



Designation: C 827 – 01

Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures¹

This standard is issued under the fixed designation C 827; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the determination of change in height of cylindrical specimens from the time of molding until the mixture is hard.

1.2 This test method covers height change measurements at early ages for cementitious mixtures of paste, grout, mortar, and concrete.

1.3 This test method is intended for determination of changes in height that occur from the time of placement until the specimen is fully hard. These include shrinkage or expansion due to hydration, settlement, evaporation, and other physical and chemical effects.

1.4 The values stated in SI units are to be regarded as the standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, 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.*

1.6 The text of this test method references notes and footnotes that provide explanatory information. These notes and footnotes shall not be considered as requirements of the test method.

2. Referenced Documents

2.1 ASTM Standards:

C 109/C 109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)²

C 125 Terminology Relating to Concrete and Concrete Aggregates³

C 143/C 143M Test Method for Slump of Hydraulic-Cement Concrete³

C 191 Test Method for Time of Setting of Hydraulic Cement by Vicat Needle²

C 192/C 192M Practice for Making and Curing Concrete

Test Specimens in the Laboratory³

C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency²

C 403/C 403M Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance³

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials³

C 807 Test Method for Time of Setting of Hydraulic Cement Mortar by Modified Vicat Needle²

C 939 Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)³

C 953 Test Method for Time of Setting of Grouts for Preplaced-Aggregate Concrete in the Laboratory³

C 1437 Test Method for Flow of Hydraulic Cement Mortar²

3. Terminology

3.1 *Definitions*—The terms used in this test method are defined in Terminology C 125.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *early-age change in height, n*—the measured increase or decrease in height of a laterally confined cylindrical test specimen from the time of molding to when the mixture becomes hard. The user may want to define this age as the time when a companion specimen of the same batch has reached the time of final setting by Test Method C 191 (paste), C 953 (mortar or grout), C 403/C 403M (concrete), or establish a predetermined age in minutes from the time the specimen is cast as the defined age to record the final measurement. Changes in height are measured and expressed as a positive or negative change in the height of a test specimen that is restrained from lateral movement.

4. Significance and Use

4.1 This test method provides a means for comparing the relative shrinkage or expansion of cementitious mixtures. It is particularly applicable to grouting, patching, and form-filling operations where the objective is to completely fill a cavity or other defined space with a freshly mixed cementitious mixture that will continue to fill the same space at time of hardening. It would be appropriate to use this test method as a basis for prescribing mixtures having restricted or specified volume change before the mixture becomes hard.

4.2 This test method can be used for research purposes to

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.68 on Volume Change.

Current edition approved Aug. 10, 2001. Published October 2001. Originally published as C 827 – 75 T. Last previous edition C 827 – 95a (1997)^{ε1}.

² *Annual Book of ASTM Standards*, Vol 04.01.

³ *Annual Book of ASTM Standards*, Vol 04.02.