

### Wood Composites (Interior Use)

Wood composites include particleboards, hardboards and medium density fibre boards (MDF) designed for use as a sheet flooring or wall linings. They may be finished with a thin, decorative, timber veneer.

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Extraction and manufacture	
<b>Impact of extraction</b>	Wood composites are manufactured from renewable forest resources, and from lower grade wood product and from waste wood products.
<b>Energy use</b>	Embodied energy is quoted <sup>1</sup> as 12 MJ/kg for MDF  Energy required in manufacture of wood composites may be provided by waste from other processes.
<b>By-products/emissions</b>	Wood composites typically use a urea binder which can give off VOCs and formaldehyde.
Sourcing	
<b>Material sources</b>	Wood composite sheets are locally made from NZ raw materials. Imported products are also available.  Use of a natural timber veneer as a surface finish can provide an effective use of a scarce resource.
<b>Availability</b>	Wood composite raw sheets are readily available. Veneered material is generally available for commonly available timber species.
<b>Cost</b>	Up-front costs: low to medium.
<b>Transport to site</b>	Pallets of wood composite sheeting such as 20 mm particleboard are heavy and bulky to transport.
Construction/installation	
<b>Health and safety during construction/installation</b>	Dust when power cutting is a hazard.
<b>Ease of construction/installation</b>	Large sheet sizes give quick installation. Sheets have to be attached to frames. Once delivered, materials can be handled by site labour.
<b>Adaptability</b>	Limited – depends on design and fixing methods
Performance	
<b>Health and safety during life of building</b>	Wood composites can emit formaldehyde. Emissions can be reduced by sealing the product and ensuring the space is well ventilated in the period after installation.
<b>Structural capability</b>	Wood composites can be used as a structural component (for bracing, diaphragms).
<b>Expected durability</b> (assuming correct installation and maintenance)	50+ years if kept dry
<b>Maintenance rating</b>	Generally nil when overlaid with carpet/vinyl or tiles.  Medium when used as an exposed floor or wall surface – the surface will have to be recoated every 7-10 years.

<b>Moisture resistance</b>	Poor – particleboard is not suitable for use in wet areas without an impervious coating. MDF should not be used in moist areas. Oil-tempered hardboard often with a factory finish has been used successfully in wet areas.  Particleboard and MDF will degrade rapidly if wet or damp.
<b>Rot, mould and corrosion</b>	Moulds such as the toxic stachybotrys will form on wet material.
<b>Thermal performance</b>	Low R-value and thermal mass capacity.
<b>Sound insulation</b>	Products may be used as a component of a specifically designed and tested acoustic construction
<b>Fire performance</b>	Very limited - combustible.
<b>Waste disposal/recycling/re-use</b>	
<b>Re-use</b>	Sheets may be reused if carefully removed.
<b>Recycling</b>	Not currently recycled.
<b>Waste disposal</b>	Will degrade when wet.

1. Embodied energy figures taken from work © J. Andrew Alcorn, 2010. (Alcorn, J. Andrew, Global Sustainability and the New Zealand House, a thesis submitted to Victoria University of Wellington in fulfilment of the requirements for the degree of Doctor of Philosophy in Architecture, Wellington, 2010.

Alternatives to wood-based panelling and toxic resins are being developed from agricultural waste products. Straw panelling, assembled with water-based adhesives and fibreglass tape, is available for use as exterior sheathing. Like the wood in strand board, the straw is shredded and compressed to form a lightweight, monolithic panel that can be assembled into roof and walls with specially developed latex adhesives and coatings. This replaces conventional materials such as wood, steel, and cement. This product turns agriculture waste that is usually burned (contributing to air pollution) into a valuable commodity and preserves other natural resources. The product is non-toxic, biodegradable, energy efficient, and long-lived.