

Precast concrete products — Special roof elements

ICS 91.100.30

National foreword

This British Standard is the UK implementation of EN 13693:2004+A1:2009. It supersedes BS EN 13693:2004 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by **A1** ~~A1~~.

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 13693 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 13693 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 13693 is the subject of transitional arrangements agreed under the Commission mandate. The Member States have agreed a nominal transition period for the co-existence of EN 13993 and their corresponding national standard(s). It is intended that this period will comprise a nominal nine month period, during which any required changes to national regulations are to be made, followed by a further nominal 12 month period 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 At the end of this co-existence period, the national standard(s) will be withdrawn.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.

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 10 December 2004

© BSI 2010

ISBN 978 0 580 64397 2

Amendments/corrigenda issued since publication

| Date | Comments |
|---------------|---|
| 30 April 2010 | Implementation of CEN amendment A1:2009 |
| | |
| | |
| | |

English Version

Precast concrete products - Special roof elements

Produits préfabriqués en béton - Éléments spéciaux de
couverture

Betonfertigteile - Besondere Fertigteile für Dächer

This European Standard was approved by CEN on 24 June 2004 and includes Amendment 1 approved by CEN on 19 June 2009.

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: Avenue Marnix 17, B-1000 Brussels

Contents

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

| | page |
|--|------|
| Foreword..... | 3 |
| Introduction | 5 |
| 1 Scope | 6 |
| 2 Normative references | 6 |
| 3 Terms and definitions | 6 |
| 4 Requirements | 6 |
| 4.1 Material requirements | 6 |
| 4.2 Production requirements | 7 |
| 4.2.1 Concrete production | 7 |
| 4.2.2 Hardened concrete | 7 |
| 4.2.3 Structural reinforcement | 7 |
| 4.3 Finished product requirements | 7 |
| 4.3.1 Geometrical properties | 7 |
| 4.3.2 Surface characteristics | 8 |
| 4.3.3 Mechanical resistance | 9 |
| 4.3.4 Resistance and reaction to fire | 9 |
| 4.3.5 Acoustic properties | 9 |
| 4.3.6 Thermal properties | 9 |
| 4.3.7 Durability | 9 |
| 4.3.8 Other requirements | 10 |
| 5 Test methods | 10 |
| 5.1 Tests on concrete | 10 |
| 5.2 Measuring of dimensions | 10 |
| 5.3 Weight of the elements | 11 |
| 5.4 Load test of elements | 11 |
| 6 Evaluation of conformity | 11 |
| 6.1 General | 11 |
| 6.2 Type testing | 11 |
| 6.3 Factory production control | 11 |
| 7 Marking and labelling | 12 |
| 8 Technical documentation | 12 |
| Annex A (informative) Terminology of plate elements | 13 |
| Annex B (informative) Types of products | 15 |
| Annex C (informative) Mechanical behaviour | 23 |
| Annex D (informative) Serviceability and resistance verifications | 28 |
| Annex E (informative) Flexural test of elements | 32 |
| Annex F (normative) A₁ Complementary elements A₁ | 39 |
| Annex Y (Informative) Choice of CE marking method | 43 |
| Annex ZA (informative) A₁ Relationship between this European Standard and the essential requirements of EU Directive 89/106/EEC, EU Construction Products Directive A₁ | 44 |
| Bibliography | 58 |

Foreword

This document (EN 13693:2004+A1:2009) has been prepared by Technical Committee CEN/TC 229 “Precast concrete products”, the secretariat of which is held by AFNOR. A1 This document was examined by and agreed with a joint working party appointed by the Liaison Group CEN/TC 229 – CEN/TC 250, particularly for its compatibility with structural Eurocodes. A1

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 January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

This document includes Amendment 1, approved by CEN on 2009-06-19.

This document supersedes EN 13693:2004.

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

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 Construction Products Directive (89/106/EEC) of European Union (EU).

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

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 products*, from which also the relevant requirements of the *EN 206-1: Concrete - Part 1: Specification, performances, production and conformity* are taken.

The references to EN 13369 by CEN/TC229 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 an European prestandard. In all countries it can be accompanied by alternatives for national application and it shall not be treated as a European Standard.

The programme 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*
- A1 EN 12794, *Precast concrete products - Foundation piles* A1
- EN 12843, *Precast concrete products - Masts and poles*
- EN 13224, *Precast concrete products - Ribbed floor elements*
- EN 13225, *Precast concrete products - Linear structural elements*
- EN 13693, *Precast concrete products - Special roof elements*
- A1 EN 13747, *Precast concrete products - Floor plates for floor systems* A1
- A1 EN 13978, *Precast concrete products - Precast concrete garages* A1

-  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 15037, *Precast concrete products - Beams for beam-and-block floor systems* 

This standard defines in Annex ZA the application methods of CE marking to products designed using the relevant EN Eurocodes (EN 1992-1-1 and EN 1992-1-2). 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 and resistance to fire principal reference is made to EN 1992-1-1 and EN 1992-1-2. Additional complementary rules are provided where necessary.

In Clause 4.3.3 and 4.3.4 this document includes specific provisions resulting from the application of EN 1992-1-1 and EN 1992-1-2 rules to the concerned product. The use of these provisions is consistent with a design of works made with EN 1992-1-1 and EN 1992-1-2.