



Designation: F 1960 – 03

An American National Standard

## Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing<sup>1</sup>

This standard is issued under the fixed designation F 1960; 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 cold expansion fittings and cross-linked (PEX) reinforcing rings for use with cross-linked polyethylene (PEX) plastic tubing in  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ , 1, 1- $\frac{1}{4}$ , and 1- $\frac{1}{2}$  in. nominal diameters that meet the requirements of Specifications F 876 and F 877. 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). The system is comprised of a PEX reinforcing ring and a cold expansion fitting. Included are the requirements for materials, workmanship, dimensions, and markings to be used on the fitting components. The components covered by this specification are intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor-heating systems.

1.2 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 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:

A 351 Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts<sup>2</sup>

B 16 Specification for Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines<sup>3</sup>

B 140/B 140M Specification for Copper-Zinc-Lead (Leaded Red Brass or Hardware Bronze) Rod, Bar, and Shapes<sup>3</sup>

B 283 Specification for Copper and Copper-Alloy Die Forging (Hot Pressed)<sup>3</sup>

B 584 Specification for Copper Alloy Sand Castings for General Applications<sup>3</sup>

D 792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement<sup>4</sup>

D 1505 Test Method for Density of Plastics by the Density-Gradient Technique<sup>4</sup>

D 1600 Terminology for Abbreviated Terms Relating to Plastics<sup>4</sup>

D 2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings<sup>5</sup>

D 2765 Test Methods for Determination of Gel Content and Swell Ratio of a Crosslinked Ethylene Plastics<sup>6</sup>

D 3045 Practice for Heat Aging of Plastics Without Load<sup>6</sup>

D 6394 Specification for Sulfone Plastics (SP)1.<sup>7</sup>

F 412 Terminology Relating to Plastic Piping Systems<sup>4</sup>

F 876 Specification for Crosslinked Polyethylene (PEX) Tubing<sup>5</sup>

F 877 Specification for Crosslinked Polyethylene (PEX) Plastic Hot and Cold-Water Distribution Systems<sup>5</sup>

#### 2.2 Military Standard:

MIL-STD-P46120A Polysulfone GF120<sup>8</sup>

#### 2.3 ANSI Standard:

B1.20 Pipe Threads General Purpose<sup>9</sup>

B16.18 Cast Copper Alloy Solder Joint Pressure Fittings

B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

#### 2.4 NSF Standards:

NSF 14 for Plastic Piping Components and Related Materials<sup>10</sup>

<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> Annual Book of ASTM Standards, Vol 08.02.

<sup>7</sup> Annual Book of ASTM Standards, Vol 08.03.

<sup>8</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robins Ave., Philadelphia PA 19111-5094, Attn: NPODS.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.10 on Fittings. Current edition approved April 10, 2003. Published July 2003. Originally approved in 1999. Last previous edition approved in 2002 as F 1960 – 02b.

<sup>2</sup> Annual Book of ASTM Standards, Vol 01.02.

<sup>3</sup> Annual Book of ASTM Standards, Vol 02.01.

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

<sup>10</sup> Available from the National Sanitation Foundation (NSF International), PO Box 1468, Ann Arbor, MI, 48106.