BRITISH STANDARD

BS EN
323:1993

Wood-based panels — Determination of density

The European Standard EN 323:1993 has the status of a British Standard

UDC 674.815:620.1:531.754

Cooperating organizations

The European Committee for Standardization (CEN), under whose supervision this European Standard was prepared, comprises the national standards organizations of the following countries:

Austria	Oesterreichisches Normungsinstitut
Belgium	Institut belge de normalisation
Denmark	Dansk Standardiseringsraad
Finland	Suomen Standardisoimisliito, r.y.
France	Association française de normalisation
Germany	Deutsches Institut für Normung e.V.
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Iceland	Technological Institute of Iceland
Ireland	National Standards Authority of Ireland
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Luxembourg	Inspection du Travail et des Mines
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Switzerland	Association suisse de normalisation
United Kingdom	British Standards Institution

This British Standard, having been prepared under the direction of the Technical Sector Board for Building and Civil Engineering (B/-), was published under the authority of the Standards Board and comes into effect on 15 April 1993

The following BSI references relate to the work on this standard:
Committee reference B/541
Draft for comment 90/11136 DC

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Amendments issued since publication

Amd. No.	Date	Comments

Contents

National foreword

This British Standard has been prepared under the direction of the Technical Sector Board for Building and Civil Engineering and is the English language version of EN 323:1993, *Wood-based panels — Determination of density,* published by the European Committee for Standardization (CEN).

EN 323 was produced as a result of international discussion in which the UK took an active part.

The principle of this method is technically equivalent to **A.4** of BS 1142:1989 *Specification for fibre building boards* and to clause **8** of BS 5669 *Particleboard* — Part 1:1989 *Methods of sampling, conditioning and test,* both of which will be withdrawn in due course.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 6, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 323

February 1993

UDC 674.815:620.1:531.754

Descriptors: Wood-based panel, fibreboard, particleboard, plywood, OSB, cement-bonded particleboard, test method, density (mass/volume)

English version

Wood-based panels — Determination of density

Panneaux à base de bois — Détermination de la masse volumique

Holzwerkstoffe — Bestimmung der Rohdichte

This European Standard was approved by CEN on 1992-12-15. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard was prepared by Working Group 4 “Common test methods” (Secretariat: United Kingdom) of Technical Committee CEN/TC 112 “Wood-based panels” (Secretariat: Germany).

The text is based on ISO 9427:1989 which has been elaborated with European participation.

This Standard is one of a series of standards specifying methods of test for determining dimensions and properties of wood-based panels.

No existing European Standard is superseded.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1993, and conflicting national standards shall be withdrawn at the latest by December 1994.

In accordance with the Common CEN/CENELEC Rules the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Contents

1 Scope

This European Standard specifies a method for determining the density of test pieces of wood-based panels. Such result may be used to estimate the density of wood-based panels according to EN 326-1.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard, only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 325, *Wood-based panels — Determination of dimensions of test pieces.*

EN 326-1, *Wood-based panels — Sampling cutting and inspection — Part 1: Sampling and cutting of test pieces and expression of test results*[1)].

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, and the use of these results to estimate the density of whole boards.

4 Apparatus

4.1 *Instrument for thickness measurement*

Micrometer or similar measuring instrument, having flat and parallel circular measuring surfaces of (16 ± 1) mm diameter and an operation force of (4 ± 1) N. The graduation of the apparatus shall allow reading to 0,01 mm.

4.2 *Instrument for length and width measurement*

Sliding caliper, or any other instrument with measuring surfaces of at least 5 mm width, graduated to allow reading to 0,1 mm.

4.3 *Balance*

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 EN 326-1.

5.2 Dimensions

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

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.

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 to be 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.

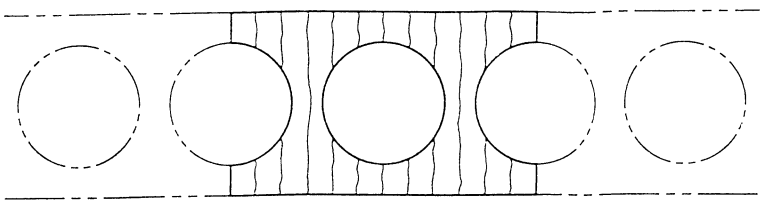


Figure 1 — Cross-section of a tubular board

[1)] At present at the draft stage

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 EN 325, as follows.

a) Measure the thickness, t, at a 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 piece.

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 kg/m^3) shall be calculated from the formula:

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

where

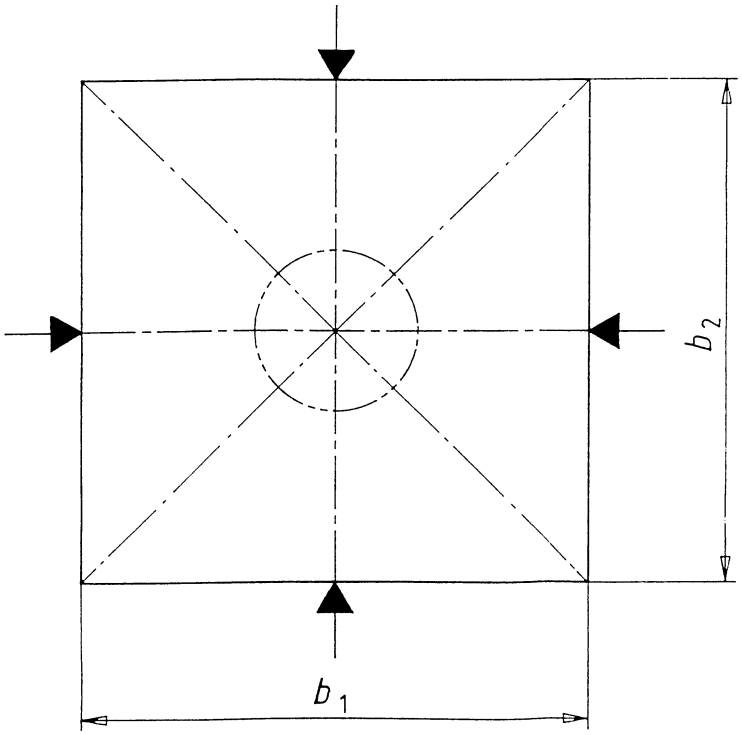
m is the mass of the test pieces in g

b_1, b_2 and t are in mm, as defined in **6.2**.

7.2 The density of a board shall be obtained by calculating the arithmetic mean of the densities of all the test pieces taken from the same board and is expressed in kg/m^3 to three significant figures.

8 Test report

As described in EN 326-1.



Dimensions in millimetres.

Figure 2 — Point of measurement

Annex A (informative)
Bibliography

EN 309, *Particleboards — Definition and classification.*

EN 313-1, *Plywood — Classification and terminology — Part 1: Classification.*

EN 316, *Fibreboards — Definition classification and symbols.*

EN 633, *Cement-bonded particleboards — Definition*[2)].

ISO 9427:1989, *Wood-based panels — Determination of density.*

[2)] At present at the draft stage

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National annex NA (informative)
Committees responsible

The United Kingdom participation in the preparation of this European Standard was entrusted by the Technical Sector Board for Building and Civil Engineering (B/-) to Technical Committee B/541, upon which the following bodies were represented:

American Plywood Association
Association of British Plywood and Veneer Manufacturers
British Woodworking Federation
Chartered Institute of Building
Co-ordinator for Timber and Timber Products
Council of the Forest Industries of British Columbia
Department of the Environment (Timber Division Building Research Establishment)
Fibre Building Board Organisation (FIDOR)
Finnish Plywood International
Flat Roofing Contractors' Advisory Board
Forestry Commission
Furniture Industry Research Association
Institution of Structural Engineers
National Federation of Roofing Contractors
National House-building Council
National Panel Products Association
Royal Institute of British Architects
Timber Research and Development Association
Timber Trade Federation
United Kingdom and Ireland Particleboard Association
Coopted member

National annex NB (informative)
Cross-references

Publication referred to	Corresponding British Standard
EN 325:1993	BS EN 325:1993 *Wood-based panels — Determination of dimensions of test pieces*

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It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

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