

# PARTICLEBOARD & MEDIUM DENSITY FIBREBOARD

Although in existence for 30 years, the demand for medium density fibreboard (MDF) produced in New Zealand is still increasing. Due to its dense, uniform composition, flatness and versatility it has become highly sought after, for both fine cabinetry operations and for more routine applications such as a lining material.

New Zealand MDF is made almost exclusively from New Zealand pine. It has

in a very short time achieved a reputation for its consistent high quality, its light colour (good for overlays) and in particular the high quality of its surface finish. The New Zealand MDF industry has also been very innovative, leading in developing new features or product configurations targeted at special applications. An example is a panel with high density outer layers resulting in a product with very high bending strength ideal for load-carrying applications such as flooring or shelving. Similarly, the development of lower density boards provides a lower weight panel still retaining the excellent surface and machining properties. Thin boards (3mm thickness) are also a more recent development and have found application as lining materials, able to compete with hardboard and with the advantage of the light colour.

With an annual production of about 600,000 m<sup>3</sup> annually, New Zealand is in the top five MDF producers in the world.

*Reconstituted panel products*

*made from New Zealand*

*pine have earned a good*

*reputation for consistency*

*and these products are*

*sought after in*

*many countries.*



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## TYPICAL PROPERTIES OF NEW ZEALAND MDF

Property	Thinboards	Regular MDF (e.g. 3 mm)	Lightweight MDF
Density kg/m <sup>3</sup>	780	700	600
Modulus of rupture MPa	46	40	33
Modulus of elasticity MPa	2,900	3,000	2,500
1 hr thickness swell %	9.5	1.7 to 3.8	2 to 4
1 hr water absorption %	7.9	2 to 3	2 to 2.5
Moisture content	8	8	8

*Note: These are indicative only and for exact values reference should be made to the manufacturer-supplied data.*

## MANUFACTURE

The raw material for New Zealand MDF varies according to the specific plant, but typically consists of New Zealand pine logs chipped on site, or wood chips produced from local wood processing plants. The chips are washed to remove foreign material and softened using steam before being refined to produce the small fibres characteristic of the product. Adhesives, typically urea formaldehyde or melamine urea formaldehyde, are added after the refining stage, along with wax. The resultant resinated fibres are dried, formed into large mats and then hot pressed to the final material dimensions, using either large batch (multi-daylight) or continuous presses. After pressing, the boards are cooled and sanded before stacking. Careful control of the pressing schedule allows introduction of the many characteristic properties, particularly the density profile through the board thickness.

## PROPERTIES

New Zealand MDF has excellent working properties. This is attributed to the density profile that is developed during manufacture. The dense outer

face provides the high quality surface feature and the high bending strength. The even density of the inner layer provides the uniform and excellent machining characteristics.

The above combination of attributes means that New Zealand MDF lends itself to a very wide range of uses. This includes: fine furniture, mouldings, shelving, stair treads, flooring overlays, shop fittings, cabinetry (kitchens and bathrooms), bedroom furniture and much more. Its high density and fine surface also assist applications requiring exacting detail such as in shaping or carving operations.

The lightness, flatness and uniform qualities of the surface make it an ideal substrate for overlays, veneering and paint finishes. The resultant product is suitable for either a very traditional or a very modern look.

## WORKING WITH MDF

MDF can be machined without chipout. A saw cut can produce a very smooth edge, directly eliminating the need for subsequent sanding. The product also lends itself to routing or shaping. Very fine edges, sometimes almost razor sharp, can be produced. Tungsten

carbide tipped cutters are recommended.

Jointing of MDF is also very easy with either adhesives or mechanical fasteners. MDF will accept a wide range of adhesives although gap-filling types such as PVA, urea formaldehyde or epoxies are preferred. Note should be taken of the particular manufacturer's recommendations, but generally a light sanding, followed by removal of any surface dust is recommended prior to gluing.

MDF can also be jointed using traditional wood working joints such as dovetails, butt joints, or tenons. Dowelling is also popular but grooved dowels are recommended.

For screwing operations, straight shanked screws only are advised, preferably with wide sharp threads. A pilot hole is essential. If greater strength is required it is advisable to use longer, not larger, screws as larger, or thick, or tapered screws will promote splitting. Conventional woodscrews should not be used.

Veneering or painting should be carried out on both faces, otherwise differential moisture uptake will occur and the product will bend. Three coats of paint are also advised. Alkyd paints work best but if a water-based paint is used, sanding will be necessary after the first coat as the water solvent will produce some surface roughening.

New Zealand MDF is not intended for exterior use. Regardless of application, some coating, a paint or overlay should be applied. Just like the finest of woods the fine surface can stain or scratch easily so care should always be taken during product fabrication.

Before use the material should be acclimatised to its final use conditions. A few days storing will allow it to incrementally adjust its moisture content to that of its new environment.

During processing operations such as sawing or routing, care should be

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taken not to inhale the dust. The fine resinated dust is very light and easily air distributed, so good dust extraction and ventilation systems are important. Alternatively, dust masks should be worn to ensure safe working conditions.

New Zealand MDF manufacturers also produce MDF that meets the internationally recognised European E1 standard for low formaldehyde emission from boards.

## PERFORMANCE

New Zealand MDF has developed a very strong market acceptance, ideal for both traditional and new applications, for the small scale wood working enthusiast and large scale factory production operations. As the New Zealand MDF industry has a track record for continuous development and improvement, we can be sure of a very bright future for this product.

## PARTICLEBOARD & OTHER RECONSTITUTED PANEL PRODUCTS

New Zealand produces a range of panel products in addition to MDF based on New Zealand pine. They include particleboard, fine particleboard and an MDF-strandboard combination called Triboard.

Particleboard is manufactured from New Zealand pine chips from wood processing operations or from logs chipped on site. The particles are dried, mixed with glue, such as urea formaldehyde or melamine urea formaldehyde (where better moisture resistance is required), formed into mats and then hot pressed. New Zealand particleboard is predominantly used for flooring and less so for cabinetry and furniture. The fine surface boards are generally used with a variety of finishes and laminates, and with overlays for moisture resistant panels for use in areas with high humidity or occasional dampness.

Triboard is manufactured by combining processes producing MDF and strands. Mats of resinated MDF fibre and strands are laid up in a three-layer sandwich, with the MDF fibres in the outer layers. The mat is pressed in a steam injection press, prior to cooling and sanding. Product thicknesses up to 100 mm are possible. Triboard combines the stability associated with strandboard with the fine surface finish associated with MDF. Applications include wall sections, solid core door stock, stair treads and flooring, including specialist products such as computer room flooring.

