



Standard Test Method for Determination of the Point Load Strength Index of Rock¹

This standard is issued under the fixed designation D 5731; 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 guidelines, requirements, and procedures for determining the point load strength index of rock. Specimens in the form of rock cores, blocks, or irregular lumps can be tested by this test method. This test method can be performed in the field or laboratory because the testing machine is portable. This is an index test and is intended to be used to classify and characterize rock.

1.2 This test method applies to hard rock (compressive strength over 15 MPa (2200 psi)).

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

1.3.1 The method used to specify how data are collected, calculated, or recorded in this standard 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.

1.4 The values stated in the SI units are to be regarded as standard.

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:

D 653 Terminology Relating to Soil, Rock, and Contained Fluids²

D 2216 Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock²

D 2938 Test Method for Unconfined Compressive Strength of Intact Rock Core Specimens²

D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock

as Used in Engineering Design and Construction²

D 5079 Practices for Preserving and Transporting Rock Core Samples²

D 6026 Practice for Using Significant Digits in Geotechnical Data³

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials⁴

2.2 ISRM Standard:

Suggested Methods for Determining Point Load Strength⁵

3. Terminology

3.1 For definitions of terms used in this test method refer to Terminology D 653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *point load strength index*—an indicator of strength (see 9.1) obtained by subjecting a rock specimen to an increasingly concentrated point load, applied through a pair of truncated, conical platens, until failure occurs.⁵

4. Summary of Test Method

4.1 This index test is performed by subjecting a rock specimen to an increasingly concentrated load until failure occurs by splitting the specimen. The concentrated load is applied through coaxial, truncated conical platens. The failure load is used to calculate the point load strength index and to estimate the uniaxial compressive strength.

5. Significance and Use

5.1 The uniaxial compression test (see Test Method D 2938) is used to determine compressive strength of rock specimens, but it is a time-consuming and expensive test that requires specimen preparation. When extensive testing is required for preliminary and reconnaissance information, alternative tests such as the point load test can be used in the field to reduce the time and cost of compressive strength tests.

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.12 on Rock Mechanics. Current edition approved Nov. 10, 2002. Published January 2003. Originally approved in 1995. Last previous edition approved in 1995 as D 5731–95.

² *Annual Book of ASTM Standards*, Vol 04.08.

³ *Annual Book of ASTM Standards*, Vol 04.09.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

⁵ "Suggested Methods for Determining Point Load Strength", International Society for Rock Mechanics Commission on Testing Methods, *Int. J. Rock. Mech. Min. Sci. and Geomechanical Abstr.*, Vol 22, No. 2, 1985, pp. 51–60.