



Standard Test Method for Measuring Early-Age Compressive Strength and Projecting Later-Age Strength¹

This standard is issued under the fixed designation C918/C918M; 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.

1. Scope*

1.1 This test method covers a procedure for making and curing concrete specimens and for testing them at an early age. The specimens are stored under standard or accelerated curing conditions and the measured temperature history is used to compute a maturity index that is related to strength gain.

1.2 This test method also covers a procedure for using the results of early-age compressive-strength tests to project the potential strength of concrete at later ages.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of 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. (Warning—Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure.)*²

2. Referenced Documents

2.1 ASTM Standards:³

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.61 on Testing for Strength.

Current edition approved Dec. 1, 2013. Published January 2014. Originally approved in 1980. Last previous edition approved in 2007 as C918–07. DOI: 10.1520/C0918_C0918M-13.

² Section on Safety Precautions, Manual of Aggregate and Concrete Testing, Annual Book of ASTM Standards, Vol. 04.02.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

C31/C31M Practice for Making and Curing Concrete Test Specimens in the Field
C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens
C192/C192M Practice for Making and Curing Concrete Test Specimens in the Laboratory
C470/C470M Specification for Molds for Forming Concrete Test Cylinders Vertically
C617/C617M Practice for Capping Cylindrical Concrete Specimens
C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
C1074 Practice for Estimating Concrete Strength by the Maturity Method
C1231/C1231M Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders
C1768/C1768M Practice for Accelerated Curing of Concrete Cylinders

3. Terminology

3.1 Definitions:

3.1.1 Refer to Practice C1074 for the definitions of the following terms: datum temperature, equivalent age, maturity, maturity function, maturity index, and temperature–time factor.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *potential strength, n*—the strength of a test specimen that would be obtained at a specified age under standard curing conditions.

3.2.2 *prediction equation, n*—the equation representing the straight-line relationship between compressive strength and the logarithm of the maturity index.

3.2.2.1 *Discussion*—The prediction equation is used to project the strength of a test specimen based upon its measured early-age strength. The general form of the prediction equation used in this test method is:

$$S_M = S_m + b(\log M - \log m) \quad (1)$$

where:

S_M = projected strength at maturity index M ,
 S_m = measured compressive strength at maturity index m ,
 b = slope of the line,

*A Summary of Changes section appears at the end of this standard