



NSAI
Standards

Irish Standard
I.S. EN 1995-1-1:2005+NA:2010+A1:2013

Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings (Including Irish National Annex)

I.S. EN 1995-1-1:2005+NA:2010+A1:2013

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-1-1:2005

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S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

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English Version

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

Eurocode 5: Conception et calcul des structures en bois -
Partie 1-1 : Généralités - Règles communes et règles pour
les bâtiments

Eurocode 5: Bemessung und Konstruktion von Holzbauten
- Teil 1-1: Allgemeines - Allgemeine Regeln und Regeln für
den Hochbau

This amendment A1 modifies the European Standard EN 1995-1-1:2004; it was approved by CEN on 10 April 2008.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This amendment 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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

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

Foreword

This document (EN 1995-1-1:2004/A1:2008) has been prepared by Technical Committee CEN/TC 250 "Structural Eurocodes", the secretariat of which is held by BSI.

This Amendment to the European Standard EN 1995-1-1:2004 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2008, and conflicting national standards shall be withdrawn at the latest by March 2010.

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 United Kingdom.

I.S. EN 1995-1-1:2005

EUROPEAN STANDARD

EN 1995-1-1:2004/AC

NORME EUROPÉENNE

June 2006

EUROPÄISCHE NORM

Juin 2006

Juni 2006

ICS 91.010.30; 91.080.20

English version
Version Française
Deutsche Fassung

**Eurocode 5: Design of timber structures - Part 1-1: General - Common
rules and rules for buildings**

**Eurocode 5: Conception et calcul des
structures en bois - Partie 1-1 : Généralités
- Règles communes et règles pour les
bâtiments**

**Eurocode 5: Bemessung und Konstruktion
von Holzbauten - Teil 1-1: Allgemeines -
Allgemeine Regeln und Regeln für den
Hochbau**

This corrigendum becomes effective on 7 June 2006 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 7 juin 2006 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 7.Juni 2006 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.



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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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von CEN vorbehalten.

Ref. No.: EN 1995-1-1:2004/AC:2006 D/E/F

English version

6.5.2 Beams with a notch at the support

Paragraph (2), modify χ to read as follows:

x is the distance from the line of action of the support reaction to the corner of the notch, in mm;

8.2.2 Timber-to-timber and panel-to-timber connections

Paragraph (2), second indent, modify to read as follows

– Square and grooved nails 25 %

8.3.1.1 General

Paragraph (4), modify to read as follows:

$$M_{y,Rk} = \begin{cases} 0,3 f_u d^{2,6} & \text{for round nails} \\ 0,45 f_u d^{2,6} & \text{for square and grooved nails} \end{cases} \quad (8.14)$$

8.3.1.2 Nailed timber-to-timber connections

Paragraph (3), modify to read as follows:

(3) Nails in end grain should not be considered capable of transmitting lateral forces.

I.S. EN 1995-1-1:2005

Eurocodes National Foreword

This Irish Standard is the official English language version of EN 1995-1-1:2004, prepared by Technical Committee CEN TC 250 "Structural Eurocodes". This document supersedes ENV 1995-1-1:1993.

This standard forms part of a package of 58 Eurocodes, which covers the basis of structural design, actions (loadings), the main structural materials, geotechnical design and design provisions for earthquakes. The European Commission document – Guidance Paper L – Application and Use of Eurocodes provides guidance on the elaboration, implementation and use of Eurocodes.

Where a normative part of this EN allows for a choice to be made at the national level the range and possible choices are given in the normative text and a Note will qualify it as a Nationally Determined Parameter (NDP).

To enable EN 1995-1-1:2004 to be used in Ireland the Nationally Determined Parameters will be published in a National Annex after public consultation has taken place.

Until the National Annex is available, publication of this European Standard is solely for educational/training purposes and this standard should not be used in project design until the relevant National Annex is available.

Note: For use of this European standard after publication of the Irish National Annex.

I.S. EN 1995-1-1:2005 may now be used in Ireland. The Nationally Determined Parameters, which have been prepared by the NSAI National Eurocode Advisory Committee, are included as an informative annex to the standard.

The National Annex to I.S. EN 1995-1-1:2005 is also available as a separate publication as recommended in Guidance Paper L.

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| In line with international standards practice the decimal point is shown as a comma (,) throughout this document. |
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I.S. EN 1995-1-1:2005

I.S. EN 1995-1-1:2005

EUROPEAN STANDARD

EN 1995-1-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2004

ICS 91.010.30; 91.080.20

Supersedes ENV 1995-1-1:1993

English version

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

Eurocode 5: Conception et calcul des structures en bois -
Partie 1-1 : Généralités - Règles communes et règles pour
les bâtiments

Eurocode 5: Bemessung und Konstruktion von Holzbauten
- Teil 1-1: Allgemeines - Allgemeine Regeln und Regeln für
den Hochbau

This European Standard was approved by CEN on 16 April 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.

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COMITÉ EUROPÉEN DE NORMALISATION
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I.S. EN 1995-1-1:2005

Foreword

This European Standard EN 1995-1-1 has been prepared by Technical Committee CEN/TC250 "Structural Eurocodes", the Secretariat of which is held by BSI.

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 March 2010.

This European Standard supersedes ENV 1995-1-1:1993.

CEN/TC250 is responsible for all Structural Eurocodes.

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, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Background of the Eurocode programme

In 1975, the Commission of the European Community decided on an action programme in the field of construction, based on article 95 of the Treaty. The objective of the programme was the elimination of technical obstacles to trade and the harmonisation of technical specifications.

Within this action programme, the Commission took the initiative to establish a set of harmonised technical rules for the design of construction works which, in a first stage, would serve as an alternative to the national rules in force in the Member States and, ultimately, would replace them.

For fifteen years, the Commission, with the help of a Steering Committee with Representatives of Member States, conducted the development of the Eurocodes programme, which led to the first generation of European codes in the 1980s.

In 1989, the Commission and the Member States of the EU and EFTA decided, on the basis of an agreement¹ between the Commission and CEN, to transfer the preparation and the publication of the Eurocodes to CEN through a series of Mandates, in order to provide them with a future status of European Standard (EN). This links de facto the Eurocodes with the provisions of all the Council's Directives and/or Commission's Decisions dealing with European standards (e.g. the Council Directive 89/106/EEC on construction products – CPD – and Council Directives 93/37/EEC, 92/50/EEC and 89/440/EEC on public works and services and equivalent EFTA Directives initiated in pursuit of setting up the internal market).

The Structural Eurocode programme comprises the following standards generally consisting of a number of Parts:

| | |
|--------------|---|
| EN 1990:2002 | Eurocode: Basis of Structural Design |
| EN 1991 | Eurocode 1: Actions on structures |
| EN 1992 | Eurocode 2: Design of concrete structures |
| EN 1993 | Eurocode 3: Design of steel structures |
| EN 1994 | Eurocode 4: Design of composite steel and concrete structures |
| EN 1995 | Eurocode 5: Design of timber structures |
| EN 1996 | Eurocode 6: Design of masonry structures |
| EN 1997 | Eurocode 7: Geotechnical design |

¹ Agreement between the Commission of the European Communities and the European Committee for Standardisation (CEN) concerning the work on EUROCODES for the design of building and civil engineering works (BC/CEN/03/89).

I.S. EN 1995-1-1:2005

EN 1995-1-1:2004 (E)

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| EN 1998 | Eurocode 8: Design of structures for earthquake resistance |
| EN 1999 | Eurocode 9: Design of aluminium structures |

Eurocode standards recognise the responsibility of regulatory authorities in each Member State and have safeguarded their right to determine values related to regulatory safety matters at national level where these continue to vary from State to State.

Status and field of application of Eurocodes

The Member States of the EU and EFTA recognise that Eurocodes serve as reference documents for the following purposes:

- as a means to prove compliance of building and civil engineering works with the essential requirements of Council Directive 89/106/EEC, particularly Essential Requirement N°1 – Mechanical resistance and stability – and Essential Requirement N°2 – Safety in case of fire ;
- as a basis for specifying contracts for construction works and related engineering services ;
- as a framework for drawing up harmonised technical specifications for construction products (ENs and ETAs)

The Eurocodes, as far as they concern the construction works themselves, have a direct relationship with the Interpretative Documents² referred to in Article 12 of the CPD, although they are of a different nature from harmonised product standards³. Therefore, technical aspects arising from the Eurocodes work need to be adequately considered by CEN Technical Committees and/or EOTA Working Groups working on product standards with a view to achieving full compatibility of these technical specifications with the Eurocodes.

The Eurocode standards provide common structural design rules for everyday use for the design of whole structures and component products of both a traditional and an innovative nature. Unusual forms of construction or design conditions are not specifically covered and additional expert consideration will be required by the designer in such cases.

National Standards implementing Eurocodes

The National Standards implementing Eurocodes will comprise the full text of the Eurocode (including any annexes), as published by CEN, which may be preceded by a National title page and National foreword, and may be followed by a National annex.

The National annex may only contain information on those parameters which are left open in the Eurocode for national choice, known as Nationally Determined Parameters, to be used for the design of buildings and civil engineering works to be constructed in the country concerned, i.e.:

- values and/or classes where alternatives are given in the Eurocode;
- values to be used where a symbol only is given in the Eurocode;
- country specific data (geographical, climatic, etc.), e.g. snow map;

² According to Art. 3.3 of the CPD, the essential requirements (ERs) shall be given concrete form in interpretative documents for the creation of the necessary links between the essential requirements and the mandates for harmonised ENs and ETAGs/ETAs.

³ According to Art. 12 of the CPD the interpretative documents shall:
give concrete form to the essential requirements by harmonising the terminology and the technical bases and indicating classes or levels for each requirement where necessary ;
indicate methods of correlating these classes or levels of requirement with the technical specifications, e.g. methods of calculation and of proof, technical rules for project design, etc. ;
serve as a reference for the establishment of harmonised standards and guidelines for European technical approvals.

The Eurocodes, *de facto*, play a similar role in the field of the ER 1 and a part of ER 2.

- the procedure to be used where alternative procedures are given in the Eurocode;
- decisions on the application of informative annexes;
- references to non-contradictory complementary information to assist the user to apply the Eurocode.

Links between Eurocodes and harmonised technical specifications (ENs and ETAs) for products

There is a need for consistency between the harmonised technical specifications for construction products and the technical rules for works⁴. Furthermore, all the information accompanying the CE Marking of the construction products which refer to Eurocodes shall clearly mention which Nationally Determined Parameters have been taken into account.

Additional information specific to EN 1995-1-1

EN 1995 describes the Principles and requirements for safety, serviceability and durability of timber structures. It is based on the limit state concept used in conjunction with a partial factor method.

For the design of new structures, EN 1995 is intended to be used, for direct application, together with EN 1990:2002 and relevant Parts of EN 1991.

Numerical values for partial factors and other reliability parameters are recommended as basic values that provide an acceptable level of reliability. They have been selected assuming that an appropriate level of workmanship and of quality management applies. When EN 1995-1-1 is used as a base document by other CEN/TCs the same values need to be taken.

National annex for EN 1995-1-1

This standard gives alternative procedures, values and recommendations with notes indicating where national choices may have to be made. Therefore the National Standard implementing EN 1995-1-1 should have a National annex containing all Nationally Determined Parameters to be used for the design of buildings and civil engineering works to be constructed in the relevant country.

National choice is allowed in EN 1995-1-1 through clauses:

| | |
|-------------|--|
| 2.3.1.2(2)P | Assignment of loads to load-duration classes; |
| 2.3.1.3(1)P | Assignment of structures to service classes; |
| 2.4.1(1)P | Partial factors for material properties; |
| 6.4.3(8) | Double tapered, curved and pitched cambered beams; |
| 7.2(2) | Limiting values for deflections; |
| 7.3.3(2) | Limiting values for vibrations; |
| 8.3.1.2(4) | Nailed timber-to-timber connections: Rules for nails in end grain; |
| 8.3.1.2(7) | Nailed timber-to-timber connections: Species sensitive to splitting; |
| 9.2.4.1(7) | Design method for wall diaphragms; |
| 9.2.5.3(1) | Bracing modification factors for beam or truss systems; |
| 10.9.2(3) | Erection of trusses with punched metal plate fasteners: Maximum bow; |
| 10.9.2(4) | Erection of trusses with punched metal plate fasteners: Maximum deviation. |

⁴ see Art.3.3 and Art.12 of the CPD, as well as clauses 4.2, 4.3.1, 4.3.2 and 5.2 of ID 1.

Section 1 General

1.1 Scope

1.1.1 Scope of EN 1995

(1)P EN 1995 applies to the design of buildings and civil engineering works in timber (solid timber, sawn, planed or in pole form, glued laminated timber or wood-based structural products, e.g. LVL) or wood-based panels jointed together with adhesives or mechanical fasteners. It complies with the principles and requirements for the safety and serviceability of structures and the basis of design and verification given in EN 1990:2002.

(2)P EN 1995 is only concerned with requirements for mechanical resistance, serviceability, durability and fire resistance of timber structures. Other requirements, e.g concerning thermal or sound insulation, are not considered.

(3) EN 1995 is intended to be used in conjunction with:
EN 1990:2002 Eurocode – Basis of design
EN 1991 “Actions on structures”
EN’s for construction products relevant to timber structures
EN 1998 “Design of structures for earthquake resistance”, when timber structures are built in seismic regions

(4) EN 1995 is subdivided into various parts:
EN 1995-1 General
EN 1995-2 Bridges

(5) EN 1995-1 “General” comprises:
EN 1995-1-1 General – Common rules and rules for buildings
EN 1995-1-2 General rules – Structural Fire Design

(6) EN 1995-2 refers to the common rules in EN 1995-1-1. The clauses in EN 1995-2 supplement the clauses in EN 1995-1.

1.1.2 Scope of EN 1995-1-1

(1) EN 1995-1-1 gives general design rules for timber structures together with specific design rules for buildings.

(2) The following subjects are dealt with in EN 1995-1-1:

- Section 1: General
- Section 2: Basis of design
- Section 3: Material properties
- Section 4: Durability
- Section 5: Basis of structural analysis
- Section 6: Ultimate limit states
- Section 7: Serviceability limit states
- Section 8: Connections with metal fasteners
- Section 9: Components and assemblies
- Section 10: Structural detailing and control.

(3)P EN 1995-1-1 does not cover the design of structures subject to prolonged exposure to temperatures over 60°C.

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