~~Designation:D 3967–95a~~ Designation: D3967 – 08

Standard Test Method for Splitting Tensile Strength of Intact Rock Core Specimens[1]

This standard is issued under the fixed designation D3967; 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 testing apparatus, specimen preparation, and testing procedures for determining the splitting tensile strength of rock by diametral line compression of a disk.

NOTE 1—The tensile strength of rock determined by tests other than the straight pull test is designated as the "indirect" tensile strength and, specifically, the value obtained in Section ~~8~~9 of this test is termed the "splitting" tensile strength.

~~1.2The values stated in SI units are to be regarded as the standard.~~

~~1.3~~

1.2 The values stated in SI units are to be regarded as the standard. The values in parentheses are mathematical conversions and are provided for information only.

1.3 All dimension and force measurements, and stress calculations shall conform to the guidelines for significant digits and rounding established in Practice D6026.

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:*[2]

D653 Terminology Relating to Soil, Rock, and Contained Fluids

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

D6026 Practice for Using Significant Digits in Geotechnical Data

E4 Practices for ~~Load~~Force Verification of Testing Machines

E~~691–92~~691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. ~~Significance and Use~~

~~3.1By definition the tensile strength is obtained by the direct uniaxial tensile test. But the tensile test is difficult and expensive for routine application. The splitting tensile test appears to offer a desirable alternative, because it is much simpler and inexpensive. Furthermore, engineers involved in rock mechanics design usually deal with complicated stress fields, including various combinations of compressive and tensile stress fields. Under such conditions, the tensile strength should be obtained with the presence of compressive stresses to be representative of the field conditions. The splitting tensile strength test is one of the simplest tests in which such stress fields occur. Since it is widely used in practice, a uniform test method is needed for data to be comparable. A uniform test is also needed to insure positively that the disk specimens break diametrally due to tensile pulling along the loading diameter.~~ Terminology

3.1 Refer to Terminology D653 for specific definitions.

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[1] This test method is under the jurisdiction of ASTM Committee ~~D-18~~D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.12 on Rock Mechanics.
~~Current edition approved Dec. 10, 1995. Published April 1996. Originally published as D 3967–81. Last previous edition D 3967–95.~~
Current edition approved July 1, 2008. Published July 2008. Originally approved in 1981. Last previous edition approved in 2005 as D3967 – 05. DOI: 10.1520/D3967-08.

[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*~~, Vol 03.01~~, volume information, refer to the standard's Document Summary page on the ASTM website.

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

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NOTE 2—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 D3740 are generally considered capable of competent and objective testing. Reliable testing depends on many factors; Practice D3740 provides a means of evaluating some of these factors.

5. Apparatus

~~4.1~~

5.1 *Loading Device*, to apply and measure axial load on the specimen, of sufficient capacity to apply the load at a rate conforming to the requirements in ~~7.3~~8.3. It shall be verified at suitable time intervals in accordance with Practices ~~E 4~~E4and shall comply with the requirements prescribed therein.

~~4.2~~

5.2 *Bearing Surfaces*—The testing machine shall be equipped with two steel bearing blocks having a Rockwell hardness of not less than 58 HRC (see Note ~~2~~3).

NOTE~~2—False~~ 3—False platens, with bearing faces conforming to the requirements of this standard, may be used. These shall be oil hardened to more than 58 HRC, and surface ground. With abrasive rocks these platens tend to roughen after a number of specimens have been tested, and hence need to be surfaced from time to time.

~~4.2.1~~5.2.1 *Flat Bearing Blocks*—During testing the specimen can be placed in direct contact with the machine bearing plates (or false platens, if used) (see Fig. 1). The bearing faces shall not depart from a plane by more than 0.0125 mm when the platens are new and shall be maintained within a permissible variation of 0.025 mm. The bearing block diameter shall be at least as great as the specimen thickness.

~~4.2.2~~

5.2.2 *Curved Bearing Blocks*, may be used to reduce the contact stresses. The radius of curvature of the supplementary bearing plates shall be so designed that their arc of contact with the specimen will in no case exceed 15° or that the width of contact is less than *D*/6, where *D* is the diameter of the specimen.

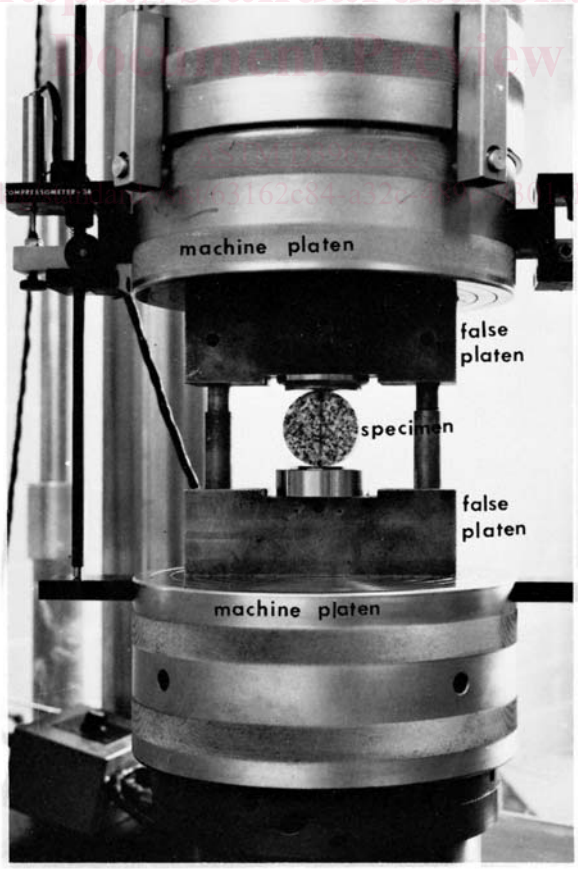

FIG. 1 One ~~of the~~ Proposed Testing Setup for Splitting Tensile Strength