



Standard Test Method for Air-Entraining Admixtures for Concrete¹

This standard is issued under the fixed designation C 233; 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 testing of materials proposed for use as air-entraining admixtures in the field.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information purposes only.

1.3 *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.*

1.4 The text of this test method 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.

2. Referenced Documents

2.1 ASTM Standards:

- C 33 Specification for Concrete Aggregates²
- C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens²
- C 78 Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)²
- C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates²
- C 143/C 143M Test Method for Slump of Hydraulic Cement Concrete²
- C 150 Specification for Portland Cement³
- C 157 Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete²
- C 172 Practice for Sampling Freshly Mixed Concrete²
- C 173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method²
- C 185 Test Method for Air Content of Hydraulic Cement Mortar³
- C 192/C 192M Test Method for Making and Curing Concrete Test Specimens in the Laboratory²

C 231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method²

C 232 Test Methods for Bleeding of Concrete²

C 260 Specification for Air-Entraining Admixtures for Concrete²

C 403/C 403M Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance²

C 666 Test Method for Resistance of Concrete to Rapid Freezing and Thawing²

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²

D 75 Practice for Sampling Aggregates⁴

D 1193 Specification for Reagent Water⁵

E 70 Test Method for pH of Aqueous Solutions with the Glass Electrode⁶

2.2 ACI Standards:

ACI 211.1 Recommended Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete⁷

3. Significance and Use

3.1 This test method is used to develop data for comparison with the requirements of Specification C 260. These tests are based on arbitrary stipulations permitting highly standardized testing in the laboratory, and are not intended to simulate actual job conditions.

4. Materials

4.1 *Cement*—The cement used in any series of tests shall be either the cement proposed for specific work in accordance with 4.4, a Type I or Type II cement conforming to Specification C 150, or a blend of two or more cements, in equal parts. Each cement of the blend shall conform to the requirements of either Type I or Type II, Specification C 150. If a blend of cements is used, it shall be a combination which produces an air content of less than 10 % when tested in accordance with Test Method C 185 (Note 3).

4.2 *Aggregates*—Except when tests are made in accordance with 4.4, using the aggregates proposed for specific work, the fine and coarse aggregates used in any series of tests shall come

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.23 on Chemical Admixtures.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.01.

⁴ *Annual Book of ASTM Standards*, Vol 04.03.

⁵ *Annual Book of ASTM Standards*, Vol 11.01.

⁶ *Annual Book of ASTM Standards*, Vol 15.05.

⁷ American Concrete Institute Manual of Concrete Practice, Part 1, pp. 211-1 to 211-38 (1993).