



Designation: C 497 – 03

Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile¹

This standard is issued under the fixed designation C 497; 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 These test methods cover testing of concrete pipe, manhole sections, and tile. The test methods described are used in production testing and acceptance testing to evaluate the properties provided for in the specifications.

1.2 The test methods appear in the following order:

	Section
External Load Crushing Strength	4
Flat Slab Top	5
Core Strength	6
Absorption	7
Hydrostatic	8
Permeability	9
Manhole Step	10
Cylinder Strength	11

1.3 The test specimens shall not have been exposed to a temperature below 40°F for the 24 h immediately preceding the test.

1.4 If any test specimen fails because of mechanical reasons such as failure of testing equipment or improper specimen preparation, it shall be discarded and another specimen taken.

1.5 Specimens shall be selected in accordance with the specifications for the type of pipe or tile being tested.

1.6 A complete metric companion to Test Methods C 497 has been developed—C 497M; therefore, no metric equivalents are presented in these methods.

1.7 *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 31 Practice for Making and Curing Concrete Test Specimens in the Field²

C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens²

C 42 Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete²

C 617 Practice for Capping Cylindrical Concrete Specimens²

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²

C 822 Terminology Relating to Concrete Pipe and Related Products³

C 1231 Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders²

D 2240 Test Method for Rubber Property-Durometer Hardness⁴

E 4 Practices for Force Verification of Testing Machines⁵

3. Terminology

3.1 *Definitions*—For definitions of terms relating to concrete pipe, see Terminology C 822.

4. External Load Crushing Strength Test by the Three-Edge Bearing Test Method

4.1 *Summary of Test Method*—The test specimen is tested in a machine designed to apply a crushing force upon the specimen in a plane through the vertical axis extending along the length of the specimen.

4.2 *Significance and Use*—The crushing test shall be either a quality control test performed to establish that the finished, shippable pipe has sufficient strength to withstand the crushing loads stated in the specifications or a proof of design test performed to prove the adequacy of design.

4.3 Apparatus:

4.3.1 The testing machine shall be of any type of sufficient capacity and shall be capable of providing the rate of loading prescribed in 4.5.3.

4.3.2 The testing machine shall be substantial and rigid throughout, so that the distribution of the load will not be affected appreciably by the deformation or yielding of any part.

4.3.3 The three-edge-bearing method of loading shall be used. The test specimen shall be supported on a lower bearing

¹ These test methods are under the jurisdiction of ASTM Committee C13 on Concrete Pipe and are the direct responsibility of Subcommittee C13.09 on Methods of Test.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.05.

⁴ Annual Book of ASTM Standards, Vol 09.01.

⁵ Annual Book of ASTM Standards, Vol 03.01.