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Nederlandse norm

# NEN-EN 1995-1-1 (en)

Eurocode 5 - Ontwerp en berekening van  
houtconstructies - Deel 1-1: Algemeen -  
Gemeenschappelijke regels en regels voor  
gebouwen

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

ICS 91.010.30; 91.080.20  
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VOORBEELD  
Preview

Normcommissie 351 001 "Technische Grondslagen voor Bouwconstructies"

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## Nederlands voorwoord

### Waarschuwing

De publicatie van deze norm is een **tussenfase** in de uniformering van de technische grondslagen voor berekening van bouwconstructies in Europa.

Na publicatie van deze norm wordt gewerkt aan een vertaling in het Nederlands en aan het opstellen van de nationale bijlage. In deze nationale bijlage worden de nationaal vast te stellen parameterwaarden gegeven, waarmee per land het vereiste veiligheidsniveau wordt bereikt. In Nederland wordt gestreefd naar eenzelfde niveau van betrouwbaarheid als bij toepassing van 5.3 van NEN 6700. Na publicatie van de nationale bijlage en de normtekst in het Nederlands zal naar verwachting een 'coëxistentieperiode' van 2 tot 3 jaar ingaan, waarin deze norm naast 5.2 en 5.3 van NEN 6760 voor toepassing beschikbaar is. Uiteindelijk zal deze norm NEN 6760 vervangen; nl. bij intrekking van NEN 6760. De datum van intrekking van NEN 6760 is vooralsnog gesteld op 2010-03-31.

Pas nadat de nationale bijlage is gepubliceerd en de normtekst in het Nederlands is verschenen, kan vanuit wettelijke regelingen (Bouwbesluit 2003 en Arbeidsomstandighedenbesluit) van deze norm in principe gebruik worden gemaakt. Men kan met de voorliggende uitgave dus nog **niet** aantonen dat is voldaan aan de minimumeisen van constructieve veiligheid van deze wettelijke regelingen.

Deze norm kan wel worden gebruikt voor het 'wennen' aan de methode, voor het ontwikkelen van software en voor het voorbereiden van cursussen over de Eurocodes.

### Notice

The publication of this standard is an intermediate phase in the harmonisation of technical principles for design of building structures in Europe.

After publication of this standard work will start on the translation into Dutch and on the formulation of the National Annex. In this National Annex the values of the Nationally Determined Parameters will be given, by which, the required level of safety for each member country is attained. In the Netherlands the same level of safety as attained by application of 5.3 of NEN 6700 is strived for. After publication of the National Annex and the standard in Dutch the start of a period of co-existence of 2 to 3 years is anticipated, where this standard will be available for application as an alternative to 5.2 and 5.3 of NEN 6760. Eventually this standard will replace NEN 6760, i.e. at the withdrawal of NEN 6760. The date of withdrawal of NEN 6760 for the moment is set on 2010-03-31.

Only after the National Annex has been published and the standard has been translated into Dutch, legislation (Building Decree 2003 and Decree on Working conditions) may, in principle, refer to this standard, for application (in the framework of Dutch law). With the present publication compliance with the minimum requirements on structural safety in these National regulations cannot be demonstrated yet.

This standard can however be applied for "getting accustomed" to the methods, for developing of software and for preparing courses on Eurocodes.

Voor de in deze norm vermelde normatieve verwijzingen bestaan in Nederland de volgende equivalenten:

<u>vermelde norm</u>	<u>Nederlandse norm</u>	<u>titel</u>
ISO 2081:1986	-	-
ISO 2631-2:1986	-	-
EN 300:1997	NEN-EN 300:1997	Oriented Strand Boards (OSB) - Termen en definities, classificatie en specificaties (en)
EN 301:1992	NEN-EN 301:1993	Lijmen voor dragende houtconstructies - Polycondensatielijmen op basis van phenolen en aminoplasten - Classificatie en prestatie-eisen (en)
EN 312-4:1996	-	-
EN 312-5:1997	-	-
EN 312-6:1996	-	-
EN 312-7:1997	-	-
EN 335-1:1992	NEN-EN 335-1:1992	Duurzaamheid van hout en op hout gebaseerde producten - Definitie van risicoklassen voor biologische aantasting - Deel 1: Algemeen (en)
EN 335-2:1992	NEN-EN 335-2:1992	Duurzaamheid van hout en op hout gebaseerde producten - Definitie van risicoklassen voor biologische aantasting - Deel 2: Massief hout (en)
EN 335-3:1995	NEN-EN 335-3:1995	Duurzaamheid van hout en op hout gebaseerde producten - Definitie van risicoklassen voor biologische aantasting - Deel 3: Toepassing bij op hout gebaseerde plaatmaterialen (en)
EN 350-2:1994	NEN-EN 350-2:1994	Duurzaamheid van hout en op hout gebaseerde producten - Natuurlijke duurzaamheid van massief hout - Deel 2: Richtlijn voor de natuurlijke duurzaamheid en behandelbaarheid van geselecteerde, voor Europa belangrijke houtsoorten (en)
EN 351-1:1995	NEN-EN 351-1:1995	Duurzaamheid van hout en op hout gebaseerde producten - Met verduurzamingsmiddelen behandeld massief hout - Deel 1: Classificatie van de indringing en retentie van verduurzamingsmiddelen (en)
EN 383:1993	NEN-EN 383:1994	Houtconstructies - Beproevingmethoden - Bepaling van de stuksterkte voor stiftvormige verbindingmiddelen (en)
EN 385:2001	NEN-EN 385:2001	Gevingerlast hout voor constructieve toepassingen - Prestatie-eisen en minimale eisen voor de vervaardiging (en)
EN 387:2001	NEN-EN 387:2001	Gelijmd gelamineerd hout - Grote vingerlassen - Prestatie-eisen en minimale eisen voor de vervaardiging (en)
EN 409:1993	NEN-EN 409:1994	Houtconstructies - Beproevingmethoden - Bepaling van het vloemoment van stiftvormige verbindingmiddelen - Nagels (en)
EN 460:1994	NEN-EN 460:1994	Duurzaamheid van hout en op hout gebaseerde producten - Natuurlijke duurzaamheid van massief hout - Richtlijn voor de eisen aan de duurzaamheid van hout voor toepassing in risicoklassen (en)
EN 594:1995	NEN-EN 594:1996	Houtconstructies - Beproevingmethoden - Sterkte en stijfheid van houten ribpanelen voor wanden (en)
EN 622-2:1997	-	-
EN 622-3:1997	-	-
EN 622-4:1997	NEN-EN 622-4:1997	Vezelplaten - Specificaties - Deel 4: Eisen voor zachte platen (en)
EN 622-5:1997	NEN-EN 622-5:1997	Vezelplaten - Specificaties - Deel 5: Eisen voor platen vervaardigd volgens het droge proces (MDF) (en)

EN 636-1:1996	-	-
EN 636-2:1996	-	-
EN 636-3:1996	-	-
EN 912:1999	NEN-EN 912:1999	Verbindingsmiddelen voor houtconstructies - Specificaties (en)
EN 1075:1999	NEN-EN 1075:1999	Houtconstructies - Beproevingmethoden - Verbindingen met hechtplaten (en)
EN 1380:1999	NEN-EN 1380:1999	Houtconstructies - Beproevingmethoden - Dragende nagelverbindingen (en)
EN 1381:1999	NEN-EN 1381:1999	Houtconstructies - Beproevingmethoden - Dragende nietverbindingen (en)
EN 1382:1999	NEN-EN 1382:1999	Houtconstructies - Beproevingmethoden - Uittrekweerstand van verbindingsmiddelen voor houtconstructies (en)
EN 1383:1999	NEN-EN 1383:1999	Houtconstructies - Beproevingmethoden - Intrekweerstand van verbindingsmiddelen (en)
EN 1990:2002	NEN-EN 1990:2002	Eurocode - Grondslag van het constructief ontwerp (en)
EN 1991-1-1:2002	NEN-EN 1991-1-1:2002	Eurocode 1: Belastingen op constructies - Deel 1-1: Algemene belastingen - Dichtheden, eigen gewicht en opgelegde belastingen voor gebouwen (en)
EN 1991-1-3	NEN-EN 1991-1-3	Eurocode 1: Ontwerpgrondslagen en belastingen op constructies - Deel 1-3: Algemene belastingen - Sneeuwbelasting (en)
EN 1991-1-4	NEN-EN 1991-1-4	Eurocode 1: Belastingen op constructies - Deel 1-4: Algemene belastingen - Windbelasting (en)
EN 1991-1-5	NEN-EN 1991-1-5	Eurocode 1: Belastingen op constructies - Deel 1-5: Algemene belastingen - Thermische belasting (en)
EN 1991-1-6	-	-
EN 1991-1-7	-	-
EN 10147:2000	-	-
EN 13271:2001	NEN-EN 13271:2001	Bevestigingsartikelen voor hout - Karakteristieke sterkte en stijfheid van ring-, plaatdeugel- en kramplaatverbindingen in hout (en)
EN 13986	NEN-EN 13986	Houtachtige plaatmaterialen voor gebruik in de bouw - Eigenschappen, conformiteitsbeoordeling en merken (en)
EN 14080	-	-
EN 14081-1	-	-
EN 14250	NEN-EN 14250	Houtconstructies - Producteisen voor vooraf vervaardigde onderdelen met hechtplaten (en)
EN 14279	NEN-EN 14279	Laminated Veneer Lumber (LVL) - Definities, classificatie en specificaties (en)
EN 14358	-	-
EN 14374	NEN-EN 14374	Houtconstructies - Gelamineerd fineerhout voor constructieve toepassingen - Eisen (en)
EN 14544	-	-
EN 14545	-	-
EN 14592	-	-
EN 26891:1991	NEN-ISO 6891:1991	Houtconstructies - Verbindingen vervaardigd met mechanische verbindingsmiddelen - Algemene uitgangspunten bij de bepaling van de sterkte en vervorming (en)
EN 28970:1991	NEN-ISO 8970:1991	Houtconstructies - Beproeving van verbindingen vervaardigd met mechanische verbindingsmiddelen - Eisen aan de volumieke massa van hout (en)



EUROPEAN STANDARD

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NORME EUROPÉENNE

EUROPÄISCHE NORM

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## 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

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## 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 agreement<sup>1</sup> 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

<sup>1</sup> 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).

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 Documents<sup>2</sup> referred to in Article 12 of the CPD, although they are of a different nature from harmonised product standards<sup>3</sup>. 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;

<sup>2</sup> 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.

<sup>3</sup> 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 works<sup>4</sup>. 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.

<sup>4</sup> 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.

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