Designation: F1867 – 06 (Reapproved 2012)

Standard Practice for Installation of Folded/Formed Poly (Vinyl Chloride) (PVC) Pipe Type A for Existing Sewer and Conduit Rehabilitation[1]

This standard is issued under the fixed designation F1867; 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 practice covers the procedures for the rehabilitation of sewer lines and conduits 4 in. (102 mm) to 18 in. (457 mm) in diameter by the insertion of a folded/formed PVC pipe that is heated, pressurized, and expanded to conform to the wall of the original conduit forming a new structural pipe-within-a-pipe. This rehabilitation process can be used in a variety of gravity applications such as sanitary sewers, storm sewers, and process piping.

1.2 This practice is to be used with the material specified in Section 6 of Specification F1871.

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.*

1.5 There is no similar or equivalent ISO Standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D638 Test Method for Tensile Properties of Plastics

D648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position

D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

D1600 Terminology for Abbreviated Terms Relating to Plastics

D1784 Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

F412 Terminology Relating to Plastic Piping Systems

F1417 Practice for Installation Acceptance of Plastic Nonpressure Sewer Lines Using Low-Pressure Air

F1871 Specification for Folded/Formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation

2.2 *Uni-Bell Standard:*

UNI-B-5-89 Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Sewer Pipe[3]

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology F412, and abbreviations are in accordance with Terminology D1600, unless otherwise indicated. The abbreviation for poly(vinyl chloride) plastics is PVC.

3.1.1 The term TYPE A is not an abbreviation but rather an arbitrary designation for PVC compounds with a minimum value for modulus in tension as listed in 6.1 and a maximum value as defined by cell limit 1 of Specification D1784.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *dimples (dimpling), n*—Where a side connection meets the existing conduit, there is no support for the PVC pipe during forming, causing a point of thermoplastic pipe expansion slightly beyond the existing pipe wall. This formation of an external departure from the formed pipe wall is termed dimpling.

3.2.2 *flattened pipe, n*—a flattened pipe has been manufactured and calibrated round, then subsequently cooled and deformed into a flattened shape for coiling purposes. Later, at the time of installation at the project site, the flattened pipe will be formed into the folded shape when inserted into the existing sewer and conduit rehabilitation.

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

Current edition approved April 1, 2012. Published May 2012. Originally approved in 1998. Last previous edition approved in 2006 as F1867 – 06. DOI: 10.1520/F1867-06R12.

[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.

[3] Available from Uni-Bell PVC Pipe Association, 2711 LBJ Freeway, Suite 1000, Dallas, TX 75234, http://www.uni-bell.org.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States

Documents
Document Sharing Hub
Full document details: ASTM F1867-06(2012)

3.2.3 *folded pipe, n*—pipe that has been manufactured and calibrated round, then subsequently cooled and deformed into a folded shape for use in existing sewer and conduit rehabilitation (see Fig. 1).

3.2.4 *formed field sample, n*—A formed field sample is formed when the folded pipe has been inserted into a mold pipe and expanded with steam heat and pressure..

3.2.5 *formed pipe, n*—a folded pipe that has been inserted into an existing sewer or conduit and expanded with steam heat and pressure, and, if required by the manufacturer, with a squeegee device or similar device to provide a close fit to the existing pipe (see Fig. 1).

3.2.6 *insertion point, n*—An existing manhole, existing access shaft, or an excavation that serves as the point of entrance for the folded pipe into the existing pipe.

3.2.7 *liner, n*—PVC formed pipe fully functional as a pipe within a rehabilitated pipe.

3.2.8 *termination point, n*—An existing manhole, existing access shaft, or an excavated pit that serves as the point of exit of the folded pipe from the existing pipe.

4. Significance and Use

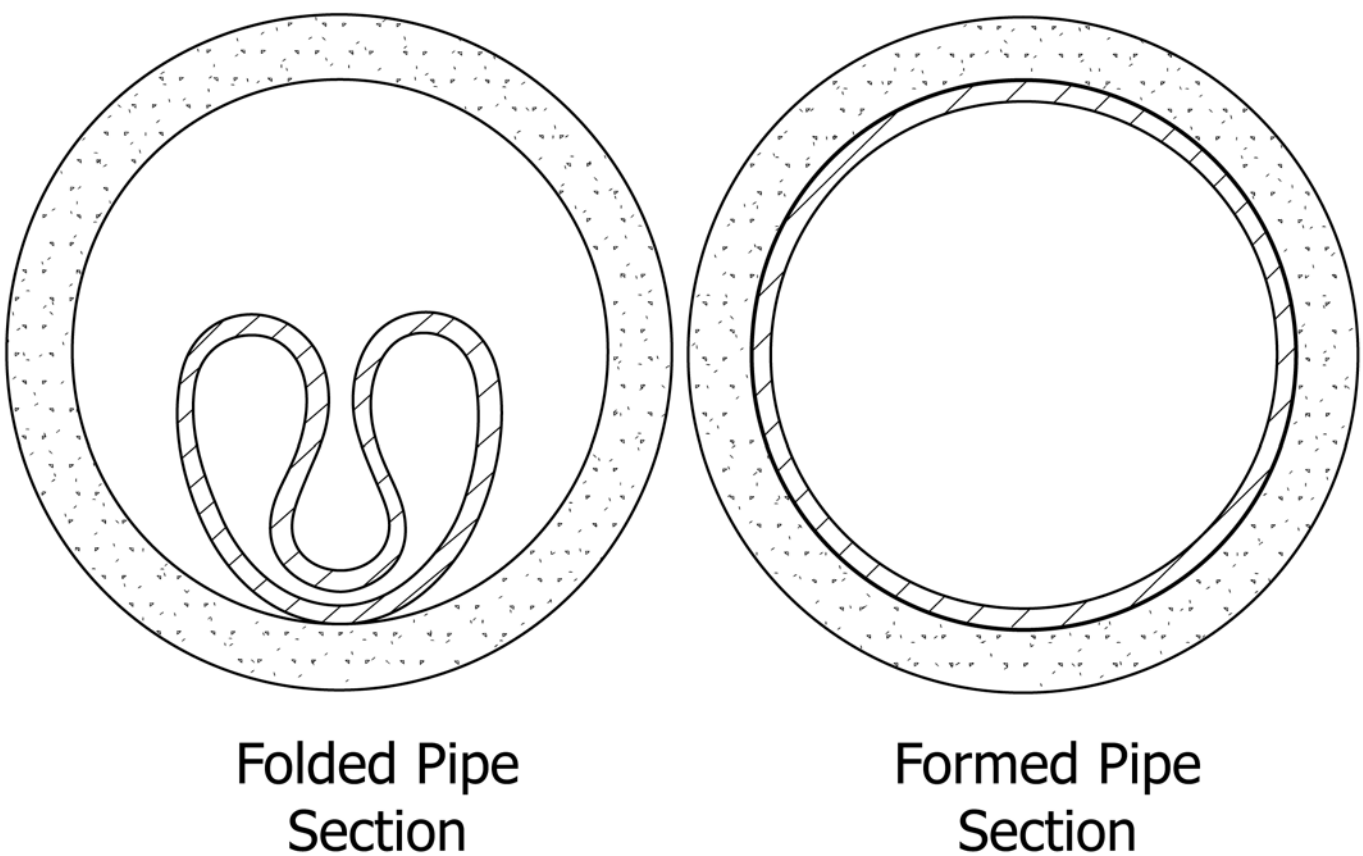
4.1 This practice is for use by designers, and specifies regulatory agencies, owners, and inspection organizations involved in the rehabilitation of non-pressure sewers and conduits. Modifications may be required, depending on specific job conditions, to establish a project specification. The manufacturer of the product should be consulted for design and installation information. Industrial waste disposal lines should be installed only with the specific approval of the cognizant code authority, since chemicals not commonly found in drains and sewers and temperatures in excess of 140 °F (60 °C) may be encountered.

5. Materials

5.1 The folded/formed PVC liner pipe should be made from PVC compound, meeting all the requirements for cell classification 12111 as defined in Specification D1784 and with minimum physical properties as listed.

NOTE 1—If required by the user, chemical resistance tests will be supplied by the pipe manufacturer.

Tensile Strength	Test Method D638	3600 PSI	(25 MPa)
Tensile Modulus	Test Method D638	155 000 PSI	(1069 MPa)
Flexural Strength	Test Method D790	4100 PSI	(28 MPa)
Flexural Modulus	Test Method D790	145 000 PSI	(1000 MPa)
Heat Deflection Temperature Tested at 264 psi	Test Method D648 (2 MPa)	115 °F	(46 °C)



NOTE 1—This figure is intended only for clarification of terms specific to this practice and shows a representative folded pipe shape. Other folded pipe shapes may meet the requirements of this practice.

FIG. 1 Folder Pipe and Formed Pipe—Clarification of Terms

AVA Documents
Document Sharing Hub

Full document details: ASTM F1867-06(2012)