

Betoonvalmistooted. Ribipaneelid

Precast concrete products - Ribbed floor elements

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NATIONAL FOREWORD

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English Version

Precast concrete products - Ribbed floor elements

Produits préfabriqués en béton - Eléments de plancher
nervurés

Betonfertigteile - Deckenplatten mit Stegen

This European Standard was approved by CEN on 1 October 2011.

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Foreword

This document (EN 13224:2011) has been prepared by Technical Committee CEN/TC 229 "Precast concrete products", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by August 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13224:2004+A1:2007.

Significant technical changes compared to the previous version are:

- a) change in the scope to also cover elements with bottom slab (as shown in Annex A);
- b) deletion of the requirement on planarity (in 4.3.1.1 and 5.2);
- c) deletion of the requirement on camber or sag (in 4.3.1.1 and 5.2);
- d) addition of a rule for elements without shear reinforcement in 4.3.3.3;
- e) adoption of the new template for Annex ZA.

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 the Construction Products Directive (89/106/EEC) of the 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/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 EN 13670:2009 *Execution of concrete structures*. In all countries it can be accompanied by alternatives for national application.

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*
- EN 12794, *Precast concrete products — Foundation piles*
- 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*
- 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 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, Croatia, 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 the 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, reference is made to EN 1992-1-1 and EN 1992-1-2. Additional complementary rules are provided where necessary.

4.3.3 and 4.3.4 include specific provisions resulting from the application of EN 1992-1-1, and EN 1992-1-2 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 and EN 1992-1-2.

1 Scope

This document identifies the requirements, the basic performance criteria and evaluation of conformity for precast ribbed elements made of reinforced or prestressed normal weight concrete, used in floors or roofs. The elements consist of a top and/or bottom slab and one or more (usually two) ribs; transverse ribs may also be present.

Some examples of precast elements considered in this document are shown in Annex A.

Specific requirements for minor floor elements are listed in Annex B.

This document covers terminology, performance criteria, tolerances, relevant physical properties, test methods and aspects of transport and erection.

This document does not cover load-bearing capacity determined by testing.

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 1991-1-6:2005, *Eurocode 1 — Actions on structures — Part 1-6: General actions — Actions during execution*

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

3 Terms, definitions, and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1992-1-1:2004 and EN 13369:2004 and the following apply.

3.1.1

ribbed precast concrete element

precast unit consisting in a slab stiffened by one or more ribs

3.1.2

minor floor element

ribbed precast floor elements having limited dimensions, which are in compliance with Annex B