the flooring back to the air causing board shrinkage. Relative humidity is expressed as a percentage (%) where 30% and below would represent very dry conditions and 80% and above very moist and humid conditions. Also see hygroscopic, stability and moisture content.

Scuffing and scratching – Although coatings provide a floor with a good wear resistant surface they can mark with grit or objects drawn across them. More flexible coatings will tend to show dull marks know as scuffing and harder brittle coatings will tend to show scratch marks. All floors require normal care provisions.

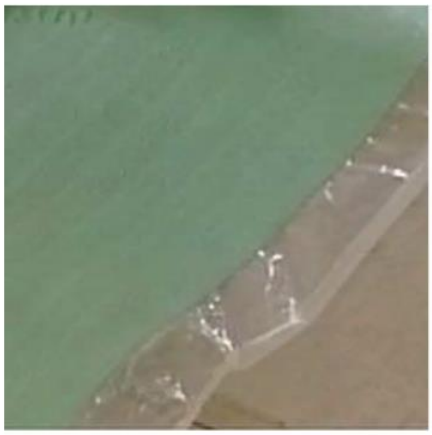
Stability – In terms of timber flooring, a more stable flooring product is one which undergoes only small changes in its dimensions (width and length) as a result of moisture vapour uptake or loss from the air. Consequently, expansion and shrinkage of the product in response to changing environmental conditions is small. Also see hygroscopic, relative humidity and moisture content.

Strip construction – Reference is at times given to the terms ‘one strip’, ‘two strips’ and ‘three strips’. This refers to the number of widths of lamella covering the base layer, i.e. a two-strip floor will have what would appear to be two board widths adhered to a single layer beneath. Also see lamella.

Subfloor – The term subfloor is the structural surface over which an engineered floor is laid. This can be concrete, particleboard and plywood or in some instances joists. Also see underlay.

Tongue and Groove – This is often abbreviated as T&G and refers to a board profile that slides together at edges and ends. When used with floating floors adhesive is applied to the joints. Also see glue less joint system.

Underlay – With floated floors it is necessary to provide a cushion between the flooring and subfloor. This is the underlay which is generally a thin foam, but which often contains a moisture retarding barrier. Also see subfloor.



Underlay with integral moisture retarding layer

UV cured – When prefinished flooring is manufactured the coating system applied in the factory is cured by ultra violet light and as this is almost instant, boards can be handled immediately at the end of the coating line. This process enables wear resistant layers to be added to the coating system and provides a very high standard of finish. Also see prefinished.

Veneer – With engineered flooring this refers to the thinner layer of decorative timber on the face of the board. A veneer is often up to 2 mm thick but may also be thicker. Also see lamella.