BRITISH STANDARD

BS EN
311:2002

Wood-based panels — Surface soundness — Test method

The European Standard EN 311:2002 has the status of a British Standard

ICS 79.060.20

National foreword

This British Standard is the official English language version of EN 311:2002. It supersedes BS EN 311:1992 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/541, Wood-based panels, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard, having been prepared under the direction of the Building and Civil Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 27 May 2002

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 8, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

ISBN 0 580 39783 1

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 311

May 2002

ICS 79.060.20

Supersedes EN 311:1992

English version

Wood-based panels - Surface soundness - Test method

Panneaux à base de bois - Arrachement de la surface - Méthode d'essai

Holzwerkstoffe - Abhebefestigkeit der Oberfläche - Prüfverfahren

This European Standard was approved by CEN on 24 February 2002.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword

This document EN 311:2002 has been prepared by Technical Committee CEN/TC 112 "Wood-based panels", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

This document supersedes EN 311:1992.

Compared to the version EN 311:1992 the following modifications have been made:

a) The scope has been extended. The standard is now also applicable to overlaid wood-based panels, to wet and dry process fibreboards, and cement bonded particleboards.

b) The number of test pieces has been changed from 10 to 8.

c) The test procedure for boards thinner than 15 mm has been modified.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a method of assessing the surface soundness of overlaid wood-based panels and unfaced particleboards, wet and dry process fibreboards and cement bonded particleboards.

NOTE The grid patterned face of wet processed hardboards cannot be tested according to this European Standard.

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 (including amendments).

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

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
surface soundness
strength or quality of bonding between the particles or fibres at the surface of a board and the layer below (unfaced panels) or between the coating material and the underlying board (overlaid panels)

3.2
overlaid panel
panel surfaced with one or more overlay sheets or films, for example impregnated paper, plastics, resin film, metal, decorative veneer

4 Principle

Measurement of the tensile load required to pull off a defined surface area of overlaid or unfaced panel.

5 Apparatus

5.1 Devices to produce a groove as illustrated in Figure 1 within the tolerance specified in 6.2.

5.2 Steel mushroom-shaped pad with a diameter of $35{,}6 \pm 0{,}1$ mm and of a sufficient thickness to prevent bending during the test. A typical example is shown in Figure 2.

5.3 Centring frame with sufficient stiffness, shaped to fit the mushroom-shaped pad shown in Figure 2. An example of the frame is shown in Figure 3.

5.4 Tensile testing machine with a sufficient loading capacity, having an accuracy of 1 % of the applied load, and an adjustable loading rate.

5.5 Steel gimbal as illustrated in Figure 4.

6 Test pieces

6.1 Sampling and cutting

Carry out the sampling and cutting in accordance with EN 326-1.

8 test pieces, each 50 mm × 50 mm, shall be taken from each board to be tested.

6.2 Preparing the groove in the test piece

6.2.1 Unfaced panels

A circular groove shall be cut into the surface of the test pieces (see Figure 1) by means of a milling tool (5.1).

On half of the test pieces this groove shall be on one surface of the board and on the other half it shall be on the other surface.

The groove shall have an inside diameter of 35,7 ± 0,2 mm (enclosing an area of 1 000 mm^2) and a depth of (0,3 ± 0,1) mm.

6.2.2 Overlaid panels

A circular groove shall be cut through the coating material so that it just breaks through into the underlying board. The groove shall not penetrate more than 0,3 mm into the board. The groove shall have an inside diameter of 35,7 ± 0,2 mm. If the panel has the same type of coating on both sides then on half of the test pieces the groove shall be on one surface of the board and on the other half it shall be on the other surface.

If the panel has different types of coating on its two surfaces then 8 test pieces for each surface shall be used.

6.3 Conditioning

All test pieces shall be conditioned to constant mass in an atmosphere with a percentage relative humidity of (65 ± 5) % and a temperature of (20 ± 2) °C prior to the bonding of the steel mushroom-shaped pad (5.2) to the surface. 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.

7 Procedure

7.1 Bonding the steel pad to the surface

NOTE 1 The type of adhesive used, the quantity used, and the manner of application can all affect the measured strengths.

In general use a hot-melt adhesive with a melting point under 150 °C, spread evenly across the face of the heated steel pad. The centring frame is used to position the pad exactly on the test piece. Whilst in the centring frame the hot pad shall be pressed onto the surface of the piece and held with a light pressure of 0,1 N/mm^2 to 0,2 N/mm^2 until the adhesive has cooled and hardened.

If there is a weakening effect to the surface soundness from the heating procedure with hot melts (e.g. in the case of dry process fibreboards (MDF) or some kinds of overlaid boards) a cold setting epoxy adhesive shall be used instead of the hot melt.

If the boards to be tested are thinner than 15 mm the test pieces shall be strengthened by bonding a 50 mm × 50 mm steel plate of at least 10 mm thickness to their underside.

NOTE 2 When testing overlaid boards, in order to obtain an efficient bond between the steel pad and the surfacing material it can be necessary to prepare the surface by sanding or solvent cleaning.

7.2 Determination of force at fracture

After the adhesive has cooled and hardened, the test piece shall be placed in the gimbal (5.5).

A force shall be applied at a constant speed so that failure occurs in (60 ± 30) s.

Record the force at failure.

For surfaced boards additionally record the failure mode:

- within coating;
- within glueline;
- between surface material and underlying board;
- within underlying board.

If mixed, the percentage of the different fracture mode shall be recorded.

The results from test pieces that fail within the glueline of the pad shall be rejected, unless the specification value is lower than the test results.

8 Expression of results

The surface soundness SS for each test piece in Newtons per square millimetre shall be calculated from the equation

$$SS = F/A$$

where

F is the maximum force in Newtons;

A is the surface area given in 6.2 (1 000 mm^2).

Express the result to the nearest 0,01 N/mm^2.

9 Test report

As described in EN 326-1.

The results of each surface shall be calculated and reported separately, the set with lower mean giving the value of the board unless its surfaces are clearly marked.

In case of overlaid panels report also the failure mode and if relevant the percentage of the different fracture modes.

Dimensions in millimetres

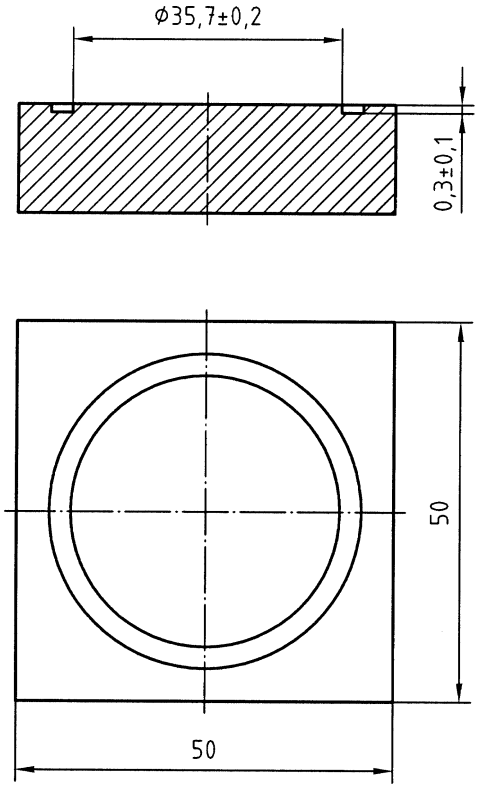

Figure 1 — Test piece — showing circular groove

Dimensions in millimetres

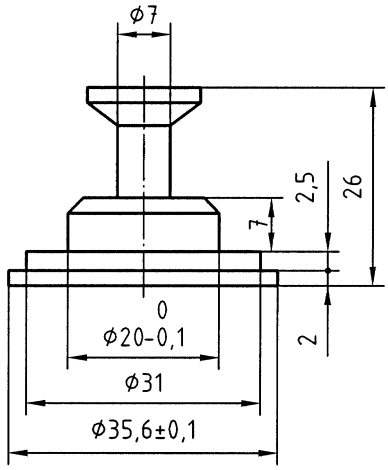

Figure 2 — Example of a steel mushroom-shaped pad

Dimensions in millimetres

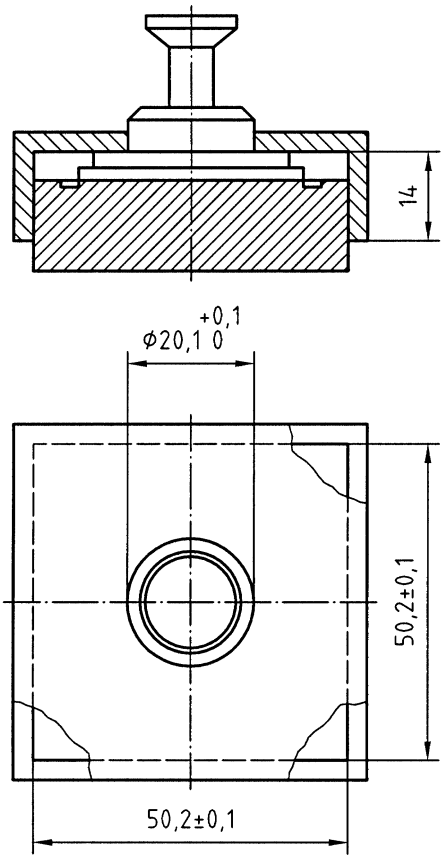

Figure 3 — Example of centring frame

Dimensions in millimetres

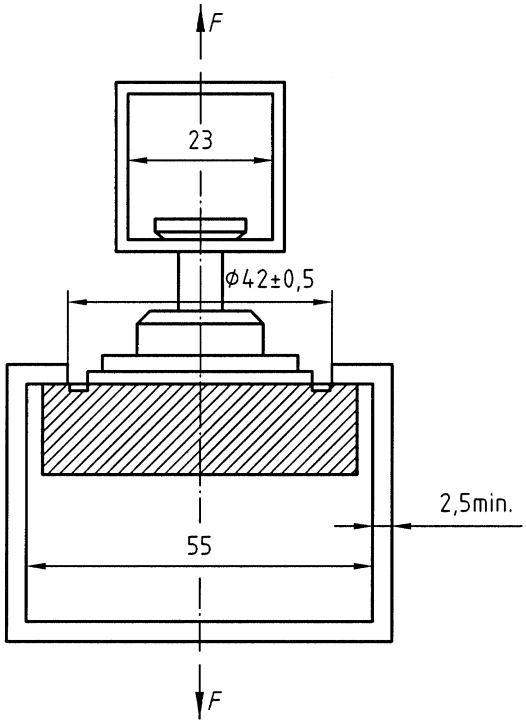

Figure 4 — Gimbal-mounted tensile testing device

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