DIN EN 1996-1-1

DIN

ICS 91.010.30; 91.080.30

Supersedes
DIN EN 1996-1-1:2010-12

Eurocode 6: Design of masonry structures – Part 1-1: General rules for reinforced and unreinforced masonry structures; English version EN 1996-1-1:2005+A1:2012, English translation of DIN EN 1996-1-1:2013-02

Eurocode 6: Bemessung und Konstruktion von Mauerwerksbauten –
Teil 1-1: Allgemeine Regeln für bewehrtes und unbewehrtes Mauerwerk;
Englische Fassung EN 1996-1-1:2005+A1:2012,
Englische Übersetzung von DIN EN 1996-1-1:2013-02

Eurocode 6: Calcul des ouvrages en maçonnerie –
Partie 1-1: Règles générales pour ouvrages en maçonnerie armée et non armée;
Version anglaise EN 1996-1-1:2005+A1:2012,
Traduction anglaise de DIN EN 1996-1-1:2013-02

Document comprises 117 pages

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

A comma is used as the decimal marker.

National foreword

This document (EN 1996-1-1:2005+A1:2012) 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 005-06-01 AA *Mauerwerksbau*.

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 compulsory transitional periods for the introduction of the Eurocodes in the member states. Refer to current announcements regarding the relevance of this standard for building legislation.

Irrespective of 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.

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

Amendments

This standard differs from DIN EN 1996-1-1:2010-12 as follows:

a) specifications relating to composite lintels have been added;

b) Amendment 1 has been incorporated;

c) the resolution of the figures has been optimized.

Previous editions

DIN 1053: 1937x-02, 1952-12, 1962-11
DIN 1053-1: 1974-11, 1990-02, 1996-11
DIN 1053-2: 1984-07
DIN 1053-3: 1974-11, 1990-02
DIN 1053-100: 2004-08, 2006-08, 2007-09
DIN 4156: 1943-05
DIN V ENV 1996-1-1: 1996-12
DIN V ENV 1996-1-3: 1999-08
DIN EN 1996-1-1: 2006-01, 2010-12
DIN EN 1996-1-1 Corrigendum 1: 2009-11

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1996-1-1:2005+A1

November 2012

ICS 91.010.30; 91.080.30

Supersedes EN 1996-1-1:2005

English Version

Eurocode 6 - Design of masonry structures - Part 1-1: General rules for reinforced and unreinforced masonry structures

Eurocode 6: Calcul des ouvrages en maçonnerie - Partie 1-1: Règles générales pour ouvrages en maçonnerie armée et non armée

Eurocode 6 - Bemessung und Konstruktion von Mauerwerksbauten - Teil 1-1: Allgemeine Regeln für bewehrtes und unbewehrtes Mauerwerk

This European Standard was approved by CEN on 23 June 2005 and includes Amendment 1 approved by CEN on 6 July 2012.

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 CEN-CENELEC Management Centre or to any CEN member.

This European Standard 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
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Ref. No. EN 1996-1-1:2005+A1:2012: E

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Foreword

This document (EN 1996-1-1:2005+A1:2012) 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 May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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 includes Corrigendum 1 issued by CEN on 29 July 2009 and Amendment 1 approved by CEN on 6 July 2012.

This document supersedes [A1] EN 1996-1-1:2005 [A1].

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] [A1].

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags [AC] [AC].

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Background to 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

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).

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, *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 struc*tures

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

2) According to Article 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 Article 12 of the CPD the interpretative documents shall :

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 (informative).

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 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[4)] . 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.

This European Standard is Part of EN 1996 which comprises the following Parts:

Part 1-1: *General rules for reinforced and unreinforced masonry* 〖AC〗 *structures* 〖AC〗

NOTE This Part combines ENV 1996-1-1 and ENV 1996-1-3.

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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.

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