uponor

Piping systems installation guide

Piping systems installation guide
is published by

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This piping systems installation guide is published for mechanical contractors, installers and building officials interested in Uponor PEX piping systems. It describes general installation recommendations that use Uponor PEX piping products. Refer to local codes for additional requirements.

Uponor made reasonable efforts to collect, prepare and provide quality information and material in this installation guide. However, system enhancements may result in modification of features or specifications without notice.

Uponor is not liable for installation practices that deviate from this installation guide or are not acceptable practices within the mechanical trades, codes or standards of practice.

Prior to installing Uponor piping systems, Uponor recommends all installers attend Uponor piping systems installation training performed by an Uponor trainer or manufacturer's representative. To schedule a training session at your business or job site, contact your local Uponor representative or call 800.321.4739.

Direct any questions regarding the suitability of an application or a specific design to a local Uponor representative by calling 888.594.7726 (U.S.) or 888.994.7726 (Canada).

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Important safety information

To reduce the risk of injury, read and understand this piping systems installation guide before beginning work.

Read all product safety warnings and operator's manuals for the Milwaukee® Tool M12™, M18™ and FORCE LOGIC™ ProPEX expansion tools, ProPEX 201 corded expander tool, PEX pipe cutters and other installation tools to operate those tools safely and correctly.

Always wear safety goggles or safety glasses with side shields when performing work.

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Standards, codes and listings

Uponor PEX pipe and ProPEX fittings are designed to all applicable industry standards, codes and listings. Refer to our product submittals on uponorpro.com for complete details.

Making a ProPEX® connection

Important installation information

- Use only Milwaukee® ProPEX expander heads or Uponor standard expander heads on Milwaukee tools. Using incorrectly sized expansion heads may result in faulty connections which could result in leaking and property damage.
- Uponor standard expansion heads do not auto-rotate on Milwaukee ProPEX expansion tools. If using Uponor standard expansion heads, be sure to manually rotate the pipe or tool after each expansion to prevent deep grooves and faulty connections which could result in leaking and property damage.
- Ensure the Milwaukee expansion head is rotating during each expansion. This ensures no deep grooves on the inside of the pipe.
- Do not force the tool into the pipe.
- Improper lubrication (too much or too little) on the expansion cone and head may result in faulty connections which could result in leaking and property damage.

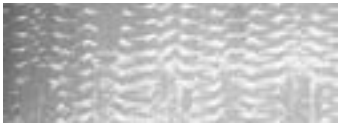


Figure 1: Expansion with proper rotation

Figure 2: Expansion without proper rotation

- Always remove the battery pack before changing or removing accessories, and only use accessories specifically recommended for the tool.
- Recharge only with the charger specified for the battery. For charging instructions, refer to the tool manual.

- To reduce risk of injury and damage, never immerse the tool, battery pack or charger in liquid or allow a liquid to flow inside the tool.
- Always unplug the charger and remove the battery pack from the charger or tool before performing any maintenance. Never disassemble the tool, battery pack or charger.
- Contact Milwaukee Tool at 800.SAWDUST (800.729.3878) for all service and repair work.

Figure 3: Milwaukee M12™ ProPEX expansion tool for ⅜" to 1" pipe

Figure 4: Milwaukee M18™ ProPEX expansion tool for ⅜" to 1½" pipe

ProPEX connections with Milwaukee tools

Refer to the following steps to make ½" to 3" ProPEX connections. Each expansion tool features slight differences in operation. Use the Milwaukee M12 ProPEX expansion tool for ½" to 1" connections; use the Milwaukee M18 ProPEX expansion tool for ½" to 1½" connections.

Figure 5: Square cut the pipe.

Figure 6: Place the ProPEX ring over the end of the pipe.

Figure 7: Expand the pipe and ring until it reaches the collar. Then complete a minimum of one more expansion.

Figure 8: Insert the ProPEX fitting fully to the pipe stop.

Making ⅜" ProPEX connections

When making a ⅜" ProPEX connection, expand the ring once on each side to properly fit over the piping. Refer to the following instructions to make a ⅜" ProPEX connection.

1. Square cut the PEX piping perpendicular to the length of the piping. Remove all excess material or burrs that might affect the fitting connection.
2. Expand each side of the ring once.
3. Slide the expanded ring over the end of the piping. Extend the end of the ring over the end of the piping no more than 1/16" (1mm).
4. After the ring is on the piping, continue with the regular steps for making a proper connection with your specific tool.

Uponor ProPEX 201 corded expander tool

Use the ProPEX 201 corded expander tool to make 2" ProPEX connections.

Figure 9: ProPEX 201 tool

Note: The ProPEX 201 corded expander tool head does not manually rotate like the Milwaukee tool heads. It is important to properly rotate the pipe or tool after each expansion to prevent deep grooves in the piping. Failure to do so could result in leaking and property damage.

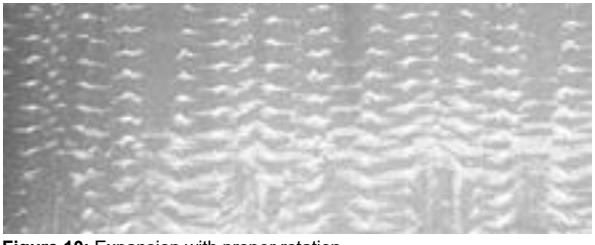


Figure 10: Expansion with proper rotation

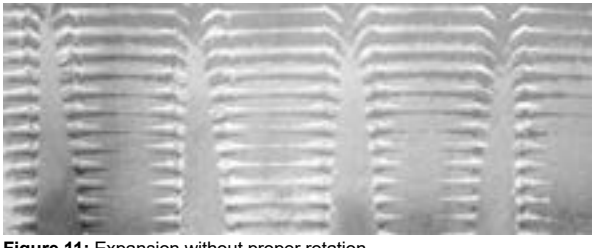


Figure 11: Expansion without proper rotation

Milwaukee M18 FORCE LOGIC™ ProPEX expansion tool

Use the Milwaukee M18 FORCE LOGIC tool for 2" to 3" pipe.

Figure 12: Milwaukee M18 FORCE LOGIC ProPEX expansion tool

Figure 13: When installing 2"- 3" heads, ensure the cogs are aligned and engaged with the tool.

Figure 14: Expander head collar should sit tight against the tool.

Figure 15: If not installed correctly, the expander head will “flower”.

Cutting large-diameter PEX pipe

CAUTION: Read and thoroughly understand all safety instructions in the pipe cutter operator's manuals before performing work.

CAUTION: Be sure to wear safety gloves and proper eye protection prior to cutting pipe. Failure to do so could result in personal injury.

Use a swing or ratchet-type cutter to create smooth, clean cuts.

Figure 16: Uponor swing-style pipe cutter for up to 4" pipe (E6084000)

Figure 17: Uponor ratchet-style pipe cutter for up to 3" pipe (E6083000)

Troubleshooting a ProPEX connection

1. Ensure the expansion tool is properly maintained and in good working condition.
2. Ensure the expansion head is securely tightened onto the tool; frequently check that the head remains securely tightened throughout the installation process.
3. Ensure the segment fingers are not bent.
4. Remove excess grease.
5. Check the fitting for damage. Nicks and gouges will cause the fitting to leak.
6. Make sure the last expansion is not held in the expanded position before inserting the fitting.
7. Ensure proper rotation is occurring.
8. If a ProPEX ring slips, make sure that the outer pipe surface is clean and clear of any liquids. Inspect that the stop edge is present on the ProPEX ring**.**

Cold-weather expansions

Temperatures affect the time required for the piping and ring to shrink onto the fitting. Follow the below steps when making expansions in cold weather.

1. Warming the ProPEX fittings and ProPEX rings reduces contraction time. Put fittings and rings in your pockets prior to installation to keep them warm.
2. Make ProPEX connections at temperatures above 5°F (-15°C).
3. Fewer expansions are necessary in temperatures below 40°F (4.4°C).
4. Perform a test connection for each pipe size when temperatures differ from day to day, keeping note of the number of expansions to make a snug-fitting connection.

Verifying ProPEX connections

Ensure the ProPEX ring is tight against the fitting shoulder.

Figure 18: Coupling shoulder

Figure 19: Tee shoulder

Minimum distance between fittings

Uponor requires a minimum distance between ProPEX fittings to avoid damaging the fittings during installation and to protect against elevated stress on the pipe and fittings.

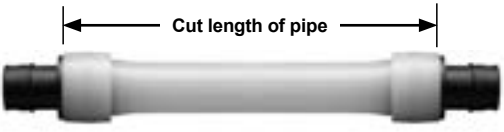


Figure 20: Minimum PEX length between fittings

Table 1: Minimum PEX cut length

Pipe size	Minimum cut length of pipe
½"	2" (51mm)
⅝"	2½" (64mm)
¾"	3" (76mm)
1"	3½" (89mm)
1¼"	4½" (114mm)
1½"	4½" (114mm)
2"	6" (152mm)
2½"	7½" (191mm)
3"	9" (229mm)

Bending PEX

Uponor PEX bend radius

The minimum bend radius of Uponor AquaPEX pipe is six times the outside diameter. Bend supports are available for ⅜", ½", ¾" and 1" piping and may be used to facilitate 90-degree rigid bends. Use large-diameter PVC conduit to facilitate 90-degree bends in larger-diameter Uponor PEX piping.

Table 2: Bending Uponor PEX

Pipe size	Pipe O.D.	Min. bend radius	2 x O.D.
½"	0.625"	3¾" (95mm)	1¼" (32mm)
¾"	0.875"	5¼" (133mm)	1¾" (44mm)
1"	1.125"	6¾" (171mm)	2¼" (57mm)

To alleviate stress on ProPEX connections and fittings, do not change direction immediately after a ProPEX connection.

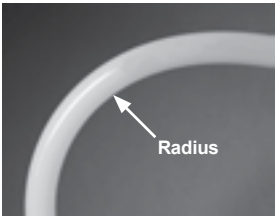


Figure 21: Bend radius

Uponor recommends a minimum of two times the outside diameter (O.D.) of the pipe as the minimum distance before changing direction; however, it is up to the installer to use best judgment. See **Figures 22** and **23** for guidance.

Note: When a proper bend is not possible, use a ProPEX elbow.

Note: Uponor recommends the use of elbows in sizes 1¼" and larger for directional changes unless adequate space is available for a proper bend.

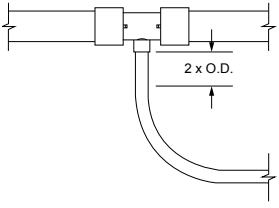


Figure 22: Correct bending

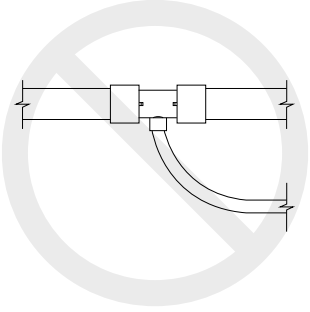


Figure 23: Incorrect bending

Uponor PEX ultraviolet (UV) resistance ratings

Table 3: Uponor PEX UV resistance ratings

Product	Marking	UV resistance
Uponor AquaPEX white	5106	1 month
Uponor AquaPEX blue	5306	6 months
Uponor AquaPEX red	5306	6 months
Wirsbo hePEX™	5106	1 month

Note: Uponor AquaPEX Reclaimed Water pipe has not been tested for UV resistance.

UV from light fixtures

Do not install PEX within 5 ft. (1.5m) of direct view from fluorescent and LED lights unless protected with a UV-blocking material (i.e., approved insulation or plastic wrap/sleeve).

Storing and handling guidelines

- Uponor PEX may be connected directly to electric water heaters, as well as power-vented gas water heaters where allowed by local code.
- Protect Uponor PEX with grommets when passing through metal framing members.
- Do not store Uponor PEX piping outdoors. Keep the piping in the original packaging until the time of installation.
- Do not use Uponor PEX piping where temperatures and pressures exceed limits.
- Do not weld, glue or use adhesives or adhesive tape with Uponor PEX piping.
- Do not apply open flame to Uponor PEX piping.
- Do not install Uponor PEX within 6" (15.2cm) of a vent pipe for direct or gravity-vented appliances.*

*Maintain a minimum 1" (25mm) distance from double-wall B vents or zero-clearance plastic vents.

- Do not install Uponor PEX piping within 12" (0.3m) of any recessed light fixture unless the piping is protected with suitable insulation or the light is Insulation Contact (I.C.) rated. Note that PEX must maintain a minimum 2" (51mm) clearance unless insulated with a suitable insulation.
- Do not solder, braze, weld or fusion-weld within 18" (45.7cm) of any Uponor PEX piping in the same water line. Make any heat-related connections prior to making the ProPEX connection.
- Use ProPEX lead-free (LF) brass copper press adapters for a flameless transition.
- Do not spray on or allow organic chemicals, strong acids or strong bases to come into contact with Uponor PEX piping.
- Only use closed-cell spray foams approved for use with PEX pipe.
- Avoid spray foam contact with Uponor engineered polymer (EP) fittings.
- Do not use petroleum or solvent-based paints, greases or sealants on Uponor PEX piping. For chemical compatibility questions, contact Uponor Technical Services at 888.594.7726 (U.S.) or 888.994.7726 (Canada).
- Do not install Uponor PEX piping between the tub/shower valve and the tub spout.
- Do not use Uponor PEX piping for an electrical ground.
- Do not press Uponor ProPEX brass sweat fittings. For copper press systems, use Uponor ProPEX LF brass copper press adapters.

Note: When transitioning from Uponor PEX to other piping materials, follow the appropriate installation instructions for that product.

Supporting Uponor PEX pipe

General notes

- Use copper tube size (CTS) clamps/supports
- Use clamps/supports designed for plastic pipe
- Follow local code requirements

Coiled piping

Refer to **Table 4** when supporting coiled PEX piping. Utilize the pipes natural flexibility to reduce fittings and connections for fixture runouts.

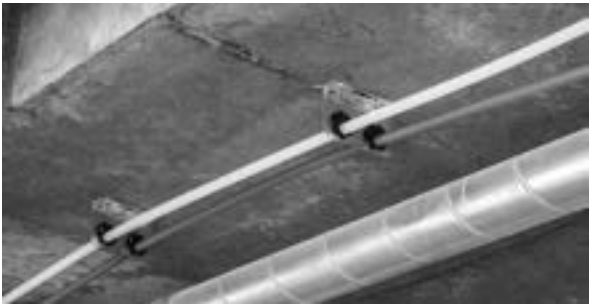


Figure 24: Supporting small-diameter coiled PEX

Table 4: Support requirements for coiled PEX pipe

Nominal pipe size	Maximum horizontal support spacing for coiled PEX pipe	
	International codes (IPC/IMC) and Uniform Codes (UPC/UMC)	National Plumbing Code of Canada (NPCC)
1" and smaller	2.67 ft. (32")	0.8m
1¼" and larger[1]	4 ft. (48")	0.8m

[1] Uponor recommends the use of PEX-a Pipe Support for systems with a Delta T (ΔT) greater than 40°F (22.2°C).

Supporting Uponor multiport tees

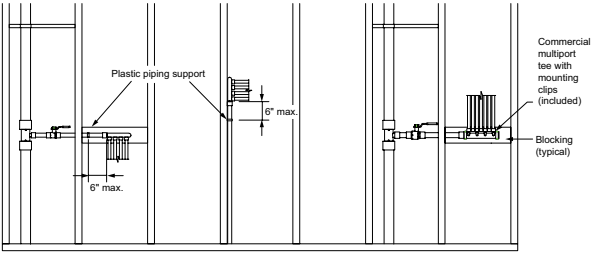


Figure 25: In-wall supports for multiport tees

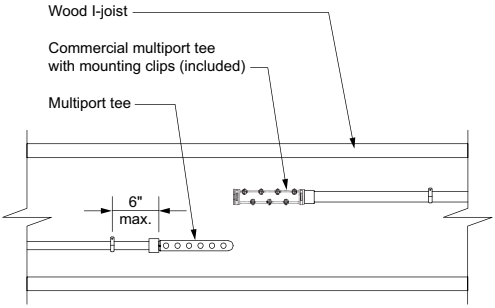


Figure 26: Supporting multiport tees on wood I-joists

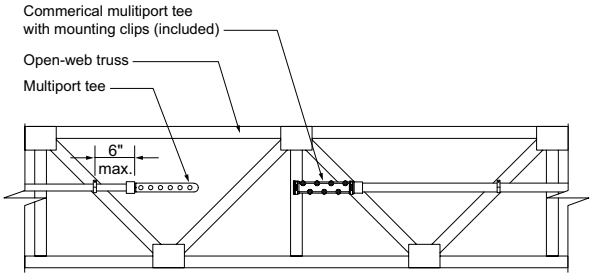


Figure 27: Supporting multiport tees on open-web wood trusses

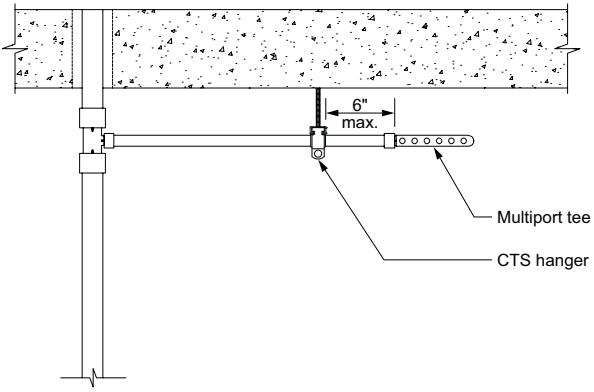


Figure 28: Supporting multiport tees in suspended applications

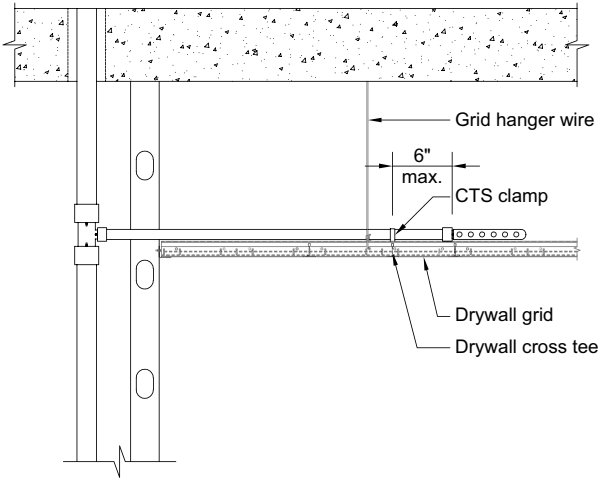


Figure 29: Supporting multiport tees on drywall grid

Strapping

Support Uponor PEX pipe by approved materials/methods only, including:

- Tube talons
- Clamps and hangers (i.e., loop or clevis hangers)
- Stand-off brackets

Isolate piping from other mechanical, electrical and plumbing (MEP) systems by means of insulation or stand-off brackets. Uponor does not recommend strapping PEX pipe directly to waste and vent piping. Always follow local code.

Figure 30: Proper bundling of Uponor PEX

Bundling

Parallel runs of Uponor PEX may be bundled together, when approved by local code, given the following:

- Bundle hot and cold water pipes separately at least 6" apart (15.2cm), unless piping is insulated.
- Support the bundle at the required on-center distance.
- Use cable ties to group a bundle.*

*Cable ties are not approved for supporting pipe.

Main/corridor straight-length piping

Per ICC-ES PMG 1006, using Uponor PEX-a Pipe Support allows extended support spacing up to 8 ft. (2.4m). Refer to **Table 5**.

Note: To minimize sagging and expansion/contraction, Uponor recommends using PEX-a Pipe Support for all main/corridor piping systems with ΔTs greater than 40°F (22.2°C).

Table 5: Horizontal support requirements with PEX-a Pipe Support

System type	Max. support spacing with PEX-a Pipe Support	Fixed points
ΔT less than or equal to 40°F (22.2°C) (e.g., domestic cold water, chilled water)[1]	8 ft. (2.4m)	Not required
ΔT greater than 40°F (22.2°C) (e.g., domestic hot water, domestic hot water recirculation, heating hot water)[1]	8 ft. (2.4m) with clamps every 32 ft. (9.7m) max.[2]	**See Table 6**

[1]These system examples are merely a suggestion of system types. The deciding factor is the temperature differential (Delta T) at the time of system start up.

[2]Fittings that are 1½" and smaller require support within 12" (0.3m) to prevent sagging. It is acceptable practice to support the fittings from their respective branch pipes.

Definitions

Use the below definitions with **Tables 5 and 6**.

Delta T (ΔT) – Difference between ambient air temperature and average system operating temperature.

Support – Loop, clevis, strut or similar that provide support for the piping system.

Clamps – Strut clamps or split-ring clamps that both support the piping system and limit its movement.

Fixed point – A support with clamps that is braced to the structure to prevent its movement due to expansion and/or contraction of the piping system. See **Figure 31**.

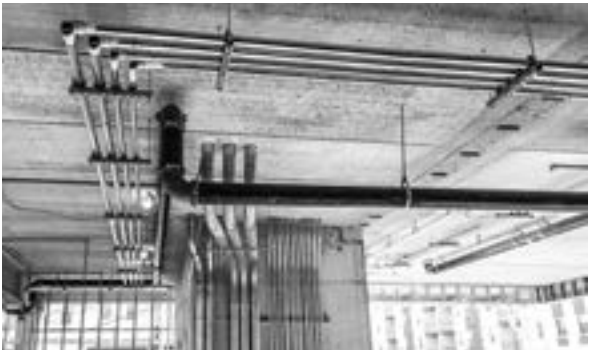


Figure 31: Supporting PEX with PEX-a Pipe Support

Expansion and contraction

To help minimize expansion and contraction in long, continuous piping runs with ΔTs greater than 40°F (22.2°C), use fixed points in conjunction with PEX-a Pipe Support and clamps. Refer to **Table 6** for requirements.

Table 6: Fixed-point requirements

Length of straight-piping run	# of fixed points*	Fixed-point spacing
0 – 63 ft. (0 – 19.2m)	0	N/A
64 – 128 ft. (19.5 – 39m)	1	Closest support with clamps to center
129 – 192 ft. (39.3 – 58.5m)	2	Min. 64 ft. apart (19.5m)
193 – 256 ft. (58.8 – 78m)	3	
257 – 320 ft. (78.3 – 97.5m)	4	

*Pipes 1" and smaller do not require fixed points.

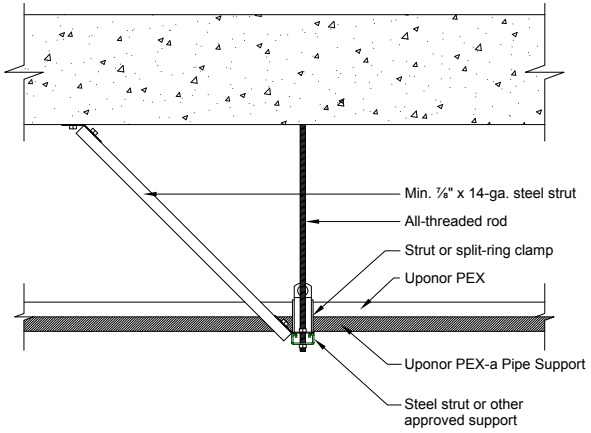


Figure 32: Fixed point

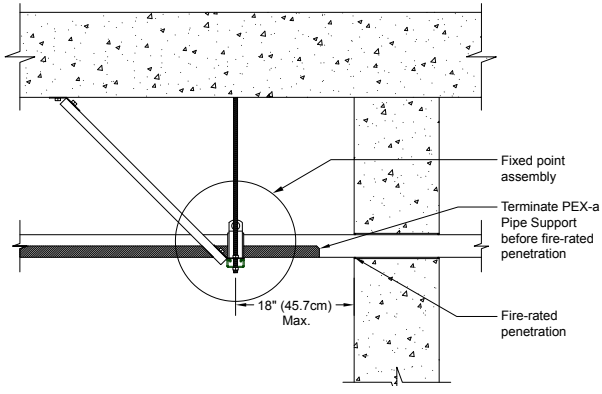


Figure 33: Fixed point near fire-penetration

Note: For 1¼" and larger PEX pipes with a ΔT greater than 40°F (22.2°C), install a fixed point within 18" (45.7cm) of a horizontal fire penetration.

Installing Uponor PEX-a Pipe Support

- Use full lengths and minimize cutting when possible.
- Deburr sharp edges if cutting is required.
- Maintain minimum distance to fittings according to **Table 7**.
- Secure included straps according to **Figures 35-38**.

Table 7: Minimum distance to fittings for PEX-a Pipe Support

Nominal pipe size	Distance to fitting "A"
½"	1¼" (32mm)
¾"	1¾" (44mm)
1"	2¼" (57mm)
1¼"	2¾" (70mm)
1½"	3" (76mm)
2"	4" (102mm)
2½"	5" (127mm)
3"	6" (152mm)

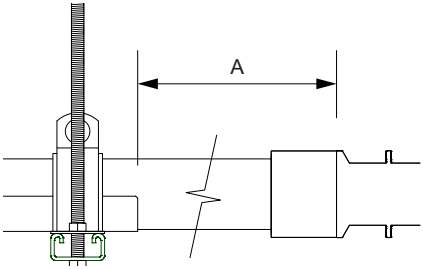


Figure 34: Minimum distance to fitting

Strapping PEX-a Pipe Support

Use the included stainless-steel straps to secure PEX-a Pipe Support to the PEX pipe. If the straps are misplaced, use a stainless-steel strap with a minimum 300-lb. rating that is also rated for the application (e.g., temperature, UV).

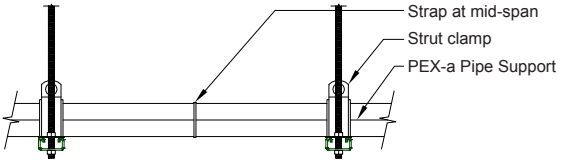


Figure 35: Strapping for systems using strut-type clamps or equivalent

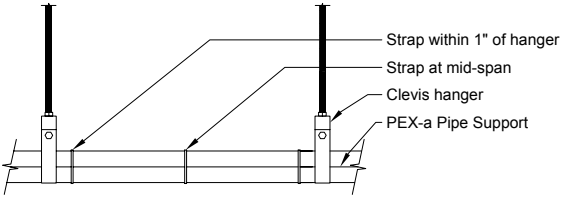


Figure 36: Strapping for systems using clevis or loop-type hangers or equivalent

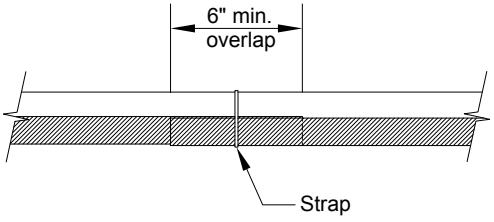


Figure 37: Strapping for overlaps

Fitting bridges

Use a fitting bridge to provide additional support to ½" to 1½" mid-span fittings. To create a fitting bridge, cut an oversized piece of PEX-a Pipe Support to the length shown in **Table 8** and strap using the included stainless-steel straps.

Table 8: Fitting bridge size and length

Nominal pipe/ fitting size	PEX-a Pipe Support size	PEX-a Pipe Support bridge minimum length
½"	1"	5½" (13.9cm)
¾"	1¼"	7½" (19cm)
1"	1½"	10½" (26.6cm)
1¼"	2"	12" (30.4cm)
1½"	2"	13½" (34.2cm)

Note: Fitting bridges are not required on 2" and larger pipe sizes.

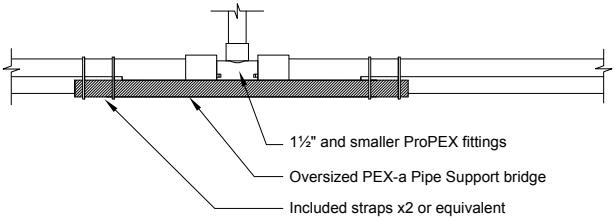


Figure 38: Fitting bridge

ASTM E84 requirements for PEX-a Pipe Support

Uponor PEX-a Pipe Support is tested and approved for use in ASTM E84 applications. To meet the requirements, install PEX-a Pipe Support per the following requirements:

- Cover pipe or fittings without PEX-a Pipe Support with a minimum ½" (13mm) thick rated insulation.
- There is no minimum segment length of PEX-a Pipe Support.

When installed per the above requirements, there are no spacing limitations between parallel piping runs.

Note: The above requirements also apply to PEX-a Pipe Support installed in a vertical position for ASTM E84 applications.

Note: Exposed sections of ½" and ¾" Uponor PEX pipe can be installed un-insulated if the pipe runs are separated by a minimum of 18" (45.7cm).

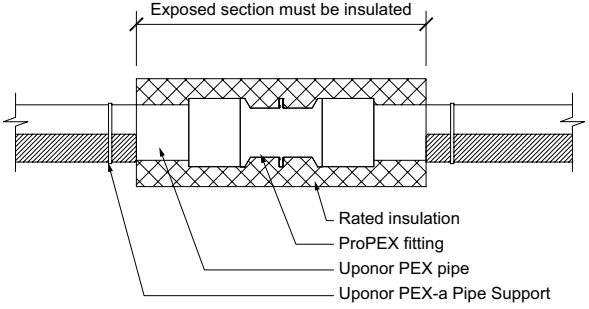


Figure 39: PEX-a Pipe Support installations in ASTM E84 applications

Supporting large-diameter valves

Table 9: Support requirements for large-diameter valves

Nominal pipe size	Valve-type	Maximum support distance “A”
1¼"- 2"	Ball	18" (45.7cm)
2½"- 3"	Butterfly	7" (17.7cm)

Note: For ball valves larger than 2", support within 7" (17.7cm).

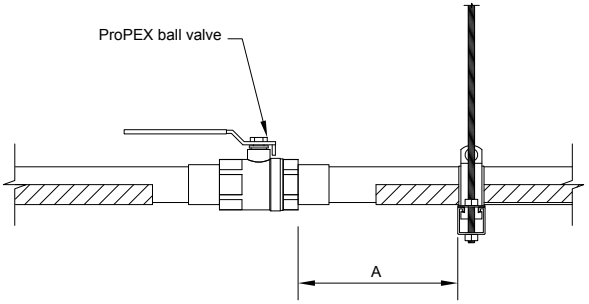


Figure 40: Supporting 1¼" to 2" ball valves

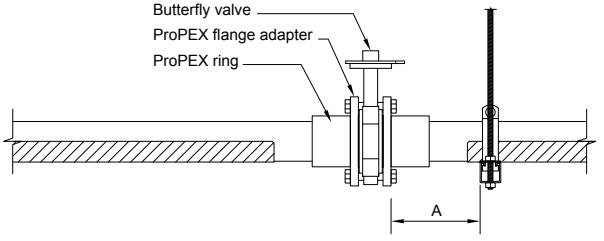


Figure 41: Supporting 2½" to 3" butterfly valves

Vertical support requirements

Vertical runs of pipe fall into two categories: in-wall and risers.

In-wall piping is typically smaller in diameter (<1"), and does not pass through multiple floors like a riser. It is most often the dedicated supply piping to the fixture.

Riser piping is typically larger in diameter (>1") and passes through multiple floors, often requiring fire-penetration sealants.

Note: The two categories above are not mutually exclusive. Use best judgement when determining which supports are necessary.

Table 10: Vertical support requirements for PEX pipe

		Nominal pipe size	All codes
In wall		All pipe sizes	5 ft. (1.5m)
Risers	**Domestic cold water**	All pipe sizes	Clamp at the base of each floor; clamp at top of every fourth floor; support every 5 ft. (1.5m)
	Domestic hot water	All pipe sizes	Clamp at base of each floor; clamp at top of every-other floor; support every 5 ft. (1.5m)
	Heating hot water; chilled water	All pipe sizes	Clamp at base of each floor; clamp at top of every floor; support every 5 ft. (1.5m)

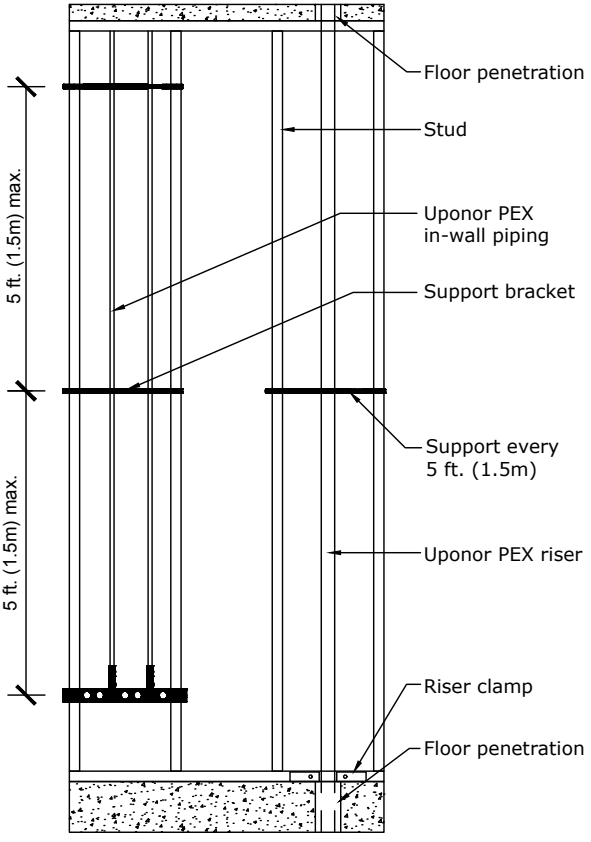


Figure 42: In-wall versus riser piping

Riser clamps

To prevent damage to ProPEX fittings, Uponor recommends the following minimum distances between riser clamps and ProPEX fittings.

Table 11: Distance to clamps

Nominal pipe size	2 x O.D.
½"	1¼" (32mm)
⅝"	1½" (38mm)
¾"	1¾" (44mm)
1"	2¼" (57mm)
1¼"	2¾" (70mm)
1½"	3¼" (83mm)
2"	4¼" (108mm)
2½"	4¾" (133mm)
3"	6¼" (159mm)
3½"	7¼" (184mm)
4"	8¼" (210mm)

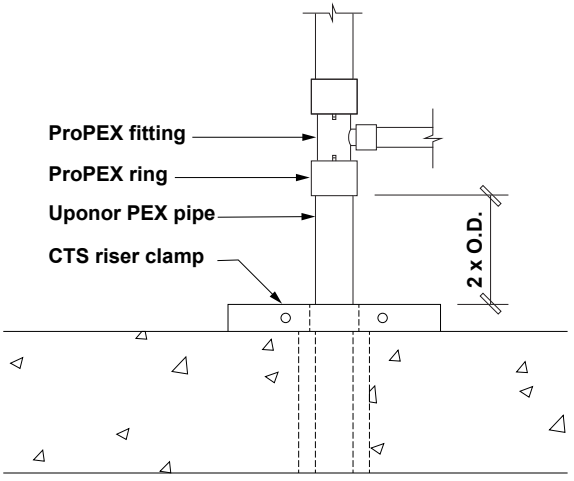


Figure 43: Riser clamp detail

Risers

Vertical piping runs must comply with support spacing as defined by code. Best practice is to use the floor/ceiling assembly as a fixed point for controlling expansion and contraction by means of riser clamps.

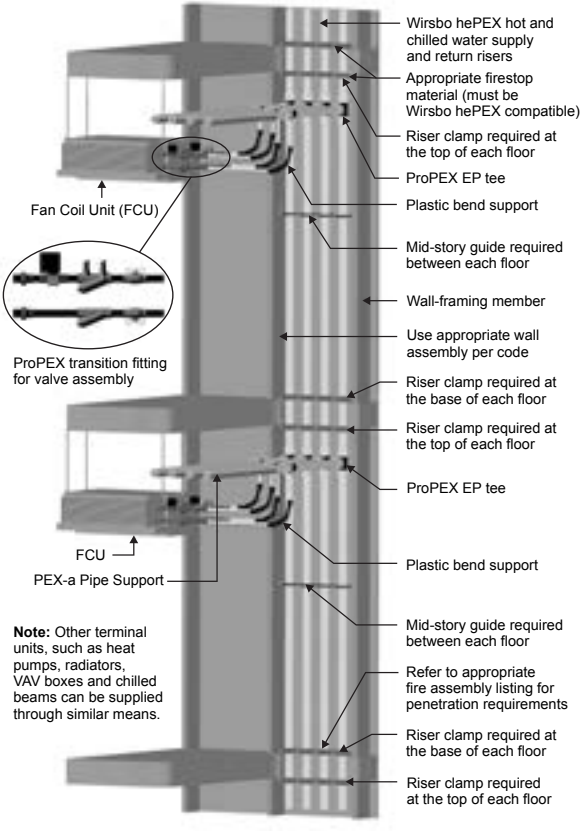


Figure 44: Hydronic piping riser detail

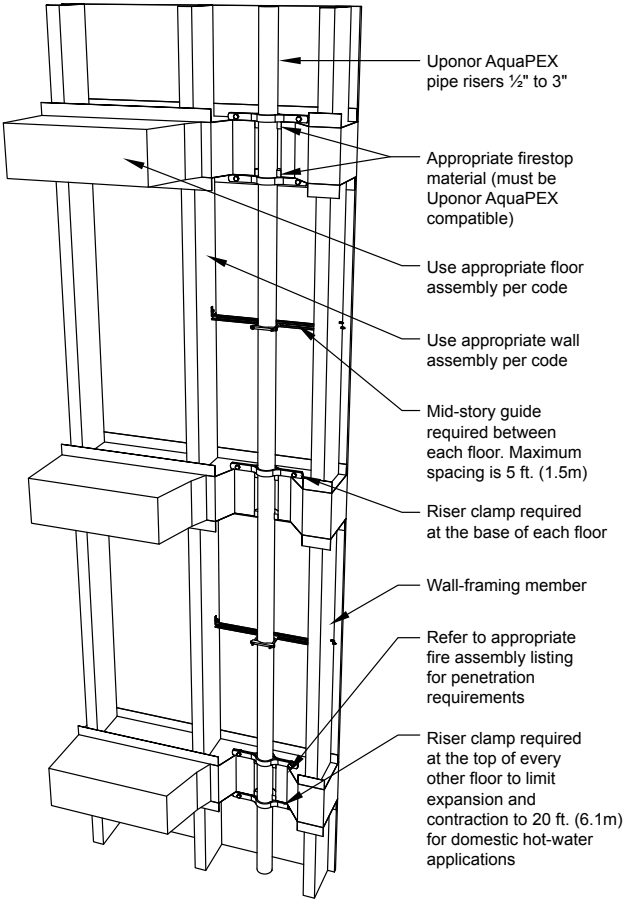


Figure 45: Domestic hot-water riser detail

Fire-resistant construction

The following requirements are for Uponor products installed in return-air plenum spaces.

United States — ASTM E84

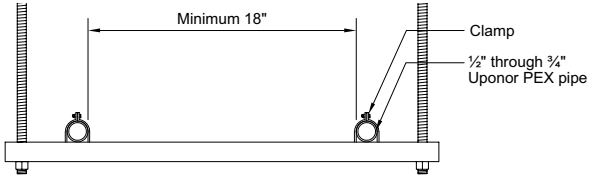


Figure 46: QAI P321-1

Guidelines: ½" through ¾" (uninsulated)
Limitations: Adjacent runs shall be located at least 18" (45.7cm) apart.

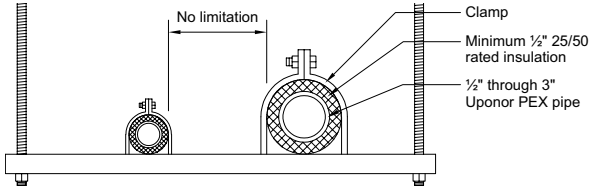


Figure 47: QAI P321-1

Guidelines: ½" through 3" (insulated)
Limitations: ½" minimum thickness insulation as specified in **Table 12**.

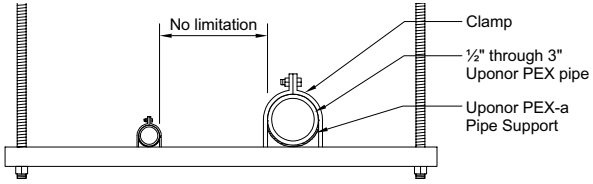


Figure 48: QAI P321-2

Guidelines: ½" through 3" (PEX-a Pipe Support)
Limitations: Pipe or fitting sections without PEX-a Pipe Support must be covered with a rated insulation per **Table 12**. There is no minimum length of PEX-a Pipe Support segments.

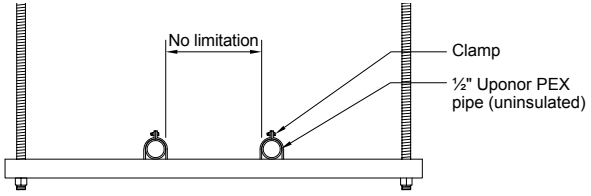


Figure 49: QAI P321-1

Guidelines: ½" (uninsulated)
Limitations: No spacing limitations.

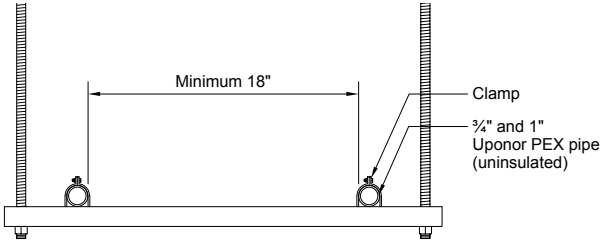


Figure 50: QAI P321-1

Guidelines: ¾" and 1" (uninsulated)
Limitations: Adjacent pipe runs shall be located at least 18" (45.7cm) apart.

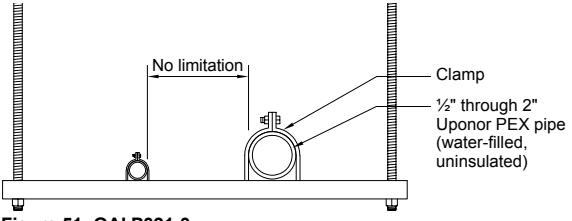


Figure 51: QAI P321-3

Guidelines: ½" through 2" (water-filled)
Limitations: No spacing limitations.

Canada — CAN/ULC-S102.2

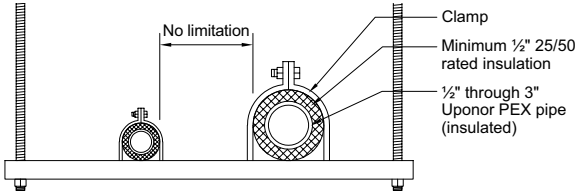


Figure 52: QAI P321-1

Guidelines: ½" through 3" (insulated)
Limitations: ½" minimum thickness insulation as specified in **Table 12**.

Table 12: Specifications for pipe insulations in ASTM E84 and CAN/ULC-S102.2 applications

Specifications for pipe insulations in ASTM E84 and CAN/ULC-S102.2 applications			
Products (minimum thickness)	ASTM E84 and CAN/ULC-S102.2		Density of insulation
	Flame spread	Smoke developed	
½" Manson Alley-K Fiberglass Pipe Insulation	25 or less	50 or less	4.0 pcf
½" Armaflex Composite Pipe Insulation	25 or less	50 or less	3.0 pcf
½" Johns Manville Micro-Lok Fiberglass Pipe Insulation	25 or less	50 or less	3.3 pcf
½" Johns Manville Micro-Lok HP	25 or less	50 or less	3.5 pcf
½" Owens Corning VaporWick Pipe Insulation	25 or less	50 or less	4.0 pcf
½" Owens Corning Fiberglass Pipe Insulation	25 or less	50 or less	3.5 pcf
½" Knauf Earthwool Redi-Klad Pipe Insulation	25 or less	50 or less	3.8 pcf
½" GLT Pipe and Tank Insulation	25 or less	50 or less	4.5 pcf
½" Nomalock Pipe Insulation*	25 or less	50 or less	4.0 pcf

*Check the rated grade of Nomalock insulations for plenum use.

ASTM E814 and CAN/ULC S115 listings

Table 13: Fire assemblies per manufacturer

Assembly types		Manufacturer			
		3M™		Hilti®	
		Wall	Floor/ceiling	Wall	Floor/ceiling
Wood-stud/steel-stud assemblies	1-hour	PHV-120-04	F-C-2039	W-L-2186	F-C-2081
		PHV-120-11	F-C-2240	W-L-2235	F-C-2230
		W-L-2091	F-C-2343	W-L-2466	F-C-2310
		W-L-2146	F-C-2344	W-L-2474	F-C-2334
		W-L-2173	F-C-2391	W-L-2480	F-C-8038
		W-L-2448	F-E-2002	W-L-2537	F-C-8044
		W-L-2483	F-E-2012	W-L-2467	
		W-L-2543	F-E-2040	W-L-5224	
		W-L-2547	PHV-120-04		
		W-L-2299	PHV-120-11		
		PV-60-02			

Note: This table is not meant to address every compatible fire assembly or firestop manufacturer. approved and current for the specific application. Please refer to the respective manufacturer's w

= ASTM E814 and CAN/ULC S115 = ASTM E814 only

Manufacturer			
RectorSeal®		STI	
Wall	Floor/ceiling	Wall	Floor/ceiling
W-L-2342	F-C-2298	F-C-2319	F-C-2032
W-L-2262	F-C-8015	W-L-2100	F-C-2252
W-L-2373	F-C-2329	W-L-2144	F-C-2319
W-L-2430	F-C-2212	W-L-2241	F-E-2003
W-L-2526	F-E-2007	W-L-2242	F-C-8021
W-L-2121	F-C-2221	W-L-2423	F-C-8029
W-L-2209	F-C-2385	W-L-2508	F-E-8003
W-L-2528		W-L-2548	F-C-8045
W-L-2402		W-L-2549	F-E-8010
W-L-2638		W-L-7193	
W-L-2639		F-C-8021	
W-L-2007		F-C-8029	
W-L-2170		W-L-5290	
W-L-2287		W-L-2631	
W-L-2457			
W-L-2524			
W-L-2594			
W-L-2595			

It is the end user's responsibility to ensure the fire assembly documentation being used is ebsite for detailed listing information.

= ASTM E814 and CAN/ULC S115 = ASTM E814 only

ASTM E814 and CAN/ULC S115 listings

Table 14: Fire assemblies per manufacturer

Assembly types		Manufacturer			
		3M™		Hilti®	
		Wall	Floor/ceiling	Wall	Floor/ceiling
Wood-stud/steel-stud assemblies	2-hour	PHV-120-04	PHV-120-04	W-L-2186	F-C-2081
		PHV-120-11	PHV-120-11	W-L-2235	F-C-2310
		W-L-2090		W-L-2466	
		W-L-2091		W-L-2474	
		W-L-2146		W-L-2480	
		W-L-2448		W-L-2537	
		W-L-2483		W-L-2467	
		W-L-2543		W-L-5224	
		W-L-2547			
		W-L-2299			

Note: This table is not meant to address every compatible fire assembly or firestop manufacturer. approved and current for the specific application. Please refer to the respective manufacturer's w

= ASTM E814 and CAN/ULC S115 = ASTM E814 only

RectorSeal®		STI	
Wall	Floor/ceiling	Wall	Floor/ceiling
W-L-2342	F-C-2221	W-L-2100	
W-L-2262	F-C-2385	W-L-2144	
W-L-2373		W-L-2241	
W-L-2430		W-L-2242	
W-L-2526		W-L-2423	
W-L-2121		W-L-2508	
W-L-2209		W-L-2548	
W-L-2528		W-L-2549	
W-L-2402		W-L-7193	
W-L-2638		W-L-5290	
W-L-2639		W-L-2631	
W-L-2170			
W-L-2287			
W-L-2457			
W-L-2524			
W-L-2594			
W-L-2595			

It is the end user's responsibility to ensure the fire assembly documentation being used is ebsite for detailed listing information.

= ASTM E814 and CAN/ULC S115 = ASTM E814 only

ASTM E814 and CAN/ULC S115 listings

Table 15: Fire assemblies per manufacturer

Assembly types		Manufacturer			
		3M™		Hilti®	
		Wall	Floor/ceiling	Wall	Floor/ceiling
Concrete assemblies	2-hour	C-AJ-2510	C-AJ-2510	C-AJ-2170	C-AJ-2170
		C-AJ-2536	C-AJ-2536	C-AJ-2407	C-AJ-2407
		PHV-120-04	F-A-2115	C-AJ-2647	C-AJ-2647
		PHV-120-11	PH-120-10	W-J-2207	C-AJ-2674
		C-AJ-2213	PHV-120-04	W-J-2229	F-B-2040
		C-AJ-2378	PHV-120-11	W-J-2206	F-B-2041
		W-J-2231	C-AJ-2076	W-J-5122	F-A-2142
		W-J-2110	C-AJ-2213		W-J-2071
		C-AJ-2213	C-AJ-2378		
		C-AJ-2378	C-AJ-2213		
		C-AJ-2738	C-AJ-2378		
		PHV-120-12	C-AJ-2738		
		C-AJ-2698	PHV-120-12		
			C-AJ-2698		
	3-hour			C-BJ-2028	C-BJ-2028
				C-BJ-2040	C-BJ-2040
				C-BJ-2041	C-BJ-2041

Note: This table is not meant to address every compatible fire assembly or firestop manufacturer. approved and current for the specific application. Please refer to the respective manufacturer's w

= ASTM E814 and CAN/ULC S115 = ASTM E814 only

RectorSeal®		STI		HOLDRITE
Wall	**Floor/ceiling**	**Wall**	**Floor/ceiling**	**Floor/ceiling**
W-J-2162	C-AJ-2628	W-J-2021	C-AJ-2031	F-A-2188
W-J-2122	F-A-2171	W-J-2043	C-AJ-2140	F-A-2221
W-J-2180	C-AJ-2701	W-J-2076	C-AJ-2291	F-B-2042
W-J-2025	C-AJ-2176	W-J-2077	F-A-2186	F-A-2269
C-AJ-2628	F-A-2235	W-J-2232	F-A-2224	F-A-2222
C-AJ-2679	F-A-2237	W-J-2233	F-A-2225	F-A-2037
C-AJ-2701	C-AJ-2494	W-J-5148	C-AJ-2586	
W-J-2295	C-AJ-2679	C-AJ-2586	C-AJ-5345	
W-J-2296	C-AJ-2702	C-AJ-5345	C-BJ-2046	
C-AJ-2702		C-BJ-2046		
C-AJ-2176		W-J-2291		
C-AJ-2494				
W-J-2035				
W-J-2051				
W-J-2142				
W-J-2197				
W-J-2220				
W-J-2222				
W-J-2224				
W-J-2266				
C-AJ-2119	C-AJ-2119	C-AJ-2671	C-AJ-2671	F-A-2176
C-AJ-2194	C-AJ-2194	C-AJ-5344	C-AJ-5344	F-A-2221
C-AJ-2622	C-AJ-2622	C-AJ-5346	C-AJ-5346	F-B-2042
			C-AJ-2578	F-A-2269
			F-A-2203	F-A-8034
			F-A-2204	F-A-2222

It is the end user's responsibility to ensure the fire assembly documentation being used is ebsite for detailed listing information.

= ASTM E814 and CAN/ULC S115 = ASTM E814 only

Below-grade installation

Uponor PEX piping and ProPEX fittings (EP and LF brass) are all approved for burial directly in soil. Refer to **Figures 53** and **54** for proper trench preparation. Always follow local code when burying Uponor PEX pipe as some jurisdictions require additional sleeving and protection.

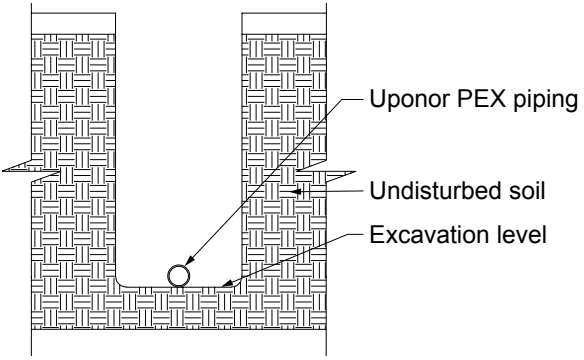


Figure 53: Good soil conditions

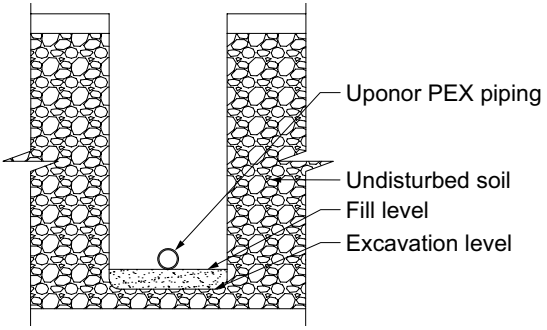


Figure 54: Poor soil conditions

Horizontal directional drilling (HDD)

Uponor PEX HDD requirements:

- Up to 600 ft. (182m) in length
- Depths up to 15 ft. (4.5m)

PEX pipe must:

- Be the follow pipe
- Not contact any sharp objects
- Be pressure tested after installation

Table 16: Safe pull force

SDR9 PEX-a 12-hour pull		
Nominal pipe size	**Tensile yield design (safety) factor**	**Allowable tensile load at 73°F (22.8°C) lbs. (N)**
½"	0.4	128 (569)
¾"	0.4	248 (1,103)
1"	0.4	411 (1,828)
1¼"	0.4	615 (2,735)
1½"	0.4	859 (3,821)
2"	0.4	1,465 (6,516)
2½"	0.4	2,239 (9,960)
3"	0.4	3,169 (14,096)

In-slab installation

Uponor PEX piping and ProPEX EP and brass fittings are approved for embedment in concrete. Always follow local code when embedding Uponor PEX pipe as some jurisdictions require additional sleeving and protection. Uponor recommends using Pre-sleeved Uponor AquaPEX pipe for embedment in concrete when additional protection is required.

Note: Cover brass fittings with a protective material, such as 6-mil poly wrap, and secure with cable ties.

Figure 55: In-slab installation

Pressure testing

Residential applications

1. Pressurize system to 25 psi (1.7 bar) above working pressure or 100 psi (6.9 bar).
2. Test in accordance with local code.

Commercial applications

1. Visually confirm all connections are properly made per Uponor installation guidelines.
2. Ensure that all components, fixtures and equipment not rated for the test pressure are isolated from the test system.
3. Ensure that all other thermoplastic piping materials are isolated from the test system.
4. Fill the system with potable water, air or a mixture of both.
5. Condition the system to 1.5 times the required test pressure for 30 minutes. This will require constant pumping or cycling the valve and compressor to maintain a pressure of 1.5 times the test pressure. If cycling the valve and compressor, apply additional pressure once the psi has dropped 10 psi (0.7 bar).
6. After conditioning the system for 30 minutes, quickly relieve excess pressure by opening the valve. Close the valve when the system has reached the desired test pressure.

   Note: Uponor recommends a test pressure of 80 psi (5.5 bar) (unless local code dictates higher pressures).
7. Once the valve is closed, confirm a slight rise in pressure 3 to 6 psi (0.2 to 0.4 bar). This increase will occur as the pipe's I.D. is shrinking from its conditioned state to equalize at the lower pressure.
8. 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).
9. 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, especially during long durations (e.g., 24 hours).

10. Flush the system as required by code.

Note: 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.

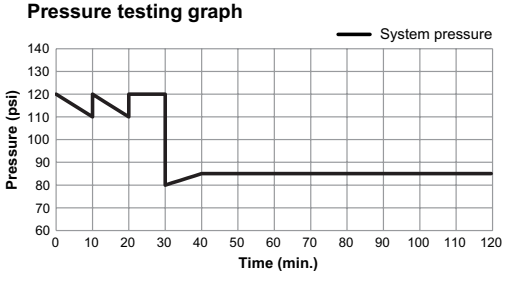


Figure 56: Pressure testing graph

Water system disinfection

Uponor recommends flushing an AquaPEX plumbing system with clean, potable water. When system disinfection is required, Uponor AquaPEX piping should be disinfected in accordance with AWWA C651, Standard for Disinfecting Water Mains, or local codes.

Note: To prevent reduced service life of system components, disinfection solutions should not remain in the system longer than 24 hours. Flush the system with potable water after disinfection.

Use a chlorine solution of 50 parts per million (ppm) for 24 hours or 200 ppm for three hours for disinfection.

Appendix A: Dimensions and physical characteristics of Uponor PEX pipe

Table A-1: Dimensions and physical characteristics of SDR9 Uponor PEX pipe

Dimensions and physical characteristics of SDR9 Uponor PEX pipe					
Nominal pipe size	Pipe O.D. (in)	Pipe I.D. (in)	Weight of pipe only lbs/ft (kg/m)	Contents of pipe gal/ft (l/m)	Weight of pipe and water lbs/ft (kg/m)
¼"	0.375	0.241	0.04 (0.018)	0.0024 (0.009)	0.06 (0.027)
⅜"	0.50	0.35	0.05 (0.022)	0.005 (0.018)	0.09 (0.040)
½"	0.625	0.475	0.06 (0.027)	0.0092 (0.034)	0.14 (0.063)
⅝"	0.750	0.574	0.08 (0.036)	0.0134 (0.050)	0.19 (0.086)
¾"	0.875	0.671	0.1 (0.045)	0.0184 (0.069)	0.25 (0.113)
1"	1.125	0.862	0.2 (0.090)	0.0303 (0.114)	0.45 (0.204)
1¼"	1.375	1.054	0.34 (0.154)	0.0453 (0.171)	0.72 (0.326)
1½"	1.625	1.244	0.44 (0.199)	0.0632 (0.239)	0.96 (0.435)
2"	2.125	1.629	0.682 (0.309)	0.1083 (0.409)	1.58 (0.716)
2½"	2.625	2.011	0.93 (0.421)	0.1649 (0.624)	2.3 (1.043)
3"	3.125	2.4	1.28 (0.580)	0.2351 (0.889)	3.24 (1.469)

Appendix B: Hydrostatic temperature and pressure ratings

Uponor maintains standard-grade ratings for Uponor PEX piping. Uponor PEX carries the following temperature and pressure ratings shown in **Table B-1**.

Note: Uponor EP and LF brass fittings carry the same temperature and pressure ratings as Uponor PEX pipe.

Table B-1: Hydrostatic temperature and pressure ratings for Uponor PEX pipe

ASTM F876 temperature and pressure ratings for SDR9 PEX		
Rated temperature	**Hydrostatic design stress (HDS) psi**	**Pressure rating for water psi**
73.4°F/23°C	630	160 psi (11 bar)
180°F/82°C	400	100 psi (6.9 bar)
200°F/93°C	315	80 psi (5.5 bar)

Interpolation method

Pressure ratings at different temperatures are determined by using a linear relationship between the standard-grade ratings. See **Table B-2** for interpolated temperature and pressure ratings.

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 PEX is 210ºF at 150 psi (99ºC at 10 bar).

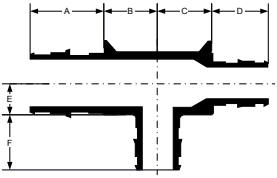
This standard requires that Uponor PEX piping maintain its integrity for a period of 720 hours (30 days) at 210ºF (99ºC) at 150 psi (10 bar). If installed as directed, Uponor PEX will withstand these conditions.

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

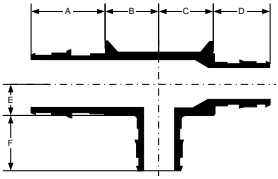
Table B-2: Interpolated hydrostatic temperature and pressure ratings for Uponor PEX pipe

Interpolated hydrostatic temperature and pressure ratings	
ºF/ºC	**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

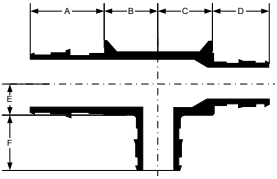
Appendix C: ProPEX fitting dimensions



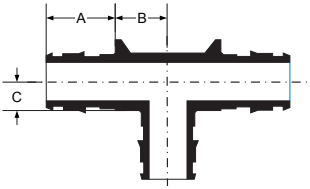
ProPEX EP reducing tees		A	B	C	D	E	F
Description	Part no.	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm
½" PEX x ½" PEX x ¾" PEX	Q4755575	¾	11/16	11/16	¾	½	15/16
		19	18	18	19	13	24
¾" PEX x ½" PEX x ½" PEX	Q4757555	15/16	11/16	11/16	¾	½	¾
		24	18	18	19	13	19
¾" PEX x ½" PEX x ¾" PEX	Q4757557	15/16	11/16	11/16	¾	½	15/16
		24	18	18	19	13	24
¾" PEX x ¾" PEX x ⅝" PEX	Q4757563	15/16	11/16	11/16	15/16	9/16	⅞
		24	18	18	24	14	22
¾" PEX x ¾" PEX x ½" PEX	Q4757550	15/16	11/16	11/16	15/16	9/16	¾
		24	18	18	24	14	19
¾" PEX x ¾" PEX x 1" PEX	Q4757710	15/16	⅞	⅞	15/16	11/16	1 3/16
		24	22	22	24	18	30
1" PEX x ¾" PEX x ¾" PEX	Q4751775	1 3/16	⅞	⅞	15/16	11/16	15/16
		30	22	22	24	18	24
1" PEX x ¾" PEX x 1" PEX	Q4751751	1 3/16	⅞	⅞	15/16	11/16	1 3/16
		30	22	22	24	18	30
1" PEX x 1" PEX x ½" PEX	Q4751150	1 3/16	⅞	⅞	1 3/16	11/16	¾
		30	22	22	30	18	19
1" PEX x 1" PEX x ¾" PEX	Q4751175	1 3/16	⅞	⅞	1 3/16	11/16	15/16
		30	22	22	30	18	24
1¼" PEX x 1" PEX x ¾" PEX	Q4751317	1 3/16	15/16	15/16	1 7/16	15/16	15/16
		30	25	25	37	24	24
1¼" PEX x 1" PEX x 1" PEX	Q4751311	1 7/16	15/16	15/16	1 3/16	15/16	1 3/16
		37	25	25	30	24	30
1¼" PEX x 1¼" PEX x ½" PEX	Q4751350	1 7/16	¾	¾	1 7/16	¾	¾
		37	19	19	37	19	19
1¼" PEX x 1¼" PEX x ¾" PEX	Q4751337	1 7/16	⅞	⅞	1 7/16	¾	15/16
		37	23	23	37	19	24
1¼" PEX x 1¼" PEX x 1" PEX	Q4751331	1 7/16	15/16	15/16	1 7/16	15/16	1 3/16
		37	25	25	37	24	30
1½" PEX x 1" PEX x ¾" PEX	Q4751517	1 11/16	1 3/16	1 3/16	1 3/16	1⅛	15/16
		43	30	30	30	28	24
1½" PEX x 1" PEX x 1" PEX	Q4751511	1 11/16	1 3/16	1 3/16	1 3/16	1⅛	1 3/16
		43	30	30	30	28	30
1½" PEX x 1" PEX x 1½" PEX	Q4751505	1 11/16	1¼	1¼	1 3/16	15/16	1 11/16
		43	32	32	30	24	43



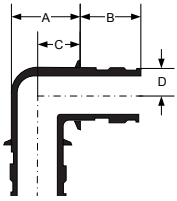
ProPEX EP reducing tees		A	B	C	D	E	F
Description	Part no.	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm
1½" PEX x 1¼" PEX x ¾" PEX	Q4751537	1 11/16	1⅛	1⅛	1 7/16	⅞	15/16
		43	29	29	37	23	24
1½" PEX x 1¼" PEX x 1" PEX	Q4751531	1 11/16	1⅛	1⅛	1 7/16	⅞	1 3/16
		43	29	29	37	23	30
1½" PEX x 1¼" PEX x 1¼" PEX	Q4751533	1 11/16	1⅛	1⅛	1 7/16	⅞	1 7/16
		43	29	29	37	23	37
1½" PEX x 1½" PEX x ½" PEX	Q4751550	1 11/16	¾	¾	1 11/16	13/16	¾
		43	19	19	43	21	19
1½" PEX x 1½" PEX x ¾" PEX	Q4751557	1 11/16	1 3/16	1 3/16	1 11/16	1⅛	15/16
		43	30	30	43	28	24
1½" PEX x 1½" PEX x 1" PEX	Q4751551	1 11/16	1 3/16	1 3/16	1 11/16	1⅛	1 3/16
		43	30	30	43	28	30
1½" PEX x 1½" PEX x 1¼" PEX	Q4751553	1 11/16	1 3/16	1 3/16	1 11/16	1⅛	1 7/16
		43	30	30	43	28	37
2" PEX x 1½" PEX x ¾" PEX	Q4752575	2 3/16	1 5/16	1 5/16	1 11/16	1 5/16	15/16
		56	34	34	43	33	24
2" PEX x 1½" PEX x 1" PEX	Q4752051	2 3/16	1 5/16	1 5/16	1 11/16	1 5/16	1 3/16
		56	34	34	43	33	30
2" PEX x 1½" PEX x 1¼" PEX	Q4752053	2 3/16	1⅜	1⅜	1 11/16	1 5/16	1 7/16
		56	35	35	43	33	37
2" PEX x 1½" PEX x 1½" PEX	Q4752055	2 3/16	1⅜	1⅜	1 11/16	1 5/16	1 11/16
		56	35	35	43	33	43
2" PEX x 1½" PEX x 2" PEX	Q4752152	2 3/16	1¾	1¾	1 11/16	1 1/16	2 3/16
		56	44	44	43	26	56
2" PEX x 2" PEX x ½" PEX	Q4752250	2 3/16	¾	¾	2 3/16	1 1/16	¾
		56	19	19	56	26	19
2" PEX x 2" PEX x ¾" PEX	Q4752275	2 3/16	1 5/16	1 5/16	2 3/16	1 5/16	15/16
		56	34	34	56	33	24
2" PEX x 2" PEX x 1" PEX	Q4752210	2 3/16	1 5/16	1 5/16	2 3/16	1 5/16	1 3/16
		56	34	34	56	33	30
2" PEX x 2" PEX x 1¼" PEX	Q4752213	2 3/16	1 5/16	1 5/16	2 3/16	1 5/16	1 7/16
		56	34	34	56	33	37
2" PEX x 2" PEX x 1½" PEX	Q4752215	2 3/16	1 5/16	1 5/16	2 3/16	1 5/16	1 11/16
		56	34	34	56	33	43



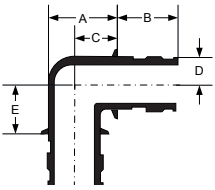
ProPEX EP reducing tees		A	B	C	D	E	F
Description	Part no.	in mm	in mm	in mm	in mm	in mm	in mm
2½" PEX x 2" PEX x 1½" PEX	Q4752525	2 13/16 72	1 5/8 41	1 5/8 41	2 3/16 56	1 5/16 33	1 11/16 43
2½" PEX x 2" PEX x 2" PEX	Q4752522	2 13/16 72	2 51	2 51	2 3/16 56	1 5/16 33	2 3/16 56
2½" PEX x 2½" PEX x ¾" PEX	Q4752557	2 13/16 72	1 1/8 29	1 1/8 29	2 13/16 72	1 5/16 33	15/16 24
2½" PEX x 2½" PEX x 1" PEX	Q4752510	2 13/16 72	1 1/4 32	1 1/4 32	2 13/16 72	1 5/16 33	1 3/16 30
2½" PEX x 2½" PEX x 1¼" PEX	Q4752513	2 13/16 72	1 1/2 38	1 1/2 38	2 13/16 72	1 5/16 33	1 7/16 37
2½" PEX x 2½" PEX x 1½" PEX	Q4752515	2 13/16 72	1 5/8 41	1 5/8 41	2 13/16 72	1 5/16 33	1 11/16 43
2½" PEX x 2½" PEX x 2" PEX	Q4752520	2 13/16 72	2 51	2 51	2 13/16 72	1 1/4 32	2 3/16 56
3" PEX x 2" PEX x 2" PEX	Q4753220	3 3/8 86	2 51	2 51	2 3/16 56	1 9/16 39	2 3/16 56
3" PEX x 2½" PEX x 1½" PEX	Q4753215	3 3/8 86	1 5/8 41	1 5/8 41	2 13/16 72	1 9/16 39	1 11/16 43
3" PEX x 2½" PEX x 2" PEX	Q4753252	3 3/8 86	2 51	2 51	2 13/16 72	1 9/16 39	2 3/16 56
3" PEX x 3" PEX x ¾" PEX	Q4753375	3 3/8 86	1 1/8 29	1 1/8 29	3 3/8 86	1 9/16 39	15/16 24
3" PEX x 3" PEX x 1" PEX	Q4753310	3 3/8 86	1 1/4 32	1 1/4 32	3 3/8 86	1 9/16 39	1 3/16 30
3" PEX x 3" PEX x 1¼" PEX	Q4753313	3 3/8 86	1 1/2 38	1 1/2 38	3 3/8 86	1 9/16 39	1 7/16 37
3" PEX x 3" PEX x 1½" PEX	Q4753315	3 3/8 86	1 5/8 41	1 5/8 41	3 3/8 86	1 9/16 39	1 11/16 43
3" PEX x 3" PEX x 2" PEX	Q4753320	3 3/8 86	2 51	2 51	3 3/8 86	1 9/16 39	2 13/16 72
3" PEX x 3" PEX x 2½" PEX	Q4753325	3 3/8 86	2 1/2 64	2 1/2 64	3 3/8 86	1 9/16 39	2 13/16 72



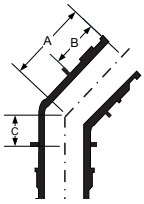
ProPEX tees		A	B	C
Description	Part no.	in	in	in
		mm	mm	mm
½" PEX x ½" PEX x ½" PEX	Q4755050	¾	9/16	⅜
		19	15	10
½" PEX x ½" PEX x ½" PEX	LF4705050	11/16	9/16	5/16
		18	14	8
¾" PEX x ¾" PEX x ¾" PEX	Q4757575	15/16	11/16	½
		24	18	13
¾" PEX x ¾" PEX x ¾" PEX	LF4707575	15/16	11/16	⅜
		24	18	10
1" PEX x 1" PEX x 1" PEX	Q4751010	1 3/16	⅞	11/16
		30	22	18
1" PEX x 1" PEX x 1" PEX	LF4701010	1 3/16	⅞	9/16
		30	22	14
1¼" PEX x 1¼" PEX x 1¼" PEX	Q4751313	1 7/16	15/16	15/16
		37	25	24
1½" PEX x 1½" PEX x 1½" PEX	Q4751515	1 11/16	1 3/16	1⅛
		43	30	28
2" PEX x 2" PEX x 2" PEX	Q4752000	2 3/16	1 9/16	1⅝
		56	40	41
2½" PEX x 2½" PEX x 2½" PEX	Q4752500	2 13/16	2 7/16	1 5/16
		72	62	34
3" PEX x 3" PEX x 3" PEX	Q4753000	3⅜	2¾	1 7/16
		86	70	37



EP elbow

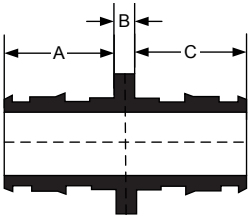


Brass elbow

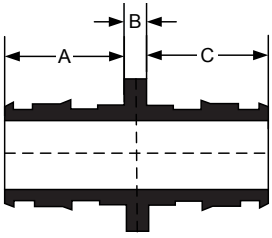


EP elbow

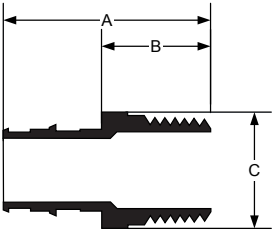
ProPEX elbows		A	B	C	D	E
Description	Part no.	in mm	in mm	in mm	in mm	in mm
½" PEX x ½" PEX EP Elbow	Q4760500	1 1/16 21	¾ 19	9/16 14	¼ 7	
¾" PEX x ¾" PEX EP Elbow	Q4760750	1 1/16 27	15/16 24	1 1/16 17	⅜ 10	
¾" PEX x ¾" PEX Brass Elbow	LF4710750	1 1/16 27	15/16 24	1 1/16 18	⅜ 10	⅜ 10
1" PEX x 1" PEX EP Elbow	Q4761000	1⅝ 42	1 3/16 30	⅞ 22	13/16 20	
1" PEX x 1" PEX Brass Elbow	LF4711000	1¼ 32	1 3/16 30	⅞ 22	13/16 14	9/16 14
1¼" PEX x 1¼" PEX EP Elbow	Q4761250	1¾ 43	1 7/16 37	1⅛ 28	⅝ 15	
1½" PEX x 1½" PEX EP Elbow	Q4761500	1⅞ 47	1 11/16 43	1 3/16 30	1 1/16 17	
1½" PEX x 1½" PEX 45 Elbow	Q4761515	2 5/16 59	1 11/16 43	⅝ 15		
2" PEX x 2" PEX EP Elbow	Q4762000	2 9/16 65	2 3/16 56	1⅝ 41	15/16 24	
2" PEX x 2" PEX 45 Elbow	Q4762020	2 15/16 74	2 3/16 56	¾ 19		
2½" PEX x 2½" PEX EP Elbow	Q4762500	3 5/16 84	2 13/16 72	2⅛ 53	1 3/16 31	
2½" PEX x 2½" PEX 45 Elbow	Q4762525	3 13/16 97	2 13/16 72	1 25		
3" PEX x 3" PEX EP Elbow	Q4763000	3 15/16 99	3⅜ 86	2½ 64	1 7/16 36	
3" PEX x 3" PEX 45 Elbow	Q4763030	4½ 114	3⅜ 86	1⅛ 28		



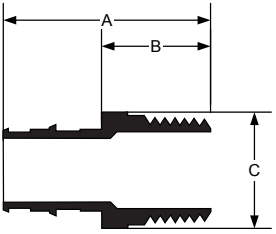
ProPEX couplings		A	B	C
Description	Part no.	in mm	in mm	in mm
½" PEX x ½" PEX	Q4775050	¾ 19	⅛ 3	¾ 19
	LF4545050	11/16 18	⅛ 3	11/16 18
¾" PEX x ¾" PEX	Q4777575	15/16 24	⅛ 3	15/16 24
	LF4547575	15/16 24	⅛ 3	15/16 24
1" PEX x 1" PEX	Q4771010	1 3/16 30	⅛ 3	1 3/16 30
	LF4541010	1 3/16 30	⅛ 3	1 3/16 30
1¼" PEX x 1¼" PEX	Q4771313	1 7/16 37	⅛ 3	1 7/16 37
1½" PEX x 1½" PEX	Q4771515	1 11/16 44	⅛ 3	1 11/16 44
2" PEX x 2" PEX	Q4772020	2 3/16 56	¼ 6	2 3/16 56
2½" PEX x 2½" PEX	Q4772525	2 13/16 72	¼ 6	2 13/16 72
3" PEX x 3" PEX	Q4773030	3⅜ 86	¼ 6	3⅜ 86



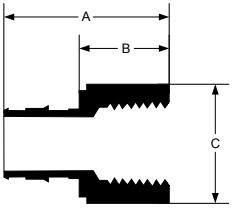
ProPEX reducing couplings		A	B	C
Description	Part no.	in mm	in mm	in mm
¾" PEX x ½" PEX	Q4775075	15⁄16 24	⅛ 3	¾ 19
1" PEX x ¾" PEX	Q4777510	1 3⁄16 30	⅛ 3	15⁄16 24
	LF4547510	1 3⁄16 30	⅛ 3	15⁄16 24
1¼" PEX x ¾" PEX	Q4771307	1 7⁄16 37	⅛ 3	15⁄16 24
1¼" PEX x 1" PEX	Q4771310	1 7⁄16 37	⅛ 3	1 3⁄16 30
1½" PEX x ¾" PEX	Q4771507	1 11⁄16 44	⅛ 3	15⁄16 24
1½" PEX x 1" PEX	Q4771510	1 11⁄16 44	⅛ 3	1 3⁄16 30
1½" PEX x 1¼" PEX	Q4771513	1 11⁄16 44	⅛ 3	1 7⁄16 37
2" PEX x 1½" PEX	Q4772015	2 3⁄16 56	¼ 6	1 11⁄16 44
2½" PEX x 1¼" PEX	Q4772513	2 13⁄16 72	¼ 6	1 7⁄16 37
2½" PEX x 1½" PEX	Q4772515	2 13⁄16 72	¼ 6	1 11⁄16 44
2½" PEX x 2" PEX	Q4772520	2 13⁄16 72	¼ 6	2 3⁄16 56
3" PEX x 2" PEX	Q4773020	3⅜ 86	¼ 6	2 3⁄16 56
3" PEX x 2½" PEX	Q4773025	3⅜ 86	¼ 6	2 13⁄16 72



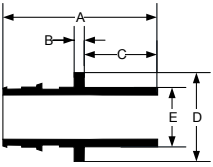
ProPEX brass male threaded adapters		A	B	C
Description	Part no.	in	in	in
		mm	mm	mm
⅜" PEX x ½" NPT	LF4523850	1⅝	1	⅞
		41	25	22
½" PEX x ½" NPT	Q5525050	1⅝	⅞	⅞
		41	23	22
	LF4525050	1 11/16	15/16	⅞
		42	24	22
½" PEX x ¾" NPT	LF4525075	1 13/16	1 1/16	1⅛
		45	27	29
¾" PEX x ¾" NPT	LF4527575	1⅞	1	1⅛
		48	25	29
	Q5527575	1⅞	⅞	1⅛
		47	23	29
¾" PEX x 1" NPT	LF4527510	2¼	1¼	1⅜
		56	32	35
	Q5527510	2	1 1/16	1⅜
		51	27	35
1" PEX x ¾" NPT	LF4521075	2¼	1 1/16	1¼
		57	27	32
	Q5521075	2 1/16	1 1/16	1¼
		53	27	32
1" PEX x 1" NPT	LF4521010	2 5/16	1⅛	1⅜
		59	29	35
	Q5521010	2¼	1 1/16	1⅜
		57	27	35
1¼" PEX x 1¼" NPT	LF4521313	2⅝	1 3/16	1¾
		66	30	44
	Q5521313	2½	1 1/16	1¾
		64	27	44



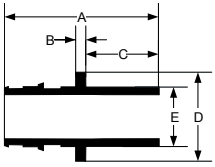
ProPEX brass male threaded adapters		A	B	C
Description	Part no.	in	in	in
		mm	mm	mm
1½" PEX x 1½" NPT	LF4521515	3	1¼	2
		76	32	51
	Q5521515	2 15/16	1¼	2
		74	32	51
2" PEX x 2" NPT	LF4522020	3 9/16	1⅜	2⅜
		90	35	60
	Q5522020	3 7/16	1 5/16	2⅜
		87	33	60
2½" PEX x 2½" NPT	LF4522525	4 13/16	2	3¼
		123	51	83
3" PEX x 3" NPT	LF4523030	5½	2⅛	3¾
		140	55	95



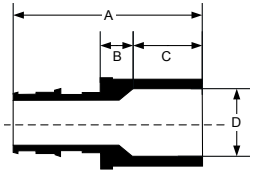
ProPEX brass female threaded adapters		A	B	C
Description	Part no.	in mm	in mm	in mm
½" PEX x ½" NPT	Q5575050	1 9/16 40	7/8 22	1 25
	LF4575050	1 9/16 40	7/8 22	1 25
½" PEX x ¾" NPT	LF4575075	1¾ 44	1 1/16 26	1 3/16 30
¾" PEX x ¾" NPT	Q5577575	1⅞ 47	7/8 23	1 3/16 30
	LF4577575	1⅞ 47	7/8 23	1 3/16 30
¾" PEX x 1" NPT	Q5577510	2⅛ 54	1 3/16 32	1½ 38
	LF4577510	2 3/16 56	1¼ 32	1½ 38
1" PEX x 1" NPT	Q5571010	2⅜ 60	1 3/16 30	1½ 38
	LF4571010	2⅜ 60	1 3/16 30	1½ 38
1¼" PEX x 1¼" NPT	Q5571313	2 9/16 65	1⅛ 28	2 51
	LF4571313	2 9/16 65	1⅛ 28	2 51
1½" PEX x 1½" NPT	Q5571515	2⅞ 73	1⅛ 29	2¼ 57
	LF4571515	2⅞ 73	1⅛ 29	2¼ 57
2" PEX x 2" NPT	Q5572020	3 9/16 90	1⅜ 35	3 76
	LF4572020	3 9/16 90	1⅜ 35	3 76



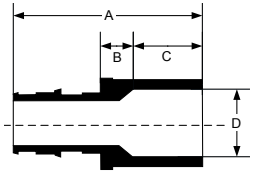
ProPEX brass fitting adapters		A	B	C	D	E
Description	Part no.	in mm	in mm	in mm	in mm	in mm
½" PEX x ½" Copper	LF4505050	1⅜ 35	⅛ 3	9/16 14	¾ 19	⅝ 16
	Q5505050	1 11/16 43	⅛ 3	⅞ 22	¾ 19	⅝ 16
½" PEX x ¾" Copper	LF4505075	1⅝ 42	⅛ 3	13/16 21	15/16 23	⅞ 22
⅝" PEX x ½" Copper	Q4506350	1 9/16 39	⅛ 3	9/16 14	1 1/16 26	⅝ 16
⅝" PEX x ¾" Copper	Q4506375	1 13/16 46	⅛ 3	13/16 21	15/16 24	⅞ 22
¾" PEX x ½" Copper	LF4507550	1⅝ 41	⅛ 3	9/16 14	1⅛ 28	⅝ 16
	Q5507550	1 15/16 50	⅛ 3	⅞ 22	1⅛ 28	⅝ 16
¾" PEX x ¾" Copper	LF4507575	1⅞ 48	⅛ 3	13/16 21	1⅛ 28	⅞ 22
	Q5507575	2 1/16 53	⅛ 3	1 25	1⅛ 28	⅞ 22
¾" PEX x 1" Copper	LF4507510	2 1/16 53	⅛ 3	1 25	1 3/16 30	1⅛ 28
	Q5507510	2 1/16 53	⅛ 3	1 25	1⅛ 29	1⅛ 28
1" PEX x 1" Copper	LF4501010	2¼ 58	⅛ 3	1 25	1⅜ 35	1⅛ 29
	Q5501010	2 5/16 59	⅛ 3	1 25	1⅜ 35	1⅛ 29
1¼" PEX x 1¼" Copper	LF4501313	2⅝ 66	⅛ 3	1 25	1⅝ 42	1⅜ 35
	Q5501313	2 11/16 69	⅛ 3	1⅛ 29	1¾ 44	1⅜ 35



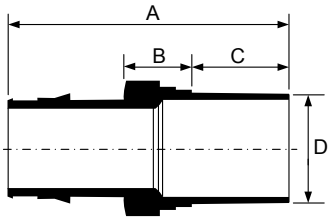
ProPEX brass fitting adapters		A	B	C	D	E
Description	Part no.	in	in	in	in	in
		mm	mm	mm	mm	mm
1½" PEX x 1½" Copper	LF4501515	3	⅛	1 3/16	1⅞	1⅝
		76	3	29	48	41
	Q5501515	3⅜	⅛	1 9/16	1⅞	1⅝
		86	3	40	48	41
2" PEX x 2" Copper	LF4502020	3 13/16	¼	1 7/16	2⅝	2⅛
		97	6	36	66	54
	Q5502020	4⅛	¼	1¾	2 11/16	2⅛
		105	6	44	68	54



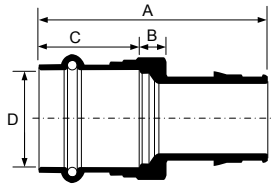
ProPEX brass sweat adapters		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
⅜" PEX x ½" Copper	LF4513850	1 5/16 34	¼ 6	½ 13	⅝ 16
½" PEX x ½" Copper	LF4515050	1⅜ 35	3/16 5	½ 13	⅝ 16
	Q5515050	1⅜ 35	3/16 5	½ 13	⅝ 16
½" PEX x ¾" Copper	LF4515075	1⅝ 41	3/16 5	¾ 19	⅞ 22
¾" PEX x ½" Copper	LF4517550	1 11/16 42	¼ 6	½ 13	⅝ 16
	Q5517550	1 11/16 42	¼ 6	½ 13	⅝ 16
¾" PEX x ¾" Copper	LF4517575	1⅞ 47	3/16 5	¾ 19	⅞ 22
	Q5517575	1⅞ 47	3/16 5	¾ 19	⅞ 22
¾" PEX x 1" Copper	LF4517510	2⅛ 53	¼ 6	15/16 23	1⅛ 29
	Q5517510	2⅛ 53	¼ 6	15/16 23	1⅛ 29
1" PEX x 1" Copper	LF4511010	2¼ 58	3/16 5	15/16 23	1⅛ 29
	Q5511010	2¼ 58	3/16 5	15/16 23	1⅛ 29
1¼" PEX x 1¼" Copper	LF4511313	2⅝ 66	3/16 5	1 25	1⅜ 35
	Q5511313	2⅝ 66	3/16 5	1 25	1⅜ 35



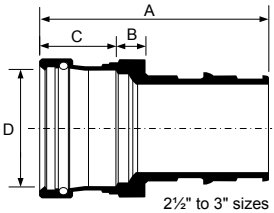
ProPEX brass sweat adapters		A	B	C	D
Description	Part no.	in	in	in	in
		mm	mm	mm	mm
1½" PEX x 1½" Copper	LF4511515	3 3/16	¼	1 1/16	1 5/8
		78	6	28	41
	Q5511515	3 3/16	¼	1 1/16	1 5/8
		78	6	28	41
2" PEX x 2" Copper	LF4512020	3¾	¼	1 5/16	2⅛
		95	6	34	54
	Q5512020	3¾	¼	1 5/16	2⅛
		95	6	34	54
2½" PEX x 2½" Copper	LF4512525	4 9/16	5/16	1 7/16	2⅝
		116	8	37	67
3" PEX x 3" Copper	LF4513030	5 5/16	5/16	1 11/16	3⅛
		135	8	42	80



ProPEX LF brass copper press fitting adapters		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
½" PEX x ½" copper	LFP4505050	2 51	9/16 14	¾ 19	⅝ 16
¾" PEX x ¾" copper	LFP4507575	2⅜ 61	⅝ 15	⅞ 22	⅞ 22
1" PEX x 1" copper	LFP4501010	2⅞ 73	11/16 17	1 25	1⅛ 29
1¼" PEX x 1¼" copper	LFP4501313	3 5/16 84	¾ 19	1 1/16 27	1⅜ 35
1½" PEX x 1½" copper	LFP4501515	3⅞ 99	¾ 19	1 7/16 36	1⅝ 41
2" PEX x 2" copper	LFP4502020	4⅝ 118	15/16 24	1 9/16 40	2⅛ 54
2½" PEX x 2½" copper	LFP4502525	5⅞ 149	1⅜ 36	1⅝ 41	2⅝ 67
3" PEX x 3" copper	LFP4503030	6 11/16 169	1½ 38	1 13/16 46	3⅛ 79

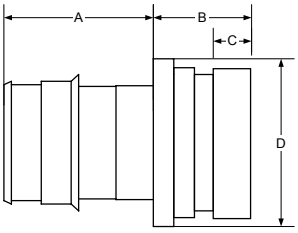


½" to 2" sizes

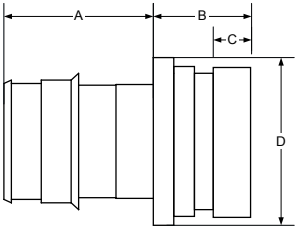


2½" to 3" sizes

ProPEX LF brass copper press adapters		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
½" PEX x ½" copper	LFP4515050	2 1/16 53	7/16 11	7/8 22	5/8 16
¾" PEX x ¾" copper	LFP4517575	2 3/8 61	9/16 14	7/8 22	7/8 22
1" PEX x 1" copper	LFP4511010	2 11/16 68	5/16 8	1 3/16 30	1 1/8 29
1¼" PEX x 1¼" copper	LFP4511313	3 1/16 77	9/16 14	1 25	1 3/8 35
1½" PEX x 1½" copper	LFP4511515	3 5/8 91	9/16 14	1 5/16 34	1 5/8 42
2" PEX x 2" copper	LFP4512020	4 5/8 118	½ 12	2 51	2 1/8 54
2½" PEX x 2½" copper	LFP4512525	5 1/4 133	11/16 17	1 3/4 44	2 5/8 67
3" PEX x 3" copper	LFP4513030	6 1/8 156	15/16 24	1 15/16 49	3 1/8 80

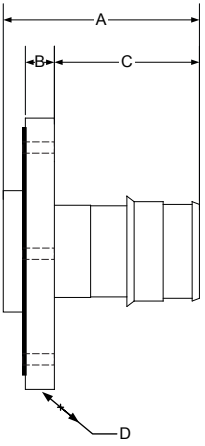


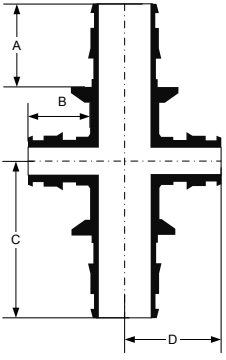
ProPEX LF brass groove fitting adapters		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
2" PEX x 2" CTS Groove	LFV2962020	2⅛ 54	1½ 38	⅝ 15	2 11/16 68
2" PEX x 2½" CTS Groove	LFV2962025	2⅛ 54	1½ 38	⅝ 15	2 11/16 68
2½" PEX x 2½" CTS Groove	LFV2962525	2 13/16 72	1½ 38	⅝ 15	3⅜ 86
3" PEX x 3" CTS Groove	LFV2963030	3⅜ 86	1½ 38	⅝ 15	3 13/16 96
2" PEX x 2" IPS Groove	LFV2972020	2⅛ 54	1½ 38	⅝ 15	2 11/16 68
2" PEX x 2½" IPS Groove	LFV2972025	2⅛ 54	1½ 38	⅝ 15	2⅞ 73
2½" PEX x 2" IPS Groove	LFV2972520	2 13/16 72	1½ 38	⅝ 15	3⅜ 86
2½" PEX x 2½" IPS Groove	LFV2972525	2 13/16 72	1½ 38	⅝ 15	3⅜ 86



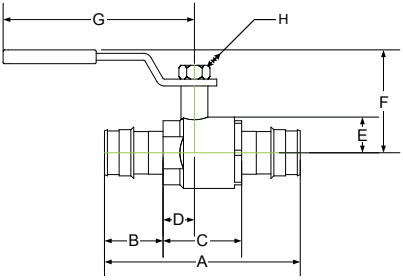
ProPEX LF brass groove fitting adapters		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
2½" PEX x 3" IPS Groove	LFV2972530	2 13/16 72	1½ 38	⅝ 15	3½ 89
3" PEX x 2½" IPS Groove	LFV2973025	3⅜ 86	1½ 38	⅝ 15	3 13/16 96
3" PEX x 3" IPS Groove	LFV2973030	3⅜ 86	1½ 38	⅝ 15	3 13/16 96

ProPEX LF brass flange adapter		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
2½" PEX x Flange	LF2982525	3¾ 96	⅝ 16	2 13/16 72	7 178
3" PEX x Flange	LF2983030	4 5/16 110	⅝ 16	4 1/16 104	7½ 191

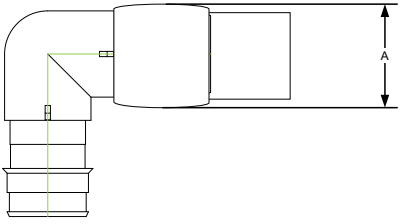




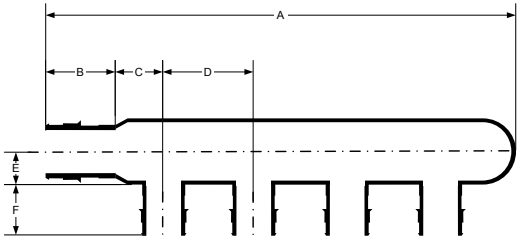
ProPEX EP opposing-port tees		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
1" PEX x 1" PEX x ¾" PEX x ¾" PEX	Q4801075	1 3/16 30	15/16 24	2 1/16 53	1 5/8 41
1¼" PEX x 1¼" PEX x ¾" PEX x ¾" PEX	Q4801375	1 7/16 37	15/16 24	2 3/8 60	1 3/4 44
1½" PEX x 1½" PEX x ¾" PEX x ¾" PEX	Q4801575	1 11/16 43	15/16 24	2 11/16 69	1 15/16 49
2" PEX x 2" PEX x ¾" PEX x ¾" PEX	Q4802075	2 3/16 56	15/16 24	3 3/16 81	2 51



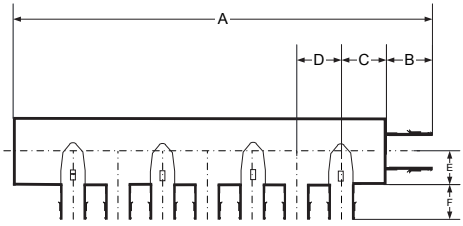
ProPEX brass ball valves		A	B	C	D	E	F	G	H
Description	Part no.	in	in	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm	mm	mm
½" PEX x ½" PEX	A3205050	2½	11/16	1 1/16	3/8	½	1 11/16	3 3/8	3/8
		64	18	27	10	12	43	86	10
	LFC4825050	2½	11/16	1 1/16	3/8	½	1 11/16	3 3/8	3/8
		64	18	27	10	12	43	86	10
¾" PEX x ¾" PEX	A3207575	3 3/8	15/16	1½	½	½	1 7/8	3 3/8	3/8
		86	24	38	12	12	47	86	10
	LFC4827575	3 3/8	15/16	1½	½	½	1 7/8	3 3/8	3/8
		86	24	38	12	12	47	86	10
1" PEX x 1" PEX	A3201010	4 3/16	1 3/16	1 13/16	¾	13/16	1 7/8	4 7/16	½
		106	30	46	19	20	48	114	12
	LFC4821010	4 3/16	1 3/16	1 13/16	¾	13/16	1 7/8	4 7/16	½
		106	30	46	19	20	48	114	12
1¼" PEX x 1¼" PEX	A3201313	4 13/16	1 7/16	1 15/16	5/8	15/16	2¼	4 7/16	½
		122	37	49	17	24	58	114	12
	LFC4821313	4 13/16	1 7/16	1 15/16	5/8	15/16	2¼	4 7/16	½
		122	37	49	17	24	58	114	12
1½" PEX x 1½" PEX	A3201515	5 11/16	1 11/16	2 1/8	15/16	1 1/8	2 11/16	5 9/16	9/16
		145	43	58	23	28	69	142	14
	LFC4821515	5 11/16	1 11/16	2 1/8	15/16	1 1/8	2 11/16	5 9/16	9/16
		145	43	58	23	28	69	142	14
2" PEX x 2" PEX	A3202020	7 1/8	2 1/8	2 13/16	1 1/8	1 7/16	3 3/8	5 9/16	9/16
		181	55	72	28	37	86	142	14
	LFC4822020	7 1/8	2 1/8	2 13/16	1 1/8	1 7/16	3 3/8	5 9/16	9/16
		181	55	72	28	37	86	142	14



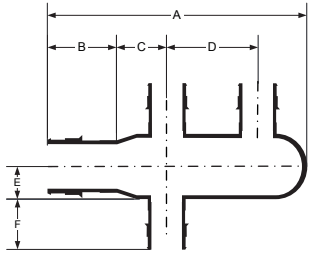
ProPEX ring installed diameter		A
Description	Part no.	in
		mm
½" ProPEX ring with stop	Q4690512	15/16
		24
¾" ProPEX ring with stop	Q4690756	1¼
		32
1" ProPEX ring with stop	Q4691000	1 9/16
		40
1¼" ProPEX ring with stop	Q4691250	1 13/16
		47
1½" ProPEX ring with stop	Q4691500	2 1/16
		53
2" ProPEX ring with stop	Q4692000	2 15/16
		74
2½" ProPEX ring with stop	Q4692500	3 9/16
		91
3" ProPEX ring with stop	Q4693000	4¼
		108



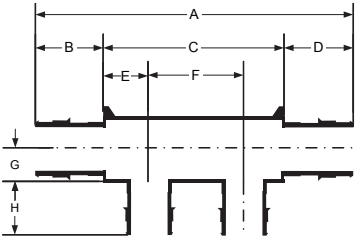
EP branch multiport tees		A	B	C	D	E	F
Description	Part no.	in mm	in mm	in mm	in mm	in mm	in mm
¾" EP Branch Multiport Tee, 3 outlets	Q2237550	5⅛ 131	15/16 24	⅝ 16	1¼ 32	7/16 12	¾ 19
1¼" EP Branch Multiport Tee, 3 outlets	Q2231375	6⅞ 174	1 7/16 37	⅞ 23	1¾ 44	11/16 18	15/16 24
¾" EP Branch Multiport Tee, 4 outlets	Q2247550	6⅜ 163	15/16 24	⅝ 16	1¼ 32	7/16 12	¾ 19
1" EP Branch Multiport Tee, 4 outlets	Q2241050	6 11/16 170	1 3/16 30	13/16 21	1¼ 32	⅝ 15	¾ 19
¾" EP Branch Multiport Tee, 6 outlets	Q2267550	8⅞ 226	15/16 24	⅝ 16	1¼ 32	7/16 12	¾ 19
1" EP Branch Multiport Tee, 6 outlets	Q2261050	9¼ 235	1 3/16 30	⅝ 16	1¼ 32	9/16 14	¾ 19



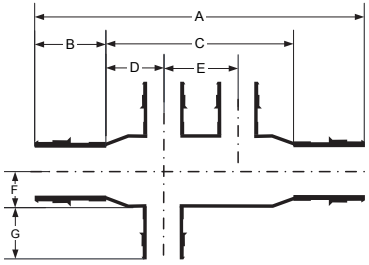
Commercial EP branch multiport tees		A	B	C	D	E	F
Description	Part no.	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm
¾" EP Branch Multiport Tee, 7 outlets	Q2277550	8 11/16	15/16	1 1/8	7/8	11/16	¾
		220	24	28	23	18	19
¾" EP Branch Multiport Tee, 8 outlets	Q2287550	9 9/16	15/16	1 1/8	7/8	11/16	¾
		243	24	28	23	18	19
1" EP Branch Multiport Tee, 7 outlets	Q2271051	8 7/8	1 3/16	1 1/8	7/8	11/16	¾
		226	30	28	23	18	19
1" EP Branch Multiport Tee, 8 outlets	Q2281051	9 13/16	1 3/16	1 1/8	7/8	11/16	¾
		249	30	28	23	18	19
1" EP Branch Multiport Tee, 10 outlets	Q2101051	11 9/16	1 3/16	1 1/8	7/8	11/16	¾
		294	30	28	23	18	19
1" EP Branch Multiport Tee, 12 outlets	Q2121051	13 3/8	1 3/16	1 1/8	7/8	11/16	¾
		340	30	28	23	18	19



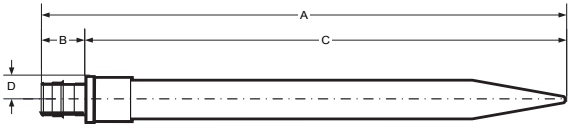
EP branch opposing-port multiport tees		A	B	C	D	E	F
Description	Part no.	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm
¾" EP Branch Opposing-port Multiport Tee, 3 outlets	Q2337550	3 9/16	15/16	5/8	1 1/4	7/16	¾
		91	24	16	32	11	19
¾" EP Branch Opposing-port Multiport Tee, 4 outlets	Q2347550	3 9/16	15/16	5/8	1 1/4	7/16	¾
		91	24	16	32	11	19
¾" EP Branch Opposing-port Multiport Tee, 8 outlets	Q2387550	6 1/16	15/16	5/8	1 1/4	7/16	¾
		154	24	16	32	11	19



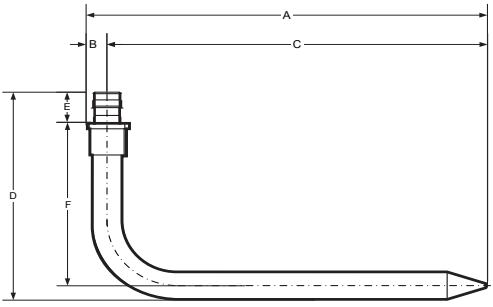
EP flow-through multiport tees		A	B	C	D	E	F	G	H
Description	Part no.	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm
2 outlets, ¾" x ¾"	Q2227557	4 3/8 112	15/16 24	2 1/2 64	15/16 24	5/8 16	1 1/4 32	7/16 11	3/4 19
3 outlets, ¾" x ¾"	Q2237557	5 11/16 143	15/16 24	3 3/4 95	15/16 24	5/8 16	1 1/4 32	7/16 11	3/4 19
3 outlets, 1" x ¾"	Q2231057	6 3/16 157	1 3/16 30	4 1/16 103	15/16 24	3/4 19	1 1/4 32	9/16 14	3/4 19
3 outlets, 1¾" x 1¼"	Q2231373	8 3/16 208	1 7/16 37	5 5/16 135	1 7/16 37	7/8 23	1 3/4 44	5/8 17	1 25
3 outlets, 2" x 2"	Q2232102	10 5/8 269	2 3/16 56	6 1/4 158	2 3/16 56	1 1/8 28	2 51	15/16 24	1 5/16 33
4 outlets, ¾" x ¾"	Q2247557	7 13/16 198	15/16 24	5 7/8 150	15/16 24	11/16 18	1 1/2 38	7/16 11	3/4 19
4 outlets, 1" x ¾"	Q2241057	7 1/8 180	1 3/16 30	5 127	15/16 24	5/8 16	1 1/4 32	9/16 14	3/4 19
4 outlets, 1" x 1"	Q2241051	7 11/16 195	1 3/16 30	5 5/16 135	1 3/16 30	3/4 19	1 1/4 32	9/16 14	3/4 19
6 outlets, ¾" x ¾"	Q2267557	9 3/8 239	15/16 24	7 1/2 191	15/16 24	5/8 16	1 1/4 32	7/16 11	3/4 19
6 outlets, 1" x ¾"	Q2261057	9 5/8 244	1 3/16 30	7 1/2 191	15/16 24	5/8 16	1 1/4 32	9/16 14	3/4 19
6 outlets, 1" x 1"	Q2261051	9 7/8 251	1 3/16 30	7 1/2 191	1 3/16 30	5/8 16	1 1/4 32	9/16 14	3/4 19



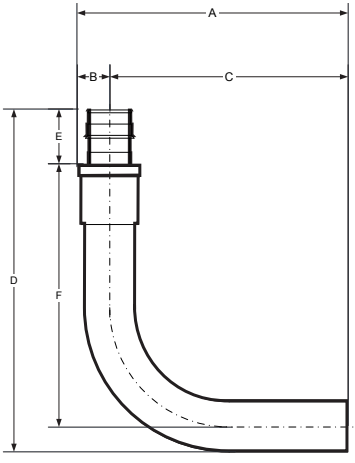
EP flow-through opposing-port multiport tees		A	B	C	D	E	F	G
Description	Part no.	in mm	in mm	in mm	in mm	in mm	in mm	in mm
3 outlets, ¾" x ¾"	Q2337557	4 7/16 112	15/16 24	2½ 63	⅝ 16	1¼ 32	½ 12	¾ 19
4 outlets, ¾" x ¾"	Q2347557	4 7/16 112	15/16 24	2½ 63	⅝ 16	1¼ 32	½ 12	¾ 19
6 outlets, ¾" x ¾"	Q2367557	5 11/16 144	15/16 24	3¾ 95	⅝ 16	1¼ 32	½ 12	¾ 19



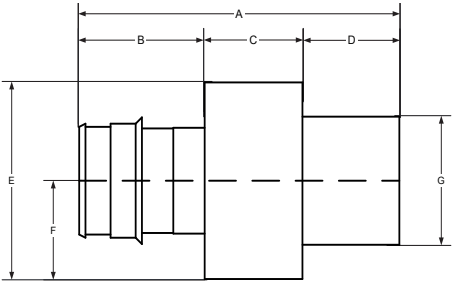
ProPEX LF copper straight stubs		A	B	C	D
Description	Part no.	in mm	in mm	in mm	in mm
½" PEX LF Brass x ½" Copper, 8"	LF2935050	8 5/16 211	11/16 18	7 9/16 193	⅜ 10
½" PEX LF Brass x ½" Copper, 15"	LF2945050	14½ 368	11/16 18	13 13/16 350	⅜ 10
2½" PEX LF Brass x 2½" Copper	LF2962525	12⅛ 308	2 13/16 72	9¼ 236	1 13/16 46
3" PEX LF Brass x 3" Copper	LF2963030	13 11/16 347	3⅜ 86	10 5/16 261	2⅛ 53



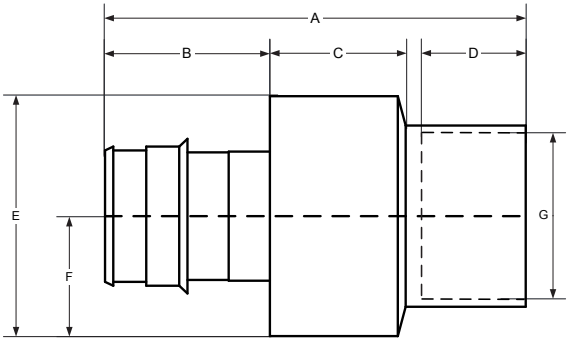
ProPEX LF copper stub ells		A	B	C	D	E	F
Description	Part no.	in mm	in mm	in mm	in mm	in mm	in mm
½" PEX LF Brass x ½" Copper, 3½" x 8"	LF2865050	8 3/8 213	3/8 10	8 203	4 3/4 121	11/16 18	3 3/4 95
½" PEX LF Brass x ½" Copper, 13" x 8"	LF2855050	8 3/8 213	3/8 10	8 203	13 5/16 338	11/16 18	12 5/16 312
½" PEX LF Brass x ½" Copper, 8" x 13"	LF2895050	13 3/8 340	3/8 10	13 330	13 5/16 338	11/16 18	7 5/16 185
¾" PEX LF Brass x ¾" Copper, 4" x 8"	LF2897575	8 9/16 217	9/16 14	8 203	5 7/16 138	15/16 24	4 1/16 103
1" PEX LF Brass x 1" Copper, 12" x 12"	LF2891010	13 11/16 347	11/16 17	13 330	16 406	1 3/16 30	14 1/4 362



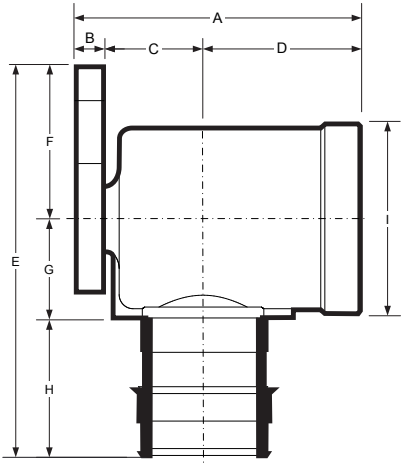
ProPEX LF copper tub ells		A	B	C	D	E	F
Description	Part no.	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm
½" PEX LF Brass x ½" Copper, 3" x 6"	LF2875050	3⅜	⅜	3	6$^{5}/_{16}$	$^{11}/_{16}$	5¼
		86	10	76	160	18	134
½" PEX LF Brass x ½" Copper, 3" x 4"	LF2885050	3⅜	⅜	3	4$^{5}/_{16}$	$^{11}/_{16}$	3¼
		86	10	76	109	18	83



ProPEX LF brass CPVC spigot adapters		A	B	C	D	E	F	G
Description	Part no.	in	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm	mm
1¼" PEX x 1¼" CPVC (CTS)	CP4501313	3 11/16	1 7/16	1⅛	1⅛	2⅛	1 1/16	*
		94	37	29	29	54	27	35
1½" PEX x 1½" CPVC (CTS)	CP4501515	4 3/16	1 11/16	1 3/16	1 5/16	2⅜	1 3/16	1⅝
		107	43	30	34	61	30	41
2" PEX x 2" CPVC (CTS)	CP4502020	5 3/16	2 3/16	1 7/16	1¾	3	1½	2⅛
		134	56	36	44	76	38	54



ProPEX LF brass CPVC socket adapters		A	B	C	D	E	F	G
Description	Part no.	in	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm	mm
1¼" PEX x 1¼" CPVC (CTS)	CP4511313	3 11/16	1 7/16	1¼	1	2⅛	1 1/16	1⅜
		94	37	32	26	54	27	35
1½" PEX x 1½" CPVC (CTS)	CP4511515	4 3/16	1 11/16	1¼	1 5/16	2⅜	1 3/16	1⅝
		106	43	32	33	61	30	42
2" PEX x 2" CPVC (CTS)	CP4512020	5 3/16	2 3/16	1⅜	2	3	1½	2⅛
		133	56	35	43	76	38	54



ProPEX LF brass drop ear elbow		A	B	C	D	E	F	G	H	I
Description	Part no.	in	in	in	in	in	in	in	in	in
		mm	mm	mm	mm	mm	mm	mm	mm	mm
½" PEX x ½" FIP	LF4235050	1 11/16	¼	7/16	1	2 3/16	1	9/16	11/16	1 1/16
		43	6	11	26	56	26	14	18	26
¾" PEX x ¾" FIP	LF4237575	1 15/16	¼	¾	1	2 3/16	1 3/16	11/16	15/16	1 3/8
		49	6	19	26	56	29	17	24	35
1" PEX x ¾" FIP	LF4231010	2 7/16	¼	⅞	1 ¼	3 5/16	1 5/16	⅞	1 3/16	1 5/8
		62	6	22	32	84	33	22	30	42

Appendix D:
Uponor piping systems installation test questions

Please circle the correct answer below.

Section 1 – General installations

1. When making a ProPEX connection…

a. Place the ProPEX ring on the pipe to the stop edge

b. Make sure the head is installed and rotating properly

c. Do not force the pipe onto the head when expanding

d. Completely insert the fitting so the pipe/ring reach the fitting shoulder

e. All of the above

2. Maintain a minimum distance between ProPEX fittings...

a. To prevent damage to fittings

b. To prevent damage to expander heads

c. All of the above

3. When storing Uponor PEX piping…

a. Keep in its original packaging

b. Keep out of direct UV light

c. All of the above

4. When making ProPEX-to-copper transitions…

a. Maintain a minimum of 18" between solder/sweat and ProPEX connections

b. Make solder/sweat connections prior to making ProPEX connections

c. Use ProPEX copper press adapters for a flameless transition

d. All of the above

5. Uponor's full 25-year warranty requires using Uponor PEX pipe with Uponor ProPEX rings and fittings.

a. True

b. False

Section 2 – Residential and in-suite installations

6. Per the IPC and UPC, support bare Uponor PEX piping...

a. Every 32" (0.8m) horizontally for 1" and smaller pipe

b. Every 48" (1.2m) for 1¼" and larger pipe

c. Every 5 ft. (1.5m) vertically for all pipe sizes

d. All of the above

7. When installing Uponor PEX systems, be sure to…

a. Maintain a minimum distance of 12" (0.3m) from recessed light fixtures (unless insulated with suitable insulation)

b. Maintain a minimum distance of 5 ft. (1.5m) from fluorescent lights (unless insulated with suitable insulation)

c. Not use PEX between the tub/shower valve and tub spout

d. All of the above

8. When installing Uponor PEX piping systems below grade…

a. Use engineered polymer (EP) fittings approved for direct burial

b. Cover brass fittings with a minimum 6-mil poly wrap

c. Sleeve through concrete/masonry penetrations

d. All of the above

9. When pressure testing Uponor PEX piping systems…

a. Pressurize to 25 psi above working pressure or 100 psi

b. Use a mixture of water and air

c. Use air when allowed by local code

d. All of the above

Section 3 – Commercial installations

10. PEX pipe must be protected when passing through steel framing.

a. True b. False

11. What are the horizontal support requirements when using PEX-a Pipe Support?

a. Maximum support distance is 8 ft. (2.4m) for all pipe sizes

b. Support fittings 1½" and smaller within 12" (0.3m)

c. Clamp the pipe at a maximum of 32 ft. (9.7m)

d. All of the above

12. When installing PEX-a Pipe Support…

a. Minimize cutting by using full lengths when possible

b. Deburr sharp edges if cutting is required

c. Strap according to **Figures 35-38** in this guide

d. All of the above

13. To minimize expansion and contraction in systems with ΔTs greater than 40°F (22.2°C)…

a. Support PEX with PEX-a Pipe Support and included straps

b. Clamp the pipe at a maximum 32 ft. (9.7m) on center

c. Use fixed points according to length of run and pipe size

d. All of the above

14. When installing Uponor PEX piping for vertical riser applications…

a. Support at the base of each floor with a CTS riser clamp

b. Support every 5 ft. (1.5m)

c. Clamp at the top of the floors according to system type (e.g., domestic hot water, heating hot water, etc.)

d. All of the above

15. When pressure testing large-volume commercial PEX systems…

a. Fill system with potable water, air or a combination of both

b. Condition the pipe to 1.5 times the test pressure or 120 psi (8.2 bar) for 30 minutes

c. After 30 minutes, release excess pressure until you reach desired test pressure [80 psi (5.5 bar) recommended]

d. Monitor system for leaks over the required time period

e. All of the above

Notes

Notes

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