



Standard Specification for Fly Ash and Other Pozzolans for Use With Lime for Soil Stabilization¹

This standard is issued under the fixed designation C593; 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 specification covers the qualification of fly ash and other pozzolans for use with lime in plastic, nonplastic mixtures and other mixtures that affect lime pozzolanic reaction required by soil stabilization. Evaluation of pozzolans containing available lime, such as Class C fly ash, is given consideration. Pozzolans covered include artificial pozzolans such as fly ash, and natural pozzolans, such as diatomite and pumicite, in either raw or calcined state.

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.*

2. Referenced Documents

2.1 ASTM Standards:²

C25 Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime

C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens

C50 Practice for Sampling, Sample Preparation, Packaging, and Marking of Lime and Limestone Products

C51 Terminology Relating to Lime and Limestone (as used by the Industry)

C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

C110 Test Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone

C305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency

¹ This specification is under the jurisdiction of ASTM Committee C07 on Lime and is the direct responsibility of Subcommittee C07.02 on Specifications and Guidelines.

Current edition approved June 1, 2011. Published July 2011. Originally approved in 1966. Last previous edition approved in 2006 as C593 – 06. DOI: 10.1520/C0593-06R11.

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.

C311 Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
C821 Specification for Lime for Use with Pozzolans
D1557 Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))

3. Terminology

3.1 For definitions of terms specific to this specification, see Terminology C51.

4. Physical Properties

4.1 Pozzolans for use with lime in plastic mixtures, when tested in accordance with the procedures of Sections 7-9, shall conform to the requirements prescribed in Table 1.

4.2 Pozzolans for use with lime in nonplastic mixtures shall conform to the requirements of Table 1, except the lime-pozzolan strength requirement, and in addition shall be tested in accordance with the procedures of Section 10.

NOTE 1—If the minimum value of the vacuum saturation strength specified in 4.2 of this specification is reduced, sufficient documentation shall be provided to the user to enable the determination of a satisfactory minimum residual strength for the given material in its intended use. Such documentation should include at least the following: (1) determination of a minimum residual strength requirement that will enable the material to perform its structural function in the pavement system; and (2) a rational analysis, using actual climatic data, that will show the severity of exposure of the material to cyclic freeze-thaw action.

5. Sampling

5.1 Sample pozzolan in accordance with the applicable provisions of Test Methods C311, except take one 10-lb (4.5-kg) sample from approximately each 400 tons (350 metric tons) of pozzolan.

5.2 The sampling procedures and techniques shall be consistent from original sample to project completion.

TEST METHODS

6. Significance and Use

6.1 This test method states various procedures that are recommended to quantify various aspects of the lime enhanced