



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

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

1.4 *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 125 Terminology Relating to Concrete and Concrete Aggregates²
- C 360 Test Method for Ball Penetration in Freshly Mixed Hydraulic Cement Concrete²
- 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
- D 6023 Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Controlled Low Strength Material³
- PS 28 Provisional Test Method for Flow Consistency of Controlled Low Strength Material³

¹ 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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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.08.

3. Terminology

3.1 *Definitions*—Except as follows in 3.2, all definitions are in accordance with Terminology C 125 and D 653.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *Controlled Low Strength Material (CLSM)*—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 Provisional Test Method PS 28.

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 which 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 3470 provides a means of evaluating some of those factors.

6. Apparatus

6.1 *Ball-drop Apparatus*—a cylinder with a hemispherically



SUMMARY OF CHANGES

This section identifies the location of changes to this test method since the last edition.

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| (1) This test method previously had the designation PS 31 – 95, a provisional standard. | (4) Note 1 and Note 2 were added. |
| (2) The differences between this version of the test method and the previous one are as follows: | (5) SI units were made the standard. |
| (3) Sections 1.3, 5.3 and 6.2 were added. | (6) Sections 3.2.1.1, 4.1, 6.1.3, 6.1.4, 7.1, 7.2, 8, 9.1, and 10 were rewritten. |
| | (7) Fig. 1 blocks were added to the drawing. |

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