



SLOVENSKI STANDARD
SIST EN 12350-6:2009

01-julij-2009

BUXca Yý U
SIST EN 12350-6:2001

Preskušanje svežega betona - 6. del: Gostota

Testing fresh concrete - Part 6: Density

Prüfung von Frischbeton - Teil 6: Frischbetonrohichte

Essai pour béton frais - Partie 6: Masse volumique

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: EN 12350-6:2009

<https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4e7b5967576b/sist-en-12350-6-2009>

ICS:

91.100.30 Beton in betonski izdelki Concrete and concrete products

SIST EN 12350-6:2009

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12350-6:2009

<https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4c7b5967576b/sist-en-12350-6-2009>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12350-6

April 2009

ICS 91.100.30

Supersedes EN 12350-6:1999

English Version

Testing fresh concrete - Part 6: Density

Essai pour béton frais - Partie 6: Masse volumique

Prüfung von Frischbeton - Teil 6: Frischbetonrohddichte

This European Standard was approved by CEN on 20 January 2009.

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.

(standards.iteh.ai)

SIST EN 12350-6:2009

<https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4c7b5967576b/sist-en-12350-6-2009>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
1 Scope	5
2 Normative references	5
3 Principle	5
4 Apparatus	5
5 Sampling	6
6 Procedure	6
7 Calculation of density	8
8 Test report	8
9 Precision	8
Annex A (normative) Calibration of container	10

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 12350-6:2009](#)

<https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4c7b5967576b/sist-en-12350-6-2009>

Foreword

This document (EN 12350-6:2009) 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 2009, and conflicting national standards shall be withdrawn at the latest by October 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.

This document supersedes EN 12350-6:1999.

The results of a recent laboratory inter-comparison, part-funded by the EC under the Measurement and Testing programme, contract MAT1-CT94-0043mtp, have been taken into account. The compaction of specimens using hand tamping, vibrating table, or internal (poker) vibrator are accepted as equivalent. However, the use of an internal vibrator to compact specimens containing entrained air should be carried out with caution.

A procedure for calibrating the container has been included as a normative Annex A.

This series EN 12350 includes the following parts.

EN 12350 Testing fresh concrete (standards.iteh.ai)

Part 1: Sampling;

Part 2: Slump-test; <https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4c7b5967576b/sist-en-12350-6-2009>

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 (in preparation);

Part 9: Self-compacting concrete - V-funnel test (in preparation);

Part 10: Self-compacting concrete - L-box test (in preparation);

Part 11: Self-compacting concrete - Sieve segregation test (in preparation);

Part 12: Self-compacting concrete - J-ring test (in preparation).

CAUTION — When cement is mixed with water, alkali is released. Take precautions to avoid dry cement entering the eyes, mouth and nose whilst mixing concrete. Prevent skin contact with wet cement or concrete by wearing suitable protective clothing. If cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay. Wash wet concrete off the skin immediately.

EN 12350-6:2009 (E)

The following amendments have been made to the 1999-10 edition of this standard:

- editorial revision
- detailing of compaction process
- accuracy of balance, scales and other testing equipment.

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 12350-6:2009](#)

<https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4c7b5967576b/sist-en-12350-6-2009>

1 Scope

This European standard specifies a method for determining the density of compacted fresh concrete both in the laboratory and in the field.

NOTE It may not be applicable to very stiff concrete which cannot be compacted by normal vibration.

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 12350-1, *Testing fresh concrete — Part 1: Sampling*

3 Principle

Fresh concrete is compacted into a rigid and watertight container of known volume and mass and is then weighed.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4 Apparatus

4.1 Container, watertight, of sufficient rigidity to retain its shape, made of metal not readily attacked by cement paste, having a smooth internal face, with the rim machined to a plane surface. The rim and base shall be parallel. The smallest dimension of the container shall be at least four times the maximum nominal size of the coarse aggregate in the concrete, but shall be not less than 150 mm. The volume of the container shall be not less than 5 l.

4.2 Filling frame, filling may be simplified by using a filling frame fitted tightly to the container

4.3 Means of compacting the concrete, which may be one of the following:

- a) internal (poker) vibrator with a minimum frequency of approximately 120 Hz (7 200 cycles per minute), the diameter of the internal vibrator not exceeding approximately one-quarter of the smallest dimension of the container;
- b) vibrating table with a minimum frequency of approximately 40 Hz (2 400 cycles per minute);
- c) compacting rod of circular cross-section, straight, made of steel, having a diameter of approximately 16 mm, length of approximately 600 mm and with rounded ends;
- d) compacting bar, straight, made of steel having a square cross-section of approximately 25 mm × 25 mm and length of approximately 380 mm.

EN 12350-6:2009 (E)

4.4 Balance or scales, capable of determining the mass of the compacted concrete to an accuracy of 0,01 kg

4.5 Straight-edged scraper, made of steel, not less than 100 mm greater in length than the maximum internal dimension of the top of the container

4.6 Scoop, of approximately 100 mm width

4.7 Steel trowel or float

4.8 Remixing container, flat tray of rigid construction and made from a non- absorbent material not readily attacked by cement paste. It shall be of appropriate dimensions such that the concrete can be thoroughly re-mixed, using the square-mouthed shovel.

4.9 Shovel, with square mouth

NOTE The square mouth is required to ensure proper mixing of material on the remixing container.

4.10 Mallet, soft faced

5 Sampling

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

The sample shall be re-mixed using the remixing container and the square mouthed shovel or equivalent remixing procedure specified in the national annex NA before carrying out the test.

<https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-4c7b5967576b/sist-en-12350-6-2009>

6 Procedure

6.1 Calibration

Calibrate the container in accordance with Annex A, to obtain the volume of the container (V).

6.2 Mass of container

Weigh the container to determine its mass (m_1) and record the value indicated.

6.3 Filling the container

Depending on the consistence of the concrete and the method of compaction, the container shall be filled in two or more layers to achieve full compaction, except in the case of self-compacting concrete for which the container shall be filled in one operation.

If a filling frame is used, the amount of concrete used to fill the mould shall be such that a layer of concrete remains in the filling frame after compaction. The thickness of this layer shall be 10 % to 20 % of the height of the container.

6.4 Compacting the concrete

6.4.1 General

The concrete shall be compacted immediately after placing in the moulds in such a way as to produce full compaction of the concrete with neither excessive segregation nor laitance. Each layer shall be compacted by using one of the methods described in 6.4.2 or 6.4.3.

In the case of self-compacting concrete, no mechanical or hand compaction shall be applied during filling or after the container is filled.

NOTE 1 Full compaction is achieved using mechanical vibration, when there is no further appearance of large air bubbles on the surface of the concrete and the surface becomes relatively smooth with a glazed appearance, without excessive segregation.

NOTE 2 Further guidance on methods of compaction for concretes having different consistencies or cast in different sizes of containers, may be given in national annex NA.

6.4.2 Mechanical compaction

6.4.2.1 Compacting with internal vibrator

Apply the vibration for the minimum duration necessary to achieve full compaction of the concrete. Avoid over-vibration, which may cause loss of entrained air.

NOTE Care should be taken not to damage the container. The use of a filling frame is recommended.

Ensure that the vibrator is kept vertical and not allowed to touch the bottom or sides of the container.

Laboratory tests have shown that great care is needed if loss of entrained air is to be avoided, when using an internal vibrator.

[SIST EN 12350-6:2009](https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-1c775b1e7576b/sist-en-12350-6-2009)

[https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-](https://standards.iteh.ai/catalog/standards/sist/e1411cc5-3faf-42a7-b792-1c775b1e7576b/sist-en-12350-6-2009)

6.4.2.2 Compacting with vibrating table

Apply the vibration for the minimum duration necessary to achieve full compaction of the concrete. The container should preferably be attached to, or firmly held against the table. Avoid over-vibration, which may cause loss of entrained air.

6.4.3 Compacting by hand with compacting rod or bar

Distribute the strokes of the compacting rod, or bar, in a uniform manner over the cross-section of the container. Ensure that the compacting rod, or bar, does not forcibly strike the bottom of the container when compacting the first layer, nor penetrate significantly any previous layer. Subject the concrete to a sufficient number of strokes per layer, typically 25 for concretes having a consistence equivalent to slump classes S1 and S2, in order to remove pockets of entrapped air but not the entrained air. After compaction of each layer, tap the sides of the container smartly with the mallet until large bubbles of air cease to appear on the surface and depressions left by the compacting rod or bar, are removed.

6.5 Surface levelling

If a filling frame is used, remove it immediately after compaction.

After the top layer has been compacted, smooth it level with the top of the container, using the steel float or trowel. Skim the surface and rim with the straightedge and wipe the outside of the container clean.

6.6 Weighing

Weigh the container with its contents to determine its mass (m_2) and record the value indicated.