# **Standard Method of Test for**

# Concrete Pipe, Manhole Sections, or Tile

AASHTO Designation: T 280-14 (2018)<sup>1</sup> Technical Subcommittee: 4a, Concrete Drainage Structures Release: Group 2 (June) ASTM Designation: C497-13



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## 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 ar	opear in the	following order
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	Section
External load crushing strength	4
Flat slab tops	5
Core strength	6
Absorption	7
Hydrostatic	8
Permeability	9
Manhole step	10
Cylinder strength	11
Gasket lubricant	12
Joint shear	13
Alkalinity	14
Gasket measurement	15
Off-center hydrostatic joint test	16

- **1.3.** The test specimens shall not have been exposed to a temperature below 4°C [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. The values stated in SI units are to be regarded as the standard.
- **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. *AASHTO Standards*:

- M 231, Weighing Devices Used in the Testing of Materials
- M 262, Concrete Pipe and Related Products
- T 22, Compressive Strength of Cylindrical Concrete Specimens
- T 23, Making and Curing Concrete Test Specimens in the Field
- T 24M/T 24, Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- T 231, Capping Cylindrical Concrete Specimens

#### 2.2. *ASTM Standards*:

- C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- C1231/C1231M, Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Specimens
- D2240, Standard Test Method for Rubber Property—Durometer Hardness
- E4, Standard Practices for Force Verification of Testing Machines

#### 3. TERMINOLOGY

3.1. *Definitions*—For definitions of terms relating to concrete pipe, see M 262.

#### 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 Section 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 of two parallel longitudinal strips and the load applied through an upper bearing (Figures 1, 2, 3, and 4). At the option of the manufacturer, either or both the lower bearing and the upper bearing beam shall extend the full length or any portion of the length of the specimen (Figure 5).