



Designation: F 2159 – 03

Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing¹

This standard is issued under the fixed designation F 2159; 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 establishes requirements for sulfone plastic insert fittings and copper crimp rings for three sizes ($\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$) of cross-linked polyethylene (PEX) plastic tubing. These fittings are intended for use in 100 psi (690 kPa) cold- and hot-water distribution systems operating at temperatures up to and including 180°F (82°C). Included are the requirements for material, molded part properties, performance, workmanship, dimensions, and markings to be used on the fittings and rings.

1.2 *Units*—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units, which are provided for information only and are not considered the standard.

1.3 The following is an index of the appendix in this specification:

GO/NO-GO Crimp Gauges

Appendix X1

1.4 The following precautionary caveat pertains only to the test method portions, Sections 11 and 12, 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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing²
- D 1598 Test Method for Time-To-Failure of Plastic Pipe Under Constant Internal Pressure³
- D 1599 Test Method for Short-Time, Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings³
- D 1600 Terminology for Abbreviated Terms Relating to Plastics²
- D 2122 Test Method for Determining Dimensions of Ther-

moplastic Pipe and Fittings³

D 6394 Specification for Sulfone Plastics (SP)⁴

F 412 Terminology Relating to Plastic Piping Systems³

F 876 Specification for Cross-linked Polyethylene (PEX) Tubing³

F 877 Specification for Cross-linked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems³

F 1498 Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings³

F 1807 Specification for Metal Insert Fitting Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing³

2.2 ASME Standard:

B 1.20.1 Pipe Threads General Purpose Inch⁵

2.3 NSF International Standard:

ANSI/NSF Standard No. 14 for Plastic Piping Components and Related Materials⁶

ANSI/NSF Standard No. 61 for Drinking Water System Components-Health Effects⁶

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology F 412 and abbreviations are in accordance with Terminology D 1600, unless otherwise indicated.

4. Classification

4.1 This specification governs one class of fittings and copper crimp rings suitable for use with nominal size $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$ size PEX tubing that meets the requirements of ASTM Specifications F 876 or F 877.

5. Materials and Manufacture

5.1 *Material*—Fittings shall be molded from sulfone plastic (SP) as specified in Specification D 6394. The material shall be unreinforced polysulfone (group 01, class 1, grade 2) or polyphenylsulfone (group 03, class 1, grade 1). Material may also be an unreinforced blend of these two materials with the

¹ This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.10 on Fittings.

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² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 08.04.

⁴ *Annual Book of ASTM Standards*, Vol 08.03.

⁵ Available from the American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

⁶ Available from the National Sanitation Foundation (NSF International), P.O. Box 130140, Ann Arbor, MI 48113.