



## Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens<sup>1</sup>

This standard is issued under the fixed designation C 496/C 496M; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope\*

1.1 This test method covers the determination of the splitting tensile strength of cylindrical concrete specimens, such as molded cylinders and drilled cores.

1.2 The values stated in either inch-pound or SI units are to be regarded separately as standard. The SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.3 *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.*

1.4 The text of this standard references notes that provide explanatory material. These notes shall not be considered as requirements of the standard.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

- C 31/C 31M Practice for Making and Curing Concrete Test Specimens in the Field
- C 39/C 39M Test Method for Compressive Strength of Cylindrical Concrete Specimens
- C 42/C 42M Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- C 192/C 192M Practice for Making and Curing Concrete Test Specimens in the Laboratory
- C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.61 on Testing Concrete for Strength.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

### 3. Summary of Test Method

3.1 This test method consists of applying a diametral compressive force along the length of a cylindrical concrete specimen at a rate that is within a prescribed range until failure occurs. This loading induces tensile stresses on the plane containing the applied load and relatively high compressive stresses in the area immediately around the applied load. Tensile failure occurs rather than compressive failure because the areas of load application are in a state of triaxial compression, thereby allowing them to withstand much higher compressive stresses than would be indicated by a uniaxial compressive strength test result.

3.2 Thin, plywood bearing strips are used to distribute the load applied along the length of the cylinder.

3.3 The maximum load sustained by the specimen is divided by appropriate geometrical factors to obtain the splitting tensile strength.

### 4. Significance and Use

4.1 Splitting tensile strength is generally greater than direct tensile strength and lower than flexural strength (modulus of rupture).

4.2 Splitting tensile strength is used in the design of structural lightweight concrete members to evaluate the shear resistance provided by concrete and to determine the development length of reinforcement.

### 5. Apparatus

5.1 *Testing Machine*—The testing machine shall conform to the requirements of Test Method C 39/C 39M and be of a type with sufficient capacity that will provide the rate of loading prescribed in 7.5.

5.2 *Supplementary Bearing Bar or Plate*—If the diameter or the largest dimension of the upper bearing face or the lower bearing block is less than the length of the cylinder to be tested, a supplementary bearing bar or plate of machined steel shall be used. The surfaces of the bar or plate shall be machined to within  $\pm 0.001$  in. [0.025 mm] of planeness, as measured on any line of contact of the bearing area. It shall have a width of at least 2 in. [50 mm], and a thickness not less than the distance

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