



Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)¹

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1. Scope

1.1 This practice covers the procedures for the reconstruction of pipelines and conduits (4 to 48 in. (100 to 1200 mm) diameter) by the pulled-in place installation of a resin-impregnated, flexible fabric tube into an existing conduit followed by inflation with compressed air (see Fig. 1). The resin/fabric tube can be cured by either the flow through the fabric tube of mixed air and steam or by use of ultraviolet light. When cured, the finished cured-in-place pipe will be continuous and tight fitting. This reconstruction process can be used in a variety of gravity flow applications such as sanitary sewers, storm sewers, process piping, electrical conduits, ventilation systems, and pressure applications.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for informational purposes only.

1.3 *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:²

- D 543 Testing Method of Resistance of Plastics to Chemical Reagents
- D 578 Specifications for Glass Fiber Strands
- D 638 Testing Method for Tensile Properties of Plastics
- D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D 1600 Terminology for Abbreviated Terms Relating to Plastics

¹ This practice is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.67 on Trenchless Plastic Pipeline Technology.

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² 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.

D 1682 Test Method for Breaking Load and Elongation of Textile Fabrics³

D 3039/D 3039M Test Method for Tensile Properties of Polymer Matrix Composite Materials

D 3567 Practice for Determining Dimensions of Reinforced Thermosetting Resin Pipe (RTRP) and Fittings

D 5813 Specification for Cured-in-Place Thermosetting Resin Sewer Pipe

F 412 Terminology Relating to Plastic Piping Systems

F 1216 Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

F 1417 Test Method for Installation Acceptance of Gravity Plastic Sewer Lines Using Low Pressure Air Testing

F 1743 Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in Place Thermosetting Resin Pipe (CIPP)

2.2 AWWA Standard:

Manual on Cleaning and Lining Water Mains, M28⁴

2.3 NASSCO Standard:

Recommended Specifications for Sewer Collection System Rehabilitation⁵

3. Terminology

3.1 General:

3.1.1 Definitions are in accordance with Terminology F 412. Abbreviations are in accordance with Abbreviations D 1600, unless otherwise indicated.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *calibration hose*—an impermeable bladder installed inside the fabric tube, and inflated with air or steam, or both to press the tube firmly against the wall of the existing pipe until the resin is cured with air and steam or ultraviolet light. The calibration hose is removed when the installation is finished.

3.2.2 *cured-in-place pipe (CIPP)*—a hollow cylinder consisting of a glass reinforced plastic (GRP) fabric tube with

³ Withdrawn.

⁴ Available from American Water Works Association (AWWA), 1401 New York Ave., NW, Suite 640, Washington, DC 20005.

⁵ Available from National Association of Sewer Service Companies, 423 W. King Street, Suite 3000, Chambersburg, PA 17201