



**SLOVENSKI STANDARD**  
**oSIST prEN 13353:2021**  
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**Masivne lesne plošče (SWP) - Zahteve**

Solid wood panels (SWP) - Requirements

Massivholzplatten (SWP) - Anforderungen

Bois panneautés (SWP) - Exigences

**Ta slovenski standard je istoveten z: prEN 13353**

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EUROPEAN STANDARD  
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English Version

## Solid wood panels (SWP) - Requirements

Bois panneautés (SWP) - Exigences

Massivholzplatten (SWP) - Anforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 112.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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## European foreword

This document (prEN 13353:2021) has been prepared by Technical Committee CEN/TC 112 “Wood-based panels”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede 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.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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**prEN 13353:2021 (E)****1 Scope**

This document specifies requirements for solid wood panels as defined in EN 12775 with a maximum thickness of 80 mm for use in dry, humid and exterior conditions as defined in service classes 1, 2 and 3 of EN 1995-1-1:2004<sup>1</sup>.

Additional information on supplementary properties for certain applications is also given.

**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 301:2017, *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 338, *Structural timber — Strength classes*

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*

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

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 1156, *Wood-based panels — Determination of duration of load and creep factors*
- EN 1195, *Timber structures — Test methods — Performance of structural floor decking*
- EN 1995-1-1:2004,<sup>1</sup> *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 14358, *Timber structures — Calculation and verification of characteristic values*
- 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*
- EN 15416-5, *Adhesives for load bearing timber structures other than phenolic and aminoplastic — Test methods — Part 5: Determination of minimum pressing time under referenced conditions*
- EN 15425, *Adhesives — One component polyurethane (PUR) for load-bearing timber structures — Classification and performance requirements*
- EN 16254:2013+A1:2016, *Adhesives — Emulsion polymerized isocyanate (EPI) for load-bearing timber structures — Classification and performance requirements*
- EN 16351:2015, *Timber structures — Cross laminated timber — Requirements*

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<sup>1</sup> As impacted by EN 1995-1-1:2004/AC:2006, EN 1995-1-1:2004/A1:2008 and EN 1995-1-1:2004/A2:2014.

### 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 <http://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 defined in service class 1 of EN 1995-1-1:2004<sup>1</sup> and use class 1 of EN 335

Note 1 to entry: Service class 1 is characterised 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.

##### 3.1.2

##### **solid wood panel for use in humid conditions**

panel intended for use in protected external applications as defined in service class 2 of EN 1995-1-1:2004<sup>1</sup> 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 characterised 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 defined in service class 3 of EN 1995-1-1:2004<sup>1</sup> 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 characterised 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 despatch 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 <sup>a</sup>		Tolerance <sup>b</sup> for	
Nominal length and width <sup>a</sup>	Tolerance within an 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
<sup>a</sup>	Determined in accordance with EN 324-1			
<sup>b</sup>	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 has to 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.

**prEN 13353:2021 (E)****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/mm<sup>2</sup>.

The mean wood failure percentage of each panel shall be more than 40 % except if the density is more than 600 kg/m<sup>3</sup>.

**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 <sup>2</sup>	Wood failure %
$0,4 \leq f_v < 0,8$	$\geq 40$
$0,8 \leq f_v < 1,2$	$\geq 20$
$f_v \geq 1,2$	no requirement

**4.3.4 Adhesive for solid wood panels in structural applications**

Where panels are intended for structural applications, a thermosetting adhesive (phenoplastic or aminoplastic type), a polyurethane adhesive (PU) according to EN 15425 or an emulsion polymerised isocyanate (EPI) according to EN 16254:2013+A1:2016 shall be used for the bonding of the layers to each other.

Moisture-curing polyurethane-based adhesives shall meet the requirements of EN 15425 and EN 16351:2015, B.2, taking into account the conditions given at EN 16351:2015, B.1. Emulsion polymer isocyanate adhesives shall fulfil the requirements set out in EN 16254:2013+A1:2016, taking into account the conditions given at EN 16254:2013+A1:2016, Annex B. If necessary, the influence of the climate on the minimum pressing time according to EN 15416-5 shall be checked and declared. Other adhesives have to show their suitability by fulfilling the requirements to thin (0,1 mm) glue-line according to EN 301:2017, 5.2, regarding tensile shear and according to EN 301:2017, 5.3 regarding delamination and with regard to creep according to EN 15416-3 with a thin glue-line (0,1 mm) or EN 1156.

**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 may 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.