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# Testing of concrete —

## Part 13: Properties of fresh self compacting concrete

*Essais du béton —*

*Partie 13: Titre manque*

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# Contents

Page

**Foreword** ..... **v**

**1 Scope** ..... **1**

**2 Normative references** ..... **1**

**3 Terms and definitions** ..... **1**

**4 Slump-flow test** ..... **2**
4.1 General ..... 2
4.2 Principle ..... 2
4.3 Apparatus ..... 2
4.4 Test sample ..... 2
4.5 Procedure ..... 2
4.6 Test result ..... 4
4.7 Test report ..... 4
4.8 Repeatability and reproducibility ..... 5

**5 V funnel test** ..... **5**
5.1 General ..... 5
5.2 Principle ..... 5
5.3 Apparatus ..... 5
5.4 Test sample ..... 6
5.5 Procedure ..... 6
5.6 Test report ..... 6
5.7 Repeatability and reproducibility ..... 7

**6 L box test** ..... **7**
6.1 General ..... 7
6.2 Principle ..... 7
6.3 Apparatus ..... 7
6.4 Test sample ..... 9
6.5 Test procedure ..... 9
6.6 Test result ..... 9
6.7 Test report ..... 9
6.8 Repeatability and reproducibility ..... 10

**7 Sieve segregation test** ..... **10**
7.1 General ..... 10
7.2 Principle ..... 10
7.3 Apparatus ..... 10
7.4 Test sample ..... 11
7.5 Procedure ..... 11
7.6 Test result ..... 12
7.7 Test report ..... 13
7.8 Repeatability and reproducibility ..... 13

**8 J-ring test** ..... **13**
8.1 General ..... 13
8.2 Principle ..... 13
8.3 Apparatus ..... 14
8.4 Test sample ..... 15
8.5 Procedure ..... 15
8.6 Expression of results ..... 16
8.6.1 Passing ability PJ ..... 16
8.6.2 Flow spread $SF_J$ ..... 16
8.6.3 Flow time, $t_{500j}$ ..... 17
8.7 Test report ..... 17
8.8 Repeatability and reproducibility ..... 17

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**9 Drop and fill height test for self-compactability of fresh concrete ..... 18**
9.1 General ..... 18
9.2 Principle ..... 18
9.3 Apparatus ..... 18
9.4 Test sample ..... 20
9.5 Procedure ..... 20
9.6 Expression of results ..... 22
9.6.1 Filling time ..... 22
9.6.2 Filling height ..... 22
9.6.3 Coarse aggregate content of concrete after flowing through the obstacle (when necessary) ..... 22
9.7 Test report ..... 22
**Bibliography ..... 23**

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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 1, *Test methods for concrete*.

A list of all parts in the ISO 1920 series can be found on the ISO website.

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# Testing of concrete —

# Part 13:
# Properties of fresh self compacting concrete

## 1 Scope

This document specifies procedures for testing fresh self-compacting concrete. It specifies the following test methods: determination of consistence (slump flow test), V funnel test, L box test, sieve segregation test, J-ring test and self-compactability test.

## 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.

ISO 1920-1, *Testing of concrete — Part 1: Sampling of fresh concrete*

ISO 1920-2, *Testing of concrete — Part 2: Properties of fresh concrete*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

**3.1**
**self-compacting concrete**
**SCC**
innovative concrete that does not require vibration for placing and compaction because it is able to flow under its own weight, completely filing formwork and achieving full compaction, even in the presence of congested reinforcement

**3.2**
**passing ability**
ability of fresh concrete to flow through tight openings such as spaces between steel reinforcing bars without segregation or blocking

**3.3**
**segregation resistance**
ability of fresh concrete to remain homogeneous in composition while in its fresh state

**3.4**
**slump flow**
mean diameter of the spread of fresh concrete from a standardized slump cone

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**3.5**
**viscosity**
<concrete> resistance to flow of fresh concrete once flow has started

# 4 Slump-flow test

## 4.1 General

This test specifies the procedure for determining the slump-flow and $t_{500}$ time for self-compacting concrete. The test is not suitable when the maximum size of the aggregate exceeds 40 mm.

## 4.2 Principle

The slump-flow test is an indication of the flowability of self-compacting concrete in the absence of obstructions. It is based on the slump test described in ISO 1920-2. The flowability is evaluated by measuring the spreading maximum diameter, $d_{max}$, and the time it reaches the spreading diameter of 500 mm, $t_{500}$. The $d_{max}$ of spreading is a measure of the self-compacting concrete flow range when subjected to load from its own weight. It is an indication of the yield stress of the self-compacting concrete. The $t_{500}$ time is a measure of the speed of flow and an indication of the relative viscosity of the self-compacting concrete. The result is an indication of the filling ability of self-compacting concrete.

The fresh concrete is poured into a cone as specified for the ISO 1920-2 slump test. When the cone is withdrawn upwards, the time from commencing upward movement of the cone to when the concrete has flowed to a diameter of 500 mm is measured; this is the $t_{500}$ time. The largest diameter of the flow spread of the concrete and the diameter of the spread at right angles to it are then measured and the mean is the slump-flow.

## 4.3 Apparatus

**4.3.1 Mould,** in accordance with ISO 1920-2:2016, 4.3.2.1 (see Figure 1).

**4.3.2 Rule or measuring tape,** of minimum length 1 000 mm and having sub-divisions not greater than 5 mm along its entire length.

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

**4.3.4 Spirit level,** for checking horizontality of base plate prior to commencing the test.

**4.3.5 Container,** to hold the test sample and having a volume of at least 10 l.

**4.3.6 Collar,** (optional) having a mass of at least 9 kg (see Figure 2).

NOTE The collar allows the test to be carried out by one person.

## 4.4 Test sample

The sample shall be obtained in accordance with ISO 1920-1.

## 4.5 Procedure

Place the baseplate on a flat and horizontal surface free from external vibration or shock. Check the top surface for horizontality using the spirit level. Clean the table and the cone and dampen immediately prior to testing, but keep free from excess moisture.

Fit the collar to the cone if being used.


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