

# BULLETIN



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## CARE OF KILN DRIED FRAMING TIMBER



- ❑ Kiln dried timber is popular with builders and designers because it can be put to its final use immediately, but it does need a high level of care.
- ❑ This Bulletin provides practical advice for the care of kiln dried framing timber so it will perform as the manufacturers and specifiers intend.



## 1.0 INTRODUCTION

1.01 Kiln dried timber is used extensively in the building industry. Both treated and untreated kiln dried timbers are available. Generally joinery and internal finishing timbers are supplied untreated, whereas framing timbers and external finishing timbers can be supplied as either treated or untreated – depending on the species and the requirements of NZS 3602. The care of treated and untreated kiln dried timbers is the same. This bulletin deals specifically with the care of kiln dried framing timbers.

1.02 Kiln dried framing timber is available in untreated or treated (H1 and H3) forms. H1 and H3 kiln dried framing timber is usually supplied LOSP (Light Organic Solvent Preservative) treated. However, Boron treated H1 and CCA (Copper Chrome Arsenate) H1 and H3 treated timber can also be supplied. Although ACQ (Ammoniacal copper quaternary) and CuAz (copper azole) treatments are available for H3 framing timbers, they are not currently being used in conjunction with kiln drying.

## 2.0 ADVANTAGES AND DISADVANTAGES

2.01 Generally kiln dried timber is straight, light, stable and – due to its low moisture content – able to be put immediately to its end use. It is stable because 75% of timber shrinkage takes place between 28 and 16% moisture content (which occurs during the kiln drying process). The untreated kiln dried timber may be cheaper than other framing timbers if bought in large volumes. Their downside is that they need more thorough planning and care procedures to ensure the timber stays dry both during and after construction. Exposing these timbers to moisture;

- increases the risk of distortion due to moisture uptake and subsequent drying out;
- increases the likelihood the wood will develop mould; and
- may cause a contract delay while the framing dries out to acceptable levels.

## 3.0 USE

3.01 Untreated kiln dried timber should never be used unless there is a guarantee it will remain dry throughout its in-service life. NZS 3602 allows the

use of untreated framing timber which has been planer gauged and kiln dried at 74°C or above. It must also have an in-service moisture content of 18% or less. To enable the framing to maintain this required moisture content while in use, it must be:

- protected from the weather;
- remain in a dry environment; and
- protected from ground moisture.

3.02 The in-service moisture content of 18% or less required by NZS 3602 for untreated kiln dried framing ensures, that if it is not exceeded during the life of the structure, the timber will not decay. This moisture level also reduces the risk of borer attack. There is evidence that the risk of borer attack is further reduced by the kiln drying, particularly if the process involves temperatures above 100°C. At these temperatures the timber is not only sterilised, but it also undergoes changes that are thought to make it unpalatable to borer. Borer have trouble digesting wood this dry and consequently will leave it alone.

## 4.0 MOISTURE CONTENT

4.01 Kiln dried framing timber is supplied with a moisture content level that is below 20% and may even be as low as 6%. Although kiln dried timber will dry quickly if temporarily wetted, it will absorb moisture if the environment it is kept in is very humid or the timber remains wet over a long time. This can be a particular problem when work is being done in damp and shady areas, where there is little wind to help dry out the timber. In these situations the timber moisture content should be monitored, and it may require a drying time between cladding and lining as with wet timbers. NZS 3602 Table 4 gives the allowable moisture content at the time of enclosure.

4.02 Do not use kiln dried timber in conjunction with wet timber, as the kiln dried timber will absorb moisture.

## 5.0 PLANNING

5.01 Kiln dried timber should be delivered to the site as near as possible to the time it is to be used. Good planning processes for making this happen are similar to “just in time” procedures used effectively in many manufacturing processes to ensure that materials are not delivered too soon or

too late. Arranging for delivery, therefore, involves working out exactly when the framing will be needed.

5.02 To ensure that the timber has little opportunity to absorb moisture it needs to be cared for from its point of manufacture to its final use. The timber needs to be ordered early enough to ensure a confirmed supply and delivery programme for the required treatment. The delivery programme should be monitored and updated so it keeps pace with site activities. It is best if pre-nailed frames and trusses are put in place immediately after delivery.

5.03 If possible ensure the timber is not old stock. Timber kept in stock for a long time is more likely to be exposed to factors that lead to deterioration. Untreated kiln dried timber, in particular, can rot if not stored correctly. This is especially so if cycles of condensation have been allowed to occur over a prolonged period. An example would be if a merchant has stored the timber outside for an extended period of time with damaged wrapping that allows moisture into the bundle. It should be noted that H1 timbers, both kiln and air dried, can suffer a similar deterioration if stored incorrectly.

## 6.0 DELIVERY

6.01 To ensure any protective wrapping is not damaged, care must be taken when transporting kiln dried

timber. This may mean using protective shoulders on the edges of the timber bundles, to avoid chaffing from straps or chains. When delivered, the timber must be stacked at least 100 mm clear of the ground or concrete in an area free from ponding of water. If timber bundles are stored on concrete that is still curing or on damp ground, they should sit on polythene or plywood. Using the correct dunnage is also important, and whatever dunnage is chosen should not damage the wrapping. The timber should be stacked level and should never be tipped from the delivery truck.

## 7.0 SITE PROTECTION

7.01 Although the bulk framing timber comes wrapped in a protective plastic cover – at least the top, sides and end of the bundles – the plastic wrapping alone may not be sufficient if the timber is to be stored for any length of time. The protective wrapping itself should be kept in place until the timber is ready to be used, and care should be taken to make sure the wrapping doesn't get damaged. The wrapping's condition should be checked upon delivery and regularly thereafter. Note: site-specific small volume timbers won't necessarily be delivered pre-wrapped in a protective covering, so individual attention will be needed.

7.02 Because it is so important to keep the timber dry, we recommend it be stored under cover or a shelter be



*Rot showing on timber that has been stored outside for a long period and moisture has penetrated the protective covering.*



*Poorly protected frames.*

built over it. If a tarpaulin cover is to be used, it needs to be ventilated to minimise sweating or condensation. The cover should be inspected regularly for damage and repaired as necessary.

## **8.0 CONSTRUCTION USE AND CARE**

8.01 Kiln dried framing timber usually comes in 35 mm and 45 mm thicknesses. It is important to mark out accurately for these sizes and use the correct nail lengths. The dryness of the timber means that it is better to use nail guns for fixing as less splitting results.

8.02 In addition to keeping the timber dry when in storage and during construction, the building works must be “wrapped” and clad as soon as possible after erection. NZS 3602 instructs that the building should be closed in to protect untreated timber from the weather and dampness within one month.

8.03 It is particularly important to apply building wrap in a way that makes it as weathertight as possible. In addition to ensuring the walls and framing are fully protected we recommend that window openings should be left covered over where practical. Doorway plates should be cut out as soon as possible – to minimise the risk of ponded water gathering on the floor and against the wall plates. It should be noted that some air-permeable building wraps allow the passage of liquid water through them, so may not protect against rain.

8.04 Even if the timber being used has been treated with a water repelling agent, it will still absorb moisture through the cut ends. The moisture levels of the framing should be checked before lining to make sure they meet the manufacturer’s recommendations.

8.05 All timber, (whether kiln or air dried, H1, H3 or untreated) may decay and also be subject to fungal attack if used in wall cavities that allow high levels of moisture to enter, without sufficient ventilation to dry the timber adequately after being temporarily wet. Note: H3 timber, however, is the most durable.

## **9.0 PRE-NAILED FRAMES AND TRUSSES**

9.01 Pre-nailed frames and trusses should be treated in a similar way to loose framing. They should be stored upright if possible, level and clear of the ground. They should be covered to keep out moisture but still allow through-ventilation. Frames should be erected promptly after delivery.

## **10.0 CONCLUSION**

10.01 If kiln dried timber’s end use is carefully considered and the timber has been cared for as described, there is no reason why the timber will not perform as it is intended.

## **11.0 STANDARDS**

Standards New Zealand. Wellington

NZS 3602: 1995 Timber and wood –  
based products for use in building  
Incorporating Amendment No 1 Aug 1996

## **12.0 FURTHER READING**

Technical Literature and Handbooks

ORIGIN Timeframe Handbook  
Pinex Laserframe Instruction Manual  
Pinepac E-frame® Handling and use

BRANZ Bulletins

347 (1996) Using Kiln-Dried MSG  
Radiata Pine Framing  
343 (1996) Moisture in Timber

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