Radiant Systems Pressure Testing

Because radiant tubing is installed in areas such as slabs, walls or ceilings (making it hard to access the tubing after the project is complete), it is important to properly pressure test the system to check for leaks when the tubing is easily accessible.

There are several options to pressure test a system, including air and water. However, air provides a much more rigorous test compared to water at the same pressure. Plus, pressure testing with water can provide challenges during winter months with below-freezing temperatures.

The following procedure is acceptable for testing with air, water or a mixture of both for Uponor crosslinked polyethylene (PEX-a) tubing and radiant system components.

Maximum Temperature/Pressure Ratings

The test pressure applied to the system must meet Uponor’s pressure testing requirements (or local codes if higher), but cannot be lower than the system operating pressure. In hydronic radiant systems, Uponor recommends a test pressure of 3 times the operating pressure, or at least 40 psi.

If testing with water, the test pressure and temperature cannot exceed the following tubing listings:
- 73.4°F (23°C) at 160 psi
- 180°F (82.2°C) at 100 psi
- 200°F (93.3°C) at 80 psi

Note: The pressure with air must not exceed 120 psi.

Note: When pressure testing tubing with water in a concrete slab, continuous testing pressures higher than 80 psi may cause issues if pressure is left on the tubing during the concrete curing process. If pressures higher than 80 psi are required by local code, and are maintained through the curing process, install a safety device, such as a pressure-relief valve (PRV) to protect the tubing and concrete slab. Failure to install a safety device can result in damage to the tubing due to over pressurization.

Importance of Conditioning PEX-a Pipe

Uponor recommends conditioning the system at 1.5 times the test pressure, or 60 psi. The following conditioning procedure is unique to PEX-a due to the high degree of crosslinking and associated thermal and elastic properties of the pipe.

When pressure is applied against the inner wall of PEX-a, the internal diameter (ID) of the pipe will slightly increase, causing the pressure to drop while the system equalizes. After a period of 30 minutes, the PEX-a piping will be sufficiently conditioned to start the pressure test.

Conditioning and Sustained Pressure Testing Procedure

1. Visually confirm all connections are properly made per Uponor’s installation guidelines.
2. Ensure that all components and equipment not rated for the test pressure are isolated from the test system.
3. Fill the system with the test media: air, water or a mixture of both.
4. Condition the system at 1.5 times the required test pressure for 30 minutes. Note: During the conditioning process, it will be necessary to add additional pressure once the pressure has dropped 5 psi.

Definitions

Operating pressure — The static pressure of the hydronic system (typically 12–15 psi)

Test pressure — The sustained pressure to test the system for leaks (set at 3X the operating pressure or at least 40 psi)

Conditioning pressure — The pressure required to acclimate the tubing (1.5X test pressure)