

Fibreboards — Specifications —

Part 2: Requirements for hardboards

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National foreword

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Foreword

This document (EN 622-2:2004) 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of an identical text or by endorsement, at the latest by October 2004, and conflicting national standards shall be withdrawn at the latest by October 2004.

Annexes A, B and C are normative.

This standard is one of a series specifying requirements for fibreboards. The other parts of this series are listed in clause 2 and in the bibliography.

This document supersedes EN 622-2:1997.

The following modifications have been made:

- a) The quality requirements of the panel types HB, HB.HLA1 and HB.HLA2 have been modified.
- b) The test interval for moisture resistance has been reduced in accordance with EN 13986.

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1 Scope

This European Standard specifies the requirements for hardboards as defined in EN 316.

The values listed in this standard relate to product properties but they are not characteristic values to be used in design calculations¹⁾.

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 310:1993, *Wood-based panels — Determination of modulus of elasticity in bending and of bending strength.*

EN 317, *Particleboards and Fibreboards — Determination of swelling in thickness after immersion in water.*

EN 318, *Wood-based panels — Determination of dimensional changes associated with changes in relative humidity.*

EN 319, *Particleboards and Fibreboards — Determination of tensile strength perpendicular to the plane of the board.*

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

EN 326-2, *Wood-based panels — Sampling, cutting and inspection — Part 2: Quality control in the factory.*

EN 326-3, *Wood-based panels — Sampling, cutting and inspection — Part 3: Inspection of an isolated lot of panels.*

EN 382-2, *Fibreboards — Determination of surface absorption — Part 2: Test method for hardboards.*

EN 622-1, *Fibreboards — Specifications — Part 1: General requirements.*

EN 1087-1:1995, *Particleboards — Determination of moisture resistance — Part 1: Boil test.*

EN 12871, *Wood-based panels — Performance specifications and requirements for load-bearing boards for use in floors, walls and roofs.*

EN 13986:2002, *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking.*

ENV 1995-1-1:1993, *Eurocode 5 — Design of timber structures — Part 1-1: General rules and rules for buildings.*

ISO 3340, *Fibre building boards — Determination of sand content.*

1) Such characteristic values (e.g. for use in design calculation in ENV 1995-1-1) are either given EN 12369-1 or derived by testing according to EN 789, EN 1058 and ENV 1156.

3 Terms and definitions

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

3.1

dry conditions

conditions corresponding to service class 1 of ENV 1995-1-1:1993 which is characterised by a moisture content in the material corresponding to a temperature of 20 °C and a relative humidity of the surrounding air only exceeding 65 % for a few weeks per year
[EN 13986:2002]

3.2

humid conditions

conditions corresponding to service class 2 of ENV 1995-1-1:1993 which is characterised by a moisture content in the material corresponding to a temperature of 20 °C and a relative humidity of the surrounding air only exceeding 85 % for a few weeks per year
[EN 13986:2002]

3.3

external conditions

conditions corresponding to service class 3 of ENV 1995-1-1:1993 which is characterised by climatic conditions leading to higher moisture contents than in service class 2
[EN 13986:2002]

3.4

general purpose use

all non-load bearing applications, e.g. furniture and fitments

3.5

load-bearing use

use in a load-bearing construction, i.e. an organized assembly of connected parts designed to provide mechanical resistance and stability to the works. Also referred to as "structure"

3.6

load duration category

see Table 1

Table 1 — Load duration categories

Load duration category	Order of accumulated duration of characteristic load	Examples of loading
Permanent	more than 10 years	self weight
Long-term	6 months to 10 years	storage
Medium-term	1 week to 6 months	imposed load
Short-term	less than one week	snow ^a , wind
Instantaneous		accidental loading

^a In areas which have a heavy snow load for a prolonged period of time, part of the load should be regarded as medium-term.

4 Requirements

4.1 General

Hardboards shall comply with the general requirements of EN 622-1 together with the relevant requirements set out in 4.2 and 4.3 of this standard. The requirements for some supplementary properties are given in annex A.

The requirements in Tables 2 to 7 shall be met by 5 percentile values (95 percentile values in the case of swelling in thickness), based on the mean test values for individual panels and calculated in accordance with EN 326-1. In the case of swelling in thickness, they shall be equal to or less than the values in the Tables, and in the case of all other properties, they shall be equal to or greater than the values in the Tables. The values in the Tables for both bending strength and modulus of elasticity shall apply to test results obtained in any direction in the plane of the panel.

With the exception of swelling in thickness, internal bond after boil test (see Tables 3, 4, 6, 7) and bending strength after boil test (see Table 7), the values given in the tables are characterised by a moisture content in the material corresponding to a temperature of 20 °C and a relative humidity of 65 %. The values given for swelling in thickness, internal bond after boil test and bending strength after boil test are characterised by a moisture content in the material corresponding to a temperature of 20 °C and a relative humidity of 65 % before the treatment (immersion in water or boil treatment).

The moisture resistance of hardboards for use in humid and exterior conditions (see Tables 3, 4, 6 and 7) is assessed either as internal bond after boil test (according to EN 1087-1), with the modified procedure given in annex B, or as bending strength after boil test (according to EN 1087-1), with the modified procedure given in annex C. These two testing procedures are regarded as equivalent alternatives. Where requirements for both procedures are given, compliance with only one set of specifications is required (see Table 7).

4.2 Requirements for general purpose boards

4.2.1 Requirements for boards for use in dry conditions

Table 2 specifies the requirements for general purpose boards for use in dry conditions, e.g. interior fitments including furniture.

Table 2 — Requirements for general purpose boards for use in dry conditions (type HB)

Property	Test method	Unit	Ranges of nominal thickness (mm)		
			≤ 3,5	> 3,5 to 5,5	> 5,5
Swelling in thickness 24 h	EN 317	%	37	30	25
Internal bond	EN 319	N/mm ²	0,50	0,50	0,50
Bending strength	EN 310	N/mm ²	30	30	25

4.2.2 Requirements for boards for use in humid conditions

Table 3 specifies the requirements for general purpose boards for use in humid conditions.

Table 3 — Requirements for general purpose boards for use in humid conditions (type HB.H)

Property	Test method	Unit	Ranges of nominal thickness (mm)		
			≤ 3,5	> 3,5 to 5,5	> 5,5
Swelling in thickness 24 h	EN 317	%	25	20	20
Internal bond	EN 319	N/mm ²	0,60	0,60	0,60
Bending strength	EN 310	N/mm ²	35	32	30
Internal bond after boil test ^a	EN 319 EN 1087-1	N/mm ²	0,30	0,30	0,25

^a For the determination of internal bond after boil test, the modified procedure given in annex B applies.

4.2.3 Requirements for boards for use in exterior conditions

Table 4 specifies the requirements for general purpose boards for use in exterior conditions.

Table 4 — Requirements for general purpose boards for use in exterior conditions (type HB.E)

Property	Test method	Unit	Ranges of nominal thickness (mm)		
			≤ 3,5	> 3,5 to 5,5	> 5,5
Swelling in thickness 24 h	EN 317	%	12	10	8
Internal bond	EN 319	N/mm ²	0,70	0,60	0,50
Bending strength	EN 310	N/mm ²	40	35	32
Modulus of elasticity in bending	EN 310	N/mm ²	3 600	3 100	2 900
Internal bond after boil test ^a	EN 310 EN 1087-1	N/mm ²	0,50	0,42	0,35

^a For the determination of internal bond after boil test, the modified procedure given in annex B applies.

4.3 Requirements for load-bearing boards

4.3.1 Requirements for boards for use in dry conditions

Table 5 specifies the requirements for load-bearing boards for use in dry conditions **for all load duration categories**.

Table 5 — Requirements for load-bearing boards for use in dry conditions (type HB.LA)

Property	Test method	Unit	Ranges of nominal thickness (mm)		
			≤ 3,5	> 3,5 to 5,5	> 5,5
Swelling in thickness 24 h	EN 317	%	35	30	25
Internal bond	EN 319	N/mm ²	0,60	0,60	0,60
Bending strength	EN 310	N/mm ²	33	32	30
Modulus of elasticity in bending	EN 310	N/mm ²	2 700	2 500	2 300

If it is made known by the purchaser that the boards are intended for specific use in flooring, walls or roofing, the performance standard EN 12871 also has to be consulted. This may result in additional requirements having to be complied with.

4.3.2 Requirements for boards for use in humid conditions

Table 6 specifies the requirements for load-bearing boards for use in humid conditions **for all load duration categories**.

Table 6 — Requirements for load-bearing boards for use in humid conditions (type HB.HLA1)

Property	Test method	Unit	Ranges of nominal thickness (mm)		
			≤ 3,5	> 3,5 to 5,5	> 5,5
Swelling in thickness 24 h	EN 317	%	17	15	12
Internal bond	EN 319	N/mm ²	0,80	0,70	0,65
Bending strength	EN 310	N/mm ²	38	36	34
Modulus of elasticity in bending	EN 310	N/mm ²	3 800	3 600	3 100
Internal bond after boil test ^a	EN 319 EN 1087-1	N/mm ²	0,50	0,42	0,35

If it is made known by the purchaser that the boards are intended for specific use in flooring, walls or roofing, the performance standard EN 12871 also has to be consulted. This may result in additional requirements having to be complied with.

^a For the determination of internal bond after boil test, the modified procedure given in annex B applies.

Table 7 specifies the requirements for heavy-duty load bearing boards for use in humid conditions **for load duration categories**.

Table 7 — Requirements for heavy-duty load-bearing boards for use in humid conditions (type HB.HLA2)

Property	Test method	Unit	Ranges of nominal thickness (mm)		
			≤ 3,5	> 3,5 to 5,5	> 5,5
Swelling in thickness 24 h	EN 317	%	17	15	12
Internal bond	EN 319	N/mm ²	0,80	0,70	0,65
Bending strength	EN 310	N/mm ²	44	42	38
Modulus of elasticity in bending	EN 310	N/mm ²	4 500	4 300	4100
Internal bond after boil test ^a	EN 319 EN 1087-1	N/mm ²	0,50	0,42	0,35
Bending strength after boil test ^b	EN 319 EN 1087-1	N/mm ²	17	16	15
If it is made known by the purchaser that the boards are intended for specific use in flooring, walls or roofing, the relevant performance standard EN 12871 also has to be consulted. This may result in additional requirements having to be complied with.					
<p>^a For the determination of internal bond after boil test, the modified procedure given in annex B applies.</p> <p>^b For the determination of bending strength after boil test, the modified procedure given in annex C applies. Bending strength after boil test is calculated on the initial dimensions of the test piece (before boil treatment).</p>					

5 Verification of compliance

5.1 General

Verification of compliance with this European Standard shall be carried out using the test methods listed in EN 622-1 and in Tables 2, 3, 4, 5, 6 and 7, as appropriate.

5.2 External control

External control of the factory, if any, shall be carried out according to EN 326-2.

The inspection of an isolated lot of panels shall be carried out according to EN 326-3.

5.3 Factory production control

Factory production control shall be carried out according to EN 326-2.

The properties listed in Tables 2, 3, 4, 5, 6 and 7 and in EN 622-1 shall be controlled, using intervals between tests not exceeding the intervals given in Table 8. Sampling shall be carried out at random. Alternative test methods and/or unconditioned test pieces may be used if a valid correlation to the specified test methods can be proven. The intervals between tests given in Table 8 are related to a production under statistical control.

Table 8 — Maximum intervals between test for each production line

Property	Maximum interval between tests
General properties	see EN 622-1
All other properties listed in Tables 2, 3, 4, 5, 6 and 7	8 h ^a
^a If several thickness ranges are produced in 8 h, the factory production control shall be organized so that at least one board of each thickness range is tested in one week's production.	

6 Marking

6.1 General purpose boards

Each panel or package shall be clearly marked by the manufacturer either by indelible direct printing or by an adhesive label with at least the following information in this sequence:

- manufacturer's name, trade mark or identification mark;
- number of this EN 622-2 and the symbol of the board type (HB, HB.H, HB.E, as appropriate);
- nominal thickness;
- batch number or the production week and year.

6.2 Load-bearing boards

Each panel shall be clearly marked by the manufacturer by indelible direct printing with at least the following information in this sequence:

- manufacturer's name, trade mark or identification mark;
- number of this EN 622-2 and the symbol of the board type (HB.HLA1/HB.HLA2, as appropriate);
- nominal thickness;
- batch number or the production week and year or the production date.

NOTE In case of cut-to-size panels, where the first purchaser is the user of the product and where he agrees that marking (other than on the package) is unnecessary, the marking of such individual panels in the package need not be undertaken.

6.3 Colour coding

See EN 622-1.

Annex A (normative)

Supplementary properties

For specific applications, information on some of the properties specified in Table A.1 may be required. On request, this information shall be supplied by the board manufacturer, in which case it shall have been derived using the test methods in Table A.1.

The values in Table A.1 are defined as follows:

Dimensional changes associated with changes in relative humidity, unilateral surface absorption and sand content are individual maximum values, i.e. no individual test result may be higher than the values in the Table.

Table A.1 — Requirements for supplementary properties

Property	Test method	Unit	Requirement
Dimensional changes			
Length	EN 318	%	0,20
Thickness	EN 318	%	10
Unilateral surface absorption	EN 382-2	g/m ²	300
Sand Content	ISO 3340	%	0,05

NOTE For certain applications, information on additional properties not specified in Table A.1 can be required. For instance, information on thermal conductivity water vapour permeability and fire behaviour of fibreboards is given in EN 13986.

Annex B (normative)

Boil test according to EN 1087-1:1995 — Modified procedure

EN 1087-1:1995 shall be applied with the following modifications to clauses:

4.5 Air circulating oven, capable of maintaining an internal temperature of (70 ± 2) °C;

5.5 The bonding of the test pieces to the loading blocks shall only be carried out **after** the boil treatment (6.1) and subsequent retreatment (6.2) has been completed;

All other provisions of this clause apply;

6.2 After (120 ± 5) min remove the test pieces and immerse them in water at (20 ± 5) °C for (60 ± 5) min. The test pieces shall have their faces vertical and be separated from each other and from the bottom of the container by not less than 15 mm;

Remove the test pieces from the water, dry them with a paper towel and place them, with their faces horizontal, in the drying oven at (70 ± 2) °C for (960 ± 15) min. Remove the test pieces from the oven, allow them to cool to approximately room temperature and bond the loading blocks to the faces;

NOTE If the surfaces of the test pieces are rough or uneven, they can be smoothed before bonding to the blocks by rubbing on a piece of abrasive paper which is held on a flat surface.

Annex C (normative)

Determination of bending strength after boil test according to EN 1087-1:1995 — Modified procedure

EN 10987-1:1995 shall be applied with the following modifications to clauses:

- 4.3** Testing machine — according to 4.2.1 and 4.2.3 of EN 310:1993;
- 4.4** Testing blocks — not applicable;
- 5.2** Test pieces — dimensions — according to 5.2 of EN 310:1993;
- 5.4** Measurement of dimensions — not applicable;
- 6.1** Applies with the provision that it is the bending test pieces 5.2 of EN 310:1993 which are submitted to the boil treatment as described;
- 6.3** Application of the load and measurement of maximum load — use the testing procedure according to clause 6 of EN 310:1993;
- 7** Expression of results — according to 7.2 of EN 310:1993.

Bibliography

EN 316, *Wood fibreboards — Definition, classification, and symbols.*

EN 622-3, *Fibreboards — Specifications — Part 3: Requirements for medium boards.*

EN 622-4, *Fibreboards — Specifications — Part 4 Requirements for softboards.*

EN 622-5, *Fibreboards — Specifications — Part 5: Requirements for dry process boards (MDF).*

EN 789, *Timber structures — Test methods — Determination of mechanical properties of wood-based panels.*

EN 1058, *Wood-based panels — Determination of characteristic values of mechanical properties and density.*

EN 12369-1, *Wood-based panels — Characteristic values for structural design — Part 1: OSB, particleboards and fibreboards.*

ENV 1156, *Wood-based panels — Determination of duration of load and creep factors.*

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