



Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing¹

This standard is issued under the fixed designation F3347; 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 copper alloy metal press insert fittings with factory assembled stainless steel press sleeves incorporating 3 view holes and tool locator ring. These fittings are for use with cross-linked polyethylene (PEX) tubing in nominal sizes $\frac{3}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 that meet the requirements for Specification **F876** or **F3253** and for use with polyethylene of raised temperature (PE-RT) tubing in nominal sizes $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 that meet the requirements of Specification **F2769**. These fittings are intended for use in 100 psi (689.5 kPa) hot and cold water distribution systems operating at temperatures up to, and including, 180 °F (82 °C). The requirements for materials, workmanship, dimensions, and markings to be used on the fittings and sleeves are also included.

1.1.1 When used with PEX tubing in accordance with Specification **F876**, the fittings covered by this specification are intended for use in, but not limited to, residential and commercial, hot- and cold-potable water distribution systems, water service lines, building supply lines, reclaimed water, fire protection, radiant heating and cooling systems, hydronic distribution systems, snow and ice melting systems, geothermal ground loops, district heating, turf conditioning, compressed air distribution and building services pipe.

1.1.2 When used with PEX tubing in accordance with Specification **F3253**, the fittings covered by this specification are intended for use in residential and commercial hydronic heating and cooling systems.

1.1.3 When used with PE-RT tubing in accordance with Specification **F2769**, the fittings covered by this specification are intended for use in residential and commercial, hot- and cold-potable water distribution systems, and building supply lines.

1.2 *Units*—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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- A269/A269M** Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
- B124/B124M** Specification for Copper and Copper Alloy Forging Rod, Bar, and Shapes
- B16/B16M** Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines
- B283/B283M** Specification for Copper and Copper-Alloy Die Forgings (Hot-Pressed)
- B371/B371M** Specification for Copper-Zinc-Silicon Alloy Rod
- B584** Specification for Copper Alloy Sand Castings for General Applications
- D1600** Terminology for Abbreviated Terms Relating to Plastics
- D2122** Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

¹ This test method 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 Feb. 1, 2023. Published February 2023. Originally approved in 2018. Last previous edition approved in 2022 as F3347–22. DOI: 10.1520/F3347–23

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.

*A Summary of Changes section appears at the end of this standard

E92 Test Methods for Vickers Hardness and Knoop Hardness of Metallic Materials

F412 Terminology Relating to Plastic Piping Systems

F876 Specification for Crosslinked Polyethylene (PEX) Tubing

F877 Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems

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

2.2 *ASME Standards*:³

B1.20.1 Pipe Threads General Purpose (Inch)

B16.18 Cast Copper Alloy Solder Joint Pressure Fittings

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

2.3 *Manufacturer's Standardization Society Standard*:⁴

MSS SP-104 Wrought Copper Solder Joint Pressure Fittings

2.4 *NSF/ANSI Standards*:⁵

Standard 14 Plastic Piping Components and Related Materials

Standard 61 Drinking Water System Components-Health Effects

Standard 372 Drinking Water System Components-Lead Content

2.5 *EN Standard*:⁶

EN 1982 Copper and Copper Alloys, Ingots and Castings

3. Terminology

3.1 Unless otherwise specified, definitions, abbreviations and initialisms are in accordance with Terminology **F412** and Terminology **D1600**.

3.2 *Definitions*:

3.2.1 *metal press insert fitting, n*—A type of piping component that is pushed into the open end of the plastic tubing and attaches by mechanically pressing and deforming an outer stainless steel sleeve over the outside diameter of the plastic tubing. The seal is realized between the outer diameter of the insert fitting and the inner diameter of the plastic tubing. Mechanical pressing is achieved by the use of a press tool.

3.2.2 *press sleeve, n*—Cylindrical shaped stainless steel ring which is compressed with a pressing tool while located over the PEX tubing securing it permanently to the underlying insert fitting.

3.2.3 *press tool, n*—A device by which the stainless sleeve is compressed by a forming die that is radially closed down on the press sleeve by either hand powered or electro-mechanical pressing action.

³ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁴ Available from Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), 127 Park St., NE, Vienna, VA 22180-4602, <http://www.mss-hq.org>.

⁵ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48105, <http://www.nsf.org>.

⁶ Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, <http://www.cen.eu>.

4. Classification

4.1 This specification covers one class of fittings and stainless steel press sleeve suitable for use with PEX tubing that meet either the requirements of Specification **F876** or **F3253**, or with PE-RT tubing that meets the requirements of Specification **F2769**.

5. Materials and Manufacture

5.1 *Fittings*—The fittings shall be made from one of the following metals:

5.1.1 *Cast Copper Alloys*—Cast copper alloy fittings shall be made from material meeting the requirements of Specification **B584**, copper alloy UNS Nos. C87710 or C87850 or Standard EN 1982, copper alloy EN Symbol CuSn4Zn6Pb3–C.

5.1.2 *Machined Copper Alloy*—Machined Copper Alloy fittings shall be made from material meeting the requirements one of the following:

Specification	Aloy Designation
B16/B16M	UNS C36000
B124/B124M	UNS C65680, C87700
B371/B371M	UNS C69300, UNS 69850

5.1.3 *Forged Copper Alloy*—Forged Copper Alloy fittings shall be made from material meeting the requirements of Specification **B283/B283M**, Copper Alloy UNS Nos. C37700, C65680, C69300, C69850, or C87700.

5.2 *Press Sleeves*—Press sleeves shall be made from Specification **A269/A269M** UNS S30400 or S31600 and have an allowable hardness of 130 ± 20 HV5 according to Test Method **E92**.

5.3 *Potable Water Requirements*—Products intended for the transport of potable water shall be evaluated, tested and certified for conformance with NSF/ANSI Standard 61 or the health effects portion of NSF/ANSI Standard 14 by an acceptable certifying organization when required by the regulatory authority having jurisdiction.

5.3.1 NSF/ANSI Standard 372, limiting lead content of a water contacting component to ≤ 0.25 %, is a mandatory requirement within the current version of NSF/ANSI Standard 61.

NOTE 1—Not all alloys listed in **5.1** are NSF/ANSI 61 or NSF 372 compliant.

5.3.2 *Corrosion Resistance*—Fittings intended for potable water applications shall comply with dezincification resistance and stress corrosion cracking resistance requirements of NSF/ANSI Standard 14.

6. Requirements

6.1 *General*—All performance tests shall be performed on assemblies of fittings, press sleeves, and PEX or PE-RT tubing. Fittings and press sleeves shall meet the material and dimensional requirements of this specification. PEX tubing shall meet the requirements of Specification **F876** or **F3253** and PE-RT tubing shall meet the requirements of Specification **F2769**. Use separate sets of assemblies for each performance test requirement.

6.1.1 Fittings manufactured according to this specification for use with PEX tubing shall comply with Specification **F877**