



Standard Test Method for Water-Soluble Chloride in Mortar and Concrete¹

This standard is issued under the fixed designation C 1218/C 1218M; 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 provides procedures for the sampling and analysis of hydraulic-cement mortar or concrete for chloride that is water soluble under the conditions of test.

1.2 The text of this standard references notes and footnotes that provide explanatory information. These notes and footnotes shall not be considered as requirements of this standard.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as a 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.

1.4 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C 42/C 42M Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

C 114 Test Methods for Chemical Analysis of Hydraulic Cement

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

C 823 Practice for Examination and Sampling of Hardened Concrete in Constructions

C 1084 Test Method for Portland-Cement Content of Hardened Hydraulic-Cement Concrete

D 1193 Specification for Reagent Water

E 11 Specification for Wire Cloth and Sieves for Testing Purposes

E 832 Specification for Laboratory Filter Papers

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.69 on Miscellaneous Tests.

Current edition approved Jan. 1, 2008. Published January 2008. Originally approved in 1992. Last previous edition approved in 1999 as C 1218/C 1218M – 99.

² 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.

3. Significance and Use

3.1 Water-soluble chloride, when present in sufficient amount, is capable of leading to initiation or acceleration of the corrosion of metals, such as steel, embedded in or contacting a cement system such as mortar, grout, or concrete. Thus, its determination shall be required to evaluate the potential of a cement system for undergoing such reactions or to investigate cement systems where such reaction has already occurred. However, it must be recognized that water-soluble chloride determined at some particular time in the life of a cement system is capable of being substantially different than that at another time; for example, the service environment is capable of resulting in a higher water-soluble chloride content due to changes in solubility or a lower one due to leaching.

3.1.1 Test conditions are capable of affecting water-soluble chloride determinations. Take caution when comparing results from this test method with those from other test methods.

3.2 Sulfides are known to interfere with the determination of chloride content. Blast-furnace slag aggregates and cements contain sulfide sulfur in concentrations that are capable of such interference and produce erroneously high test results. Treatment with hydrogen peroxide, as discussed in Test Methods **C 114**, is used to eliminate such interference.

3.3 There are aggregates that contain chloride that is not available for corrosion. Such chloride will be detected by use of this test method.³

4. Apparatus

4.1 *Sampling Equipment:*

4.1.1 The apparatus required for obtaining samples by coring or sawing is described in Test Method **C 42/C 42M**.

4.1.2 Use the following apparatus for sampling by drilling (pulverization):

4.1.2.1 Rotary impact drill and drill or pulverizing bits.

4.1.2.2 Spoon or other suitable means to collect without contamination pulverized sample material produced by drilling.

³ For more information see "The Determination of the Chloride Content of Concrete," by Brian B. Hope, John A. Page and John S. Poland, *Cement and Concrete Research*, Volume 15, Number 5, Pergamon Press, New York, September 1985, pp. 863–870.