



Standard Specification for Glass Fiber Reinforced Thermoplastic Pipe¹

This standard is issued under the fixed designation F2686; 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 specification covers coiled, machine-made glass fiber reinforced thermoplastic pipe² up to 6 in. nominal size, having discrete, unbonded inner and outer layers of thermoplastic compounds and an intermediate structural layer of unbonded, dry glass fiber reinforcement to provide higher strength. Included are a classification system and requirements for materials, mechanical properties, dimensions, performance, methods of test, and marking. Reinforced thermoplastic pipes are used for oil and gas applications, including transport of multiphase fluids, hydrocarbon gases, hydrocarbon liquids and non-potable water.

1.2 The piping system will comprise one or more runs of pipe along with mechanical fittings, designed and for use with this composite pipe, connecting them to each other and to the other pipeline components.

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

2. Referenced Documents

2.1 ASTM Standards:³

¹ This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.68 on Energy Piping Systems.

Current edition approved March 1, 2014. Published December 2014. Originally approved in 2010. Last previous edition approved in 2010 as F2686–10. DOI:10.1520/F2686–14.

² The glass fiber reinforced thermoplastic pipe described in this specification is covered by a patent (US Patents 6,889,716, 6,902,205, and 7,946,629 B2). Interested parties are invited to submit information regarding the identification of an alternative(s) to this patented item to the ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

A105/A105M Specification for Carbon Steel Forgings for Piping Applications

A106/A106M Specification for Seamless Carbon Steel Pipe for High-Temperature Service

A333/A333M Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness

A350/A350M Specification for Carbon and Low-Alloy Steel Forgings, Requiring Notch Toughness Testing for Piping Components

D578 Specification for Glass Fiber Strands

D618 Practice for Conditioning Plastics for Testing

D883 Terminology Relating to Plastics

D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure

D1599 Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings

D1600 Terminology for Abbreviated Terms Relating to Plastics

D2105 Test Method for Longitudinal Tensile Properties of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Tube

D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

D2143 Test Method for Cyclic Pressure Strength of Reinforced, Thermosetting Plastic Pipe

D2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

D2992 Practice for Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings

D3350 Specification for Polyethylene Plastics Pipe and Fittings Materials

F412 Terminology Relating to Plastic Piping Systems

2.2 PPI Standards:⁴

TR-4 PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe

⁴ Available from Plastics Pipe Institute (PPI), 105 Decker Court, Suite 825, Irving, TX 75062, <http://www.plasticpipe.org>.

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