



## Standard Specification for Lime Putty for Structural Purposes<sup>1</sup>

This standard is issued under the fixed designation C 1489; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

<sup>ε1</sup> NOTE—A units statement was added editorially as new subsection 1.2 in September 2008.

### 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 and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

- C 5 Specification for Quicklime for Structural Purposes
- C 25 Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime
- C 50 Practice for Sampling, Sample Preparation, Packaging, and Marking of Lime and Limestone Products
- C 51 Terminology Relating to Lime and Limestone (as used by the Industry)
- C 110 Test Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone
- C 185 Test Method for Air Content of Hydraulic Cement Mortar
- C 206 Specification for Finishing Hydrated Lime
- C 207 Specification for Hydrated Lime for Masonry Purposes

### 3. Terminology

#### 3.1 Definitions:

<sup>1</sup> 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.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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 C 51.

### 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 (non volatile basis)	92 % min.
Carbon dioxide (presoaked basis)	
If sample is taken at place of manufacture	5 % max.
If sample is taken at other place	7 % max.

4.2 Chemical composition of putty product of unknown composition must be determined by drying the sample in a CO<sub>2</sub> free atmosphere by a method such as Test Methods C 25, Section 21, (Free Moisture in Hydrated Lime).

### 5. Plasticity

5.1 Lime putty shall have a plasticity of not less than 200 Emley units when tested by the Emley method prescribed in Test Methods C 110. Vicat consistency of the putty should be adjusted to a penetration of  $20 \pm 5$  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 C 110. 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.

### 6. Residue

6.1 Residue of lime putty shall not be more than 0.5 % on a 30 mesh sieve on a total putty weight basis. The residue of lime putty should be determined by the method in Test Methods C 110, Section 5, 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 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 C 110. Vicat consistency of the lime putty should be adjusted to a penetration of  $20 \pm 5$  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 C 110. 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.

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## 9. Density

9.1 The wet density of the lime putty shall be no less than 80 lbs/ft<sup>3</sup> and not more than 90 lbs/ft<sup>3</sup>. The density of lime putty can be measured in the 400 ml cylindrical cup described in the Apparatus Section of Test Method C 185. 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 C 110, Section 16.

## 10. Sampling and Inspection

10.1 The sampling, inspection, rejection, retesting, packaging, and marking shall be conducted in accordance with Practice C 50.

## 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 C 25.

11.1.2 *Physical Analysis*—Test Methods C 110.

## 12. Keywords

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