

Australian/New Zealand Standard™

AS/NZS 4266.6

Reconstituted wood-based panels— Methods of test

Method 6: Tensile strength perpendicular to the plane of the panel (internal bond 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 4266.6(Int):2001.

This Standard is equivalent to the industrial Standard harmonized between the wood panel industries in Australia, Japan and New Zealand, known as JANS 4.

METHOD

1 SCOPE

This Standard specifies a method for determining the resistance to tension perpendicular to the plane of the panel, i.e., internal bond strength of reconstituted wood-based panels.

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

Determination of resistance to tension perpendicular to the surface of the test piece by submitting the latter to a uniformly distributed tensile force until rupture occurs. Tensile strength perpendicular to the plane of the panel is determined by the maximum load in relation to the surface area of the test piece.

5 APPARATUS

5.1 Sliding calliper

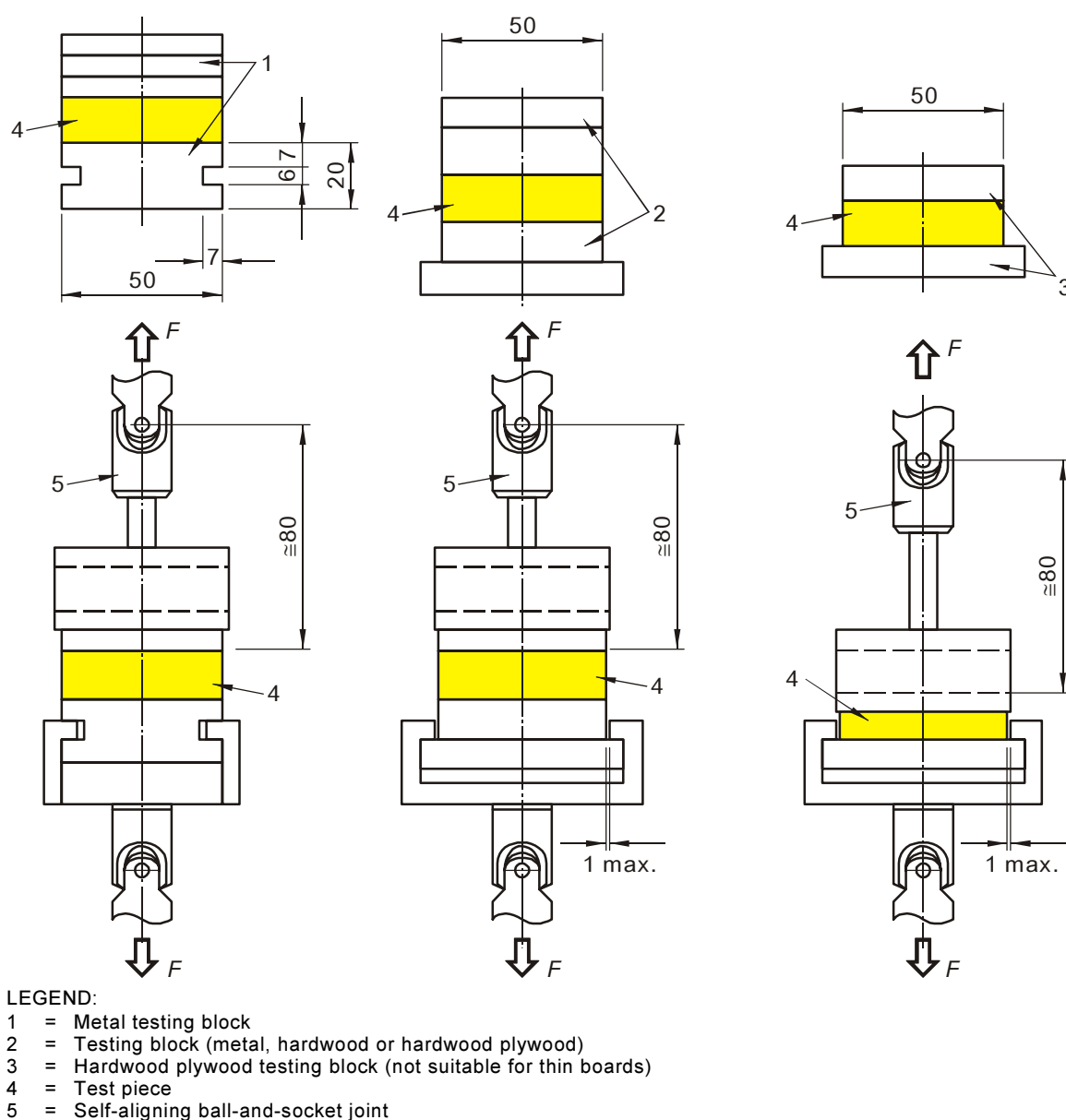
Sliding calliper, or any other instrument with measuring surfaces of at least 5 mm in width, graduated to allow reading to 0.1 mm.

5.2 Testing machine

Testing machine, capable of applying a tensile force perpendicular to the surfaces of the test piece by means of grips (see Figure 1), and measuring this force to an accuracy of 1%. At least one grip shall be self-aligning.

5.3 Test blocks

Test blocks (metal, hardwood or hardwood plywood), compatible with the fixing device, to which the test pieces are to be bonded (see Figure 1). Hardwood or hardwood plywood shall have an air-dry density of $>600 \text{ kg/m}^3$.



DIMENSIONS IN MILLIMETRES

FIGURE 1 EXAMPLES OF APPARATUS FOR TESTING TENSILE STRENGTH PERPENDICULAR TO THE PLANE OF THE BOARD

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6 TEST PIECES

6.1 Sampling

Eight test pieces shall be taken from 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 square with a side length of 50 ± 1 mm. The test pieces shall be cut with precision, the angles shall be 90° and the edges shall be straight and clean.

6.3 Conditioning

The test pieces and the hardwood, or hardwood plywood, testing blocks shall be conditioned in accordance with AS/NZS 4266.1.

6.4 Determination of dimensions

After conditioning, measure the length and width of each test piece in accordance with AS/NZS 4266.35.

6.5 Bonding of the test pieces to the loading blocks

Each test piece shall be bonded to loading blocks using a suitable adhesive. The upper and lower blocks shall be orientated at 90° as shown in Figure 1. Excess glue pressed out from the glueline shall be removed. If hot-melt glue is used, the screen side of hardboards shall be sanded off until a smooth surface is achieved. If the screen side is not sanded off, a gap-filling glue (epoxy glue) shall be used.

When gluing, additional stresses affecting the test piece, by the moisture contained in the adhesive and the rise in temperature, and the like, shall be avoided as far as possible.

NOTE: The following combinations have proved suitable:

- (a) Hot melt and epoxy glues with metal blocks.
- (b) Hot melt, epoxy, PVAC, UF, phenol-resorcinol glues with hardwood and hardwood-plywood blocks.

Certain glues are not suitable for bonding test pieces that have been subjected to a cyclic test in humid conditions or an immersion-in-water test. If the test pieces are bonded to their loading blocks after such a pre-treatment, they may be lightly sanded on the top and bottom, to remove any roughness that has occurred during pre-treatment.

The tests shall not be carried out until the glue has had sufficient time to cure, so that rupture does not occur in the glueline, and until the test pieces have regained an equal distribution of moisture.

NOTE: By experience, approximately 24 h are sufficient if hot-melt or epoxy glues are used, and approximately 72 h if other glues are used. During this time, the glued assembly should be stored under controlled conditions of $65 \pm 5\%$ relative humidity and a temperature of $20 \pm 2^\circ\text{C}$. Test pieces should be tested not more than 1 h after removal from the conditioning environment.

Conditioning is not applicable to test pieces or glued assemblies that have been subjected to a cyclic test in humid conditions or an immersion-in-water test or to those that will be tested in the humid stage.

NOTE: When thin panels (< 8.0 mm thickness) or high density panels ($> 800 \text{ kg/m}^3$) are tested, it is recommended to use metal blocks, since experience has shown that the results are more variable with wooden blocks in these cases.

7 PROCEDURE

7.1 Application of the load

Place the testing assembly in the grips and apply an increasing force until rupture occurs. The load shall be applied at a constant rate of crosshead-movement throughout the test. The rate of loading shall be adjusted so that the maximum load is reached within 60 ± 30 s.