



SLOVENSKI STANDARD

oSIST prEN 13224-2:2020

01-november-2020

Montažni betonski izdelki - Rebraste etažne plošče - 2. del: Specifikacije

Precast concrete products - Ribbed floor elements - Part 2: Specifications

Betonfertigteile - Deckenplatten mit Stegen - Teil 2: Eigenschaften

Produits préfabriqués en béton - Eléments de planchers nervurés - Partie 2 :
Spécifications

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Ta slovenski standard je istoveten z: **prEN 13224-2**

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ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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prEN 13224-2

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ICS 91.100.30

Will supersede EN 13224:2011

English Version

Precast concrete products - Ribbed floor elements - Part 2: Specifications

Produits préfabriqués en béton - Eléments de
planchers nervurés - Partie 2 : Spécifications

Betonfertigteile - Deckenplatten mit Stegen - Teil 2:
Eigenschaften

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 229.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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prEN 13224-2:2020 (E)

European foreword

This document (prEN 13224-2:2020) has been prepared by Technical Committee CEN/TC 229 “Precast concrete products”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13224:2011.

The main changes are the splitting in two parts, the present part 2 specifying production and information regarding design. Reference is made to part 1 for essential characteristics and AVCP provisions related to Mandate M/100. Normative references were updated. No technical change was made.

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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 or light 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. The concrete does not contain more than 1 % of homogeneously distributed organic material, by mass or by volume (whichever is the most onerous).

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 206, *Concrete — Specification, performance, production and conformity*

prEN 13224-1:2020, *Precast concrete products — Ribbed floor elements — Part 1: Essential characteristics*

EN 13369:2018, *Common rules for precast concrete products*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13224-1, EN 1992-1-1:2004¹ and EN 13369 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

minor floor element

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

¹ As impacted by EN 1992-1-1:2004/AC:2010 and EN 1992-1-1:2004/A1:2014.

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4 Requirements

4.1 Material requirements

4.1.1 General

For general aspects, reinforcing and prestressing steel, inserts and connectors, the relevant subclauses of EN 13369:2018, 4.1 shall apply. For constituent materials of concrete EN 206 shall apply.

4.1.2 Reinforcing steel

EN 13369:2018, 4.1.3 shall apply.

4.1.3 Prestressing steel

EN 13369:2018, 4.1.4 shall apply.

4.2 Production requirements

4.2.1 General

The production of precast ribbed elements shall comply with the requirements in EN 13369:2018, 4.2.

NOTE In addition to EN 13369:2018, 4.2.2 for cast-*in situ* concrete considered to act compositely with precast units in the structural resistance (e.g. structural top layer), the minimum strength class is C 20/25.

In particular, the compressive strength of concrete shall be considered.

For minor floor elements, strength classes shall comply with B 23.

4.2.2 Shrinkage of lightweight concrete

For lightweight concrete, when declared, the shrinkage shall be determined according to EN 13369:2018, 4.2.2.4 and expressed in ‰.

4.3 Finished product requirements

4.3.1 Geometrical properties

4.3.1.1 Production tolerances

Complementary to EN 13369:2018, 4.3.1.1 the following tolerances shall apply (Figure 1).

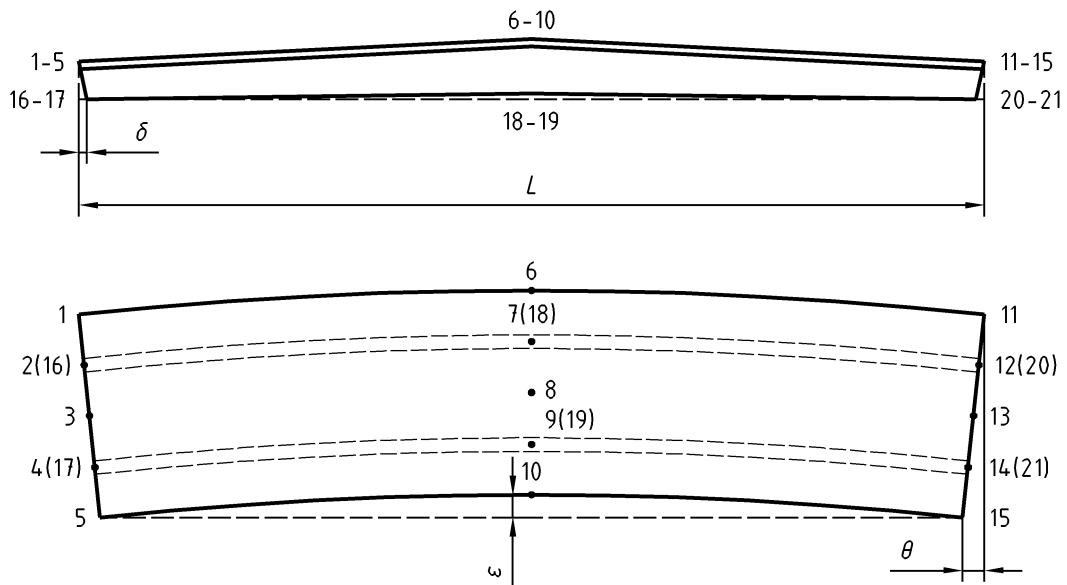


Figure 1 — Reference points for standard check of tolerances

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Table 1 — Production tolerances
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Dimension	Permitted deviation (mm)
Skewness (θ)	± 15
Lateral bow (ε)	± 10 or $L/1\,000$ (whichever is greater)
Angular deviation of ribs (δ)	± 15

Methods of measurements are given in 5.3.

For prestressed elements the values of tolerance in lateral bow (ε) and angular deviation of ribs (δ) can be increased by 50 %; this includes the effect of prestressing tolerances.

For minor floor elements according to Annex B, the permitted deviation on length is ± 25 mm.

4.3.1.2 Minimum dimensions

EN 13369:2018, 4.3.1.2 shall apply.

4.3.1.3 Longitudinal connections

If the precast units are connected along their longitudinal edges by means of a cast in situ mortar or concrete joint, the minimum joint width shall be at least 30 mm at the top to allow satisfactory casting. The joint face shall be provided with at least one groove. The size shall be appropriate with regard to the shear resistance of the grout.

If tie bars are to be anchored within the joint, the joint width at the tie bar level shall be at least three times the diameter of the bar to enable a satisfactory bond and a complete encasing of the bar.

If welded connections are used, the connection devices should be designed in order to allow an easy compensation of camber and erection deviations and welding execution.

prEN 13224-2:2020 (E)**4.3.1.4 Concrete cover**

For the protection against corrosion EN 13369:2018, 4.3.7 shall apply.

For minor floor elements see Annex B.

4.3.2 Surface characteristics

EN 13369:2018, 4.3.2 shall apply.

4.3.3 Mechanical resistance**4.3.3.1 General**

In Annex F, relevant clauses in this standard related to structural design are summarised.

EN 13369:2018, 4.3.3.1 to 4.3.3.5 shall apply, except 4.3.3.4.

For minor floor elements see Annex B.

For transverse distribution of loads see Annex E.

For diaphragm actions see Annex F.

4.3.3.2 Transient situations

For transient situations EN 13369:2018, 4.3.3.6 shall apply.

Unless compensating devices are used during lifting, each suspension point should be verified on the basis that only two are being active.

In the erection phases in which the access of workers on the elements can be expected, the construction loads of EN 1991-1-6 shall be considered and the supports for safety devices shall withstand the appropriate horizontal force, placed in the most unfavourable position of the upper side of the protection rail.

4.3.3.3 Shear reinforcement

It is allowed to omit the transversal shear reinforcement where it is not required by the resistance to loads or fire verification provided adjacent units are connected.

At least the minimum shear reinforcement according to EN 1992-1-1:2004, 9.2.2 shall be provided in the anchorage zone of prestressing tendons, unless a greater area is required by the relevant verification.

This minimum shear reinforcement is not required for ribbed elements used for roofs, provided the spalling stress in the webs is lower than the tensile strength of concrete at time of prestress release.

In ribs with a thickness not exceeding 120 mm the shear reinforcement may be shaped in one leg only, placed in the middle plane of the rib and properly anchored beyond the main reinforcement.

4.3.3.4 Shear and negative moments

In elements without shear reinforcement, negative moments and unintended restraining effects at the supports should be considered in the design of the elements and in the detailing of the connections at the supports in order to prevent possible restraint cracks which can initiate shear failure near the support.

Two methods to deal with negative or unintended fixing moments are applicable:

- detailing the connection in such a way that these negative moments will not occur;
- design by calculations. Design methods to consider negative or unintended moments are given in Annex C.

4.3.3.5 Longitudinal shear

EN 1992-1-1:2004¹, 6.2.4 shall apply.

4.3.4 Acoustic properties

EN 13369:2018, 4.3.5 shall apply.

4.3.5 Thermal properties

EN 13369:2018, 4.3.6 shall apply.

4.3.6 Other requirements**4.3.6.1 Safety in handling**

EN 13369:2018, 4.3.8.1 shall apply.

4.3.6.2 Safety in use

EN 13369:2018, 4.3.8.2 shall apply.

4.3.7 Durability

EN 13369:2018, 4.3.7 shall apply.

5 Test methods iTeh STANDARD PREVIEW (standards.iteh.ai)

5.1 General

EN 13369:2018, Clause 5 shall apply, with the following rules.

5.2 Measuring of dimensions and surface characteristics

EN 13369:2018, 5.2 shall apply with the following additional rules (see Figure 1):

Skewness (θ)	(for elements having rectangular shape only): measure the distance of points 5 and 15 from straight lines normal to the straight line 1-11, containing respectively the points 1 and 11
Lateral bow (ε)	measure the distance of points 6 and 10 from straight lines respectively 1-11 and 5-15
Angular deviation of ribs (δ)	measure the distance of points 2 and 12 (4 and 14) from straight lines normal to the lines 16-20 (17-21), containing respectively the points 16 and 20 (17 and 21)

6 Factory production control

In addition to items 4 and 5 of D.4.1 of Table D.4 of EN 13369:2018, the check of Table 2 shall be performed.