



**SLOVENSKI STANDARD**  
**SIST EN 15644:2009**

**01-april-2009**

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**Tradicionalno oblikovane predizdelane stopnice iz masivnega lesa - Specifikacije in zahteve**

Traditionally designed prefabricated stairs made of solid wood - Specifications and requirements

Traditionell geplante, vorgefertigte Treppen aus Massivholz — Spezifikationen und Anforderungen

Escaliers préfabriqués de conception traditionnelle en bois massif - Spécifications et exigences

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**Ta slovenski standard je istoveten z: EN 15644:2008**

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91.060.30      Stropi. Tla. Stopnice      Ceilings. Floors. Stairs

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EUROPEAN STANDARD

EN 15644

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## Traditionally designed prefabricated stairs made of solid wood - Specifications and requirements

Escaliers préfabriqués de conception traditionnelle en bois  
massif - Spécifications et exigences

Traditionell konstruierte, vorgefertigte Treppen aus  
Massivholz - Spezifikationen und Anforderungen

This European Standard was approved by CEN on 8 November 2008.

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## Contents

Page

Foreword.....	5
<b>1</b> <b>Scope .....</b>	<b>6</b>
<b>2</b> <b>Normative references .....</b>	<b>6</b>
<b>3</b> <b>Terms and definitions .....</b>	<b>7</b>
<b>4</b> <b>General principles.....</b>	<b>8</b>
<b>4.1</b> <b>Classification.....</b>	<b>8</b>
<b>4.1.1</b> <b>General.....</b>	<b>8</b>
<b>4.1.2</b> <b>Climatic conditions (location) .....</b>	<b>8</b>
<b>4.1.3</b> <b>Traffic frequency.....</b>	<b>9</b>
<b>4.1.4</b> <b>Comfort.....</b>	<b>9</b>
<b>4.2</b> <b>Performance characteristic required .....</b>	<b>9</b>
<b>4.2.1</b> <b>General.....</b>	<b>9</b>
<b>4.2.2</b> <b>Mechanical resistance and stability.....</b>	<b>9</b>
<b>4.2.3</b> <b>Safety in case of fire.....</b>	<b>10</b>
<b>4.2.4</b> <b>Hygiene, health and environment (dangerous substances) .....</b>	<b>10</b>
<b>4.3</b> <b>Geometry of stairs and safety in use.....</b>	<b>11</b>
<b>4.3.1</b> <b>Geometry of stairs including landings .....</b>	<b>11</b>
<b>4.3.2</b> <b>Slipperiness.....</b>	<b>11</b>
<b>4.3.3</b> <b>Safety equipment.....</b>	<b>11</b>
<b>4.3.4</b> <b>Safe breakage.....</b>	<b>13</b>
<b>4.3.5</b> <b>Impact resistance.....</b>	<b>14</b>
<b>4.4</b> <b>Protection against noise.....</b>	<b>14</b>
<b>4.5</b> <b>Energy economy .....</b>	<b>14</b>
<b>4.6</b> <b>Aspects of durability, serviceability and identification .....</b>	<b>14</b>
<b>4.6.1</b> <b>General.....</b>	<b>14</b>
<b>4.6.2</b> <b>Resistance to deterioration caused by climatic conditions.....</b>	<b>14</b>
<b>4.6.3</b> <b>Resistance to deterioration caused by chemical agents.....</b>	<b>14</b>
<b>4.6.4</b> <b>Resistance to deterioration caused by biological agents .....</b>	<b>14</b>
<b>4.6.5</b> <b>Finishes .....</b>	<b>15</b>
<b>5</b> <b>Methods of verification and assessments .....</b>	<b>15</b>
<b>5.1</b> <b>Performance characteristics and verification methods.....</b>	<b>15</b>
<b>5.1.1</b> <b>General.....</b>	<b>15</b>
<b>5.1.2</b> <b>Mechanical resistance and stability.....</b>	<b>17</b>
<b>5.1.3</b> <b>Design provisions for earthquake resistance.....</b>	<b>18</b>
<b>5.1.4</b> <b>Load/displacement behaviour and vibrations .....</b>	<b>18</b>
<b>5.1.5</b> <b>Resistance of fixings .....</b>	<b>18</b>
<b>5.2</b> <b>Safety in case of fire.....</b>	<b>18</b>
<b>5.2.1</b> <b>Resistance to fire .....</b>	<b>18</b>
<b>5.2.2</b> <b>Reaction to fire.....</b>	<b>18</b>
<b>5.3</b> <b>Safety in use.....</b>	<b>19</b>
<b>5.3.1</b> <b>Geometry on the stair including landings.....</b>	<b>19</b>
<b>5.3.2</b> <b>Slipperiness.....</b>	<b>21</b>
<b>5.3.3</b> <b>Safety equipment.....</b>	<b>21</b>
<b>5.3.4</b> <b>Safe breakage.....</b>	<b>21</b>
<b>5.3.5</b> <b>Impact resistance.....</b>	<b>22</b>
<b>5.4</b> <b>Protection against noise .....</b>	<b>22</b>
<b>5.5</b> <b>Thermal performance .....</b>	<b>22</b>
<b>5.6</b> <b>Aspect of durability, serviceability and identification .....</b>	<b>22</b>
<b>5.6.1</b> <b>General.....</b>	<b>22</b>
<b>5.6.2</b> <b>Resistance to deterioration caused by climatic conditions.....</b>	<b>22</b>

5.6.3	Resistance to deterioration caused by chemical agents .....	23
5.6.4	Resistance to deterioration caused by biological agents .....	23
5.6.5	Finishes .....	23
6	Application to prefabricated stairs made of solid wood .....	23
6.1	Intended use.....	23
6.1.1	General.....	23
6.1.2	Intended use: heated space .....	23
6.1.3	Intended use: unheated space (humid conditions) .....	23
6.1.4	External conditions non exposed or exposed.....	23
6.2	Materials .....	24
7	Solid wood prefabricated stair characteristics .....	24
7.1	General.....	24
7.2	Solid wood products .....	24
7.3	Other materials .....	24
7.4	Safety in case of fire.....	24
7.4.1	Resistance to fire.....	25
7.4.2	Reaction to fire.....	25
7.5	Dangerous substances .....	28
7.5.1	Formaldehyde release (expressed in term of classes).....	28
7.5.2	Content of pentachlorophenol (expressed in term of values) .....	28
7.6	Safety in use.....	28
7.6.1	Impact resistance .....	28
7.6.2	Slipperiness .....	28
7.6.3	Load bearing capacity of stairs.....	28
7.6.4	Stability and stiffness.....	28
7.6.5	Resistance to fixing.....	29
7.7	Acoustic performance.....	29
7.8	Biological durability .....	29
7.8.1	General.....	29
7.8.2	Natural durability .....	29
7.8.3	Wood treated against biological attack.....	29
7.8.4	Biological durability level (expressed in term of use classes).....	30
7.9	Surface resistance.....	30
7.9.1	Finishes and wear resistance.....	30
7.9.2	Hardness .....	30
7.9.3	Resistance to chemical agents .....	30
7.10	Safety equipment.....	30
7.11	Safe breakage .....	30
7.12	Impact resistance .....	30
7.13	Behaviour of stair in various/changing indoor and outdoor climates .....	30
7.14	Dimensions .....	31
7.15	Classification and decorative appearance of elements.....	31
7.16	Dimensioning of risers and treads and the slope of the stair.....	31
7.17	Finishing.....	31
8	Factory production control.....	31
8.1	General.....	31
8.2	Equipment .....	32
8.3	Raw material and components.....	32
8.4	Production process .....	32
8.5	Product testing and evaluation .....	32
8.6	Non-conforming products .....	32
9	Labelling .....	33
10	Handling, installation, maintenance and care .....	34
Annex A	(informative) Dimensional and performance characteristics of balustrades, handrails and flights of stairs in connection with the classification given in 4.1 .....	35
A.1	Handrails and/or balustrades .....	35

## EN 15644:2008 (E)

<b>A.1.1</b>	<b>Minimum lowest height of handrails and/or balustrades corresponding to the classification given in 4.1</b> .....	<b>35</b>
<b>A.1.2</b>	<b>Grip of handrail</b> .....	<b>36</b>
<b>A.2</b>	<b>Mechanical performance characteristics</b> .....	<b>36</b>
<b>A.3</b>	<b>Sequence of tests</b> .....	<b>36</b>
<b>Annex B</b>	<b>(informative) General considerations regarding biological durability</b> .....	<b>37</b>
<b>B.1</b>	<b>General precautions (extract from EN 335-2:2006, Annex 3)</b> .....	<b>37</b>
<b>B.2</b>	<b>Natural or conferred durability of sound wood (extract from EN 335-2:2006, Annex 4)</b> .....	<b>37</b>
<b>Annex C</b>	<b>(normative) Formaldehyde classes</b> .....	<b>38</b>
<b>C.1</b>	<b>Product to be tested</b> .....	<b>38</b>
<b>C.2</b>	<b>Materials to be tested</b> .....	<b>38</b>
<b>Annex D</b>	<b>(informative) Remind of classes of reaction to fire performance for construction products for flooring including their surface coverings (OJEC 150/18 - 23.2.2000) (Extract from EN 13501-1:2007)</b> .....	<b>40</b>
<b>Annex E</b>	<b>(informative) Examples of traditional and non traditional timber stairs</b> .....	<b>41</b>
<b>E.1</b>	<b>Examples of traditional timber stairs</b> .....	<b>41</b>
<b>E.2</b>	<b>Examples of non traditional timber stairs</b> .....	<b>43</b>
	<b>Bibliography</b> .....	<b>46</b>

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## Foreword

This document (EN 15644:2008) has been prepared by Technical Committee CEN/TC 175 “Round and sawn timber”, the secretariat of which is held by AFNOR.

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 June 2009, and conflicting national standards shall be withdrawn at the latest by June 2009.

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

This standard is divided into parts:

- Clauses 4 and 5: General questions;
- Clauses 6 to 11: Applications to stairs made of solid wood.

If a general standard on stairs is developed and adopted, Clauses 4 and 5 of this document will be reconsidered to be aligned with the general standard, if needed.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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**EN 15644:2008 (E)****1 Scope**

This European Standard gives specifications and requirements for prefabricated stairs made of solid wood, i.e. where the components contributing to the fulfilment of mechanical resistance and stability characteristics are made of solid wood. These stairs are traditionally designed.

NOTE 1 If the filling of the guarding does not contribute to the mechanical stability and resistance, the used material is not relevant.

NOTE 2 Examples of traditionally made/designed stairs are given in Annex E.

This European Standard covers: stairs either pre-assembled, partly pre-assembled or in component form including balustrades and handrails for internal or external use.

This European Standard does not consider the contribution of these elements to the overall structure design. The ability of a stair to contribute to the overall stability of the works or to the strength of the structure is not covered by this standard.

Carpets on stairs are not covered by this Standard.

The surfaces of the wooden elements may be exposed or covered by finishes.

Where stairs are supplied with a finish or covering, aesthetic or visual characteristics will not be covered by this Standard and references shall be made to the appropriate product standard (e.g. colour fastness of carpet finishes).

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**2 Normative references**

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The following referenced documents are indispensable for the application 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 335-2:2006, *Durability of wood and wood-based products — Definition of use classes — Part 2: Application to solid wood*

EN 350-1, *Durability of wood and wood-based products – Natural durability of solid wood – Part 1: Guide to the principles of testing and classification of the natural durability of wood*

EN 350-2, *Durability of wood and wood-based products – Natural durability of solid wood – Part 2: Guide to natural durability and treatability of selected wood species of importance in Europe*

EN 351-1, *Durability of wood and wood-based products — Preservative-treated solid wood — Part 1: Classification of preservative penetration and retention*

EN 599-1, *Durability of wood and wood-based products — Efficacy of preventive wood preservatives as determined by biological tests — Part 1: Specification according to use class*

EN 599-2, *Durability of wood and wood-based products — Performance of preventive wood preservatives as determined by biological tests — Part 2: Classification and labelling*

EN 1121, *Doors - Behaviour between two different climates - Test method*

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

EN 1365-6, *Fire resistance tests for loadbearing elements - Part 6: Stairs*

EN 1534, *Wood and parquet flooring – Determination of resistance to indentation (Brinell) – Test method*

EN 1990, *Eurocode – Basis of structural design*



- EN 1995-1-1, *Eurocode 5 - Design of timber structures – Part 1-1: General – Common rules and rules for buildings*
- ENV 1998-1-2:1994, *Eurocode 8 – Design provisions for earthquake resistance of structures – Part 1-2: General rules – General rules for buildings*
- EN 12219, *Doors – Climatic influences – Requirements and classification*
- EN 12600, *Glass in building – Pendulum test. Impact test - method and classification for flat glass*
- EN 13442, *Wood and parquet flooring and wood panelling and cladding – Determination of the resistance to chemical agents*
- EN 13501-1:2007, *Fire classification and construction products and building elements – Part 1: Classification using data from reaction to fire tests*
- EN 13647, *Wood and parquet flooring and wood panelling and cladding – Determination of geometrical characteristics*
- EN 13696, *Wood flooring – Test methods to determine elasticity and resistance to wear and impact resistance*
- EN 13986, *Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking*
- EN 14076:2004, *Timber stairs — Terminology*
- CEN/TS 15680, *Prefabricated timber stairs – Mechanical test methods*

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### 3 Terms and definitions [\(standards.iteh.ai\)](https://standards.iteh.ai/)

For the purposes of this document, the terms and definitions given in EN 14076:2004 and the following apply.

#### 3.1

##### overlap

horizontal distance (o) between the nosing of a tread that covers the rear edge of the immediate lower tread (see Figure 4)

#### 3.2

##### calculation

assessment of characteristics (for example mechanical resistance, stability, etc.) using formulae of appropriate design models for the structural behaviour of stairs and components including the use of tabulated values (for some characteristics, Eurocodes are relevant)

#### 3.3

##### traditionally-designed prefabricated stair

stair made of solid wood with steps with or without riser, housed on both ends into strings, either close string(s) and/or cut string(s)

NOTE Fixing of steps on both ends in/on strings indicates a design of steps as single-span beam (examples given in Annex E).

#### 3.4

##### solid wood

wood sawn or otherwise machined which may include finger jointed and/or laminated wood (as defined in EN 335-2)

NOTE A decorative veneer may be used if the hidden parts are made of solid wood.

**EN 15644:2008 (E)****3.5****historical data**

test results following the provisions of the product technical specification, obtained before it was in force and complying with this technical specification (see Guidance Paper M:May 2005)

**3.6****stair made of solid wood**

components (steps, strings, guarding/railing, etc.) which contribute to the fulfilment of mechanical resistance and stability characteristics (vertical and horizontal) are of solid wood

**3.7****classified without the need further testing****CWFT**

procedure by which the level of performance of a product is initially demonstrated by testing, in such a way that manufacturers may refer to that performance without the need of further tests (see Guidance Paper M:May 2005)

**3.8****conventional accepted performance****CAP**

provisions presented or referred to in the technical specification that allows manufacturers to declare product performances without the need to perform initial type tests, calculations, etc. such as tabulated values, descriptive solutions and alike (see Guidance Paper M :May 2005)

**3.9****balustrade**

safety barrier that shall prevent a person falling from the stair or being trapped.

**3.10****walking line**

theoretical line indicating the average path of the user of the stair

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**4 General principles****4.1 Classification****4.1.1 General**

For the purpose of this standard, 3 systems are considered: climatic conditions, traffic frequency and comfort.

For each performance given in the clauses below, a verification method is given in Clause 5.

**4.1.2 Climatic conditions (location)**

The intended use (location) is defined in the following Table 1:

**Table 1 — Climatic conditions**

Internal	<ul style="list-style-type: none"> <li>- for space with room temperature below 12 °C</li> <li>- for space with room temperature included between 12 °C and 21 °C</li> <li>- for space with room temperature over 21 °C</li> </ul>
External	No subclasses NOTE Border values are given in 5.6.2.

Specific climatic conditions relevant for wooden stairs are given in Clause 6.

#### 4.1.3 Traffic frequency

The material used in the stairs shall take into account the intended use (frequency:  $F_x$ ):

- $F_1$  (low traffic): typical use: domestic: 1 – 10 persons using the stair in the building;
- $F_2$  (moderate traffic): typical use: domestic and/or commercial: 10 - 20 persons;
- $F_3$  (high traffic): typical use: public and industrial: more than 20 persons.

#### 4.1.4 Comfort

There are different aspects of the comfort, for example: number of steps, the clear width, the pitch.

Classifications exist concerning comfort. These classifications can rely on the relation between rise and going. Following this relation, the stairs can be tight, ordinary or comfortable.

Another way to classify the comfort is the modulus given by the relation  $g$  (going) + 2  $r$  (rise). If no national regulation exists, this relation shall be between 580 mm and 660 mm.

## 4.2 Performance characteristic required

### 4.2.1 General

NOTE 1 This clause is necessary mostly to take into account the existing laws or regulations or administrative provisions enforced for some buildings and/or for some European countries or for particular cases.

The following aspect(s) of performance(s) are relevant.

NOTE 2 Methods for verification and assessment can be found in Clause 5.

### 4.2.2 Mechanical resistance and stability

#### 4.2.2.1 Load bearing capacity

The prefabricated stair shall have sufficient mechanical resistance and stability to withstand static or dynamic loads from the actions (permanent, variable and accidental) without reaching its serviceability limit state. The actions shall be in accordance with the laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

#### 4.2.2.2 Design provisions for earthquake resistance

In seismic zones, the product, together with the fixing, may be able to resist to seismic actions, when relevant.

#### 4.2.2.3 Stability and stiffness

Stability and stiffness are expressed as load-displacement behaviour and vibrations.

The stair as a whole and its parts, such as steps and barriers, shall be designed to limit the deflection and vibrations under working conditions.

**EN 15644:2008 (E)****4.2.2.4 Resistance of fixings**

The fixings to the supporting structure and the connection of the stair components to each other shall be designed in such a way that the actions from the different parts of the prefabricated stair shall be transferred to the supporting structure in an appropriate way.

**4.2.3 Safety in case of fire****4.2.3.1 Resistance to fire**

The load bearing capacity needs to be evaluated, when relevant.

**4.2.3.2 Reaction to fire**

Material, which is part of the prefabricated stairs, shall have the necessary performance concerning reaction to fire in accordance with laws, regulations and administrative provisions applicable to the prefabricated stairs in the end use situation.

**4.2.4 Hygiene, health and environment (dangerous substances)****4.2.4.1 General**

For components of prefabricated stairs, the following aspects of performance are relevant.

In so far as the state of the art permits, the manufacturer shall establish those materials in the product which are liable to emission or migration during normal intended use and for which emission or migration into the environment is potentially dangerous to hygiene, health or the environment. The manufacturer or importer shall establish and make the appropriate declaration of content according to the legal requirements in the intended state of destination.

NOTE An informative database of European and national provisions on dangerous substances is:  
<http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm>

**4.2.4.2 Release of formaldehyde**

The components shall be made of concerned materials and the concerned surface treatments shall be made, in order that release of formaldehyde is in accordance with laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

**4.2.4.3 Content of pentachlorophenol (PCP)**

The components shall be made of such materials and the surface treatments shall be made, in order that the content of pentachlorophenol is in accordance with laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

**4.2.4.4 Content of asbestos**

The components shall be made of such materials that the content of asbestos is in accordance with laws, regulations and administrative provisions applicable for the location where the product is incorporated in the works.

NOTE See Council Directive 91/382/EEC of 25 June 1991 amending Directive 83/477/EEC and Council Directive 87/217/EEC of 19 March.

### 4.3 Geometry of stairs and safety in use

#### 4.3.1 Geometry of stairs including landings

Prefabricated stairs, including landings, shall be normally accessible and safe during their daily use and function as main escape in the case of fire where required.

The dimensions listed below are related to varying (minimum and/or maximum) requirements set out in the relevant laws, regulations and administrative provisions applicable for the location where the product is incorporated in the works. For stairs to be used by special groups (e.g. handicapped people, children), specific values for these will have to be met.

- length;
- height;
- width;
- going – rise;
- pitch / constant pitch line;
- overlap;
- number of rises between landings;
- maximum openings (the size and shape of the openings shall be such that a person is prevented from falling from the stair or being trapped);
- clear width of stair (maximum and/or minimum);
- minimum headroom (in cases where the minimum headroom is relevant for the stair itself (e.g. spiral stair), this performance characteristic shall be considered);
- dimensions of landing.

#### 4.3.2 Slipperiness

The slipperiness of steps and landings is dependent on the surface treated or untreated and has to be evaluated. Unsafe final surface shall be avoided.

NOTE Surface layers like carpets can be used. They will modify the product against slipperiness.

#### 4.3.3 Safety equipment

##### 4.3.3.1 Openings

Openings created in a stair shall be designed to reduce the risk of injury e.g. by entrapment maintaining the safety in use of the stair.