



National Standards Authority of Ireland

IRISH STANDARD

ENV 1996-1-2: 1995

ICS 13.220.50

91.010.30

**EUROCODE 6 : DESIGN OF MASONRY  
STRUCTURES - PART 1-2 : GENERAL RULES -  
STRUCTURAL FIRE DESIGN**

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

**ADOPTED EUROPEAN PRESTANDARD  
PRENORME EUROPÉENNE ADOPTÉE  
ANGENOMMENE EUROPÄISCHE VORNORM**

**ENV 1996-1-2:1995**

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

**Date of ratification\*(dor): 1994-06-10**

\*In the case of an ENV, this is the date of acceptance

**Mandated  
BC/CEN/90/10.44**

1995-07-05

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Sehr geehrte Mitglieder,

aufgrund des positiven Ergebnisses der formellen Abstimmung senden wir Ihnen den ratifizierten Text der o.g. Europäischen Vornorm in den offiziellen Sprachfassungen zwecks Übernahme als Nationale Norm unter Ihrer Verantwortung.

Ihre Verpflichtungen als CEN-Mitglied in Bezug auf Europäische Vornormen sind in der CEN/CENELEC Geschäftsordnung, Abschnitt 7, Absatz 7.6 festgelegt.

Wir bitten Sie, uns jede Information hinsichtlich der Übernahme dieser Europäischen Vornorm und/oder die Form unter der die ENV verfügbar ist in Ihrem Land entsprechend der o.g. Geschäftsordnung zu übersenden.

In Übereinstimmung mit den Entscheidungen des Verwaltungsrates bezüglich der Verbesserung der Transparenz und Verfügbarkeit von ENVs kann der ratifizierte Text der ENVs schon vor der Übernahme als Nationale Normen verkauft werden.

Anbei senden wir Ihnen eine Anmerkung auf blauem Papier, die als Deckblatt für den ratifizierten Text während dieser Interimperiode gebraucht werden soll.

Mit freundlichen Grüßen

Dear Members,

Further to the favourable result of the formal vote, please find enclosed the text of the above-mentioned European Prestandard in the official languages of CEN in view of its implementation as National Standard under your responsibility.

Your obligations as a CEN member towards European Prestandards are laid down in the CEN/CENELEC Internal Regulations, clause 7, subclause 7.6.

We kindly request you to send us all information concerning your action for the implementation of this European Prestandard and/or the means by which this ENV has been made available in your country according to the above-mentioned regulations.

In accordance with the decisions of the Administrative Board of CEN aiming at an improvement of the transparency and availability of ENVs, the ratified text of the ENVs may be sold in anticipation of the National Standards transposing those ENVs.

We enclose for your convenience a notice printed on blue coloured paper which is to be used as a cover page for the ratified text during this interim period.

Yours faithfully,

J. REPUSSARD  
Secrétaire Général  
CEN

Chers Membres,

Suite au résultat favorable du vote formel, nous vous prions de trouver ci-joint le texte définitif de la Prénorme Européenne ci-dessus mentionnée dans les langues officielles du CEN en vue de sa transposition comme Norme Nationale sous votre responsabilité.

Vos obligations comme membre du CEN vis-à-vis des Prénormes Européennes sont établies dans le Règlement Intérieur du CEN/CENELEC, article 7, paragraphe 7.6.

Nous vous demandons de nous envoyer toute information concernant votre action pour la transposition de cette Prénorme Européenne et/ou la forme sous laquelle cette ENV a été rendue disponible dans votre pays selon le règlement mentionné ci-dessus.

Selon les décisions du Conseil d'Administration du CEN pour améliorer la transparence et la disponibilité des ENV, le texte ratifié des ENV peut être vendu en anticipation des normes nationales transposant ces ENV.

Nous joignons pour votre facilité un avertissement imprimé sur du papier bleu destiné à être utilisé comme page de garde du texte ratifié durant cette période transitoire.

Veuillez agréer, Chers Membres, l'expression de nos sentiments distingués.

Enclosures

PP/BONGA



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ICS 13.220.50; 91.080.30

Descriptors: buildings, construction, masonry work, building codes, computation, fire tests

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

This European Prestandard (ENV) was approved by CEN on 1994-06-10 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into an European Standard (EN).

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

**Page 2**  
**ENV 1996-1-2:1995**

**Contents**

	<b>Page</b>
<b>Foreword</b>	<b>3</b>
<b>1 General</b>	<b>7</b>
1.1 Scope	7
1.2 Normative references	7
1.3 Definitions	9
1.4 Symbols	10
1.5 Units	11
<b>2 Basic principles</b>	<b>11</b>
2.1 Performance requirements	11
2.2 Actions	12
2.3 Design values of material properties	12
2.4 Assessment methods	12
<b>3 Fire resistance of masonry walls</b>	<b>13</b>
3.1 General information on the design of walls	13
3.2 Materials for use in masonry walls	14
3.3 Additional requirements related to masonry walls	16
3.4 Assessment by testing	16
3.5 Assessment by tables	16
3.6 Assessment by calculation	17
<b>Annexes</b>	
<b>A Testing the fire resistance of masonry walls</b>	<b>18</b>
<b>B Guidance on selection of fire resistance periods</b>	<b>19</b>
<b>C Assessment by tables</b>	<b>20</b>

## **Foreword**

### **Objectives of the Eurocodes**

- (1) The Structural Eurocodes comprise a group of standards for the structural and geotechnical design of buildings and civil engineering works.
- (2) They cover execution and control only to the extent that it is necessary to indicate the quality of the construction products, and the standard of workmanship needed on and off site to comply with the assumptions of the design rules.
- (3) Until the necessary set of harmonized technical specifications for products and for the methods for testing their performance are available, some of the Structural Eurocodes cover some of these aspects in informative annexes.

### **Background of the Eurocode programme**

- (4) The Commission of the European Communities (CEC) initiated the work of establishing a set of harmonized technical rules for the design of building and civil engineering works which would initially serve as an alternative to the different rules in force in the various member states and would ultimately replace them. These technical rules became known as the Structural Eurocodes.
- (5) In 1990, after consulting their respective Member States, the CEC transferred the work of further development, issue and updating of the Structural Eurocodes to CEN, and the EFTA secretariat agreed to support the CEN work.
- (6) CEN Technical Committee CEN/TC 250 is responsible for all Structural Eurocodes.

### **Eurocode programme**

- (7) Work is in hand on the following Structural Eurocodes, each generally consisting of a number of parts:-

EN 1991 Eurocode 1 : Basis of design and 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 alloy structures.

(8) Separate sub-committees have been formed by CEN/TC250 for the various Eurocodes listed above.

(9) This Part 1-2 of ENV 1996 is being published as a European Prestandard (ENV) with an initial life of three years.

(10) This prestandard is intended for experimental application and for the submission of comments.

(11) After approximately two years, CEN members will be invited to submit formal comments to be taken into account in determining future actions.

(12) Meanwhile feedback and comments on this prestandard should be sent to the Secretariat of CEN/TC 250/SC6 at the following address:-

DIN  
Burggrafenstrasse 6  
D-10787 Berlin  
Germany

or to your national standards organization.

#### National Application Documents (NAD's)

(13) In view of the responsibilities of authorities in member countries for safety, health and other matters covered by the essential requirements of the Construction Products Directive (CPD), certain safety elements in this ENV have been assigned indicative values which are identified by  ("boxed values"). The authorities in each member country are expected to review the "boxed values" and may substitute alternative definitive values for these safety elements for use in national application.

(14) Some of the supporting European or International standards may not be available by the time this prestandard is issued. It is therefore anticipated that a National Application Document (NAD) giving any substitute definitive values for safety elements, referencing compatible supporting standards and providing guidance on the national application of this prestandard, will be issued by each member country or its standards organisation.

(15) It is intended that this prestandard is used in conjunction with the NAD valid in the country where the building and civil engineering work is located.



### **Matters specific to this prestandard**

(16) The scope of Eurocode 6 is defined in clause 1.1.1 of ENV 1996-1-1 and the scope of this Part of Eurocode 6 is defined in clause 1.1. Additional parts of Eurocode 6 which are planned are indicated in clause 1.1.3 of ENV 1996-1-1.

(17) 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.

(18) 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 capacity 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."

(19) According to the Interpretative Document "Safety in Case of Fire" the Essential Requirement may be observed by following various fire safety strategies, including passive and active fire protection measures.

(20) The Structural Eurocodes deal with specific aspects of passive fire protection in terms of designing structures and parts thereof for adequate load-bearing capacity and for limiting spread as relevant.

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

(22) This Part 1-2 of ENV 1996, together with ENV 1991-2-2, gives differences from or the supplements to ENV 1996-1-1 which are necessary so that structures designed according to this set of Structural Eurocodes may also comply with structural fire resistance requirements.

(23) A full analytical procedure for structural fire design would take into account the behaviour of the structural system at elevated temperatures, the potential heat exposure and

the beneficial effects of active fire protection systems, together with the uncertainties associated with these three features and the importance of the structure (consequences of failure). At the present time a full analytical procedure is not available for masonry, but one is being developed.

(24) At the present time it is possible to undertake a procedure for determining adequate performance which incorporates some, if not all, of these parameters and to demonstrate that the structure, or its components, will give adequate performance in a real building fire. However, the principal current procedure in European countries is one based on results from standard fire resistance tests. The grading system in regulations, which call for specific periods of fire resistance, takes into account (though not explicitly) the features and uncertainties described above.

(25) Due to the limitations of the test method, further tests or analyses may be used. Nevertheless, the results of standard fire tests form the bulk of the input to calculation methods for structural fire design. This prestandard therefore deals in the main with design for the standard fire resistance.

(26) Application of this Part of ENV 1996 with the thermal actions given in ENV 1991-2-2 is illustrated in table 1.

**Table 1: Design procedure**

Thermal actions given in ENV 1991-2-2	Design by prescriptive rules/tabulated data given in this Part of ENV 1996	Design by calculation methods given in this Part of ENV 1996
standard temperature-time curve	mainly from fire resistance tests	not yet applicable
other nominal temperature-time curves	not yet applicable	not yet applicable

## **1 General**

### **1.1 Scope**

(1)P This Part 1-2 of ENV 1996 deals with the design of masonry structures for the accidental situation of fire exposure and shall be used in conjunction with ENV 1996-1-1 and ENV 1991-2-2 . This Part identifies only differences from or supplements to normal design.

(2) This Part deals only with passive methods of fire protection. Active methods are not covered.

(3) This Part 1-2 of ENV 1996-1 applies to elements of building structures which, for reasons of general fire safety, are required to fulfil certain functions in exposure to fire, in terms of:

- avoiding premature collapse of the structure (load-bearing function).
- limiting fire spread (flames, hot gases, excessive heat) and temperature rise beyond designated areas (separation failure).

(4) This Part gives Principles and Application Rules (see 1.2 in ENV 1996-1-1) for designing structures for specified requirements in respect of the aforementioned functions and levels of performance.

(5) This Part applies only to those masonry structures, or parts thereof, that are described in ENV 1996-1-1 and ENV 1996-2<sup>1)</sup> and are designed accordingly. This Part deals with the following:

- non-loadbearing internal walls.
- non-loadbearing external walls.
- loadbearing internal walls with separating or non-separating functions.
- loadbearing external walls with separating or non-separating functions.

### **1.2 Normative references**

(1) This European prestandard 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 prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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<sup>1)</sup> ENV 1996-2 is in course of preparation.

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