

Timber flooring

Timber Inspection Branch

Home design considerations

Shrinkage and expansion of timber floorboards and timber wall panelling is a natural and cyclical process. The degree of movement depends on the surrounding changes in atmospheric moisture content and therefore is generally controlled by seasonal weather conditions. Changes are most evident during long periods of either dry or wet conditions. However, local conditions also have considerable influence.

Good ventilation under your floor is a very significant factor in a successful timber floor installation. Minimum ventilation recommendations may not be adequate for your site. Excessive humidity in the under-floor area can be caused by the lack of sufficient cross-ventilation or from damp soil conditions arising from poor drainage. Ensure that water from gardens or stormwater does not drain under the floor area and that no water lies in the under-floor area.

The profile of wall panelling is usually such that each board allows for a reasonable amount of dimensional change without shrinkage or expansion being obvious. The same, however, does not apply to floorboards, where if shrinkage occurs, small gaps can be seen.

Air conditioning and heating systems dramatically reduce the general moisture content within a home. Your flooring or panelling specialist should be made aware when these systems are to be used. It may be necessary or advisable before fixing and coating to operate these systems and to acclimatise the flooring or panelling to the average conditions expected in these situations.

Shutting a house up when away on holidays for long periods can also create abnormal humid conditions.

Full length windows, large glass areas and skylights which admit direct sunlight can create sunroom conditions with high temperatures and low moisture

conditions causing flooring or panelling to shrink. Direct sunlight will also cause colour changes to the timber, so it is a good idea to move rugs occasionally and to use curtains or blinds.

If your home is located close to a body of water, such as the ocean, a river, lake, dam or wetlands, or if it will experience prevailing winds which may direct particularly moist or dry air towards your home, special moisture control measures may be required. Expert advice should be sought.

Table 1 gives an indication of the equilibrium moisture content to be expected for a range of atmospheric conditions.

Polyurethane finishes

Timber is a natural material. Its moisture content at any time will be influenced by the ambient moisture content of its surroundings. For this reason, it is important that the finish coating, or lacquer, applied as a sealant should be of a type that will allow free movement between dry jointed timbers.

Seasoned flooring is supplied with a moisture content within the range of 9 per cent to 14 per cent.

Careful consideration needs to be given to the moisture content of the timber floor when fixing it in place, i.e. location, time of year, type of heating/cooling system to be used, etc. It should not be assumed that the moisture content of the seasoned timber will be at a desired level unless the desired level has been determined and the timber checked prior to fixing.

If the timber has been fixed at an appropriate moisture content level for the environment within the room, then the timber will expand and contract slightly and uniformly as the 'environment' gets slightly moister or drier.

With free movement in the joints this movement is hardly noticeable. However, a sealant which gets between the dry joints and effectively bonds the boards together does not allow the free movement

and the result is often a 'clumping' of boards with irregular, larger, more noticeable gaps between every fifth or sixth board. In some instances the gluing effect is stronger than the timbers ability to hold itself together and the board may split.

Polyurethane sealants are in a group of sealants which are capable of bonding or gluing boards together.

If the floorboards are fixed at the correct moisture content for the location and the ambient moisture content of the surroundings does not fluctuate excessively then there will be minimal movement and therefore no problem with bonding or gluing type sealants.

Prior to specifying any sealant for a timber used as flooring or wall panelling, advice should be sought as to its ability to allow free movement of timbers that are intended to be dry jointed.

Acclimatisation of natural timber flooring

Acclimatisation of floorboards prior to fitting is only recommended when there is a difference between the moisture content of the floorboards and the average moisture content expected in the building after occupation of that building. Acclimatisation was always recommended in years gone by when drying techniques were poorer and the moisture content in the floorboards often varied. In some instances, flooring was supplied unseasoned or partly seasoned. There was an expectation that the floorboards would be closer to the equilibrium moisture content if they were acclimatised at the site.

With improved drying practices and greater knowledge of the drying process, floorboards can now be supplied at a reasonably uniform and predictable moisture content. Acclimatisation is, in most cases, not considered necessary particularly when such acclimatisation is to the conditions prevailing on site during construction rather than to the conditions expected to prevail in the finished and occupied building.

The equilibrium moisture content (EMC) for the Sydney area is about 12 per cent moisture content (MC). In general, timber in service inside an un-airconditioned building in the Sydney area will achieve an equilibrium with its surroundings at about 12 per cent MC depending, of course, on local conditions such as climate, proximity to a large body of water, dry or moist prevailing winds, skylights, direct sunlight, and so on. Some buildings will have an EMC higher than 12 per cent MC and other buildings will have an EMC lower than 12 per cent MC. Seasoned timber including floorboards with a moisture content of about 12 per cent MC is generally considered a good starting point for the majority of buildings in the Sydney area.

During the life of a floor the floorboards will take up a little moisture and lose a little moisture in a cyclical way as the changing seasons influence the relative humidity and temperature in the local area.

As a result, the floorboards will expand a little and shrink a little. The degree of expansion and shrinkage is generally so small it won't be noticed.

If a floor is wider than about six metres (measured at right angles to the lengths of the floorboards) it is considered a "wide" floor.

Care should be taken to ensure that adequate provision has been made for any potential expansion. In "wide" floors even a small expansion in individual floorboards can have a cumulative effect across the floor which may cause problems with the floor unless such provision has been made.

In the unlikely event that there is a problem with a timber floor or panelling, Forests NSW Timber Inspection Service can inspect the timber and prepare reports.

Timber Inspection Service

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (February 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up-to-date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

