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Designation: C125 – 12a

StandardTerminology Relating to Concrete and Concrete Aggregates[1]

This standard is issued under the fixed designation C125; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This standard is a compilation of definitions of terms as they are used in standards under the jurisdiction of Committee C09.

1.2 Other terminology under the jurisdiction of Committee C09 is included in two specialized standards. Terms relating to constituents of concrete aggregates are defined in Descriptive Nomenclature C294. Terms relating to constituents of aggregates for radiation-shielding concrete are defined in Descriptive Nomenclature C638.

1.3 Related terminology for hydraulic cement is included in Terminology C219. Additionally, the American Concrete Institute has an electronic document, *ACI Concrete Terminology*,[2] which is updated periodically. While this ACI Terminology is a useful resource, it shall not be referenced directly in ASTM standards because it is not a consensus document. The use of individual ACI or other definitions in ASTM standards shall be in accordance with *Form and Style*, Section E5.9, *Attributions*.

1.4 When a term is used in an ASTM standard for which Committee C09 is responsible, it is included herein only if used in more than one Committee C09 standard.

NOTE 1—The subcommittee responsible for this standard will review definitions on a five-year basis to determine if the definition is still appropriate as stated. Revisions will be made when determined necessary. The year shown in parentheses at the end of a definition indicates the year the definition or revision to the definition was approved. A letter R and a year indicate when the definition was reviewed. No date indicates the term has not yet been reviewed.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

C94/C94M Specification for Ready-Mixed Concrete
C143/C143M Test Method for Slump of Hydraulic-Cement Concrete
C219 Terminology Relating to Hydraulic Cement
C294 Descriptive Nomenclature for Constituents of Concrete Aggregates
C403/C403M Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance
C494/C494M Specification for Chemical Admixtures for Concrete
C511 Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
C638 Descriptive Nomenclature of Constituents of Aggregates for Radiation-Shielding Concrete
C939 Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)
C1074 Practice for Estimating Concrete Strength by the Maturity Method
C1077 Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
C1240 Specification for Silica Fume Used in Cementitious Mixtures
C1437 Test Method for Flow of Hydraulic Cement Mortar
C1610/C1610M Test Method for Static Segregation of Self-Consolidating Concrete Using Column Technique
C1611/C1611M Test Method for Slump Flow of Self-Consolidating Concrete
E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials

3. Terms and Their Definitions

absorption, *n*—the process by which a liquid is drawn into and tends to fill permeable pores in a porous solid body; also, the increase in mass of a porous solid body resulting from the penetration of a liquid into its permeable pores. (R 2008)

DISCUSSION—In the case of concrete and concrete aggregates, unless otherwise stated, the liquid involved is water, the increase in mass is that which does not include water adhering to the outside surface, the increase in mass is expressed as a percentage of the dry mass of the body and the body is considered to be "dry" when it has been treated by an appropriate process to remove uncombined water, such as drying to constant mass at a temperature between 100 and 110°C.

[1] This terminology is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.91 on Terminology.

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[2] Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, http://www.terminology.concrete.org.

[3] 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.

***A Summary of Changes section appears at the end of this standard**

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accreditation, *n—of testing agency*, a process by which an evaluation authority attests that a testing agency has demonstrated the competency to perform specific tasks in accordance with a standard. (2011)

admixture, *n*—a material other than water, aggregates, hydraulic cementitious material, and fiber reinforcement that is used as an ingredient of a cementitious mixture to modify its freshly mixed, setting, or hardened properties and that is added to the batch before or during its mixing. (R 2008)

accelerating admixture, n—admixture that accelerates the setting and early strength development of concrete. (C494/C494M)

air-entraining admixture, n—admixture that causes the development of a system of microscopic air bubbles in concrete or mortar during mixing.

chemical admixture, n—a nonpozzolanic admixture in the form of a liquid, suspension, or water-soluble solid.

mineral admixture, n—deprecated term.

DISCUSSION—This term has been used to refer to different types of water insoluble, finely divided materials such as pozzolanic materials, cementitious materials, and aggregate. These materials are not similar, and it is not useful to group them under a single term. The name of the specific material should be used, for example, use "pozzolan," "slag cement," or "finely divided aggregate," as is appropriate.

retarding admixture, n—admixture that retards the setting of concrete. (C494/C494M)

water-reducing admixture, n—admixture that either increases the slump of freshly mixed mortar or concrete without increasing the water content or that maintains the slump with a reduced amount of water due to factors other than air entrainment.

water-reducing admixture, high-range, n—a water-reducing admixture capable of producing at least 12 % reduction of water content when tested in accordance with Specification C494/C494M and meeting the other relevant requirements of Specification C494/C494M.

aggregate, *n*—granular material, such as sand, gravel, crushed stone, or iron blast-furnace slag, used with a cementing medium to form hydraulic-cement concrete or mortar. (R 2008)

coarse aggregate, n—(1) aggregate predominantly retained on the 4.75-mm (No. 4) sieve; or *(2)* that portion of an aggregate retained on the 4.75-mm (No. 4) sieve.

DISCUSSION—The definitions are alternatives to be applied under differing circumstances. Definition *(1)* is applied to an entire aggregate either in a natural condition or after processing. Definition *(2)* is applied to a portion of an aggregate. Requirements for properties and grading should be stated in the specification.

fine aggregate, n—(1) aggregate passing the 9.5-mm (⅜-in.) sieve and almost entirely passing the 4.75-mm (No. 4) sieve and predominantly retained on the 75-μm (No. 200) sieve; or *(2)* that portion of an aggregate passing the 4.75-mm (No. 4) sieve and retained on the 75-μm (No. 200) sieve.

DISCUSSION—The definitions are alternatives to be applied under differing circumstances. Definition *(1)* is applied to an entire aggregate either in a natural condition or after processing. Definition *(2)* is applied to a portion of an aggregate. Requirements for properties and grading should be stated in the specifications.

heavyweight aggregate, n—see *high-density aggregate*.

high-density aggregate, n—aggregate with relative density greater than 3.3, such as: barite, magnetite, limonite, ilmenite, iron, or steel.

lightweight aggregate, n—see *low-density aggregate*.

low-density aggregate, n—aggregate with bulk density less than 1120 kg/m^3 [70 lb/ft^3], such as: pumice, scoria, volcanic cinders, tuff, and diatomite; expanded or sintered clay, shale, slate, diatomaceous shale, perlite, vermiculite, or slag; and end products of coal or coke combustion.

normal-density aggregate, n—aggregate that is neither high nor low density.

DISCUSSION—This term refers to aggregate with relative density typically ranging between 2.4 and 3.0, or with bulk density typically ranging between 1120 kg/m^3 [70 lb/ft^3] and 1920 kg/m^3 [120 lb/ft^3].

normalweight aggregate, n—see *normal-density aggregate*.

air content, *n*—the volume of air voids in cement paste, mortar, or concrete, exclusive of pore space in aggregate particles, usually expressed as a percentage of total volume of the paste, mortar, or concrete. (R 2008)

air-cooled blast-furnace slag—see **blast-furnace slag, air-cooled.**

air, entrained, *n*—air voids, typically between 10 and 1000 μm (1 mm) in diameter and spherical or nearly so, that are incorporated intentionally into a cementitious mixture during mixing by use of an air entraining admixture. (2012)

DISCUSSION—Entrained air is used primarily to increase the durability of cementitious mixtures exposed to cycles of freezing and thawing in wet environments. Entrained air may affect workability and strength of a hardened cementitious mixture.

air, entrapped, *n*—air voids, typically 1 mm or larger in size and mainly irregular in shape, that are incorporated unintentionally into a cementitious mixture during mixing and handling. (2012)

air void—see **void, air.**

authority, evaluation, *n*—an independent entity, apart from the testing agency being evaluated, that has the capability to provide an unbiased evaluation of the technical activities of concrete and concrete aggregates testing agencies. (2011)

DISCUSSION—Two acceptable methods of evaluation are inspection and accreditation, and these services are offered by various evaluation authorities.

blast-furnace slag, *n*—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. (R 2008)

blast-furnace slag, air-cooled , *n*—the material resulting from solidification of molten blast-furnace slag under atmospheric conditions; subsequent cooling may be accelerated by application of water to the solidified surface. (R 2008)

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blast-furnace slag, expanded, *n*—the low density cellular material obtained by controlled processing of molten blast-furnace slag with water or water and other agents, such as steam or compressed air or both. (R 2011)

blast-furnace slag, granulated, *n*—the glassy, granular material formed when molten blast-furnace slag is rapidly chilled, as by immersion in water. (R 2008)

bleeding, *n*—the autogenous flow of mixing water within, or its emergence from, newly placed concrete or mortar caused by the settlement of the solid materials within the mass, also called water gain. (R 2008)

bulk density, *n—of aggregate,* the mass of a unit volume of bulk aggregate material (the unit volume includes the volume of the individual particles and the volume of the voids between the particles). (R 2008)

DISCUSSION—This term replaces the deprecated term **unit weight**—*of aggregate*.

bulk specific gravity, *n*—the ratio of the mass of a volume of a material (including the permeable and impermeable voids in the material, but excluding the voids between particles of the material) at a stated temperature to the mass of an equal volume of distilled water at a stated temperature. (R 2008)

bulk specific gravity *(saturated surface dry),* *n*—the ratio of the mass of a volume of a material including the mass of water within the pores in the material (but excluding the voids between particles) at a stated temperature, to the mass of an equal volume of distilled water at a stated temperature. (R 2008)

calcined, *adj*—heated to a temperature less than the melting point so as to bring about a decomposition, phase transition, or removal of a volatile fraction of a solid material. (2012)

calibration, *n—of measuring instrument*, a process that, under specified conditions and following a standard procedure, establishes metrological traceability by determining: (1) the relationship between the quantity values provided by measurement standards or certified reference materials and the corresponding indications from a measuring instrument or system; and (2) the estimated uncertainty of measurements made subsequently with the instrument or system. (2011)

DISCUSSION—Calibration takes into account systematic error (or bias) of the measuring instrument or system as well as random error that is associated with the use of the measurement instrument or system and error associated with the measurement standards or certified reference materials. Calibration should not be confused with an adjustment of a measuring instrument or with verification of a measuring instrument. Sometimes the first step alone is mistakenly called calibration, but performing only the first step is the process of **standardization**. In tests of concrete and concrete aggregates, standardization of measuring instruments or systems is often sufficient.

cellular concrete—see **concrete, cellular.**

cement, hydraulic, *n*—a cement that sets and hardens by chemical reaction with water and is capable of doing so under water. (R 2008)

cement, slag, *n*—granulated blast-furnace slag that has been ground to cement fineness, with or without additions, and that is a hydraulic cement.

cementitious material *(hydraulic)* **,** *n*—an inorganic material or a mixture of inorganic materials that sets and develops strength by chemical reaction with water by formation of hydrates and is capable of doing so under water. (R 2008)

cementitious material, supplementary, (SCM), *n*—an inorganic material that contributes to the properties of a cementitious mixture through hydraulic or pozzolanic activity, or both. (2012)

DISCUSSION—Some examples of supplementary cementitious materials are fly ash, silica fume, slag cement, rice husk ash, and natural pozzolans. In practice, these materials are used in combination with portland cement.

cementitious mixture, *n*—a mixture (mortar, concrete, or grout) containing hydraulic cement. (R 2008)

certification, *n—of technician*, a process by which an examiner determines and attests in writing that an individual has met established criteria and is qualified to perform specific test methods or practices. (2011)

compound, curing, *n*—a liquid that, when applied to the surface of newly-placed concrete, forms a membrane that impedes the evaporation of water and, in the case of white pigmented compounds, reflects heat. (2010)

concrete, *n*—a composite material that consists essentially of a binding medium within which are embedded particles or fragments of aggregate; in hydraulic-cement concrete, the binder is formed from a mixture of hydraulic cement and water. (R 2008)

concrete, cellular, *n*—a lightweight hydraulic-cement concrete having a homogeneous void or cell structure attained using gas-forming chemicals or foaming agents. (R 2008)

concrete, fresh, *n*—concrete which possesses enough of its original workability so that it can be placed and consolidated by the intended methods. (R 2008)

concrete, hardened, *n*—concrete that has developed sufficient strength to serve some defined purpose or resist a stipulated loading without failure. (R 2008)

concrete, roller-compacted, RCC, *n*—concrete compacted while fresh by a roller, often a vibratory roller. (R 2008)

concrete, self-consolidating, SCC, *n*—concrete that can flow around reinforcement and consolidate under its own weight without additional effort and without exceeding specified limits of segregation. (2010)

DISCUSSION—Project specifications shall indicate the acceptable segregation based upon a specified test method. Test Method C1610/C1610M provides a procedure for determining the degree of aggregate segregation under static conditions and the Appendix of Test Method C1611/C1611M describes a non-mandatory technique for assessing the degree of segregation under flowing conditions.

consistency, *n—of a fresh cementitious mixture,* the relative mobility or ability to flow. (2010)

DISCUSSION—This characteristic of fresh cementitious mixtures is difficult to quantify and empirical test methods have been adopted to provide indicators of consistency. For example, the slump test described in Test Method C143/C143M is used for concrete that flow

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