



Designation: D1598 – 24

Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure¹

This standard is issued under the fixed designation D1598; 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 the determination of the time-to-failure of both thermoplastic and reinforced thermosetting/resin pipe under constant internal pressure.

1.2 This test method provides a method of characterizing plastics in the form of pipe under the conditions prescribed.

1.3 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.

1.4 *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.*

1.5 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

[D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure](#)

[D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings](#)

[D2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products](#)

[D2992 Practice for Obtaining Hydrostatic or Pressure Design Basis for “Fiberglass” \(Glass-Fiber-Reinforced Thermosetting-Resin\) Pipe and Fittings](#)

[D2517 Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings](#)

[D3567 Practice for Determining Dimensions of “Fiberglass” \(Glass-Fiber-Reinforced Thermosetting Resin\) Pipe and Fittings](#)

[E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *failure, n*—occurrence of ballooning, rupture, seepage or weeping.

3.1.1.1 *ballooning, n*—any localized expansion of a pipe while under internal pressure. This is sometimes referred to as ductile failure.

3.1.1.1.1 *Discussion*—Overall distention caused by applied stress is not considered to be a failure.

3.1.1.2 *rupture, n*—a break in the pipe wall with immediate loss of test fluid and continued loss at essentially no pressure. If rupture is not preceded by some yielding, this may be termed a non-ductile failure.

3.1.1.3 *seepage or weeping, n*—test fluid passing through cracks in the pipe wall to an extent detectable visually or electronically. A reduction in pressure will frequently enable the pipe to carry fluid without apparent evidence of loss of fluid.

3.1.2 *free (unrestrained) end closure, n*—a pipe specimen end closure(cap) that seals the end of the pipe against loss of internal fluid and is fastened to the pipe specimen.

3.1.3 *restrained end closure, n*—a pipe specimen end closure (cap) that seals the end of the specimen against loss of internal fluid and pressure, but is not fastened to the pipe specimen. Retained end closures rely on tie-rod(s) through the pipe specimen or on an external structure to resist internal pressure end thrust.

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

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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.

*A Summary of Changes section appears at the end of this standard