

# Pynefloor™



## Technical Manual

another trade essential from  
THE **laminex** GROUP™

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# Forward

In the early 1960s, particleboard panels first became available in New Zealand, for use in the construction industry, primarily as flooring. Growth was slow for the first six or seven years, and then, in an amazingly short time, particleboard had taken over as the major flooring product, eclipsing the traditional strip flooring, in both residential and commercial applications.

Many obvious advantages were immediately apparent to the end user:

- o Pre-laying panels became possible, providing a working platform together with a reduction in construction times.
- o Sheet material had a structural element and could act as a diaphragm, for the transfer of wind and earthquake loads.
- o Up to two months exposure to weathering was acceptable.
- o Large sheets were simple to lay and fix.
- o Special applications were available for commercial and industrial structures, by the use of double layers.
- o Sanding and clear finishing gave an economic finish.

At the forefront of particleboard flooring is Pynefloor™ – manufactured by The Laminex Group™. Pynefloor is the major player in the New Zealand market, being the preferred material for most residential and commercial applications.

Pynefloor's main advantage is the range of sizes offered; in particular the 3600 x 1800 panel, used by most builders for maximum coverage. This is only possible due to The Laminex Group's "six foot" press – the only one in the country – located at their North Island, Kumeu plant.

The plant runs as a 24 hour, seven day a week operation, only closing for programmed, operational or routine maintenance. Constant monitoring is carried out, including engineering tests, to ensure board properties are consistent and weathering exposure is confirmed to maintain a 50 year durability. All product is identified by its unique code that enables detailed information to be recorded on specific panels.

The development of Pynefloor continues and the solutions team are constantly working on improved techniques, board composition and new applications. Pynefloor has a current BRANZ (Building Research Association of New Zealand) appraisal certificate and meets the 50 year durability requirement of the New Zealand Building Code.

To align with NZS 3604:1999 (the current acceptable solution for Timber Framed Buildings of the New Zealand Building Code), a similar index and numbering system has been used, and this document should be read in conjunction with that standard. Any future amendments will again follow the accepted method by highlighting and dating specific clauses.

This manual (originally published February 2006) supersedes all previous technical documents and should be read in conjunction with the general Pynefloor literature dated June 2006.

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# Scope & Interpretation

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# Scope & Interpretation

## 1.1 Compliance

Pynefloor particleboard has a BRANZ Appraisal, Certificate – No. 254 – covering use within the New Zealand Building Code. The current certificate can be viewed on their web site – [www.branz.co.nz](http://www.branz.co.nz).

In the opinion of BRANZ, Pynefloor will meet the following provisions of the New Zealand Building Code:

- o Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2, B1.3.3 and B1.3.4.
- o Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years for pre-laid flooring and B2.3.1 (b) 15 years and 5 years for post-laid non-diaphragm flooring.
- o Clause E2 EXTERNAL MOISTURE: Performance E2.3.4 and E2.3.6.
- o Clause E3 INTERNAL MOISTURE: Performance E3.3.2, E3.3.3. and E3.3.6.
- o Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.

## 1.2 Scope

The Pynefloor information in this manual has been specifically designed in accordance with AS/NZS 1170 to comply with the appropriate design loadings for domestic and commercial buildings.

Pynefloor particleboard panels are suitable for timber framed buildings within the scope of NZS 3604:1999, clause 1.1.2 and those uses specifically designed within this manual.

Tables 1.1 and 1.2 together with Figure, 1.1 and 1.2 in NZS 3604:1999 may be used to determine the scope.

## 1.3 Interpretation

Interpretation shall be as detailed in NZS 3604:1999, clause 1.2.

## 1.4 Definitions

Definitions are those given in NZS 3604:1999, clause 1.3.

### C1.3.

In particular, the words “shall” or “must” identify a mandatory requirement and “should” or “recommend” is advisory. Clauses prefixed by “C” (such as these) are intended as comments.

# General Product Description

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# General Product Description

## 2.1 Pynefloor Material

High-density particleboard is manufactured as a trade essential from The Laminex Group, primarily for use as flooring, under the trade mark Pynefloor™.

Panels are produced in three layers with an inner core and two high density surfaces. All edges are sealed with a yellow wax, which will help to minimise edge swell.

## 2.2 Identification

All panels have an identifying label on the upper face and are marked on the underside with a Julian date of manufacture – the first two numbers indicate the year and the following three numbers the day. (Refer Figure 2.1)



**Figure 2.1. Julian Date & Label – This example would be the 340th day of 2005.**

## 2.3 Uses

Pynefloor can be used:

- o As pre-laid or post-laid flooring over traditional timber floor joists, engineered timber (“I” joists) such as IBUILT™ Structural Flooring Solutions or steel joist supports in single or double layer applications.
- o As an overlay to concrete floor slabs or wooden floors.
- o As floor diaphragms for the transfer of wind and earthquake loads.
- o For general stair construction.
- o For shelving and packaging.
- o As carcass members for cabinetry.

**C2.4.1**

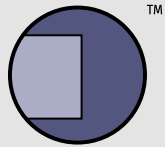
This is to ensure that timber nogs are used to support edges – if Tounge and Groove product is used, cracking of surface coatings may eventuate due to slight differential movement.

**C2.4.3**

Refer Section 4 – Durability.

## 2.4 Pynefloor Types

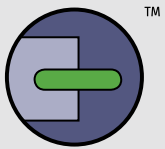
Three particular types are marketed, each having their own qualities and unique uses.



**Pynefloor™**  
STRAIGHT EDGE™

### 2.4.1 Pynefloor™ Straight Edge™

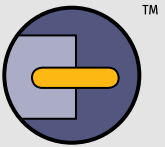
- o Pynefloor Straight Edge consists of 20mm nominally thick wood based structural particleboard.
- o Panels are finished with a square edge.
- o This is a general purpose product intended for all uses.
- o Pynefloor Straight Edge shall always be used when it is intended to clear finish the particleboard floor.



**Pynefloor™**  
GREEN TONGUE™

### 2.4.2 Pynefloor™ Green Tongue™

- o Pynefloor Green Tongue consists of 20mm nominally thick wood based structural particleboard, specifically marketed as flooring.
- o It is identical to Straight Edge in its manufacture but has the addition of a polypropylene green tongue, to one long edge, and a groove to the other.
- o When correctly installed this gives the required sheer strength and eliminates the need for timber nogs.
- o There is a range of four panel sizes particularly designed for common joists centres.



**Pynefloor™**  
GOLD™

### 2.4.3 Pynefloor™ Gold™

- o Pynefloor Gold consists of 22mm nominally thick wood based structural particleboard, specifically marketed as a premium flooring panels.
- o The 10% increase in thickness together with improved resin composition provides a more rigid floor, with the added benefit of a 50% increase in exposure.
- o As with Pynefloor Green Tongue it has the addition of a polypropylene Gold tongue, to one long edge, and a groove to the other.
- o When correctly installed this gives the required sheer strength and eliminates the need for timber nogs.
- o The additional properties are ideal for floors with joists at maximum centres – i.e. 600mm.
- o There is one panel size designed for common joists centres.

## 2.5 Flooring Guide

Figure 2.2. is a helpful guide when determining which product suits a particular application. Other considerations may be necessary but the flow chart is a good first step.

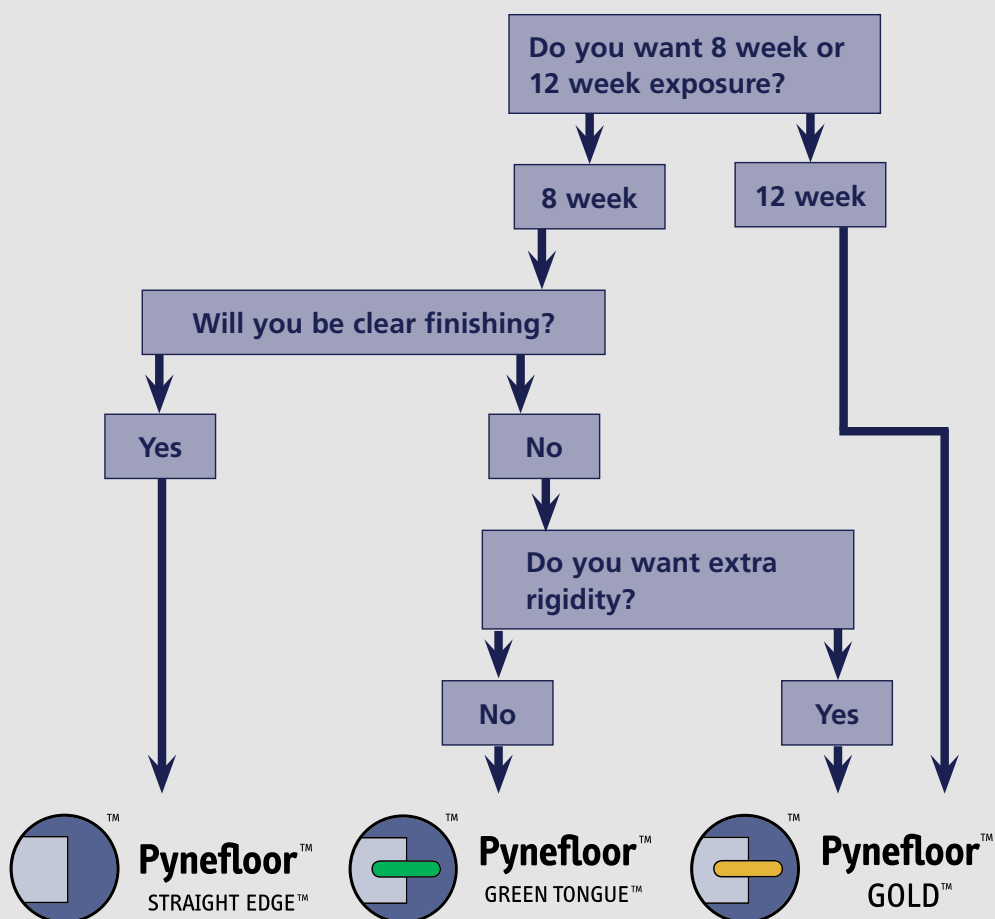


Figure 2.2

### C2.5

Refer Section 5 – Flooring Design.

# Material Properties

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# Material Properties

## 3.1 Description

Pynefloor is manufactured from wood particles of various wood species; predominantly pine, which provide a range of colour tones within the panel. The wood particles are bonded with melamine urea formaldehyde resin.

Pynefloor panels contain a wax emulsion. This is added to the adhesive during the manufacturing process to impart additional moisture resistance throughout the panel.

The edges of the panel are factory wax sealed to further control the effects of moisture during building construction.

The long edges of Pynefloor Green Tongue and Pynefloor Gold are factory grooved and fitted on one side with a polypropylene tongue.

## 3.2 Panel Dimensions

Table 3.1 gives panel dimensions for all products.

| Panel Dimensions |                  |                   |                                  |
|------------------|------------------|-------------------|----------------------------------|
|                  | Panel Sizes (mm) | Weight panel (kg) | Mean Weight (kg/m <sup>2</sup> ) |
| Straight Edge    | 3600 x 1800 x 20 | 89.4              | 13.8                             |
|                  | 2400 x 1200 x 20 | 39.7              | 13.8                             |
| Green Tongue     | 3600 x 1800 x 20 | 89.4              | 13.8                             |
|                  | 3600 x 1200 x 20 | 59.6              | 13.8                             |
|                  | 3600 x 900 x 20  | 44.7              | 13.8                             |
|                  | 2400 x 1200 x 20 | 39.7              | 13.8                             |
| Gold             | 3600 x 900 x 22  | 50.5              | 15.6                             |

Table 3.1

## 3.3 Panel Tolerances

Table 3.2 gives panel tolerances for all products (ex factory).

| Panel Tolerances        |  |
|-------------------------|--|
| Length                  | +/- 1.5mm  |
| Width                   | +/- 1.5mm  |
| Thickness               | +/- 0.2mm  |
| Panel Edge Straightness | 0.4mm/metre maximum deviation from line.                               |
| Panel Squareness        | The difference between the measured diagonals is no greater than 3.0mm |

Table 3.2

**C3.4a**

Panels are conditioned to 13% moisture content, then tested to AS/NZS 4266:

### 3.4 Physical Properties

Pynefloor Straight Edge, Pynefloor Green Tongue and Pynefloor Gold are manufactured to meet or exceed the requirements of AS/NZS 1860.1 :2002 Specifications for Particleboard Flooring. The minimum requirements when tested using methods stated in AS/NZS 4266 are listed below in Table 3.3.

| Property                    | Units            | Pynefloor Straight Edge and<br>Pynefloor Green Tongue | Pynefloor Gold |
|-----------------------------|------------------|---|----------------|
| Bending Strength (MOR)      | MPa              | 17  | 19             |
| Modulus of Elasticity (MOE) | MPa              | 2650  | 2750           |
| Internal Bond Strength      | MPa              | 0.50  | 0.55           |
| 24-hour Thickness Swell     | %                | 14  | 8              |
| Thickness Stability         | %                | 25  | 14             |
| Glue Bond Quality           | %                | 17  | 45             |
| Wet Bending Strength        | MPa              | Not specified   | 4.2            |
| Surface Water Absorption    | g/m <sup>2</sup> | 200   | 150            |

**Table 3.3**

Note

The requirements in Table 3.3 are the lower specification limits for the following properties:

- a) Bending Strength (MOR)
- b) Modulus of Elasticity (MOE)
- c) Internal bond strength
- d) Wet bending strength after immersion in boiling water
- e) Glue bond quality

The requirements in Table 3.3 are the upper specification limits for the following properties:

- a) 24 hour thickness swell
- b) Thickness stability
- c) Surface water absorption

### 3.5 Formaldehyde

The formaldehyde content of Pynefloor complies with the limits specified in AS/NZS 1860.1:2002 Particleboard flooring Part 1 Specifications and the World Health Organisation.

The extractable formaldehyde content being  $\leq 1.5$  milligrams per litre of water.

When installed, emission levels can be controlled by room ventilation together with the sealing of the surface or finishing with a three-coat polyurethane coating system or the use of coverings such as foam-backed carpet, carpet with rubber underlay, vinyl or tiles. **Sealing or covering of the surface shall be carried out before the building is occupied.**

#### C3.5

Refer also Section 10 – Finishing and Section 12 – Health and Safety.

# Durability

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# Durability

## 4.1 Producer Statement

When stored, handled, installed and maintained in accordance with this document, Pynefloor panels will meet: **The durability performance requirements of NZBC B2.3.1 (a) for 50 years.**

The specifications, details and methods described herein shall be strictly observed to avoid building code non-compliance.

The Laminex Group will not be liable to any person if the conditions as to storage, handling, installation and maintenance of Pynefloor as outlined within this document are not complied with.

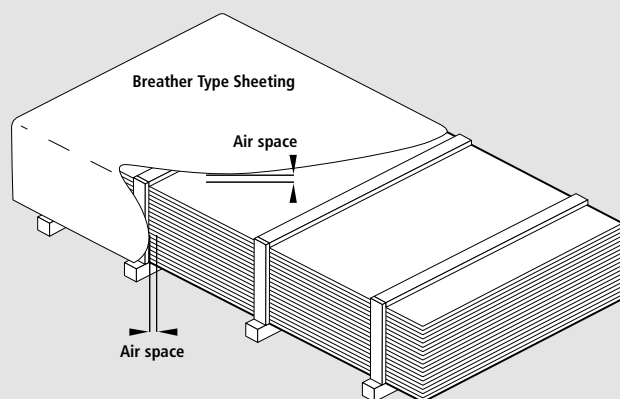


Figure 4.1

## 4.2 BRANZ Appraisal

Pynefloor has a BRANZ Appraisal Certificate No. 254 – The current edition is published on the BRANZ web site – [www.branz.co.nz](http://www.branz.co.nz).

The BRANZ opinion confirms that:

- o Pynefloor will have an acceptably low level of risk of attack by insects such as borer or termites.
- o Pynefloor will have a life of at least 50 years.

**C4.3.2**

The “weather exposed” period includes the time that the panels are in an exposed condition when being transported or stored on site without covering. Panels will respond to changes in humidity and moisture content. Some edge peaking expansion and grain raising may result. Loss of stiffness and strength can occur if panels are exposed to sub-zero conditions whilst saturated – i.e. ski lodges.

If the exposure period cannot be met, then panels shall be post laid (once the structure is enclosed). Alternatively, sheet covering may be used providing it is indirect and adequate air space is maintained (“tent” effect).

**C4.3.3**

A “wet area” is any area within a building supplied with water from a water supply system, e.g. kitchens, bathrooms, toilets, shower rooms, laundries, changing rooms, ensuites, etc.

**C4.3.4**

Over floor type heating systems may be used with Pynefloor products providing the operating temperature does not exceed 35°C and the panel moisture content is less than 15%. Under floor systems are not acceptable. The heating system manufacturer shall be consulted prior to installation.

## 4.3 Durability Conditions

The following conditions shall be met; otherwise the durability of Pynefloor particleboard will be compromised.

### 4.3.1 Handling & Storage

- o Panels shall be stored and handled so as to minimise surface and edge damage.
- o Wherever possible panels shall be stored inside under cover. Outside storage shall be for short periods only. Panels shall not be stacked on wet concrete floors.
- o The panels shall be flat stacked clear of the ground, on evenly placed, full width, level bearers. Bearers shall be of uniform thickness and shall extend across the full width of the stack. (Refer Figure 4.1)
- o When stored in external situations, panels shall be protected from the weather. A breather-type cover shall be used, supported clear of the top and sides of the panels using battens to allow air to circulate freely around the pack. (Refer Figure 4.1)

### 4.3.2 Weathering

- o Pynefloor Straight Edge and Pynefloor Green Tongue shall not be exposed to weathering for more than eight weeks.
- o Pynefloor Gold shall not be exposed to weathering for more than 12 weeks.
- o Panel properties may be affected by moisture saturation and exposure to sub-zero temperatures.
- o During the exposed period, do not allow water to pond on the surface. Remove by sweeping and forming small holes adjacent to plate lines. Do not directly cover panels with sheeting or apply liquid sealers to any surface. Panels should weather in their raw condition to allow release of absorbed moisture.

### 4.3.3 Wet Areas

- o In “wet areas” panels shall be protected with a suitable wet area membrane or an integrally waterproof sheet material.
  - Section 10: Finishing – 10.3 Wet Areas.

### 4.3.4 Heat

- o Panels shall be separated from fuel burning appliances, flues and chimneys in accordance with NZBC Section C – AS/1.
- o Panels shall not be subjected to temperatures exceeding 50°C for a prolonged period.

### 4.3.5 Prohibited Uses

- o Panels shall not be used in covered exterior situations with no weather protection e.g. open verandas.
- o Panels shall not be used as a substrate for roofing or decking membranes.
- o Panels shall not be used in spa-pool rooms.
- o Once installed and in use, panels shall not be subjected to conditions that will allow the continuing moisture content to be above 16%.

# Floor Design

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# Floor Design

## 5.1 Non-Specific Design

The following design information covers the use of Pynefloor particleboard when used in buildings detailed by 1.1.2(e) of NZS 3604 which is an acceptable solution of the New Zealand Building Code (not requiring specific design) .

### 5.1.1 Joist Selection

Ranges of joists are now available, in solid timber, engineered timber (“I” joists) and steel. Each has its particular advantages and preferences.

The use of solid timber or “I” joists, with a moisture content of less than 15%, is strongly recommended and will provide the following benefits:

- o Post construction shrinkage and distortion will be minimised, limiting fastener noise and nail popping.
- o Deflection will be limited as dry timber is stronger and stiffer.
- o In all cases joists are lighter and easier to handle – particularly with “I” joists.

In some cases it is hard to avoid the use of “wet” timber due to the treatment requirements of NZS 3602. If this is the case care should be taken to select straight and undistorted material or consideration given to post laying of panels.

### 5.1.2 Domestic Buildings

In domestic housing applications, joist support centres up to 600mm are acceptable for all Pynefloor products, in line with Table 1.2 of NZS 3604.

- o If a more rigid floor is required use Pynefloor Gold or reduce support centres to 450mm.
- o For large floors, over 15m long, consider post laying or allow for expansion.
- o Ensure that adequate ventilation is provided in sub-floor areas.
- o When clear finish is required, use only Pynefloor Straight Edge.
- o Additional panel support will be required for high point loads such as pianos, billiard tables etc.

#### C5.1.2a

See Section 8 – 8.4. Large floors.

#### C5.1.2b

This is to ensure that timber nogs are used to support edges – if Tounge and Groove product is used, cracking of surface coatings may eventuate due to slight differential movement.

**C5.1.3**

Residential, institutional, educational and other buildings as described in NZS 3604: clause 1.1.2 (e), (ii) - (v)

**C5.1.4**

See Section 8 – Installation, for special fixing details.

**5.1.3 All Other Buildings**

In all non-domestic building applications (i.e. residential, institutional, educational and other buildings) .

joist spacings shall not exceed:

- o For Pynefloor Straight Edge and Pynefloor Green Tongue, 450mm.
- o For Pynefloor Gold, 600mm.

The kPa loadings, from Table 1.2 of NZS 3604, shall not be exceeded without specific design.

Special attention shall be given at the design stage to the effects of concentrated loadings, such as high density foot traffic, storage racks, hand trolley point loads etc.

Where a double layer floor system is used, joists can be spaced up to 600mm support centres for all products.

Adequate cross flow ventilation shall be provided in all subfloor areas.

Where large areas of Pynefloor are laid e.g. gymnasiums, community halls, institutional type dwellings, farm buildings etc., it is important to ensure that careful consideration is given to the cross flow effect of sub-floor ventilation and allowance is made for panel expansion.

Post laying is always the better option for large floors, particularly where clear finishing.

**5.1.4 Structural Diaphragms**

All Pynefloor products can be used for structural diaphragms. Design requirements for diaphragms to resist wind or seismic loads are given in NZS 3604.

- o Pynefloor Straight Edge complies if fixed in accordance with this manual.
- o Pynefloor Green Tongue and Pynefloor Gold comply if fixed in accordance with this manual and centres do not exceed 450mm.

For floor diaphragms complying with NZS 4229 – Concrete Masonry Buildings Not Requiring Specific Engineering Design – Pynefloor Straight Edge shall be used. Details shall be in accordance with NZS 4229.

## 5.2 Specific Design, Commercial & Industrial Use

The following information has been specifically designed for Pynefloor products.  
All calculation is based on the requirements and methods detailed in AS/NZS 1170.

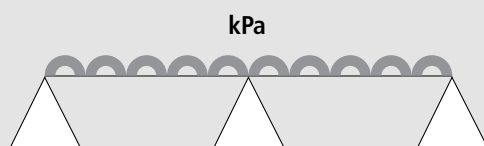
Reference to Table 3.1 of this Standard will give the requirements for particular activities, which can then be aligned with these tables.

This information is by no means exhaustive but covers the common commercial and industrial situations that may occur outside the scope of NZS 3604 and the majority of those within AS/NZS 1170.

All other situations require individual specific design.

### 5.2.1 Uniformly Distributed Actions

Tables 5.1 and 5.2 give safe uniformly distributed actions for Pynefloor Straight Edge, Pynefloor Green Tongue and Pynefloor Gold respectively.



| Pynefloor Straight Edge & Pynefloor Green Tongue |       |
|--|-------|
| Span up to 450mm                                 |       |
| Single Layer                                     | 5kPa  |
| Double Layer                                     | 10kPa |

Table 5.1

| Pynefloor Gold   |       |
|------------------|-------|
| Span up to 600mm |       |
| Single Layer     | 5kPa  |
| Double Layer     | 10kPa |

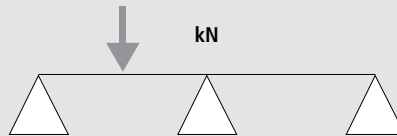
Table 5.2

### C5.2.1

Refer Section 8 – Installation, for double layer fixing details.

### 5.2.2 Concentrated Actions

Tables 5.3. and 5.4. give safe concentrated actions for Pynefloor Straight Edge, Pynefloor Green Tongue and Pynefloor Gold respectively.



| Pynefloor Straight Edge & Pynefloor Green Tongue |                  |                  |
|--|------------------|------------------|
|  | Span up to 400mm | Span up to 450mm |
| Single Layer                                     | 2.4kN            | 1.9kN            |
| Double Layer                                     | 4.8kN            | 3.8kN            |

Table 5.3

| Pynefloor Gold |           |       |       |       |       |
|----------------|-----------|-------|-------|-------|-------|
|                | Up to 400 | 450   | 500   | 550   | 600   |
| Single Layer   | 3.7kN     | 3.6kN | 2.9kN | 2.4kN | 2.0kN |
| Double Layer   | 7.4kN     | 7.2kN | 5.8kN | 4.8kN | 4.0kN |

Table 5.4

## 5.3 Sub-Floor Ventilation

Subfloor ventilation must be provided to all platform floors suspended above the ground to ensure the ongoing moisture content of the Pynefloor remains at or below 16%.

The following information shall be regarded as the minimum levels required. Failure to control moisture in the particleboard could result in a non-performance which The Laminex Group will not be responsible for.

### 5.3.1 Opening Requirement

This requirement shall be met by the provision of evenly distributed openings in the foundation wall, at a rate of no less than 3500mm<sup>2</sup> for every m<sup>2</sup> of floor area. The openings shall be as near as possible to the underside of the plates and bearers and be positioned to allow effective cross flow.

Either one, or a combination of the following methods, may be used to construct ventilation openings:

- o Continuous gaps, at least 20mm wide between baseboards, around the building perimeter.
- o Perimeter wall ventilators with sufficient net open area spaced regularly, commencing 750mm from the wall corner and at intervals of no greater than 1.8m.
- o A 50mm gap between the wall plates and a boundary joist at the ends of cantilevered floor joists and the wall plate and joist, where the bearer is cantilevered.
- o Other regularly spaced openings that will provide adequate ventilation.

### C5.3.1

All requirements in accordance with NZBC – E2/AS1 and NZS 3604.

It is important to ensure that party walls, internal foundations, attached terraces, or any other impediment, do not obstruct the subfloor ventilation airflow, and that:

- o No point of the ground is more than 7.5m from a ventilation opening, or
- o The subfloor ventilation rate is greater than 10 air changes per hour for wet sites, or five air changes per hour for dry sites.

### 5.3.2 Vapour Barriers

Where a sub-floor space cannot be adequately ventilated, the ground under a suspended floor shall be covered with a vapour barrier having a vapour flow resistance of no less than 50MN s/g, and a thickness of no less than 0.25mm.

Even with a vapour barrier, ventilation openings shall still be provided, but the net open area may be reduced to no less than 700mm<sup>2</sup> for every m<sup>2</sup> of floor area and be located to provide air cross flow in the subfloor space.

The vapour barrier shall be installed in a way that ensures:

- o It covers the total ground area.
- o Adjacent sheets are lapped no less than 75mm and laps are intermittently tapped.
- o The ground is shaped to prevent, water accumulation on the vapour barrier.
- o Water drains to the exterior.
- o It is securely held in place by bricks, large stones or a similar method.

Where floor area designs still do not meet the above criteria, consideration should be given to the use of mechanical draft ventilation systems that create a subfloor ventilation rate greater than 10 air changes per hour for wet sites, or five air changes per hour for dry sites.

It is essential that all ventilation openings remain unrestricted and that vegetation is not allowed to cause obstructions over the life of the building.

## 5.4 Ground Clearance

A minimum clearance of 550mm between the surface of the ground beneath the building and the underside of the flooring panels shall be provided in order to give adequate sub-floor air capacity and to provide access for inspection of the sub-floor structure.

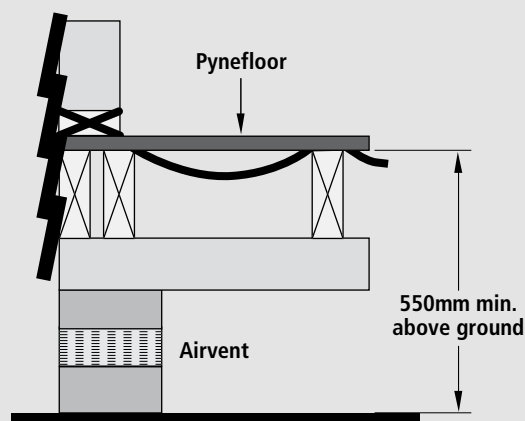


Figure 5.5

The clearance of 550mm may not be reduced, even when vapour barriers are installed. Vapour barriers only allow the reduction in the ventilation requirement not the clearance dimension.

For ground clearance detail, see Figure 5.5.

### C5.3.2

It is strongly recommended that vapour barriers be installed regardless of the situation. Great advantages can be gained in the reduction of sub-floor moisture content for very little cost.

**C5.6**

The use of alternatives, particularly polystyrene, is becoming more common. The prime advantage is that the top of the joists is left free and therefore allows the use of adhesive.

Refer Section 8 – Installation.

## 5.5 Fire Ratings

Pynefloor can be used as flooring in detached dwellings that have no specific fire resistance rating requirements under the NZBC. (Purpose Group SH).

For other types of occupancy, product use depends on the number of stories, the number of full and intermediate floors involved and whether the building is sprinkled etc.

The required fire resistance rating for floors and surface finish in NZBC Acceptable Solution C3/AS1 shall be complied with.

## 5.6 Insulation

When used in conjunction with correctly placed draped perforated foil or other alternatives, Pynefloor will contribute toward the building performance index requirement in NZBC.

To achieve the thermal insulation requirements of the NZBC, suspended timber ground floors need additional insulation material.

The traditional material used is Draped Foil:

- o A 100mm drape shall be provided in the foil to ensure insulation performance and protection of Pynefloor from moisture.
- o Under-floor foil shall be perforated.
- o If Pynefloor is to be pre-laid, it is important that moisture build-up does not occur during the construction period. Additional holes in the lowest part of each foil drape shall be provided if the perforations in the foil are not at the lowest point of the foil trough between the joists.

Alternative materials and methods are:

- o Fix foil to underside of joists.
- o Fix foil-backed fibreglass insulation to underside of joists after close in.
- o Polystyrene sheet insulation between joists.

When using alternatives to foil insulation, it is important to ensure that moisture which has entered the joist cavity during construction and from spills can dissipate easily. Steps shall be taken to ensure a clearance is left between the top surface of the insulation and the underside of the flooring.

## 5.7 Supporting Timber

The moisture content of the support system at the time of laying and fixing the flooring panels can affect the performance of the total floor system. As wet framing dries it will shrink. This can reduce the effectiveness of the fixing, allowing movement of panels resulting in floor squeaking and nail-head rise under vinyl flooring.

The use of kiln dried timber or “I” joists is therefore recommended.

Herringbone strutting in lieu of solid blocking will reduce the likelihood of a noisy floor. End nailing of solid blocks often results in squeaking and is hard to rectify once the structure is closed in.

# Specification Clauses

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# Specification Clauses

## 6.1 General

The clauses listed below are those recommended to be used when specifying Pynefloor products for all building uses as covered by NZS 3604 1.1.2 (e).

It will be necessary to edit those particular sections that apply to the specific project documentation.

## 6.2 Recommended Clauses

### 6.2.1 Documents Referred To

Documents referred to in this section are:

- o AS/NZS 1860 Particleboard flooring, 1860.1: Specifications.
- o NZS 3604 Timber framed buildings.
- o BRANZ Appraisal 254 (see BRANZ website for current edition).

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

### 6.2.2 Manufacturers Documents

Confirm current status of documentation held:

- o By visiting The Laminex Group website – [www.thelaminexgroup.co.nz](http://www.thelaminexgroup.co.nz).
- o Or call The Laminex Group Customer Services Department – 0800 303 606.

### 6.2.3 Materials

- o Pynefloor Straight Edge
- o Pynefloor Green Tongue
- o Pynefloor Gold

### 6.2.4 Components

- o NAILS – 60mm annular grooved gun nails or annular grooved particleboard nails.
- o SCREWS – (for timber joists) – 45mm x 8g Type 17 countersunk head self drilling screws.
- o SCREWS – (for steel joists) – 50mm x 12g Tek self drilling screws corrosion resistant.
- o ADHESIVE – Flexible, solvent based, elastomeric, construction adhesive.

### 6.2.5 On-Site Conditions

Take delivery of and accept packets of particleboard, dry and undamaged. Reject all damaged material. Store on a level, firm base, well ventilated and completely protected from weather and damage, all as manufacturers requirements.

Avoid distortion and contact with damaging substances. Protect edges and surfaces from damage. Use a sufficient number of people to lift and lay sheets with ease.

Do not commence work until the substrate is plumb and level, in true alignment and to the particleboard manufacturer's requirements.

### C6.2.2

It is important to ensure that all on-site personnel have access to up to date information. Products are not used in isolation, but as part of a process. Particular details of handling, storage, installation, finishing and protection, can vary from what is considered the norm.

### C6.2.3

Select the appropriate material by referring to Section 2 – Product Description and Section 5 – Floor Design.

### C6.2.4

Select the appropriate component by referring to Section 8 – Installation.

### C6.2.5

Refer Section 4 – Durability.

## SECTION 6: Specification Clauses

**C6.2.6a**

The Plan-A-Floor software is freely available on the website under the "TOOLS" button – Refer Section 7. Select the preferred fixing method:

- o Nailing
  - o Nailing with Adhesive
  - o Screwing
  - o Screwing with Adhesive
- In general terms nailing with adhesive is the recommended method.

**C6.2.6b**

Refer to Section 8 – Installation – for double nailing requirements for diaphragm floors.

**C6.2.6c**

Screw fixing is not acceptable for diaphragm floors.

**C6.2.7**

Select the appropriate clause.

**6.2.6 Application**

- o Plan Layout – Use The Laminex Group's "Plan-A-Floor" software to plan layout and determine quantities, available at [www.thelaminexgroup.co.nz](http://www.thelaminexgroup.co.nz), under "TOOLS".
- o Adhesive Fastening – Use construction adhesive to joists in conjunction with mechanical fixing. Apply adhesive in a continuous 5mm bead to all floor joists. For Pynefloor Green Tongue and Pynefloor Gold, apply a 2mm bead of construction adhesive to the top of the tongue prior to insertion into the groove. Remove excess adhesive.
- o Nail Fixing – Nail panel ends (and panel edges for Pynefloor Straight Edge) at 150mm centres 10mm from the edge. Nail intermediates at maximum 200mm, with all nails slightly skewed except for corner vertical nails. Where Tongue and Groove material is used, nails shall be 15mm from the edge to avoid tongue damage.
- o Screw Fixing – Screw panel ends (and panel edges for Pynefloor Straight Edge) at 150mm centres 10mm from the edge. Screw intermediate support at maximum 200mm. For Pynefloor Green Tongue and Pynefloor Gold, locate screws 15mm from the edge to avoid tongue damage. Pre-drill the panel for screw fixing.

**6.2.7 Installation****Laying of Pynefloor Green Tongue and Pynefloor Gold**

- o Programme work for minimal exposure to weather and lay sheets across the joists in a staggered pattern.
- o Panels to span at least three joists.
- o Lay panels with brand name down.
- o Allow 8mm minimum clearance between panel edges and fixed objects including columns and bottom plates.
- o Provide continuous edge support at building perimeter.
- o Provide continuous tongue and groove edge support (nogs) in wet areas or where rigid floor finishes (ceramic tiles) are used.
- o All fixings to finish flush with surface at time of fixing. Tighten fixings; punch nails and tighten screws just prior to sanding.
- o Close butt edges and ends of panels. Do not cramp.
- o Do not allow water to remain ponded on the floor surface – remove as soon as possible.
- o Do not cover panels with polythene or apply liquid sealers, while exposed to weathering.

**Laying of Pynefloor Straight Edge**

- o Programme work for minimal exposure to weather and lay sheets across the joists in a staggered pattern.
- o Panels to span at least three joists.
- o Lay panels with brand name down.
- o Allow 8mm minimum clearance between panel edges and fixed objects including columns and bottom plates.
- o Provide continuous edge support at perimeter and at panel edges with solid blocking minimum 100mm x 50mm.
- o All fixings to finish flush with surface at time of fixing. Tighten fixings; punch nails and tighten screws just prior to sanding.
- o Close butt edges and ends of panels. Do not cramp.

- o Do not allow water to remain ponded on the floor surface – remove as soon as possible.
- o Do not cover panels with polythene or apply liquid sealers, while exposed to weathering.

#### **6.2.8 Completion**

- o Leave work to the standard required by following procedures.
- o Remove all debris, unused materials and elements from the site.

#### **6.2.9 Surface Finish**

- o Carpet and Wet Area Membrane – Single cut with a drum or belt sander – 60 to 100 grit.
- o Sheet Vinyl – Single cut with a drum or belt sander – 60 to 100 grit. Do not fill nail holes.
- o Clear Coating – 1st cut with a drum sander – 60 to 80 grit.  
2nd cut with a disc sander – 100 grit.  
3rd cut with disc sander – 120 to 150 grit.

Follow coating manufacturer's instructions.

#### **C6.2.9**

For vinyl finish, filling holes can lead to “show through” of filler. Refer also Section 10 – Finishing. Clear coating is not suitable for wet areas. Clear coating or covering the board with an impervious layer should not be carried out if particleboard is above 15% moisture content.

# “Plan-A-Floor”

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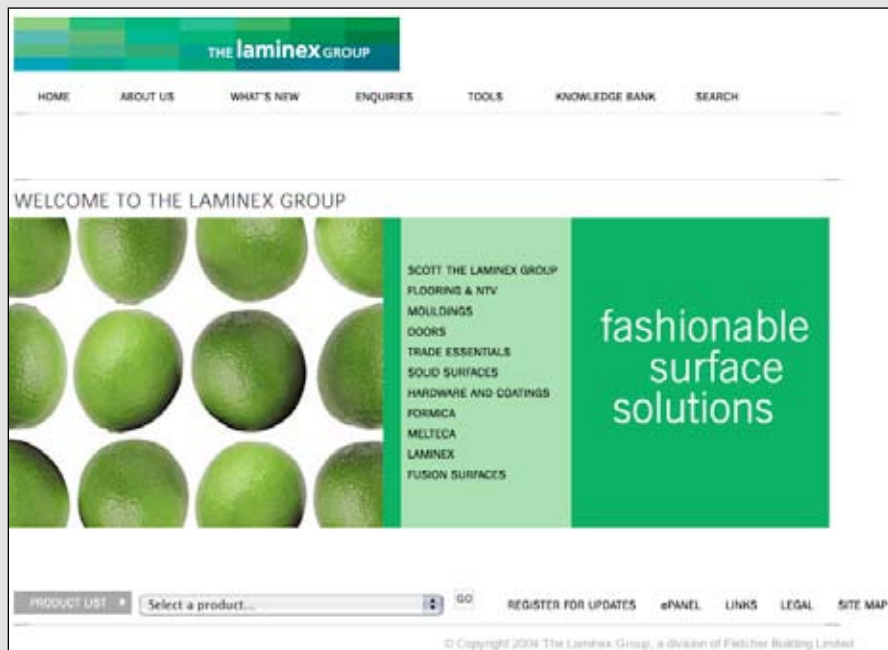
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# “Plan-A-Floor”

## 7.1 Description

Pynefloor Green Tongue Plan-A-Floor is a free web based software package that has been developed to help the builder or installer of Pynefloor Green Tongue select and layout particleboard flooring panels as easily and economically as possible. It can be accessed by clicking on the “TOOLS” button on The Laminex Group website: [www.thelaminexgroup.co.nz](http://www.thelaminexgroup.co.nz).



## 7.2. Uses

This software may be used by builders, to calculate their flooring panel requirements. It will also calculate nail and adhesive needs.

As the software generates a report including a diagram of the floor lay out, the report can also be used as an attachment to the builders' order or can be used on the building site to indicate the pattern in which the floor should be laid to get the best result.

Builders' Merchants can also use the software to provide a service for their customers.

## 7.3. Getting Started

After accessing the website, click on the “TOOLS” button then select Green Tongue Planafloor.

The software will start (it takes a few minutes the first time) and the “Floor Plan Shapes” dialogue box will appear.

(Refer Figure 7.1)

Type in “Project Name”, select the floor plan that best approximates your need and then click “continue”.

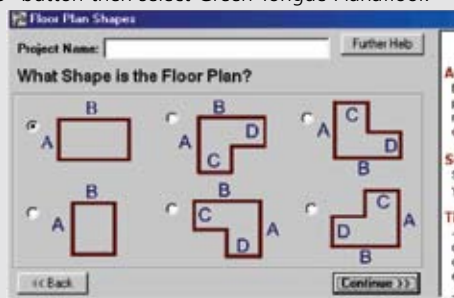


Figure 7.1

### C7.1

The programme can equally be used for Pynefloor Straight Edge and Pynefloor Gold.

### C7.2

For Pynefloor Straight Edge some additional fixings will be required for fastening to noggs.

## 7.4. Enter Dimensions

In this section you can enter the building dimensions, select joist centres and direction as well as the preferred Green Tongue flooring panel size. After completing this, click "Finish". (Refer Figure 7.2)

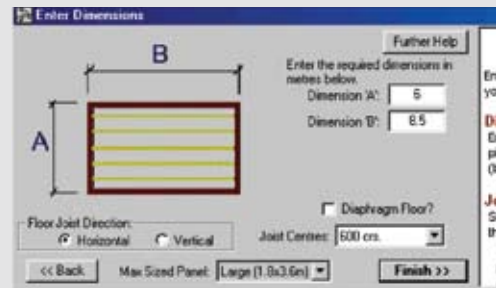


Figure 7.2

## 7.5. Layout

The software will then automatically layout the Pynefloor Green Tongue flooring panels using any panel off cuts where appropriate. (Refer Figure 7.3)

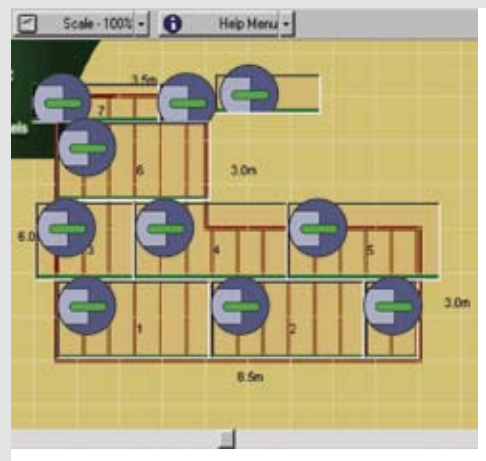


Figure 7.3

## 7.6. Modifying

The design can be modified to further optimise against panel waste. Adding walls is as simple as clicking and dragging. (Refer Figure 7.4) The option then exists to go back and change the design, create a new design or print the current design. Printing the current design generates a report showing the lay out as well as quantities and descriptions of the Pynefloor Green Tongue floor panel required plus nails and adhesives.

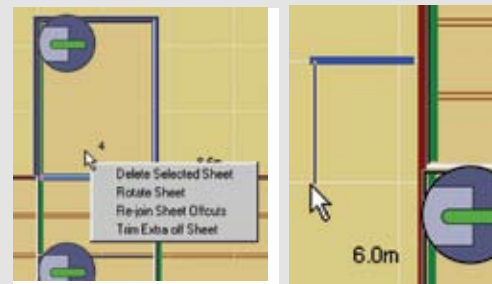


Figure 7.4

## 7.7. Limitations

Users should make themselves familiar with the Pynefloor technical literature, in particular the information on design, installation, layout, fixing, etc. All these principles have been incorporated into the software and are used as defaults where appropriate.

It is recommended that the new user visit the Plan-A-Floor "HELP" file first to become familiar with the scope and options that are available. Please also note the disclaimer at the end of the "TOOLS" page on The Laminex Group website.

Although the software will produce a solution, this is by no means the only or best answer. The user is able to make adjustments and the more the software is used the better the results.

# Installation

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# Installation

## 8.1 General

The following information applies to all Pynefloor products.

- o Continuous support shall be provided at the building perimeter.
- o Place Julian date down and label up.
- o Panels shall be close butted together without being placed under pressure by mechanical cramping.
- o Panels shall be staggered when used as a diaphragm and it is recommended that staggering is used for general use.
- o Each panel shall span at least two floor joist spacings (i.e. supported over three consecutive joists) except where part panels provide the necessary infill at the building edge.
- o A minimum of 8mm clearance shall be made between edges and any fixed object e.g. bottom plates, masonry walls, abutting concrete floors, structural columns etc. This is to accommodate linear expansion that may occur during the weather exposure period and eliminate moisture transfer from concrete to Pynefloor.
- o To stop permanent staining do not leave materials (scaffolding, nails, etc.) on panels during wet conditions and avoid spills of cement, paint, tea, etc.
- o If adhesive is being used apply a continuous 5mm bead to the top of the joists (and nogs if used) just prior to each sheet being positional and fixed in place.

## 8.2 Pynefloor Straight Edge

The following information applies to Pynefloor Straight Edge only.

- o Support shall be provided to all panel edges or ends by way of nogs/dwangs.
- o All supporting timber shall be a minimum of 100 x 50.

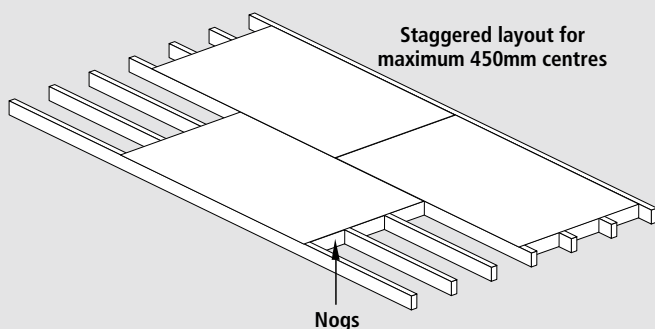


Figure 8.1

- o For joist spacings of 450mm or 400mm, panels can be laid with, or across the joists. (Refer Figure 8.1)
- o For joist spacings of 600mm panels shall be laid across the joists. (Refer Figure 8.2)

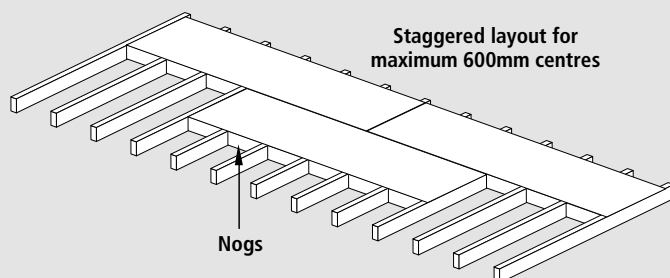


Figure 8.2

When Pynefloor Straight Edge is to be clear finished, ensure panel sizes, types and batch numbers are not mixed.

### C8.1

Where a part panel is necessary, consideration should be given to the specific location and potential loads. If the area is likely to carry regular foot traffic or heavy concentrated loads, consideration should be given to installing nogs/dwangs at centres matching the joist spacings.

### C8.2

This will ensure that shading between panels does not occur – Julian dates are batch numbers.

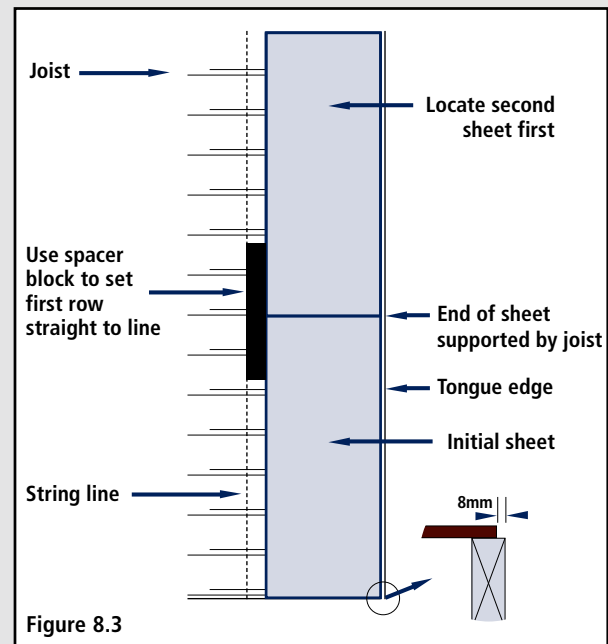
**C8.3a**

At this stage the tongue in the first row is redundant and can be removed for use elsewhere, if required.

## 8.3 Pynefloor Green Tongue & Pynefloor Gold

The following information applies to Pynefloor Green Tongue and Pynefloor Gold, it also outlines techniques used in the laying of tongued and grooved panels.

- o Panels shall always be laid across the joists. (Refer Figure 8.2)
- o Lay the first row with the brand name down and the tongue aligned to the perimeter of the floor. (Refer Figure 8.3)
- o Ends of sheets should be close butted and centred over joists.
- o Check the grooved edge, for straightness, with a string line.
- o Fix panels with only sufficient fastenings to avoid movement – this will stop any distortion of the grooved edge prior to further installation.
- o Allow for a stagger of at least one joist space and position the first sheet of the second row, with the tongue adjacent to the groove of the first row.
- o If adhesive is to be used, apply a thin bead along the top of each tongue, before insertion into the groove.



- o Lay a blocking piece (an off-cut of minimum 150 x 50 timber 1.4m long) across the joists, in the centre of the panel, on the grooved edge.
- o Stand on the blocking piece and strike with a heavy hammer to drive the panel tongue into the groove of the first row.
- o It will assist if a second person can stand on the joint between the two rows.
- o Fix, as before and continue the process to complete the second row – the first row can now be fully fixed.
- o Subsequent rows are similarly installed to complete the floor.

**C8.3b**

Refer 8.6 Diaphragm Floors.

Table 8.1 gives an indication of the quantity of fixings required for Pynefloor Green Tongue and Pynefloor Gold. Extra fixings will be required for diaphragm floors. C/A equals construction adhesive cartridges (375ml).

| Fixing Quantities |             |             |             |             |            |             |             |             |
|-------------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| Panel Size (mm)   | 1800 x 3600 |             | 1200 x 3600 |             | 900 x 3600 |             | 1200 x 2400 |             |
|                   | Nails       | C/A         | Nails       | C/A         | Nails      | C/A         | Nails       | C/A         |
| Joist Centres     | (number)    | (cartridge) | (number)    | (cartridge) | (number)   | (cartridge) | (number)    | (cartridge) |
| 600mm             | 76          | 0.8         | 53          | 0.6         | 44         | 0.5         | 39          | 0.5         |
| 450mm             | 96          | 1.0         | 67          | 0.7         | 56         | 0.6         |             |             |
| 400mm             | 106         | 1.1         | 74          | 0.8         | 62         | 0.6         | 53          | 0.6         |

**Table 8.1**

## 8.4 Large Floors

A large floor is one with a length or width exceeding 15m.

All large floors that are pre-laid (exposed to weather) shall provide for panel expansion.

This can be achieved by:

- o Leaving out one row of flooring panels across the building width at centres not exceeding 15m until the structure is completely closed in.
- o Providing a 40mm wide expansion or gap under partition lines or other hidden situations, at no greater than 15m intervals.  
(Refer Figure 8.4) Insert a filler strip on completion.

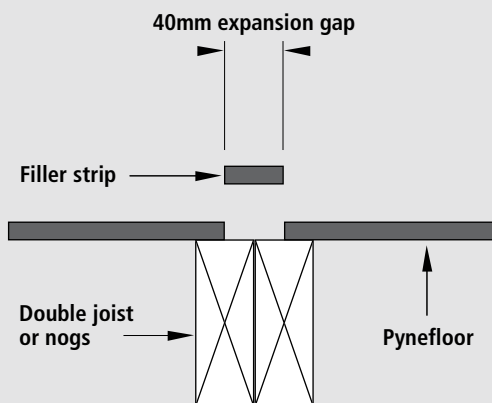


Figure 8.4

All large floors that are post-laid (not exposed to weather) do not require expansion provisions. It is essential that no exposure of any type occur.

## 8.5 Fixing

The type and position of the fastening chosen is important for long-term performance. Incorrectly fixed panels and high moisture content in timber may lead to squeaking floors which can be difficult to remedy at a later date.

Table 8.2. gives details of acceptable fastener types. All others, including staples, are unacceptable.

Perimeter fixing shall be 10mm from the panel edges except where long edges have tongues. Increase to 15mm to avoid tongue damage.

### 8.5.1 Adhesive

Adhesive is recommended for use in conjunction with mechanical fastening.

| Fastener Types   |                 |  |                |
|--|-----------------|--|----------------|
| Timber Joists  | Size            | Fixing Centres mm  |                |
|  |                 | (Edges)  | (Intermediate) |
| Annular grooved particle board flooring nails            | 60mm            | 150  | 200            |
| Galvanized Jolt head nails                               | 60mm            | 150  | 200            |
| Type 17 countersunk self drilling screws                 | 45mm x 8 gauge  | 150  | 200            |
| Steel Joists   |                 |  |                |
| Tek self drilling screw (corrosion resistant)            | 50mm x 12 gauge | 150  | 200            |
| Adhesive   |                 |  |                |
| Flexible solvent based elastomeric construction adhesive |                 | 5mm bead to the top of each joist.<br>2mm bead to the top of tongue. |                |

Table 8.2

Adhesive should be applied in a continuous 5mm bead to all floor joists and a 2mm bead along the tongue of Pynefloor Green Tongue and Pynefloor Gold, prior to insertion.

### C8.4

Ensure that the 8mm clearance is maintained around the perimeter and between fixed objects. Where a double joist is not available, use rows of double nogs.

## SECTION 8: Installation

**C8.5.1**

The use of polystyrene insulation will avoid this process. (Refer 5.6 Insulation)

**C8.5.2**

Hand nailing will generally give the best result as more control can be exercised. The best possible result will be achieved with the proper use of annular grooved hand driven nails used in conjunction with adhesive.

**C8.5.3**

Care should be taken when retightening screws, as heads are liable to shear, particularly if rusting has occurred.

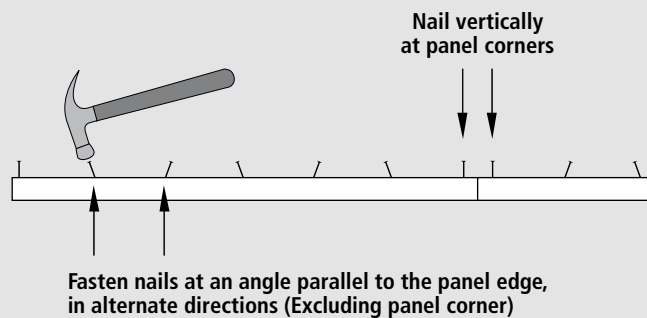
When using adhesive fastening where under floor insulation is required, ensure the Pynefloor is bonded directly to the joists. Draped foil can be installed by, “double row stapling” and removing foil between the staples to expose the joists for adhesive contact.

**8.5.2 Nails**

Hand-driven nails shall initially be driven flush with the surface. Punching of nails must take place after building is closed in – just prior to sanding. This allows for the moisture content of joists to dry during building construction.

Hand-driven nail fastening usually provides a better finish for clear coatings than power-driven nails.

To improve lateral holding, nails shall be slightly angled and be driven parallel to the sheet edge. (Refer Figure 8.5)



**Figure 8.5**

When using power-driven nails, set the depth adjuster attachment on the power tool to drive nails flush with the surface of the panel. This will allow hand punching to take place just prior to sanding.

The use of the pre-punching mechanism increases the risk of squeaky floors, as any timber shrinkage that occurs as the supports dry out is not taken up later as is the case when the punching process is carried out at sanding and floor finishing stage.

**8.5.3 Screws**

For a satisfactory result with screws it is essential to first drill pilot holes. This will avoid fibre being driven ahead of the screw and being deposited on the top of the joist, adding to potential movement and noise.

When using screws, it is important to initially finish flush, to allow retightening just prior to sanding.

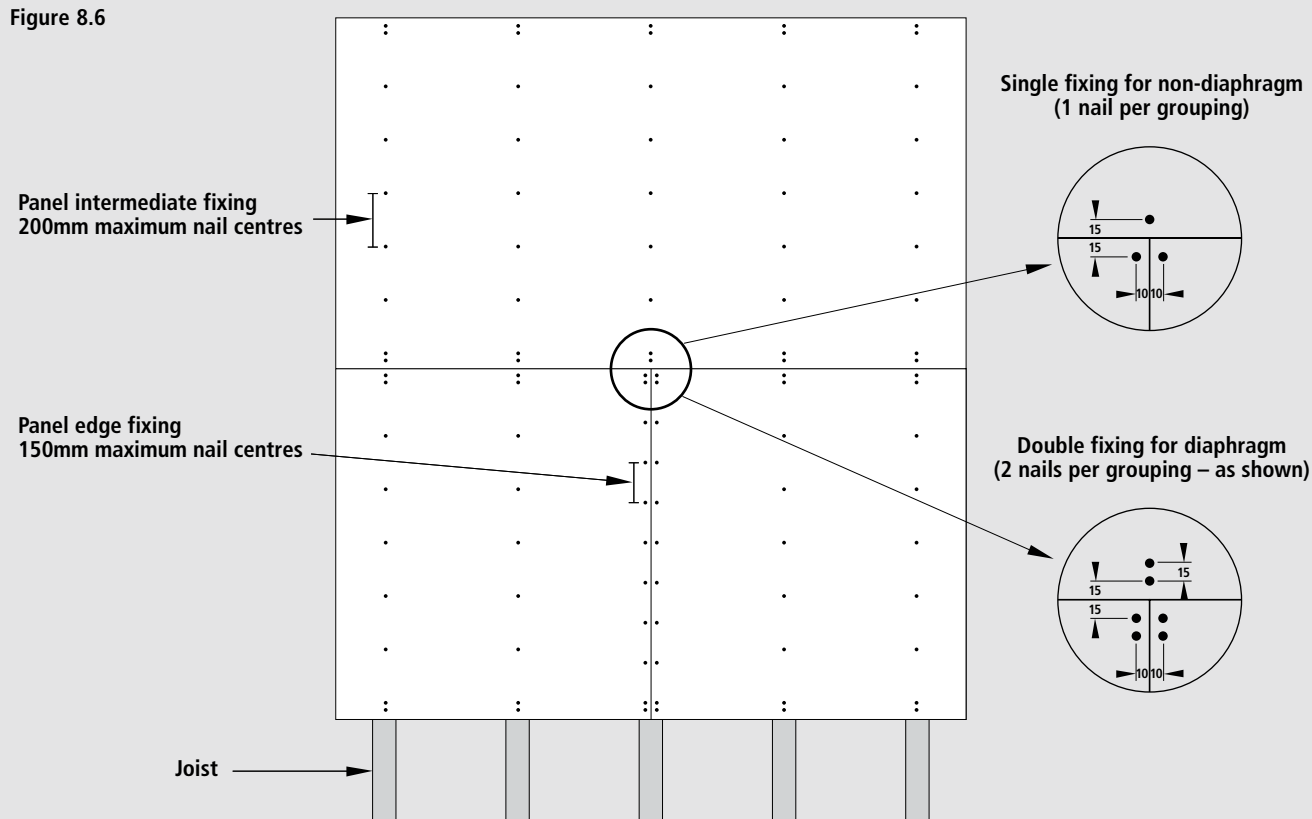
## 8.6 Diaphragm Floors

For Pynefloor Green Tongue and Pynefloor Gold diaphragm floors, the maximum joist spacing is 450mm and additional fixings are required.

In addition to the standard nailing, extra nails, as shown in Figure 8.6, are required to the long edge placed 30mm back. Screw fixing is not acceptable for diaphragm floors.

There are no additional requirements for the use of Pynefloor Straight Edge in diaphragm floors.

Figure 8.6



## 8.7 Double Layer Installation

The bottom layer of Pynefloor shall be laid as for single layer flooring panels.

The top layer shall be laid in a similar pattern with edges of panels offset in each direction from the bottom layer edges.

All panel edges shall be located centrally over joists or blocking to ensure positive fixing and nail length increased to 75mm.

When installing a double layer flooring system, allow for the installation of the second layer after closing in and when all sub-trade work is completed. This will provide a clean unweathered surface for clear finishing.

Moisture content of the first layer must be at 15% or below before the second layer is installed.

## 8.8 Avoiding “Squeaking & Creaking”

Since the 1960s when particleboard flooring was introduced, the panels have been laid on “green” floor joists.

The drying out of this timber is a major cause of panel movement that can lead to a noisy floor.

Particleboard itself does not create noise, but common causes of creaking or squeaking floors are:

- o Poor alignment of the joists bearing surfaces, creating gaps resulting in uneven stress on fixings.
- o Shrinkage as the joists dry out – timber shrinks across the grain, leaving a gap between the underside of the sheet and the top of the joist.
- o Using long span joists which allow the floor to deflect more and creak at the solid blocking fixings.
- o Insufficient and loose strutting or blocking of the joists.
- o Swelling of the particleboard panels exposed to the weather. Swollen edges of the panel may not bear tightly on the joists when they dry. Sanding may level the thickened edge, but this does not rectify the underside. Nails shall therefore be punched just prior to sanding.
- o Insufficient fixings holding the panels to the support system.
- o Panels not being fully fixed down when laid.
- o Foot traffic in the house working the panels down the shank of the nails onto the top of the joists often leading to squeaking as the nail shafts work in the particleboard panels.
- o Power fastenings being over-driven into the panel core.
- o Hand fixed nailing being punched off at the initial fastening stage with no allowances made for any subsequent movement as drying of materials occurs.
- o Nails being positioned too close to the panel edges.

The following good practice will help to avoid a noisy floor:

- o When possible, use dry joists.
- o For new buildings, reduce the joist span or increase joist depth to reduce deflection (prop green long span joists at mid span until they are dry).
- o Level the joist tops before laying the flooring panels.
- o Ensure dry solid blocking or herringbone strutting is fitted tightly to stiffen floor in accordance with NZS 3604.
- o If using solid blocking fit as late as possible so that joists are drier and shrinkage will be less.
- o Herringbone strutting is preferred as it can be tightened from the underside after timber is dry and before ceilings are fixed to upper floor joists.
- o Lay flooring panels with staggered joints.
- o Don't cramp flooring panels tightly together.
- o Drive fastenings flush with the top surface of the board at time of laying.
- o Leave punching of nails as long as possible.
- o Use adhesive/nail fixing system where possible and completely nail off at time of laying.

# Flooring Overlays

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# Flooring Overlays

## 9.1 General

The Laminex Group manufactures a range of panel products suitable for overlaying existing concrete and wooden floors for commercial and domestic requirements.

There is a panel suitable for most flooring overlay applications, including:

- o All Pynefloor™ products
- o Lakepine® MDF
- o Trade Essentials® Particleboard (medium density particleboard)
- o Hardboard

This section is specific to Pynefloor, for others refer to individual publications.

All other sections of this manual apply equally to this section.

Overlays are only intended for interior use and should not be exposed to weathering. The fixing of overlays should not be carried out until the structure is closed and the substrate is waterproof and dry.

## 9.2 Uses

Overlays can be used for:

- o Refurbishing uneven and damaged tongue and groove wooden floors.
- o Re-leveling damaged and uneven concrete floors in commercial premises prior to laying carpet, vinyl, parquet or floor tiles.
- o Upgrading of school and community halls, gymnasium floors and stages, to meet the requirements for dancing, indoor bowling and other sporting activities.
- o Structural upgrades of wooden flooring in existing commercial buildings.
- o As a substrate for solid timber tongue and groove overlays.

## 9.3 Pre-conditioning

To ensure equilibrium of product, panels should be conditioned (left separated and standing vertically) in the installation location for at least 48 hours, prior to commencing fixing.

## 9.4 Direct Floor Overlay

All Pynefloor products may be attached directly to existing concrete or timber floors.

(Refer Figure 9.1)

The use of tongue and groove Pynefloor Green Tongue and Pynefloor Gold will control long edge differential movement, and improve panel hold down when direct overlaying.

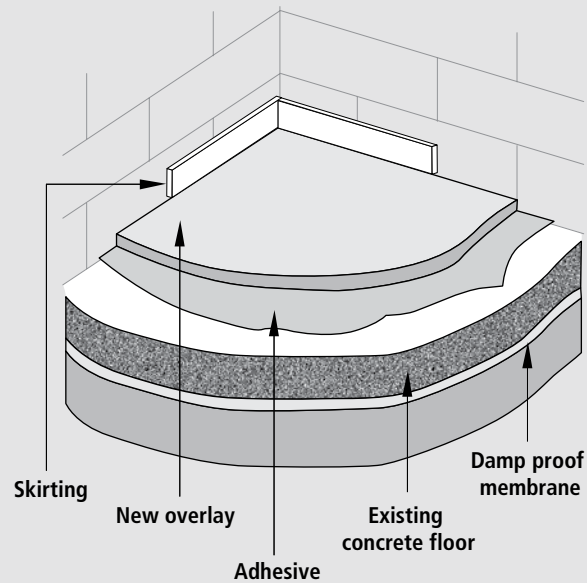


Figure 9.1

**C9.4.1**

Refer section 8 – Installation, for fixing specifications.

**C9.4.2a**

Concrete waterproofing additives do not guarantee a dry substrate. A membrane is the only safe solution.

**C9.4.2b**

BRANZ Bulletin No. 388 “Site Measurement of Moisture in Timber and Concrete”, describes the whole process and how measurements shall be taken.

**9.4.1 Timber Substrates**

For best results when direct overlaying, use a combined nail/full spread adhesive method. This eliminates any tendency for “drumming” in the new floor. A construction adhesive is recommended and should be applied as a full spread, to the manufacturer’s instructions.

Existing tongue and groove wooden floors shall be refixed and repunched as applicable, and then coarse sanded to provide a flat substrate. Ensure that there are no protruding nails prior to machine sanding.

When overlaying a tongue and groove timber floor, or existing particleboard floor, ensure that the joints in the new panels do not occur directly above parallel joints in the base floor.

All clearances, fastening and finishing detail applies equally where described elsewhere in this manual.

**9.4.2 Concrete Substrates**

For best results when direct overlaying onto concrete, use a full spread adhesive method. This reduces panel movement and “drumming”.

Mechanical fixing of direct overlays on concrete floors should be avoided.

A construction adhesive is recommended and should be applied as a full spread, to the manufacturer’s instructions

Localised defects in the existing floor (i.e. exceeding 5mm undulations per 3m in any direction) shall be matrix filled to a leveled surface as applicable, and high spots ground flat.

The prepared floor surface shall be clean, sound and dust free.

New and old concrete floor slabs shall be dry before laying. As a guide for new concrete, allow one-month drying time per 25mm of floor slab thickness.

There are a number of “rule of thumb” methods to determine if concrete is sufficiently dry to install overlays. The only true method is to measure the relative humidity of the concrete surface, using a Flooring Hygrometer. (Refer Figure 9.2)

**The reading shall be below 70% before the laying of particleboard can be considered.**

Substrates shall be free from wax, oil, moisture, grease, dirt and dust or loose material.

Construction joints shall be formed in the overlay to coincide with those in the concrete substrate. Bridging construction joints is not recommended.

Before applying adhesive the floor shall be vacuumed clean and wiped over with a damp mop.

Apply full spread adhesive to the manufacturer’s specifications.

All clearances, fastening and finishing details apply equally where described elsewhere in this manual.

Temporary even pressure (i.e. sandbags) should be laid over the floor area until the adhesive has cured. Pay particular attention to square-edged panel intersections, where it is necessary to eliminate surface differentials.

Prohibit traffic over the new floor until the new adhesive is fully cured as recommended by the adhesive manufacturer.

#### C9.4.2c

The adhesive shall be full spread. Spot or bead application may lead to “drumming”.

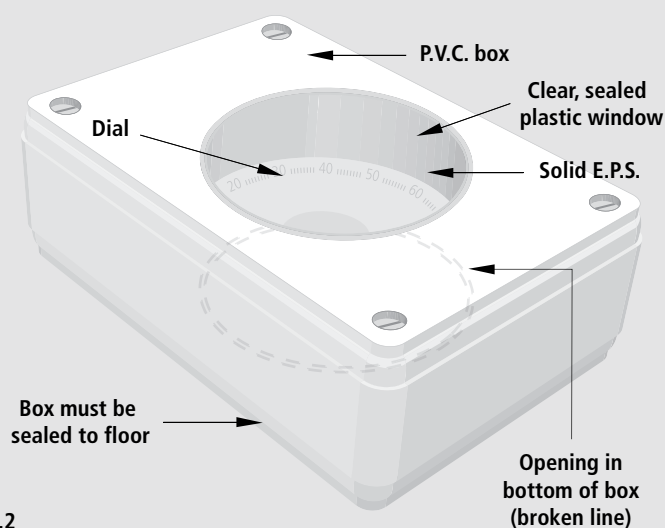


Figure 9.2

**C9.5a**

Refer Section 5-Floor Design, for all joist spacings.

**C9.5b**

BRANZ Bulletin No. 388 "Site Measurement of Moisture in Timber and Concrete", describes the whole process and how measurements shall be taken.

## 9.5 Indirect Floor Overlay

All Pynefloor products can be used for indirect overlays, up to spans of 600mm.

Flooring panels are fastened to timber battens fixed to the existing concrete or timber surface, dependent on end application (straight edge or tongue and groove). (Refer Figures 9.3 and 9.4)

Indirect overlaying of concrete, with tongue and groove product, allows for services to be installed within the cavity and specialist sprung floors can be accommodated. (Refer Figure 9.4)

Increased floor stiffness will be achieved when closer support centres are used.

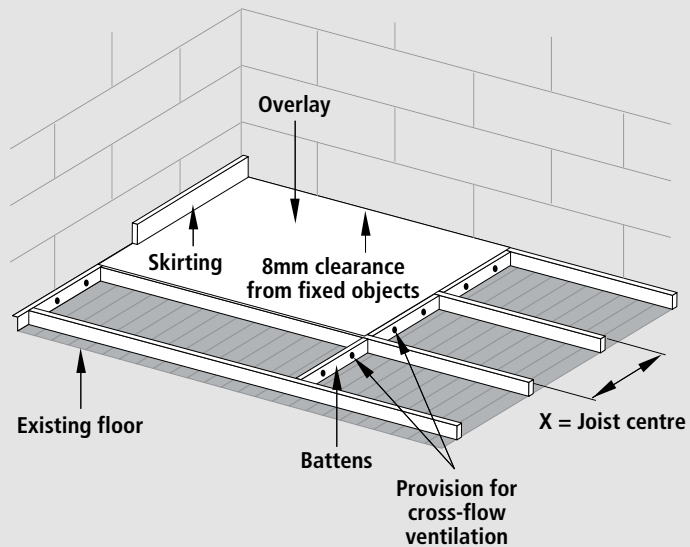


Figure 9.3

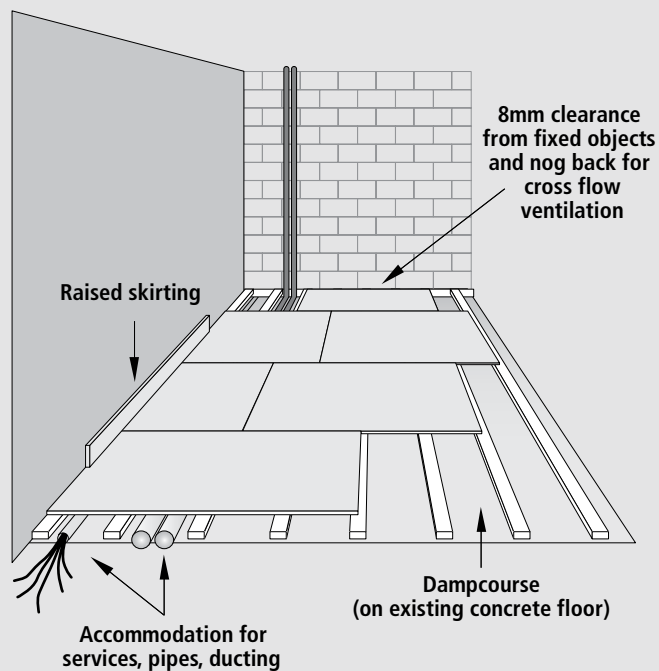


Figure 9.4

Provision shall be made for cross flow air change within the new floor cavity especially when overlaying concrete substrates. (Refer Figure 9.3)

Where large floor areas are to be installed, effective cross flow ventilation between battens is essential and a surface moisture barrier may be required.

Again new and old concrete floor slabs shall be dry before laying and the use of a hygrometer is essential.

**The reading shall be below 70% before the laying of particleboard can be considered.**

Ensure battening accommodates any excessive sub-floor undulations and ensure “hold downs” are secure.

Sub-floor framing moisture content shall not exceed 18%.

# Finishing

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# Finishing

## 10.1 General Preparation

Pynefloor flooring panels provide an ideal substrate for most types of floor finishes. All floors will require sanding prior to covering or coating.

All Pynefloor material shall not remain in a permanently raw unfinished condition. After the building is completed and before occupation panels shall be finished with floor coverings such as carpet, sheet vinyl, ceramic tiles etc, or a coating system.

| Floor Sanding  |        |              |            |
|--|--------|--------------|------------|
| Surface Finish   | Cut    | Sander Type  | Paper Grit |
| Clear Coating  | First  | Drum         | 60 – 80    |
|  | Second | Disc         | 100        |
|  | Third  | Disc, Sander | 120 – 150  |
| Other Finishes<br>(Carpet, Vinyl, Wet Area Membranes etc.) | Single | Drum / Belt  | 60 – 100   |

**Table 10.1**

Prior to applying floor finishes, nails shall be punched or screws retightened, to give a maximum penetration into the panel of 2mm. All panels should be sanded in line with Table 10.1. Excessive sanding of Pynefloor or using too coarse a paper will reduce the thickness of the panel thereby affecting the structural strength of the panel and will result in colour variations when clear coatings are applied.

## 10.2 Dry areas

The following applies to areas that are not supplied with water from a water supply system:

### 10.2.1 Sheet Vinyl

- o The moisture content of panels shall be checked prior to laying. The maximum moisture content shall not exceed 15% especially at panel edges before any finishing takes place. Covering of Pynefloor with higher moisture content can result in an unsatisfactory visual appearance owing to panel shrinkage as it dries out over a period of time.
- o Carefully sand the entire floor area as required in Table 10.1.
- o Do not fill nail holes as filling can lead to show through.
- o Prior to the application of sheet vinyl, or other adhesive bonded finishes, panels shall first be sealed. This will reduce absorption of adhesive and extend tack off time.

### 10.2.2 Carpet

- o Carefully sand the entire floor area as required in Table 10.1.

### C10.1a

Refer Section 12 – Health and Safety.

### C10.1b

Penetration in excess of 2mm may affect the tightness of the fastening.

### C10.2.1a

If nail holes are filled, subsequent movement of fastenings can cause filler to rise up, resulting in show through.

### C10.2.1b

The sheet vinyl manufacturer will specify a suitable sealer.

## SECTION 10: Finishing

**C10.2.3a**

This is to ensure that timber nogs are used to support edges – if Tounge and Groove product is used cracking of surface coatings may eventuate due to slight differential movement.

**C10.2.3b**

This will ensure that shading between panels does not occur – Julian dates are batch numbers.

**C10.2.3c**

Refer Definition 10.3 – Wet Areas

**C10.2.3d**

Best results are achieved when specialist applicators carry out the work. Should any imperfections appear in panel surfaces during coating, cease work and contact the panel supplier or the coating manufacturer.

**10.2.3 Clear Finish**

- o When clear coating use only Pynefloor Straight Edge.
- o Hand-driven nailing will usually give a better finish than power-driven nails.
- o Panel sizes and batch numbers shall not be mixed.
- o Flooring intended for clear finishing shall be kept clean and free from staining, soiling and abrasion.
- o When clear finishing large floor areas, e.g., halls and gymnasiums, etc., post laying of the floor is recommended.
- o Clear finishing is not suitable in wet areas.
- o The moisture content of panels shall be checked prior to coating. The maximum moisture content shall not exceed 15% especially at panel edges before any finishing takes place. Coating of Pynefloor with higher moisture content can result in an unsatisfactory visual appearance owing to panel shrinkage as it dries out over a period of time.
- o Clear coatings should provide protection in normal domestic building applications for a limited period. The clear coating manufacturer's application instructions shall be strictly followed and their requirements for periodic recoating shall be adhered to.

The following sequence is required for clear coating.

- o Ensure floor panels are dry, at or below 15% moisture content.
- o Punch nails just prior to sanding.
- o Fill nails holes with a compatible filler colour matched to the particleboard.
- o Carefully sand the entire floor area as required in Table 10.1.
- o Remove dust from the entire floor surface and skirtings by broom and vacuum cleaner.
- o Apply the first coat of polyurethane in accordance with the manufacturer's instructions.
- o Sand and apply further coats as required by coating manufacturer.
- o At all times strictly follow the coating manufacturer's instructions.

**10.2.4 Sports Court Markings**

It is recommended that painted court markings be carried out prior to clear finishing and follow the requirements of the final coating manufacturer.

## 10.3 Wet Areas

The long-term performance of Pynefloor will be adversely affected if exposed to moisture for prolonged periods. It is therefore essential to prevent moisture penetration into the Pynefloor panels in wet areas.

### 10.3.1 Definition

A wet area is any area within a building supplied with water from a water supply system, e.g. kitchens, bathrooms, toilets, shower rooms, laundries, changing rooms, en-suites etc.

### 10.3.2 Impervious Surface Finish

In wet areas, Pynefloor panels shall be covered with a floor covering or finish that is impervious (i.e. does not allow the passage of moisture).

While Acceptable Solution E3/AS1 provides a list of impervious surface finishes that meet the requirements of the NZBC, The Laminex Group believe that the laying of an **integrally waterproof sheet material** (e.g. Polyvinylchloride) with sealed joints, or the installation of ceramic or stone tiles laid over an appropriate<sup>(1)</sup> **wet area membrane**, are the only acceptable methods to ensure the Pynefloor remains dry during its intended life.

An integrally waterproof sheet material (sheet vinyl) shall be installed with heat welded joints. The vinyl shall be covered at the wall/floor intersection, and where a fixture (cabinet/shower/bath etc.) intersects the floor. It shall be continued under any floor fixed toilet pan. Where coving at the intersection of the floor and fixture is considered undesirable, the vinyl shall be installed prior to the installation of the fixture. In these instances the vinyl shall be covered at the wall/floor intersection behind/under all fixtures. Coving of the vinyl shall be in accordance with NZBC Acceptable Solution E3/AS1 Figure 1 (a).

The installation of an appropriate wet area membrane shall be in accordance with the manufacturers' recommendations. As with the vinyl covering, the membrane shall be returned up the wall at least 75mm. Where appropriate, the membrane shall be returned up the vertical front face of any fixture. If not appropriate, the membrane shall continue under the fixture and return up the wall at the room perimeter.

It is strongly recommended that floor drains be installed where ever possible to control the affect of any accidental flood. Critical areas for the inclusion of a floor drain include: under dish washers, in laundries and where spa baths are installed.

Care must be taken to ensure all pipes and penetrations through the vinyl or wet area membrane are fully sealed to eliminate any seepage through to the particleboard.

If floor finishes other than sheet vinyl with heat welded joints, or ceramic or stone tile laid over an appropriate wet area membrane are desired, the specifier must satisfy themselves that water will not penetrate through to the particleboard.

### Impervious Coatings (polyurethane/paint)

While historically polyurethane coatings have been an acceptable finish for particleboard, The Laminex Group believe these finishes do not provide the necessary medium or long term protection to ensure all requirements of the NZBC are met. Therefore they are not acceptable finishes on the particleboard or any other material which is fixed directly to the particleboard substrate in wet areas.

Where alternative coverings are laid over an appropriate wet area membrane, compatibility between the two products must be checked.

Maintenance recommendations as prescribed by the vinyl or wet area membrane manufacturers must be adhered too.

The particular clause – 10.2.1. Sheet Vinyl – applies equally to "Wet Areas".

Please Note: As with other floor coverings the moisture content of the particleboard must not exceed 15%, especially at sheet edges, at the time the vinyl or wet area membrane is installed.

(1) An appropriate wet area membrane is one that complies with AS/NZS 4858 or which carries a current BRANZ Appraisal (see BRANZ web site [www.branz.co.nz](http://www.branz.co.nz) for the current list of appraised wet area membranes).

# Maintenance

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# Maintenance

## 11.1 Ongoing Maintenance

The occupier or owner, throughout the life of the building, shall maintain the following specific areas.

### 11.1.1 Floor Coverings

- o Floor coverings in wet areas, shall be maintained to ensure water cannot penetrate through to the Pynefloor. To ensure long-term performance of the flooring, the surface protection system shall be repaired at any sign of damage.
- o Other floor coverings and coatings shall be maintained to ensure the particleboard surface is protected.
- o Floor wastes shall remain unobstructed and drain to the outside of the building.

### 11.1.2 Sub-Floor Space

- o The sub-floor space shall continue to receive ventilation throughout the life of the building.
- o Air vents in the foundation enclosure perimeter of the building shall not be obstructed by shrubs and gardens, etc. or any building extensions including decks. Building extensions shall allow for the continued compliance with sub-floor ventilation requirements.
- o Vapour barriers required to provide adequate moisture control in the sub-floor areas shall be maintained in an effective condition.
- o Clothes drier vents or steam vents shall not be allowed to exit into the sub-floor space. All relief valves or overflow pipes shall discharge outside of the building.

## 11.2 General Precautions

- o Pynefloor shall not be re-exposed to weather during renovations or extensions.
- o Where heavy floor loads are intended such as iron-framed pianos or billiard tables, etc. professional engineering advice should be sought to avoid undesired deflection or surface failure.

## 11.3 Accidental Flooding

- o In any area where accidental flooding may occur, such as where water holding whiteware appliances are installed, a floor waste is recommended.
- o If for any reason flooding should occur, care shall be taken to ensure that the panels can dry out quickly. Removal of carpets or other loose laid floor coverings may be necessary and the slitting of the under floor foil, to ensure water is not trapped in the drape, may also be required.
- o It is essential that air be allowed to circulate around the panels and the replacement of floor coverings etc. shall not be considered until the particleboard is below 15% moisture content.

If required, The Laminex Group will test samples to verify continued fitness for use.

# Health & Safety

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# Health & Safety

## 12.1 Working Conditions

Health and Safety precautions shall be taken when working with wood panel products.

- o Exposure to wood dust and/or formaldehyde may cause irritation to the eyes, respiratory system and skin, and may cause sensitisation resulting in asthma, and by skin contact resulting in dermatitis.
- o Wood dust is classified as a known carcinogen. Repeated inhalation of wood dust over many years may cause nasal cancer. Formaldehyde is classified as a known carcinogen.
- o Storage areas containing large quantities of Pynefloor shall be adequately ventilated.
- o Work areas shall be well ventilated and kept clean.
- o Sawing, sanding and machining equipment shall be fitted with dust extractors to ensure that dust levels are kept within standards laid down by Occupational Health and Safety New Zealand, Worksafe Australia or the specific country of use. If not, a dust mask conforming with AS/NZS 1715 and AS/NZS 1716 and eye protection conforming with AS/NZS 1337 shall be worn.
- o Offcuts, shavings and dust shall be disposed of in a manner that avoids the generation of dust and in accordance with the requirements of local waste authorities.
- o In end use applications all product surfaces exposed to occupied space shall be sealed.

## 12.2 Formaldehyde

### 12.2.1 Control

When installed, emission levels can be controlled by room ventilation and covering of the surface. The surface shall be sealed or covered with a coating system or alternatively, with a floor covering such as foam-backed carpet, carpet with rubber underlay, sheet vinyl or ceramic tiles.

Sealing or covering of the surface shall be carried out before the building is occupied.

When it is anticipated that the building may be closed for long periods of time, “trickle” ventilators shall be provided.

### 12.2.2 Formaldehyde Facts

Formaldehyde is a clear, naturally occurring gas, which is given off by plants, animals and human beings as part of the normal life process.

Formaldehyde is used in a wide range of consumer products and scientific and industrial processes. Formaldehyde is biodegradable, being destroyed by exposure to the atmosphere and by biological processes in soil and water, plants, animals and human beings.

Because some people can react to low levels of formaldehyde exposure, all possible sources of emissions in homes should be checked.

Among the factors which can lead to a build-up of formaldehyde levels in some homes are:

- o Unsealed or uncovered reconstituted wood flooring.
- o Unpainted or unsealed reconstituted wood products such as door jambs, scotias and skirting boards, doors and plywood.
- o Unpainted or unsealed furniture made out of reconstituted wood products like cupboards, chests of drawers and kitchen and laundry units.
- o Thermal backed curtaining and upholstery.
- o LPG-Fuelled heaters and cookers (unflued).
- o Cooking with hot oil.
- o Cigarette smoke.

### **12.2.3 Risks**

Formaldehyde is a natural gas, which will break down when exposed to the atmosphere, but in confined spaces this dissipation is slower.

Formaldehyde is irritating to the nose and throat, eyes and skin. Some people are hypersensitive to formaldehyde and experience allergic reactions resembling asthma. They also experience runny noses and skin reactions.

### **12.2.4 Detecting Formaldehyde**

Air-borne formaldehyde is detectable by smell at about 0.3 – 0.4 parts per million (ppm) and at this level may cause mild eye irritation for some people.

At 0.5 ppm some people notice a mild effect in the throat. At 1.0 ppm and over, watering of the eye begins. At 10.0 ppm, intolerable irritant effects on the nose and throat are felt.

# Related Documents

## New Zealand/Australian Standards:

- o NZS3602:2003 Timber and Wood Based Products for Use in Building.
- o NZS 3603:1993 Timber Structures Standard.
- o NZS 3604:1999 Timber Framed Buildings.
- o NZS 4203:1992 Code of Practice for General Structural Design and Design Loadings for Buildings.
- o AS/NZS 1170:2002 Structural design actions part 0 and part 1.

## The Building Research Association of New Zealand (BRANZ) has produced the following documents:-

- o BRANZ Appraisal, Certificate No. 254 – The current edition is published on the BRANZ web site – [www.branz.co.nz](http://www.branz.co.nz)
- o BRANZ Bulletin No. 378 – “Tiling Wet Area Floors”
- o BRANZ Report STR 296 – Report on Tension Testing of Particleboards 1995
- o BRANZ Report STO 443 – Report on Shear Testing of Particleboards 2000
- o BRANZ Report STO 411 – Report on Tension Testing of Particleboard Green Tongue 1999
- o BRANZ Report STO 426 – Report on the Punch Testing of Particleboards 2000
- o BRANZ Report MTR 1244 – Analysis of Borer in Flooring in BRANZ House Condition Survey 1999
- o BRANZ Report April 1993 – Borer Infestation Particleboard
- o BRANZ Report 1995 Testing of Weathered Flooring
- o BRANZ Report STO 485 – Diaphragm Joint Tests on Pynefloor Green Tongue Particleboard Flooring 2001
- o BRANZ Report STO 485/1 – Diaphragm Joint Tests on Pynefloor Green Tongue Particleboard Flooring 2001