



Standard Specification for Admixtures for Shotcrete¹

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1. Scope

1.1 This specification covers materials proposed for use as admixtures to be added to a portland-cement shotcrete mixture for the purpose of altering the properties of the mixture.

1.2 *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.*

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

- C 125 Terminology Relating to Concrete and Concrete Aggregates²
- C 136 Test Method For Sieve Analysis of Fine and Coarse Aggregates²
- C 138 Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete²
- C 173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method²
- C 183 Practice for Sampling and the Amount of Testing of Hydraulic Cement³
- C 231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method²
- C 260 Specification for Air-Entraining Admixtures for Concrete²
- C 311 Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete²
- C 494 Specification for Chemical Admixtures for Concrete²
- C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete²
- C 979 Specification for Pigments for Integrally Colored Concrete²
- C 989 Specification for Ground Granulated Blast Furnace

Slag for Use in Concrete and Mortars²

C 1240 Specification for Silica Fume for Use in Hydraulic-Cement Concrete and Mortar²

C 1438 Specification for Latex and Powder Polymer Modifiers for Hydraulic Cement Concrete and Mortar²

D 98 Specification for Calcium Chloride⁴

2.2 ACI Documents:

318 Building Code Requirements for Reinforced Concrete⁵

3. Terminology

3.1 The terms used in this standard are defined in Terminology C 125.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *dry-mix shotcrete*—Shotcrete in which most of the mixing water is added at the nozzle.

3.2.2 *shotcrete*—Mortar or concrete pneumatically projected at high velocity onto a surface.

3.2.3 *wet-mix shotcrete*—Shotcrete in which most of the ingredients, including the water, are mixed prior to introduction into the delivery hose.

4. Classification

4.1 This specification recognizes grades of admixtures, used in shotcrete made by either of two processes, as follows:

4.1.1 *Type I*—Dry mix shotcrete.

4.1.1.1 *Grade 1*—Accelerating admixture, conventional.

4.1.1.2 *Grade 2*—Retarding admixture.

4.1.1.3 *Grade 3*—Pozzolan admixture.

4.1.1.4 *Grade 4*—Metallic iron admixture.

4.1.1.5 *Grade 5*—Coloring admixture.

4.1.1.6 *Grade 6*—Organic polymer admixture.

4.1.1.7 *Grade 7*—Not applicable.

4.1.1.8 *Grade 8*—Not applicable.

4.1.1.9 *Grade 9*—Accelerating admixture, quick-setting.

4.1.2 *Type II*—Wet-mix shotcrete.

4.1.2.1 *Grade 1*—Accelerating admixture, conventional.

4.1.2.2 *Grade 2*—Retarding admixture.

4.1.2.3 *Grade 3*—Pozzolan admixture.

4.1.2.4 *Grade 4*—Metallic iron admixture.

4.1.2.5 *Grade 5*—Coloring admixture.

4.1.2.6 *Grade 6*—Organic polymer admixture.

4.1.2.7 *Grade 7*—Water reducing admixture.

¹ This specification is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.46 on Shotcrete.

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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 Available from American Concrete Institute, P.O. Box 19150, Detroit, MI 48219.