



SLOVENSKI STANDARD

SIST EN 300:1998

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Oriented Strand Boards (OSB) - Definitions, classification and specifications

Platten aus langen, schlanken, ausgerichteten Spänen (OSB) - Definitionen, Klassifizierung und Anforderungen

Panneaux de lamelles minces, longues et orientées (OSB) - Définitions, classification et exigences

STANDARD PREVIEW
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EUROPEAN STANDARD

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Descriptors: wooden boards, particle boards, drop wires, classifications, specifications, dimensional tolerances, mechanical properties, tests, marking

English version

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CEN

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

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 112 "Woodbased panels", the secretariat of which is held by DIN.

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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of an identical text or by endorsement, at the latest by September 1997, and conflicting national standards shall be withdrawn at the latest by September 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of 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 the United Kingdom.



1 Scope

This European Standard gives definitions, a classification and specifies the requirements for Oriented Strand Boards (OSB).

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

NOTE: Test methods for the determination of mechanical properties for structural purposes are given in EN 789. Determination of characteristic values of mechanical properties and density for structural purposes is given in EN 1058.

Information on supplementary properties is given in annex C.

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 120

Wood-based panels – Determination of formaldehyde content – Extraction method called the perforator method

EN 310

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 319

Particleboards and fibreboards – Determination of tensile strength perpendicular to the plane of the board

EN 321

Fibreboards – Cyclic test in humid conditions

EN 322

Wood-based panels – Determination of moisture content

EN 323

Wood-based panels – Determination of density

EN 324-1

Wood-based panels – Determination of dimensions of boards – Part 1: Determination of thickness, width and length

EN 324-2

Wood-based panels – Determination of dimensions of boards – Part 2: Determination of squareness and edge straightness

EN 326-1

Wood-based panels – Sampling, cutting and inspection – Part 1: Sampling and cutting of test pieces and expression of test results

EN 1087-1 : 1995

Particleboards – Determination of moisture resistance – Part 1: Boil test

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 Oriented Strand Board (OSB): multi-layered board made from strands of wood of a predetermined shape and thickness together with a binder. The strands in the external layers are aligned and parallel to the board length or width; the strands in the centre layer or layers can be randomly oriented, or aligned, generally at right angles to the strands of the external layers.

3.2 major axis: direction in the plane of the board in which the bending properties have the higher values.

3.3 minor axis: direction in the plane of the board at right angles to the major axis.

3.4 dry conditions: conditions defined in terms of service class 1 of ENV 1995-1-1 for load bearing boards and characterised by a moisture content in the materials corresponding to a temperature of 20 °C and a relative humidity of the surrounding air exceeding 65 % only for a few weeks per year.

3.5 humid conditions: conditions defined in terms of service class 2 of ENV 1995-1-1 and characterised by a moisture content in the materials corresponding to a temperature of 20 °C and a relative humidity of the surrounding air exceeding 85 % only for a few weeks per year.

4 Classification of boards

Four types of board are classified and distinguished as follows:

OSB/1 General purpose boards, and boards for interior fitments (including furniture) for use in dry conditions.

OSB/2 Load-bearing boards for use in dry conditions.

OSB/3 Load-bearing boards for use in humid conditions.

OSB/4 Heavy duty load-bearing boards for use in humid conditions.

NOTE: Load-bearing boards are intended for use in the design and construction of load-bearing or stiffening building elements e.g. walls, flooring, roofing and I-beams (see ENV 1995-1-1 and/or Performance Standards) for use in dry or humid conditions.

5 General requirements of all OSB types

Oriented Strand Board shall comply with the general requirements listed in table 1 when dispatched from the producing factory.

Table 1: General requirements for all OSB Types

| No. | Property | Test method | Requirement |
|---|--|-------------|---|
| 1 ¹⁾²⁾ | Tolerances on nominal dimensions – Thickness (sanded) within and between boards – Thickness (unsanded) within and between boards – Length and Width | EN 324-1 | +/-0,3 mm +/-0,8 mm +/-3,0 mm |
| 2 ¹⁾²⁾ | Edge straightness tolerance | EN 324-2 | 1,5 mm/m |
| 3 ¹⁾²⁾ | Squareness tolerance | EN 324-2 | 2,0 mm/m |
| 4 ¹⁾ | Moisture content – OSB/1 OSB/2 – OSB/3 OSB/4 | EN 322 | 2 % to 12 % 5 % to 12 % |
| 5 ²⁾ | Tolerance on the mean density within a board | EN 323 | ±10 % |
| 6 ³⁾ | Formaldehyde potential (perforator value) – Class 1 – Class 2 | EN 120 | ≤ 8 mg/100 g > 8 mg/100 g ≤ 30 mg/100 g |
| <p>¹⁾ Certain uses of Oriented Strand Board can require other tolerances: see separate performance standards.</p> <p>²⁾ These values are characterised by a moisture content in the material corresponding to a relative humidity of 65 % and a temperature of 20 °C.</p> <p>³⁾ A number of amendments are being studied regarding a reference moisture content and a related conversion factor.</p> | | | |

NOTE: On delivery of OSB panels, their moisture content should be determined prior to use, and allowed to come into equilibrium with the ambient climatic conditions.

6 Requirement values

The levels which are given in tables 2 to 7, determined by the relevant test methods as listed in clauses 7 to 10, are to be used for quality control purposes only and shall not be used in design calculations.

With the exception of internal bond after option 2 and swelling in thickness, the values given in tables 2 to 7 are characterised by a moisture content in the material corresponding to a relative humidity of 65 % and a temperature of 20 °C.

The values for internal bond after option 2 (tables 5 and 7) and swelling in thickness (tables 2 to 4 and 6) are characterised by a moisture content in the material before the treatment corresponding to a relative humidity of 65 % and a temperature of 20 °C.

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 values for individual boards 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 2 to 4 and 6 and in the case of all other properties they shall be equal to or greater than the values in the tables.

7 Requirements for general purpose boards, and boards for interior fitments (including furniture) for use in dry conditions (Type OSB/1)

This clause specifies the requirements, in addition to those specified in clause 5, for general purpose boards, and boards for interior fitments (including furniture), for use in dry conditions¹⁾. Therefore, boards of this type shall comply with the requirements given in table 1 and table 2.

For definitions of values given in the tables see clause 6.

Table 2: General purpose boards, and boards for interior fitments (including furniture) for use in dry conditions – Requirements for specified mechanical and swelling properties

| Board Type OSB/1 | Test method | Unit | Requirement | | |
|---|-------------|-------------------|--|---------------|----------|
| | | | Board Thickness Range (mm, nominal) | | |
| | | | 6 to 10 | > 10 and < 18 | 18 to 25 |
| Property | | | | | |
| bending strength – major axis | EN 310 | N/mm ² | 20 | 18 | 16 |
| bending strength – minor axis | EN 310 | N/mm ² | 10 | 9 | 8 |
| modulus of elasticity in bending – major axis | EN 310 | N/mm ² | 2 500 | 2 500 | 2 500 |
| modulus of elasticity in bending – minor axis | EN 310 | N/mm ² | 1 200 | 1 200 | 1 200 |
| internal bond | EN 319 | N/mm ² | 0,30 | 0,28 | 0,26 |
| swelling in thickness – 24 h | EN 317 | % | 25 | 25 | 25 |

8 Requirements for load-bearing boards for use in dry conditions (Type OSB/2)

This clause specifies the requirements, in addition to those specified in clause 5, for load-bearing boards for use in dry conditions¹⁾. Therefore, boards of this type shall comply with the requirements given in table 1 and table 3.

For determining characteristic values see clause 1.

For definitions of values given in the table see clause 6.

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Table 3: Load-bearing boards for use in dry conditions – Requirements for specified mechanical and swelling properties

| Board Type OSB/2 | Test method | Unit | Requirement | | |
|---|-------------|-------------------|--|---------------|----------|
| | | | Board Thickness Range (mm, nominal) | | |
| | | | 6 to 10 | > 10 and < 18 | 18 to 25 |
| Property | | | | | |
| bending strength – major axis | EN 310 | N/mm ² | 22 | 20 | 18 |
| bending strength – minor axis | EN 310 | N/mm ² | 11 | 10 | 9 |
| modulus of elasticity in bending – major axis | EN 310 | N/mm ² | 3 500 | 3 500 | 3 500 |
| modulus of elasticity in bending – minor axis | EN 310 | N/mm ² | 1 400 | 1 400 | 1 400 |
| internal bond | EN 319 | N/mm ² | 0,34 | 0,32 | 0,30 |
| swelling in thickness – 24 h | EN 317 | % | 20 | 20 | 20 |

NOTE: 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 has also to be consulted. This can result in additional requirements having to be complied with.

¹⁾ Boards of this type are only suitable for use in biological hazard class 1 of EN 335-3.

9 Requirements for load-bearing boards for use in humid conditions (Type OSB/3)

9.1 General

This clause specifies the requirements, in addition to those specified in clause 5, for load-bearing boards for use in humid conditions²⁾. Therefore, boards of this type shall comply with the requirements of tables 1, 4 and 5.

For determining characteristic values see clause 1.

For definitions of values given in the tables see clause 6.

9.2 Mechanical and swelling properties

Table 4: Load-bearing boards for use in humid conditions – Requirements for specified mechanical and swelling properties

| Board Type OSB/3 Property | Test method | Unit | Requirement | | |
|---|-------------|-------------------|------------------------------------|---------------|----------|
| | | | Board Thickness Range (mm nominal) | | |
| | | | 6 to 10 | > 10 and < 18 | 18 to 25 |
| bending strength – major axis | EN 310 | N/mm ² | 22 | 20 | 18 |
| bending strength – minor axis | EN 310 | N/mm ² | 11 | 10 | 9 |
| modulus of elasticity in bending – major axis | EN 310 | N/mm ² | 3 500 | 3 500 | 3 500 |
| modulus of elasticity in bending – minor axis | EN 310 | N/mm ² | 1 400 | 1 400 | 1 400 |
| internal bond | EN 319 | N/mm ² | 0,34 | 0,32 | 0,30 |
| swelling in thickness – 24 h | EN 317 | % | 15 | 15 | 15 |

NOTE: 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 has also to be consulted. This can result in additional requirements having to be complied with.

9.3 Moisture resistance

Table 5: Load-bearing boards for use in humid conditions – Requirements for moisture resistance

| Board Type OSB/3 Property | Test method | Unit | Requirement | | |
|---|----------------------------------|-------------------|-------------------------------------|---------------|----------|
| | | | Board Thickness Range (mm, nominal) | | |
| | | | 6 to 10 | > 10 and < 18 | 18 to 25 |
| bending strength after cyclic test – major axis | EN 321 + EN 310 ²⁾ | N/mm ² | 9 | 8 | 7 |
| option 1 ¹⁾ internal bond after cyclic test | EN 321 + EN 319 | N/mm ² | 0,18 | 0,15 | 0,13 |
| option 2 ¹⁾ internal bond after boil test | EN 1087-1 : 1995 ³⁾ | N/mm ² | 0,15 | 0,13 | 0,12 |

¹⁾ the above choice of procedure should be regarded only as an interim measure pending the result of a prenormative research programme to develop a solution independent of the board composition.

²⁾ for the calculation of bending strength after cyclic test, the thickness taken into account is the thickness measured after the cyclic test.

³⁾ EN 1087-1 : 1995 shall be used with the modified procedure given in Annex A.

²⁾ Boards of this type are suitable for use in biological hazard classes 1 and 2 of EN 335-3.

With the exception of certain OSBs in which the wood species imparts a sufficient degree of durability, OSB cannot generally be used in biological hazard class 3 of EN 335-3.

Requirements for moisture resistance are determined by two test methods, bending strength and internal bond. The test for bending strength is carried out after the humid cyclic test EN 321. The requirements for internal bond are dependent upon the test method employed in the assessment of this property. Thus, two alternative sets of requirements for this property (Option 1 and Option 2) are set out in Table 5 corresponding to the two principal recognised methods of evaluation. It is necessary for the manufacturer to show compliance with only one of these two options.

Option 1 requirements apply to those boards subjected to a test described in EN 321. The glues or adhesive systems suitable for the application of Option 1 are unrestricted.

Option 2 requirements apply to boards with adhesive systems based on alkaline hardening phenolic resins or the isocyanate PMDI, or the adhesive system approved by an accredited body. The approvals which are known at the moment are listed in annex E. The boil test (see annex A and EN 1087-1 : 1995) is used for verification of conformity to control the bond quality reached with these proven adhesive systems.

The alkali content of boards in their total thickness shall not be higher than 2 %, based on oven-dry mass (tested analytically) and not higher than 1,7 % in the outer layers (by calculation).

When verifying compliance by external control only the test option performed and notified by the manufacturer shall be carried out. If the option is unknown it will be necessary to carry out both sets of procedures, but compliance is required with only one set of requirements.

10 Requirements for heavy duty load-bearing boards for use in humid conditions (Type OSB/4)

10.1 General

This clause specifies the requirements, in addition to those specified in clause 5, for heavy duty load-bearing boards for use in humid conditions³⁾. Therefore, boards of this type shall comply with the requirements of tables 1, 6 and 7.

For determining characteristic values see clause 11/standards/sist/66cb8855-3369-42de-99ff-9f233267e1a8/sist-en-300-1998

For definitions of values given in the tables see clause 6.

10.2 Mechanical and swelling properties

Table 6: Heavy duty load-bearing boards for use in humid conditions – Requirements for specified mechanical and swelling properties

| Board Type OSB/4 Property | Test method | Unit | Requirement | | |
|---|-------------|-------------------|------------------------------------|---------------|----------|
| | | | Board Thickness Range (mm nominal) | | |
| | | | 6 to 10 | > 10 and < 18 | 18 to 25 |
| bending strength – major axis | EN 310 | N/mm ² | 30 | 28 | 26 |
| bending strength – minor axis | EN 310 | N/mm ² | 16 | 15 | 14 |
| modulus of elasticity in bending – major axis | EN 310 | N/mm ² | 4 800 | 4 800 | 4 800 |
| modulus of elasticity in bending – minor axis | EN 310 | N/mm ² | 1 900 | 1 900 | 1 900 |
| internal bond | EN 319 | N/mm ² | 0,50 | 0,45 | 0,40 |
| swelling in thickness – 24 h | EN 317 | % | 12 | 12 | 12 |

NOTE: 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 has also to be consulted. This can result in additional requirements having to be complied with.

²⁾ Boards of this type are suitable for use in biological hazard classes 1 and 2 of EN 335-3.

With the exception of certain OSBs in which the wood species imparts a sufficient degree of durability, OSB cannot generally be used in biological hazard class 3 of EN 335-3.

10:3 Moisture resistance

Table 7: Heavy duty load-bearing boards for use in humid conditions – Requirements for moisture resistance

| Board Type OSB/4 | Test method | Unit | Requirement | | |
|--|----------------------------------|-------------------|-------------------------------------|---------------|----------|
| | | | Board Thickness Range (mm, nominal) | | |
| Property | | | 6 to 10 | > 10 and < 18 | 18 to 25 |
| bending strength after cyclic test – major axis | EN 321 + EN 310 ²⁾ | N/mm ² | 15 | 14 | 13 |
| option 1 ¹⁾ internal bond after cyclic test | EN 321 + EN 319 | N/mm ² | 0,21 | 0,17 | 0,15 |
| option 2 ¹⁾ internal bond after boil test | EN 1087-1:1995 ³⁾ | N/mm ² | 0,17 | 0,15 | 0,13 |
| <p>¹⁾ the above choice of procedure should be regarded only as an interim measure pending the result of a prenormative research programme to develop a solution independent of the board composition.</p> <p>²⁾ for the calculation of bending strength after cyclic test, the thickness taken into account is the thickness measured after the humid cyclic test.</p> <p>³⁾ EN 1087-1:1995 shall be used with the modified procedure given in Annex A.</p> | | | | | |

Requirements for moisture resistance are determined by two tests, bending strength and internal bond. The test for bending strength is carried out after the humid cyclic test in EN 321. The requirements for internal bond are dependent upon the test method employed in the assessment of this property. Thus, two alternative sets of requirements for this property Option 1 and Option 2 are set out in Table 7 corresponding to the two principal recognised methods of evaluation. It is necessary for the manufacturer to show compliance with only one of these two options.

Option 1 requirements apply to those boards subjected to a test described in EN 321. The glues or adhesive systems suitable for the application of Option 1 are unrestricted.

Option 2 requirements apply to boards with adhesive systems based on alkaline hardening phenolic resins or the isocyanate PMDI, or the adhesive system approved by an accredited body. The approvals which are known at the moment are listed in annex E. The boil test (see annex A and EN 1087-1 : 1995) is used for verification of conformity to control the bond quality reached with these proven adhesive systems.

The alkali content of boards in their total thickness shall not be higher than 2 %, based on oven-dry mass (tested analytically) and not higher than 1,7 % in the outer layers (by calculation).

When verifying compliance by external control only the test option performed and notified by the manufacturer shall be carried out. If the option is unknown it will be necessary to carry out both sets of procedures, but compliance is required with only one set of requirements.

11 Verification of compliance

11.1 General

Verification of compliance with this EN shall be carried out using the test methods given in the relevant tables above.

Sampling and cutting of test pieces and expression of test results shall be in accordance with EN 326-1.