



SLOVENSKI STANDARD

SIST EN 12350-3:2019

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Nadomešča:
SIST EN 12350-3:2009

Preskušanje svežega betona - 3. del: Vebe preskus

Testing fresh concrete - Part 3: Vebe test

Prüfung von Frischbeton - Teil 3: Vébé-Prüfung

Essais pour béton - Partie 3 : Essai Vébé

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Ta slovenski standard je istoveten z: EN 12350-3:2019

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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

EN 12350-3

June 2019

ICS 91.100.30

Supersedes EN 12350-3:2009

English Version

Testing fresh concrete - Part 3: Vebe test

Essais pour béton frais - Partie 3 : Essai Vébé

Prüfung von Frischbeton - Teil 3: Vébé-Prüfung

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.

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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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European foreword

This document (EN 12350-3:2019) 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 12350-3:2009.

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 revision;
- b) use of a trowel to strike off concrete;
- c) reference to common apparatus and specification given in EN 12350-1.

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.

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1 Scope

This document specifies a method for determining the consistence of fresh concrete by means of the Vebe time.

The test is suitable for specimens having a declared value of D of the coarsest fraction of aggregates actually used in the concrete (D_{\max}) not greater than 63 mm.

If the Vebe time is less than 5 s or more than 30 s, the concrete has a consistence for which the Vebe test is unsuitable.

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 slump cone. The cone is lifted clear of the concrete and a transparent disc is swung over the top of the concrete and carefully lowered until it comes in contact with the concrete. The slump of the concrete is recorded. The vibrating table is started and the time taken for the lower surface of the transparent disc to be fully in contact with the grout (the Vebe time), is measured.

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 EN 12350-1 and as specified below;

5.1.1 Vebe meter (Consistometer), see Figure 1, consisting of:

- a) **Container**, made of metal not readily attacked by cement paste, cylindrical in shape (A), having an internal diameter of (240 ± 5) mm and a height of (200 ± 2) mm. The thickness of the wall shall be approximately 3 mm and that of the base approximately 7,5 mm. The container shall be watertight and of sufficient rigidity to retain its shape under rough usage. It shall be fitted with handles and brackets, the latter enabling it to be securely clamped to the top of the vibrating table (G) by means of wing nuts (H);
- b) **Cone**, having the same specification and dimensions as the Hollow Cone specified in EN 12350-1 except the handles shall be at approximately two thirds of the height and there shall be no fixing clamps or foot pieces;

- c) **Disc, transparent**, horizontal (C), attached to a rod (J) which slides vertically through a guide sleeve (E) mounted on a swivel arm (N) and which can be fixed in position by a screw (Q). The swivel arm also supports a funnel (D), the bottom of which coincides with the top of the cone when the latter is positioned concentrically in the container. The swivel arm is located by a holder (M) and can be fixed in position by a screw (F). When in the appropriate position, the axes of the rod and of the funnel shall be coincident with the axis of the container. The transparent disc shall be (230 ± 2) mm in diameter and (10 ± 2) mm in thickness. A weight (P) placed directly above the transparent disc shall be provided such that the moving assembly comprising rod, transparent disc and weight has a mass of $(2\,750 \pm 50)$ g. The rod shall be provided with a scale at 5 mm intervals to record the slump of the concrete;
- d) **Vibrating table (G)**, having minimum dimensions of (380 ± 3) mm in length and (260 ± 3) mm in width and supported on four rubber shock absorbers on a hollow base (K), which in turn rests on three rubber feet. A vibrator unit (L) is securely fixed to the bottom of the table. The vibrator shall operate at a nominal frequency of 50 Hz to 60 Hz and the vertical amplitude of the table with the empty container on top of it shall be approximately $\pm 0,5$ mm.

5.1.2 Compacting rod.

5.1.3 Timer.

5.1.4 Remixing container or tray.

5.1.5 Shovel.

5.1.6 Moist cloth.

5.1.7 Scoop.

5.1.8 Trowel or float.

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6 Sampling

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

The sample shall be re-mixed using the remixing container or tray and the square mouthed shovel before carrying out the test.

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

7 Procedure

Place the Vebe meter on a rigid horizontal base, ensuring that the container (A) is firmly fixed to the vibrating table (G) by means of the wing nuts (H). Dampen the cone (B) with the moist cloth and place it in the container. Swing the funnel (D) into position over the cone and lower onto the cone. Tighten the screw (F) so that the cone cannot rise from the bottom of the container.

From the sample of concrete obtained in accordance with Clause 6, 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, ensuring that the strokes are uniformly distributed 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 concrete throughout its whole depth, taking care not to strike the base. Compact the second layer and the top layer throughout its depth, so that the strokes just penetrate into the underlying layer. In filling and tamping the top layer, heap the concrete

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above the cone before tamping is started. If necessary, add further concrete to maintain an excess above the top of the cone throughout the compacting operation.

After the top layer has been tamped, loosen the screw (F) and raise the funnel (D) and swing it out of the way and tighten the screw (F) in the new position. Ensure that the cone (B) does not rise or move prematurely and concrete is not allowed to fall into the container (A).

Strike off the surface of the concrete with a trowel or by means of a sawing and rolling motion of the compacting rod. Remove the cone (B) from the concrete by raising it carefully in a vertical direction, using the handles. 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.

If the concrete shears, as shown in Figure 2 b), collapses, as shown in Figure 2 c), or slumps to the extent that it touches the wall of the container (A), record the fact.

If the concrete has not slumped into contact with the wall of the container (A), and a true slump, as shown in Figure 2 a) has been obtained, record the fact.

Swing the transparent disc (C) over the top of the concrete, loosen the screw (Q) and lower the transparent disc very carefully until it just comes into contact with the concrete.

Provided there has been a true slump, when the transparent disc (C) just touches the highest point of the concrete, tighten the screw (Q). Read and record the value of the slump from the scale (J). Loosen the screw (Q) to allow the transparent disc (C) to easily slide down into the container to rest fully on the concrete.

If there has not been a true slump ensure that screw (Q) is loosened to allow the transparent disc (C) to slide down into the container to rest on the concrete.

Start the vibration of the table and the timer simultaneously. Observe the way the concrete is remoulded through the transparent disc (C). As soon as the lower surface of the transparent disc (C) is fully in contact with the cement grout, stop the timer and switch off the vibrating table. Record the time taken to the nearest second.

Carry out the entire operation, from the start of the filling, without interruption, and complete within 5 min.

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

Record the time read from the timer, to the nearest second. This is the Vebe time, expressing the consistence of the mix under test.

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) type of slump — true/collapse/shear;

- f) measured true slump, to nearest 10 mm (if appropriate);
- g) Vebe time in s;
- 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.

10 Precision

There is currently no precision data for this test.

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