Designation: C1006 – 07 (Reapproved 2013)

Standard Test Method for Splitting Tensile Strength of Masonry Units[1]

This standard is issued under the fixed designation C1006; 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 determination of the splitting tensile strength of masonry units.

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

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E4 Practices for Force Verification of Testing Machines

3. Significance and Use

3.1 Masonry units alone and within assemblages commonly fail in a tensile mode when loaded in compression to failure. These tensile stresses result from differences in modulus of elasticity and Poisson's ratio between the masonry unit and mortar. Additionally, the dissimilarity in behavior of the grout within cores of masonry units under load leads to tensile stresses in the units and results in a splitting failure.

3.2 This test method produces a line load along the bed surface of the masonry unit. The compressive load applied to the unit, imposed by means of bearing rods, results in a tensile stress distributed over the height of the unit for the split length of the unit. This test method can be conducted with the rod oriented either in the longitudinal direction or in the transverse direction of the bed face. The splitting tensile strength is calculated by the equation given in 7.1.

3.3 The test value provides an indicator of masonry-unit splitting tensile strength. Additionally, the presence of defects such as visible voids or impurities in masonry units may be revealed.

4. Apparatus

4.1 *Bearing Rods*— Matched, paired steel bearing rods with diameters within 1⁄8 to 1⁄12 of the specimen height, of a length greater than the length of the intended test area, and of straightness within 0.5 % of the specimen length shall be provided for each unit. Bearing rods that meet the straightness requirement can be reused.

4.2 *Supplemental Bearing Bar or Plate*—If the diameter or largest dimension of the upper bearing face or lower bearing block is less than the length of the specimen to be tested, a supplementary bearing bar or plate shall be used. The contact surfaces of the bar or plate shall be machined to within 0.05 % of planeness as measured on any line of contact of the bearing area. The bearing bar or plate shall have a width of at least 2 in. (51 mm), and a thickness not less than the distance from the edge of the spherical or rectangular bearing block to the end of the specimen. The bar or plate shall be used in such a manner that the load will be uniformly applied over the entire intended split length of the specimen.

4.3 *Testing Machine:*

4.3.1 The testing machine shall conform to the requirements of Practices E4, and may be of any type of sufficient capacity that will provide the rate of loading prescribed in 6.3.

4.3.2 The upper, hardened metal bearing face shall be spherically seated and attached at the center of the upper head of the machine. The center of the sphere shall lie at the center of the surface of the plate in contact with the specimen. The bearing plate shall be closely held in its spherical seat but shall be free to turn in any direction; its perimeter at the ball face shall have at least ¼ in. (6.4 mm) clearance from the head of the machine to allow for specimens whose test surfaces are not exactly parallel. The diameter of the bearing surface shall be at least 5 in. (127 mm). The bearing block surfaces that will contact the bearing bar or plate shall not depart from plane surfaces by more than 0.05 %.

5. Sampling

5.1 *Selection*—For the purpose of this test, full-size masonry units shall be selected at random by the purchaser or by

[1] This test method is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.04 on Research.

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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.

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