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Montažni lahki betonski proizvodi z odprto strukturo

Precast lightweight concrete products with an open structure

Fertigteile aus haufwerksporigem Leichtbeton

Produits préfabriqués en béton de granulats légers à structure ouverte

Ta slovenski standard je istoveten z: EN 1520:2026

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ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products
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EN 1520

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ICS 91.100.30

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**Precast lightweight concrete products with an open
structure**

Produits préfabriqués en béton de granulats légers à
structure ouverte

Vorgefertigte Bauteile aus haufwerksporigem
Leichtbeton

This European Standard was approved by CEN on 22 June 2026.

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European foreword

This document (EN 1520:2026) has been prepared by Technical Committee CEN/TC 177 “Prefabricated reinforced elements of autoclaved aerated concrete or lightweight aggregate concrete with open structure”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by January 2027, and conflicting national standards shall be withdrawn at the latest by April 2028.

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

This document supersedes EN 1520:2011.

EN 1520:2026 includes the following significant technical changes with respect to EN 1520:2011:

- the references to EN 206 have been replaced with the corresponding technical content,
- Annex ZA considering the standardization request addressed to CEN by the European Commission has been updated.
- the text has been adjusted to the standardization request to the European Committee for Standardization as regards precast concrete products in support of Regulation (EU) No 305/2011;
- terms and definitions have been updated;
- the order of clauses has been changed;
- normative references have been updated, adjusted and dated;
- properties and requirements of elements have been adapted, e.g. acoustic properties, thermal resistance.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

1 Scope

This document covers, regardless of if manufactured in factories or in temporary plants on site under the same conditions, precast concrete elements made of lightweight concrete with an open structure, and with a dry density between 400 and 2000 kg/m³, intended to be used as structural element:

- solid, hollow core and multilayer load-bearing wall elements;
- retaining wall elements, excluding retaining walls intended to retain tanks or reservoirs of liquids and diaphragm walls (concrete sheet piling);
- solid, hollow core and multilayer roof elements, excluding ribbed floor elements and floor slabs elements;
- solid, hollow core and multilayer floor elements excluding floor elements with the intended use to carry traffic loads;
- solid and hollow core beams;
- solid piers.

This document covers, regardless of if manufactured in factories or in temporary plants on site under the same conditions, precast concrete elements made of lightweight concrete with an open structure, and with a dry density between 400 and 2000 kg/m³, intended for not to be used as structural use:

- solid, hollow core and multilayer non-loadbearing wall elements;
- cladding elements;
- rectangular cross-section box culverts;
- components for noise barriers.

NOTE In addition to their loadbearing and encasing function, elements can also be used to provide fire resistance, sound insulation and thermal insulation.

Recycled lightweight concrete with an open structure (other than closed-loop recycling during production) is covered by this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes the requirements 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.

CEN/TS 12390-9:2016, *Testing hardened concrete - Part 9: Freeze-thaw resistance with de-icing salts - Scaling*

EN 206-1:2026, *Concrete - Specification, performance, production and conformity - Part 1: Performance, requirements, factory production control and assessment criteria for individual values*

EN 990:2002, *Test methods for verification of corrosion protection of reinforcement in autoclaved aerated concrete and lightweight aggregate concrete with open structure*

EN 991:1995, *Determination of the dimension of prefabricated reinforced components made of autoclaved aerated concrete or lightweight aggregate concrete with open structure*

- EN 992:1995, *Determination of the dry density of lightweight aggregate concrete with open structure*
- EN 1352:1996, *Determination of static modulus of elasticity under compression of autoclaved aerated concrete or lightweight aggregate concrete with open structure*
- EN 1354:2005, *Determination of compressive strength of lightweight aggregate concrete with open structure*
- EN 1355:1996, *Determination of creep strains under compression of autoclaved aerated concrete or lightweight aggregate concrete with open structure*
- EN 1364-1:2015, *Fire resistance tests for non-loadbearing elements - Part 1: Walls*
- EN 1365-1:2012,¹ *Fire resistance tests for loadbearing elements — Part 1: Walls*
- EN 1365-2:2014, *Fire resistance tests for loadbearing elements - Part 2: Floors and roofs*
- EN 1365-3:1999, *Fire resistance tests for loadbearing elements - Part 3: Beams*
- EN 1365-4:1999, *Fire resistance tests for loadbearing elements - Part 4: Columns*
- EN 1739:2007, *Determination of shear strength for in-plane forces of joints between prefabricated components of autoclaved aerated concrete or lightweight aggregate concrete with open structure*
- EN 1740:1998, *Performance test for prefabricated reinforced components made of autoclaved aerated concrete or lightweight aggregate concrete with open structure under predominantly longitudinal load (vertical components)*
- EN 1741:1998, *Determination of shear strength for out-of-plane forces of joints between prefabricated components made of autoclaved aerated concrete or lightweight aggregate concrete with open structure*
- EN 1745:2020, *Masonry and masonry products - Methods for determining thermal properties*
- EN 1793-1:2025, *Road traffic noise reducing devices - Test method for determining the acoustic performance - Part 1: Intrinsic characteristics - Sound absorption under diffuse sound field conditions*
- EN 12664:2001, *Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Dry and moist products of medium and low thermal resistance*
- EN 13501-1:2018, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*
- EN 13501-2:2023, *Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance and/or smoke control tests, excluding ventilation services*
- EN 13823:2020+A1:2022, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 15804:2012+A2:2019, *Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products*

¹ As impacted by EN 1365-1:2012/AC:2013.

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EN 16516:2017+A1:2020, *Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air*

EN 16637-1:2023, *Construction products: Assessment of release of dangerous substances - Part 1: Guidance for the determination of leaching tests and additional testing steps*

EN 16637-2:2023, *Construction products: Assessment of release of dangerous substances - Part 2: Horizontal dynamic surface leaching test*

EN 18185:2026, *Sustainability of construction works - Environmental product declarations - Product Category Rules for precast lightweight concrete with an open structure and precast autoclaved aerated concrete*

EN ISO 354:2003, *Acoustics - Measurement of sound absorption in a reverberation room (ISO 354:2003)*

EN ISO 717-1:2020, *Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (ISO 717-1:2020)*

EN ISO 717-2:2020, *Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (ISO 717-2:2020)*

EN ISO 1182:2020, *Reaction to fire tests for products - Non-combustibility test (ISO 1182:2020)*

EN ISO 1716:2018, *Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value) (ISO 1716:2018)*

EN ISO 10140-2:2021, *Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2021)*

EN ISO 10140-3:2021, *Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation (ISO 10140-3:2021)*

EN ISO 10456:2007,² *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007+ Cor. 1:2009)*

EN ISO 11925-2:2026, *Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test (ISO 11925-2:2026)*

EN ISO 12354-1:2017, *Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (ISO 12354-1:2017)*

EN ISO 12354-2:2017, *Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (ISO 12354-2:2017)*

EN 12504-1:2019, *Testing concrete in structures - Part 1: Cored specimens - Taking, examining and testing in compression*

EN ISO 12572:2016,³ *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties (ISO 12572:2016)*

² As impacted by EN ISO 10456:2007/AC:2009.

³ As impacted by EN ISO 12572:2016/A1:2024.

EN ISO 15630-1:2019, *Steel for the reinforcement and prestressing of concrete - Test methods - Part 1: Reinforcing bars, rods and wire (ISO 15630-1:2019)*

EN ISO 15630-2:2019, *Steel for the reinforcement and prestressing of concrete - Test methods - Part 2: Welded fabric and lattice girders (ISO 15630-2:2019)*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 206-1:2026 and the following apply.

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

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

3.1.1

product family

group of products produced by one manufacturer for which the assessment results for one or more characteristics from any one product within the range are valid for all other products within this range

3.1.2

lightweight aggregate

LWA

aggregate of mineral origin having a particle density not exceeding 2 000 kg/m³ (2,00 Mg/m³) or a loose bulk density not exceeding 1 200 kg/m³ (1,20 Mg/m³)

[SOURCE: EN 13055-1:2002, 3.2]

3.1.3

lightweight concrete with an open structure

LAC

lightweight concrete with an open or porous structure having a dry density between 400 and 2 000 kg/m³ and made with lightweight aggregates (LWA)

3.1.4

recycled lightweight concrete

material produced from crushed construction and demolition waste originating from lightweight concrete with an open or porous structure elements

3.1.5

concrete

normal-weight concrete with a closed structure having a dry density between 2000 and 2 600 kg/m³

3.1.6

loadbearing element

element designed to contribute to the mechanical resistance and stability of the works

Note 1 to entry: Elements exposed mainly to wind loads or acting as part of fire-resisting walls are considered to be loadbearing.

EN 1520:2026 (E)**3.1.7****non-loadbearing element**

element that mainly supports its own weight and does not contribute to the stability of the work

3.1.8**reinforced element**

element with a reinforcement used for both structural and non-structural purposes

3.2 Symbols**3.2.1 General symbols**

A area

E modulus of elasticity

f strength

k coefficient, factor

3.2.2 Subscripts

c concrete parameter, compression

dry dry state

k characteristic value

m mean

3.2.3 Symbols used in this document

A_{gt} elongation at maximum load — reinforcing steel

A_t total elongation at fracture — reinforcing steel

E_{cm} mean value of the modulus of elasticity of LAC

f_{ck} characteristic compressive strength of LAC

f_{cmin} required minimum compressive strength of LAC

$f_{c,n}$ required minimum compressive strength of a test set with $n \geq 6$ test specimens

$f_{c,3}$ required minimum compressive strength of each test set of three consecutive test specimens

f_k characteristic value of strength parameters

f_{min} required minimum strength

$f_{m,n}$ mean value of n strength results

K_n statistical coefficient for determination of characteristic strength (λ is used in EN 206-1)

n number of test specimens in a sample, number of test results

R_e yield strength, MPa

R_{eH} Upper yield strength, MPa

$R_{p0,2}$ yield strength at 0,2 % plastic elongation, MPa

R_m tensile strength, MPa

s_n	standard deviation of n test results
η_2	coefficient according to Formula (2)
λ	thermal conductivity
$\lambda_{10\text{dry}}$	thermal conductivity in the dry state, determined at a mean test temperature of 10 °C
μ_m	moisture content, related to mass
ρ	dry density of LAC

3.3 Abbreviations

FPC	factory production control
LAC	lightweight concrete with an open structure
RH	relative humidity

4 Characteristics

4.1 Concrete

4.1.1 Compressive strength lightweight concrete with an open structure

The compressive strength of lightweight concrete with an open structure is an indication of the loadbearing capacity of an element.

When assessing compressive strength, this shall be determined in accordance with 5.1.2. The performance of compressive strength shall be expressed as a class.

4.1.2 Dry density lightweight concrete with an open structure

The dry density lightweight concrete with an open structure serves as a reference for the calculation of some mechanical values and thermal insulation properties of elements.

When assessing dry density, this shall be determined in accordance with 5.1.3, the performance of density shall be expressed as a class.

4.1.3 Modulus of elasticity lightweight concrete with an open structure - testing

When assessing the modulus of elasticity using the test methods given in 5.1.4, the modulus of elasticity shall be expressed in MPa.

4.1.4 Modulus of elasticity lightweight concrete with an open structure - calculation

When assessing the modulus of elasticity using the calculation method given in 5.1.5, the modulus of elasticity shall be expressed in MPa.

4.1.5 Drying shrinkage lightweight concrete with an open structure- testing

When assessing drying shrinkage, this shall be determined in accordance with 5.1.6. The performance of drying shrinkage shall be expressed in mm/m, rounded to the nearest 0,01.

EN 1520:2026 (E)**4.1.6 Drying shrinkage lightweight concrete with an open structure – tabulated values**

When using a tabulated value for drying shrinkage, the value given in 5.1.7 shall be used. The performance of drying shrinkage shall be expressed in mm/m, rounded to the nearest 0,01 together with the relevant relative humidity of the environment.

4.1.7 Creep lightweight concrete with an open structure - testing

Creep describes the deformation of lightweight concrete with an open structure under longer lasting stress-induced loading.

When assessing creep, this shall be determined in accordance with 5.1.8. The performance of creep shall be expressed in mm/m.

4.1.8 Freeze–thaw resistance of concrete

When assessing the freeze–thaw resistance of concrete, this shall be determined in accordance with 5.1.9 and expressed in kg/m². The freezing agent used shall be specified.

4.1.9 Corrosion protection

When assessing the corrosion protection of concrete, this shall be determined in accordance with 5.1.10. The type of corrosion protection (galvanized, stainless or coated steel) used shall be provided. The type of corrosion protection and the % of corroded surface area shall be provided. The performance of the corrosion protection shall be expressed as percentage.

4.2 Reinforcing steel**4.2.1 Elongation at maximum load — reinforcing steel**

When assessing the elongation at maximum load of reinforcing steel (A_{gt}), this shall be determined in accordance with 5.2.1. The performance of elongation at maximum load of reinforcing steel shall be expressed as a ratio, rounded to the nearest 0,1.

4.2.2 Elongation after fracture — reinforcing steel

When assessing the elongation after fracture of reinforcing steel (A_r), this shall be determined in accordance with 5.2.2. The performance of elongation after fracture of reinforcing steel shall be expressed as a ratio, rounded to the nearest 0,1.

4.2.3 Stress ratio — reinforcing steel

When assessing the stress ratio of reinforcing steel (R_m/R_e), this shall be determined in accordance with 5.2.3. The performance of stress ratio of reinforcing steel shall be expressed as a ratio, rounded to the nearest 0,01.

4.2.4 Tensile yield strength — reinforcing steel

When assessing the tensile yield strength of reinforcing steel (R_e), this shall be determined in accordance with 5.2.4. The performance of tensile yield strength of reinforcing steel shall be expressed in MPa, rounded to the nearest integer.

4.2.5 Ultimate tensile strength — reinforcing steel

When assessing the ultimate tensile strength of reinforcing steel (R_m), this shall be determined in accordance with 5.2.5. The performance of ultimate tensile strength of reinforcing steel shall be expressed in MPa, rounded to the nearest integer.

4.3 Mechanical performance

4.3.1 Mechanical strength — testing — lightweight concrete with an open structure — longitudinal load

When assessing the mechanical strength of elements under longitudinal load, this shall be determined in accordance with 5.3.2. The performance of mechanical strength of elements under longitudinal load shall be expressed in MN

The calculation and corresponding test method shall be part of the documentation provided with the declaration in accordance with 4.12.

4.3.2 Mechanical strength — testing — lightweight concrete with an open structure — rigidity of joints-in-plane-shear

When using the rigidity of joints in design the mechanical strength of joints under in-plane-shear shall be determined in accordance with 5.3.3. The performance mechanical strength of joints under in-plane-shear shall be expressed in MPa.

The calculation and corresponding test method shall be part of the documentation provided with the declaration in accordance with 4.12.

4.3.3 Mechanical strength — testing — lightweight concrete with an open structure — rigidity of joints — out-of-plane-shear

When using the rigidity of joints in design the mechanical strength of joints under out-of-plane-shear shall be determined in accordance with 5.3.4. The performance mechanical strength of joints under out-of-plane-shear shall be expressed in MPa.

The calculation and corresponding test method shall be part of the documentation provided with the declaration in accordance with 4.12.

4.4 Fire performance

4.4.1 Reaction to fire

4.4.1.1 Classification by testing

The reaction to fire indicates the response of a lightweight concrete with an open structure element in contributing by its own decomposition to a fire to which it is exposed, under specified conditions. When tested in accordance with the test method given in 5.4.1, relevant for the claimed class, the test results are expressed as a class according to the classification published in the Official Journal of the European Union on this specific matter.

NOTE The applicable document at the time this document was drafted is Commission Delegated Regulation (EU) 2016/364 of 1 July 2015. https://eur-lex.europa.eu/eli/reg_del/2016/364

4.4.1.2 Classification without further testing (WFT)

Whether products covered by this document fulfil the conditions, under which they have demonstrated of having a stable reaction to fire performance in a given reaction to fire class, based on testing to the