



## Standard Test Method for Lime Content of Uncured Soil-Lime Mixtures<sup>1</sup>

This standard is issued under the fixed designation D 3155; 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 test method covers the determination of the lime content of soil-lime mixtures sampled from a project under construction or at the pug-mill, or both.

1.2 In soils with highly variable amounts of  $\text{CaCO}_3$  (such as caliche), it may be difficult to obtain a representative sample.

1.3 The values stated in metric units are to be regarded as the standard.

1.4 *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:

C 51 Definitions of Terms Relating to Lime and Limestone<sup>2</sup>

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials<sup>2</sup>

D 653 Terminology Relating to Soil, Rock and Contained Fluids<sup>3</sup>

D 1193 Specification for Reagent Water<sup>4</sup>

D 3740 Practice for the Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction<sup>3</sup>

D 4753 Specification for Evaluating, Selecting and Specifying Balances and Scales for Use in Testing Soil, Rock, and Related Construction Materials<sup>3</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 Refer to Terminology C 51 for terms relating to lime.

3.1.2 Refer to Terminology D 653 for terms relating to soil.

### 4. Summary of Test Method

4.1 A representative specimen is obtained after thorough

mixing of the soil and lime and sieving through a 4.75-mm (No. 4) sieve.

4.2 A 300 g specimen of the minimum 4.75-mm (No. 4) material is shaken together with 600-mL of ammonium chloride solution.

4.3 A 10 mL aliquot of fluid from 4.2 is mixed with 100 mL of water, and sodium hydroxide is added until a pH of 13.0 to 13.5 is obtained.

4.4 Triethanolamine and indicator powder is added to the solution and EDTA is used to titrate to a clear blue endpoint.

4.5 The mL of EDTA used is compared to a calibration curve to determine percent lime by dry mass of the total specimen.

### 5. Significance and Use

5.1 This test method can be used to determine the lime content of uncured soil-lime mixtures.

5.1.1 Lime content in soil-lime mixes is needed by agencies such as highway departments, that have to determine lime content in soil-lime for payments to contractors, to check compliance with specifications, or to check the efficacy of quality control measures.

5.1.2 Lime content is also needed by producers of soil-lime mixtures who have to determine lime content for production control purposes.

NOTE 1—Notwithstanding the statements on precision and bias contained in this test method: The precision of this test method is dependent on the competence of the personnel performing it and the suitability of the equipment and facilities used. Agencies that meet the criteria of Practice D 3740 are generally considered capable of competent and objective testing. Users of this test method are cautioned that compliance with Practice D 3740 does not in itself ensure reliable testing. Reliable testing depends on several factors; Practice D 3740 provides means of evaluating some of those factors.

### 6. Apparatus

6.1 *Balance*, a class GPI balance having a capacity of 1000 g or more and meeting the requirements of Specification D 4753.

6.2 *Glassware*—25-mL graduated cylinder, 1000-mL graduated cylinder, 25-mL burets, 10-mL volumetric pipets, 250-mL Erlenmeyer flasks, medicine droppers.

6.3 *Plasticware*—1.9-L (2 qt) polyethylene containers with snap-on covers, 300-mm (12 in.) diameter plastic funnel, 19-L (5-gal) polyethylene bottles for ammonium chloride, 19-L (5-gal) polyethylene bottles for water.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.15 on Stabilization with Admixtures.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 04.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.08.

<sup>4</sup> Annual Book of ASTM Standards, Vol 02.05..