



SLOVENSKI STANDARD
SIST EN 15564:2009

01-marec-2009

Montažni betonski izdelki - Epoksi vezan beton - Zahteve in preskusne metode

Precast concrete products - Resin bound concrete - Requirements and test methods

Betonfertigteile - Kunstharzbeton - Anforderungen und Prüfverfahren

Produits préfabriqués en béton - Béton de résine - Prescriptions et méthodes d'essai

Ta slovenski standard je istoveten z: EN 15564:2008

[SIST EN 15564:2009](https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009)

<https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>

ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products
-----------	---------------------------	--------------------------------

SIST EN 15564:2009

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 15564:2009

<https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>

EUROPEAN STANDARD

EN 15564

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2008

ICS 91.100.30

English Version

Precast concrete products - Resin bound concrete - Requirements and test methods

Produits préfabriqués en béton - Béton de résine -
Prescriptions et méthodes d'essai

Betonfertigteile - Kunstharzbeton - Anforderungen und
Prüfverfahren

This European Standard was approved by CEN on 13 September 2008.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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.

[SIST EN 15564:2009](https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009)

<https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Requirements	7
4.1 General.....	7
4.2 Constituent materials	7
4.2.1 Aggregates	7
4.2.2 Filler	7
4.2.3 Resin	7
4.3 Other materials.....	8
4.4 Properties of resin-bound concrete.....	8
4.4.1 General.....	8
4.4.2 Apparent density, water absorption and water permeability	8
4.4.3 Strength	8
4.4.4 Surface hardness.....	8
4.4.5 Slipperiness behaviour	8
4.4.6 Abrasion resistance	8
4.4.7 Thermal shock resistance.....	8
4.4.8 Impact resistance.....	8
4.4.9 Linear thermal expansion coefficient.....	9
4.4.10 Chemical resistance.....	9
4.4.11 Freeze and thaw resistance.....	9
4.4.12 Thermal conductivity.....	9
4.4.13 Reaction to fire.....	9
5 Tests.....	9
5.1 Constituent materials	9
5.1.1 Aggregates	9
5.1.2 Filler	9
5.1.3 Resin	9
5.2 Test specimens.....	10
5.2.1 General.....	10
5.2.2 Cast test specimens	10
5.3 Apparent density, water absorption and water permeability	10
5.4 Strength	10
5.5 Surface hardness.....	11
5.6 Slipperiness behaviour	11
5.7 Abrasion resistance	11
5.8 Thermal shock resistance.....	11
5.9 Impact resistance.....	11
5.10 Linear thermal expansion coefficient.....	11
5.11 Chemical resistance	11
5.12 Freeze and thaw resistance	11
5.13 Thermal conductivity.....	11
5.14 Reaction to fire.....	11
6 Evaluation of conformity.....	12
6.1 General.....	12
6.2 Initial type tests.....	12
6.3 Factory production control.....	12

6.3.1	General	12
6.3.2	Organisation	12
6.3.3	Control system	13
6.3.4	Document control	13
6.3.5	Process control	13
6.3.6	Inspection and testing	13
6.3.7	Non-conforming products	18
6.3.8	Indirect or alternative test method	19
Annex A	(normative) Determination of the viscosity of the resin.....	20
A.1	Aim	20
A.2	Method	20
A.3	Apparatus	20
A.4	Procedure	21
A.4.1	Preliminary operations.....	21
A.4.2	Test procedure.....	21
A.5	Results.....	22
Annex B	(normative) Determination of the reactivity of the resin	23
B.1	Aim	23
B.2	Method	23
B.3	Apparatus	23
B.4	Procedure	23
B.5	Results.....	24
Annex C	(normative) Determination of the surface hardness.....	25
C.1	Aim	25
C.2	Method.....	25
C.3	Apparatus	25
C.4	Procedure	25
C.4.1	Calibration of the hardness tester	25
C.4.2	Test procedure.....	26
C.5	Results.....	26
Bibliography	27

Foreword

This document (EN 15564:2008) 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 April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

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.

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 the United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 15564:2009](#)

<https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>

1 Scope

This European Standard specifies common requirements for resin-bound concrete used in the fabrication of precast concrete products. It is intended to be used when preparing documents for resin-bound concrete products.

Resin-bound concrete product standards will define specific requirements, which may be additional to those given in this document. Product standards will give any limiting values.

Examples for the use of resin-bound concrete are: street furniture and garden products, decorative elements, window sills, machine tool structures, elements for fence, animal troughs and slats, etc.

This standard is not applicable to polymer-modified or impregnated mortar and concrete (only PC not PCC or SPCC).

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 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method*

EN 933-10, *Tests for geometrical properties of aggregates — Part 10: Assessment of fines — Grading of fillers (air jet sieving)*

EN 1097-5, *Test for mechanical and physical properties of aggregates — Part 5: Determination of the water content by drying in a ventilated oven*

EN 12620, *Aggregates for concrete*

EN 12664, *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, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 14231, *Natural stone test methods — Determination of the slip resistance by means of the pendulum tester*

EN 14617-1, *Agglomerated stone — Test methods — Part 1: Determination of apparent density and water absorption*

EN 14617-2, *Agglomerated stone — Test methods — Part 2: Determination of flexural strength (bending)*

EN 14617-4, *Agglomerated stone — Test methods — Part 4: Determination of the abrasion resistance*

EN 14617-5, *Agglomerated stone — Test methods — Part 5: Determination of freeze and thaw resistance*

EN 14617-6, *Agglomerated stone — Test methods — Part 6: Determination of thermal shock resistance*

EN 15564:2008 (E)

EN 14617-9, *Agglomerated stone — Test methods — Part 9: Determination of impact resistance*

EN 14617-10, *Agglomerated stone — Test methods — Part 10: Determination of chemical resistance*

EN 14617-11, *Agglomerated stone — Test methods — Part 11: Determination of linear thermal expansion coefficient*

EN 14617-15, *Agglomerated stone — Test methods — Part 15: Determination of compressive strength*

EN 14618:2005, *Agglomerated stone — Terminology and classification*

EN 14889-1, *Fibres for concrete — Part 1: Steel fibres — Definitions, specifications and conformity*

EN 14889-2, *Fibres for concrete — Part 2: Polymer fibres — Definitions, specifications and conformity*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178:2001)*

EN ISO 584, *Plastics — Unsaturated polyester resins — Determination of reactivity at 80 °C (conventional method) (ISO 584:1982)*

EN ISO 2555, *Plastics — Resins in the liquid state or as emulsions or dispersions — Determination of apparent viscosity by the Brookfield Test method. (ISO 2555:1989)*

EN ISO 3219, *Plastics — Polymers/resins in the liquid state or as emulsions or dispersions — Determination of viscosity using a rotational viscometer with defined shear rate (ISO 3219:1993)*

EN ISO 9371, *Plastics — Phenolic resins in the liquid state or in solution — Determination of viscosity (ISO 9371:1990)*

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

iTech STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 15564:2009
<https://standards.iteh.ai/catalog/standards/sist/96106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>

3 Terms and definitions

For the purposes of this document the terms and definitions given in EN 14618:2005 and the following apply.

3.1

additive

material used to impart specific properties to the resin

3.2

binder

organic chemical product used to bind via an irreversible process the aggregates and the filler

3.3

characteristic value

value of a property below which 5 % of the population of all possible property determinations of the volume of resin-bound concrete under consideration are expected to fall

3.4

resin

liquid cross-linkable chemical product, generally constituted by a solution of a polymer in a monomer, used to form the organic binding paste

NOTE 1 Examples of most commonly used resins in polymer concrete are unsaturated polyester (i.e., polyester-styrene system), epoxy, and acrylic (i.e., methyl methacrylate monomer).

WARNING — The attention is drawn to the dangers which the handling of the resins and catalysts presents. Supplier's technical data sheet may give information on the precautions of use of such products.

3.5

resin-bound concrete

polymer concrete made with natural or artificial aggregates and an organic binder, which can be cast into forms or moulds by means of conventional concrete techniques (centrifugation or vibration/compaction process) or other techniques

4 Requirements

4.1 General

The specifications of the materials to be used shall be included in the production control documentation (see 6.3). If appropriate documents are available, they shall be used. If not available, the manufacturer shall specify the materials and have data on their suitability.

4.2 Constituent materials

4.2.1 Aggregates

4.2.1.1 General

General suitability is established for aggregates conforming to EN 12620.

Aggregates shall not contain harmful constituents in such quantities as may be detrimental to the curing, strength, and durability of the polymer concrete.

The size of particles in aggregates shall not exceed $\frac{1}{3}$ of the smallest thickness of the product.

4.2.1.2 Grading

The aggregate grading shall be determined according to 5.1.1.1.

4.2.1.3 Water content

When required, the water content of the aggregates shall be determined according to 5.1.1.2.

4.2.2 Filler

General suitability is established for mineral fillers conforming to EN 12620.

Fillers shall not contain harmful constituents in such quantities as may be detrimental to the curing, strength, and durability of the resin bound concrete.

The filler grading shall be determined according to 5.1.2.

4.2.3 Resin

4.2.3.1 General

The resin shall be kept away from light, in a dry place and at a constant temperature.

EN 15564:2008 (E)**4.2.3.2 Viscosity**

Where the viscosity of the resin is to be determined, it shall be measured according to 5.1.3.1.

4.2.3.3 Reactivity

Where the reactivity of the resin is to be determined, it shall be measured according to 5.1.3.2.

4.3 Other materials

- Fibres

Where fibres are used to strengthen the binder, general suitability is established for metallic fibres conforming to EN 14889-1 and for polymer fibres to EN 14889-2.

4.4 Properties of resin-bound concrete**4.4.1 General**

The main properties of resin-bound concrete are defined below.

Product standards may identify additional properties.

Results obtained from testing shall be expressed as characteristic values.

4.4.2 Apparent density, water absorption and water permeability

When required, apparent density, water absorption and/or water permeability of resin-bound concrete shall be given and determined according to 5.3.

<https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>

4.4.3 Strength

When required, flexural and/or compressive strength shall be given and determined according to 5.4.

4.4.4 Surface hardness

When required, the surface hardness shall be given and determined according to 5.5.

4.4.5 Slipperiness behaviour

When required, the unpolished or polished slip/skid resistance shall be given and determined according to 5.6.

4.4.6 Abrasion resistance

When required, the abrasion resistance shall be given and determined according to 5.7.

4.4.7 Thermal shock resistance

When required, the thermal shock resistance of resin-bound concrete shall be given and determined according to 5.8.

4.4.8 Impact resistance

When required, the impact resistance shall be given and determined according to 5.9.

4.4.9 Linear thermal expansion coefficient

When required, the linear thermal expansion coefficient shall be given and determined according to 5.10.

4.4.10 Chemical resistance

When required, the chemical resistance of resin-bound concrete shall be given and determined according to 5.11.

4.4.11 Freeze and thaw resistance

When required, the freeze and thaw resistance shall be given and determined according to 5.12.

4.4.12 Thermal conductivity

When required, thermal conductivity shall be given and determined according to 5.13.

4.4.13 Reaction to fire

When required, reaction to fire shall be given and determined according to 5.14.

5 Tests

5.1 Constituent materials

5.1.1 Aggregates

5.1.1.1 Grading <https://standards.iteh.ai/catalog/standards/sist/9b106a49-777c-4e44-a750-c3c99f013c92/sist-en-15564-2009>

The aggregate grading shall be measured according to EN 933-1, and the results expressed accordingly.

5.1.1.2 Water content

The aggregate water content shall be measured according to EN 1097-5, and the results expressed accordingly.

5.1.2 Filler

The filler grading shall be measured according to EN 933-10, and the results expressed accordingly.

5.1.3 Resin

5.1.3.1 Viscosity

The viscosity of the resin shall be determined either by means of one of the following methods and the results expressed accordingly:

- Brookfield test method conforming to EN ISO 2555;
- test method described in EN ISO 3219;
- any test method conforming to EN ISO 9371 provided that its suitability is established for the kind of resin to be tested;