

ICC-ES Evaluation Report**ESR-1402***Effective Date: August 1, 2011**This report is subject to re-examination one year.*www.icc-es.org | (800) 423-6587 | (562) 699-0543 | A Subsidiary of the International Code Council®**DIVISION: 23 00 00 – Heating Ventilating and Air-Conditioning (HVAC)**
Section: 23 21 13 – Hydronic Piping**REPORT HOLDER:****UPONOR, INC.**
5925 148TH STREET WEST
APPLE VALLEY, MN 55124
www.uponor.com**EVALUATION SUBJECT:****UNIPIPE® PEX-AL-PEX****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2012, 2009 and 2006 *International Mechanical Code*® (IMC)
- 2012, 2009 and 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Temperature and pressure ratings
- Physical properties

2.0 USES

Unipipe® is Hydronic piping used in radiant heating or cooling systems where water is the transfer fluid under Chapter 12 of the IMC and Chapter 21 of the IRC.

3.0 DESCRIPTION**3.1 Pipe:**

Unipipe® is a co-extruded, cross-linked, polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) piping with adhesively bonded layers complying with ASTM F 1281. The aluminum layer retards oxygen diffusion. Unipipe® is available in 3/8- through 1-inch-diameter (9.5 through 25.4 mm) coils or 5-meter straight lengths, with three types of fittings. The pressure rating is in excess of 100 psi @ 180°F (690 kPa @ 82°C).

3.2 Fittings:

Uponor supplies two types of proprietary fittings for use with Unipipe®. Multi-Press (MP) fittings utilize a single or double O-ring seal and are joined to the pipe by use of a proprietary installation tool which presses the outer metal sleeve over the piping onto the fitting's inner serrated layer. Screwed

fittings use the tightening torque to make the fitting compress over the piping. The screwed portion of the fitting can then be removed. Fittings are illustrated in Figure 1.

4.0 INSTALLATION**4.1 General:**

Radiant piping shall be installed in accordance with this report, the manufacturer's published installation instructions and Chapter 12 of the IMC or Chapter 21 of the IRC, as applicable; and the installation is subject to approval by the code official. All circuits shall be formed from continuous lengths of piping, from manifold supply to the return or fixture. No splices are allowed. The system shall be installed either in concrete or cementitious underlayment, or underneath the floor or behind the ceiling or wall structure. When the system is embedded in concrete, tubing shall be covered by a minimum of 3/4 inch (19.1 mm) of concrete and installation shall comply with Chapter 19 of the IBC or Chap 3 of the IRC, as applicable. Horizontally laid pipe shall be secured in a manner so that temperature-induced expansion and contraction are accommodated. Minimum bending radius is five times the outside tube diameter of the pipe.

4.2 Fittings:

Only Uponor's proprietary fittings shall be used in the Uponor system. Fittings shall be attached to piping in strict accordance with the Uponor installation instructions, which are provided with the product. Press fittings shall be made with the proprietary tool, and screw fittings shall be installed with the specified torque to produce a tight fit and engage the fitting's clamping device.

4.3 Inspection:

They system shall be pressure-tested for leaks before installation of covering, as noted in Chapter 12 of the IMC or Chapter 21 of the IRC (as applicable). The leak test shall be witnessed by the code official or the code official's designated representative. During placement of the cover over the piping, the pipe shall be maintained at the specified operating pressure.

5.0 CONDITIONS OF USE

The Uponor Unipipe® piping and fitting systems described in this report comply with, or are suitable alternatives to what is specified in , those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Pipe and fitting systems shall be manufactured, identified and installed in accordance with this report, the applicable code and the manufacturer's published installation instructions. Manufacturer's published installation instructions shall be furnished to the code

official. The instructions within this report shall govern if there are any conflicts between the manufacturer's instructions and this report.

- 5.2 When installation is in fire-resistance-rated assemblies, evidence of compliance with Chapter 7 (penetration) of the IBC shall be provided to the code official for approval.
- 5.3 Details on the design and installation of the system shall be submitted to the code official for approval. The maximum pressure and temperature shall not exceed the pipe rating.
- 5.4 The piping shall be maintained at the specified operating pressure during placement of concrete cover for Hydronic piping systems.
- 5.5 Each installation shall be pressure-tested for leaks in the presence of the code official or the code official's designated representative.
- 5.6 Clearances from heat-producing equipment shall be in accordance with Chapter 5 of the International Fuel Gas Code®.
- 5.7 The use of the tubing in hydronic systems shall be limited to applications using water as the transfer fluid.

- 5.8 The pipe and fitting systems shall not be used as a source to electrical ground.
- 5.9 Unipipe® piping and fitting systems shall not be used for potable water applications.
- 5.10 The Unipipe® system of piping and fittings is manufactured at the Uponor manufacturing facility under a quality control program with inspections by NSF International (AA-633).

6.0 IDENTIFICATION

6.1 Pipe:

The Unipipe® piping covered by this report shall be labeled every 3 feet (914 mm) with the manufacturer's name and/or trademark (Uponor, Inc.), product name (Unipipe®) nominal tubing size, material designation (PEX-AL-PEX), temperature and pressure ratings, ASTM F 1281 designation, name of the inspection agency (NSF International) and the evaluation report number (ESR-1402).

6.2 Fittings:

The packages containing Multi-Press (MP) fittings, Press Fittings and Screwed Fittings covered by this report shall be labeled with the Uponor name and the nominal pipe size.

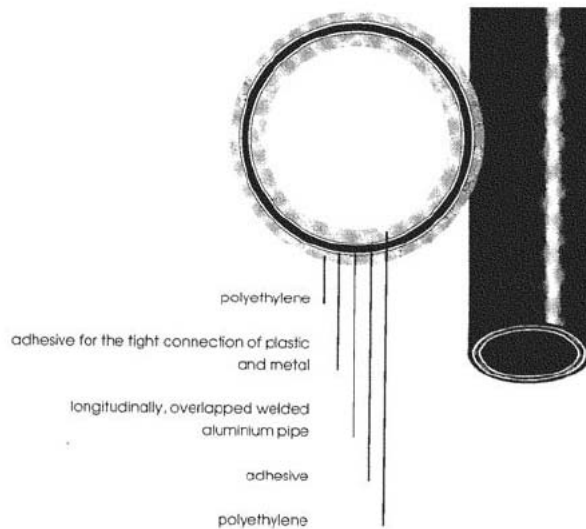


FIGURE 1—SYSTEM COMPONENTS