



STRUCTURAL PLYWOOD

Structural plywood is an option when long-term load carrying and structural performance is required. But how do you tell if a sheet of plywood is structural or not?

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Structural plywood can be used in engineering design. The properties of the plywood must be well known and consistent to ensure it is capable of carrying structural load reliably and safely for the intended life of the structure or component.

What is structural plywood?

Specifications for structural plywood are set out in AS/NZS 2269.0:2008 *Plywood – Structural – Specifications*.

The structural properties are determined by machine stress-grading 100% of production or through in-grade analysis where product is manufactured to a strict specification. Samples of individual structural properties of modulus of elasticity (MoE), bending strength, shear strength, tension strength and compression strength are determined by laboratory analysis. On-going in-mill verification monitors stiffness and strength properties.

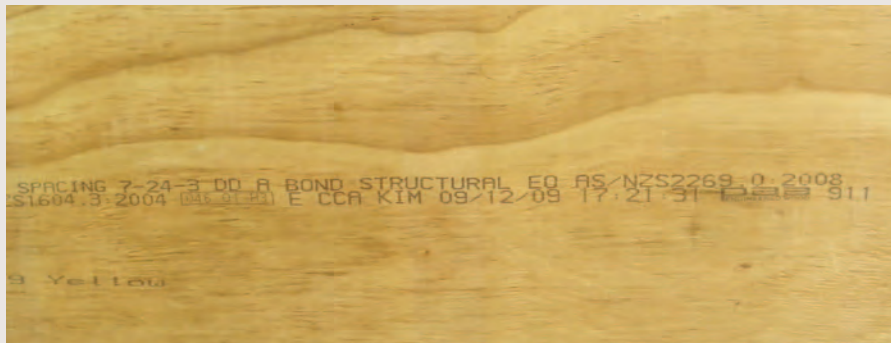
The adhesive must be durable and creep resistant. Type A bond phenolic adhesives are durable for 50-plus years in full exposure.

Identifying structural plywood on site

Structural plywood can be identified by checking the rear of the plywood sheet for the standard number AS/NZS 2269. This indicates the plywood has been tested to this standard and can be used in structural applications.

AS/NZS 2269 requires that the following be clearly marked on the rear of all structural plywood sheets:

- Manufacturer's name or brand name to allow easy identification. There are three New Zealand manufacturers of structural plywood:
 - Carter Holt Harvey® Woodproducts
 - Juken New Zealand (JNL)
 - International Panel & Lumber (IPL).
- The word 'structural' or product description.
- Reference to AS/NZS 2269.0.
- Visual face grades defining the front (first



Markings on the rear of a sheet of structural plywood.

and back surface veneers, for example, CD has grade C veneer on the front and D on the back. These grades are:

- A – high appearance grade suitable for clear finishing
- B – appearance grade with a solid sanded surface
- C – non-appearance grade with a solid sanded surface
- D – non-appearance grade with permitted open defects
- S – an appearance grade permitting natural characteristics as decorative features.

- Sheet glue bond, for example, A Bond. New Zealand manufacturers use Type A (marine grade) adhesives. These are extremely durable and can be expected to provide a quality veneer bond for in excess of 50 years in full exposure and much longer in dry protected environments.

- Sheet stress grades. The most common New Zealand manufactured grades are F8 and F11, which are suitable for applications outlined in the Building Code compliance document B1 *Structure*.

- Panel construction code, for example, 17-24-7 (17 is the panel's nominal thickness in mm, 24 is the nominal thickness of the face veneer in mm × 10⁻¹ and 7 is the number of veneers).

- Formaldehyde emission class – all New Zealand-manufactured structural plywood meets an E₀ emission classification, which is a maximum emission limit of 0.5 mg/L.
- If immunised or preservative treated, branding in accordance with AS/NZS 1604.3. →



Example of structural plywood use.

Structural plywood uses

Structural plywood is used in a wide array of applications including flooring, structural bracing and roofing substrates. It is valued for its uniformity of performance, easy workability and sustainability.

Structural plywood can meet the New Zealand Building Code's not less than 50-year durability requirement for dry protected applications and can typically be untreated. Where it is exposed to moisture, such as for an exterior

cladding, structural plywood must be treated to a minimum timber treatment hazard class of H3 to ensure the Building Code's durability requirements are achieved.

Plywood ≠ structural plywood

Plywood that has not been tested to AS/NZS 2269 cannot be substituted for structural plywood. Using non-structural plywood could result in failure of the structure or component and ultimately collapse of the structure. ❖

SPECIFY TIMBER TREATMENT

Designers need to specify both the plywood hazard class and preservative treatment to ensure the appropriate material is used.

The plywood hazard classes listed in NZS 3602:2003 *Timber and wood-based products for use in building* are shown as the hazard class category, for example, H3, and this is not broken down further into the treatment such as H3.1 or H3.2.

However, plywood can be treated with several preservatives, and some of these are incompatible in some applications. A good example is membrane-roofing substrate, which must have a waterborne preservative system – so specify H3 CCA or H3 waterborne preservative. Solvent-based preservatives, such as LOSP, are not permitted, and only specifying H3 means plywood with the wrong treatment may be used. ❖

