



PEX PLUMBING SYSTEMS

**DOMESTIC
WATER RISERS**

INSTRUCTION SHEET

Uponor AquaPEX® for Domestic Water Risers

Uponor AquaPEX® piping is an ideal material for use in domestic water applications, including risers. With temperature and pressure ratings based on an extrapolated life of 50 years, engineers and designers can feel confident specifying Uponor PEX pipe for their domestic water riser applications.

Hydrostatic Temperature and Pressure Ratings

Temperature and pressure ratings for PEX piping are determined by the Plastics Pipe Institute (PPI) as required by the ASTM F876 standard. The minimum burst pressure per F876 is 480 psi at 73°F (33 bar at 22.7°C) for ½" PEX and 475 psi at 73°F (32.75 bar at 22.7°C) for ¾" and larger PEX.

Note: Uponor PEX-a pipe can withstand burst pressures up to 800 psi at 73°F (55.1 bar at 22.7°C) without failure, so designers can feel comfortable designing Uponor PEX-a pipe up to its maximum temperature and pressure limits.

To start the evaluation, pipes of all sizes are empirically tested to ASTM D2837 to determine the hydrostatic design basis (HDB); this test method is used for all polyethylene-based piping. That data is then multiplied by a 0.5 design factor to determine the hydrostatic design stress (HDS). The HDS is then run through an ISO equation (ISO R-161-1690) to determine the temperature and pressure limits of the pipe.

Through scientific research and historical experience, hydrostatic design basis (HDB) ratings have been shown to be useful indicators of relative long-term strength of thermoplastic materials when tested under the conditions specified in test method ASTM D2837. The HDB is used to determine the temperature and pressure ratings of a specific material. These temperature and pressure ratings are based on an extrapolated life of 50 years.

Uponor AquaPEX Pipe Limitations

Using **Table 1**, engineers and designers can confidently specify Uponor AquaPEX pipe for domestic cold-water risers with pressures up to 160 psi (11 bar) with water temperatures up to 73.4°F (23°C).

In domestic hot-water applications, Uponor AquaPEX is rated for pressures up to 111 psi (7.7 bar) at 160°F (71.1°C).

Note: For risers that are part of a continuous hot-water recirculation system, the maximum water temperature allowed is 140°F (60°C) with a resulting maximum pressure of 123 psi (8.5 bar).

Excessive Temperature and Pressure Capability

In accordance with ASTM F876 *Standard Specification for Crosslinked Polyethylene (PEX) Piping*, the excessive temperature

and pressure capability of Uponor AquaPEX is 210°F at 150 psi (99°C at 10 bar).

This standard requires that Uponor AquaPEX piping maintain its integrity for a period of 720 hours (30 days) at 210°F (99°C) at 150 psi (10 bar). If installed as directed, Uponor AquaPEX will withstand these conditions.

Note: Excessive temperature and pressure requirements are always subject to approval by local building codes (e.g., T&P relief valves).

Temperature and Pressure Ratings	
°F/°C	PSI/Bar
200.0/93.3	80/5.5
190.0/87.8	90/6.2
180.0/82.2	100/6.9
170.0/76.7	106/7.3
160.0/71.1	111/7.7
150.0/65.6	117/8.0
140.0/60.0	123/8.5
130.0/54.4	128/8.8
120.0/48.9	134/9.2
110.0/43.3	139/9.6
100.0/37.8	145/10.0
90.0/32.2	151/10.4
80.0/26.7	156/10.8
73.4/23.0	160/11.0
60.0/15.6	168/11.6
50.0/10.0	173/11.9
40.0/4.4	179/12.3

Table 1: Interpolated Hydrostatic Temperature and Pressure Ratings for Uponor AquaPEX Piping

Supporting Uponor AquaPEX Risers

Domestic Cold Water

In domestic cold-water applications, copper tube size (CTS) riser clamps are used to support the piping at the base of each floor. In conjunction with the riser clamps at the base of each floor, a riser clamp shall be used at the top of every fourth floor, limiting expansion and contraction to 40 feet. A mid-story guide is also required on every floor to guide the piping and maintain alignment. Uponor recommends the use of iron pipe size (IPS) clamps for mid-story guides as to not restrain the piping.

Domestic Hot Water

In domestic hot-water applications, copper tube size (CTS) riser clamps are used to support the piping at the base of each floor. In conjunction with the riser clamps at the base of each floor, a riser clamp shall be used at the top of every other floor, limiting expansion and contraction to 20 feet. A mid-story guide is also required on every floor to guide the piping and maintain alignment. Uponor recommends the use of iron pipe size (IPS) clamps for mid-story guides as to not restrain the piping.

Refer to the Uponor Plumbing Design Assistance Manual (PDAM) for more information on domestic water riser applications.

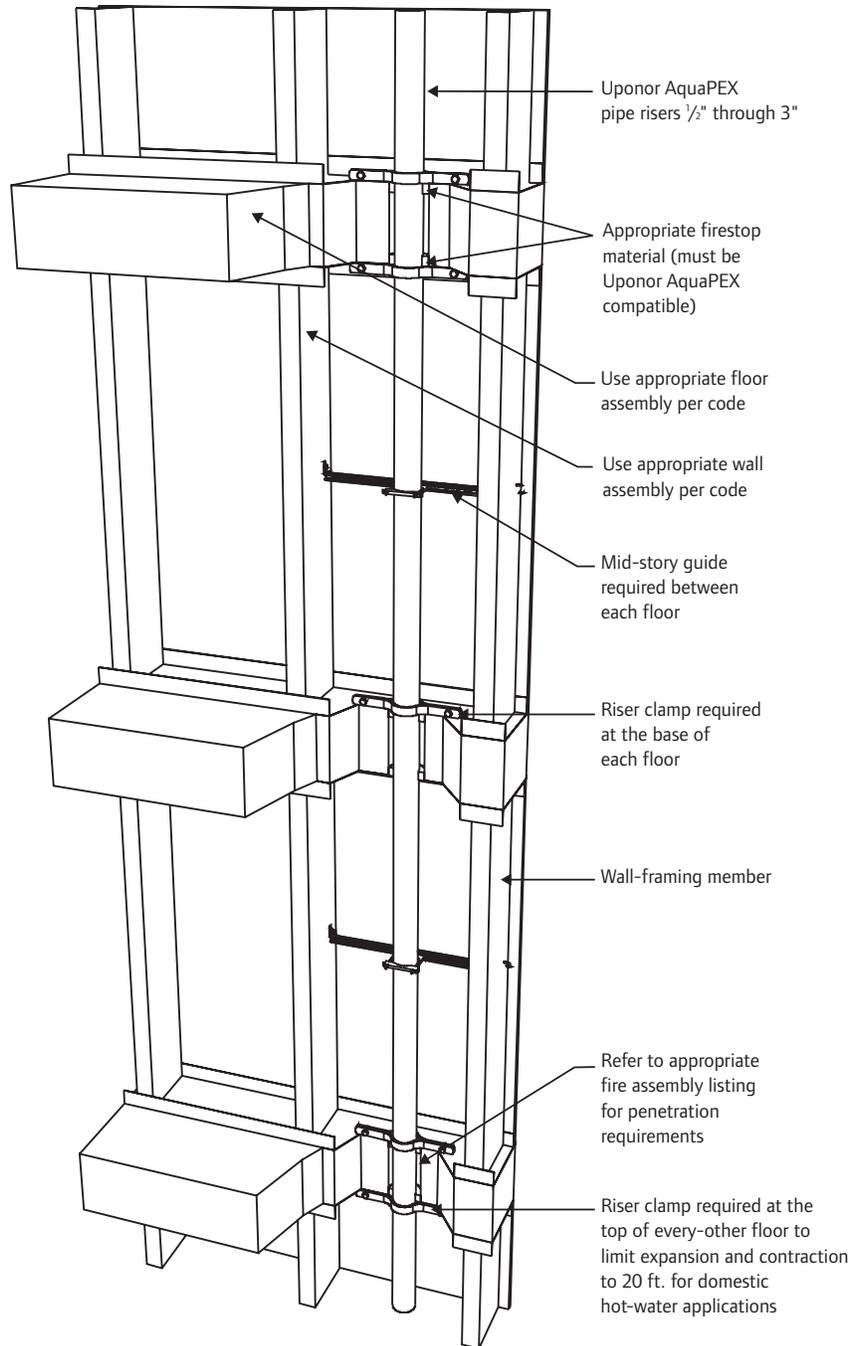


Figure 1: Hot-water Riser

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