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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12871:2010 sisaldab Euroopa standardi EN 12871:2010 ingliskeelset teksti.

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English Version

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

Panneaux à base de bois - Specifications et exigences fonctionnelles pour panneaux travaillants utilisés en planchers, murs et toitures

Holzwerkstoffe - Leistungsspezifikationen und Anforderungen für tragende Platten zur Verwendung in Fußböden, Wänden und Dächern

This European Standard was approved by CEN on 30 January 2010.

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Foreword

This document (EN 12871:2010) has been prepared by Technical Committee CEN/TC 112 "Wood-based panels", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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 document supersedes EN 12871:2001.

Compared to EN 12871:2001 the following changes have been made:

- a) the publication of EUROCODE 1 (EN 1991-1-1) and EUROCODE 5 (EN 1995-1-1) after EN 12871 made the latter obsolete with regard to coefficients, loads and testing apparatus;
- b) the serviceability limit, for which EN 12871 sets specifications, is missing in EN 1195. If test reports in accordance with that standard do not allow to determine this factor, this revised version provides a means to derive it;
- c) where no national regulations exist, specifications are proposed for panel deflection under concentrated loading;
- d) the additional requirements for roofing covered with membrane has been upgraded with regard to the shrinkage of the supporting panels;
- e) the exploitation of the results has been updated to take into account the revision of EN 14358.

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, Croatia, 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.

Introduction

This revision incorporates modifications introduced since the publication of the previous version in European Standards, especially EN 1995-1-1 (EUROCODE 5) and wood-based panels harmonised standard: EN 13986.

To assess the performances of completed structures incorporating wood-based panels, two complementary procedures are available.

The first approach is to design the structure by calculation in accordance with EN 1995-1-1, using structural characteristic values, tabled in EN 12369 (all parts) or derived according to EN 1058 and EN 789. This method can be applied to any structure.

However, these standards provide no evaluation for concentrated loads or impact loads. Non-standard calculation methods for these properties may not lead to an optimised design in terms of performance.

The second approach is to design the structure by type testing in order to satisfy the requirements for both impact and concentrated loading. This approach yields an optimised design since the results from the testing apply only to that one specific design.

This standard relates specifically to the second approach, namely, design by type testing. Thus, this standard sets out the specifications and requirements for structural floor or roof decking or wall sheathing using wood-based panels.

1 Scope

This European Standard specifies the performance requirements and the procedure for demonstrating compliance, through type testing, of load-bearing wood-based panels fitted on:

- a) structural joists for decking:
 - in flooring applications in categories of use A, B, C and D;
 - in roof applications in categories of use H and I;

for which type testing involves:

- punching shear under concentrated loading;
- vertically dropped soft body impact;

- b) studs for walling application for which type testing involves:

- racking behaviour;
- pendular soft body impact.

This European Standard also provides a calculation method related to soft overlays that may be installed on roofs or floors with uniform loading.

NOTE Soft body impact, addressing safety matters both during construction and in service, is defined in EN 1990 and EN 1991-1 (all parts).

Annex A (normative) lists the contact areas of the loading heads that may be used for concentrated loading.

Annex B (informative) provides examples for a decking application in a floor and a roof.

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.

2.1 General

EN 204, *Classification of thermoplastic wood adhesives for non-structural applications*

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

EN 318:2002, *Wood based panels — Determination of dimensional changes associated with changes in relative humidity*

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 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 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*

ENV 1156, *Wood-based panels — Determination of duration of load and creep factors*

EN 1195, *Timber structures — Test methods — Performance of structural floor decking*

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

EN 1990, *Eurocode — Basis of structural design*

EN 1991-1-1, *Eurocode 1: Actions on structures — Part 1-1: General actions – Densities, self-weight, imposed loads for buildings*

EN 1991-1-3, *Eurocode 1 — Actions on structures — Part 1-3: General actions – Snow loads*

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

EN 12369-1, *Wood-based panels — Characteristic values for structural design — Part 1: OSB, particleboards and fibreboards*

EN 12369-2, *Wood-based panels — Characteristic values for structural design — Part 2: Plywood*

EN 12369-3, *Wood-based panels — Characteristic values for structural design — Part 3: Solid-wood panels*

EN 13446, *Wood-based panels - Determination of withdrawal capacity of fasteners*

EN 14358, *Timber structures — Calculation of characteristic 5-percentile values and acceptance criteria for a sample*

2.2 Product standards

EN 300, *Oriented Strand Boards (OSB) — Definitions, classification and specifications*

EN 312, *Particleboards — Specifications*

EN 622-2, *Fibreboards — Specifications — Part 2: Requirements for hardboards*

EN 622-3, *Fibreboards — Specifications — Part 3: Requirements for medium boards*

EN 622-5, *Fibreboards — Specifications — Part 5: Requirements for dry process boards (MDF)*

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

EN 13986:2004, *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*

EN 14279, *Laminated Veneer Lumber (LVL) — Definitions, classification and specifications*

EN 14374, *Timber structures — Structural laminated veneer lumber — Requirements*

3 Symbols and subscripts

3.1 Symbols

EI	Bending stiffness (value to be used where a uniformly distributed load is applied), in kilonewtons multiplied by square meter
F	Force applied to the component being tested, in kilonewtons
H	Height of a wall, in millimetres
L	Span between joists or studs (axis to axis distance), in millimetres
MC	Moisture content in the panels, in percent
N	Number of spans
Q_k	Variable action, conventional (or imposed) concentrated load, in relation to types of buildings, specified in National Annexes to EN 1991-1-1 or, where not available, in EN 1991-1-1, in kilonewtons
R	Stiffness of the structural decking or sheathing to concentrated loading (experimental value) and racking, in kilonewtons per millimetre
e	Opening of the joint between adjoining panels occurring under drying or edge rotation under load, its permissible value depends on the overlay material, in millimetres
i	Rank of a specimen in a sample
k_{def}	Deformation factor defined by EN 1995-1-1
k_{dis}	Correction factor converting test loads, for consideration of influence of size and shape of the load pad
k_{mod}	Modification factor defined by EN 1995-1-1
k_u	Conversion factor between Newtons and kilonewtons
n	Number of specimens in a test sample
q_d	Design (imposed) uniformly distributed load, in kilonewtons per square metre
r_L	Coefficient of expansion of the panel in its plane, derived from EN 318, in 1/1 000 %
s	Conventional snow-load per horizontal unit of area, specified in National Annexes to EN 1991-1-3 or, where not available, in EN 1991-1-3, in kilonewtons per square metre
t	Thickness of the panels, in mm