



SLOVENSKI STANDARD

SIST EN 14843:2007

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Montažni betonski izdelki - Stopnice

Precast concrete products - Stairs

Betonfertigteile - Treppen

Produits préfabriqués en béton - Escaliers

Ta slovenski standard je istoveten z: EN 14843:2007

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English Version

Precast concrete products - Stairs

Produits préfabriqués en béton - Escaliers

Betonfertigteile - Treppen

This European Standard was approved by CEN on 17 February 2007.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14843:2007) 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of an identical text or by endorsement, at the latest by October 2007, and conflicting national standards shall be withdrawn at the latest by January 2009.

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 13369:2004: *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. 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 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.*

prEN 15037, *Precast concrete products - Beam-and-block floor systems.*

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 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.

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Introduction

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

The documentation accompanying a manufactured component will refer to the clauses of this standard with which it complies.

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1 Scope

This standard gives specifications for materials, production, properties, requirements and methods of testing for precast concrete monolithic stairs, and for precast concrete elements (e.g. individual steps) used to make reinforced and/or prestressed concrete stairs.

This standard is applicable to structural stairs for indoor or outdoor use.

This standard covers precast concrete stairs and associated landings of monolithic design or constructed from individual steps supported by beams or columns. Supporting elements may include in situ concrete.

This standard covers terminology, performance criteria, verification methods, tolerances, relevant physical properties, special test methods and specific aspects of transport, erection and connection.

Geometrical properties related to functionality of stairs are not covered by this standard and can be found in National regulations or local practice.

Precast concrete stairs are classified into two main product families :

- monolithic stairs constructed from precast concrete components consisting of flights, landings or a combination of these. They may include vertical supporting elements ;
- stairs constructed from individual steps, whether load bearing or not, assembled on site with, for example, carriages or a central column.

Their shape may be straight or winding.

Stairs may incorporate parapets (on one or both sides) and landings.

Stairs may have simple bearings (e.g. on corbels, walls or beams), bolted connections or they may be connected with reinforcement and in situ concrete.

The surfaces of the precast elements may be exposed or covered by finishes.

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*

3 Terms and definitions

3.1 General

Subclauses 3.1 and J.4 of EN 13369:2004 shall apply.

Terms and definitions for stairs are given in Annex A (informative).

4 Requirements

4.1 Material requirements

Subclause 4.1 of EN 13369:2004 shall apply.

4.2 Production requirements

Subclause 4.2 of EN 13369:2004 shall apply.

The concrete shall have a minimum class of C30/37 for reinforced or prestressed concrete stairs.

4.3 Finished product requirements

4.3.1 Geometrical properties

4.3.1.1 Production tolerances

Unless stricter tolerances are given in the project specification, subclause 4.3.1.1 of EN 13369:2004 shall apply except for the amendments given in Table 1 below.

Table 1 — Amendment to EN 13369:2004, Table 4
Permitted deviations of cross-sections for structural elements

Target dimension of the cross-section in the direction to be checked	ΔL^a (mm)	Δc^b (mm)
$L \leq 150$ mm	+ 10 - 5	± 5
$L \geq 400$ mm	± 15	+ 15 - 10
Linear interpolation for Intermediate values. ^a The difference between two consecutive rises shall not exceed 6 mm. ^b The minimum concrete cover defined in 4.3.7 shall take into account the depth of any concrete removed by a finishing process. The positioning of reinforcement shall ensure that the minimum cover defined in 4.3.7 is achieved. NOTE 1 ΔL and the positive values for Δc (upper permitted deviation) are given to ensure that deviations in cross-sectional dimensions and in the position of the reinforcement do not exceed values covered by the relevant safety factors in the Eurocodes. NOTE 2 The negative values for Δc (lower permitted deviation) are given for durability purposes.		

4.3.1.2 Minimum nominal dimensions

The minimum nominal dimensions of Table 2 shall apply.

Table 2 — Minimum nominal dimensions (mm)

Dimension	Minimum dimension
Thickness of a step or landing	45
Thickness of a wall	80
Thickness of a parapet	60
Wall thickness of a hollow element	45
Plan dimensions of a column	120

In case of 45 mm of thickness, special care shall be paid to the correct positioning of reinforcement.

4.3.2 Surface characteristics

Subclause 4.3.2 of EN 13369:2004 shall apply.

The tolerances for surface characteristics listed in Table 3 shall be permitted for precast concrete stair components.

Table 3 — Permitted deviations for surface characteristics (sizes in mm)

L = length of the reference ruler ^a $\Delta d = d_1 - d_2$	$\Delta d \leq (2 + L / 500)$
^a See 5.2 https://standards.iteh.ai/catalog/standards/sist/763d5ab0-bfee-48fa-9101-cbf05b21e6e8/sist-en-14843-2007	

NOTE A client may inform the producer that specific surfaces are intended to be finished with paint or a thin coating.

4.3.3 Mechanical resistance

4.3.3.1 General

Subclause 4.3.3.1 of EN 13369:2004 shall apply.

4.3.3.2 Verification by calculation

Subclause 4.3.3.2 of EN 13369:2004 shall apply.

Both static and dynamic loading should be considered.

NOTE 1 For steps less than 80 mm thick or independent steps, the dynamic coefficient may be defined in National regulations or other rules valid in the place of use of the product.

NOTE 2 For accidental actions and robustness requirements see National regulation.

4.3.3.3 Verification by calculation aided by testing

Subclause 4.3.3.3 of EN 13369:2004 shall apply.

The test methods recommended in Annex B may be used to support verification by calculation.

4.3.4 Resistance and reaction to fire

4.3.4.1 General

Subclauses 4.3.4.1 of EN 13369:2004 shall apply.

4.3.4.2 Resistance to fire

Subclauses 4.3.4.2 and 4.3.4.3 of EN 13369:2004 shall apply.

4.3.4.3 Reaction to fire

Subclause 4.3.4.4 of EN 13369:2004 shall apply.

4.3.5 Acoustic properties

Subclause 4.3.5 of EN 13369:2004 shall apply.

4.3.6 Thermal properties

Subclause 4.3.6 of EN 13369:2004 shall apply.

4.3.7 Durability

Subclause 4.3.7 of EN 13369:2004 shall apply, except for the minimum concrete cover for stair corbels defined in subclause 4.3.9.

4.3.8 Other requirements

Subclause 4.3.8 of EN 13369:2004 shall apply.

4.3.9 Detailing

The detailing of the element, with respect to geometrical data and complementary properties of materials and inserts shall be given in technical documentation, which shall include the construction data, such as the dimensions, the tolerances, the layout of reinforcement, the concrete cover, the expected transient and final support conditions and lifting conditions. In particular, the technical documentation shall include the maximum acceptable gap between components when erected to ensure the design overlap of the reinforcement is achieved (see 10.9.4.7 of EN 1992-1-1:2004).

The design of the bearings shall be in accordance with 10.9.5 of EN 1992-1-1:2004 and due allowances shall be made for erection tolerances.

For the application of this rule, two classes of stair corbels are defined (Figure 1) :

- Class A : the stair corbel is manufactured with the design cover according to 4.3.1.1 ;
- Class B : the stair corbel is similar to class A but with a reduced cover at the extreme end. In this case the concrete cover is achieved on site with a non shrink mortar. The mortar and its minimum thickness shall respect Clause 4 of EN 1992-1-1:2004.

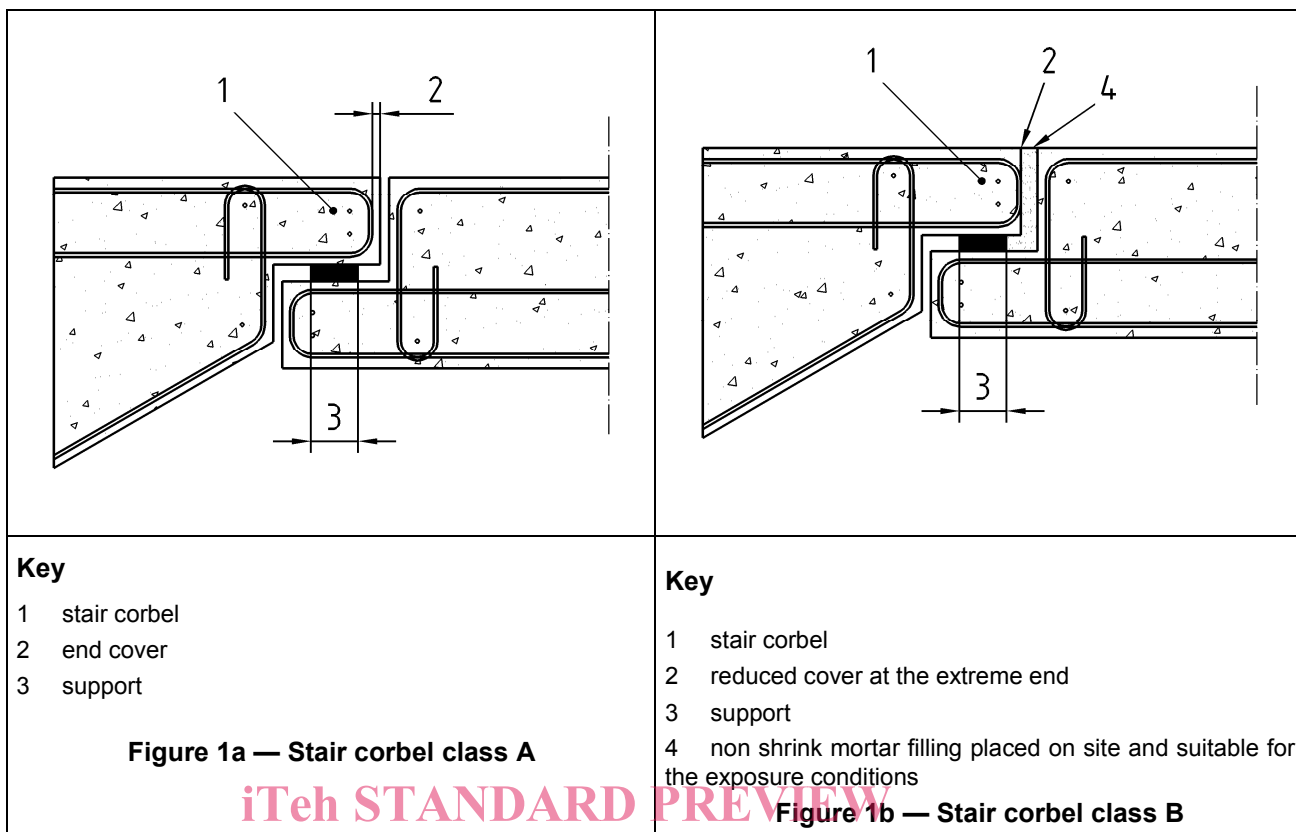


Figure 1 — Definition of classes of stair corbels

NOTE Consideration should be given to the use of stainless or protected reinforcement to ensure adequate durability of stair corbel class B. <https://standards.iteh.ai/catalog/standards/sist/763d5ab0-bfee-48fa-9101-cbf05b21e6e8/sist-en-14843-2007>

5 Test methods

5.1 Tests on concrete

Subclause 5.1 of EN 13369:2004 shall apply.

5.2 Measuring of dimensions and surface characteristics

Subclause 5.2 of EN 13369:2004 shall apply.

With reference to Figure J.5 of EN 13369:2004, ruler of 200 mm or 1 000 mm may be used according to the dimensions being verified.

5.3 Weight of the product

Subclause 5.3 of EN 13369:2004 shall apply.

6 Evaluation of conformity

Clause 6 of EN 13369:2004 shall apply.

Table 4 replaces item 2 of Table D.4 of EN 13369:2004.