



SLOVENSKI STANDARD
oSIST prEN 14732:2011
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Lesene konstrukcije - Montažne stene, stropni in strešni elementi - 1. del: Zahteve

Timber structures - Prefabricated wall, floor and roof elements - Requirements

Holzbauwerke - Vorgefertigte Wand-, Decken- und Dachelemente - Anforderungen

Structures en bois - Eléments de mur, de plancher et de toiture préfabriqués - Exigences

Ta slovenski standard je istoveten z: prEN 14732

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Timber structures - Prefabricated wall, floor and roof elements - Requirements

Structures en bois - Eléments de mur, de plancher et de
toiture préfabriqués - Exigences

Holzbauperwerke - Vorgefertigte Wand-, Decken- und
Dachelemente - Anforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 124.

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Foreword

This document (prEN 14732:2011) has been prepared by Technical Committee CEN/TC 124 “Timber structures”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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 89/106/EEC.

For relationship with EU Directive 89/106/EEC, see informative Annex ZA which is an integral part of this document.

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1 Scope

This European Standard specifies performance requirements at delivery for prefabricated structural (load-bearing) wall, floor and roof elements (diaphragm assemblies) consisting of framing members of timber and/or wood-based panels or boards on one or both sides, for use in service class 1 or 2 in accordance with EN 1995-1-1:2004. The panels and/or boards are connected to the joists by suitable adhesive bonding or by mechanical fixing. The cavities of the elements may be filled entirely or partially with insulating materials. The exterior faces of the elements may also be covered with insulation material.

This European Standard applies to elements with lengths and cross-sectional depths of up to 10 m and 0,30 m, respectively.

This European Standard specifies requirements for structural (3.3) and non-structural (3.4) components and lays down minimum requirements for the production of prefabricated elements.

The European Standard also covers methods to carry out the evaluation of conformity and marking of these elements.

This European Standard applies to elements that may have openings, e. g. for windows, doors etc. It does not apply to the properties of incorporated doors or windows.

Furthermore, it does not cover elements treated to enhance their fire performance.

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. oSIST prEN 14732:2011

<https://standards.iteh.ai/catalog/standards/sist/537edcad-9470-4ad0-94eb-8f771458-14732-14732>

EN 300, *Oriented strand boards (OSB) — Definitions, classification and specifications*

EN 301, *Adhesives, phenolic and aminoplastic, for load-bearing structures — Classification and performance requirements*

EN 302-1, *Adhesives for load-bearing timber structures — Test methods — Part 1: Determination of bond strength in longitudinal tensile shear strength*

EN 302-2, *Adhesives for load-bearing timber structures — Test methods — Part 2: Determination of resistance to delamination*

EN 302-3, *Adhesives for load-bearing timber structures — Test methods — Part 3: Determination of the effect of acid damage to wood fibres by temperature and humidity cycling on the transverse tensile strength*

EN 302-4, *Adhesives for load-bearing timber structures — Test methods — Part 4: Determination of the effects of wood shrinkage on the shear strength*

EN 302-6, *Adhesives for load-bearing timber structures — Test methods — Part 6: Determination of the conventional pressing time*

EN 312, *Particleboards — Specifications*

EN 335-1, *Durability of wood and wood-based products — Definition of use classes — Part 1: General*

EN 335-2, *Durability of wood and wood-based products — Definition of use classes — Part 2: Application to solid wood*

- EN 335-3, *Durability of wood and wood-based products — Definition of use classes — Part 3: Application to wood-based panels*
- EN 336, *Structural timber — Sizes, permitted deviations*
- 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 386, *Glued laminated timber — Performance requirements and minimum production requirements*
- EN 408, *Timber structures — Structural timber and glued laminated timber — Determination of some physical and mechanical properties*
- EN 460-1, *Durability of wood and wood-based products — Preservative-treated solid wood — Part 1: Classification of preservative penetration and retention*
- EN 520, *Gypsum plasterboards — Definitions, requirements and test methods*
- 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 622-2, *Fibreboards — Specifications — Part 2: Requirements for hardboards*
- EN 622-3, *Fibreboards — Specifications — Part 3: Requirements for medium boards*
- EN 622-4, *Fibreboards — Specifications — Part 4: Requirements for softboards*
- EN 622-5, *Fibreboards — Specifications — Part 5: Requirements for dry process boards (MDF)*
- EN 634-1, *Cement-bonded particleboards — Specifications — Part 1: General requirements*
- EN 634-2, *Cement-bonded particleboards — Specifications — Part 2: Requirements for OPC bonded particleboards for use in dry, humid and external conditions*
- EN 636, *Plywood — Specifications*
- EN 717-1, *Wood-based panels — Determination of formaldehyde release — Part 1: Formaldehyde emission by the chamber method*
- EN 1195, *Timber structures — Test methods — Performance of structural floor decking*
- EN 1365-1, *Fire resistance tests for loadbearing elements — Part 1: Walls*
- EN 1365-2, *Fire resistance tests for loadbearing elements — Part 2: Floors and roofs*
- EN 1931, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties*
- EN 1990, *Eurocode: Basis of structural design*
- EN 1995-1-1:2004, *Eurocode 5: Design of timber structures — Part 1-1: General rules and rules for buildings*

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EN 1995-1-2, *Eurocode 5: Design of timber structures — Part 1-2: General rules — Structural fire design*

EN 12524, *Building materials and products — Hygrothermal properties — Tabulated design values*

EN 12871, *Wood-based panels — Performance specifications and requirements for load bearing boards for use in floors, walls and roofs*

EN 12939, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Thick products of high and medium thermal resistance*

EN 13162, *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

EN 13163, *Thermal insulation products for buildings — Factory made products of expanded polystyrene foam (EPS) — Specification*

EN 13164, *Thermal insulation products for buildings — Factory made products of extruded polystyrene foam (XPS) — Specification*

EN 13165, *Thermal insulation products for buildings — Factory made products of rigid polyurethane foam (PUR) — Specification*

EN 13166, *Thermal insulation products for buildings — Factory made products from phenolic foam (PF) — Specification*

EN 13167, *Thermal insulation products for buildings — Factory made cellular glass products (CG) — Specification*

EN 13168, *Thermal insulation products for buildings — Factory made wood wool products (WW) — Specification*

EN 13169, *Thermal insulation products for buildings — Factory made products of expanded perlite (EPB) — Specification*

EN 13170, *Thermal insulation products for buildings — Factory made products of cork (ICB) — Specification*

EN 13171, *Thermal insulation products for buildings — Factory made wood fibre products (WF) — Specification*

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

EN 13353, *Solid wood panels (SWP) — Requirements*

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

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

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

EN 13963, *Jointing materials for gypsum plasterboards — Definitions, requirements and test methods*

EN 13984, *Flexible sheets for waterproofing — Plastic and rubber vapour control layers — Definitions and characteristics*

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- EN 13986, *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*
- EN 14080, *Timber structures — Glued laminated timber — Requirements*
- EN 14081-1, *Timber structures — Strength graded structural timber with rectangular cross section — Part 1: General requirements*
- EN 14279, *Laminated Veneer Lumber (LVL) — Definitions, classification and specifications*
- EN 14374, *Timber structures — Structural laminated veneer Lumber — Requirements*
- EN 14469, *Gypsum based adhesives for thermal/acoustic insulation composite panels and plasterboards — Definitions, requirements and test methods*
- EN 14545, *Timber structures — Connectors — Requirements*
- EN 14592, *Timber structures — Fasteners — Requirements*
- EN 15283-2, *Gypsum boards with fibrous reinforcement — Definitions, requirements and test methods — Part 2: Gypsum fibre boards*
- EN 15416-5, *Adhesives for load bearing timber structures other than phenolic and aminoplastic — Test methods — Part 5: Determination of conventional pressing time*
- EN 15425, *Adhesives — One component polyurethane for load bearing timber structures — Classification and performance requirements*
- EN 15497, *Finger-jointed structural timber — Performance requirements and minimum production requirements*
- EN ISO 9001:2008, *Quality management systems — Requirements (ISO 9001:2008)*
<https://standards.iteh.ai/catalog/standards/sist/537edcad-9470-4ad0-94eb-86b1-14732>
- EN ISO 12572, *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties*
- ISO 8258, *Shewhart control charts*
- ETAG 004, *Guideline for European technical approval for external thermal insulation composite systems with rendering*
- ETAG 011, *Guideline for European technical approval for light composite wood-based beams and columns*
- ETAG 015, *Guideline for European technical approval for three-dimensional nailing plates*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1

batch

all elements produced to the same specifications in one shift

3.2

element

prefabricated load bearing member comprising various structural and non-structural components that are mechanically jointed or adhesively bonded

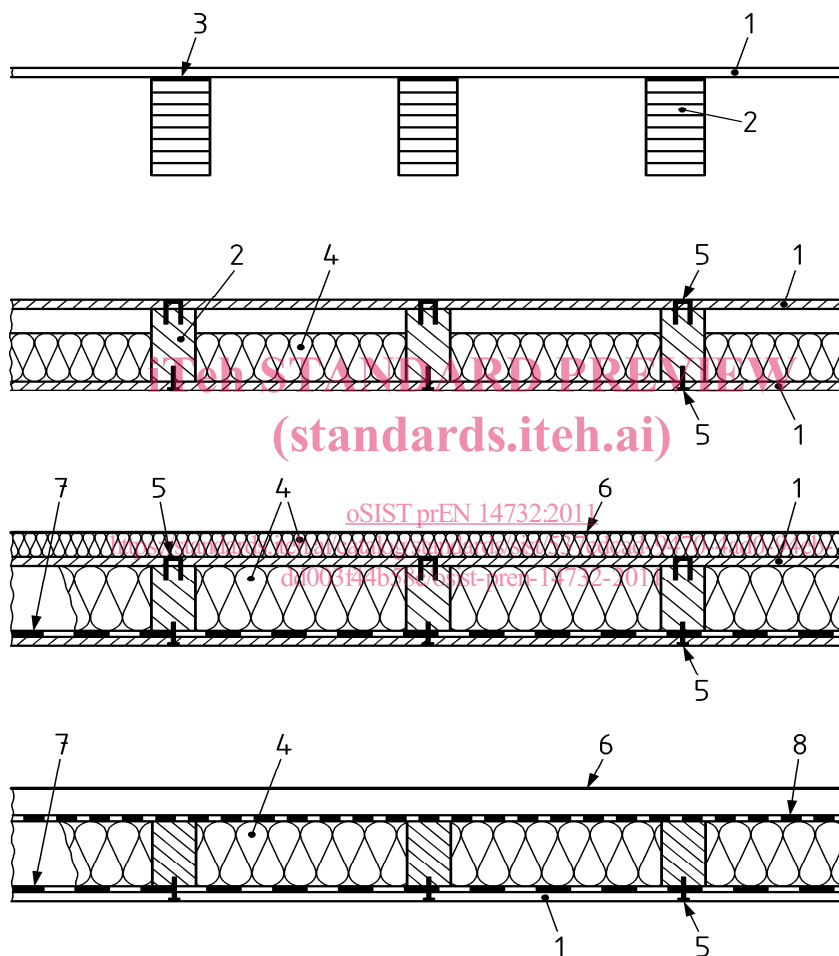
NOTE An element may be used for exterior and interior walls, roofs and floors and can have openings (for windows, doors, etc.). Examples of typical constructions are shown in Figure 1.

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3.3 non-structural component
any material permanently installed/fixed to the element not intentionally contributing to the structural composite behaviour but contributing to thermal insulation

3.4 structural component
wood-based joists, light composite wood-based beams and columns, wood-based panels and panels made of gypsum plaster board intended to contribute to the structural composite behaviour of an element (see Figure 1)

3.5 gap filling adhesive
adhesive suitable for glue line thicknesses up to 2 mm

**Key**

- 1 panel product, e.g. plywood, OSB etc.
- 2 framing member, e.g. structural timber, glued laminated timber or wood-based product
- 3 adhesive bonded joint
- 4 insulation
- 5 fastener (e.g. nail, staple or screw)
- 6 exterior non-structural cladding
- 7 vapour barrier
- 8 watertight breather membrane

Figure 1 — Examples of the construction of a typical element

4 Symbols

A	shear area
B	width of floor or roof element
D	diagonal length of wall, floor or roof elements
F_u	ultimate load
H	height of wall element
L	length of wall, floor or roof element
O_1, O_2, O_3	opening dimensions of wall, floor or roof elements
T	(cross-sectional) thickness of element
b	width of framing member
f_v	shear strength
h	depth of framing member
l	length of sheared bond line, parallel to applied force
t_1, t_2	thicknesses of panels 1 and 2
t_{r1}, t_{r2}	thicknesses of glued-on reinforcement panels of compression shear specimen
w	width of panel of compression shear specimen

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5 Requirements for components

5.1 Framing members

5.1.1 Structural timber

Structural timber, whether untreated or treated against biological attack, shall comply with EN 14081-1. As a minimum, the tolerances of this timber shall conform to EN 336, class 2.

NOTE 1 Production requirements may require stricter tolerances.

In the case of adhesive bonded elements, only species proven to be suitable for bonding shall be used.

NOTE 2 Species suitable for the production of bond lines of sufficient strength are:

Spruce (*Picea abies*), Fir (*Abies alba*), Scots pine redwood (*Pinus sylvestris*), Douglas fir (*Pseudotsuga menziesii*), Western Hemlock (*Tsuga heterophylla*), Corsican pine and Austrian black pine (*Pinus nigra*), Larch (*Larix decidua*), Maritime pine (*Pinus pinaster*), Poplar (*Populus robusta*, *Populus elba*), Radiata-Pine (*Pinus radiata*), Sitka-spruce (*Picea sitchensis*), Southern Yellow pine (*Pinus palustris*), Western Red Cedar (*Thuja plicata*), Yellow Cedar (*Chamaecyparis nootkatensis*).

5.1.2 Finger jointed timber

Finger jointed timber shall comply with EN 15497.

NOTE Production requirements may require stricter tolerances.

prEN 14732:2011 (E)**5.1.3 Glued laminated timber**

Glued laminated timber shall comply with EN 14080.

NOTE Production requirements may require stricter tolerances.

5.1.4 Laminated veneer lumber (LVL)

Structural LVL shall comply with EN 14374.

NOTE Production requirements may require stricter tolerances.

5.1.5 Structural, prefabricated beams and columns

Light composite wood-based beams and columns shall comply with the provisions in ETAG 011.

5.2 Panels and/or boards**5.2.1 Wood-based panels**

Panels, whether untreated or treated against biological attack, used for load bearing purposes shall conform to EN 13986.

Tolerances shall as a minimum comply with EN 12871.

NOTE Wood-based panels according to EN 13986 include solid wood panels (EN 13353), OSB (EN 300), particleboards (EN 312), cement bonded particleboards (EN 634-1 and EN 634-2), plywood (EN 636), fibreboards (EN 622-2 to EN 622-5) and LVL (EN 14279).

5.2.2 Gypsum boards

Load-bearing gypsum plasterboards shall comply with EN 520 or EN 15283-2.

5.3 Adhesives**5.3.1 General**

Adhesives for adhesively bonded elements shall permit the production of bonds of such strength and durability that integrity is maintained throughout the intended lifetime of the structure in the relevant service class according to EN 1995-1-1.

The adhesive shall be chosen considering the climatic conditions in service, the timber species, the type of panel, the preservative used (if any) and the production methods. For elements used in service class 1, type I or type II adhesives according to EN 301 or EN 15425 shall be used. For elements used in service class 2, type I adhesives according to EN 301 or EN 15425 shall be used.

The following types of adhesive are applicable:

- a) phenolic, melamine or melamine-urea adhesives in accordance with 5.3.2;
- b) moisture curing one component polyurethane adhesives in accordance with 5.3.3.

If a preservative treatment is applied to the structural timber before bonding of the element, it shall be documented that the requirements for the combination of the preservative and adhesive are fulfilled.

It shall be documented that all relevant documentation of the adhesive manufacturer demonstrating the suitability of the adhesive for the respective production conditions are followed.

5.3.2 Phenolic, melamine or melamine-urea adhesives

5.3.2.1 General requirements

Phenolic, melamine or melamine-urea adhesives shall be tested according to EN 302-1 to EN 302-4 and EN 302-6 and shall meet the requirements stated in EN 301.

The separate application of resin and hardener for the production of glue lines is not allowed.

5.3.2.2 Additional requirements for gap filling adhesives

In addition to the requirement of 5.3.2.1, the following requirements shall be fulfilled:

- a) requirements in D.2 for the results of the tests specified in D.2, and
- b) requirements in D.4 for the tests specified in D.3 and D.4.

5.3.3 Moisture curing one component polyurethane adhesives

Moisture curing one component polyurethane adhesives shall fulfil the requirements of EN 15425. Additionally, the requirements in D.4 for the tests specified therein shall be fulfilled.

The influence of the climate on the conventional pressing time shall be verified in accordance with EN 15416-5.

5.4 Mechanical fasteners and connectors

For structural purposes mechanical fasteners shall conform to EN 14592 and connectors to EN 14545 or European technical approval (according to ETAG 015).

The corrosion protection shall as a minimum correspond to EN 1995-1-1:2004, service class 2.

It shall be verified that the fastener and connector materials and wood or preservative treated products are compatible.

5.5 Thermal insulation materials and systems

Thermal insulation materials shall comply with the requirements of EN 13162, EN 13163, EN 13164, EN 13165, EN 13166, EN 13167, EN 13168, EN 13169, EN 13170 or EN 13171. Thermal insulation systems shall comply with other appropriate European technical approval according to ETAG 004.

5.6 Vapour barriers

Vapour barrier properties shall comply with EN 13984 or shall be verified according to EN ISO 12572.

6 Requirements for prefabricated elements

6.1 General

Elements shall be designed and produced in such a way that, during their intended service life and with the appropriate degrees of reliability, they:

- resist all actions and influences likely to occur during execution and use, and
- remain fit for their intended use.

These general requirements shall be considered satisfied if the requirements for the materials in Clause 5 and the minimum production requirements in Clause 7 are met.