



SLOVENSKI STANDARD

SIST EN 206-9:2010

01-oktober-2010

Beton - 9. del: Dodatna pravila za samozgoščevalni beton (SCC)

Concrete - Part 9: Additional Rules for Self-compacting Concrete (SCC)

Beton - Teil 9: Ergänzende Regeln für selbstverdichtenden Beton (SVB)

Béton - Partie 9 : Règles complémentaires pour le béton auto placant

Ta slovenski standard je istoveten z: **EN 206-9:2010**

[SIST EN 206-9:2010](https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aef7c/sist-en-206-9-2010)

<https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aef7c/sist-en-206-9-2010>

ICS:

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

SIST EN 206-9:2010

en,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 206-9:2010

<https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aefa7c/sist-en-206-9-2010>

EUROPEAN STANDARD

EN 206-9

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2010

ICS 91.100.30

English Version

**Concrete - Part 9: Additional Rules for Self-compacting
Concrete (SCC)**Béton - Partie 9 : Règles complémentaires pour le béton
auto-plaçantBeton - Teil 9: Ergänzende Regeln für selbstverdichtenden
Beton (SVB)

This European Standard was approved by CEN on 27 February 2010.

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, 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 and United Kingdom.

SIST EN 206-9:2010

<https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aef7c/sist-en-206-9-2010>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms, definitions, symbols and abbreviations.....	7
3.1 Terms and definitions	7
3.2 Symbols and abbreviations	7
4 Classification.....	8
4.1 Exposure classes related to environmental actions.....	8
4.2 Fresh concrete	8
4.3 Hardened concrete	9
5 Requirements for concrete and methods of verification.....	10
5.1 Basic requirements for constituent materials.....	10
5.2 Basic requirements for composition of concrete	10
5.3 Requirements related to exposure classes	11
5.4 Requirements for fresh concrete.....	11
5.5 Requirements for hardened concrete.....	12
6 Specification of concrete	12
6.1 General.....	12
6.2 Specification for designed concrete	12
6.3 Specification for prescribed concrete	13
6.4 Specification of standardized prescribed concrete.....	13
7 Delivery of fresh concrete.....	13
7.1 Information from the user of the concrete to the producer	13
7.2 Information from the producer of the concrete to the user	13
7.3 Delivery ticket for ready-mixed concrete	13
7.4 Delivery information for site-mixed concrete	13
7.5 Consistence at delivery.....	13
8 Conformity control and conformity criteria	14
8.1 General.....	14
8.2 Conformity control for designed concrete	14
8.3 Conformity control of prescribed concrete including standardized prescribed concrete	14
8.4 Actions in the case of non-conformity of the product.....	14
9 Production control.....	14
9.1 General.....	14
9.2 Production control systems	15
9.3 Recorded data and other documents	15
9.4 Testing	15
9.5 Concrete composition and initial testing	15
9.6 Personnel, equipment and installation.....	15
9.7 Batching of constituent materials.....	15
9.8 Mixing of concrete	15
9.9 Production control procedures	15
10 Evaluation of conformity.....	16
11 Designation for designed concrete.....	16

Annex A (normative) Initial Test	17
A.1 General	17
A.2 Party responsible for initial tests	17
A.3 Frequency of initial tests	17
A.4 Test conditions	17
A.5 Criteria for adoption of initial tests	17
Annex B (normative) Identity testing for compressive strength	18
Annex C (normative) Provisions for assessment , surveillance and certification of production control	19
Annex D (informative) Bibliography	20
Annex E (informative) Guidance on the application of the equivalent performance concept of concrete properties	21
Annex F (informative) Recommendations for limiting values of concrete compositions	22
Annex H (informative) Additional provisions for high strength concrete	23
Annex J (informative) Performance-related design methods with respect to durability	24
Annex K (informative) Concrete families	25
Annex L (informative) Guidelines for SCC requirements in the fresh state	26
L.1 General	26
L.2 Recommendations on classification of SCC	27
L.2.1 Slump flow	27
L.2.2 Viscosity	27
L.2.3 Passing ability	27
L.2.4 Stability	27

SIST EN 206-9:2010

<https://standards.itech.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aefa7c/sist-en-206-9-2010>

EN 206-9:2010 (E)**Foreword**

This document (EN 206-9:2010) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", 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 October 2010, and conflicting national standards shall be withdrawn at the latest by October 2010.

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, 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 and the United Kingdom.

This European Standard is additional to EN 206-1:2000 and it gives the rules for self-compacting concrete (SCC). Common rules are not repeated in this European Standard and as a consequence, it has to be used with EN 206-1:2000. When EN 206-1:2000 is revised, this European Standard will be merged into the main document.

The numbering of this European Standard follows EN 206-1:2000.

SIST EN 206-9:2010

<https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aefa7c/sist-en-206-9-2010>

Introduction

Self-compacting concrete (SCC) is an evolving technology and practices vary. This European Standard sets common requirements, but where this is not possible the relevant clause contains permission for the application of national standards or provisions valid in the place of use of the concrete.

This European Standard will be applied in Europe under different climatic and geographical conditions, different levels of protection and under different, well established, regional traditions and experience. Classes for self-compacting concrete properties have been introduced to cover this situation. Where such general solutions were not possible, the relevant clauses contain permission for the application of national standards or provisions valid in the place of use of the concrete.

In tables, notes and footnotes in this European Standard are normative unless stated otherwise; other notes and footnotes are informative.

Further explanations and guidance on the application of this European Standard are given in other documents valid in the place of use.

Further guidance on the production and other aspects of SCC is given in The European Guidelines for Self-Compacting Concrete – Specification, Production and Use, see also Annex D.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 206-9:2010](https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aefa7c/sist-en-206-9-2010)

<https://standards.iteh.ai/catalog/standards/sist/498b238d-5325-4853-9e9e-56b660aefa7c/sist-en-206-9-2010>

EN 206-9:2010 (E)**1 Scope**

This European Standard applies to SCC for structures cast in situ, precast structures, and structural precast products for buildings and civil engineering structures.

This European Standard applies to SCC which is self-compacting by gravity to retain no appreciable amount of entrapped air other than entrained air. This Standard applies to normal-weight concrete. Experience with SCC containing light-weight or heavy-weight aggregate and fibres is limited. Some but not all provisions of this Standard apply for these forms of SCC but the requirements have to be determined on a case by case basis.

The SCC may be mixed on site, ready-mixed concrete or produced in a plant for precast concrete products.

In addition to those in EN 206-1:2000, this European Standard specifies requirements for:

- the constituent materials of SCC;
- the properties of fresh and hardened SCC and their verification;
- the limitations for SCC composition;
- the specification of SCC;
- the factory production control procedures;
- the conformity criteria.

STANDARD PREVIEW
(standards.iteh.ai)

Other European Standards for specific products e.g. precast products or for processes within the field of the scope of this European Standard may require or permit deviations from this European Standard.

The limitations described in the scope of EN 206-1:2000 apply to SCC conforming to this European Standard.

This European Standard does not cover health and safety requirements for the protection of workers during production and delivery of concrete.

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 206-1:2000, *Concrete - Part 1: Specification, performance, production and conformity*

FprEN 12350-8, *Testing fresh concrete - Part 8: Self-compacting concrete – Slump-flow test*

FprEN 12350-9, *Testing fresh concrete - Part 9: Self-compacting concrete – V-funnel test*

FprEN 12350-10, *Testing fresh concrete - Part 10: Self-compacting concrete – L box test*

FprEN 12350-11, *Testing fresh concrete - Part 11: Self-compacting concrete – Sieve segregation test*

FprEN 12350-12, *Testing fresh concrete - Part 12: Self-compacting concrete – J-ring test*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 206-1:2000 and the following apply.

3.1.47

self-compacting concrete (SCC)

concrete that is able to flow and compact under its own weight, fill the formwork with its reinforcement, ducts, boxouts etc., whilst maintaining homogeneity

3.1.48

flowability

the ease of flow of fresh SCC when unconfined by formwork and/or reinforcement

3.1.49

segregation resistance

the ability of fresh SCC to remain homogeneous in composition while in its fresh state

3.1.50

slump-flow

the mean diameter of the spread of fresh SCC from a conventional slump cone

3.1.51

viscosity

the resistance to flow of fresh SCC once flow has started

3.1.52

passing ability

the ability of fresh SCC to flow through tight openings such as spaces between steel reinforcing bars without segregation or blocking

3.2 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in EN 206-1:2000 and the following apply.

SCC	Self-compacting concrete
SF	Slump-flow class
VS	Viscosity class for the t_{500} test
VF	Viscosity class for the V-funnel test
t_{500}	Time in seconds to flow to a diameter of 500 mm in a slump-flow test
PL	Passing ability class for the L-box-test
PJ	Passing ability class for the J-ring-test
SR	Segregation resistance class

EN 206-9:2010 (E)

4 Classification

4.1 Exposure classes related to environmental actions

EN 206-1:2000, 4.1 applies

4.2 Fresh concrete

4.2.1 Consistence classes

The following consistence classes apply to SCC:

Table 1 — Slump-flow classes

Class	Slump-flow in mm ^{a, b} (Limit values for individual batches)
SF1	550 to 650
SF2	660 to 750
SF3	760 to 850

^a The specification of a slump-flow class may be replaced by a target value.
^b The classification is not applicable to concrete with a maximum aggregate size exceeding 40 mm.

(standards.iteh.ai)

Table 2 — Viscosity classes – t_{500}

Class	t_{500} (s) ^{a, b} (Limit values for individual batches)
VS1	< 2,0
VS2	≥ 2,0

^a The specification of a viscosity class may be replaced by a target value.
^b The classification is not applicable to concrete with a maximum aggregate size exceeding 40 mm.

Table 3 — Viscosity classes – V-funnel

Class	V-funnel flow time (s) ^{a, b} (Limit values for individual batches)
VF1	< 9,0
VF2	9,0 to 25,0

^a The specification of a viscosity class may be replaced by a target value.
^b The classification is not applicable to concrete with a maximum aggregate size exceeding 22,4 mm.

Table 4 — Passing ability classes - L-box

Class	L-box ratio (-) ^a (Limit values for individual batches)
PL1	≥ 0,80 with 2 rebars
PL2	≥ 0,80 with 3 rebars
^a The specification of a passing ability class may be replaced by an alternative minimum value.	

Table 5 — Passing ability classes – J-ring

Class	J-ring step (mm) ^{a, b} (Limit values for individual batches)
PJ1	≤ 10 with 12 rebars
PJ2	≤ 10 with 16 rebars
^a The specification of a passing ability class may be replaced by an alternative maximum value.	
^b The classification is not applicable to concrete with a maximum aggregate size exceeding 40 mm.	

Table 6 — Sieve segregation resistance classes

Class	Segregated portion (%) ^{a, b} (Limit values for individual batches)
SR1	≤ 20
SR2	≤ 15
^a The specification of a segregation resistance class may be replaced by an alternative maximum value.	
^b The classification is not applicable to concrete containing fibres or lightweight aggregate.	

NOTE 1 The classes in tables 2 and 3 are similar but not exactly correlated.

NOTE 2 The classes in tables 4 and 5 are similar but not exactly correlated.

4.2.2 Classes related to maximum aggregate size

EN 206-1:2000, 4.2.2 applies

4.3 Hardened concrete

4.3.1 Compressive strength classes

EN 206-1:2000, 4.3.1 applies

4.3.2 Density classes for light-weight concrete

EN 206-1:2000, 4.3.2 applies