SLOVENSKI STANDARD
SIST EN 12350-2:2019

01-september-2019

Nadomešča:
SIST EN 12350-2:2009

Preskušanje svežega betona - 2. del: Preskus s posedom stožca

Testing fresh concrete - Part 2: Slump test

Prüfung von Frischbeton - Teil 2: Setzmaß

Essais pour béton frais - Partie 2 : Essai d'affaissement

Ta slovenski standard je istoveten z: **EN 12350-2:2019**

ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products

SIST EN 12350-2:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12350-2

June 2019

ICS 91.100.30

Supersedes EN 12350-2:2009

English Version

Testing fresh concrete - Part 2: Slump test

Essais pour béton frais - Partie 2 : Essai d'affaissement

Prüfung von Frischbeton - Teil 2: Setzmaß

This European Standard was approved by CEN on 29 April 2019.

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-CENELEC 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-CENELEC 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

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

Ref. No. EN 12350-2:2019 E

Contents

Page

European foreword

This document (EN 12350-2:2019) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by SN.

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of an identical text or by endorsement, at the latest by December 2019, and conflicting national standards shall be withdrawn at the latest by December 2019.

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 12350-2:2009.

This standard is one of a series on testing concrete.

EN 12350, *Testing fresh concrete*, consists of the following parts:

— *Part 1: Sampling and common apparatus*

— *Part 2: Slump test*

— *Part 3: Vebe test*

— *Part 4: Degree of compactability*

— *Part 5: Flow table test*

— *Part 6: Density*

— *Part 7: Air content – Pressure methods*

— *Part 8: Self-compacting concrete – Slump-flow test*

— *Part 9: Self-compacting concrete – V-funnel test*

— *Part 10: Self-compacting concrete – L-box test*

— *Part 11: Self-compacting concrete – Sieve segregation test*

— *Part 12: Self-compacting concrete – J-ring test*

The following amendments have been made to the 2009 edition of this standard:

a) editorial revisions;

b) reference to common apparatus and specifications given in EN 12350-1;

c) reference and procedure for slump retention testing;

d) option to include specified slump class or slump target value in the report.

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, Turkey and the United Kingdom.

1 Scope

This document specifies a method for determining the consistence of fresh concrete by the slump test.

The slump test is sensitive to changes in the consistence of concrete, which correspond to slumps between 10 mm and 210 mm. Beyond these extremes the measurement of slump can be unsuitable and other methods of determining the consistence should be considered.

If the slump continues to change over a period of 1 min after withdrawing of the cone, the slump test is not suitable as a measure of consistence.

The test is not suitable when the declared value of D of the coarsest fraction of aggregates actually used in the concrete (D_{max}) is greater than 40 mm.

2 Normative references

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

EN 12350-1, *Testing fresh concrete — Part 1: Sampling and common apparatus*

3 Terms and definitions

No terms and definitions are listed in this document.

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

4 Principle

The fresh concrete is compacted into a cone. When the cone is withdrawn upwards, the distance the concrete has slumped provides a measure of the consistence of the concrete.

5 Apparatus

5.1 Common apparatus for fresh concrete testing

The apparatus listed below for the execution of this test method shall be in accordance with the specification given in EN 12350-1 and as specified below:

5.1.1 Hollow cone.

5.1.2 Compacting rod.

5.1.3 Funnel (optional).

5.1.4 Rule.

5.1.5 Base plate/surface.

5.1.6 Remixing container or tray.

5.1.7 Shovel.

5.1.8 Moist cloth.

5.1.9 Scoop.

5.1.10 Timer.

5.1.11 Sealed container (when slump retention is to be measured).

5.1.12 Trowel or float.

6 Test sample

The sample of the concrete shall be obtained in accordance with EN 12350-1.

The sample shall be re-mixed using the remixing container or tray and the shovel or scoop before carrying out the test. Where the sample is intended to be used to measure slump retention at a specified time, the concrete from the sealed container shall be emptied on the remixing container or tray and re-mixed using the shovel or scoop before carrying out the test.

Alternative sampling procedures may be given in provisions valid in the place of use of the concrete.

7 Procedure

Dampen the cone and base plate, remove any excess moisture with the moist cloth and place the cone on the horizontal base plate/surface. During filling of the cone hold it firmly against the base plate/surface by clamping in place, or by standing on the two foot pieces.

Fill the cone in three layers, each approximately one-third of the height of the cone when compacted. Compact each layer with 25 strokes of the compacting rod. Uniformly distribute the strokes over the cross-section of each layer. For the bottom layer this will necessitate inclining the rod slightly and positioning approximately half the strokes spirally toward the centre. Compact the first layer throughout its depth, taking care not striking the base. Compact the second layer and the top layer each throughout its depth, so that the strokes just penetrate into the immediately underlying layer. In filling and compacting the top layer, heap the concrete above the cone before compacting is started.

If the compacting operation of the top layer results in subsidence of the concrete below the top edge of the cone, add more concrete to keep an excess above the top of the cone at all times. After the top layer has been compacted, strike off the surface of the concrete with a trowel or by means of a sawing and rolling motion of the compacting rod.

Remove spilled concrete from the base plate/surface. Remove the cone from the concrete by raising it carefully in a vertical direction.

Perform the operation of raising the cone in 2 s to 5 s, by a steady upward lift, with no lateral or torsional motion being imparted to the concrete.

Carry out the operation from the start of the filling to the removal of the cone without interruption and complete it within 150 s.

Immediately after removal of the cone, measure and record the slump *h* by determining the difference between the height of the cone and that of the highest point of the slumped test specimen as shown in Figure 1.

The consistence of a concrete mix changes with time, due to hydration of the cement and, possibly, loss of moisture. Tests on different samples should, therefore, be carried out at the same time interval after mixing, if comparable results are to be obtained.

8 Test result

The test is only valid if it yields a true slump, this being a slump in which the concrete remains substantially intact and symmetrical as shown in Figure 2 a).

If the specimen shears, as shown in Figure 2 b), the test is not valid and another sample shall be taken and the procedure repeated.

If two consecutive tests show a portion of the concrete shearing off from the mass of the test specimen, the concrete lacks the necessary plasticity and cohesiveness for the slump test to be suitable.

Report the true slump *h*, as shown in Figure 1, to the nearest 10 mm.

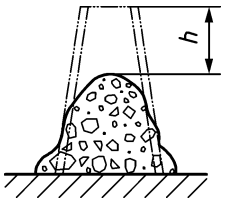

Figure 1 — Slump measurement

a) True slump **b) Shear slump**

Figure 2 — Forms of slump

9 Test report

The report shall include:

a) reference to this standard;

b) identification of the test sample;

c) location of performance of test;

d) date of test;

e) in the case of slump retention testing, the age of the sample from the first contact between cement and water;

f) type of slump – true/shear;

g) measured true slump, to nearest 10 mm;

h) any deviation from standard test method;

i) declaration by the person technically responsible for the test that it was carried out in accordance with this document, except as noted in item h).

The report may include:

j) temperature of the concrete sample at time of test;

k) time of test;

l) specified slump class or specified slump target value.

10 Precision

Precision data are given in Table 1. These apply to initial slump measurements made on concrete from the same sample and when each test result is obtained from a single slump determination. The values which apply when each test result is obtained as the average of duplicate determinations are given in Table 2.

Table 1 — Precision data for slump measurements (single determination)

Range mm	Repeatability conditions		Reproducibility conditions	
	s_r mm	r mm	s_R mm	R mm
50 to 80	5,8	16	9,0	25

Table 2 — Precision data for slump measurements (duplicate determinations)

Range mm	Repeatability conditions		Reproducibility conditions	
	s_r mm	r mm	s_R mm	R mm
50 to 80	4,1	11	8,0	22

NOTE 1 The precision data was determined as part of an experiment in the UK in 1987 in which precision data was obtained for several of the tests then described in BS 1881 [3]. The experiment involved 16 operators. The concretes were made using an ordinary Portland cement, Thames Valley sand, and Thames Valley 10 mm and 20 mm coarse aggregates.

NOTE 2 The difference between two test results from the same sample by one operator using the same apparatus within the shortest feasible time interval will exceed the repeatability value r on average not more than once in 20 cases in the normal and correct operation of the method.

NOTE 3 Test results on the same sample obtained within the shortest feasible time interval by two operators each using their own apparatus will differ by the reproducibility value R on average not more than once in 20 cases in the normal and correct operation of the method.

NOTE 4 For further information on precision, and for definitions of the statistical terms used in connection with precision, see ISO 5725-1 [1].

NOTE 5 In 2013 round robin tests were carried out by Swiss contractors on 7 tests with 53 participants. The precision and reproducibility data from these tests can be found in VAB-Round robin test document No. 2-1-038-01.14[2]