



Designation: C1719 – 24

Standard Test Method for Installed Precast Concrete Tanks and Accessories by the Negative Air Pressure (Vacuum) Test Prior to Backfill¹

This standard is issued under the fixed designation C1719; 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 procedures for testing precast concrete tanks (and installed accessories) used for on-site wastewater treatment, grease interception, grit/oil separation, water storage, or other applications requiring watertight construction and installation. This test method uses partial vacuum to demonstrate the integrity of the installed materials and the construction processes.

1.2 This test method is intended to be used to demonstrate the condition of the installed system (precast concrete tank and accessories) prior to backfill.

1.3 Testing of the system before backfill is necessary so as to preclude inadvertent structural overloading of the system components during the test.

NOTE 1—Vacuum test criteria presented in this test method are similar to those in general use. The test and criteria have been widely and successfully used in testing manholes as specified in Test Method C1244/C1244M.

1.4 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.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee C27 on Precast Concrete Products and is the direct responsibility of Subcommittee C27.30 on Water and Wastewater Containers.

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2. Referenced Documents

2.1 ASTM Standards:²

C822 Terminology Relating to Concrete Pipe and Related Products

C1227 Specification for Precast Concrete Septic Tanks

C1244/C1244M Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill

3. Terminology

3.1 For definitions of terms relating to tanks, see Terminology C822.

4. Summary of Test Method

4.1 The tank shall be set in its installed position. Required accessories and pipes shall be installed. All openings and pipes entering the tank shall be plugged. A vacuum shall be drawn and vacuum retention over a specified time period is used to determine the acceptability of the tank and installed accessories.

5. Significance and Use

5.1 This is not a routine test. The values recorded are applicable only to the tank being tested and at the time of testing. This test is intended only to demonstrate the sealing effectiveness of the installed system. Structural design of the tank is defined or demonstrated within the scope of other applicable specifications and test methods, including Specification C1227.

6. Equipment Required

6.1 A vacuum device is required and shall be capable of reliably drawing the required vacuum. Suitable vacuum devices include vane- and venturi-type pumps, vehicle vacuum systems, and high-performance shop-style vacuum cleaners.

6.2 A vacuum measuring device is required and shall be a vacuum gauge, mercury manometer, or water manometer

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

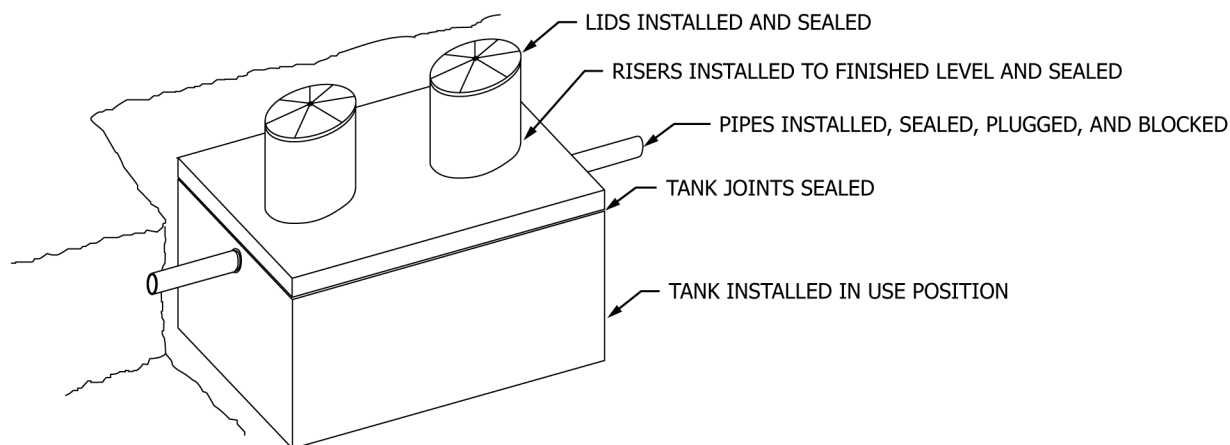


FIG. 1 Preparation of Tank for Vacuum Testing (Schematic Representation)

accurate to 0.1 in. (2.5 mm) Hg [1.4 in. (35 mm) H₂O]. If a gauge is used, it shall be in current calibration to standards traceable to NIST and shall have a range of no more than 10 in. (254 mm) Hg.

6.3 Suitable pipes (or pipe stubs), pipe plugs, and proper blocking for same shall be used. If temporary stubs are used, they shall be of the same size and type of pipe as that to be used in the final installation of the system, and shall be placed in the same orientation as required by the final installation of the system.

6.4 Suitable hose/tubing, valves, and related vacuum plumbing shall be used to allow the test to be conducted as required below.

7. Preparation of the System

7.1 The tank shall be placed into its final installed position. All section joints of the tank shall be sealed as required by the manufacturer.

7.2 All pipes and conduits entering the tank shall be installed and temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the tank.

7.3 Risers and their lids shall be installed to finished level and sealed as required by the manufacturer.

8. Procedure

8.1 Using an opening in the tank, install equipment capable of drawing a vacuum of more than 54.0 in. (1370 mm) of water or 4.0 in. (100 mm) of mercury. All other openings in the tank shall be sealed.

8.2 A vacuum gauge capable of measuring a minimum of 54.0 in. (1370 mm) of water or 4.0 in. (100 mm) of mercury shall be used. The gauge shall be capable of measuring the vacuum in increments of 2.0 in. (50 mm) or less of water or 0.1 in. (2.5 mm) or less of mercury.

8.3 A vacuum of at least 54.0 in. (1370 mm) of water or 4.0 in. (100 mm) of mercury shall be drawn on the system. This is

the initial test level. Wait one minute. If the vacuum decreases, return the vacuum to the initial test level and repeat this process until the reading stabilizes.

NOTE 2—As the tank seal compresses due to the vacuum, the reading may change initially. A vacuum of greater than 81.0 in. (2060 mm) of water or 6.0 in. (150 mm) of mercury is not advised because it may exceed 1.5 times the minimum design load.

8.4 With the tank holding a vacuum of at least 54.0 in. (1370 mm) of water or 4.0 in. (100 mm) of mercury, start a timer.

8.5 The system shall pass if the vacuum is maintained for 5 min. Should the vacuum reduce by 2.0 in. (50 mm) or more of water or 0.1 in. (2.5 mm) or more of mercury during the 5 min. test duration, the vacuum shall be returned to the initial test level and the test time restarted. The system shall not be prohibited from being repaired and retested. Repairs shall be made in accordance with the precast concrete tank manufacturer's recommended method.

9. Report

9.1 At the conclusion of the test, a report shall be recorded and shall include at a minimum: Date, time, and location of the test; staff performing test and anyone else present; test equipment used and verification of calibration (as required); test set-up; test results and comments; and a positive statement as to the conformance of the system with this test method.

9.2 The test report shall be presented to the system owner or their representative, and a copy shall be retained by the individual performing the test.

10. Precision and Bias

10.1 No justifiable statement can be made either on the precision or bias of this procedure, since the test result merely states whether there is conformance to the criteria of the test specified.

11. Keywords

11.1 acceptance criteria; concrete; on-site; tank; test method; vacuum test