



Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings¹

This standard is issued under the fixed designation D 1599; 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 determination of the resistance of either thermoplastic or reinforced thermosetting resin pipe, tubing, or fittings to hydraulic pressure in a short time period. Procedure A is used to determine burst pressure of a specimen if the mode of failure is to be determined. Procedure B is used to determine that a specimen complies with a minimum burst requirement.

1.2 This test method is suitable for establishing laboratory testing requirements for quality control purposes or for procurement specifications.

1.3 The values given in parentheses are provided for information purposes only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings²

D 3517 Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe²

D 3567 Practice for Determining Dimensions of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings²

3. Summary of Test Method

3.1 This test method consists of loading a specimen to failure, or a predetermined minimum level, in short-time interval by means of continuously increasing internal hydraulic-pressure while immersed in a controlled-temperature environment.

¹ This test method is under the jurisdiction of ASTM Committee F-17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.40 on Test Methods.

Current edition approved December 10, 1999. Published March 2000. Originally published as D 1599 – 62 T. Last previous edition D 1599 – 88 (1995).

² *Annual Book of ASTM Standards*, Vol 08.04.

4. Significance and Use

4.1 This test method establishes the short-time hydraulic failure pressure of thermoplastic or reinforced thermosetting resin pipe, tubing, or fittings. Data obtained by this test method are of use only in predicting the behavior of pipe, tubing, and fittings under conditions of temperature, time, method of loading, and hoop stress similar to those used in the actual test. They are generally not indicative of the long-term strength of thermoplastic or reinforced thermosetting resin pipe, tubing, and fittings.

4.2 Procurement specifications utilizing this test method may stipulate a minimum and maximum time for failure other than the 60 to 70 s listed in 9.1.3. Either the internal hydraulic pressure or the hoop stress may be listed in the requirements.

NOTE 1—Many thermoplastics give significantly different burst strengths depending on the time to failure. For instance, significant differences have been observed between failure times of 65 and 85 s.

4.3 This test method is also used as a short-term pressurization validation procedure, where the specimens are pressurized to a predetermined minimum pressure requirement.

5. Failure

5.1 Any instantaneous or rapid loss of pressure shall constitute failure.

5.2 Any visible passage of fluid through the wall of the specimen shall constitute failure.

5.3 Any loss of pressure that interrupts the continuous and uniform pressure increase, described in 9.1.3, shall constitute failure.

5.4 Leakage at the end closure or fracture of the specimen in the immediate vicinity of the end closure shall be considered as an invalid test item, not a failure.

6. Apparatus

6.1 *Constant-Temperature Bath*—A water bath or other fluid bath equipped so that uniform temperature is maintained throughout the bath. This may require agitation. If an air or other gaseous environment is used, provisions shall be made for adequate circulation. Unless otherwise stated, the tests shall be conducted at $23 \pm 2^\circ\text{C}$ ($73 \pm 3.6^\circ\text{F}$). The tolerance on other test temperatures shall be $\pm 2^\circ\text{C}$ (3.6°F). Fluid environments