INTERNATIONAL STANDARD

ISO 9427

Second edition
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Wood-based panels — Determination of density

Panneaux à base de bois — Détermination de la masse volumique

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9427 was prepared by Technical Committee ISO/TC 89, *Wood-based panels*.

This second edition is based on European Standard EN 323. It cancels and replaces the first edition (ISO 9427:1989). The following modifications have been made compared to the first edition:

— a range of anvil diameters for the thickness measurement has been specified;

— the dimensions of the test pieces and the number of measuring points for thickness measurement have been changed.

Wood-based panels — Determination of density

1 Scope

This International Standard specifies a method for determining the density of wood-based panels.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9424, *Wood-based panels — Determination of dimensions of test pieces*

ISO 16999, *Wood-based panels — Sampling and cutting of test pieces*

3 Principle

Density is determined as the ratio of the mass of each test piece, to its volume, both measured at the same moisture content.

4 Apparatus

4.1 Micrometer or **similar measuring instrument**, for thickness measurement, having flat and parallel circular anvils of diameter between 6,0 mm and 20,0 mm and an operating pressure between 0,02 MPa and 0,05 MPa. The graduation of the apparatus shall allow a reading to 0,01 mm.

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.

4.2 Sliding caliper or **any other instrument**, for length and width measurement, with measuring surfaces of at least 5 mm width, graduated to allow reading to 0,1 mm.

4.3 Balance, allowing measurement to 0,01 g.

5 Test pieces

5.1 Sampling and cutting

Sampling and cutting of the test pieces shall be carried out in accordance with ISO 16999.

5.2 Dimensions

The test pieces shall be square in shape, with sides of a nominal length of 50 mm.

NOTE Test pieces with sides of a nominal length up to 150 mm may be used for factory-production control if a valid correlation can be proven.

In the case of extruded panels, cellular panels, or panels of similar structure with cavities parallel to the length or width of the test piece, the total length or width of the test piece shall be at least twice the length or width of any individual core element (i.e. two tube diameters plus two web thicknesses) and the test pieces shall have a symmetrical cross-sectional area as shown in Figure 1.

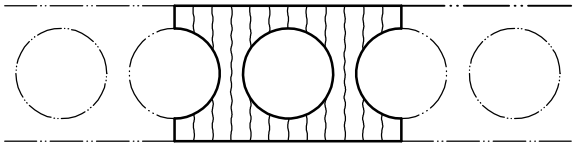

Figure 1 — Cross-section of a tubular panel

5.3 Conditioning

If necessary, the test pieces shall be conditioned to constant mass in an atmosphere with a relative humidity of (65 ± 5) % and a temperature of (20 ± 2) °C. Constant mass is considered as having been reached when the results of two successive weighing operations, carried out at an interval of 24 h, do not differ by more than 0,1 % of the mass of the test piece.

6 Procedure

6.1 Weighing

Weigh each test piece to an accuracy of 0,01 g.

6.2 Measurement of dimensions

Measure the dimensions of each test piece, in accordance with ISO 9424, as follows.

a) Measure the thickness, t, at the point of the intersection of the diagonals as shown in Figure 2 (unless this coincides with a surface irregularity which may influence the measurement) to an accuracy of 0,05 mm.

   Apply the measuring instrument slowly to the surfaces of the test pieces.

b) Measure b_1 and b_2, at two points, parallel to the edges of the test piece, along lines which pass through the centres of opposite edges as shown in Figure 2, to an accuracy of 0,1 mm.

7 Expression of results

7.1 The density, ρ, of each test piece, in kilograms per cubic metre (kg/m^3), shall be calculated from the following equation:

$$\rho = \frac{m}{b_1 b_2 t} \times 10^6$$

where

m is the mass of the test piece, in grams (g);

b_1 and b_2 are the width and the length of the test piece, in millimetres (mm), (b_1 = b_2);

t is the thickness of the test piece, in millimetres (mm).

7.2 The density of a panel shall be obtained by calculating the arithmetic mean of the densities of all the test pieces taken from the same panel and is expressed in kilograms per cubic metre (kg/m^3) to the nearest whole number.

Dimensions in millimetres

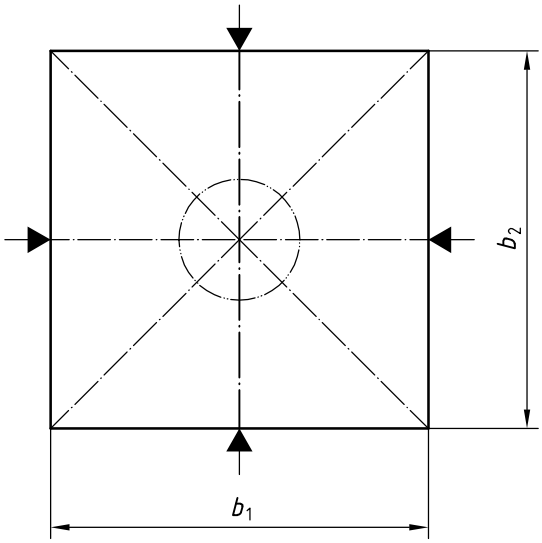

Figure 2 — Point of measurement

8 Test report

The test report shall contain the following information:

— name and address of the test laboratory;

— sampling report according to ISO 16999;

— date of the test report;

— reference to this International Standard;

— type and thickness of the panel;

— relevant product specification;

— surface treatment, if relevant;

— specific apparatus used, in case of different possibilities allowed in this International Standard;

— test results, expressed as stated in Clause 7;

— all deviations from this International Standard.

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