



Designation: C 170 – 90 (Reapproved 1999)

Standard Test Method for Compressive Strength of Dimension Stone¹

This standard is issued under the fixed designation C 170; 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 sampling, preparation of specimens, and determination of the compressive strength of dimension stone.

1.2 *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:*

C 119 Terminology Relating to Dimension Stone²

E 4 Practices for Force Verification of Testing Machines³

3. Terminology

3.1 *Definitions*—All definitions are in accordance with Terminology C 119.

4. Significance and Use

4.1 This test method is useful in indicating the differences in compressive strength between the various dimension stones. This test method also provides one element in comparing stones of the same type.

5. Apparatus

5.1 Any testing machine conforming to Practices E 4 and to the speed of testing requirements prescribed in Section 9 of this test method may be used.

5.2 In vertical testing machines, the spherical bearing block shall be suspended from the upper head of the machine in such a manner that the contact plate remains in a central position (spherical surfaces in full contact) when not loaded. The spherical surfaces shall be well lubricated, and the center of curvature shall lie in the surface of contact with the specimen.

¹ This test method is under the jurisdiction of ASTM Committee C-18 on Dimension Stone and is the direct responsibility of Subcommittee C18.01 on Test Methods.

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² *Annual Book of ASTM Standards*, Vol 04.07.

³ *Annual Book of ASTM Standards*, Vol 03.01.

6. Sampling

6.1 The sample shall be selected to represent a true average of the type or grade of stone under consideration and shall be of the quality supplied to the market in finished form under the type designation to be tested. The sample may be selected by the purchaser or his authorized representative from quarried stone or taken from the natural ledge and shall be of adequate size to permit the preparation of the desired number of test specimens. When perceptible variations occur, the purchaser may select as many samples as are necessary for determining the variation in compressive strength.

7. Test Specimens

7.1 The test specimens may be cubes, square prisms, or cylinders and shall be cut from the sample with saws or core drills. The diameter or lateral dimension (distance between opposite vertical faces) shall be not less than 2 in. (50.8 mm) (Explanatory Note 1), and the ratio of height (Explanatory Note 2) to diameter or lateral dimension should be not less than 1:1. At least five specimens shall be prepared for each condition of the test; that is, when the compressive strength is desired for the wet and dry conditions but in only one direction, such as perpendicular to the bed (or rift) (see Fig. 1(a)), ten specimens will be required. For wet and dry strength tests both perpendicular and parallel to the bed (or rift) (see Fig. 1(a) and (b)), twenty specimens are required (Explanatory Note 3). The load-bearing faces shall be finished by grinding to as nearly true and parallel planes (Explanatory Note 4) as practicable.

7.2 The load-bearing surfaces and the direction of bedding (or rift) shall be marked on each specimen after finishing.

7.3 The load-bearing areas of the specimen shall be calculated from measurements taken midway between the load-bearing surfaces. The dimensions of the specimens shall be measured to the nearest 0.02 in. (0.5 mm) and the load-bearing areas calculated to the nearest 0.04 in.² (0.26 cm²).

8. Conditioning

8.1 Before testing the specimens in a dry condition, dry them for 48 h at 60 ± 2°C (140 ± 4°F). At the 46th, 47th, and 48th h, weigh the specimens to ensure that the weight is the same. If the weight continues to drop, continue to dry the specimens until there are 3 successive hourly readings with the