

### Introduction

This data sheet considers applications where movement associated with moisture content changes needs to be considered and should be accommodated for at the time of design, specification and installation.

### Seasoned and Unseasoned Timber Products

There are a wide range of products that are seasoned and an equally wide range of products that are unseasoned. Table 1 lists out a range of product types.

### Timber used outdoors

Both seasoned and unseasoned timber is used in external applications and to some extent this relates to the end section size and stability requirements for the product. As the thickness of a piece of timber increases so does the time and difficulty in drying it. In the higher density hardwoods a thickness greater than 38 mm is seldom seasoned and in softwoods 50 mm. Even at these thicknesses seasoned material may be difficult to obtain and is often sold unseasoned. Cypress for external structural uses, with the specific properties it has, is also normally sold unseasoned.

In applications such as domestic decking where it is desirable to have relatively even gapping between boards and a more stable product at the time of installation, the material should be seasoned. With cladding it may also be desirable to have a more stable product prior to installation (to prevent repainting at board joints following shrinkage) and therefore many of these products are also seasoned. The traditional hardwood weatherboard used for many years in Queensland is an unseasoned product and both shrinkage and some limited movement in some boards can be expected after installation. Some remedial work should be allowed for in this instance.

With unseasoned products there is opportunity both at design and installation to limit the effects of shrinkage and distortion that may occur after installation. Design should ensure that unseasoned members are only used where they can be properly restrained and during installation members should be primed and fixed to limit the movement as the member naturally dries.

In commercial decking projects a wax additive may be added to the preservative treatment to slow the natural in service drying process. The notching of unseasoned members over supports to effectively reduce the depth of timber at the support will also reduce the amount of shrinkage at the support. Refer to Figure 1. When exposed to the weather durability issues must also be addressed.

Figure 1

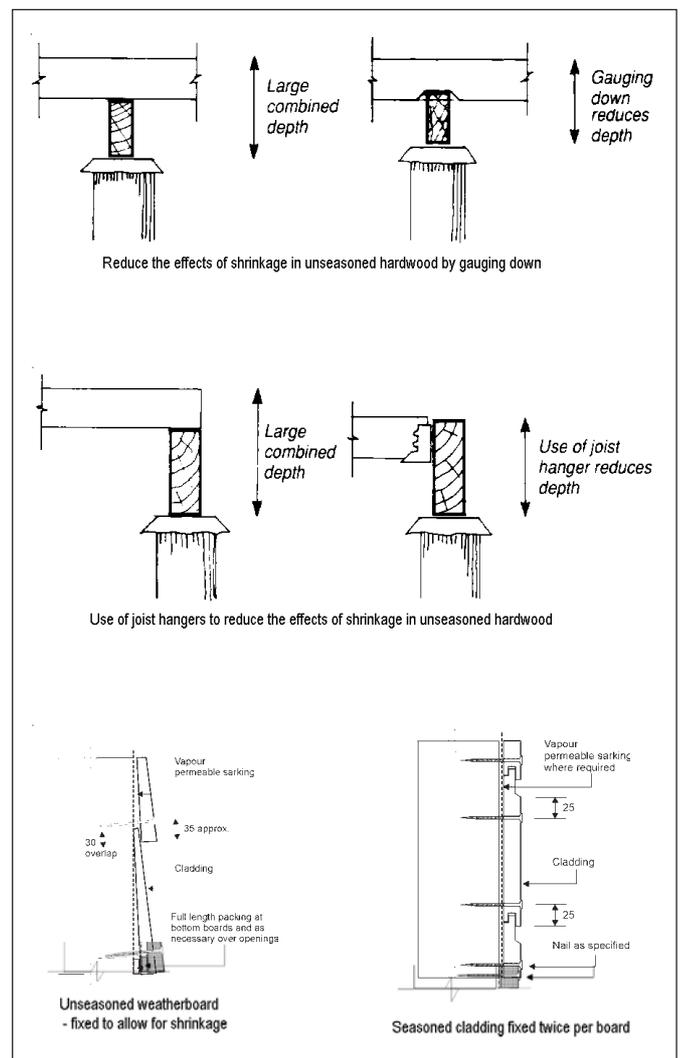


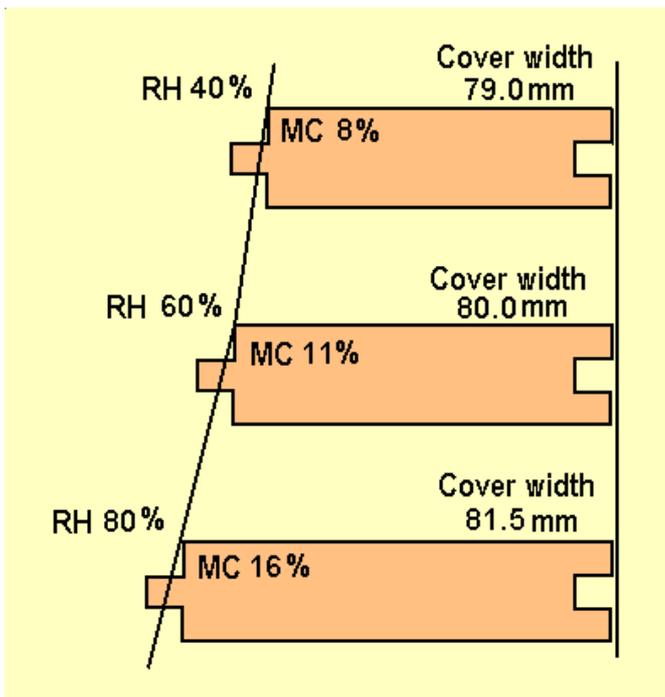
Table 1

Seasoned products	Unseasoned products
Pine house framing	High density hardwood structural framing
Medium & high density hardwood structural framing	High density hardwood large end section structural members
Engineered timber products (eg glulam & 'I'beams)	Hardwood and cypress posts
Chamferboards – (hardwood and softwood)	Cypress house framing
Light decking – (hardwood and softwood)	Hardwood Weatherboards
Flooring and lining	Commercial hardwood decking
Mouldings	Landscaping timbers and fencing
Furniture	

## Timber used in internal applications

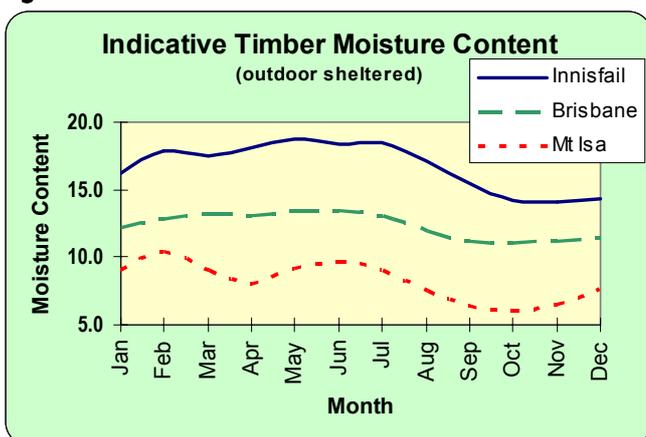
For internal applications (other than cypress and some hardwood framing), timber should be seasoned. Movement that occurs through shrinkage and distortion of unseasoned timber in internal applications is not generally acceptable. However, as previously stated, even when seasoned timber is used internally some movement still occurs which is primarily due to variations in air humidity (moisture in the air). The relationship between air humidity, timber moisture content and board movement is illustrated in Figure 2.

Figure 2



Timber is relatively slow to take up and lose moisture and due to this, average monthly changes in humidity provide a better indication of the seasonal movement that is likely to occur. Indicative graphs can be generated from weather data, which may be used as a guide to the moisture content and movement that can be expected. It should however be noted that local effects (relating to locality or building design) can significantly affect average humidities within a structure. Figure 3 provides graphs based on long term averages for Brisbane, Mt Isa and Innisfail. For timber stored outside and under cover, these illustrate the differences between dry, moderate and moist tropical climates within the state.

Figure 3



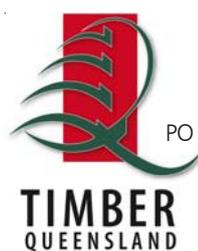
These graphs illustrate the need to accommodate the difference between the average moisture content of the timber as supplied and that which it is likely to attain in-service. Most timber for internal applications is dried to moisture contents in the range from 9% to 14% with an average of between 10% and 12.5%. In applications such as timber floors, where expansion and shrinkage affect the appearance of the floor, boards may need to be acclimatised or additional expansion allowance may be required. Acclimatising timber, where it is laid out in the in-service environment to take up or lose moisture prior to fixing, may only be effective if the environmental conditions are appropriate. The effectiveness also relates to the time period it acclimatises and response rate of the species being used.

Finishes on timber may slow the moisture uptake and loss from boards but it does not prevent it. Sealing timber does provide a useful means of reducing moisture uptake from direct wetting and solvent borne coatings are more effective than water based products.

The in-service environment can be influenced by many factors including air-conditioning, large expanses of glass, fireplaces and the degree of ventilation provided during the day. Appliances that vent warm air can also have a localised affect on timbers. Each of these alters the temperature and humidity within the dwelling and as such, with lower humidities the timber will adjust to the modified conditions by shrinking.

Care must be exercised when using timber in bathrooms and other wet areas. Generally, these areas are going to experience higher humidities and therefore adequate allowance for expansion must be provided. For wall linings and the like, increasing the number of coats will lower moisture permeability. Timber flooring is not permitted in wet areas unless a waterproof layer is applied over it. Moisture must also be prevented from seeping beneath the flooring.

The question is sometimes asked concerning the strength of timber once it has become wet. This can occur when a house frame is put up or in environmental conditions that are naturally very moist. Providing a house frame is not exposed excessively for long periods and is able to dry after the roof and wall cladding are in place, there are no ongoing effects from the exposure. If however structural timber is continually held at elevated moisture contents then the strength is affected and the appropriate modifications as provided for in AS 1720 need to be applied. In severe cases decay may develop particularly in bottom plates to the slab or over sheet flooring.



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