



**SLOVENSKI STANDARD**  
**SIST EN 14992:2007+A1:2012**  
**01-november-2012**

**Nadomešča:**  
**SIST EN 14992:2007**

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**Montažni betonski izdelki - Stenski elementi**

Precast concrete products - Wall elements

Betonfertigteile - Wandelemente

Produits préfabriqués en béton - Eléments de mur

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**Ta slovenski standard je istoveten z: EN 14992:2007+A1:2012**

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**ICS:**

91.060.10	Stene. Predelne stene. Fasade	Walls. Partitions. Facades
91.100.30	Beton in betonski izdelki	Concrete and concrete products

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14992:2007+A1**

June 2012

ICS 91.060.10; 91.140.30

Supersedes EN 14992:2007

English Version

## Precast concrete products - Wall elements

Produits préfabriqués en béton - Eléments de mur

Betonfertigteile - Wandelemente

This European Standard was approved by CEN on 17 February 2007 and includes Amendment 1 approved by CEN on 7 April 2012.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Turkey and United Kingdom.

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

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The numbering of clauses is strictly related to EN 13369:2004: *Common rules for precast concrete products*, at least for the first three digits. When a clause of EN 13369:2004 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.

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## Foreword

This document (EN 14992:2007+A1:2012) 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 Liaison Group CEN/TC 229-TC250, particularly 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 December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

This document supersedes EN 14992:2007.

This document includes Amendment 1 approved by CEN on 2012-04-07.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\boxed{A_1}$ .

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 Construction Products Directive(s) (89/106/EEC).

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

This document 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 13369:2004 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.  $\boxed{A_1}$  The installation of some structural precast concrete products is dealt with by EN 13670, *Execution of concrete structures*.  $\boxed{A_1}$   $\boxed{A_1}$  deleted text  $\boxed{A_1}$

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*.

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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 <sup>A1</sup>, *Precast concrete products - Beam-and-block floor systems.*

EN 15050, *Precast concrete products — Bridge elements.*

EN 15258 <sup>A1</sup>, *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 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, 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, Turkey and the United Kingdom.

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## 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. Additional complementary rules are provided where necessary.

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**EN 14992:2007+A1:2012 (E)****1 Scope**

This European Standard applies to prefabricated walls, made of normal weight or lightweight concrete with dense structure. <sup>(A1)</sup> Also fibre reinforced concrete (steel, polymer or other fibres covered by European Standards) may be used. <sup>(A1)</sup> <sup>(A1)</sup> These wall elements <sup>(A1)</sup> may have external wall functions (see 3.11) or not, have facing functions (see 3.12) or not or have a combination of these functions.

External wall functions could be:

- thermal insulation (see 3.11.1);
- sound insulation (see 3.11.2);
- hygrometric control (see 3.11.3);

or a combination of these.

They may be plain, reinforced or prestressed. They may be loadbearing or not.

These include:

- solid walls;
- composite walls;
- sandwich walls;
- lightened walls;
- claddings.

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The wall element may also work as a column or beam.

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

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

EN ISO 12572, *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties (ISO 12572:2001)*

**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 13369:2004 and the following apply. In general the term “product” refers to an element which is produced in large numbers. For general terms see Clause 3 of EN 13369:2004.



**3.1****wall**

vertical or inclined, plane or curved bidimensional unit

**3.2****loadbearing wall**

structural wall element, which carries external loads or is important for the safety of people

EXAMPLE Façade panels and parapets excluding small cladding panels)

**3.3****non loadbearing wall**

wall which carries only its self weight and is not necessary for the building stability or important for the safety of people

**3.4****solid wall**

precast wall of any shape produced as one solid unit including reinforcement and fixtures

NOTE See Figure 1

**3.5****composite wall**

composite wall consisting of two precast reinforced layers which are joined together with a gap by means of a lattice girder system.

NOTE 1 See Figure 2

NOTE 2 On site, the space between the layers is filled with concrete. Composite walls may also consist of a shell with lattice girders with the other side limited by an existing wall or another formwork during the erection

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**3.6****sandwich wall**

consists of a base panel, a thermal insulation layer, a possible air space and a facing panel.

NOTE 1 see Figure 3

NOTE 2 The layers may be connected stiffly or to allow relative in plane displacement between the layers

**3.6.1****facing panel**

outermost layer of a sandwich wall element

**3.6.2****base panel**

structural layer of a sandwich element  $\square_{A1}$ , which can be solid or lightened  $\square_{A1}$

NOTE It transfers its own dead load and the load from the facing panel to the structure. It may also transfer load from other members

**3.7****lightened wall**

wall produced in the precasting plant as a complete unit

NOTE 1 see Figure 4

NOTE 2 It may consist of two external concrete layers and internal blocks of light weight materials (for example foam polystyrene, polyurethane) or hollow-core

**EN 14992:2007+A1:2012 (E)****3.8****cladding**

non loadbearing panel fixed to the structure by means of connecting systems

NOTE 1 see Figure 5

NOTE 2 An insulating system may be inserted between this panel and the loadbearing structure

**3.9****small cladding**

cladding element without reinforcement with a maximum size of 2,25 m<sup>2</sup>, a maximum length of 1,5 m and a thickness smaller than 80 mm

**3.10****plain concrete element**

structural concrete elements having less reinforcement than the minimum reinforcement according to the relevant design code

EXAMPLE EN 1992-1-1:2004, Clause 9.6

**3.11****external wall functions****3.11.1****thermal insulation**

capacity to limit the transfer of thermal flow

**3.11.2****sound insulation**

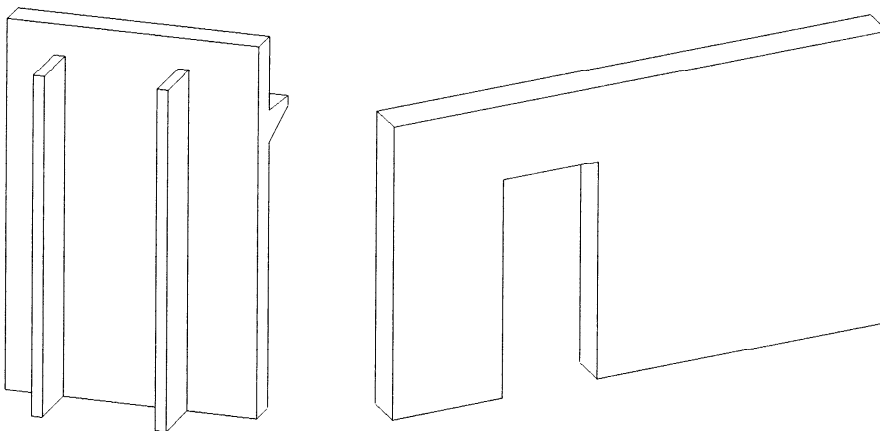
capacity to reduce the transmission of sound

**3.11.3****hygrometric control**

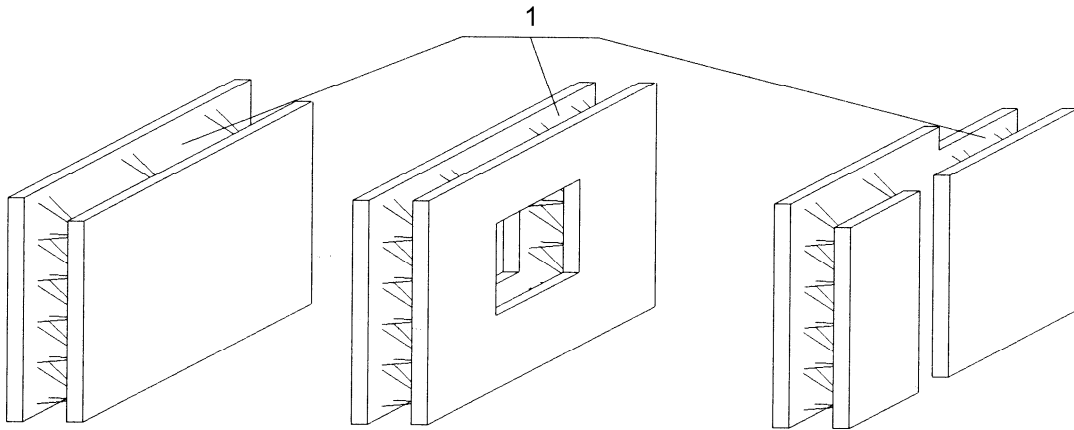
capacity to avoid the forming of condensate in the wall construction and particularly in the insulating materials which are frequently hygroscopic

**3.12****facing function**

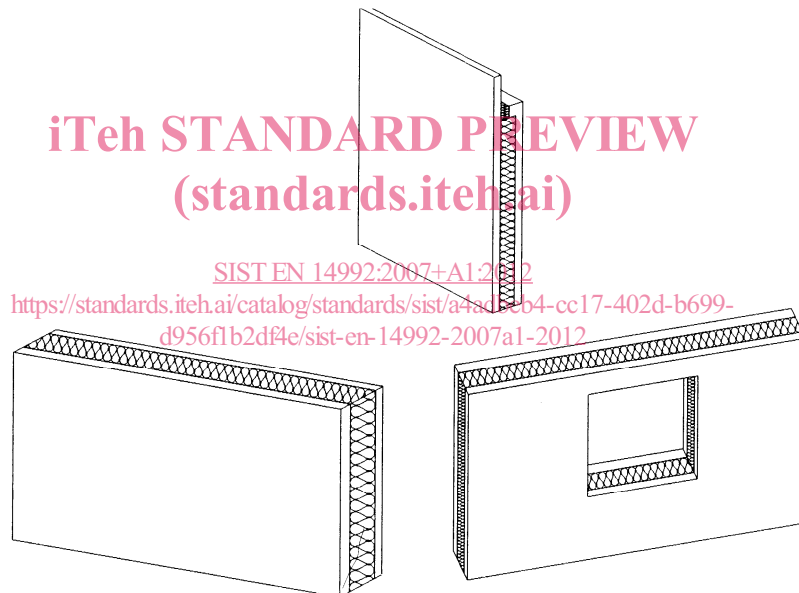
capacity to satisfy special dimensional requirements, esthetical surface requirements, esthetical shape requirements, or a combination of these



**Figure 1 — Examples of solid walls**

**Key**

1 in-situ concrete

**Figure 2 — Examples of composite elements****Figure 3 — Examples of sandwich walls**

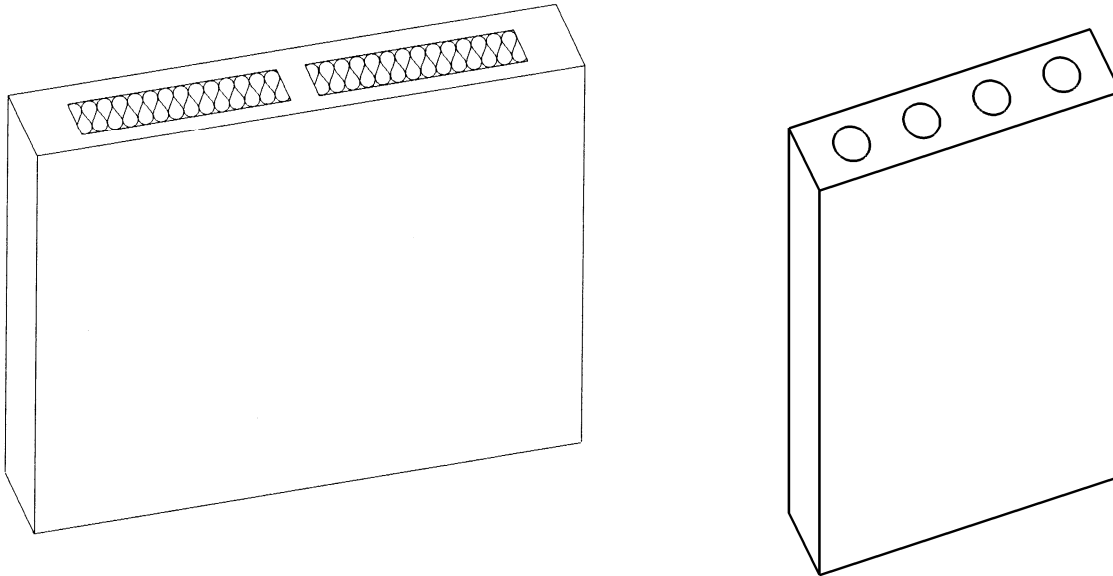


Figure 4 — Example of lightened walls



Figure 5 — Example of cladding elements

## 4 Requirements

### 4.1 Material requirements

Subclause 4.1 of EN 13369:2004 shall apply.

In addition subclause 10.9.4.1 of EN 1992-1-1:2004 shall apply.

Ⓐ) Also fibre reinforced concrete (steel – see EN 14889-1, polymer – see EN 14889-2 or other fibres (see EN 15422) covered by European Standards) may be used, provided the fibres are not taken into account in structural calculation. Ⓐ)

## 4.2 Production requirements

Subclause 4.2 of EN 13369:2004 shall apply.

## 4.3 Finished product requirements

### 4.3.1 Geometrical properties

#### 4.3.1.1 Production tolerances

In addition to subclause 4.3.1.1 of EN 13369:2004 the tolerances indicated in Tables 1 and 2 (compare Figures J.1 to J.6 of EN 13369:2004) shall apply.

If not otherwise stated class B applies to all elements.

**Table 1 — Tolerance of positioning of openings and insert**

Class	Permitted deviation
A	± 10 mm
B	± 15 mm

For inserts designed to match with layer tolerances, different values of positioning tolerances may be given in the Technical documentation.

The tolerance of lengths, heights, thickness, diagonal dimensions are given in Table 2.

**Table 2 — Tolerances of dimensions**

Class	Permitted deviation				
	Reference dimensions				
	0 – 0,5 m	0,5 m – 3 m	> 3 m – 6 m	> 6 m – 10 m	> 10 m
A	± 3 mm <sup>a</sup>	± 5 mm <sup>a</sup>	± 6 mm	± 8 mm	± 10 mm
B	± 8 mm	± 14 mm	± 16 mm	± 18 mm	± 20 mm

<sup>a</sup> ± 2 mm in the case of small claddings.

Stricter tolerances may be required in the Technical documentation.

#### 4.3.1.2 Minimum design (nominal) dimensions

Subclause 4.3.1.2 of EN 13369:2004 shall apply.

### 4.3.2 Surface characteristics

In addition to subclause 4.3.2 of EN 13369:2004 the following shall apply:

If not otherwise stated, values of Table 3 shall apply for the flatness of surfaces (compare Figures J.4 and J.5 of EN 13369:2004).