



**Summary of Substantive Changes  
between the 2015 and 2018a editions of  
ASTM F1960, Cold Expansion Fittings with PEX Reinforcing Rings for Use with  
Cross-linked Polyethylene (PEX) and  
Polyethylene of Raised Temperature (PE-RT) Tubing**

**Presented to the IAPMO Standards Review Committee on March 11, 2019**

**General:** The change to this standard should not have an impact on currently listed products. The substantive change is:

- Expanded the scope to include (PEX) Tubing with Oxygen Barrier that complies with ASTM F3253 and PE-RT tubing that complies with F2769 (see Sections 1.1, 6.1 and 10.1).
- Expanded the application for cold expansion fittings with PEX reinforcing rings used with PEX tubing to include (PEX) Tubing with Oxygen Barrier that complies with ASTM F3253 and PE-RT tubing that complies with F2769 and removed ASTM F877 from the specification (see Section 4.1).

Title Change: *Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) [and Polyethylene of Raised Temperature \(PE-RT\) Tubing](#)*

Section 1, Scope: Expanded the scope to include (PEX) Tubing with Oxygen Barrier that complies with ASTM F3253, added the use of PE-RT tubing that complies with F2769 as follows:

*1.1 This specification covers cold expansion fittings and cross-linked (PEX) reinforcing rings for use with cross-linked polyethylene (PEX) plastic tubing in nominal tubing sizes of  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , and 3 in. that meet the requirements of Specification F876 ~~and F877~~ [or F3253 and for use with Polyethylene of Raised Temperature \(PE-RT\) pipe in nominal tubing sizes of  \$\frac{3}{8}\$ ,  \$\frac{1}{2}\$ ,  \$\frac{5}{8}\$ ,  \$\frac{3}{4}\$ , 1,  \$1\frac{1}{4}\$ ,  \$1\frac{1}{2}\$ , 2,  \$2\frac{1}{2}\$ , and 3 that meet the requirements of Specification F2769.](#) 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.*

Section 2, Referenced documents: The following standards were added as follows:

**2.1 ASTM Standards**

[F2769 Specification for Polyethylene of Raised Temperature \(PE-RT\) Plastic Hot and Cold-Water Tubing and Distribution Systems](#)

[F3253 Specification for Crosslinked Polyethylene \(PEX\) Tubing with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems](#)



Section 4, Classification: Expanded the application for cold expansion fittings with PEX reinforcing rings used with PEX tubing to include (PEX) Tubing with Oxygen Barrier that complies with ASTM F3253 and PE-RT tubing that complies with F2769 and removed ASTM F877 from the specification as follows:

*4.1 This specification covers one class of cold expansion fittings with PEX reinforcing rings suitable for use with PEX tubing that meets the requirements of Specification F876 ~~and F877~~ or F3253 and with PE-RT tubing that meets the requirements of Specification F2769.*

Section 5, Materials and Manufacture: The material requirement for unreinforced polyphenylsulfone/polysulfone blend was changed as follows:

*5.1.2.2 Unreinforced Sulfone Plastic (SP)—Fittings shall be molded from sulfone plastic (SP) as specified in Specification D6394. The material shall be unreinforced polysulfone (group 01, class 1, grade 2), or polyphenylsulfone (group 3, class 1, grade 2.) ~~Material may also be an or unreinforced blend of these two materials with the polyphenylsulfone continuous phase comprising 55 to 80% of the blend /polysulfone blends (group 04, class 1, grade 2).~~*

Section 6, General Requirements: Expanded the general requirements to include PE-RT tubing that complies with ASTM F2769 and added PEX with oxygen barrier that complies with ASTM F3253 as follows:

~~6.1 The following sections of Specification F877 constitute a part of this specification.~~

~~6.1.1 Requirements,~~

~~6.1.2 Test Methods, and~~

~~6.1.3 Retest and Rejection.~~

~~6.2 In addition, when a section with a title identical to that referenced in 6.1, above, appears in this specification, it contains additional requirements that supplement those appearing in F877.~~

~~6.3 System Performance Requirements:~~

~~6.3.1 6.1 General—All performance tests shall be performed on assemblies of fittings, PEX reinforcing rings and PEX or PE-RT tubing. Fittings and reinforcing rings shall meet the material and dimensional requirements of this specification. PEX tubing shall meet the requirements of Specification F876 ~~and F877~~ or F3253. PE-RT tubing shall meet the requirements of Specification F2769. Assembly of test specimens shall be in accordance with 10.1. Each assembly shall contain at least two joints. Use separate sets of assemblies for each performance test requirement.~~

~~6.1.1 Fitting manufactured according to this specification and intended for use with PEX tubing meeting requirements of Specification F876, shall comply with the following performance requirements of Specification F877. When a section with an identical title appears in this specification, it contains additional requirements that supplement those found in Specification F877.~~

~~6.1.1.1 Requirements,~~

~~6.1.1.2 Test Methods, and~~

~~6.1.1.3 Retest and Rejection.~~

~~6.1.2 Fittings, manufactured according to this specification and intended for use with PE-RT tubing meeting the requirements of Specification F2769, shall comply with the following performance requirements of Specification F2769. When a section with an identical title appears in this Specification, it contains additional requirements that supplement those found in Specification F2769.~~

~~6.1.2.1 Requirements,~~

~~6.1.2.2 Test Methods, and~~

~~6.1.2.3 Retest and Rejection.~~



~~6.3.2~~ 6.2 *Dimensions—Any randomly selected fitting or fittings and PEX reinforcing rings shall be used to determine dimensions. Measurements shall be made in accordance with Test Method D2122, except determine diameter by making measurements at four locations spaced at approximately 45° apart around the circumference. Inspection and gauging of solder joint ends shall be accordance with ANSI B16.18, ANSI B16.22, or Manufacturers’ Standardization Society SP-104.*

Section 10, Assembly: Expanded cold expansion joints to include PEX with oxygen barrier that complies with ASTM F3253 and added PE-RT tubing that complies with ASTM F2769 as follows:

*10.1 Cold Expansion Joints—Fittings shall be joined to PEX or PE-RT tubing by the contraction of the expanded tubing and reinforcing ring over the insert of the cold expansion fitting. Fittings and PEX reinforcing rings shall meet the dimensional and material requirements of this standard. PEX tubing shall meet the requirements of Specification F876 or ~~F877~~ F3253. PE-RT tubing shall meet the requirements of Specification F2769.*