BS EN 320:2011

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Particleboards and fibreboards — Determination of resistance to axial withdrawal of screws

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National foreword

This British Standard is the UK implementation of EN 320:2011. It supersedes BS EN 320:1993, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/541, Wood based panels.

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

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EN 320

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English Version

Particleboards and fibreboards - Determination of resistance to axial withdrawal of screws

Panneaux de particules et panneaux de fibres - Détermination de la résistance à l'arrachement des vis selon leur axe

Spanplatten und Faserplatten - Bestimmung des achsenparallelen Schraubenausziehwiderstands

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Foreword

This document (EN 320:2011) 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of an identical text or by endorsement, at the latest by October 2011, and conflicting national standards shall be withdrawn at the latest by October 2011.

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

This document supersedes EN 320:1993.

Compared to EN 320:1993, the following modifications have been made:

a) Scope extended to include also particleboards;

b) Normative references updated.

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

1 Scope

This European Standard specifies a method for the determination of the resistance of fibreboards and particleboards to axial withdrawal of screws.

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.

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

EN ISO 1478, *Tapping screws thread (ISO 1478:1999)*

3 Principles

Face and edge withdrawal of screws are determined by measuring the force required to withdraw a defined screw from the test piece. Edge withdrawal is only determined on boards of 15 mm thickness or more.

4 Apparatus

4.1 Testing machine, which shall be capable of applying in increasing axial load to the underside of the screw head through a suitable stirrup, whilst adequately restraining the test piece at the same time and measuring the maximum load to an accuracy of 1 %.

4.2 Metal jig.

For testing face withdrawal of screws of boards of less than 15 mm thickness, the use of a metal jig with a central boring, which restrains the test piece (see Figure 1), is recommended.

Dimensions in millimetres

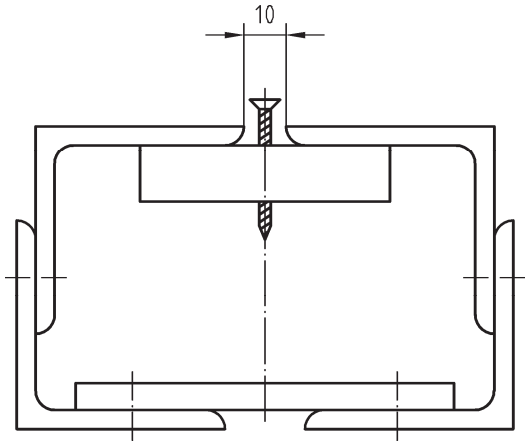


Figure 1 — Principle of testing face screwholding on boards of < 15 mm thickness

5 Test pieces

5.1 Sampling

Sampling and cutting of the test pieces shall be carried out according to EN 326-1.

5.2 Dimensions

Five test pieces are taken from each sample board. The test pieces shall be square with a side length of (75 ± 1) mm.

5.3 Conditioning

The test pieces shall be conditioned to constant mass in an atmosphere with a mean 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.

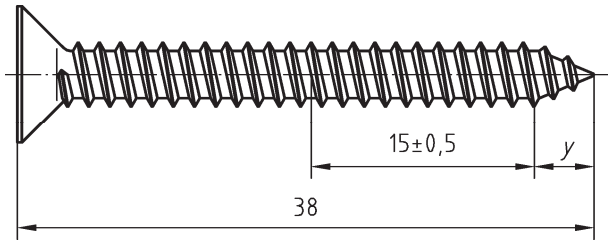
NOTE The tests should be carried out not later than 1 h after removal of the test pieces from the conditioning environment.

5.4 Preparation of test pieces

After the test pieces have been conditioned, the screws shall be inserted into prebored pilot holes. Holes shall have a diameter of (2,7 ± 0,1) mm and a depth of (19 ± 1) mm. They shall be drilled perpendicular to the surface of the test piece, located at the midpoints of one face and two adjacent edges (on edges for boards of ≥ 15 mm thickness only.

For this test, a steel screw, nominal size 4,2 mm × 38 mm, with a thread no. ST 4,2 according to EN ISO 1478 and a thread pitch of 1,4 mm (see Figure 2) shall be used. The screws shall be inserted into the test pieces in such a way, that (15 ± 0,5) mm of complete thread are embedded in the test piece. For testing face screwholding on test pieces of < 15 mm, insert the screw in such a way that the length of the incomplete thread, y, protrudes on the opposite side of the test piece.

Dimensions in millimetres



Key
y length of incomplete thread

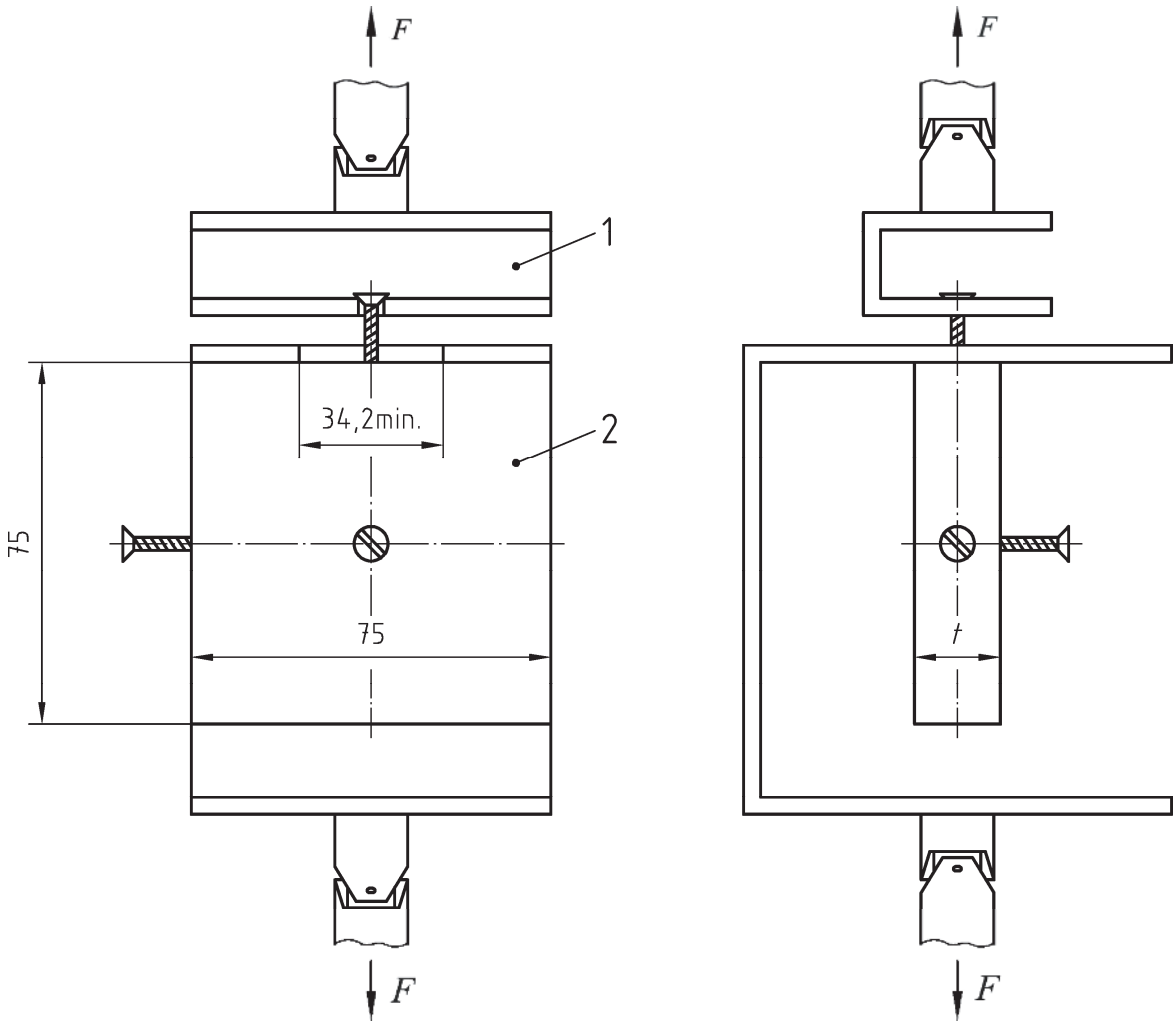
Figure 2 — Parallel shank screw, nominal size 4,2 mm × 38 mm, with a thread no. ST 4.2 according to EN ISO 1478, thread pitch: 1,4 mm

6 Procedure

6.1 Positioning of test pieces

Mount the test pieces in the testing machine so that the surface under test is not supported at any point closer than 15 mm to the periphery of the embedded part of the screw, and is held perpendicular to the direction of the force applied to the screw (see Figure 3). For the testing of face screw withdrawal on boards of < 15 mm thickness, the metal jig (see Figure 1) shall be used in such a way that the screw is inserted into the boring in the centre of the metal jig, and the test piece is well restrained by the metal jig.

Dimensions in millimetres



Key
1 Stirrup
2 Test piece
t test piece thickness
F load

Figure 3 — Screw withdrawal test on boards of ≥ 15 mm thickness (example)

6.2 Application of the force

An increasing axial force is applied to the underside of the head of each screw in turn, through a stirrup incorporating a parallel-sided slot of suitable width to fit easily to the shank of the screw. Apply the axial load to the underside of the screw head at a constant rate of movement of (10 ± 1) mm/min until maximum load is achieved.

6.3 Measurement of maximum load

Record the maximum load, to the nearest 10 N, sustained by the test piece during the withdrawal test on the face and both edges (edge screw withdrawal for boards ≥ 15 mm thickness only).

7 Expression of results

7.1 For a test piece

Separate withdrawal strengths are recorded for the face and edges of the test piece, expressed to 10 N. The edge screwholding value of a test piece is the arithmetic mean of the two results recorded on that test piece. The face screw withdrawal values of a test piece of less than 15 mm thickness shall be expressed in Newtons per millimetre (N/mm), by dividing the maximum load, in Newton, sustained by the test piece by its thickness, in millimetres, to 1 N/mm.

7.2 For a board

Face and edge screwholding values of a board are the arithmetic means of the results of all test pieced taken from that board, expressed to 10 N for boards of ≥ 15 mm thickness and to 1 N/mm for boards < 15 mm thickness.

8 Test report

According to EN 326-1.

Bibliography

[1] EN 309, *Particleboards — Definition and classification*

[2] EN 316, *Wood fibre boards — Definition, classification and symbols*

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