



Standard Test Method for Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application¹

This standard is issued under the fixed designation D 6024; 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 explains the determination of the ability of Controlled Low Strength Material (CLSM) to withstand loading by repeatedly dropping a metal weight onto the in-place material.

1.2 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D 6026.

1.2.1 The method used to specify how data are collected, calculated, or recorded in this test method is not directly related to the accuracy to which the data can be applied in design or other uses, or both. How one applies the results obtained using this standard is beyond its scope.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound equivalents are shown for information only.

1.4 CLSM is also known as flowable fill, controlled density fill, soil-cement slurry, soil-cement grout, unshrinkable fill, “K-Krete,” and other similar names.

1.5 *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 125 Terminology Relating to Concrete and Concrete Aggregates²

D 653 Terminology Relating to Soil, Rock, and Contained Fluids³

D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in the Engineering Design and Construction³

D 4832 Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders³

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.15 on Stabilization with Admixtures.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.08.

D 6023 Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Controlled Low Strength Material (CLSM)⁴

D 6026 Practice for Using Significant Digits in Geotechnical Data⁴

D 6103 Test Method for Flow Consistency of Controlled Low Strength Material (CLSM)³

3. Terminology

3.1 *Definitions*—For definitions of terms in this test method, refer to Terminology C 125 and D 653.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *Controlled Low Strength Material (CLSM), n*— a mixture of soil or aggregates, cementitious material, fly ash, water and sometimes chemical admixtures, that hardens into a material with a higher strength than the soil, but less than 8400 kPa (1200 psi).

3.2.1.1 *Discussion*—Used as a replacement for compacted backfill, CLSM can be placed as a slurry, a mortar, or a compacted material and typically has strengths of 350 to 700 kPa (50 to 100 psi) for most applications.

4. Summary of Test Method

4.1 A standard cylindrical weight is dropped five times from a specific height onto the surface of in-place CLSM. The diameter of the resulting indentation is measured and compared to established criteria. The indentation is inspected for any free water brought to the surface from the impact.

5. Significance and Use

5.1 This test method is used primarily as a field test to determine the readiness of the CLSM to accept loads prior to adding a temporary or permanent wearing surface.

5.2 This test method is not meant to predict the load bearing strength of a CLSM mixture.

5.3 This test is one of a series of quality control tests that can be performed on CLSM during construction to monitor compliance with specification requirements. The other tests that can be used during construction control are Test Methods D 4832, D 6023, and D 6103.

NOTE 1—The quality of the result produced by this standard is

⁴ Annual Book of ASTM Standards, Vol 04.09.

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

costly at this time to have ten or more agencies participate in an in situ testing program at a given site.

9.1.1 The Subcommittee D18.15 is seeking any data from users of the test method that might be used to make a limited statement on precision.

9.2 *Bias*—There is no accepted reference value for this test

method, therefore, bias cannot be determined.

10. Keywords

10.1 backfill; ball drop apparatus; bearing; CLSM; construction control; early load; flowable fill; mix design; quality control; soil stabilization; surface water; wearing surface

SUMMARY OF CHANGES

In accordance with Committee D18 policy, this section identifies the location of changes to this test method since the last edition (1996) that may impact the use of this standard.

- (1) Sections 1.2 and 1.2.1 were added in accordance with D18 policy and the subsequent sections renumbered.
- (2) C 360 was removed and Practice D 6026 was added to the list of Referenced Documents.
- (3) The designation “PS 28” was updated to Test Method D 6103 in Sections 2 and 5.3

- (4) Section 3 was revised to comply with D18 policy.
- (5) Note 1 was revised to comply with the current wording according to D18 policy.
- (6) Section 9, was revised to comply with suggested wording found in the D18 Standards Preparation Manual.

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