
INTERNATIONAL STANDARD



3347

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Wood — Determination of ultimate shearing stress parallel to grain

Bois — Détermination de la contrainte de rupture en cisaillement parallèle aux fibres

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3347 was drawn up by Technical Committee ISO/TC 55, *Sawn timber and sawlogs*, and circulated to the Member Bodies in February 1974.

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It has been approved by the Member Bodies of the following countries :

Belgium	India	Spain
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Canada	Netherlands	Thailand
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The Member Body of the following country expressed disapproval of the document on technical grounds :

Germany

Wood – Determination of ultimate shearing stress parallel to grain

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining the ultimate shearing stress of wood by compressive loading parallel to grain either along the radial or along the tangential surface.

2 REFERENCES

ISO 3129, *Wood – Sampling methods and general requirements for physical and mechanical tests.*

ISO 3130, *Wood – Determination of moisture content in physical and mechanical tests.*

3 PRINCIPLE

Determination of the ultimate shearing stress parallel to grain by application of a gradually increasing compressive load to a test piece.

4 APPARATUS

4.1 Testing machine ensuring the rate of loading of the test piece or of movement of the loading head according to 6.2 and allowing measurement of the load to an accuracy of 1 %.

4.2 Device ensuring the maximum shearing stresses in the shearing plane of the test piece.

4.3 Measuring instrument for determining the dimensions of the gauge portion of test pieces to an accuracy of 0,1 mm.

4.4 Equipment for the determination of moisture content in accordance with ISO 3130.

5 PREPARATION OF TEST PIECES

5.1 The shape of the test piece shall be such as to minimize the stresses normal to the shearing surface. The thickness of the test piece shall be either 20 or 50 mm and the length of the shearing surface shall be from 20 to 50 mm. Shearing tests shall be made in a radial or tangential plane.

5.2 The preparation, moisture content and number of test pieces shall be in accordance with ISO 3129.

6 PROCEDURE

6.1 Measure the thickness of the test piece and the length of the expected shearing surface in the plane of expected shear to an accuracy of 0,1 mm.

6.2 Ensure that bearing surfaces of the test piece are in contact with the appropriate surfaces of the device (4.2). The effort to press the movable support, if any, against the test piece shall be from 5 to 9 N. Load the test piece at a constant rate. The rate of testing (with a constant rate of loading or a constant rate of movement of the loading head) shall be such that the test piece is broken in 1,5 to 2 min from the moment of loading. Read the maximum load to accuracy specified in 4.1.

6.3 After the test has been completed, determine the moisture content of the test pieces according to ISO 3130.

Take the larger portion of the test piece as the sample for determination of moisture content. To determine the mean moisture content, it is permissible to use only some of the test pieces. The minimum number of test pieces for moisture content determination shall be in accordance with ISO 3129.

7 CALCULATION AND EXPRESSION OF RESULTS

7.1 The ultimate shearing stress parallel to grain in the radial or tangential direction, τ_W , for each test piece at a moisture content W at the time of test is given, in megapascals, by the formula :

$$\tau_W = \frac{P_{\max}}{bl}$$

where

P_{\max} is the breaking load, in newtons;

b is the thickness of the test piece, in millimetres;

l is the length of the shearing surface, in millimetres.

Express the result to an accuracy of 0,1 MPa.

7.2 When necessary, the ultimate stress, τ_W , shall be adjusted to a 12 % moisture content to an accuracy of 0,1 MPa by the following formula which is valid for a moisture content of 12 ± 3 %.

$$\tau_{12} = \tau_W [1 + \alpha (W - 12)]$$

where α is the correction factor for moisture content, whose value shall be obtained from national standards.

7.3 The average ultimate shearing stress parallel to grain of the test pieces shall be calculated to an accuracy of 0,1 MPa as the arithmetic mean of the test results obtained on the individual test pieces.

8 TEST REPORT

The test report shall include the following particulars :

- a) reference to this International Standard;
- b) details in accordance with 6.4 of ISO 3129;
- c) method of loading (the rate of loading or the rate of movement of the machine loading head);
- d) direction, radial or tangential, of the loading;
- e) description and the volume of the material submitted (the stand and the number of trees sampled, the lot of sawn timber and the number of boards sampled);
- f) shape and dimensions of the test piece;
- g) drawing of the test pieces and indication of the direction of grain;
- h) schematic drawing of the device;
- i) number of test pieces tested;
- j) test results calculated as specified in clause 7, and their statistical values;
- k) if necessary, the value of the coefficient α used in 7.2 for the adjustment of the test results to a 12 % moisture content;
- l) date when the test was carried out;
- m) name of the organization which carried out the test.

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