



# SLOVENSKI STANDARD

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Timber structures - Product requirements for prefabricated structural members assembled with punched metal plate fasteners

Holzbauwerke - Produktanforderungen an vorgefertigte Fachwerkträger mit Nagelplatten

Structures en bois - Exigences des produits relatives aux éléments de structure préfabriqués utilisant des connecteurs a plaque métallique emboutie

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English version

## Timber structures - Product requirements for prefabricated structural members assembled with punched metal plate fasteners

Structures en bois - Exigences de produits relatives aux fermes préfabriquées utilisant des connecteurs à plaque métallique emboutie

Holzbauwerke - Produktanforderungen an vorgefertigte Fachwerkträger mit Nagelplatten

This European Standard was approved by CEN on 22 July 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This document (EN 14250:2004) has been prepared by Technical Committee CEN/TC 124 "Timber structures", the secretariat of which is held by SFS.

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of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes EN 1059 :1999.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

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

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## 1 Scope

This document specifies product requirements for prefabricated structural members (e.g. trusses, beams and girders) for use in buildings and bridges made from members of structural timber (with or without finger joints) assembled with punched metal plate fasteners.

The standard also covers methods to carry out the evaluation of conformity and the marking.

## 2 Normative references

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 335-1, *Durability of wood and wood-based products – Definition of hazard classes of biological attack – Part 1: General.*

EN 335-2, *Durability of wood and wood-based products – Definition of hazard classes of biological attack – Part 2: Application to solid wood.*

EN 336, *Structural timber – Sizes, permitted deviations.*

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 385, *Finger jointed structural timber – Performance requirements and minimum production requirements.*

EN 460, *Durability of wood and wood-based products – Natural durability of solid wood – Guide to the durability requirements for wood to be used in hazard classes.*

EN 844-3, *Round and sawn timber – Terminology – Part 3: General terms relating to sawn timber.*

EN 844-9, *Round and sawn timber – Terminology – Part 9: Terms relating to features of sawn timber.*

EN 1310, *Round and sawn timber – Method of measurement of features.*

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

EN 13501-1, *Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests.*

EN 13823, *Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item.*

prEN 14081-1, *Timber structures – Strength graded structural timber with rectangular cross section – Part 1: General requirements.*

prEN 14545, *Timber structures – Connectors – Requirements.*

### 3 Terms and definitions

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

#### 3.1

##### **anchorage area**

surface area of timber occupied by the plate projections in any particular member

#### 3.2

##### **batch**

all the structural members produced according to the same specifications in one shift

#### 3.3

##### **dead knot**

knot that on the surface considered is intergrown with the surrounding wood for less than one quarter of the cross-sectional perimeter, as defined in EN 844-9

#### 3.4

##### **effective thickness/width**

the target thickness/width as defined in EN 336 minus any wane present on the edge being considered

#### 3.5

##### **internal bracing**

element to prevent lateral buckling of a compression member

#### 3.6

##### **live knot (intergrown knot)**

knot that on the surface considered is intergrown with the surrounding wood for more than three quarters of the cross-sectional perimeter as defined in EN 844-9

#### 3.7

##### **plate projection**

plate tooth, plate nail or burst used for the purpose of transferring forces between members

#### 3.8

##### **punched metal plate fastener**

metal plate having integral projections punched out in one direction perpendicular to the base of the plate, being used to join two or more pieces of timber of the same thickness in the same plane

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## 4 Material requirements

### 4.1 Timber

#### 4.1.1 Grading

Timber shall be strength graded using grading standards and methods complying with prEN 14081-1.

In addition to the specified grade requirements, timber shall meet the following criteria for spring, bow, twist and cup as defined in EN 844-3 and measured in accordance with EN 1310:

- Spring: 4 mm maximum per 2 m length,
- Bow: 6 mm maximum per 2 m length,
- Twist: 2 mm maximum per 25 mm width per 2 m length,
- Cup: 2 mm maximum per 100 mm of face.

#### 4.1.2 Finger jointed timber

Finger jointed timber shall meet the requirements of EN 385 for the appropriate service class.

#### 4.1.3 Resistance to biological organisms

The timber shall either have adequate natural durability in accordance with EN 350-2 for the intended service class as defined in EN 335-1 and EN 335-2, or be given a preservative treatment selected in accordance with EN 351-1 and EN 460.

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### 4.2 Punched metal plate fasteners

The fasteners shall fulfil the requirements of prEN 14545 and shall correspond to the fasteners specified in the design.

If the timber is preservative treated against biological attacks and fire, the preservative used shall be compatible with the fastener's treatment against corrosion.

The fastener shall bear a mark that readily identifies the producer or supplier and the type of plate.



## 5 Product requirements

### 5.1 Strength and stiffness

The structural characteristics of the members shall be declared as either:

- 1) the geometrical and material properties of the components used, determined according to clause 4, sufficient to calculate the strength and stiffness of the structural members according to methods valid in the country of use (e.g. EN 1990, EN 1991 and prEN 1995-1-1 taking into account any National Annexes); or
- 2) a reference to national design documents produced (and held) by the manufacturer according to methods valid in the country of use (e.g. EN 1990, EN 1991 and prEN 1995-1-1 taking into account any National Annexes); or
- 3) a reference to the design documents produced by another party, together with information on the party responsible for the design.

NOTE For the initial type testing or assessment according to the method of declaration, see clause 7 and for marking requirements, see clauses 8 and ZA.3.

### 5.2 Reaction to fire

Where required, the reaction to fire class shall be declared by the producer. Structural elements made of timber in accordance with Table 1 may be classified without the need for further testing. Where the manufacturer seeks a higher classification (e.g. in the case of treated timber), the timber as a material shall be tested and classified in accordance with EN 13501-1, mounted, when tested according to EN 13823, in accordance with Footnote b of Table 1.

**Table 1 – Structural timber considered as classified without further testing**

Product <sup>a</sup>	Product details	Minimum density <sup>c</sup> (kg/m <sup>3</sup> )	Minimum thickness (mm)	Class <sup>b</sup>
Structural timber	Visual and machine graded structural timber with rectangular cross-sections shaped by sawing, planing or other methods or with round cross-sections	350	22	D-s2, d0

<sup>a</sup> Applies to all species covered by the product standards.

<sup>b</sup> Class as provided for in Commission Decision 2000/147/EC Annex Table 1. For testing, the whole area of both wings in the SBI apparatus is covered with timber pieces mounted edge to edge (butt jointed), without jointing or bonding and orientated horizontally or vertically. Timber battens, minimum 40 mm by 40 mm, fixed to the test backing boards at 400-600 mm centres horizontally or vertically (perpendicular to the orientation of the timber pieces), support the timber pieces.

<sup>c</sup> At conditioning according to EN 13183-2.

### 5.3 Structural members

#### 5.3.1 Timber sizes

Member size tolerances shall as minimum be in accordance with tolerance class 2 given in EN 336.

Target sizes shall be not less than:

- Thickness (width), all members: 35 mm,
- Depth, external (chord) members: 68 mm,
- Depth, internal (web or diagonal) members: 58 mm.

The effective thickness, as defined in 3.4, of the outer face of any chord member shall not be less than 35 mm.

#### 5.3.2 Wane

Wane shall not occur within the area of any jointing device or within support areas.

#### 5.3.3 Joint gaps

Within the area of the fastener, the average gap between two adjacent members at the time of fabrication shall not exceed 1,5 mm.

#### 5.3.4 Moisture content

The maximum moisture content of the timber and of timber wedges, if any, at the time of fabrication shall not exceed 22 %. The moisture content shall be estimated in accordance with EN 13183-2 using a calibrated electric resistance moisture meter.

#### 5.3.5 Dimensional accuracy

The overall horizontal and vertical dimensions of the structural member shall not deviate from the specified dimensions by more than the following tolerances:

- dimensions up to and including 10 m: 20 mm,
- dimensions more than 10 m: 2 mm for each metre.

The dimensional variation between members within the same batch shall not differ by more than 10 mm.

#### 5.3.6 Camber

At the time of fabrication, camber shall be within a tolerance of 25 % of the camber specified in the design.

### 5.4 Joints

#### 5.4.1 Live knots

Live knots are permitted within the anchorage area, provided that the plate projections are satisfactorily embedded without visible distortion of the fasteners or splitting of the timber outside the knot.

#### 5.4.2 Dead knots or fissures

Where a dead knot, knothole, or fissure occurs within the anchorage area, the number of effective plate projections, disregarding those in the dead knot, knot hole or on the line of the fissure shall be in accordance with that specified in the design. Fissures which do not extend more than 50 mm from the tooth, burst or plate nail, which apparently caused them, shall be disregarded.

#### 5.4.3 Fastener positioning

Fasteners shall not be misplaced by more than 10 mm in any direction.

#### 5.4.4 Fastener embedment

The plate projections shall be inserted perpendicular to the embedment surface of the timber and the plate surface shall be free of distortion. Any gap between the timber surface and the underside of a punched metal plate fastener shall not exceed 1 mm and shall not occur over more than 25 % of the anchorage area in any member in any joint.

#### 5.4.5 Protruding fasteners

Punched metal plate fasteners shall not protrude outside the outer edges of the structural member. The lower edge of fasteners intended to be located over a point of support shall be at least 3 mm from the lower edge of the member in contact with the support.

NOTE It is important that consideration is given to the masking of protruding corners of fasteners; particularly those that protrude into walk spaces or other areas permitting access.

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## 6 Product documents

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Adequate drawings and written instructions shall be provided with the products relating to their transport, handling, storage, erection, positioning and internal bracing, together with any fixing details necessary to construct compound or multi-part structures.

## 7 Evaluation of conformity

### 7.1 General

The compliance of a structural member with the requirements of this standard shall be demonstrated by:

- initial assessment of produced members;
- factory production control by the producer, including product assessment.