

# INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

## IAPMO GUIDE CRITERIA FOR

### COMPRESSION FITTINGS

### FOR PEX-AL-PEX TUBING

#### IAPMO IGC 176-2002 (R2014)

## 1. PURPOSE

- 1.1** The purpose of this standard is to establish a generally acceptable standard for fittings and connectors used with Crosslinked Polyethylene-Aluminum-Crosslinked polyethylene (PEX-AL-PEX) composite pipe systems. These pipe systems are used for water distribution, water service and hydronic heating applications. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers inspectors and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of fittings complying with this standard.
- 1.2** The provisions of this standard are not intended to prevent the use of any alternate material or method of construction, provided any such alternate meets the intent and requirements of this standard.

## 2. SCOPE

- 2.1** This standard covers general requirements, testing requirements, and markings and identification for fittings used in conjunction with Crosslinked polyethylene-Aluminum-Crosslinked polyethylene (PEX-AL-PEX) pressure pipe manufactured in accordance with ASTM F1281.

## 3. REFERENCED STANDARDS

- 3.1** The standards referenced herein shall be the current edition of the standards, as published in Table 14-1 of the Uniform Plumbing Code.

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| ASTM A 276  | Stainless Steel Bars and Shapes                                     |
| ASTM B 455  | Copper-Zinc Lead Alloy (Leaded-Brass) Extruded Shapes               |
| ASTM D 1598 | Time-to-Failure of Plastic Pipe Under Constant Internal Pressure    |
| ASTM D 1599 | Resistance to Short-Time Hydraulic Failure Pressure of Plastic Pipe |
| ASTM D 2240 | Rubber Property-Durometer Hardness                                  |

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#### 4. GENERAL REQUIREMENTS

- 4.1** Fittings used in conjunction with pipe described in Section 2.1 shall be compression type fittings. The side of the connector body that engages the pipe incorporates a series of barbed projections and "O Ring" gaskets that are inserted into the bore end of the pipe. Fittings may be furnished with male NPT threaded ends, female NPT threaded ends or female copper sweat adapter ends. Fitting types may also include couplings, tees, elbows and adapters designed for use with pipe manufactured in accordance with ASTM F 1281.
- 4.2** Fittings shall be secured to pipe by a separate steel press sleeve. Assembly details are described in detail in section 8.2 of this standard.
- 4.3** Metal components of press-type fittings shall be made from the following materials.
- a) *Forged Brass Fittings*- Forged Brass fittings shall be made from material meeting the requirements of ASTM Specification B 455, copper alloys UNS C38000 and C38500.
  - b) *Steel Press Sleeves*- Press sleeves shall be made from stainless steel material meeting the performance requirements of ASTM Specification A 276 stainless steel alloys UNS S30400 or S31600.
- 4.4** O-Rings are used on mechanical fittings to make a static seal and shall be manufactured from ethylene propylene rubber (EPDM), with a Shore A durometer value of 60-70 when tested in accordance with ASTM Standard D 2240.

#### 5. DIMENSIONS AND TOLERANCES

- 5.1** The fittings manufactured in accordance with the dimensional and performance requirements referenced in this specification are expressly manufactured to be compatible with tubing manufactured in accordance with ASTM F 1281.
- 5.2** Dimensions of steel press sleeves shall be in accordance with Table A. These tolerances are required to ensure an adequate seal of the pipe and fitting connection.
- 5.3** Dimensions of brass insert fittings shall be in accordance with Table B.

#### 6. WORKMANSHIP AND FINISH

- 6.1** Fittings shall be free of cracks, holes, blisters, voids, foreign inclusions, or other defects that are visible to the naked eye and may affect wall integrity as controlled by the material requirements listed in section 4 of this specification.
- 6.2** The cast connectors have unmachined surfaces on the exterior of the fitting bodies. The threads, barbed section and external bore dimensions are machined to standard dimensions and tolerances with a commercially accepted finish.