

METHOD OF TEST FOR EVALUATION OF FRESHLY MIXED SELF-CONSOLIDATING CONCRETE BY SLUMP FLOW

1. SCOPE

This test method covers procedures for determining slump flow of self-consolidating concrete (SCC). The procedure is suitable for use in the laboratory or in the field, and is used as a measure of flowability and segregation resistance of SCC.

Note 1: This method is based on the test method outlined in the Precast/Prestressed Concrete Institute and EFNARC (European Federation of Producers and Contractors of Specialist Products for Structures) guidelines.

2. RELEVANT DOCUMENTS

- 2.1 Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants, Precast/Prestressed Concrete Institute, TR-6-03, April 2003
- 2.2 Specification and Guidelines for Self-Compacting Concrete, EFNARC, February 2002
- 2.3 CAN/CSA A 23.2-5C, Slump and Slump Flow of Concrete

3. DEFINITIONS

- 3.1 Flowability is a measure of SCC's ability to completely fill formwork without entrapped air pockets.
- 3.2 Self-Consolidating Concrete (SCC) is highly flowable yet stable concrete that can spread readily into place, fill the formwork, and encapsulate the reinforcement without any mechanical consolidation and without undergoing segregation or excessive bleeding.

4. APPARATUS

The test equipment shall be according to CSA A23.2-5C with the additional requirement that the surface of the base plate shall be smooth.

Note 2: Base plates made of steel, plastic, or that are plastic-coated are suitable.

5. SLUMP FLOW PROCEDURE

- 5.1 Follow the slump flow procedure of CSA A 23.2-5C with the following exceptions:
 - 5.1.1 Measure and record air temperature of the testing environment and of the plastic concrete.
 - 5.1.2 Position base plate on which the slump flow will be tested so that it is fully supported, flat, and level.
 - 5.1.3 Remove all excess water on the base plate using a squeegee or a sponge.

Note 3: Removing excess water is important in order to determine the Visual Stability Index in Step 5.15 below. Excess water will inhibit the accurate assessment of the outside edge of the slump flow patty.

5.1.4 The slump cone may be used in the inverted position (small opening of the mould facing down) provided that it is demonstrated that test results do not differ from those obtained with the cone in the standard upright position.

5.1.5 Following completion of the slump flow test, determine the Visual Stability Index rating.

5.1.6 Rate the stability of the mixture in 0.5 increments by visual examination using the guidelines provided in Table 1.

Table 1
Visual Stability Index

Rating	Criteria
0	No evidence of segregation in the slump flow patty or in the mixer drum or wheelbarrow.
1	No halo or aggregate pile in the slump flow patty but some slight bleeding or air bubbles on the surface of the concrete in the mixer drum or wheelbarrow.
2	A slight halo (<10 mm) at the perimeter of the slump flow patty and/or aggregate pile in the slump flow patty and highly noticeable bleeding in the mixer drum and wheelbarrow.
3	Clearly segregating by evidence of a large halo (>10mm) at the perimeter of the slump flow patty and/or large aggregate pile in the centre of the concrete patty and a thick layer of paste on the surface of the resting concrete in the mixer drum or wheelbarrow.

6. REPORT

Reporting shall be according to CSA A23.2-5C and, in addition, concrete and air temperatures and the Visual Stability Index shall be reported.