Standard Specification for

Slag Cement for Use in Concrete and Mortars

AASHTO Designation: M 302-19[1]

Technical Subcommittee: 3b, Fresh Concrete

Release: Group 1 (April)

ASTM Designation: C989/C989M-18

American Association of State Highway and Transportation Officials
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001

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1. SCOPE

1.1. This specification covers slag cement for use as a cementitious material in concrete and mortar.

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

1.3. *The following safety hazards caveat pertains only to the test methods described in this specification. 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 standard references notes that provide explanatory information. These notes and footnotes (excluding those in tables) shall not be considered as requirements of this standard.

Note 1—The material described in this specification may be used for blending with portland cement to produce a cement meeting the requirements of M 240M/M 240 or as a separate ingredient in concrete or mortar mixtures. The material may also be useful in a variety of special grouts and mortars and, when used with an appropriate activator, as the principal cementitious material in some applications.

Note 2—Information on technical aspects of the use of the material described in this specification is contained in Appendix A. More detailed information on that subject is contained in ACI 233R-17.

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- M 85, Portland Cement
- M 240M/M 240, Blended Hydraulic Cement
- R 80, Determining the Reactivity of Concrete Aggregates and Selecting Appropriate Measures for Preventing Deleterious Expansion in New Concrete Construction
- T 105, Chemical Analysis of Hydraulic Cement
- T 106M/T 106, Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in. Cube Specimens)
- T 133, Density of Hydraulic Cement
- T 137, Air Content of Hydraulic Cement Mortar
- T 153, Fineness of Hydraulic Cement by Air Permeability Apparatus

- T 192, Fineness of Hydraulic Cement by the 45- m (No. 325) Sieve

2.2. *ASTM Standards:*

- C125, Standard Terminology Relating to Concrete and Concrete Aggregates
- C452, Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate
- C465, Standard Specification for Processing Additions for Use in the Manufacture of Hydraulic Cements
- C1012/C1012M, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution
- C1038/C1038M, Standard Test Method for Expansion of Hydraulic Cement Mortar Bars Stored in Water
- D3665, Standard Practice for Random Sampling of Construction Materials

2.3. *American Concrete Institute Report*:

- 233R-17, Slag in Concrete and Mortar [1]

3. TERMINOLOGY

3.1. *Definitions*:

3.1.1. *blast-furnace slag*—the nonmetallic product, consisting essentially of silicates and aluminosilicates of calcium and other bases that is developed in a molten condition simultaneously with iron in a blast furnace. (See ASTM C125.)

3.2. *Descriptions of Terms Specific to This Standard*:

3.2.1. *granulated blast-furnace slag*—the glassy granular material formed when molten blast-furnace slag is rapidly chilled as by immersion in water. (See ASTM C125.) Compositional adjustments may be made while the blast-furnace slag is molten.

3.2.2. *slag cement*—granulated blast-furnace slag, as defined and described in Sections 3.1.1 and 3.2.1 and ground to cement fineness with or without additions meeting the requirements of the section on additions.

4. CLASSIFICATION

4.1. Slag is classified by performance in the slag activity test in three grades: Grade 80, Grade 100, and Grade 120. (See Table 1.)

5. ORDERING INFORMATION

5.1. The purchaser shall specify the grade slag desired and the optional chemical or physical data to be reported.

6. ADDITIONS

6.1. *The slag cement covered by this specification shall contain no additions except as follows*: