
Standard Specification for Processing Additions for Use in the Manufacture of Hydraulic Cements

AASHTO Designation: M 327-23

Technically Revised: 2023

Technical Subcommittee: 3a, Cement, Lime, and Concrete Materials

ASTM Designation: C465-23



American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, DC 20004

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1. SCOPE

- 1.1. This specification pertains to the criteria and tests to be used for determining whether an organic or inorganic processing addition, when used in the recommended amount at the option of the cement producer in the manufacture of hydraulic cements, meets the requirements as prescribed by definition in M 85 and M 240M/M 240 as well as ASTM C1157/C1157M and C845/C845M. The materials listed in the following former AASHTO and ASTM specifications shall be considered as meeting the organic processing additions requirements of this specification:
- M 85-57, Portland Cement
 - ASTM C205-58, Standard Specification for Portland Blast-Furnace Slag Cement
 - ASTM C340-58, Standard Specification for Portland-Pozzolan Cement
 - ASTM C358-58, Standard Specification for Slag Cement
- 1.2. *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.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 6, Fine Aggregate for Hydraulic Cement Concrete
 - M 80, Coarse Aggregate for Hydraulic Cement Concrete
 - M 85, Portland Cement
 - M 85-57, Portland Cement
 - M 240M/M 240, Blended Hydraulic Cement
 - R 39M/R 39, Making and Curing Concrete Test Specimens in the Laboratory
 - T 22, Compressive Strength of Cylindrical Concrete Specimens
 - 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 119M/T 119, Slump of Hydraulic Cement Concrete
 - T 121M/T 121, Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

- T 129, Amount of Water Required for Normal Consistency of Hydraulic Cement Paste
- T 131, Time of Setting of Hydraulic Cement by Vicat Needle
- T 137, Air Content of Hydraulic Cement Mortar
- T 152, Air Content of Freshly Mixed Concrete by the Pressure Method
- T 153, Fineness of Hydraulic Cement by Air Permeability Apparatus
- T 196M/T 196, Air Content of Freshly Mixed Concrete by the Volumetric Method
- T 231, Capping Cylindrical Concrete Specimens

2.2. *ASTM Standards:*

- C205-58, Standard Specification for Portland Blast-Furnace Slag Cement (withdrawn 1967; replaced by C595)
- C226, Standard Specification for Air-Entraining Additions for Use in the Manufacture of Air-Entraining Hydraulic Cement
- C340-58, Standard Specification for Portland-Pozzolan Cement (withdrawn 1967)
- C358-58, Standard Specification for Slag Cement (withdrawn 1967)
- C596, Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement
- C845/C845M, Standard Specification for Expansive Hydraulic Cement
- C1157/C1157M, Standard Performance Specification for Hydraulic Cement
- D891, Standard Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals
- E203, Standard Test Method for Water Using Volumetric Karl Fischer Titration

3. MATERIALS

3.1. *Cements:*

- 3.1.1. In cases where it is desired that the proposed organic processing addition be accepted for general use in portland cement, tests shall be made on cements prepared from at least five different clinkers. As a minimum, these clinkers shall represent two Type I cements containing not less than 9.0 percent C_3A , one Type II cement, and two Type III cements, all conforming to M 85.
- 3.1.2. In cases where it is also desired that the proposed organic processing addition be used in blended cements, the test and test procedures shall be as specified with a control and an addition for cement conforming to the appropriate specification, M 240M/M 240 or ASTM C1157/C1157M.
- 3.1.3. Organic processing additions that have been shown to meet the requirements of this specification may also be used in cements conforming to ASTM C845/C845M. Testing of the addition with these special cements, where desired, shall be done using the tests and test procedures as specified with a control cement and a cement containing the addition, both conforming to ASTM C845/C845M.
- 3.1.4. In cases where it is desired that the proposed organic processing addition be limited in use to specific types of cement less in number than required in Section 3.1.1, the tests and test procedures shall be as specified, and at least two pairs of cements shall be prepared from two clinkers from different plants for each type under specific consideration.
- 3.1.5. For inorganic processing additions, or in cases where it is desired that the proposed organic processing addition be limited in use to a single plant, the tests and test procedures shall be as specified, and at least two pairs of cements shall be prepared from clinkers representing each type under specific consideration.