



Standard Test Methods for Creep of Rock Core Under Constant Stress and Temperature¹

This standard is issued under the fixed designation D7070; 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 These test methods cover the creep behavior of intact weak and hard rock core in fixed states of stress at ambient (room) or elevated temperatures. For creep behavior at lower temperatures refer to Test Method [D5520](#). The methods specify the apparatus, instrumentation, and procedures necessary to determine the strain as a function of time under sustained load at constant temperature and when applicable, constant humidity.

1.1.1 Hard rocks are considered those with a maximum axial strain at failure of less than 2 %. Weak rocks include such materials as salt, potash, shale, and weathered rock, which often exhibit very large strain at failure.

1.2 This standard consists of three methods that cover the creep capacity of core specimens.

1.2.1 *Method A*—Creep of Hard Rock Core Specimens in Uniaxial Compression at Ambient or Elevated Temperature.

1.2.2 *Method B*—Creep of Weak Rock Core Specimens in Uniaxial Compression at Ambient or Elevated Temperature.

1.2.3 *Method C*—Creep of Rock Core Specimens in Triaxial Compression at Ambient or Elevated Temperature.

1.3 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice [D6026](#).

1.4 The procedures used to specify how data are collected/recorded and calculated in this standard are regarded as the industry standard. In addition, they are representative of the significant digits that generally should be retained. The procedures used do not consider material variation, purpose for obtaining data, special purpose studies, or any considerations for the user's objectives; and it is common practice to increase or reduce significant digits of reported data to commensurate with these considerations. It is beyond the scope of these test methods to consider significant digits used in analysis methods for engineering design.

1.5 *Units*—The values stated in SI units are to be regarded as the standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.6 *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 to determine the applicability of regulatory limitations prior to use. For specific precautionary statements, see Section 7.*

2. Referenced Documents

2.1 ASTM Standards:²

[D653](#) Terminology Relating to Soil, Rock, and Contained Fluids

[D2113](#) Practice for Rock Core Drilling and Sampling of Rock for Site Exploration

[D2216](#) Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

[D2845](#) Test Method for Laboratory Determination of Pulse Velocities and Ultrasonic Elastic Constants of Rock

[D3740](#) Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

[D4543](#) Practices for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerances

[D5079](#) Practices for Preserving and Transporting Rock Core Samples

[D5520](#) Test Method for Laboratory Determination of Creep Properties of Frozen Soil Samples by Uniaxial Compression

[D6026](#) Practice for Using Significant Digits in Geotechnical Data

[E4](#) Practices for Force Verification of Testing Machines

[E122](#) Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process

¹ This test method is under the jurisdiction of ASTM Committee [D18](#) and is the direct responsibility of Subcommittee [D18.12](#) on Rock Mechanics.

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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.