



SLOVENSKI STANDARD
SIST EN 13353:2022

01-september-2022

Nadomešča:

SIST EN 13353:2009+A1:2011

Masivne lesne plošče (SWP) - Zahteve

Solid wood panels (SWP) - Requirements

Massivholzplatten (SWP) - Anforderungen

Bois panneautés (SWP) - Exigences

Ta slovenski standard je istoveten z: EN 13353:2022

ICS:

79.060.99

Druge lesne plošče

Other wood-based panels

SIST EN 13353:2022

en,fr,de

EUROPEAN STANDARD

EN 13353

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2022

ICS 79.060.99

Supersedes EN 13353:2008+A1:2011

English Version

Solid wood panels (SWP) - Requirements

Bois panneau? (SWP) - Exigences

Massivholzplatten (SWP) - Anforderungen

This European Standard was approved by CEN on 20 April 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

SIST EN 13353:2022

<https://standards.iteh.ai/catalog/standards/sist/96ec44a4-6865-49de-9d0f-48bfa177fd7/sist-en-13353-2022>



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions and classes	5
3.1 Terms and definitions	5
3.2 Classes for solid wood panels indicating their intended use	6
3.2.1 Technical classes for non-structural use.....	6
3.2.2 Technical classes for structural use.....	6
3.2.3 Classes for structural use based on individually declared values	6
4 Requirements	7
4.1 Dimensional tolerances.....	7
4.2 Moisture content at dispatch.....	7
4.3 Bonding quality	7
4.3.1 General.....	7
4.3.2 Single layer solid wood panel.....	7
4.3.3 Multi-layer solid wood panel.....	7
4.3.4 Adhesive for solid wood panels in structural applications	8
4.4 Biological durability	8
4.5 Mechanical characteristics	8
4.5.1 General.....	8
4.5.2 Structural applications	8
4.5.3 Non-structural applications.....	10
4.6 Formaldehyde release	10
5 Supplementary properties	10
6 Verification of compliance	10
6.1 General.....	10
6.2 External control.....	10
6.3 Factory production control	10
7 Marking	12
7.1 Boards marketed within the European Economic Area for construction applications	12
7.2 Other boards.....	12
Annex A (normative) Properties for structural and non-structural applications	13
Annex B (normative) Alternative to determining the characteristic values for the homogeneous rectangular substitute cross-section	14
Bibliography	15

European foreword

This document (EN 13353:2022) 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 January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

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

This document supersedes EN 13353:2008+A1:2011.

Compared to EN 13353:2008+A1:2011, the following changes have been made:

- a) additional types of adhesive for load-bearing panels were included, see 4.3.4;
- b) modification of the thickness range and of the requirements for single-layer panels given in Table 3;
- c) modification of the thickness ranges and of the requirements for multi-layer panels given in Table 4;
- d) Annex B (normative) included (alternative to determining the characteristic values for the homogeneous rectangular substitute cross-section);
- e) editorial changes.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 13353:2022 (E)**1 Scope**

This document specifies requirements for solid wood panels as specified in EN 12775 with a maximum thickness of 80 mm for use in dry, humid and exterior conditions as specified in service classes 1, 2 and 3 of EN 1995-1-1.

Additional information on supplementary properties for certain applications is given in Annex A.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 301, *Adhesives, phenolic and aminoplastic, for load-bearing timber structures - Classification and performance requirements*

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

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 326-2, *Wood-based panels - Sampling, cutting and inspection - Part 2: Initial type testing and factory production control*

EN 335, *Durability of wood and wood-based products - Use classes: definitions, application to solid wood and wood-based products*

EN 384, *Structural timber - Determination of characteristic values of mechanical properties and density*

EN 594, *Timber structures - Test methods - Racking strength and stiffness of timber frame wall panels*

EN 596, *Timber structures - Test methods - Soft body impact test of timber framed walls*

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

EN 1058, *Wood-based panels - Determination of characteristic 5-percentile values and characteristic mean values*

EN 1195, *Timber structures - Test methods - Performance of structural floor decking*

EN 1995-1-1, *Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings*

EN ISO 12460-3, *Wood-based panels - Determination of formaldehyde release - Part 3: Gas analysis method (ISO 12460-3)*

EN 12775, *Solid wood panels - Classification and terminology*

EN 12871, *Wood-based panels - Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

EN 13017-1, *Solid wood panels - Classification by surface appearance - Part 1: Softwood*

EN 13017-2, *Solid wood panels - Classification by surface appearance - Part 2: Hardwood*

EN 13183-2, *Moisture content of a piece of sawn timber - Part 2: Estimation by electrical resistance method*

EN 13354, *Solid wood panels (SWP) - Bonding quality - Test method*

EN 13446, *Wood-based panels - Determination of withdrawal capacity of fasteners*

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

EN 15416-3, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 3: Creep deformation test at cyclic climate conditions with specimens loaded in bending shear*

CEN/TS 635-4, *Plywood - Classification by surface appearance - Part 4: Parameters of ability for finishing, guideline*

3 Terms and definitions and classes

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12775 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1

solid wood panel for use in dry conditions

panel intended for use in interior applications with no risk of wetting as specified in service class 1 of EN 1995-1-1 and use class 1 of EN 335

Note 1 to entry: Service class 1 is characterized by a moisture content of the material corresponding to a temperature of 20 °C and a relative humidity of the surrounding air exceeding 65 % for only a few weeks per year.

EN 13353:2022 (E)**3.1.2****solid wood panel for use in humid conditions**

panel intended for use in protected external applications as specified in service class 2 of EN 1995-1-1 and use class 2 of EN 335

Note 1 to entry: It is also capable of resisting weather exposure for short periods (e.g. when exposed during construction).

Note 2 to entry: Service class 2 is characterized by a moisture content of the material corresponding to a temperature of 20 °C and a relative humidity of the surrounding air exceeding 85 % for only a few weeks per year.

3.1.3**solid wood panel for use in exterior conditions**

panel intended for use in unprotected external applications as specified in service class 3 of EN 1995-1-1 and use class 3 of EN 335

Note 1 to entry: It is also capable of withstanding exposure to weathering conditions and liquid water, or water vapour in a damp but ventilated location where it can frequently attain a moisture content above 20 %.

Note 2 to entry: Service class 3 is characterized by a moisture content of the material higher than service class 2.

3.2 Classes for solid wood panels indicating their intended use**3.2.1 Technical classes for non-structural use**

SWP/1 NS: Solid wood panel for non-structural use in dry conditions according to 3.1.1

SWP/2 NS: Solid wood panel for non-structural use in humid conditions according to 3.1.2

SWP/3 NS: Solid wood panel for non-structural use in exterior conditions according to 3.1.3

3.2.2 Technical classes for structural use

SWP/1 S: Solid wood panel for structural use in dry conditions according to 3.1.1

SWP/2 S: Solid wood panel for structural use in humid conditions according to 3.1.2

SWP/3 S: Solid wood panel for structural use in exterior conditions according to 3.1.3

3.2.3 Classes for structural use based on individually declared values

SWP/1 SD: Solid wood panel for structural use in dry conditions according to 3.1.1

SWP/2 SD: Solid wood panel for structural use in humid conditions according to 3.1.2

SWP/3 SD: Solid wood panel for structural use in exterior conditions according to 3.1.3

Technical classes are intended to simplify the use of standardized solid wood panels by providing supporting data e.g. in EN 12369-3 as well as simplifying marking in accordance with EN 13986. Nevertheless, products should not be limited by the requirements according to the technical classes. Therefore, classes based on individually declared values may be used for such products. The calculation of characteristic values should be performed according to EN 1058 or EN 14358.

4 Requirements

4.1 Dimensional tolerances

The tolerances for the nominal length, width and thickness, thickness within the panel, edge straightness and squareness are given in Table 1. They relate to the moisture content at time of dispatch for large and medium-sized panels according to EN 12775 and shall be determined in accordance with EN 324-1 and EN 324-2 as appropriate.

Table 1 — Dimensional tolerances for both large and medium-sized panels

Tolerances on	Thickness ^a		Tolerance ^b for	
	Tolerance within a single panel	Tolerance on nominal thickness	Edge straightness	Squareness
±2,0 mm	0,5 mm	±1,0 mm	1,0 mm/m	1,0 mm/m
^a Determined in accordance with EN 324-1. ^b Determined in accordance with EN 324-2.				

4.2 Moisture content at dispatch

At time of dispatch the moisture content according to EN 322 shall be $(8 \pm 2) \%$ for use in dry conditions, $(10 \pm 3) \%$ for use in humid conditions and $(12 \pm 3) \%$ for use in exterior conditions.

If chemically or thermally treated wood is used, the equilibrium moisture content of the panels can differ significantly to those made of natural wood. In that case, a deviation from the above mentioned requirements concerning moisture content is possible.

If another moisture content is necessary, e.g. due to regional climatic condition, the appropriate moisture content shall be specified explicitly.

4.3 Bonding quality

4.3.1 General

The bonding quality shall be determined in accordance with EN 13354 after the appropriate pre-treatment for use in dry, humid or exterior condition.

4.3.2 Single layer solid wood panel

The lower 5-percentile of the shear strength, calculated in accordance with EN 326-1, shall not be less than 2,5 N/mm².

The mean wood failure percentage of each panel shall be more than 40 % except if the density is more than 600 kg/m³.

4.3.3 Multi-layer solid wood panel

The lower 5-percentile of the shear strength f_v calculated in accordance with EN 326-1 and the mean percentage wood failure of each panel shall comply with Table 2.

Table 2 — Requirements

Shear strength N/mm ²	Wood failure %
$0,4 \leq f_v < 0,8$	≥ 40
$0,8 \leq f_v < 1,2$	≥ 20
$f_v \geq 1,2$	no requirement

4.3.4 Adhesive for solid wood panels in structural applications

Where panels are intended for structural applications, a thermosetting adhesive (phenolic or aminoplastic type), a polyurethane adhesive (PU) or an emulsion polymerised isocyanate (EPI) shall be used for the bonding of the layers to each other.

Other adhesives shall show their suitability by fulfilling the requirements to thin (0,1 mm) glue-line according to EN 301 regarding tensile shear and delamination and with regard to creep according to EN 15416-3 with a thin glue-line (0,1 mm).

4.4 Biological durability

The risk of biological attack for uses in dry, humid and exterior conditions is outlined in use classes 1, 2 and 3 of EN 335. Guidance on factors affecting durability and on precautionary measures which can be considered necessary can be found in EN 335 and EN 460.

4.5 Mechanical characteristics

4.5.1 General

The mechanical properties of solid wood panels are determined according to their application. For structural applications refer to 4.5.2.

For non-structural applications refer to 4.5.3.

4.5.2 Structural applications

Single-layer solid wood panels for use in structural applications as specified in 3.2.2, shall comply with the requirements given in Table 3. For single-layer solid wood panels based on individually declared values as specified in 3.2.3, the properties given in Table 3 shall comply with the corresponding declared value of the manufacturer. Individually declared values may also be used for single layer SWP out of the thickness range given in Table 3 up to a thickness of 60 mm.

Multi-layer solid wood panels for use in structural applications as specified in 3.2.2 shall comply with the requirements of Table 4. For multi-layer solid wood panels based on individually declared values as specified in 3.2.3, the properties given in Table 4 shall comply with the corresponding declared value of the manufacturer.

The values in Tables 3 and 4 shall be determined as lower 5-percentile following the principles of EN 326-1. Sampling of test pieces shall be carried out in accordance with the given test method.

The bending properties are determined in accordance with EN 789, optional span corresponding to 30 times the nominal thickness and force applied in the third points of the span may be used. The local modulus of elasticity is determined. By the mentioned adaptation of test configuration, it is possible to reduce the problem of rolling shear failure in bending tests.

NOTE Since according to EN 789 the number of test pieces of each panel is one, the value of this test piece represents the mean value of the panel and can be used for all statistical calculations where the mean value and the