

INSTRUCTION SHEET

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.

5. After conditioning the system for 30 minutes, relieve excess pressure to achieve the desired test pressure.

Note: Uponor recommends a test pressure of 40 psi (unless local code dictates higher pressures).

6. Once the pressure has reduced to the appropriate test pressure, confirm a stabilization or slight rise in pressure (0 to 5 psi).
7. Visually check for leakage and monitor the pressure for the duration specified by local code. (A typical pressure test can range from 2 to 24 hours.)

8. If there is no reduction in pressure, the system is regarded as leak tight.

Note: Slight fluctuations of pressure are normal due to ambient temperature changes and curing temperatures in concrete. Once the concrete has been poured and has started to set without a significant pressure drop (15% of test pressure), the pressure can be removed from the radiant loops.

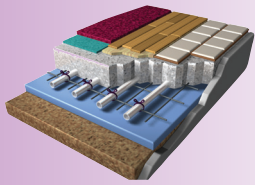
Important! If using water to pressure test the system, purge all water from the system prior to the ambient air temperatures falling to 32°F (0°C). Failing to remove the water from the system can result in damage to the piping and associated equipment.

Definitions

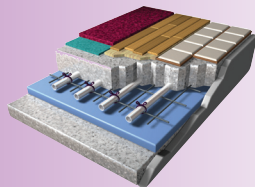
Operating pressure — The static pressure of the hydronic system (typically 12-15 psi)

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

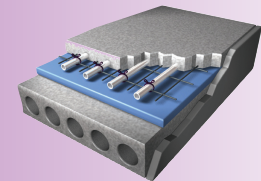
Conditioning pressure — The pressure required to acclimate the tubing (1.5X test pressure)



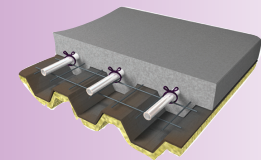
Slab On or Below Grade with Under-slab and Edge Insulation



Cap Pour Over Existing Slab with Under-slab Insulation



Cap Pour Over Precast Plank



Poured-in-place Slab Over Steel Decking

Pressure Testing Graph

