Hydronic Piping with Uponor Wirsbo hePEX™

The superior specified solution

With more than 40 years of proven performance, Uponor Wirsbo hePEX™ is the superior choice for hydronic piping applications. More than 15 billion feet of Uponor crosslinked polyethylene (PEX) is in service worldwide, making it the professional’s product for durable, long-lasting performance.

Using Wirsbo hePEX for chilled water and heating hot water distribution is a very durable, cost-effective solution for transporting water to terminal units such as chilled beams and fan coil units. Uponor even offers a PEX-a Pipe Support steel channel for suspended piping applications that enables hanger spacing similar to that of copper. And Uponor’s suspended piping assembly with Wirsbo hePEX pipe, PEX-a Pipe Support, ProPEX® connections with engineered polymer (EP) fittings (up to 3”) and/or WIPEX™ fittings is listed to ASTM E84 for use in plenum applications.

• Economical alternative to metal pipe
• Won’t pit, scale or corrode
• ProPEX expansion fittings offer faster installs
• ProPEX fittings available in sizes up to 3”
• WIPEX™ fittings available in sizes from 1” to 4”
• Wirsbo hePEX available in sizes up to 4”
• Backed by a 25-year warranty on Wirsbo hePEX pipe and ProPEX fittings*
• Proudly made in the U.S.A.

*For details, see uponorpro.com/warranties.
Wirsbo hePEX Pipe and ProPEX fittings
The core of Uponor Hydronic Piping Systems

Wirsbo hePEX oxygen-barrier pipe and ProPEX expansion fittings offer value, durability and performance to your hydronic piping projects. With more than 40 years of service in installations around the world, Uponor products and systems are the proven solution that professionals require to meet the demands of the commercial building industry.

This guide is designed for architects, building officials, building owners, engineers and mechanical contractors interested in Uponor Hydronic Piping Systems. It describes general installation recommendations that use Wirsbo hePEX pipe and ProPEX fitting products. Uponor is not liable for installation practices that deviate from this guide or are not acceptable practices within the mechanical trades, codes or standards of practice. Always refer to local codes for additional requirements. For further assistance, contact Uponor Technical Services at 888.594.7726 (U.S.) or 888.994.7726 (Canada) or e-mail technical.services@uponor.com.

Codes
ICC, IPC, IRC, IMC, UPC, UMC, NSPC, HUD, UFGS, NPC of Canada, NBC of Canada

Listings
AWWA, BMEC, CCMC, cNSFus-fs, cNSFus-pw, cNSFus-rfh, cQAlus, CSA, ETL, IAPMO, ICC-ES, Intertek, ITS, PPI TR-4, UL, ULC, WH

Standards
ASTM, NSF, AWWA, UL, ULC, ICC, IAPMO, NAHB, PHCC, PPI, HUD, NBC, NPC and CSA

- ASTM F876 for PEX tubing
- ASTM F877 for PEX hot and cold water distribution systems
- CSA B137.5 for PEX piping systems
- ASTM F1960 for cold expansion fittings for use with PEX tubing
- ASTM F2657 for UV resistance of PEX material
- ASTM E84 for plenum applications up to 3" (U.S.); CAN/ULC S102.2 (Canada)
  - Uponor PEX-a Pipe Support with Wirsbo hePEX pipe, ProPEX EP fittings and/or WIPEX™ fittings (up to 3")
- ASTM E814 for through-penetration fire stop up to 3" (U.S.); CAN/ULC S115 (Canada)
- ASTM E119/UL 263 for fire-resistive construction up to 3" (U.S.); CAN/ULC S101 (Canada)
- ANSI/NSF 14 and 61

Hydrostatic temperature and pressure ratings

Uponor maintains standard-grade ratings for Wirsbo hePEX pipe as tested in accordance with PPI TR-3. Uponor PEX products have the following continuous operating temperature and pressure ratings:

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

Excessive Short-term Temperature - Pressure Capacity:

- 210°F (98.9°C) at 150 psi tested up to 720 hours
- In accordance with Section 6.6 of ASTM F876, the minimum hydrostatic burst pressure for ½" pipe is 480 psi at 73.4°F (23°C). For ¾" pipe and larger, the minimum burst pressure is 475 psi at 73.4°F (23°C). Uponor’s quality lab performs daily burst pressure testing on all pipe sizes above and beyond the ASTM F876 standard. All samples are tested at 73.4°F (23°C) and burst at an elevated pressure of 800 psi (+/- 20 psi) — nearly twice the pressure requirement of ASTM F876.

- It can also be noted, through extensive testing at 200°F (93.3°C) Uponor PEX will burst at 240 psi which is 3x higher than the ASTM F876 requirements of 80 psi and 200°F (93.3°C).

Wirsbo hePEX has similar flow characteristics to other distribution pipes. Please reference our online Pipe Sizing Calculator at uponorpro.com/calculator.
Suspended piping installation detail

For suspended runs of piping, Wirsbo hePEX can be supported by the same conventional means as metallic pipe using copper tube size (CTS) pipe hangers or supports.

Uponor recommends using hangers and supports designed for use with plastic pipe. Uponor PEX-a Pipe Support or pipe support channel that continuously supports the pipe can be used to achieve nearly the same support spacing as copper pipe. And because PEX pipe expands at a rate of 1.1” per 100’ per 10ºF temperature rise, PEX-a Pipe Support also helps control pipe movement.

Suspended piping should be supported at intervals not to exceed 6’ for ½” and ¾” pipe; 8’ for 1” to 3½” pipe.

Maximum distance from clamp/hanger to end of PEX-a Pipe Support is 18”.

Overlapping PEX-a Pipe Support is permitted with the following guidelines:
- Minimum 6” overlap
- Minimum 300-lb., tensile-rated, stainless-steel straps (included with product)
- Hanger placed within 18” of the overlap end
Expansion and contraction

Best practice for controlling expansion forces is to continuously restrain the pipe with Uponor PEX-a Pipe Support.

- PEX with PEX-a Pipe Support and strut and strut clamps has a thermal expansion rate of 0.08"/10°F ΔT/100 ft. (2.03mm/5.56°C ΔT/30.48m).
- PEX with PEX-a Pipe Support and clevis hangers or loops has a thermal expansion rate of 0.12/10°F ΔT/100 ft. (3.05mm/5.56°C ΔT/30.48m).
- PEX has a free-body thermal expansion rate of 1.1"/10°F ΔT/100 ft. (27.94mm/5.56°C ΔT/30.48m).


Firestop solutions

All assemblies are tested in accordance with ASTM E814 (U.S.) and CAN/ULC S115 (Canada) for use with Uponor PEX pipe. See firestop manufacturer’s website for selection of appropriate fire assembly and product.

Commonly available firestop manufacturers:
- 3M™
- RectorSeal®
- Hilti®
- Holdrite®
- Passive Fire Protection Partners
- Specified Technology Inc.
- ProSet Systems®
- Holdrite®
- RectorSeal®

PEX-a Pipe Support

PEX-a Pipe Support is available in ¼", ⅜", ⅝", 1½", 1⅛", 2", 2½", 3" and 3½" sizes.
ProPEX EP tee

Riser clamp required at the top of each floor

Riser clamp required at the base of each floor

Refer to appropriate fire assembly listing for penetration requirements

Wirsbo hePEX™ hot and chilled water supply and return risers

Appropriate firestop material (must be Wirsbo hePEX compatible)

Riser clamp required at the top of each floor

ProPEX EP tee

Plastic bend support

Mid-story guide required between each floor

Wall-framing member

Use appropriate wall assembly per code

Riser clamp required at the base of each floor

Riser clamp required at the top of each floor

ProPEX transition fitting for valve assembly

ProPEX EP tee

Plastic bend support

Mid-story guide required between each floor

Fan Coil Unit (FCU)

Note: Other terminal units, such as heat pumps, radiators, VAV boxes and chilled beams can be supplied through similar means.
Ecoflex® Pre-insulated Piping for Hydronic Piping

Uponor Ecoflex® pre-insulated pipe features single or twin PEX or high-density polyethylene (HDPE) service pipes surrounded by multi-layer, PEX-foam insulation and covered by a corrugated, HDPE jacket. Designed for fluid transfer in a variety of hydronic heating and cooling applications, Ecoflex pre-insulated piping systems are easy to install, dependable, cost effective and energy saving. Recognized for its ability to stand up to harsh environments, Ecoflex is virtually maintenance-free and is an ideal solution for applications that require overhead or underground piping.

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<th>Product</th>
<th>Description</th>
<th>Codes and standards</th>
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| Ecoflex Thermal Single and Twin | ASTM Ecoflex Thermal Single and Twin are pre-insulated piping for buried or aboveground commercial and residential hydronic radiant heating and cooling applications. Service pipes are made from oxygen-diffusion barrier Wirsbo hePEX pipe, protected by multi-layer, PEX-foam insulation and covered by a corrugated, watertight, HDPE jacket. Use with ProPEX fittings (up to 3") or WIPEX DZR brass compression fittings. | Codes: IMC, UMC  
Manufacturing Standards: ASTM F876, F877 and F1960; CSA B137.5  
Product Listings: NSF-rfh, NSF-pw |
| Ecoflex Potable PEX Single and Twin | Ideal for hot and cold potable-water applications, ASTM Ecoflex Potable PEX Single and Twin feature Uponor AquaPEX service pipe protected by multi-layer, PEX-foam insulation and covered by a corrugated, watertight, HDPE jacket. Ecoflex Potable PEX uses ProPEX fittings (up to 3") or WIPEX lead-free (LF) brass compression fittings. | Codes: UPC, IPC, NSPC, NPC of Canada  
Manufacturing Standards: ASTM F876, ASTM F877, CSA B137.5  
Product Listings: NSF-pw, PEX 5106 |
| Ecoflex Potable HDPE          | Perfect for cold potable-water, cooling and low-temperature heating applications, ASTM Ecoflex Potable HDPE features HDPE service pipe protected by multi-layer, PEX-foam insulation and covered by a corrugated, watertight, HDPE jacket. Ecoflex Potable HDPE uses any industry-standard SDR 11 HDPE fitting method. | Codes: UPC, IPC, NSPC, NPC of Canada  
Manufacturing Standards: PE 3408, PE 3608 or PE 3454; AWWA C906; ASTM F714  
Product Listings: NSF-pw |
| Ecoflex Potable Plus          | Suitable for use as a water pipe or pressure-sewage system for resort villages, holiday homes, residential areas, industry ski centers and other locations susceptible to freezing. Ecoflex Potable Plus features Uponor AquaPEX or HDPE service pipe with a self-regulating heating cable, all protected by multi-layer, PEX-foam insulation and covered by a corrugated, watertight, HDPE jacket. | Codes: UPC, IPC, NSPC, NPC of Canada  
Uponor AquaPEX Manufacturing Standards: ASTM F876, ASTM F877, CSA B137.5  
HDPE Manufacturing Standards: PE 3408, PE 3608 or PE 3454; AWWA C906; ASTM F714  
Uponor AquaPEX Product Listings: NSF-pw, PEX 5106  
HDPE Product Listings: NSF-pw |

Main accessories

Rubber end caps

Made from EPDM rubber, these end caps are required on all exposed ends of Ecoflex pipes to avoid groundwater contamination. It is crucial to create a water-resistant seal on the ends of the piping. Without this seal, water can enter the pre-insulated pipe and dramatically reduce the effectiveness of the system performance.

ProPEX fittings

Available in both brass and engineered polymer (EP) up to 3”, ProPEX fittings include a full line of products designed to ensure a strong, reliable connection with Uponor PEX pipe.

WIPEX fittings

Adapter fittings are required for all PEX service pipe connections. Made with DZR or lead-free (LF) brass, the WIPEX fittings are specifically designed for connecting Uponor PEX pipe. Fittings are available in 1", 1¼", 1½", 2", 2½", 3", 3½” and 4” sizes.
Installation time comparison: Logistic International (Québec, Canada)

Ecoflex install: 224 hours (3½ days)

VS.

Suspended pipe install: 640 hours (10 days)

65% Time savings

Project highlights:
- LEED® Gold
- 5,000 feet of Ecoflex hydronic piping system
- Radiant application
- Humidity-controlled
- Geothermal

Installation Time Comparison:
- Original design used site-insulated, suspended-steel pipe
- Bid was submitted consisting of four, two-man crews

Piping layout (Ecoflex vs. Suspended piping)

Traditional Suspended Hydronic Perimeter Loop Distribution System Overlaid with an Underground Ecoflex Pre-insulated Distribution System
Uponor technical support

Uponor design and technical services
Our dedicated team of experienced design professionals and project managers have the proper training and hold the necessary credentials to ensure your plumbing, radiant heating/cooling and hydronic piping project is completed on budget and on time.

- Budget estimates
- Full heat-loss calculations
- Pipe sizing
- Hydraulic and pressure calculations
- Design calculations
- Complete materials lists (for Uponor products)
- Full-color computer-aided design (CAD) drawings
- Installation and technical support

Contact us at: U.S. - 888.594.7726 or design.services@uponor.com
Canada - 888.994.7726 or design.ca@uponor.com

Integrated product data software solutions
Get Uponor product data, in the right formats, in the right places, to quickly and accurately design and estimate your projects.

Supported CAD platforms
- AutoCAD®
- Trimble® PipeDesigner 3D®
- Pro/ENGINEER®
- Catia
- SolidWorks
- Solid Edge

BIM platforms
- Revit® MEP
- AutoCAD® MEP
- CADmep™
- Bentley®
- Building-Data.net/TSI

Uponorengineering.com – The Engineer's resource portal
The Uponor engineering resource center is your single destination for designing and specifying cost-effective, energy-efficient and high-performing building systems using PEX. This portal is custom-made to help you meet all your goals.

Whether it’s meeting specific LEED® or other green-building certification standards or incorporating value engineering into a project, Uponor can provide all the tools and resources, including specifications, submittals, CAD details, instructional manuals, design guidelines and even industry resource links to get you moving and on your way to a successful building design.

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