

**Testing fresh concrete - Part 9: Self-compacting  
concrete - V-funnel test**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12350-9:2010 sisaldab Euroopa standardi EN 12350-9:2010 ingliskeelset teksti.

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ICS 91.100.30

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English Version

## Testing fresh concrete - Part 9: Self-compacting concrete - V-funnel test

Essai pour béton frais - Partie 9: Béton auto-plaçant - Essai d'écoulement à l'entonnoir en V

Prüfung von Frischbeton - Teil 9: Selbstverdichtender Beton - Auslauftrichterversuch

This European Standard was approved by CEN on 20 June 2010.

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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.

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## Foreword

This document (EN 12350-9:2010) 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

This standard is based on the results from the EU-project "Testing-SCC" under the 5<sup>th</sup> Frame Programme (GRD2-2000-30024/G6RD-CT-2001-00580).

Owing to its significant advantages in the improvement of construction quality and working environment, self-compacting concrete (SCC) has been widely accepted by the construction owners. The use of SCC in practical concrete construction is steadily increasing. Since SCC has to give satisfactory in-situ properties (perfect filling of the mould and embedment of the reinforcement, homogeneity and full compaction) without vibration, the proper methods for testing the fresh SCC are very important. These should address three key properties: filling ability, passing ability and resistance to segregation. It is desirable, especially in the case of new constituents or new concrete compositions, to test the consistence of fresh SCC before casting in place.

A number of test methods including this test are available for testing fresh SCC. Most of the commonly used test methods were evaluated in the recently closed EU-project "Testing-SCC" under the 5<sup>th</sup> Frame Programme (GRD2-2000-30024/G6RD-CT-2001-00580). According to the results from this EU project, it seems no single test method can completely cover all the three key properties. Nevertheless any test method should at least be correlated to the practical situation and give consistent results in order to provide reliable data for judgment of concrete workability.

This standard is one of a series concerned with testing fresh concrete.

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

- *Part 1: Sampling*
- *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*

**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.

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.

## 1 Scope

This European Standard specifies the procedure for determining the V-funnel flow time for self-compacting concrete. The test is not suitable when the maximum size of the aggregate exceeds 22,4 mm.

## 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

The V-funnel test is used to assess the viscosity and filling ability of self-compacting concrete.

A V shaped funnel is filled with fresh concrete and the time taken for the concrete to flow out of the funnel is measured and recorded as the V-funnel flow time.

## 4 Apparatus

**4.1 V-funnel**, made to the internal dimensions and tolerances in Figure 1, fitted with a quick release, watertight hinged or sliding gate at its base and supported by a frame so that the top of the funnel is horizontal with sufficient clearance beneath the gate to place the container underneath.

The V-funnel shall be made from metal which shall be reference material; the surfaces shall be smooth, and not readily attacked by cement paste or be liable to rusting.

If the funnel is made from other materials, in-use performance test data shall be available which demonstrates long-term equivalence with metal.

**4.2 Container**, to hold the test sample and having a volume not less than 12 l.

**4.3 Stop watch**, capable of measuring to 0,1 s.

**4.4 Straight edge**, for striking off concrete level with the top of the funnel.