



# Standard Specification for Multilayer Pipe Type 2, Compression Fittings, and Compression Joints for Hydronic Heating Systems<sup>1</sup>

This standard is issued under the fixed designation F 1987; 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 requirements for multilayer pipe type 2 and compression fittings for hydronic heating systems, with a maximum pressure/temperature range of 1000 kPa (145 psi), at 82°C (180°F).

NOTE 1—*Multilayer Pipe Type 2*—Construction-based pressure rated pipe comprising more than one layer in which at least 60 % of the wall thickness is polymeric material.

1.2 Multilayer pipe type 2 is produced using a butt-welded aluminum pipe as a core, with an extruded inside layer of crosslinked polyethylene (PEX). An adhesive layer is used to bond the inside layer to the wall of the aluminum pipe. An outer layer of polyethylene (PE) and an adhesive layer are extruded to the outer wall of the aluminum pipe.

1.3 Multilayer pipe type 2 is produced in Configurations 1 and 2, as shown in Fig. 1.

1.4 This specification includes compression fittings, which are referenced in Fig. 2.

1.5 Specifications for threaded or solder adapters for use with pipe and fittings meeting the requirements of this specification are given in Annex A1 and Annex A2.

1.6 The following safety hazards caveat pertains only to the test method portion of this specification: *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.*

1.7 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with this specification.

NOTE 2—Multilayer pipe type 2, configurations 1 and 2, for hydronic heating systems are not compatible for drinking water use.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.11 on Composite.

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## 2. Referenced Documents

### 2.1 ASTM Standards:

- B 283 Specification for Copper and Copper-Alloy Die Forgings (Hot-Pressed)<sup>2</sup>
  - B 455 Specification for Copper-Zinc-Lead Alloy (Leaded-Brass) Extruded Shapes<sup>2</sup>
  - B 547/B 547M Specification for Aluminum and Aluminum-Alloy Formed and Arc-Welded Round Tube<sup>3</sup>
  - B 584 Specification for Copper Alloy Sand Castings for General Applications<sup>2</sup>
  - D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing<sup>4</sup>
  - D 1505 Test Method for Density of Plastics by the Density-Gradient Technique<sup>4</sup>
  - D 1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure<sup>5</sup>
  - D 1600 Terminology for Abbreviated Terms Relating to Plastics<sup>4</sup>
  - D 1898 Practice for Sampling of Plastics<sup>6</sup>
  - D 2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings<sup>5</sup>
  - D 3222 Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials<sup>7</sup>
  - D 3418 Test Method for Transition Temperatures of Polymers By Differential Scanning Calorimetry<sup>7</sup>
  - D 3350 Specification for Polyethylene Plastics Pipe and Fittings Materials<sup>7</sup>
  - D 5033 Guide for the Development of Standards Relating to the Proper Use of Recycled Plastics<sup>8</sup>
  - F 412 Terminology Relating to Plastic Piping Systems<sup>5</sup>
  - F 477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe<sup>5</sup>
- ### 2.2 ISO Standard:<sup>9</sup>

<sup>2</sup> Annual Book of ASTM Standards, Vol 02.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 02.02.

<sup>4</sup> Annual Book of ASTM Standards, Vol 08.01.

<sup>5</sup> Annual Book of ASTM Standards, Vol 08.04.

<sup>6</sup> Discontinued; see 1998 Annual Book of ASTM Standards, Vol 08.01.

<sup>7</sup> Annual Book of ASTM Standards, Vol 08.02.

<sup>8</sup> Annual Book of ASTM Standards, Vol 08.03.

<sup>9</sup> Available from American National Standards Institute, 11 West 42nd Street, 13th floor, New York, NY, 10036.