



Uponor

RADIANT HEATING AND
COOLING SYSTEMS

2" WIRSBO hePEX™
EXPANSION JOINT KIT

PRODUCT GUIDE

2" Wirsbo hePEX™ Expansion Joint Kit — Save Install Time, Costs, Connections

Why is an Expansion Joint Necessary?

An expansion joint is necessary to accommodate the expansion and contraction of crosslinked polyethylene (PEX) tubing caused by temperature changes. An expansion joint is recommended for every 50 feet of tubing, or any run longer than 20 feet when using engineered plastic (EP) fittings inline.

The 2" Wirsbo hePEX™ Expansion Joint Kit offers contractors quick, effective installations for expansion joints in closed-loop, aboveground radiant heating and cooling distribution applications.

The kit includes one pre-formed loop of 2" Wirsbo hePEX tubing, two 2" brass elbows and four 2" ProPEX® Rings.

The Wirsbo hePEX tubing loop in the expansion joint kit has an oxygen diffusion barrier layer, and is therefore recommended for closed-loop radiant heating and cooling systems.

50% Labor, Cost and Time Savings

On-site construction of an expansion joint from scratch involves 13 individual components: four feet of tubing, four elbows and eight rings. The installer must cut three lengths of tubing and make eight connections to create an expansion joint.

The Wirsbo hePEX Expansion Joint Kit features one pre-formed loop of tubing, two brass elbows and four ProPEX Rings. The kit is 53% less expensive than purchasing the 13 individual components needed for on-site construction of an expansion joint.*

Additionally, because the loop is already pre-formed, it saves contractors half the installation time on the jobsite — eliminating the added steps of connecting the tubing to two additional elbows and four additional rings to create a loop. By using the Wirsbo hePEX Expansion Joint Kit, you are saving time and money on installs and providing more reliable performance from a pre-formed system package.

* See chart on page 2.

Features and Benefits

- Saves half the labor time of creating an expansion joint from scratch
- Saves 53% over purchasing individual components separately*
- Requires fewer joints, providing more reliable performance
- Features durability of PEX-a tubing which won't pit, scale or corrode
- Incorporates exclusive ProPEX fitting system for fast, reliable connections
- Requires one tool to make a connection, without the need for torches, glues, solvents or gauges
- Tubing backed by a 30-year warranty when installed by an Uponor-trained contractor

* See chart on page 2.

Material Cost Comparison Chart

Individual Components	Site-built Cost	Wirsbo hePEX Expansion Joint Kit
4 ft. of Wirsbo hePEX	\$36.67	-
Four Brass Elbows	\$572.40	-
Eight ProPEX Rings	\$17.20	-
Total	\$626.27	\$329.00

Cost Savings
53%

Note: Price reflects Uponor 2009 U.S. Catalog List Price. Prices are subject to change.

Uponor PEX vs. The Competition

Currently, Uponor is the only manufacturer offering an expansion joint kit. However, an expansion joint can be created on-site using copper pipe for aboveground radiant distribution systems.

The benefits of PEX-a tubing over copper pipe are extensive:

- PEX-a tubing is flexible, reducing the number of fittings by up to 40% over rigid copper pipe.
- PEX tubing is highly durable; it does not pit, scale or corrode like copper.
- PEX tubing does not have the extreme cost fluctuations of copper.
- Uponor ProPEX fittings use one simple tool — offered in manual, pneumatic, corded or battery-operated — without the need for torches or gauges.
- ProPEX fittings cannot be dry fit.
- Wirsbo hePEX tubing is backed by a 30-year limited warranty when installed by an Uponor-trained contractor.

Wirsbo hePEX Expansion Joint Kit Product Offering

Part No.	Part Description
A1982000	2" Wirsbo hePEX Expansion Joint Kit



Codes and Standards

Hydrostatic Temperature and Pressure Ratings:

- 200°F at 80 psi (93.3°C at 5.51 bar)
- 180°F at 100 psi (82.2°C at 6.89 bar)
- 73.4°F at 160 psi (23°C at 11 bar)

Manufacturing Standards:

- ASTM F876
- ASTM F877
- ASTM F1960
- ASTM E84
- CSA B137.5
- ASTM E119/UL 263
- CAN/ULC S102.2

Product Listings:

- NSF-rfh
- ITS
- ICC
- UL
- PPI

Applicable Codes:

- IPC
- UPC
- NSPC
- IRC
- NPC of Canada

Fire-rated Assemblies:

- K913 — Two-hour concrete floor/ceiling assembly
- L557 — One-hour wood frame floor/ceiling assembly
- U372 — One-hour wood frame wall assembly
- V444 — One-hour steel stud wall assembly

Warnock Hersey Plenum Rating:

25 flame spread/50 smoke developed (plenum rated) to ASTM E84 and CAN/ULC - S102.2 when insulated with ½" fiberglass insulation

Expansion Joint Calculations and Instructions

Expansion Compensating Devices

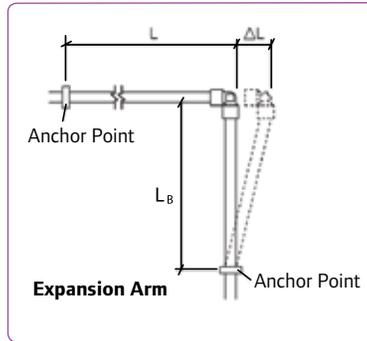
- Install expansion joints every 50 feet of straight-length tubing in horizontal runs. Always install the joint at the midpoint of two fixed points. When using EP fittings inline, an expansion joint is required at the midpoint for any run longer than 20 feet.
- Always install the joint at the midpoint of two fixed points.
- An expansion joint may not be required for installations where the tubing does not penetrate a fire-rated assembly (which constrains movement of the tubing), or where there are no restraining devices.

Example:

The tubing runs the length of a hallway, without inline tees, and turns a corner at the end. In this case, the tubing is not fixed; it can expand without restriction. Use the expansion arm formula to calculate the minimum distance to the next fixed point. In this same application using inline tees, it may be necessary to install an expansion joint to minimize the movement of the tees.

Expansion Arm

Ensure the flexible arm is long enough to prevent damage. Place support clamps far enough from the wall to allow for longitudinal thermal expansion.



Use the following formula to calculate the minimum length of the expansion arm: $L_B = C \times \sqrt{(D \times \Delta L)}$

“L” is the total distance of tubing run from a fixed point to a corner, or in the case of an expansion joint, from a fixed point to another fixed point.

The thermal expansion rate of PEX tubing is 1.1 inches per 100 feet per 10°F (12.2°C) temperature rise. The following is an example of an expansion arm calculation using 2" Wirsbo hePEX tubing.

Parameters

Tubing type	2" Wirsbo hePEX
Tubing OD	2.125"
Tubing length	50 feet
Supply fluid temperature	160°F (71.1°C)
Ambient temperature	60°F (15.6°C)

Calculation

$$L_B = C \times \sqrt{(D \times \Delta L)}$$

$$L_B = 12 \times \sqrt{2.125 \times [(1.1 \times 10) \div (100 \div 50)]}$$

$$L_B = 12 \times \sqrt{2.125 \times 5.5}$$

$$L_B = 12 \times \sqrt{11.6875}$$

$$L_B = 12 \times 3.419$$

$$L_B = 41.03 \text{ inches}$$

The required arm length is 41" to prevent excessive stress on the fittings and support clamps.

Key

L_B = the length of the flexible arm in inches

C = the material constant (PEX is 12)

$\sqrt{\quad}$ = square root

D = the outside diameter of the tubing

ΔL = the thermal expansion length in inches

Expansion Joint

The same equation applies for an expansion joint. However, the arm length (L_B) must be divided into three sections (L_1 and L_2 , see diagram at far right) using the following formulas. For demonstration purposes, use the L_B value from the previous example.

$$L_1 = L_B \div 5$$

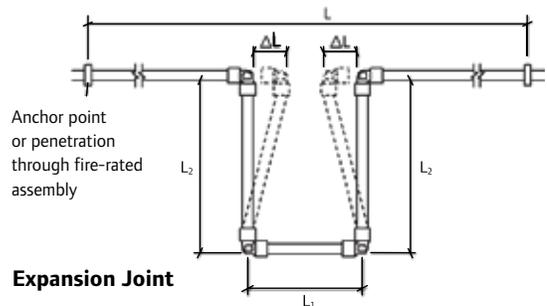
$$L_1 = 41 \div 5$$

$$L_1 = 8.2 \text{ inches}$$

$$L_2 = L_1 \times 2$$

$$L_2 = 8.2 \times 2$$

$$L_2 = 16.4 \text{ inches}$$



Expansion Joint

Wirsbo hePEX Expansion Joint Kit FAQs

Why is an expansion joint necessary?

An expansion joint is necessary to accommodate the expansion and contraction of crosslinked polyethylene (PEX) tubing caused by temperature changes. A joint is recommended for every 50 feet of tubing.

Why did Uponor develop the 2" Wirsbo hePEX Expansion Joint Kit?

The kit eliminates the labor required to build a loop from scratch on the job site. It takes fewer joints, so it costs less and also provides more reliable performance.

What does the kit contain?

The unassembled kit includes one pre-formed 2" expansion loop, two 2" brass elbows and four 2" ProPEX Rings. On-site construction from scratch involves 13 individual components: four feet of tubing, four elbows and eight rings.

How much does the kit cost compared with onsite construction materials?

The kit is 53% less expensive than purchasing the 13 individual components needed for on-site construction of an expansion joint.

Does another manufacturer offer expansion joint kits for PEX tubing?

Uponor also offers a 2" Uponor AquaPEX® Expansion Joint Kit (F8052000; \$326.00 U.S. catalog list price). However, currently no other manufacturer offers this labor-saving solution for PEX tubing.

Is this kit applicable to radiant floor heating and cooling systems?

The 2" Wirsbo hePEX Expansion Joint Kit is designed for use in closed-loop radiant heating and cooling systems. The Wirsbo hePEX tubing loop in the expansion joint kit has an oxygen diffusion barrier layer, and is therefore recommended for closed-loop radiant heating and cooling systems.

Is 2" Wirsbo hePEX tubing approved for high-rise residential construction?

Yes. The building code outlines requirements for fire-rated assemblies. Uponor 2" Wirsbo hePEX tubing is tested in accordance with ASTM E119 Standard and ASTM E84 Standard, which meet or exceed the code requirements for fire-resistive ratings up to and including 2" Wirsbo hePEX tubing.

Can 2" Wirsbo hePEX tubing be used in a return air plenum?

A return air plenum requires combustible materials within the plenum as listed to ASTM E84 FS/SD 25/50. Uponor's 2" Wirsbo hePEX tubing meets these requirements if covered with ½" fiberglass insulation wrap.

Are these listings readily available?

Yes. These listings are readily available by Uponor upon request. You can also view the listings on the Warnock Hersey website at www.intertek-etlsemko.com.

Does 2" Wirsbo hePEX tubing separate from connections over time?

Actually, it's quite the opposite. Providing the ProPEX fitting is installed properly, the connection will actually become stronger over time. A ProPEX fitting works with the shape memory of PEX-a tubing, which means as the tubing and ProPEX Ring return back to their original shape, they form a strong, durable connection with the fitting. In fact, factory pull tests prove the fitting will hold at up to 1,000 pounds of force.

Is it true that 2" Wirsbo hePEX tubing is dimensionally smaller than copper pipe?

Yes. Both copper pipe and PEX tubing's outside diameters are controlled to the same dimensions, and because PEX has a thicker wall, the inside diameter of the PEX tubing is smaller. However, PEX tubing is capable of handling higher velocities because it is not subject to erosion like copper pipe, thus providing similar flow rates.

Can you use 2" Wirsbo hePEX tubing as vertical risers in heating applications?

Yes, 2" Wirsbo hePEX tubing is used in riser applications. However, the combination of internal water pressure and water-column height cannot exceed the maximum pressure ratings for a given temperature.

Are there specific requirements for supporting 2" Wirsbo hePEX tubing?

Yes, 2" Wirsbo hePEX tubing requires support every 32" on horizontal runs, and at each floor and mid-story guide on vertical risers.

For more information, visit our websites listed below.

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