

# Particleboard

trade essentials<sup>®</sup>





**Trade Essentials® Particleboard, manufactured in Australia, is a three-layered board, with fine particles on the top and bottom surfaces, and larger wood flakes in the middle. The wood particles are pressed and bonded together with resin creating a tight compact panel that can be machined cleanly.**

**The surfaces are sanded smooth at the mill, ready for use or finishing with a high-pressure laminate, decorative foil or timber veneer.**

### **The cost effective wood panel choice**

Trade Essentials® Particleboard is lighter than medium density fibreboard yet retains a great deal of strength and stability. It is ideal for use in applications where detailed machining of the board is not required or where a lighter panel is important. This makes Trade Essentials® Particleboard the cost effective wood panel choice for a wide range of applications.

### **Renewable, sustainable resource**

The reconstituted wood fibres used to make Trade Essentials® Particleboard are obtained from Australian pine plantations

– a sustainable renewable resource. In fact, only renewable plantation timber is used in the manufacture of particleboard. Trade Essentials® Particleboard allows you to achieve fast, cost effective building results whilst maintaining our precious wilderness and rainforests.

### **Applications**

Specific Trade Essentials® Particleboard products are available to suit various applications, and these are detailed separately on the following pages.



## Particleboard Standard (STD)

Particleboard Standard is an undecorated flat panel product made from wood particles bonded together with resins. Tight compaction of the product allows clean machining and very fine surface finish.

### Applications

Particleboard STD is designed for interior use for a wide range of substrate applications including: Joinery, furniture, built-in furniture, shelving and cupboards of all types where the product will not be subjected to high humidity.

## Timber Edged Particleboard Shelving

Particleboard STD is also available as 16mm shelving. It is pre-cut, edged on one long side with a solid dressed timber strip and is available in various sheet sizes to suit most shelving applications. It allows quick, convenient cutting of shelves for cupboards and built in furniture.

## Physical Properties

(Typical physical properties when tested to AS/NZS 1859.1: 2001.Int)

| Property              | Unit              | Board Thickness |      |      |      |      |
|-----------------------|-------------------|-----------------|------|------|------|------|
|                       |                   | 9mm             | 12mm | 16mm | 18mm | 25mm |
| Board Density         | Kg/m <sup>3</sup> | 670             | 670  | 640  | 635  | 620  |
| Internal Bond         | KPa               | 550             | 550  | 460  | 460  | 440  |
| Modulus of Rupture    | MPa               | 18              | 18   | 18   | 16   | 16   |
| Modulus of Elasticity | MPa               | 2600            | 2600 | 2500 | 2500 | 2200 |
| *Screw Holding - Face | N                 | N/A             | N/A  | 700  | 700  | 700  |
| *Screw Holding - Edge | N                 | N/A             | N/A  | 800  | 800  | 800  |
| Surface Soundness     | MPa               | 0.9             | 0.9  | 1.1  | 1.1  | 1.1  |
| Moisture Content      | %                 | 5-8             | 5-8  | 5-8  | 5-8  | 5-8  |
| Thickness Swell 24hr  | %                 | 18              | 15   | 15   | 15   | 15   |
| General Board Weight  | Kg/m <sup>2</sup> | 6.0             | 8.0  | 10.2 | 11.4 | 15.5 |

\*Values reflect new testing methods for screw holding properties in AS/NZS 4266.13: 2001 (Int).

#In most instances the performance characteristics of the particleboard exceeds the minimum requirement of AS/NZS 1859.1: 2001 (Int). However for minimum property values refer to AS/NZS 1859.1: 2001 (Int).

## Fire Hazard Indices

(Typical achieved when tested to AS/NZS 1530.3: 1989)

| Indices         | Result | Range  |
|-----------------|--------|--------|
| Ignitability    | 14     | 0 - 20 |
| Spread of Flame | 8      | 0 - 10 |
| Heat Evolved    | 7      | 0 - 10 |
| Smoke Developed | 4      | 0 - 10 |



## Particleboard Moisture Resistant (MR)

Particleboard MR is a highly moisture resistant particleboard for use in areas of high humidity or areas where occasional wetting may occur.

The superior performance of Particleboard MR compared to Particleboard Standard is due to the bonding of wood particles with a special moisture resistant resin system. Particleboard HMR can be easily identified by the green dye incorporated in the core of the board.

### Applications

Particleboard MR is designed for interior use in a variety of applications including: kitchen cupboards, bathroom vanities, laundry cupboards, shelving or any situation where a moisture resistant particleboard is required. 33mm Particleboard can be used for tables, desks and bench tops.

### Moisture resistance

Particleboard complies with the Wet Cyclic Test for moisture resistance properties as specified in AS/NZS1859.1: 2001(Int). Refer to Physical Properties table for details.

### Particleboard EO MR

Particleboard MR is also available in an E0 (no added formaldehyde version) if required.

## Physical Properties

(Typical physical properties when tested to AS/NZS 1859.1: 2001.Int)

| Property              | Unit              | Board Thickness |       |             |       |       |
|-----------------------|-------------------|-----------------|-------|-------------|-------|-------|
|                       |                   | 9mm             | 12mm  | 16mm – 18mm | 25mm  | 33mm  |
| Board Density         | Kg/m <sup>3</sup> | 700             | 670   | 640         | 620   | 640   |
| Internal Bond         | KPa               | 700             | 670   | 580         | 550   | 550   |
| Modulus of Rupture    | MPa               | 19              | 19    | 19          | 18    | 18    |
| Modulus of Elasticity | MPa               | 2700            | 2800  | 2600        | 2700  | 2800  |
| *Screw Holding - Face | N                 | N/A             | N/A   | 700         | 700   | 800   |
| *Screw Holding - Edge | N                 | N/A             | N/A   | 1000        | 900   | 900   |
| Surface Soundness     | MPa               | 1.0             | 1.2   | 1.4         | 1.2   | 1.5   |
| Moisture Content      | %                 | 5-8             | 5-8   | 5-8         | 5-8   | 5-8   |
| Thickness Swell 24hr  | %                 | 10 av.          | 9 av. | 8 av.       | 7 av. | 6 av. |
| Moisture Resistance   | Test              | V313            | V313  | V313        | V313  | V313  |
| General Board Weight  | Kg/m <sup>2</sup> | 6.3             | 8.0   | 10.2/11.5   | 15.5  | 21.1  |

\*Values reflect new testing methods for screw holding properties in AS/NZS 4266.13: 2001 (Int).

#In most instances the performance characteristics of the particleboard exceeds the minimum requirement of AS/NZS 1859.1: 2001 (Int). However for minimum property values refer to AS/NZS 1859.1: 2001 (Int).

## Fire Hazard Indices

(Typical achieved when tested to AS/NZS 1530.3: 1989)

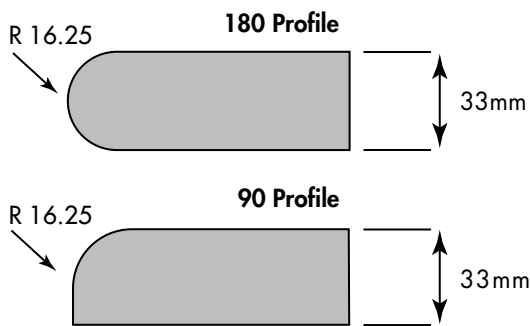
| Indices         | Result | Range  |
|-----------------|--------|--------|
| Ignitability    | 14     | 0 - 20 |
| Spread of Flame | 8      | 0 - 10 |
| Heat Evolved    | 7      | 0 - 10 |
| Smoke Developed | 4      | 0 - 10 |

## Particleboard MR benchtop substrate

Trade Essentials® 33mm Particleboard MR is also available as a ready to use benchtop substrate. It is pre-cut and pre-formed on one long side with a 90 or 180 degree profile for post forming blanks and provides a superb alternative to producing your own profiles.

It is designed for the post-forming industry and is suitable for kitchen bench tops, tables, office furniture, shelving and anywhere a strong post-formed shape is required.

### Edge profiles



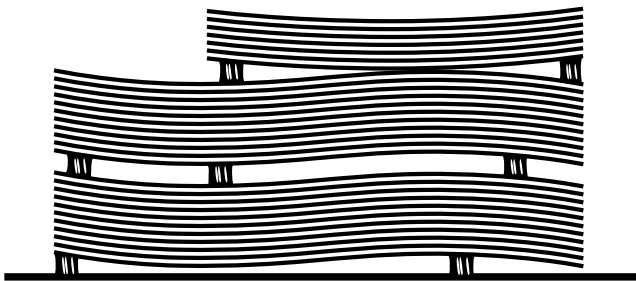
## Storage and handling of particleboard products

The following recommendations should be applied to maintain Particleboard panels in good order and condition. The storage area should be protected from the sun, rain and wind. Open sided sheds would not be regarded as dry stores.

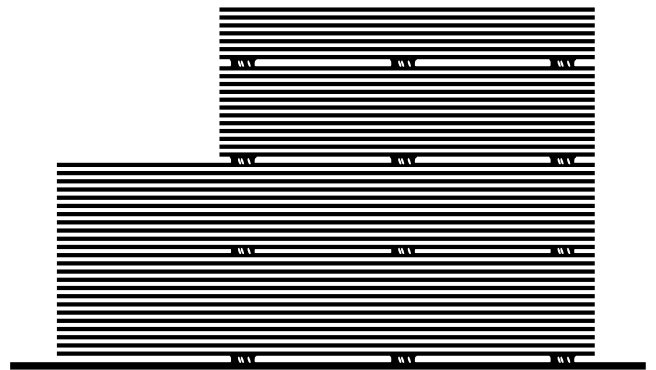
All packs should be evenly supported at each end at intervals of not more than 750mm where the packs are multiple stacked, and no further than 150mm from the edge of boards. All supports should be vertically aligned.

Keep work area clean. Avoid contact with abrasive surfaces or grit.

### Incorrect storage method



### Correct storage method



### Pre-conditioning

Laminex usually dispatches Particleboard with a moisture content of between 5% to 8%. This can alter, however, during the time the boards are in transit or storage before use. Apart from this, the relative humidity of the environment where the boards are to be fixed may call for quite a different moisture content, and some adjustment may be needed.

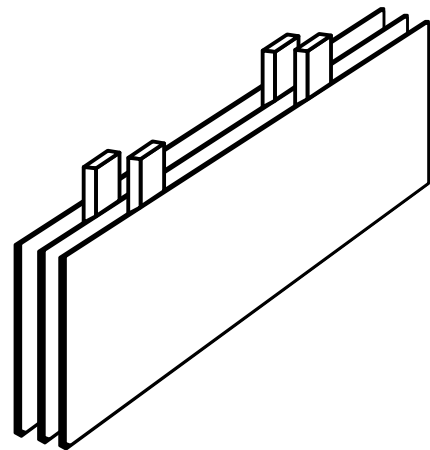
Pre-conditioning panels is recommended to ensure that they attain an equilibrium moisture content (EMC) before fixing, so as to reduce the likelihood of bowing after they have been fixed. Any subsequent movement will thus be a drying shrinkage which, given adequate support and fixings, keeps the boards flat and taut.

Some boards may achieve an EMC simply by being stored for some time in the location where they are to be used without any positive conditioning.

### Conditioning in air

Conditioning in air is adequate for most locations. It involves exposing the boards in the room where they are to be fixed for long enough to allow them to reach a moisture content which is in balance with their surroundings and adjust their dimensions accordingly.

To encourage free air circulation over all board surfaces, the boards should be arranged loosely as shown above, either vertically or horizontally. They should then be allowed to stand like this for a minimum of 48 hours.



## Fabrication

### Machining

Particleboard panels can be cut, drilled and machined using standard wood working equipment fitted with tungsten carbide tipped cutting edges.

It is recommended that the material be cut on a bench type or beam saw, using a 300mm tungsten tipped blade with 72 to 96 teeth. An alternate bevel saw blade is also satisfactory.

### Hand tools

When using hand tools to cut Particleboard panels they must be kept sharp, with no resin build up on the back of the cutter, and must not be allowed to burn.

When using electric hand saws cut with the face side down. When using hand saws hold the saw at as flat an angle as possible to the plane of the board with the face side up.

## Sanding

### Recommended abrasives

The best type of sandpaper to use on Particleboard is free cut in a A or C weight or P Graded paper.

Carbide-based abrasives are generally recommended for sanding Particleboard. (Aluminium oxide types tend to dull rapidly, producing burnishing.) A 'modified closed coat' abrasive is suggested. High sanding speeds cut the fibres most efficiently; with belt sanders, for example, belt speeds in excess of 1500 metres per minute and controllable feed speeds are recommended.

### Face sanding

Particleboard is supplied from the mill with 120 grit finish on the surfaces. This provides an excellent smooth surface - ideally suited to the direct application of most veneers and plastic foils. Scuff-sanding with the object of increasing adhesion is not recommended. For the application of thin foils, a further light sanding with 240 grit or even 320 grit belts may be advisable.

Deep sanding of the faces of Particleboard with the object of reducing thickness is not recommended.

### Edge sanding

Cut edges will require sanding with 120 grit to 380 grit. Good quality contour cutting should minimise the amount of sanding required.



## Adhesives, bonding & dowel joints

When gluing dowels or biscuits to the core of particleboard panels, a high solids PVA with good gap filling properties is suitable.

**Trade Essentials® General Purpose PVA** is recommended for this application.



## Dowel joints

Dowel joints are one of the most common adhesive based furniture assembly joints. Dowelling is a simple, inexpensive, strong and reliable way of making a butt or mitre joint.

### Machining dowel holes

Dowel holes should be cleanly machined with all loose particles blown from the holes. If a blunt drill is used the drill will overheat and polish the inside of the hole and reduce the ability of the adhesive to bond.

### Dowel diameter

Dowels used should be no thicker than 50% of the thickness of the panel used.

### Hole diameter

The fit of the dowel in the hole is critical to withdrawal strength. Holes drilled in the edges should be just a firm push-in fit to prevent the edge of the board from splitting as the dowels expand due to moisture uptake from the adhesive. Dowels inserted into the face of a panel should be a firm knock-in fit.

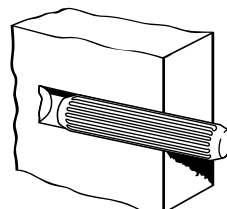
### Gluing

When using dowel joints only the dowels are glued in place. The practice of using glue between the edge and the face may actually weaken the joint.

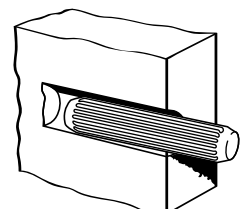
| Board Thickness (mm) | Dowel Diameter (mm) | Dowel Hole Diameter (mm) |
|----------------------|---------------------|--------------------------|
| 12 to 15             | 6                   | 6.2                      |
| 16 to 24             | 6 to 8              | 6.2 to 8.2               |
| 25 or more           | 10                  | 10.2                     |

### Depth

Inserting the dowel to the proper depth is important. They should be inserted at least 25mm into the edge of the Particleboard panel and as deep as practical into the face surface, but no more than two thirds of the thickness. In general, the longer the dowel the stronger the joint.



Interference fit  
(not recommended)



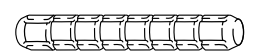
Clearance 0.1mm all round  
(preferred)

### Dowel selection

Dowels with multiple longitudinal or spiral groove patterns are recommended to ensure uniform adhesive spread within the joint. The dowels should be cleanly machined and free from any loose or torn fibres. The moisture content of dowels at the time of assembly should be in the range 10% +/-2%.



Smooth dowel  
(not recommended)



Grooved dowels  
(preferred)



## Mechanical fixing

### Selecting screw type

Quality parallel threaded screws are recommended for Particleboard.

### Selecting screw length

The length of the screw directly affects the holding power of the screws, for example, a 25mm screw has twice the holding power as a 13mm screw. This is most important when screwing into the edge of Particleboard panels.

### Selecting screw diameter

To avoid splitting the panel when screwing into the edge, the screw diameter should not exceed 20% of the panel thickness. For example, the maximum screw diameter for 16mm board is 6 gauge.

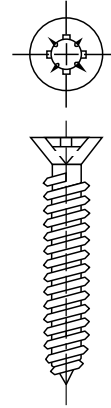
### Pilot holes

Correct pilot holes are essential to avoid splitting. The pilot holes should be approximately 80% of the screw core diameter and a minimum of 2mm beyond the screw penetration depth. Do not over tighten screws, as further turning after the screw is tight will reduce holding power.

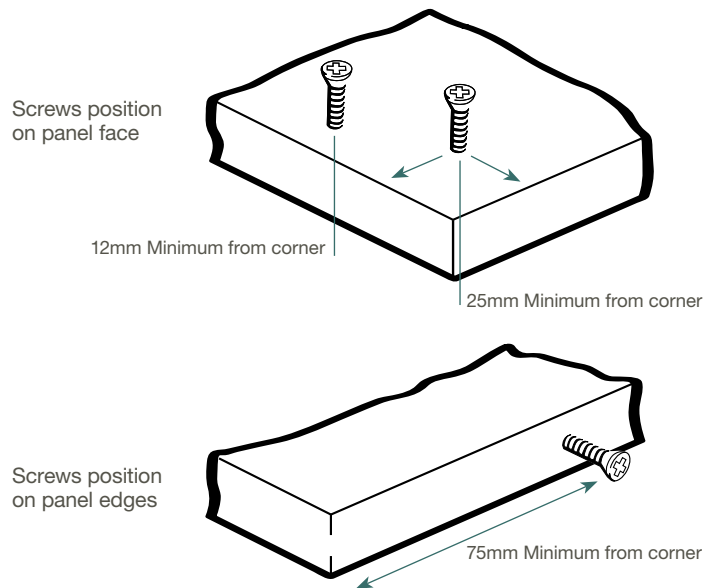
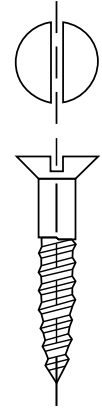
### Screw location

Screws should be carefully positioned to prevent splintering and breakout - no closer than 25mm to a corner and no closer than 12mm to the edge. When a long line of screws has to be used, it is a good idea to stagger the screws to prevent splitting the substrate being screwed to. When screwing into the edge, never place a screw closer than 75mm from the end of the panel.

Countersunk - Recessed Head  
Parallel Shank  
(recommended screw type)



Countersunk - Recessed Head  
Parallel Shank  
(not recommended)



## Screw Pilot Hole Selection

| Recommended Screw Gauge | Pilot Hole Diameter | Thickness |
|-------------------------|---------------------|-----------|
| 4                       | 2.0mm               | 9mm       |
| 5                       | 2.4mm               | 12mm      |
| 6                       | 2.6mm               | 16mm      |
| 7                       | 2.7mm               | 18mm      |
| 8                       | 3.0mm               | 25mm      |
| 9                       | 3.3mm               | 35mm      |

## Maximum Screw Gauge Selection

| Thickness | The Maximum Recommended Screw Gauge to Thickness of Particleboard |     |     |     |     |
|-----------|---|-----|-----|-----|-----|
|           | 4   | 5   | 6   | 7   | 8   |
| 9mm       | -   | -   | N/R | N/R | N/R |
| 12mm      | Yes   | Yes | N/R | N/R | N/R |
| 16mm      | Yes   | Yes | Yes | N/R | N/R |
| 18mm      | Yes   | Yes | Yes | Yes | Yes |
| 25mm      | Yes   | Yes | Yes | Yes | Yes |
| 35mm      | Yes   | Yes | Yes | Yes | Yes |

N/R = Not Recommended

## Particleboard shelf loadings

The following chart details the shelf loadings for Particleboard. Applications for shelving may range from a simple shelf in a kitchen to a huge collection of books in a library.

With shelf simply supported at both ends (no fixing) with an evenly distributed load. The shelf will not deflect more than 4mm.

| Thickness | Size          | Shelf loading | Size           | Shelf loading |
|-----------|---------------|---------------|----------------|---------------|
| 16mm      | 600mm x 200mm | 23kg          | 1000mm x 200mm | 5kg           |
| 18mm      |               | 33kg          |                | 7kg           |
| 25mm      |               | 90kg          |                | 19kg          |
| 33mm      |               | 190kg         |                | 41kg          |
| 16mm      | 600mm x 300mm | 35kg          | 1000mm x 300mm | 7kg           |
| 18mm      |               | 50kg          |                | 10kg          |
| 25mm      |               | 135kg         |                | 29kg          |
| 33mm      |               | 205kg         |                | 61kg          |
| 16mm      | 600mm x 400mm | 47kg          | 1000mm x 400mm | 10kg          |
| 18mm      |               | 67kg          |                | 14kg          |
| 25mm      |               | 181kg         |                | 39kg          |
| 33mm      |               | 380kg         |                | 82kg          |
| 16mm      | 600mm x 500mm | 59kg          | 1000mm x 600mm | 15kg          |
| 18mm      |               | 84kg          |                | 21kg          |
| 25mm      |               | 226kg         |                | 58kg          |
| 33mm      |               | 475kg         |                |               |
| 16mm      | 600mm x 600mm | 71kg          | 1200mm x 200mm | 2kg           |
| 18mm      |               | 101kg         |                | 4kg           |
| 25mm      |               | 271kg         |                | 11kg          |
| 33mm      |               | 570kg         |                | 23kg          |
| 16mm      | 900mm x 200mm | 7kg           | 1200mm x 300mm | 4kg           |
| 18mm      |               | 10kg          |                | 6kg           |
| 25mm      |               | 26kg          |                | 16kg          |
| 33mm      |               | 56kg          |                | 35kg          |
| 16mm      | 900mm x 300mm | 10kg          | 1200mm x 400mm | 5kg           |
| 18mm      |               | 15kg          |                | 8kg           |
| 25mm      |               | 40kg          |                | 22kg          |
| 33mm      |               | 84kg          |                | 47kg          |
| 16mm      | 900mm x 400mm | 14kg          | 1200mm x 600mm | 8kg           |
| 18mm      |               | 20kg          |                | 12kg          |
| 25mm      |               | 53kg          |                | 33kg          |
| 33mm      |               | 112kg         |                | 71kg          |
| 16mm      | 900mm x 600mm | 21kg          |                |               |
| 18mm      |               | 30kg          |                |               |
| 25mm      |               | 80kg          |                |               |
| 33mm      |               | 168kg         |                |               |

**Note:** These loads should be used as a guide only. We recommend that all designers carry out their own full load analysis based on their specific application.

# Particleboard

## Safety and handling

Particleboard is a reconstituted wood product containing wood, resin and wax. Machine tools should be fitted with dust extractors and the wearing of a dust mask and eye protection is recommended. Material Safety Data Sheets for Particleboard are available on request from any Laminex branch or visit [tradeessentials.thelaminexgroup.com.au](http://tradeessentials.thelaminexgroup.com.au).



Available in the Trade Essentials range:

**Adhesives**  
**Craftwood (MDF Products)**  
**Fire Retardant Products**  
**Lightweight PVC Panel Products**  
**Particleboard Products**  
**Plywood Products**  
**Strandboard Products**  
**Triboard Products**  
**Ultra LDF Products**  
**White Board and Edging Products**

**Particleboard is part of the Trade Essentials® range of products**

For more information visit [tradeessentials.thelaminexgroup.com.au](http://tradeessentials.thelaminexgroup.com.au) or call 132 136.

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