



Standard Practice for Installation of a PVC Segmental Panel Liner System in Man- Entry Size Sewers and Conduits¹

This standard is issued under the fixed designation F2985; 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 The practice describes the procedures for the rehabilitation of gravity pipes, culverts, tunnels, and conduits by the installation of a field-fabricated PVC liner system. After installation of the liner system, cementitious grout is pumped into the annular space between the liner and the host structure. The rehabilitation of the host structure by this installation practice results in a rigid composite structure (PVC liner/grout/existing pipe). This type of rehabilitation process is suitable for a variety of gravity pipe applications such as storm sewers, sanitary sewers, and culverts; and with geometries including circular, egg, ovoid, elliptical, arch, and site-specific composite shapes.

1.2 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.

1.3 *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

C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

C827/C827M Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures

F2984 Specification for Segmental Panel System for the Grout-in-Place-Liner (GIPL) Rehabilitation Method of Existing Man-Entry Size Sewers, Culverts, and Conduits

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.

3. Terminology

3.1 Definitions:

3.1.1 *cementitious grout, n*—the cementitious grout material is a mixture of Type B Portland cement, sand, and various admixtures designed to perform in a wet environment.

3.1.2 *panel assembly hardware, n*—the connecting long screw rods, bolts, and nuts made from carbon steel meeting SAE's classification No. 1020 with uni-chrome plating.

3.1.2.1 *Discussion*—The uni-chroming process deposits chromium onto the surface of the steel producing an anticorrosion, crack-free barrier that is compliant with the strain properties of the steel.

3.1.3 *PVC liner, n*—a tubular assembly field fabricated from injection molded PVC profile wall segments which are bolted together to form circumferential rings which are then joined together such that some portion of the entire inner circumference of the host structure is isolated from the fluid being transported.

3.1.4 *PVC segmental panels, n*—an injection molded element available in various geometries, consisting of a smooth inner surface and a ribbed outer surface (profile) with edge configurations to allow precise mechanical locking and sealing of adjacent panels.

4. Significance and Use – Summary of Practice

4.1 This practice is for use by engineers and owners involved in the rehabilitation of gravity piping, conduits, and small-scale tunnels. This practice conveys the necessary global information for the proper installation of a grout in place liner system that can lead to a full restoration of the original host soil-structure interaction system when properly designed by the local practicing engineer. In addition, this practice will also provide guidance to the design professional on how to address any modifications that must be made for any unique site-specific job conditions.

5. Materials

5.1 The injection-molded PVC panel segments and related small parts used for the field fabrication of the PVC liner shall meet the requirements in Specification F2984. The injection-molded PVC panel segments shall be sufficiently translucent so as to allow grout filling operations to be visually monitored.