



# SLOVENSKI STANDARD

SIST EN 1996-2:2006

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BUXca Yý U.

SIST ENV 1996-2:2004

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## Evrokod 6: Projektiranje zidanih konstrukcij - 2. del: Projektiranje z upoštevanjem izbire materialov in izvedbo zidovja

Eurocode 6 - Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry

Eurocode 6 - Bemessung und Konstruktion von Mauerwerksbauten - Teil 2: Planung, Auswahl der Baustoffe und Ausführung von Mauerwerk

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Eurocode 6 - Calcul des ouvrages en maçonnerie - Partie 2: Conception, choix des matériaux et mise en oeuvre des maçonneries

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Ta slovenski standard je istoveten z: **EN 1996-2:2006**

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### ICS:

91.010.30	V^@ã}ãããã	Technical aspects
91.080.30	Zidane konstrukcije	Masonry

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English Version

## Eurocode 6 - Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry

Eurocode 6 - Calcul des ouvrages en maçonnerie - Partie 2: Conception, choix des matériaux et mise en oeuvre des maçonneries

Eurocode 6 - Bemessung und Konstruktion von Mauerwerksbauten - Teil 2: Planung, Auswahl der Baustoffe und Ausführung von Mauerwerk

This European Standard was approved by CEN on 24 November 2005.

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.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, 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.

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## Foreword

This document EN 1996-2 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 July 2006, and conflicting national standards shall be withdrawn at the latest by March 2010.

CEN/TC 250 is responsible for all Structural Eurocodes.

This document supersedes ENV 1996-2:1998

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

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## 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 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 (eg. the Council Directive 89/106/EEC on construction products - CPD - and Council Directives 93/37/EEC,

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<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).

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 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

<sup>2)</sup> 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.

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 (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, ie.:

- 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), eg. 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.

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<sup>3)</sup> According to Article 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 ER 1 and a part of ER 2.



## 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.

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

Part 1-1: General - *Rules for reinforced and unreinforced masonry*

Part 1-2: General rules - *Structural fire design.*

Part 2: *Design considerations, selection of materials and execution of masonry.*

Part 3: *Simplified calculation methods for unreinforced masonry structures*

EN 1996-2 describes the principles and requirements for design considerations, selection of materials and execution of masonry structures.

For the design of new structures, EN 1996-1-1 is intended to be used, for direct application, together with ENs 1990, 1991, 1992, 1993, 1994, 1995, 1997, 1998 and 1999.

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

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### Additional information specific to EN 1996-2

The scope of Eurocode 6 is defined in EN 1996-1-1, and this includes information on the other parts of Eurocode 6.

### National Annex for EN 1996-2

This standard gives alternative procedures, values and recommendations for classes with notes indicating where national choices may have to be made. Therefore the National Standard implementing EN 1996-2 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 1996-2 through clauses:

— 2.3.4.2(2)

— 3.5.3.1(1)

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<sup>4)</sup> 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.

In addition to general references to non-contradictory complementary information specific references may be made through clauses:

- 1.1.(2)P
- 2.3.1.(1)
- 3.4.(3)

## 1 General

### 1.1 Scope of Part 2 of Eurocode 6

(1)P The scope of Eurocode 6 for Masonry Structures as given in 1.1.1 of EN 1996-1-1:2005 applies also to this EN 1996-2.

(2)P EN 1996-2 gives basic rules for the selection of materials and execution of masonry to enable it to comply with the design assumptions of the other parts of Eurocode 6. With the exception of the items given in 1.1(3)P, the scope of Part 2 deals with ordinary aspects of masonry design and execution including:

- the selection of masonry materials;
- factors affecting the performance and durability of masonry;
- resistance of buildings to moisture penetration;
- storage, preparation and use of materials on site;
- the execution of masonry;
- masonry protection during execution;

NOTE 1. Where general guidance only is given, additional guidance based on local conditions and practice may be made available in non contradictory complementary documents which may be referred to in the National Annex.

NOTE 2. The scope of Eurocode 6 excludes seismic, thermal and acoustic functional performance of masonry structures;

(3)P EN 1996-2 does not cover the following items:

- those aspects of masonry covered in other parts of Eurocode 6;
- aesthetic aspects;
- applied finishes;
- health and safety of persons engaged in the design or execution of masonry;
- the environmental effects of masonry buildings, civil engineering works and structures on their surroundings.

## 1.2 Normative references

(1)P This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication applies (including amendments).

- EN 206-1, *Concrete -Part 1: Specification, performance, production and conformity*
- EN 771 (all parts), *Specification for masonry units*
- EN 998-2, *Specification for mortar for masonry – Part 2: Masonry mortar*
- EN 845 (all parts), *Specification for ancillary components for masonry*
- EN 1015-11, *Methods of test for mortar for masonry - Part 11: Determination of flexural and compressive strength of hardened mortar*
- EN 1015-17, *Methods of test for mortar for masonry – Part 17: Determination of water-soluble chloride content of fresh mortars*
- EN 1052 (all parts), *Methods of test for masonry*
- EN 1990, *Eurocode: Basis of structural design*
- EN 1996-1-1, *Eurocode 6: Design of masonry structures - Part 1: General rules for reinforced and unreinforced masonry structures*
- EN 13914-1, *The design, preparation and application of external rendering and internal plastering - Part 1: External rendering*

## 1.3 Assumptions

(1)P In addition to the assumptions given in 1.3 of EN 1990:2002 the following assumptions apply in this EN 1996-2:

- Design shall be in accordance with Section 2 taking into account Section 3.
- Execution shall be in accordance with Section 3 taking into account Section 2.

(2) The design Principles are valid only when the Principles for execution in Section 3 are complied with.

## 1.4 Distinction between Principles and Application Rules

(1)P The rules in 1.4 of EN 1990:2002 apply to this EN 1996-2.

## 1.5 Definitions

### 1.5.1 General

- (1) The terms and definitions given in 1.5 of EN 1990:2002 apply to this EN 1996-2.
- (2) The terms and definitions used in EN 1996-1-1 apply to this EN 1996-2.
- (3) Additional terms and definitions used in this EN 1996-2 are given the meanings contained in 1.5.2 to 1.5.5, inclusive.

### 1.5.2 Terms and definitions relating to communication of design

#### 1.5.2.1

##### **design specification**

documents describing the designer's requirements for the construction, including drawings, schedules, test reports, references to parts of other documents and written instructions

### 1.5.3 Terms relating to climatic factors and exposure conditions

#### 1.5.3.1

##### **macro conditions**

climatic factors depending on the general climate of the region in which a structure is built, modified by the effects of local topography and/or other aspects of the site

#### 1.5.3.2

##### **micro conditions**

localised climatic and environmental factors depending on the position of a masonry element within the overall structure and taking into account the effect of protection, or lack of protection, by constructional details or finishes

### 1.5.4 Term relating to masonry units

#### 1.5.4.1

##### **accessory masonry unit**

a masonry unit which is shaped to provide a particular function, e.g. to complete the geometry of the masonry