



Standard Specification for Silica Fume Used in Cementitious Mixtures¹

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1. Scope

1.1 This specification covers silica fume for use in concrete and other systems containing hydraulic cement.

1.2 In the cases of slurried or densified silica fume, perform the tests on the raw silica fume from which these products have been made.

1.3 The units stated in SI are to be regarded as the standard. No other units of measurement are included in this standard.

1.4 The following safety hazards caveat pertains only to the test methods portions, Sections 10 – 19, of 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.* Read the material safety data sheets for materials used.

1.5 The text of this standard references notes and footnotes that provide explanatory information. These notes and footnotes (excluding those in tables) shall not be considered as requirements of this standard.

2. Referenced Documents

2.1 ASTM Standards:²

- C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
- C114 Test Methods for Chemical Analysis of Hydraulic Cement
- C125 Terminology Relating to Concrete and Concrete Aggregates
- C135 Test Method for True Specific Gravity of Refractory Materials by Water Immersion
- C183 Practice for Sampling and the Amount of Testing of Hydraulic Cement

¹ This specification is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.24 on Supplementary Cementitious Materials.

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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.

C185 Test Method for Air Content of Hydraulic Cement Mortar

C219 Terminology Relating to Hydraulic Cement

C311/C311M Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete

C430 Test Method for Fineness of Hydraulic Cement by the 45- μ m (No. 325) Sieve

C441/C441M Test Method for Effectiveness of Pozzolans or Ground Blast-Furnace Slag in Preventing Excessive Expansion of Concrete Due to the Alkali-Silica Reaction

C494/C494M Specification for Chemical Admixtures for Concrete

C604 Test Method for True Specific Gravity of Refractory Materials by Gas-Comparison Pycnometer

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

C1005 Specification for Reference Masses and Devices for Determining Mass and Volume for Use in the Physical Testing of Hydraulic Cements

C1012/C1012M Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution

C1069 Test Method for Specific Surface Area of Alumina or Quartz by Nitrogen Adsorption

C1157/C1157M Performance Specification for Hydraulic Cement

C1437 Test Method for Flow of Hydraulic Cement Mortar

3. Terminology

3.1 Definitions:

3.1.1 *silica fume, n*—very fine pozzolanic material, composed mostly of amorphous silica produced by electric arc furnaces as a by-product of the production of elemental silicon or ferro-silicon alloys (also known as condensed silica fume and microsilica).

3.1.2 *silica fume, densified, n*—silica fume processed to increase bulk density to facilitate handling and shipping.

3.1.3 *silica fume, undensified, n*—silica fume in its raw, as produced or as collected, unprocessed form.

3.1.4 Other terms in this specification are defined in Terminologies C125 and C219.