
International Standard



4859

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Wood — Determination of radial and tangential swelling

Bois — Détermination du gonflement radial et tangential

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Foreword

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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 4859 was developed by Technical Committee ISO/TC 55, *Sawn timber and sawlogs*, and was circulated to the member bodies in April 1980.

It has been approved by the member bodies of the following countries:

Australia	Ghana	Poland
Austria	Hungary	Romania
Belgium	India	South Africa, Rep. of
Brazil	Italy	Spain
Bulgaria	Korea, Dem. P. Rep. of	Sweden
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Finland	Norway	Yugoslavia

The member bodies of the following countries expressed disapproval of the document on technical grounds:

Canada
France
Ireland
Netherlands

Wood — Determination of radial and tangential swelling

1 Scope and field of application

This International Standard specifies a method for the determination of linear swelling, in the radial and tangential directions, of wood.

2 References

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

ISO 3130, *Wood — Determination of moisture content for physical and mechanical tests.*

3 Principle

Determination of the linear dimensions, in the radial and tangential directions, of test pieces after drying, at a moisture content in equilibrium with the normal environment and at a moisture content equal to or greater than the saturation point of the cellular walls of wood.

4 Apparatus

4.1 Measuring instrument, capable of determining dimensions to an accuracy of 0,01 mm, fitted with parallel flat ends, each of diameter 5 to 8 mm, and applying a clamping force which will not cause any deformation greater than the accuracy of the instrument.

4.2 Oven, for drying wood at a temperature of 103 ± 2 °C.

4.3 Vessel, containing distilled water.

4.4 Air-tight vessel, containing a desiccant.

4.5 Balance, accurate to 0,01 g, if the method of successive weighing (see ISO 3130) is to be used.

5 Preparation of test pieces

5.1 Test pieces shall be made in the form of rectangular prisms, of base 20 mm × 20 mm, and of length along the grain from 10 to 30 mm. The angle of inclination of annual rings to a pair of opposite faces of the test piece shall not exceed 10°.

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

6 Procedure¹⁾

6.1 Dry the test pieces to constant dimensions in the oven (4.2) at a temperature of 103 ± 2 °C so that no checks distorting their dimensions and shape occur. Check the changes in dimensions of two or three control test pieces by repeated measurements, every 2 h after 6 h from the beginning of drying, in corresponding directions. Stop the drying when the difference between two successive measurements does not exceed 0,02 mm. The drying of test pieces may be stopped by using the method of successive weighing in accordance with ISO 3130.

6.2 Cool the test pieces to room temperature in the air-tight vessel containing the desiccant (4.4).

6.3 Measure the cross-sectional dimensions of every test piece to an accuracy of 0,01 mm in the middle of the radial and tangential faces of the piece (dimension $l_{r \min}$ being measured in a radial direction and dimension $l_{t \min}$ in a tangential direction).

6.4 Condition the test pieces to a moisture content in equilibrium with the normal environment (relative humidity 65 ± 5 %; temperature 20 ± 2 °C) so that no checks distorting their dimensions and shape occur. Check the changes in dimensions of two or three control test pieces by repeated measurements, as specified in 6.3, every 6 h after stabilization of the conditioning environment. Stop the conditioning when the difference between two successive measurements does not exceed 0,02 mm. The conditioning of test pieces may be stopped by using the method of successive weighing in accordance with ISO 3130.

1) If necessary, swelling may also be determined at relative humidities between 30 and 90 %.