

Australian/New Zealand Standard™

AS/NZS 4266.5

**Reconstituted wood-based panels—
Methods of test****Method 5: Modulus of elasticity in bending and
bending strength**

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TM-005, Reconstituted Timber Panel Products, to supersede AS/NZS 4266.5(Int):2001.

This Standard incorporates Amendment No. 1 (February 2006). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard is equivalent to the industrial Standard harmonized between the wood panel industries in Australia, Japan and New Zealand, known as JANS 6.

METHOD

1 SCOPE

This Standard specifies a method of determining the apparent modulus of elasticity and bending strength (modulus of rupture) of reconstituted wood-based panels in flat-wise bending.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS/NZS

4266 Reconstituted wood-based panels—Methods of test

4266.1 Method 1: Sampling, cutting, and conditioning of test pieces

4266.35 Method 35: Dimensions of test pieces

4491 Timber—Glossary of terms in timber related Standards

3 DEFINITIONS

For the purpose of this Standard, the definitions in AS/NZS 4491 and AS/NZS 4266.1 apply.

4 PRINCIPLE

The modulus of elasticity in bending and bending strength are determined by applying a load to the centre of a test piece supported at two points. The modulus of elasticity is calculated by using the slope of the linear region of the load-deflection curve; the value calculated is the apparent modulus, not the true modulus, because the test method includes shear as well as bending. The bending strength of each test piece is calculated by determining the ratio of the bending moment (M), at the maximum load ($F_{\max}$), to the moment of its full cross-section.

5 APPARATUS

5.1 Measuring instruments

- (a) *For thickness* Micrometer, or similar measuring instrument having flat and parallel circular anvils of between 6.0 mm to 16.0 mm diameter and an operating pressure between 0.02 MPa to 0.05 MPa. The graduation of the apparatus shall allow a reading to 0.01 mm.

NOTE: The anvil diameter selected will depend on the panel type. In principle, panels of low density and/or uneven surface should be measured using the larger anvil diameter.

- (b) *For length and width measurement* Sliding calliper, or any other instrument with measuring surfaces of at least 5 mm width, graduated to allow reading to 0.1 mm.

5.2 Testing apparatus

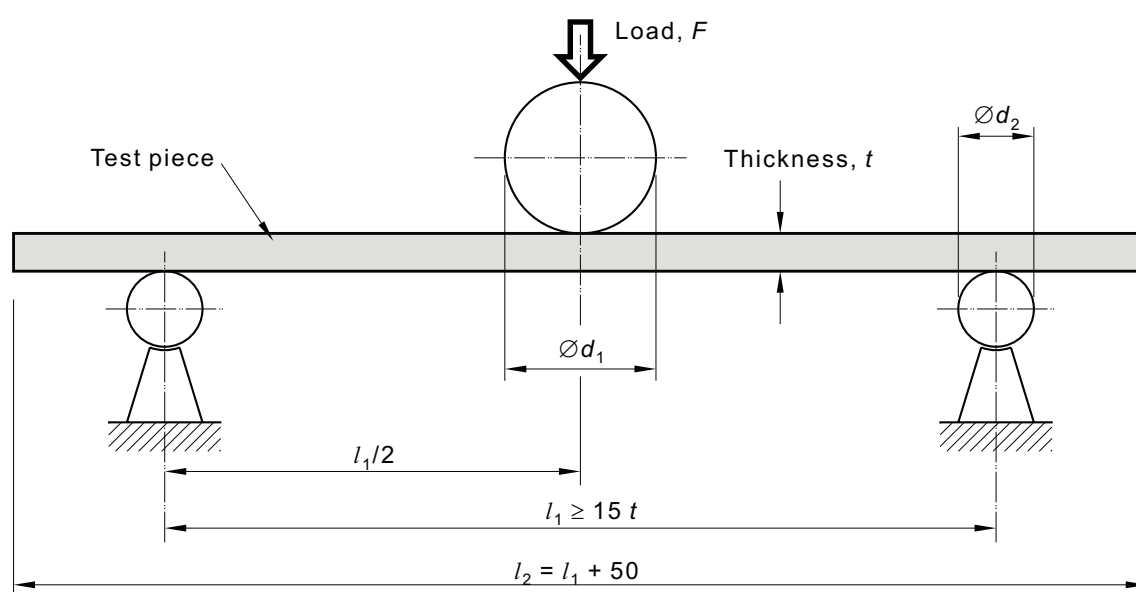
The testing apparatus (see Figure 1) shall have the following essential components:

- (a) Two parallel, cylindrical, roller-bearing supports of length exceeding the width of the test piece and of 10 ± 0.5 mm diameter for panels of a nominal thickness ≤ 6 mm and of 15 ± 0.5 mm diameter for panels of a nominal thickness > 6 mm.

The distance between the supports shall be adjustable.

A cylindrical loading head, of the same length, and 10 ± 0.5 mm in diameter for panels of a nominal thickness ≤ 6 mm, and 30 ± 0.5 mm in diameter for panels of a nominal thickness > 6 mm, placed parallel to the supports and equidistant from them.

- (b) A suitable instrument capable of measuring the deflection of the test piece in the middle of the span with an accuracy of 0.1 mm.
- (c) A suitable load measuring system capable of measuring the load applied to the test piece with an accuracy of 1% of the measured value.



NOTES:

- For $t \leq 6$, $\varnothing d_1 = \varnothing d_2 = 10 \pm 0.5$; for $t > 6$, $\varnothing d_1 = 30 \pm 0.5$, $\varnothing d_2 = 15 \pm 0.5$.
- Alternative arrangements to those shown in Figure 1 may be used if a valid correlation to the specified arrangement can be proven.

DIMENSIONS IN MILLIMETRES

FIGURE 1 ARRANGEMENT OF THE BENDING APPARATUS

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6 TEST PIECES

6.1 Sampling and cutting

Series of both transverse and longitudinal test pieces are required. Six test pieces shall be taken from each direction of each panel to be tested. Sampling and cutting of the test pieces shall be carried out in accordance with AS/NZS 4266.1.

6.2 Dimensions

The test pieces shall be rectangular and, unless otherwise specified, the width (b) shall be not less than 50 ± 1 mm.

In the case of extruded panels, cellular panels, or panels of similar structure with cavities parallel to the length of the test piece, the width of the test piece shall be at least twice the width of an individual core element (e.g., two tube diameters plus two web thickness). The test pieces shall have a symmetrical cross-sectional area as shown in Figure 2.

In test pieces with cavities perpendicular to the length, the loading head shall be located directly above a web.

The length (l_2) shall be at least 15 times the nominal thickness plus 50 mm, with a maximum length of 1050 mm and a minimum length of 150 mm.

If the deflection of the test piece exceeds the capacity of the bending apparatus but rupture (failure) does not occur, the distance between supports shall be reduced for testing the bending strength. The test report shall include the distance between supports at which failing tests were conducted. If this procedure needs to be adopted, a new set of test pieces shall be used.

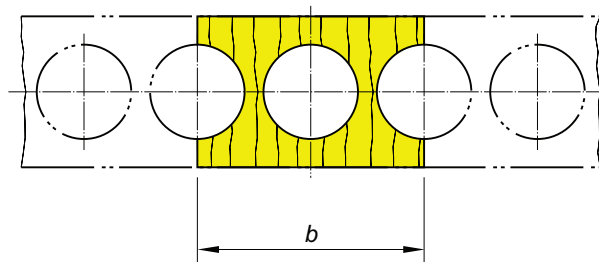


FIGURE 2 CROSS-SECTION OF A TUBULAR PANEL

6.3 Conditioning

The test pieces shall be conditioned in accordance with AS/NZS 4266.1.

7 PROCEDURE

The procedure shall be as follows:

- (a) Measure the width and thickness of each test piece according to AS/NZS 4266.35 at the following points:
 - (i) The thickness at the intersection of the diagonals.
 - (ii) The width at the mid-length.
- (b) Adjust the distance between the centres of the supports, to within 1 mm of at least 15 times the nominal thickness of the panel, but generally not less than 100 mm and not more than 1000 mm.

Measure the distance between the centres of the supports to the nearest 0.5 mm.

- (c) Place the test piece flat on the supports, with its longitudinal axis at right angles to those of the supports with the centre point under the load (see Figure 1).