BRITISH STANDARD

BS EN 15037-1:2008

Precast concrete products — Beam-and-block floor systems —

Part 1: Beams

ICS 91.100.30

National foreword

This British Standard is the UK implementation of EN 15037-1:2008.

The UK participation in its preparation was entrusted to Technical Committee B/524, Precast concrete products.

A list of organizations represented on this committee can be obtained on request to its secretary.

EN 15037-1 is a candidate "harmonized" European standard and fully takes into account the requirements of the European Commission mandate M/100, Precast concrete products, given under the EU Construction Products Directive (89/106/EEC), and is intended to lead to CE marking. The date of applicability of EN 15037-1 as a harmonized European Standard, i.e. the date after which this standard may be used for CE marking purposes, is subject to an announcement in the *Official Journal of the European Communities*.

EN 15037-1:2008 is the subject of transitional arrangements agreed under the European Commission mandate. Member States have agreed a transition period for the co-existence of BS EN 15037-1:2008 and its corresponding national standard(s). It is intended that this period will comprise a period, usually nine months, after the date of availability of the European Standard, during which any required changes to national regulations are to be made, followed by a further period, usually of 12 months, for the implementation of CE marking. At the end of this co-existence period, the national standard(s) will be withdrawn. In the UK, there are no corresponding national standards of national origin.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2008

ISBN 978 0 580 54648 8

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15037-1

April 2008

ICS 91.100.30

English Version

Precast concrete products - Beam-and-block floor systems - Part 1: Beams

Produits préfabriqués en béton - Systèmes de planchers à poutrelles et entrevous - Partie 1: Poutrelles

Betonfertigteile - Balkendecken mit Zwischenbauteilen - Teil 1: Balken

This European Standard was approved by CEN on 30 June 2007.

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 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 Management Centre has the same status as the official versions.

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

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 15037-1:2008: E

Contents

Page

The numbering of clauses is strictly related to EN 13369: *Common rules for precast concrete products*, at least for the first three digits. When a clause of EN 13369 is not relevant or included in a more general reference of this standard, its number is omitted and this may result in a gap on numbering.

Foreword

This document (EN 15037-1:2008) has been prepared by Technical Committee CEN/TC 229 “Precast concrete products”, the secretariat of which is held by AFNOR, and was examined by and agreed with a joint working party appointed by the Liasion Group CEN/TC 229-TC 250, particulary for its compatibility with structural Eurocodes.

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 October 2008, and conflicting national standards shall be withdrawn at the latest by April 2011.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

European Standard for beam-and-block floor system is made of 5 parts:

— EN 15037-1, *Precast concrete products - Beam-and-block floor systems — Part 1: Beams*

— prEN 15037-2, *Precast concrete products - Beam-and-block floor systems — Part 2: Concrete blocks*[1)]

— prEN 15037-3, *Precast concrete products - Beam-and-block floor systems — Part 3: Clay blocks*[1)]

— prEN 15037-4, *Precast concrete products - Beam-and-block floor systems — Part 4: Polystyrene blocks*[1)]

— prEN 15037-5, *Precast concrete products - Beam-and-block floor systems — Part 5: Lightweight blocks* [1)]

This standard is one of a series of product standards for precast concrete products.

For common aspects reference is made to EN 13369: *Common rules for precast concrete products*, from which also the relevant requirements of the EN 206-1: *Concrete — Part 1: Specification, performance, production and conformity* are taken.

The references to EN 13369 by CEN/TC 229 product standards are intended to make them homogeneous and to avoid repetitions of similar requirements.

Eurocodes are taken as a common reference for design aspects. The installation of some structural precast concrete products is dealt with by ENV 13670-1: *Execution of concrete structures — Part 1: Common rules*, which has at the moment the status of a European Prestandard. In all countries it can be accompanied by alternatives for national application and it should not be treated as a European Standard.

The program of standards for structural precast concrete products comprises the following standards, in some cases consisting of several parts:

EN 1168, *Precast concrete products — Hollow core slabs*

EN 12794, *Precast concrete products — Foundation piles*

EN 12843, *Precast concrete products — Masts and poles*

---

1) to be developed

EN 13224, *Precast concrete products — Ribbed floor elements*

EN 13225, *Precast concrete products — Linear structural elements*

EN 13693, *Precast concrete products — Special roof elements*

EN 13747, *Precast concrete products — Floor plates for floor systems*

EN 13978, *Precast concrete products — Precast concrete garages*

EN 14843, *Precast concrete products — Stairs*

EN 14844, *Precast concrete products — Box culverts*

EN 14991, *Precast concrete products — Foundation elements*

EN 14992, *Precast concrete products — Wall elements*

EN 15050, *Precast concrete products — Bridge elements*

prEN 15258, *Precast concrete products — Retaining wall elements*

This standard defines in Annex ZA the application methods of CE marking to products designed using the relevant EN Eurocodes (EN 1992-1-1:2004 and EN 1992-1-2:2004). Where, in default of applicability conditions of EN Eurocodes to the works of destination, design Provisions other than EN Eurocodes are used for mechanical strength and/or fire resistance, the conditions to affix CE marking to the product are described in ZA.3.4.

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, 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.

Introduction

The evaluation of conformity given in this standard refers to the completed precast elements which are supplied to the market and covers all the production operations carried out in the factory.

For design rules reference is made to EN 1992-1-1:2004. Additional complementary rules are provided where necessary.

Recommendations for beam-and-block floor systems are presented in informative annexes about monolithism of composite floor systems (Annex C), detailing of supports and anchorage reinforcement (Annex D), design of composite floor systems (Annex E), design of self-bearing beams (Annex F), diaphragm action (Annex G), resistance to fire (Annex K) and acoustic insulation (Annex L).

According to 1.2 of EN 1992-1-1:2004 the complementary rules, given in informative annexes in this standard, comply with the relevant principles given in EN 1992-1-1.

Because of the fact that the experimental evidence is mainly based on elements with limited depth and width this standard is applicable to elements with these limited dimensions. This limitation is not intended to prohibit the application of elements with larger sizes, but the experience is not yet wide enough to draw up standardised design rules.

In 4.2.3, 4.3.2, 4.3.3 and 4.3.4, this standard includes specific provisions resulting from the application of EN 1992-1-1:2004 and EN 1992-1-2:2004 rules made specific for the concerned product. The use of these provisions is consistent with a design of works made with EN 1992-1-1:2004 and EN 1992-1-2:2004.

1 Scope

This European Standard deals with the requirements, the basic performance criteria and evaluation of conformity for precast beams made of reinforced or prestressed normal weight concrete according to EN 1992-1-1:2004, with or without clay shell, used in conjunction with blocks in compliance with prEN 15037-2 or prEN 15037-3 or prEN 15037-4 or prEN 15037-5, with or without cast in-situ concrete for the construction of beam-and-block floor and roof systems. Examples of typology of floor and roof systems are given in Annex B.

It is essential that the total depth of the beam be comprised between 60 mm and 500 mm and the beams be at centres of not more than 1,00 m.

For higher depth, it is essential that the precast concrete beams be in compliance with EN 13225.

The products covered by this standard are intended to be used as structural floor and roof systems, including parking areas for light vehicles corresponding to traffic category F of EN 1991-1-1:2002, which are not subjected to fatigue loading.

The products may be used in seismic areas provided they fulfil the requirements specific to this use.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1990:2002, *Eurocode — Basis of structural design*

EN 1992-1-1:2004, *Eurocode 2: Design of concrete structures — Part 1-1: General rules and rules for buildings*

EN 1992-1-2:2004, *Eurocode 2: Design of concrete structures — Part 1-2: General rules — Structural fire design*

EN 10080:2005, *Steel for the reinforcement of concrete — Weldable reinforcing steel — General*

EN 12390-4:2000, *Testing hardened concrete — Part 4: Compressive strength — Specification for testing machines*

EN 13369:2004, *Common rules for precast concrete products*

prEN 15037-2, Precast concrete products — Beam-and-block floor systems — Part 2: Concrete blocks

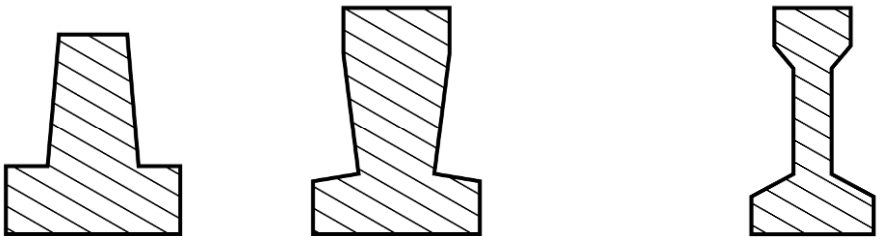
prEN 15037-3, Precast concrete products — Beam-and-block floor systems — Part 3: Clay blocks

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13369:2004 and the following apply.

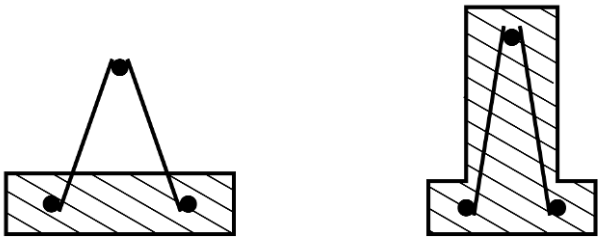
3.1
beam
linear structural element of small cross-sectional area, made of reinforced concrete or prestressed concrete, entirely or partially precast

NOTE It may include elements which may or may not contribute to its strength (e.g. clay lower toe, clay shells) as shown in Figure 1

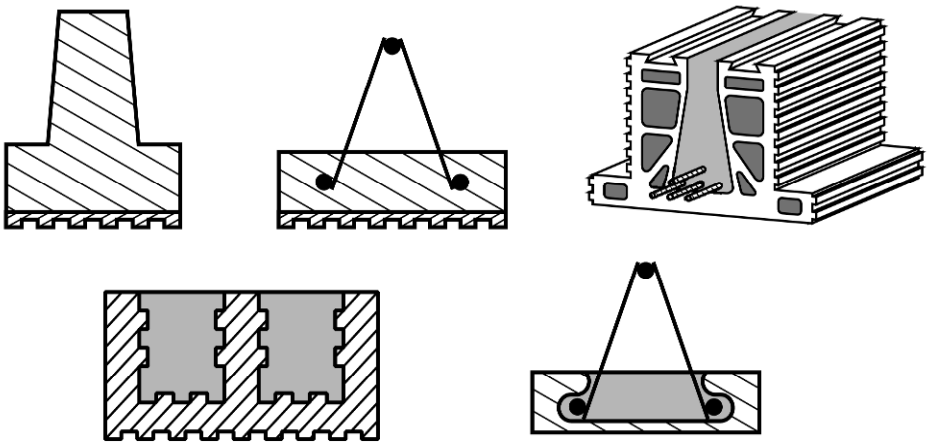


a) inverted T beams

b) I beams



c) beams with lattice girder



d) beams with clay shells

Figure 1 — Examples of beams

3.2
prestressed concrete beam
beam prestressed by pretensioning of prestressing steel which constitute the main reinforcement of the floor system

3.3
reinforced concrete beam
beam whose longitudinal reinforcement made of reinforcing steel constitutes the main reinforcement of the floor system

3.4
self-bearing beam
reinforced or prestressed concrete beam which provides the final strength of the floor system independently of any other constituent part of the floor system