

## SLOVENSKI STANDARD kSIST-TS FprCEN/TS 16526:2013

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## Lesne plošče - Lastnosti in zahteve za specifikacijo sendvič plošč za pohištvo

Wood-based panels - Determination of performance characteristics for specification of sandwich boards for furniture

Holzwerkstoffe - Bestimmung der Leistungseigenschaften von Sandwich-Platten für Möbel

## **iTeh Standards**

Panneaux sandwiches pour meubles (SWB-F) - Produits manufacturés - Définition, classification et méthodes d'essai pour la détermination des propriétés fonctionelles

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Ta slovenski standard je istoveten z: FprCEN/TS 16526

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## <u>ICS:</u>

79.060.01 Lesne plošče na splošno

Wood-based panels in general

kSIST-TS FprCEN/TS 16526:2013

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# Wood-based panels - Determination of performance characteristics for specification of sandwich boards for furniture

Holzwerkstoffe - Bestimmung der Leistungseigenschaften von Sandwich-Platten für Möbel

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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## FprCEN/TS 16526:2013 (E)

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## Foreword

This document (FprCEN/TS 16526) 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 Formal Vote.

SAFETY STATEMENT — Persons using this document should be familiar with the normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

ENVIRONMENTAL SAFETY— It is understood that some of the material permitted in this standard may have negative environmental impact. As technological advantages lead to better alternatives for these materials, they will be eliminated from this standard to the extent possible. At the end of the test, the user of the standard shall take care to carry out an appropriate disposal of the wastes, according to local regulation.

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## 1 Scope

This European Technical Specification defines terms, establishes a classification and specifies test methods for flat, factory made, non-structural, faced and unfaced sandwich boards for use in furniture manufacturing (SWB-F) for dry (service class 1) and humid conditions (service class 2). This European Technical Specification does not specify requirements.

Guidance is provided for the selection of board properties which are relevant for specific board applications.

This European Technical Specification is not applicable to products which are already covered by existing standards.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 311, Wood-based panels — Surface soundness — Test method

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

EN 320, Particleboards and fibreboards — Determination of resistance to axial withdrawal of screws

EN 322, Wood-based panels — Determination of moisture content

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 325, Wood-based panels — Determination of dimensions of test pieces

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

EN 438-2, *High-pressure decorative laminates (HPL)* — Sheets based on thermosetting resins (usually called *Laminates*) — Part 2: Determination of properties

EN 717-1, Wood-based panels — Determination of formaldehyde release — Part 1: Formaldehyde emission by the chamber method

EN 717-2, Wood-based panels — Determination of formaldehyde release — Part 2: Formaldehyde release by the gas analysis method

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

EN 826, Thermal insulating products for building applications — Determination of compression behaviour

EN 950, Door leaves — Determination of the resistance to hard body impact

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EN 1294, Door leaves — Determination of the behaviour under humidity variations in successive uniform climates

EN 1383, Timber structures — Test methods — Pull through resistance of timber fasteners

EN 1464, Adhesives — Determination of peel resistance of adhesive bonds — Floating roller method

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

EN 14323:2004, Wood-based panels — Melamine faced boards for interior uses — Test methods

EN 14727:2006, Laboratory furniture — Storage units for laboratories — Requirements and test methods

DIN 53293, Testing of sandwiches - Bending test

#### 3 Terms and definitions

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

#### 3.1

## sandwich board

#### SWB

laminar composite product consisting of at least two skins positioned on either side of a core, which is firmly connected to the skins (e.g. by bonding, by core-generated adhesion) so that the three (or more) components act compositely when under load

Note 1 to entry Wood or other lignocellulosic materials constitute at least one of the components.

#### 3.2 skin

## (https://standards.iteh.ai)

flat sheet firmly connected to the core and designed to support in-plane tensile or compressive loads in a sandwich board

Note 1 to entry Sheets used as skins may consist of composite materials.

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Note 2 to entry Skins in sandwich boards for furniture commonly consist of particleboard (EN 309), fibreboard (EN 316), 6526-2014 plywood (EN 636) etc.

Note 3 to entry If skins consist of or contain veneers (excluding decorative veneer applied to skins in faced SWB-F) or plywood, this SWB should be considered as a core or composite plywood as defined in EN 313-2. The corresponding standards may apply and have to be taken into consideration. In particular, the requirements and test methods pertaining to the bonding quality have to be considered.

#### 3.3

core

centrally positioned layer of material, generally low in density, which is bonded between two skins and is designed to support normal compressive and tensile loads and to transfer shear loads in a sandwich board

#### 3.4

#### core material

homogeneous or inhomogeneous material used in manufacturing the core

Note 1 to entry Homogeneous and inhomogeneous core materials provide continuous and discontinuous supports of the skins, respectively. Homogeneous (e.g. balsa wood, foams) or inhomogeneous (e.g. honeycomb cores) core materials can be isotropic or anisotropic.

Note 2 to entry Core materials in sandwich boards for furniture are commonly lightweight materials such as paper, metal or composite honeycomb, open and closed cell foam, corrugated material, bonded composite tubes, or naturally occurring materials such as balsa wood or lightweight (wood) fibre-based boards.

#### 3.5

#### homogenous material

material in which on a macroscopic scale relevant properties are not a function of the position within the material itself but may be a function of such parameters as time, direction, temperature, etc

#### 3.6

#### inhomogeneous material

material, also often referred to as non-homogeneous or structured in which on a macroscopic scale relevant properties are a function of the position within the material itself and relevant properties may be a function of such parameters as time, direction, temperature, etc

#### 3.7

isotropic

exhibiting the same physical and mechanical properties along different axes

#### 3.8

#### anisotropic

#### not isotropic

exhibiting different physical and mechanical properties along different axes

#### 3.9 x-axis

in sandwich boards, an axis in the plane of the skins which is used as the 0 degree reference or major axis

Note 1 to entry The board dimension in the direction of the x-axis is referred to as the length of the board.

## 3.10

### x-v plane

in sandwich boards, the reference plane parallel to the plane of the skins

#### 3.11

## y-axis

in sandwich boards, the axis in the plane of the skins which is perpendicular to the x-axis and which is referred to as the minor axis

Note 1 to entry The board dimension in the direction of the y-axis is referred to as the width of the board.

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#### z-axis

in sandwich boards, the reference axis normal to the plane of the skins

Note 1 to entry The board dimension in the direction of the z-axis is referred to as the thickness of the board.

#### 3.13 structural unit

#### SU

the entity which is repeated periodically in an inhomogeneous core material whose properties vary along the x- or y-axis of the sandwich board

Note 1 to entry An example of a structural unit is a honeycomb cell in a honeycomb core or a single profile in a corrugated core.

#### 3.14

#### factory made

mass manufactured commodity product supplied on the open market for the purpose of fabrication of furniture components or furniture

Note 1 to entry Factory made SWB-F may be subjected by the board manufacturer to additional value-adding processes (e.g. application of decorative surfaces to skins, cutting of boards to customer-specific dimensions, installation of edgebanding).

Note 2 to entry Purpose built or custom sandwich board manufactured by a furniture producer for a specific furniture product is not considered SWB-F as covered by this European Technical Specification.

#### 3.15

#### dry conditions

conditions corresponding to service class 1 of EN 1995-1-1 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

#### 3.16

#### humid conditions

conditions corresponding to service class 2 of EN 1995-1-1 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

#### 3.17

#### furniture

moveable or permanently installed articles for lying, sitting, working and storing of goods in areas intended for living, working, dwelling etc.

#### 3.18

#### non-structural use

all general applications, e.g. furniture and fitments under conditions other than load-bearing conditions as part of a building or other construction or such conditions under which the board constitutes a construction product as defined by the Council Directive 89/106/EEC

#### 3.19

#### faced sandwich board

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sandwich board with overlaid, coated, printed or veneered decorative surfaces applied to skins

#### 3.20

#### unfaced sandwich board

sandwich board without overlaid, coated, printed or veneered decorative surfaces applied to skins

#### 3.21

#### overlaid sandwich board

sandwich board surfaced with one or more overlay sheets or films, for example impregnated paper, plastics, resin film, metal

#### 3.22

#### coated sandwich board

sandwich board surfaced with a coating, normally applied in liquid form, for functional or decorative purposes

#### 3.23

#### veneered sandwich board

sandwich board overlaid with a (decorative) veneer

#### 3.24

#### mass per unit area

the quotient of mass and area (i.e. length multiplied by width) of a piece of sandwich board expressed in kilograms per square metres [kg/m<sup>2</sup>]

#### 3.25

#### apparent density

mass per unit volume, expressed in kilograms per cubic metre [kg/m<sup>3</sup>], and based on the external dimensions of the test piece to calculate the volume which is an average density of material and any hollow spaces (pores, cells, channels etc.)

#### 3.26

#### peel resistance

average force measured along the bond line, required to separate progressively the two members of a bonded test piece under specified conditions of test

## 4 Classification

#### 4.1 General

Sandwich boards can be classified according to different criteria. It is not possible to present an exhaustive classification system.

In this European Technical Specification, a combined system of criteria is presented for the classification of sandwich boards for furniture.

#### 4.2 Classification according to board lay-up

- honeycomb sandwich board;
- solid core sandwich board;
- foam core sandwich board.

4.3 Classification according to surface appearance (S. 11Ch. 21)

- unfaced sandwich board;
- faced sandwich board.

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## https://4.4 Classification according to conditions of use \_4ea7\_bed3\_d0f81a85f642/sist\_ts-cen-ts-16526-2014

- dry conditions;
- humid conditions.

#### 4.5 Classification according to application purposes

- sandwich boards for vertical elements in furniture;
- sandwich boards for horizontal elements in furniture;
- sandwich boards for front elements in furniture;

NOTE Front elements in furniture most commonly act as doors; thus the ability to install hardware in front elements is often of vital importance.

### 5 Symbols

#### 5.1 General

Different symbols are used for addressing different types of sandwich boards for furniture.

### 5.2 Symbols related to conditions of use

Table 1 specifies the symbols which shall be used to indicate the conditions of use.

#### Table 1 — Symbols related to conditions of use

Conditions of use	Symbol
Dry conditions	no symbol
Humid conditions	Н

#### 5.3 Symbols related to specific applications

Table 2 specifies the symbols which shall be used to indicate the board application in furniture manufacturing.

Table 2 — Symbols	related to board	application in	furniture	manufacturing
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Board application in furniture manufacturing	Symbol
general purpose	no symbol
vertical elements	VE
horizontal elements	HE
front elements	FE

## 5.4 Combination of symbols for identification of sandwich boards

The symbols indicating conditions of use and application purposes are added to the symbol "SWB-F" for sandwich board for furniture after a full stop, in this sequence:

"SWB-F" condition of use application purpose

#### SIST-TS CEN/TS 16526:2014

EXAMPLE 1 SWB-F.H.FE sandwich board for furniture to be used in humid conditions as front elements (e.g. for doors in bathroom furniture) en-ts-16526-2014

EXAMPLE 2 SWB-F

sandwich board for furniture to be used in dry conditions for general purposes

## 6 Conditioning and test conditions

Unless otherwise stated in this European Technical Specification the test pieces shall be conditioned to constant mass in an atmosphere with a relative humidity of  $(65 \pm 5)$  % and a temperature of  $(20 \pm 2)$  °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.

Unless otherwise stated in this European Technical Specification tests should be carried out at ambient room temperature and no requirements pertaining to the relative humidity during testing apply. However, if the ambient conditions of testing are not the same as those in the conditioning chamber, tests shall be undertaken immediately after the test pieces have been removed from the conditioning chamber.

## 7 Sampling, preparation and handling of test pieces and expression of test results

### 7.1 General requirements

Sampling, cutting of test pieces (also referred to as test pieces) and expression of test results shall be carried out according to EN 326-1.

Unless otherwise stated in this European Technical Specification the minimum number of test pieces m to be tested for determination of the respective property shall be taken from Table 3.

## Table 3 — Minimum number of test pieces m which have to be tested to determine properties of sandwich boards

	Property	Reference to test method	Minimum number of test pieces <i>m</i>	
	Moisture content	8.2.2	4	
	Apparent density and mass per unit area	8.2.3	6	
	Linear expansion due to changes in relative humidity	8.2.4	4	
	Behaviour under humidity variations in successive uniform climates	8.2.5	2	
	Moisture resistance	8.2.6	see respective test method	
	Bending test	8.3.1.2	6	
	Bending properties of sandwich board for shelving and similar	leh 8.3.1.3 daro	<b>S</b> 5	
	applications	//standards.i	teh.ai)	
	Surface soundness	8.3.2	8	
	Flatwise compressive behaviour	CUIII 8.3.3.1 FFCV	10 IO	
	Resistance to a concentrated static point load	8.3.3.2 IST-TS CEN/TS 16526:201	10 4	
st	Resistance to a concentrated static load applied in close proximity to the board edge	st/b2516a <b>8.3.3.3</b> 8-4ea7-be	13-d0f81a85f642/ <b>10</b> t-ts-cen-ts-16526-	2014
	Impact resistance	8.3.4	see respective test method	
	Shear strength	8.3.5	6	
	Resistance of the board edge with edgebanding against a static concentrated load	8.4.3.2	6	
	Peel resistance of edge-banding	8.4.3.3	6	
	Determination of axial withdrawal resistance of fastener	8.4.4.2	10	
	Pull through resistance of fasteners	8.4.4.3	10	
	Load bearing capacity of shelf supports	8.4.4.4	10	
	Shear resistance of a grooved board	8.4.5	10	

In order to determine properties, which differ with respect to the x-axis and the y-axis of the board, two groups of m test pieces shall be tested. For the purpose of ensuring and demonstrating compliance with specific requirements in factory production control, testing can be limited to test pieces with the known weakest orientation in the plane of the board.

## 7.2 Testing of SWB-F in combination with auxiliary material(s) or after execution of additional processing steps

For certain purposes (e.g. evaluation of properties of SWB-F for a very specific application or furniture design) it may be desirable to evaluate properties of SWB-F in combination with auxiliary materials or after the execution of further processing steps which are to be applied to the respective SWB-F in the manufacturing of furniture or furniture components.

Examples of such auxiliary materials and/or processing steps are the installation of edge reinforcements and/or edge banding, the application of decorative surface finishes etc. The respective auxiliary materials and/or processing steps etc. have to be specified and described in the test report. Test results are only applicable to the tested SWB-F in combination with the specified auxiliary material and/or processing steps.

#### 7.3 Test piece size

Unless other specifications are provided in this European Technical Specification for the respective test method the test piece size shall be as follows:

The test piece shall be square. The side length of the test piece shall measure 100 mm. The thickness of the test pieces shall be equal to the thickness of the sandwich board. For a sandwich board with an inhomogeneous core the side length may have to be increased in order to meet the following criteria:

For inhomogeneous core materials with a longitudinal orientation of the structural units (e.g. channels in a corrugated core) a minimum of three structural units shall be contained in the test piece cross section. For inhomogeneous core materials with cellular structural units at least nine structural units shall be contained in the test piece cross section.

Generally the person or entity applying this European Technical Specification is responsible for ensuring that representative and reproducible test results can be obtained by considering characteristics of and local variations within the respective sandwich board and its core material when choosing a sampling strategy, a test piece cutting plan and a test piece size.

https://standards.iteh.ai/catalog/standards/sist/b2516af6-7928-4ea7-bed3-d0f81a85f642/sist-ts-cen-ts-16526-2014 Test piece dimensions shall be stated in the test report.

If larger test pieces have to be employed to determine certain properties suitable modifications of the test equipment may have to be implemented and described in the test report (e.g. larger loading plates for determination of the flatwise compressive behaviour as described in 8.3.3.1).

#### 7.4 Determination of dimensions of test pieces

Unless otherwise stated in this European Technical Specification dimension of test pieces shall be determined following conditioning of test pieces according to the provisions stated in Clause 6. Dimensions of test pieces with a maximum nominal length and/or width of 300 mm shall be determined according to EN 325. Dimensions of test pieces which are larger in size shall be determined according to the provision of the respective test method or in case that no provisions are given in the respective test method by applying the procedures specified in 8.2.1.

The thickness of a test piece shall be measured at four points located 25 mm from the nearest edges. The average thickness is recorded.

The length and width of a square test piece with a nominal size of 10.000 mm<sup>2</sup> shall be measured at two points located 2 mm from the nearest edge, respectively. The average length and width shall be recorded.