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Standard Specification for Lime Putty for Structural Purposes¹

This standard is issued under the fixed designation C1489; 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 lime putty products made from hydrated lime or quicklime products. Lime putty is suitable for use in masonry, plaster and stucco applications.

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

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C5 Specification for Quicklime for Structural Purposes

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

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)

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

C185 Test Method for Air Content of Hydraulic Cement Mortar

C206 Specification for Finishing Hydrated Lime

C207 Specification for Hydrated Lime for Masonry Purposes

C1271 Test Method for X-ray Spectrometric Analysis of Lime and Limestone

C1301 Test Method for Major and Trace Elements in Limestone and Lime by Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP) and Atomic Absorption (AA)

3. Terminology

3.1 *Definitions:*

3.1.1 *lime putty*—the product obtained by either slaking quicklime with water according to the direction of the manufacturer or by mixing hydrated lime and water to the desired consistency.

3.1.2 Unless otherwise specified, for definitions of terms used in this standard, refer to Terminology C51.

4. Chemical Composition

4.1 The hydrated lime or quicklime products used to make lime putty shall conform to the following chemical composition requirements:

Calcium and magnesium oxides (LOI-free basis), min %	92
Carbon dioxide (presoaked basis)	
If sample is taken at place of manufacture, max %	5
If sample is taken at other place, max %	7

4.2 Chemical composition of putty product of unknown composition must be determined on a sample dried in a CO₂ free atmosphere.

NOTE 1—An apparatus to produce a dry, CO₂ free air stream is described in the section on Free Moisture in Hydrated Lime of Test Methods C25. Or use an inert atmosphere such as nitrogen.

5. Plasticity

5.1 Lime putty shall have a plasticity of not less than 200 Emley units when tested by the Emley method in the section on Plasticity of Lime Putty in Test Methods C110. Vicat consistency of the putty should be adjusted to a penetration of 20 mm \pm 5 mm prior to running the Emley test. If penetration results are above 25 mm, the consistency of the putty can be increased by allowing the putty to settle and decanting off the excess water or by the use of a suction pad such as the one used for the water retention test in Test Methods C110. If the penetration is below 15 mm, water should be added to the lime putty

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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.

to increase the penetration. When water is added to the putty, the putty should be mixed for a minimum of 15 s prior to testing the penetration.

6. Residue

6.1 Residue of lime putty shall not be more than 0.5 % on a 600 μm (No. 30) sieve on a total putty weight basis. The residue of lime putty should be determined in accordance with the section on Residue and Sieve Analysis of Test Methods **C110**, using an amount of lime putty equivalent to approximately 100 g of solids.

7. Soaking Period

7.1 Lime putty made from quicklime or hydrated lime must be soaked for a period of time prior to use of the product. The actual time required to ensure complete hydration of the lime putty is dependent on the reactivity of the unhydrated oxides contained in the type of lime product used to make the putty.

7.1.1 Lime putty made from quicklime must be soaked for a minimum of two weeks prior to use in construction applications.

7.1.2 Lime putty made with Type N hydrated lime must be soaked for at least 16 h prior to use.

7.1.3 Lime putty made with Type S hydrated lime requires enough soaking to wet the lime particles (minimum of 20 min).

8. Popping and Pitting

8.1 Lime putty shall show no pops or pits when tested in accordance with the method prescribed in Test Methods **C110**. Vicat consistency of the lime putty should be adjusted to a penetration of 20 mm \pm 5 mm prior to running the popping and pitting test. If penetration results are above 25 mm, the consistency of the putty can be increased by allowing the putty

to settle and decanting off the excess water or by the use of a suction pad such as the one used for the water retention test in Test Methods **C110**. If the penetration is below 15 mm, water should be added to the lime putty to increase the penetration. When water is added to the putty, the putty should be mixed for a minimum of 15 s prior to testing the penetration.

9. Density

9.1 The wet density of the lime putty shall be no less than 80 lbs/ft³ and not more than 90 lbs/ft³. The density of lime putty can be measured in the 400 mL cylindrical cup described in the Apparatus Section of Test Method **C185**. Care should be taken when placing putty in the cup to minimize the entrapment of air. The cup should be filled in three lifts, tamping after each lift to remove entrapped air. The top surface of the putty should be struck and leveled with a metal spatula prior to weighing. The calculations used for the density determination can be found in Test Methods **C110**.

10. Sampling and Inspection

10.1 The sampling, inspection, rejection, retesting, packaging, and marking shall be conducted in accordance with Practice **C50**.

11. Test Methods

11.1 Determine the properties enumerated in this specification in accordance with the following methods:

11.1.1 *Chemical Analysis*—Test Methods **C25**, or for total calcium and magnesium oxides Test Methods **C1271** or **C1301**.

11.1.2 *Physical Analysis*—Test Methods **C110**.

12. Keywords

12.1 finish lime; lime putty; masonry; plaster; plasticity; popping and pitting; residue; stucco; unhydrated oxides

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