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Eurocode 6: Design of masonry structures – Part 1-2: General rules – Structural fire design (includes Corrigendum AC:2010) English translation of DIN EN 1996-1-2:2011-04

Eurocode 6: Bemessung und Konstruktion von Mauerwerksbauten –
Teil 1-2: Allgemeine Regeln –
Tragwerksbemessung für den Brandfall
(enthält Berichtigung AC:2010)
Englische Übersetzung von DIN EN 1996-1-2:2011-04

Eurocode 6: Calcul des ouvrages en maçonnerie –
Partie 1-2: Règles générales –
Calcul du comportement au feu
(Corrigendum AC:2010 inclus)
Traduction anglaise de DIN EN 1996-1-2:2011-04

Document comprises 84 pages

Translation by DIN-Sprachendienst.
In case of doubt, the German-language original shall be considered authoritative.

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A comma is used as the decimal marker.

National foreword

This standard has been prepared by Technical Committee CEN/TC 250 “Structural Eurocodes” (Secretariat: BSI, United Kingdom).

The responsible German body involved in its preparation was the *Normenausschuss Bauwesen* (Building and Civil Engineering Standards Committee), Working Committee NA 005-52-22 AA *Konstruktiver baulicher Brandschutz*.

This European Standard is part of a series of standards dealing with structural design (Eurocodes) which are intended to be used as a “package”. In Guidance Paper L on the application and use of Eurocodes, issued by the EU Commission, reference is made to transitional periods for the introduction of the Eurocodes in the Member states. The transitional periods given in the Foreword of this standard correlate approximately with those given in the Guidance Paper.

In Germany, this standard is to be applied in conjunction with the National Annex.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. DIN [and/or DKE] shall not be held responsible for identifying any or all such patent rights.

Depending on the importance of the individual clauses, this standard distinguishes between principles and application rules (see also Subclause 1.4). Principles are identified by the letter “P” after the number of the clause (e.g. (1)P). All clauses not marked as principles are application rules.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌〈AC〉 〈AC〉▌.

Amendments

This standard differs from DIN V ENV 1996-1-2:1997-05 as follows:

a) the comments received from the national member bodies of CEN have been taken into account and the standard has been completely revised.

Compared with DIN EN 1996-1-2:2006-10, the following corrections have been made:

a) this standard is the consolidated version of the previous 2005 edition with Corrigendum AC:2010-10;

b) the standard has been editorially revised.

Previous editions

DIN 4102-22: 2004-11
DIN V ENV 1996-1-2: 1997-05
DIN EN 1996-1-2: 2006-10

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1996-1-2

May 2005

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ICS 13.220.50; 91.010.30; 91.080.10

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English version

Eurocode 6: Design of masonry structures — Part 1-2: General rules — Structural fire design

Eurocode 6: Calcul des ouvrages en maçonnerie — Partie 1-2: Règles générales — Calcul du comportement au feu

Eurocode 6: Bemessung und Konstruktion von Mauerwerksbauten — Teil 1-2: Allgemeine Regeln — Tragwerksbemessung für den Brandfall

EN 1996-1-2:2005 was approved by CEN on 2004-11-04 and Amendment AC:2010 on 2010-10-27.

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

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Ref. No. EN 1996-1-2:2005 + AC:2010 E

Contents

Foreword to EN 1996-1-2:2005 + AC:2010

This document (EN 1996-1-2:2005 + AC:2010) has been prepared by Technical Committee CEN/TC 250 “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 November 2005, and conflicting national standards shall be withdrawn at the latest by March 2010.

This document supersedes ENV 1996-1-2:1995.

CEN/TC 250 is responsible for all Structural Eurocodes.

According to the CEN-CENELEC Internal Regulations, the National Standard Organisations 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 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 1980’s.

In 1989, the Commission and the Member States of the EU and EFTA decided, on the basis of an agreement[1] between the Commission and CEN, to transfer the preparation and the publication of the Eurocodes to the 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:

[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).

EN 1990	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
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[2] referred to in Article 12 of the CPD, although they are of a different nature from harmonised product standards[3]. 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.

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[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 :

a) 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 ;

b) 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. ;

c) 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.

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,
- the procedure to be used where alternative procedures are given in the Eurocode,

and it may also contain

- 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 products harmonised technical specifications (ENs and ETAs)

There is a need for consistency between the harmonised technical specifications for construction products and the technical rules for works[4]. Furthermore, all the information accompanying the CE Marking of the construction products which refer to Eurocodes should clearly mention which Nationally Determined Parameters have been taken into account.

This European Standard is part of EN 1996 which comprises the following parts:

EN 1996-1-1: ▌AC⟩ General rules for reinforced and unreinforced masonry structures ⟨AC▐

EN 1996-1-2: General Rules - Structural Fire Design

EN 1996-2: Design, Selection of materials and execution of masonry

EN 1996-3: ▌AC⟩ Simplified calculation methods for unreinforced masonry structures ⟨AC▐

EN 1996-1-2 is intended to be used together with EN 1990, EN 1991-1-2, EN 1996-1-1, EN 1996-2 and EN 1996-3

[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.

Additional information specific to EN 1996-1-2

The general objectives of fire protection are to limit risks with respect to the individual and society, neighbouring property, and where required, directly exposed property, in the case of fire.

The Construction Products Directive 89/106/EEC gives the following essential requirement for the limitation of fire risks:

"The construction works must be designed and built in such a way that, in the event of an outbreak of fire

- the load bearing resistance of the construction can be assumed for a specified period of time
- the generation and spread of fire and smoke within the works are limited
- the spread of fire to neighbouring construction works is limited
- the occupants can leave the works or can be rescued by other means
- the safety of rescue teams is taken into consideration".

According to the Interpretative Document No 2 "Safety in Case of Fire" the essential requirement may be observed by following various possibilities for fire safety strategies prevailing in the Member States like conventional fire scenarios (nominal fires) or 'natural' (parametric) fire scenarios, including passive and/or active fire protection measures.

The fire parts of Structural Eurocodes deal with specific aspects of passive fire protection in terms of designing structures and parts thereof for adequate load bearing resistance that could be needed for safe evacuation of occupants and fire rescue operations and for limiting fire spread as relevant.

Required functions and levels of performance are generally specified by the national authorities - mostly in terms of a standard fire resistance rating. Where fire safety engineering for assessing passive and active measures is acceptable, requirements by authorities will be less prescriptive and may allow for alternative strategies.

This Part 1-2, together with EN 1991-1-2, Actions on structures exposed to fire, supplements EN 1996-1-1, so that the design of masonry structures can comply with normal and fire requirements.

Supplementary requirements concerning, for example

- the possible installation and maintenance of sprinkler systems
- conditions on occupancy of building or fire compartment
- the use of approved insulation and coating materials, including their maintenance

are not given in this document, as they are subject to specification by the competent authority.