
Standard Method of Test for Visual Stability Index (VSI) of Self-Consolidating Concrete (SCC)

AASHTO Designation: T 351-14 (2022)¹

Technically Revised: 2014

Reviewed but Not Updated: 2022

Editorially Revised: 2021

Technical Subcommittee: 3b, Fresh Concrete



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1. SCOPE

- 1.1. This test method covers determination of the visual stability index of self-consolidating concrete (SCC), both in the laboratory and in the field. SCC is defined as a highly workable concrete that can flow through densely reinforced or complex structural elements under its own weight without vibration and adequately fill voids without experiencing segregation or excessive bleeding.
- 1.2. The values stated in either SI units or inch-pound units are to be regarded separately as standard. Within the text, the inch-pound units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.
- 1.3. *This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*
- 1.4. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*
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2. REFERENCED DOCUMENTS

- 2.1. AASHTO Standards:
- R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - R 60, Sampling Freshly Mixed Concrete
 - T 119M/T 119, Slump of Hydraulic Cement Concrete
 - T 347, Slump Flow of Self-Consolidating Concrete (SCC)
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3. SUMMARY OF TEST METHOD

- 3.1. The Visual Stability Index (VSI) is a visual rating of the resistance to segregation of an SCC mixture and may be determined when performing the Slump Flow Method of Test in T 347. A

sample of freshly mixed self-consolidating concrete is placed in a mold shaped as the inverted frustum of a cone. The mold is raised, allowing the SCC to spread radially. The stability of the mixture is then rated visually and assigned a Visual Stability Index based on the criteria in this document.

4. SIGNIFICANCE AND USE

- 4.1. This test method is applicable to SCC, defined in Section 1.1.
- 4.2. This test method is intended to provide the user with a procedure to assess the stability of SCC. The stability (or segregation resistance) of an SCC mixture is the ability of the mixture to remain homogeneous in composition during transport, during placement, and subsequent to placement. The VSI does not quantify a property of the concrete mixture but is useful for quality control/consistency testing.
- 4.3. This test method is applicable to SCC having coarse aggregate up to 25 mm [1 in.].

5. APPARATUS

- 5.1. *Mold*—The SCC shall be placed in an inverted slump cone mold conforming to the applicable requirements of [T 119M/T 119](#).
- 5.2. *Base Plate*—The base plate shall be made of a stiff nonabsorbing material, at least 820 mm [32 in.] square, marked with a circle indicating the central location for the slump cone, and a concentric circle with a diameter of 500 mm [20 in.].
- 5.3. *Scoop*—A scoop of a size large enough so each amount of concrete obtained from the sampling receptacle is representative and small enough so it is not spilled during placement in the mold.
- 5.4. *Strike-Off Bar*—A flat straight bar of steel or other suitable metal at least 3 mm [$\frac{1}{8}$ in.] thick and 20 mm [$\frac{3}{4}$ in.] wide by 300 mm [12 in.] long.
- 5.5. Tape measure containing increments of 5 mm [0.25 in.] or less.

6. SAMPLE

- 6.1. Approximately 6 L [0.2 ft³] of SCC is needed to perform the slump flow and VSI tests, sampled normally.
- 6.2. The sample of concrete shall be obtained in accordance with [R 60](#).

7. PROCEDURE

- 7.1. Moisten the base plate and inside of the slump cone.
- 7.2. Place the base plate on a level stable surface and the inverted slump cone centrally on the base plate and hold down firmly (Figure 1).