National Standards Authority of Ireland

STANDARD

ENV 1992-1-2:1996

ICS 91.100.01

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EUROCODE 2 : DESIGN OF CONCRETE STRUCTURES -

PART 1-2 : GENERAL RULES - STRUCTURAL FIRE DESIGN

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IRISH NATIONAL APPLICATION DOCUMENT

FOR

EUROCODE 2 : DESIGN OF CONCRETE STRUCTURES

PART 1-2 : GENERAL RULES

STRUCTURAL FIRE DESIGN (ENV 1992-1-2:1995)

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EUROCODE 2 : PART 1-2

STRUCTURAL FIRE DESIGN (ENV 1992-1-2:1995)

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1 SCOPE

This document is intended to provide the minimum additional information required to permit the application of Eurocode 2 : Design of Concrete Structures - Part 1-2 : General Rules, Structural Fire Design (ENV 1992-1-2:1995).

The NAD is intended to provide an opportunity to apply the ENV in an experimental way and the philosophy adopted in Ireland is to accept the ENV with the minimum of modification subject to satisfaction of the Building Regulations.

The scope is defined in clause 1.1 of ENV 1992-1-2.

2 CLARIFICATIONS AND ADDITIONAL REQUIREMENTS.

1 This ENV is to be used in conjunction with XIS.ENV 1991.1, XIS.ENV 1991.2.2 and XIS.ENV 1992.1.1.

2 The information given in (22) on page 5 of the ENV is subject to the requirements of the National Application Document for XIS.ENV 1991-2-2.

3 Referring to Clause 1.3, European fire test standards are being developed but are not yet available. For the purposes of this ENV, the relevant fire resistance test standards shall be those indicated below;

BS 476; Fire tests on building materials and structures;

Part 20: 1987 Methods for the determination of fire resistance of elements of construction (general principles).

Part 21: 1987 Methods for determination of the fire resistance of loadbearing elements of construction

Part 22: 1987 Methods for determination of the fire resistance of non-loadbearing elements of construction.

Part 23: 1987 Methods for determination of the contribution of components to the fire resistance of a structure.

4 The definition given in 1.4.16 shall be altered as follows;
1.4.16 Standard Fire Resistance: Standard fire resistance shall mean the ability of the structure (or part of the structure) to fulfil required performance criteria set out in BS476: Part 20: 1987 (loadbearing capacity, integrity, insulation) for a specified period of time.

5 Referring to Clause 2.1, the performance requirements should be determined by reference to the National Application Document for XIS.ENV 1991-2-2.

3 REFERENCE DOCUMENTS

Clauses in ENV 1992-1-2	Document	Document for use in Ireland
Throughout	ENV 1992-1-1	XIS/ENV 1992-1-1
4.2.4.2(2)	ENV 1992-1-6	XIS/ENV 1992-1-6

4 BOXED VALUES

The indicative values shown boxed in the ENV may be used without alteration with the exception of the value of h_s of 80, given in the first line of column 5 (REI 30) in both Table 4.10 and 4.11, which should be changed to 60 and the value of 20% given in line 2 of the third paragraph of 4.2.1(3) which should be changed to 10%.

5 Feedback

You are invited to provide feedback on this document to Mr D Burns of The National Standards Authority for Ireland.

EUROPEAN PRESTANDARD

ENV 1992-1-2

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

November 1995

ICS 91.040.00; 91.080.40

Descriptors: buildings, concrete structures, design, computation, fire resistance

English version

Eurocode 2: Design of concrete structures - Part 1-2: General rules - Structural fire design

Eurocode 2: Calcul des structures en béton - Partie 1-2: Règles générales - Calcul du comportement au feu

Eurocode 2: Planung von Stahlbeton- und Spannbetontragwerken - Teil 1-2: Allgemeine Regeln - Tragwerksbemessung für den Brandfall

This European Prestandard (ENV) was approved by CEN on 1994-01-14 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 existance 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

Contents

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 is necessary to indicate the quality of the construction products, and the standard of the workmanship needed to comply with the assumptions of the design rules.

(3) Until the necessary set of harmonized technical specifications for products and for the methods of testing their performance are available, some of the Structural Eurocodes cover some of these aspects in informative Annexes.

Background of the Eurocode program

(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/TC250 is responsible for all Structural Eurocodes.

Eurocode program

(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 provisions for earthquake resistance of structures
EN 1999 Eurocode 9 Design of aluminium alloy structures

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

(9) This Part 1-2 of Eurocode 2 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/TC250/SC2 at the following address:

Deutsches Institut für Normung e.V. (DIN)
Burggrafenstrasse 6
D-10787 Berlin
Phone:(+49) 30 2601 2501
Fax:(+49) 30 2601 1231

or to your national standards organisation

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 assign definitive values to these safety elements.

(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 definitive values for safety elements, referencing compatible supporting standards and providing national guidance on the 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 or civil engineering works is located.

Matters specific to this prestandard

(16) The scope of Eurocode 2 is defined in 1.1.1 of ENV 1992-1-1 and the scope of this Part of Eurocode 2 is defined in 1.1. Additional Parts of Eurocode 2 which are planned are indicated in 1.1.3 of ENV 1992-1-1; these will cover additional technologies or applications, and will complement and supplement this Part.

(17) In using this Prestandard in practice, particular regard should be paid to the underlying assumptions and conditions given in 1.3 of ENV 1992-1-1.

(18) The provisions of this Prestandard are based substantially on recent CEB and FIP documents.

(19) This Part 1-2 of Eurocode 2 complements ENV 1992-1-1 for the particular aspects of structural fire design of concrete structures. The provisions in this Part 1-2 have to be considered additionally to those in other Parts of ENV 1992.

(20) The framework and structure of this Part 1-2 do not correspond to ENV 1992-1-1.

(21) This Part 1-2 contains five sections and four informative Annexes. These Annexes have been introduced by moving some of the more detailed Application Rules, which are needed in particular cases, out of the main part of the text to aid its clarity.

(22) 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.

1 General

1.1 Scope

(1)P ENV 1992-1-2 deals with the design of concrete structures for the accidental situation of fire exposure and shall be used in conjunction with ENV 1992-1-1 and ENV 1991-2-2. It provides additions to and identifies differences from the design of structures at normal temperatures.

(2)P Part 1-2 applies only to passive methods of fire protection. Active methods are not included.

(3)P Part 1-2 applies to structures which for reasons of general fire safety, are required to fulfil the following criteria when exposed to fire:

- avoid premature collapse of the structure (load-bearing function)
- limit fire spread (flames, hot gases, excessive heat) beyond designated areas (separation function)

(4)P Part 1-2 gives Principles and Application Rules (see 1.2 in ENV 1992-1-1) in respect to the design of structures to fulfil the criteria given in (3)P (e.g. in terms of required standard fire resistance).

(5)P Part 1-2 applies to those structures or parts of structures which are within the scope of Part 1-1, 1-3 to 1-6. However, it does not cover:

- structures with prestressing by external tendons
- shell structures.

(6) For structures using unbonded tendons reference should be made to 4.1(6) and 4.2.2(6).

1.2 Distinction between principles and application rules

(1) Depending on the character of the individual clauses, distinction is made in this Part between principles and application rules.

(2) The principles comprise:

- general statements and definitions for which there is no alternative, as well as
- requirements and analytical models for which no alternative is permitted unless specifically stated.

(3) The principles are identified by the letter P following the paragraph number.

(4) The application rules are generally recognized rules which follow the principles and satisfy their requirements.