~~Designation:C51–07~~ Designation: C51 – 11

Standard Terminology Relating to Lime and Limestone (as used by the Industry)[1]

This standard is issued under the fixed designation C51; 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 terminology refers to the terms relating to lime and limestone products as used by the industry.

1.2 Where appropriate, the various terms defined below should be prefixed with one or other of the adjectives "high-calcium," "magnesian," or "dolomitic." (Examples: dolomitic quicklime; high-calcium hydraulic hydrated lime; magnesian or dolomitic limestone.)

1.3 The composition of a limestone should be given in terms of a percentage of the carbonates present. In limestone of interest to the lime industry, it is usually assumed that the material consists almost entirely of carbonates. Where this assumption is not valid, the percentage of noncarbonate material should be determined, and the composition expressed in terms of the carbonate material present.

1.4 For specific application of lime or a limestone product, see the appropriate ASTM specification.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C207 Specification for Hydrated Lime for Masonry Purposes

C270 Specification for Mortar for Unit Masonry

C602 ~~Specification for Agricultural Liming Materials~~ Specification for Agricultural Liming Materials

C1707 Specification for Pozzolanic Hydraulic Lime for Structural Purposes

3. Terminology

agricultural lime—either ground quicklime or hydrated lime whose calcium and magnesium content is capable of neutralizing soil acidity.

agricultural limestone—ground or pulverized limestone whose calcium and magnesium content is capable of neutralizing soil acidity.

DISCUSSION—Agricultural lime is a very powerful neutralizing agent. Agricultural limestone, often referred to as "aglime" is the predominate material for soil pH adjustment. See Specification C602.

air-slaked lime—the product containing various proportions of the oxides, hydroxides, and carbonates of calcium and magnesium which results from the exposure of quicklime to the air in sufficient quantity to show physical signs of hydration (difficult to determine visually in pulverized quicklime).

alkaline earth solutions (AES)—an aqueous solution of the oxide or hydroxide of an element of group IIa in the periodic table, such as calcium or magnesium. These solutions may be strongly alkaline. See **pH**.

available lime index—those constituents of a lime which enter into a desired reaction under the conditions of a specific method or process.

building or construction lime—a lime whose chemical and physical characteristics and method of processing make it suitable for the ordinary or special construction uses of the product.

by-product lime—by-product limes include a variety of Calcium and/or Calcium/Magnesium compounds that are usable for specific applications but generally do not meet one or more specifications required of primary lime products. Examples include lime kiln dust and lime hydrator rejects. It is advised that the specific compositions, physical properties, performance characteristics, and anticipated variabilities of such materials be evaluated for the service intended.

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[1] This terminology is under the jurisdiction of ASTM Committee C07 on Lime and is the direct responsibility of Subcommittee C07.08 on Editorial and Nomenclature

~~Current edition approved July 15, 2007. Published August 2007. Originally approved in 1922. Last previous edition approved in 2006 as C51–06. DOI: 10.1520/C0051-07.~~ Current edition approved June 1, 2011. Published July 2011. Originally approved in 1922. Last previous edition approved in 2007 as C51 – 07. DOI: 10.1520/C0051-11.

[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.

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

calcareous—originating from predominately calcium carbonate or one of its derivative forms.

calcia—the chemical compound calcium oxide (CaO).

calcined pozzolans—materials that are produced by calcination of natural siliceous or alumino-siliceous earths, such calcination being for the purpose of activation of pozzolanic properties.

Cement-Lime Mortar—Cement-Lime Mortar primarily consists of hydraulic cement, hydrated lime or lime putty, mason's sand and water.

DISCUSSION—These mortars can be specified by proportions or properties indicated in Specification C270.

chemical lime—a quicklime or hydrated lime whose chemical and physical characteristics and method of processing make it suitable for one or more of the many and varied chemical and industrial uses of the product.

DISCUSSION—The chemical forms of calcium oxide (CaO), calcium hydroxide ($Ca(OH)_2$), magnesium oxide (MgO), or magnesium hydroxide ($Mg(OH)_2$) alone or in combination may be produced either primarily or as a by-product of materials other than limestone, for example, $Ca(OH)_2$ formed by acetylene generation from calcium carbide (CaC_2), water treatment sludges, etc.

dead burned dolomite—dolomitic limestone that has been heated with or without additives to a temperature sufficiently high and for a long enough time to decompose the carbonate structure so as to form calcium oxide and periclase in a matrix that provides resistance to subsequent hydration and recombination with carbon dioxide.

dolomitic—indicates the presence of 35 to 46 % magnesium carbonate ($MgCO_3$) in the limestone from which the material was formed.

dolomitic limestone—see **limestone.**

di-hydrated or double hydrated lime—dolomitic lime which has been hydrated under greater than atmospheric pressure and contains less than 8 % unhydrated oxides.

finishing hydrated lime—hydrated lime suitable for use in the finish coat of plaster.

finishing quicklime—quicklime suitable (after slaking to a lime putty) for use in the finish coat of plaster.

fluxing lime—a term referring to quicklime used as an agent in the manufacture of steel or glass.

fluxstone—a term referring to limestone (high-calcium, magnesian, or dolomitic) used as an agent in the manufacture of iron and steel or glass.

high-calcium—indicates the presence of 0 to 5 % magnesium carbonate ($MgCO_3$) in the limestone from which the material was formed.

high-calcium limestone—see **limestone.**

hydrated lime—a dry powder obtained by treating quicklime with water enough to satisfy its chemical affinity for water under the conditions of its hydration. It consists essentially of calcium hydroxide or a mixture of calcium hydroxide and magnesium oxide or magnesium hydroxide, or both.

DISCUSSION—The chemical forms of calcium oxide (CaO), calcium hydroxide ($Ca(OH)_2$), magnesium oxide (MgO), or magnesium hydroxide ($Mg(OH)_2$) alone or in combination may be produced either primarily or as a by-product of materials other than limestone, for example, $Ca(OH)_2$ formed by acetylene generation from calcium carbide (CaC_2), water treatment sludges, etc.

hydraulic hydrated lime—the hydrated dry cementitious product obtained by calcining a limestone containing silica and alumina to a temperature short of incipient fusion so as to form sufficient free lime (CaO) to permit hydration, and at the same time, leaving unhydrated sufficient calcium silicates to give a dry powder meeting hydraulic property requirements.

lime—a general term which includes the various chemical and physical forms of quicklime, hydrated lime, and hydraulic lime. It may be high-calcium, magnesian, or dolomitic.

DISCUSSION—The chemical forms of calcium oxide (CaO), calcium hydroxide ($Ca(OH)_2$), magnesium oxide (MgO), or magnesium hydroxide ($Mg(OH)_2$) alone or in combination may be produced either primarily or as a by-product of materials other than limestone, for example, $Ca(OH)_2$ formed by acetylene generation from calcium carbide (CaC_2), water treatment sludges, etc.

lime mortar—a lime putty mixed with an aggregate, suitable for masonry purposes.

lime putty—the product obtained by slaking quicklime with water according to the directions of the manufacturer or by mixing hydrated lime and water to a desired consistency.

limestone—an initially sedimentary rock consisting chiefly of calcium carbonate or of the carbonates of calcium and magnesium. Limestone may be of high calcium, magnesian, or dolomitic.

(*1*) *dolomitic limestone*—limestone containing from 35 to 46 % magnesium carbonate ($MgCO_3$).

(*2*) *magnesium limestone*—a limestone containing from 5 to 35 % $MgCO_3$.

(*3*) *high-calcium limestone*—a limestone containing from 0 to 5 % $MgCO_3$.

liming material—a general term which includes the various chemical and physical forms of matierals such as lime, limestone, mollusk shells, marl, byproduct lime, and slag whose calcium and magnesium compounds are capable of neutralizing acidity.

magnesia—the chemical compound magnesium oxide (MgO).

magnesian—indicates the presence of 5 to 35 % magnesium carbonate ($MgCO_3$) in the limestone from which the material was formed.