PENTARCH FORESTRY™

HARDWOOD LINING

INSTALLATION GUIDE

MAY **2023**

Pentarch Forestry's Lining is a solid hardwood timber product designed to be used indoors or in outdoor undercover applications.

Pentarch Forestry's Lining is seasoned to the moisture requirements of AS 2796.1-1999 (9% to 14%). This Installation Guide is intended to provide general advice on the installation of lining within residential applications and does not apply to specialty or commercial installations.

Individual requirements may vary from those discussed in this Installation Guide and you are advised to seek independent professional advice before commencing work. You are also advised to check with State authorities to ensure building compliance as well as make your own, and/or seek an independent professional assessment of the relevant applicable laws and standards.

Installing timber lining in certain applications may require additional considerations such as thermal performance, energy efficiency, condensation management and fire resistance. In these situations, we recommend you seek independent advice relevant to your specific requirements. Group numbers, smoke development rates and spread of flame index information is available on Pentarch's species quick reference guide.

HARDWOOD LINING

Product Handling and Site Assessment

Pentarch's plastic wrapping is for protection during transportation only. Upon delivery timber lining products should be stored undercover and protected from the elements. Ensure boards are checked before installation in case of any damages during transport. Please check all material for faults or defects prior to installation. If there are any problems before or during the installation of a Pentarch timber product, stop & do not continue installing. Contact your Pentarch representative immediately.

Timber is hygroscopic – meaning it is capable of easily absorbing and expelling moisture in response to local conditions. As timber absorbs moisture it expands and as it expels moisture it contracts. As such, factors such as relative humidity (atmospheric moisture), moisture ingress, exposure to weather and lack of protective coatings can compromise the timbers integrity. Additional allowance for expansion may need to be considered especially in external applications and high moisture environments.

FIGURE 1. Australian Hardwood lining profiles

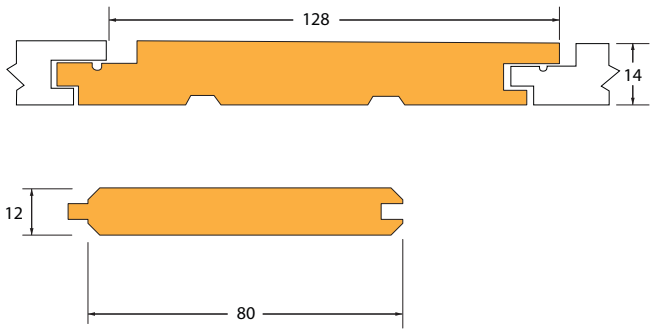


FIGURE 2(a) Non secret nail fixing detail

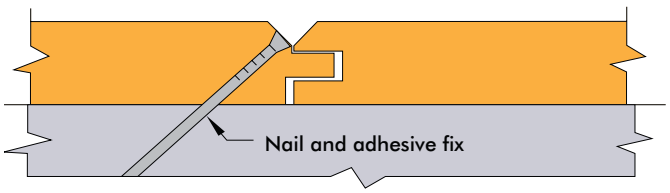
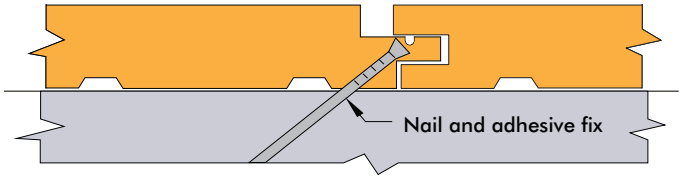


FIGURE 2(b) Secret nail fixing detail



Pre-Installation Preparation

Preparation is important and the surface that the lining is being fixed to must be flat, level and plumb.

Pentarch's hardwood lining boards are designed for use internally however they can be used outdoors in undercover applications only. Areas such as Al fresco ceilings or soffit linings must be protected from any direct sunlight or adverse or "blown in" weather. External undercover installation of lining boards should not be in areas of extreme weather such as desert or alpine areas or coastal areas where the product could be exposed to sea spray. **Note: It is recommended to use Pentarch's external cladding range for these extreme weather applications.**

Suitable coatings on all sides and corrosion resistant fixings should also be used. As timber is hydroscopic exposure to moisture including on the rear of the boards can adversely affect the performance and lead to excess expansion and cupping.

This is particularly relevant in ceiling or soffit installations so adequate ventilation (roof or soffits) and/or the use of vapor permeable sarking (as per the NCC) should be considered. When installing in these applications the profile tongues are to be facing the prevailing weather.

As timber absorbs moisture, it expands. As it expels moisture, it contracts.

Timber framing batten type	12mm	14mm
Nail size and type	40 x 1.6mm	45 x 2.0mm

Table 1.0 Minimum hand driven nail sizes for face fixing of lining boards for timber framing or cavity battens.

Fixings

Pentarch recommends a 40mm x 1.6mm nail for 12mm lining and a 45mm x 2.0 nail for our 14mm lining (hand nails) or equivalent nail gun brads may be used. For external undercover applications stainless steel or hot dip galvanised fasteners must be used. Alternative fixings such as screws may be used in accordance with the manufacturer's instructions. For installation onto steel framing manufacturers recommendations on appropriate fixings must be followed.

Acclimatisation

Solid timber lining boards may need to be acclimatised to their new local environment before installation. It is important to conduct a site climate assessment and if necessary, allow the timber to adapt to the conditions on site. Timber is a natural product that expands and contracts with seasonal changes and is affected by the moisture content of the air. The moisture content of timber is the percentage weight of water present in the timber compared to the weight of the timber with all water removed. Moisture content varies with changes in humidity and temperature in the surrounding air. Small seasonal changes in timber lining are a normal occurrence and small gaps that open up during dry periods are not considered a defect.

To minimise the movement of a hardwood lining caused by swelling on moisture uptake and shrinking on moisture loss, it is important to install timber lining that is close to the average moisture content of the environment in which it is to be installed. Solid hardwood timber lining is kiln dried to 9 to 14% moisture content as per AS 2796.1-1999. Where the average supplied moisture content of the lining is near the expected average in-service moisture content, acclimatisation of the hardwood boards may not be necessary. Where conditions are drier, such as inland areas or air-conditioned buildings, or where conditions are humid, such as in coastal areas or elevated regions, lining boards may need to be acclimatised on site.

Acclimatisation can only be effective in dry locations during dry periods or in an air-conditioned building if the air conditioning is operating at the time. Acclimatisation is only complete when the moisture content in the lining boards is equal to the relative humidity (RH) in the environment. To check that the timber has reached the required moisture content it should be moisture tested with an appropriate timber moisture meter.

Pre-Coating prior to installation

Pentarch recommends coating all sides (including the rear) prior to installation, timber can be ordered pre-oiled to save time on site. If your lining is supplied pre-oiled from Pentarch please refer to the separate pre-oiled information sheet. Ensure the end grain of each board is sealed prior to installation.

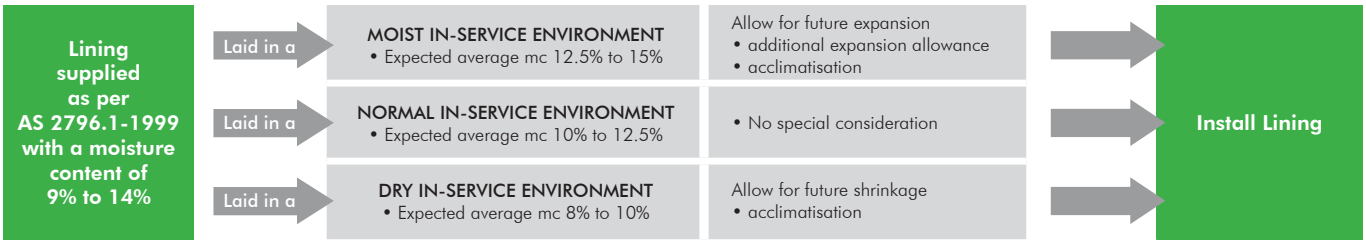
Installation – WALLS (Internal)

Pentarch timber lining can be installed either vertically, horizontally or diagonally at a maximum of 600mm centres. For face fixing nails should be at least 15mm from the edge and two fixings used per crossing. Board ends should be pre-drilled to prevent splitting.

Installation – CEILINGS

Pentarch Forestry's lining boards should be installed on ceilings at 450mm centres when installed beneath joists or rafters. This can be increased to 600mm centres when installed above exposed rafters. Generally, the fixing requirements for ceilings are the same as outlined above for wall installation. In the case of a suspended ceiling grid, calculations should also be made to allow for the additional weight of the lining material which differs from one species of timber to another. For steel framed installation manufacturers recommendations on appropriate fixings must be followed.

FIGURE 3(a) – A simple guide to whether acclimatisation is necessary is provided in the flow chart below



Some of the information regarding acclimatisation has been sourced from the FWPRDC document 'Timber Flooring' version one December 2005.

FIGURE 3(b) – Moisture content of wood at various temperatures and relative humidity readings

Temperature (°C)	Relative Humidity (percent)			
	40	50	60	70
10	7.9	9.5	11.3	13.5
16	7.8	9.4	11.1	13.3
21	7.7	9.2	11.0	13.1
27	7.6	9.1	10.8	12.9
32	7.4	8.9	10.5	12.6
38	7.2	8.7	10.3	12.3

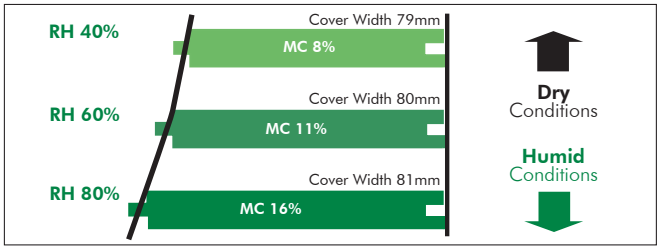


Chart taken from Wood Handbook: Wood as an Engineering material, (Agriculture Handbook 72), Forest products Laboratory, US Department of Agriculture.

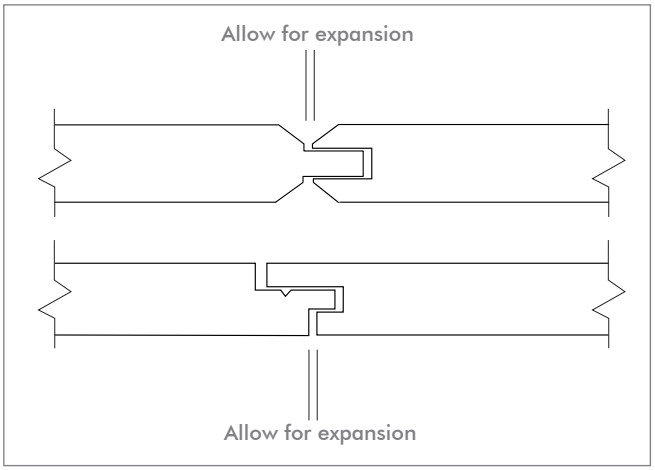
Ceilings External

It is the installers responsibility to make sure that the product and its installation is suitable for external (undercover) applications. Additional considerations such as adhesive type, corrosion resistance of fixings, condensation effects, vapour permeable barrier, suitable coatings, environmental conditions, additional expansion, and bushfire requirements (BAL rating) may need to be considered.

Expansion Joints

Timber is hygroscopic so additional expansion allowance may need to be considered especially in external applications and high moisture environments. Solid timber typically expands and contracts across the width of the boards expansion allowance can be achieved at each board by not installing the boards tight. (Ref FIGURE 4.)

FIGURE 4.

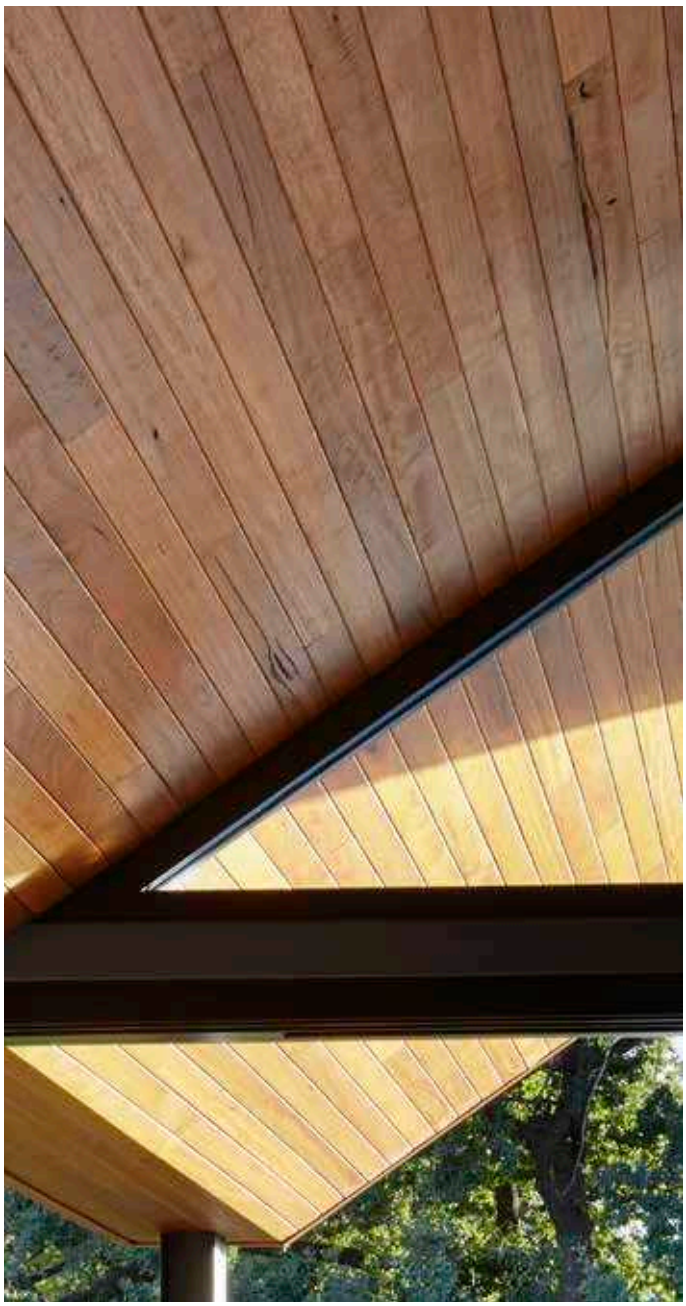


(Refer FIGURE 3.) the acclimatisation section above to establish your expected in-service environment. Checking the boards widths prior to installation is a good indicator as to any Moisture Content (MC) increase or decrease since manufacture.

Timber Finishes

If your lining has been supplied pre-oiled from Pentarch Forestry please also refer to the separate pre-oiled installation guidelines for top coating options on our website.

Timber coatings help protect the surface of the timber from the effects of the weather and slow down the rate at which timber will take up or lose moisture. By slowing down that rate the severity of any checking on the surface of the timber is reduced considerably. When applying protective finishes please ensure manufacturer's instructions are followed. The protective finish should be applied to all surfaces (including cut ends) of each lining board before installation. A protective finish includes products that penetrate the surface of the timber (such as oils and stains) and products that provide a film or coating to the surface of the timber (such as paints and clear coatings).



Safe Work Practices

All safety standards set by Safe Work Australia must be followed, including the following practices when working with timber:
Work areas must be clean. Sawing, sanding and routing equipment should be fitted with dust extractors. Dust levels should be below standards set by Safe Work Australia for wood dust.

When machining timber respiratory protection, gloves, clothing, hearing and eye protection should be worn. After handling timber, wash skin thoroughly with mild soap and regularly wash clothing.

For any treated timber, do not burn offcuts or sawdust. Preservative treated offcuts and sawdust should be disposed of by approved local authority methods.

Note: Variations within a timber species are normal, therefore photographs, samples and displays can only be indicative of colour and should not be used for final selection. It is normal for natural timber products to react to changes in atmospheric and environmental conditions such as humidity and temperature.

www.pentarch.com.au/timberproducts.html

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