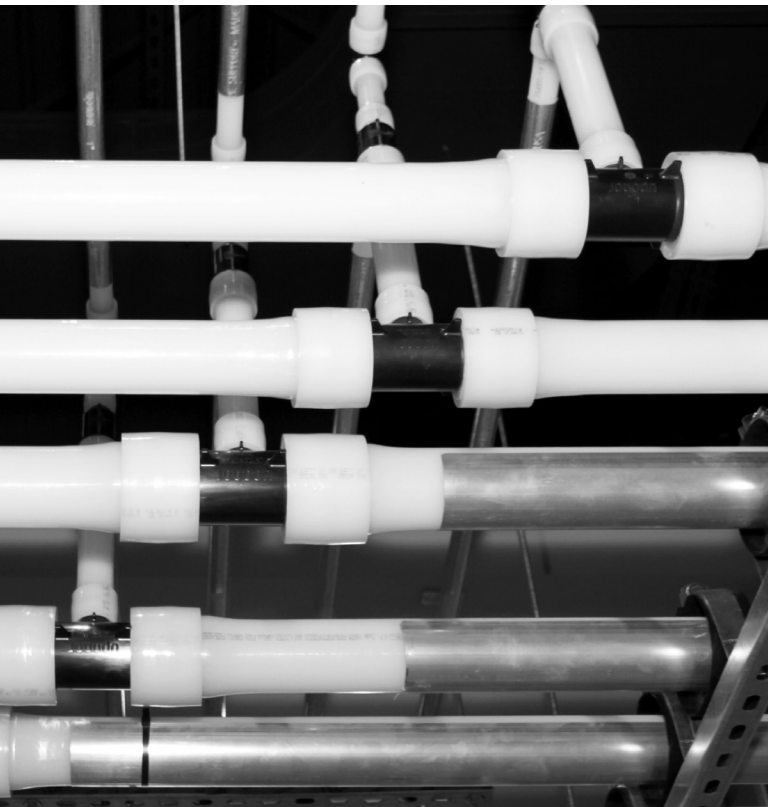
uponor

Commercial piping pocket guide



This pocket guide is published for mechanical contractors, installers and building officials interested in Uponor commercial 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 pocket 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 pocket guide or are not acceptable practices within the mechanical trades, codes or standards of practice.

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

Table of contents

Standards, codes and listings

Uponor PEX piping is manufactured to meet the following requirements.

Standards

ASTM International

- ASTM F876 Standard Specification for Cross-linked Polyethylene (PEX) Piping
- ASTM F877 Standard Specification for Cross-linked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
- ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Piping
- ASTM F2023 Standard Test Method for Evaluating the Oxidative Resistance of Cross-linked Polyethylene (PEX) Piping and Systems to Hot Chlorinated Water*
- ASTM F2657 Standard Test Method for Outdoor Weathering Exposure of Cross-linked Polyethylene (PEX) Piping
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Firestop Systems

NSF International

- ANSI/NSF Standard 14 Plastics Piping System Components and Related Materials
- ANSI/NSF Standard 61 Drinking Water System Components — Health Effects
- ANSI/NSF Standard 359 Valves for Crosslinked Polyethylene (PEX) Water Distribution Systems

*Specific to Uponor AquaPEX®

American Water Works Association (AWWA)

- AWWA C904 Cross-Linked Polyethylene (PEX) Pressure Pipe, ½" (12mm) through 3" (76mm) for Water Service

Underwriters Laboratories, Inc. (UL)

- ANSI/UL 263 Standard for Safety for Fire Tests of Building Construction and Materials
- UL 1821 Standard for Safety for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service (NFPA 13D applications only)
- UL 2846 Standard for Safety for Fire Test of Plastic Water Distribution Plumbing Pipe for Visible Flame and Smoke Characteristics

CSA Group (Canadian Standards Association)

- CAN/CSA B137.5 Crosslinked Polyethylene (PEX) Piping Systems for Pressure Applications
- CAN/CSA B214 Installation Code for Hydronic Heating Systems

American Society of Mechanical Engineers (ASME)

- ASME B16.5 Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard

Underwriters Laboratories of Canada (ULC)

- CAN/ULC-S102.2 Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies
- CAN/ULC-S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials
- CAN/ULC-S115 Standard Method of Fire Tests of Firestop Systems
- CAN/ULC/ORD-C199P Combustible Piping for Sprinkler Systems

Plastics Pipe Institute (PPI)

- PPI Technical Report TR-4

Codes

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

Listings

- cNSFus-fs
- cNSFus-rfh
- cNSFus-pw
- cQAIus
- UL
- CSA
- WH
- ETL
- PPI-TR-4
- ICC-ES-PMG
- IAPMO
- BMEC
- CCMC

Note: Obtain listings at qai.org, ul.com and nsf.org.

Making a ProPEX® connection

1. Square cut the pipe.
2. Place a ProPEX Ring on the end of the pipe. **Ensure the ring reaches the stop edge or overhangs the pipe $^{1}/_{16}$"**.
3. Expand the pipe and the ring, allowing the pipe to feed itself on to the head. **Do not force the pipe onto the expander head**.
4. Ensure the rotation of the expander head is occurring during each expansion.

   Note: If using the ProPEX 201 or Manual (Hand) Expander Tool, manually rotate the pipe or tool to ensure consistent expansion. Failure to rotate the pipe or tool will cause deep grooves in the piping which can result in potential leak paths.
5. Expand the pipe until it reaches the shoulder of the head; then complete a minimum of one to two additional expansions
6. Insert a ProPEX fitting into the end of the pipe.
7. Ensure the pipe and ring seat tight against the shoulder of the fitting.
8. Only perform the necessary number of expansions; **do not over expand the pipe**.

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.

   Note: If using the ProPEX 201 or Manual (Hand) Expander Tool, manually rotate the pipe or tool to ensure consistent expansion. Failure to rotate the pipe or tool will cause deep grooves in the piping which can result in potential leak paths.

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.

Minimum distance between fittings

Uponor requires a minimum distance between ProPEX fittings to protect the fittings and expansion heads from damage during the expansion process.

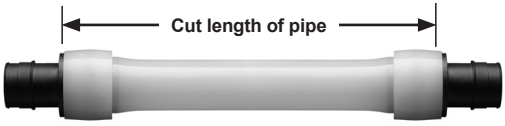


Figure 1: Minimum PEX length between fittings

Pipe size	Minimum cut length of pipe
½"	2"
¾"	3"
1"	3½"
1¼"	4½"
1½"	4½"
2"	6"
2½"	7½"
3"	9"

Table 1: Minimum PEX cut length

Uponor PEX bend radius

Nominal pipe size	O.D.	Minimum bend radius
⅜"	0.500"	3"
½"	0.625"	3.75"
¾"	0.785"	4.71"
1"	1.125"	6.75"
1¼"	1.375"	8.25"
1½"	1.625"	9.75"
2"	2.125"	12.75"
2½"	2.625"	15.75"
3"	3.125"	18.75"

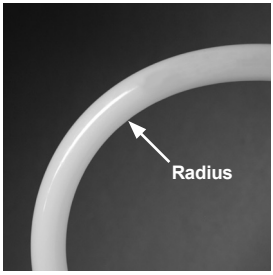


Figure 2: Bend radius

Table 2: Uponor PEX minimum bend radius

Uponor PEX ultraviolet (UV) resistance ratings

Product	Marking	UV resistance
Uponor AquaPEX White	5106	1 month
Uponor AquaPEX Blue	5206	3 months
Uponor AquaPEX Red	5206	3 months
Wirsbo hePEX™	5106	1 month

Table 3: Uponor PEX UV resistance ratings

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

Storing and handling guidelines

- 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 piping within 6" of any gas appliance vents.

Note: For double-wall b-vents or zero-clearance plastic vents, Uponor PEX must maintain a minimum 1" separation.

- Do not install Uponor PEX piping within 12" of any recessed light fixture unless the piping is protected with suitable insulation or the light is Insulation Contact (I.C.) rated.[1]
- Do not install Uponor PEX piping within 5 ft. of direct view from fluorescent lighting without sleeving the pipe with UV-blocking material.
- Do not solder, braze, weld or fusion-weld within 18" of any Uponor PEX piping in the same water line. Make any heat-related connections prior to making the ProPEX connection.
- Do not spray on or allow organic chemicals, strong acids or strong bases to come into contact with Uponor PEX piping.
- Do not use petroleum or solvent-based paints, greases or sealants on Uponor PEX piping.
- 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 standard ProPEX brass fittings (i.e. copper press).

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

[1] PEX must maintain a minimum 2" clearance unless insulated with a suitable insulation.

Supporting Uponor PEX pipe

Suspended runs of Uponor PEX pipe can be supported by the same conventional means as metallic pipe, using copper tube size (CTS) hangers and supports. However, support spacing will vary depending on local code requirements.

Note: Uponor recommends using hangers and supports designed for use with plastic piping.

Nominal pipe size	Spacing for bare PEX (Dimension A)			Spacing with PEX-a Pipe Support (Dimension B)		
	International Codes (IPC, IMC)	Uniform Codes (UPC, UMC)	National Plumbing Code of Canada (NPCC)	International Codes (IPC, IMC)	Uniform Codes (UPC, UMC)	National Plumbing Code of Canada (NPCC)
½"	32"	32"	32"	6 ft.	6 ft.	6 ft.
¾"	32"	32"	32"	6 ft.	6 ft.	6 ft.
1"	32"	32"	32"	8 ft.	8 ft.	8 ft.
1¼"	32"	48"	32"	8 ft.	8 ft.	8 ft.
1½"	32"	48"	32"	8 ft.	8 ft.	8 ft.
2"	32"	48"	32"	8 ft.	8 ft.	8 ft.
2½"	32"	48"	32"	8 ft.	8 ft.	8 ft.
3"	32"	48"	32"	8 ft.	8 ft.	8 ft.

Table 4: Horizontal support spacing requirements for Uponor PEX pipe

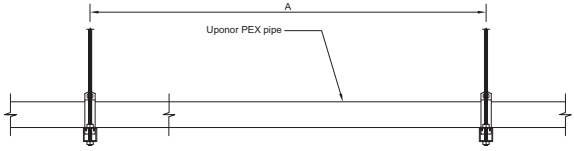


Figure 3: Maximum allowable support spacing for bare-PEX pipe

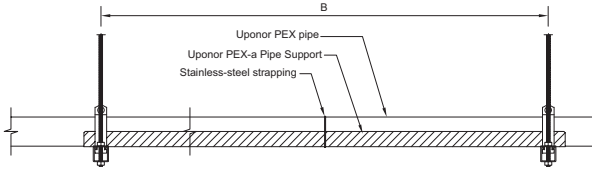


Figure 4: Maximum allowable support spacing for PEX pipe with PEX-a Pipe Support

Supporting fittings and valves

Sections of pipe with in-line fittings, such as tees, couplings and valves, must be supported per local code requirements.

Note: PEX-a Pipe Support cannot be used to increase hanger spacing of these pipe sections.

Nominal pipe size	Spacing for bare PEX (Dimension A)		
	International Codes (IPC, IMC)	Uniform Codes (UPC, UMC)	National Plumbing Code of Canada (NPCC)
½"	32"	32"	32"
¾"	32"	32"	32"
1"	32"	32"	32"
1¼"	32"	48"	32"
1½"	32"	48"	32"
2"	32"	48"	32"
2½"	32"	48"	32"
3"	32"	48"	32"

Table 5: Support requirements for fittings

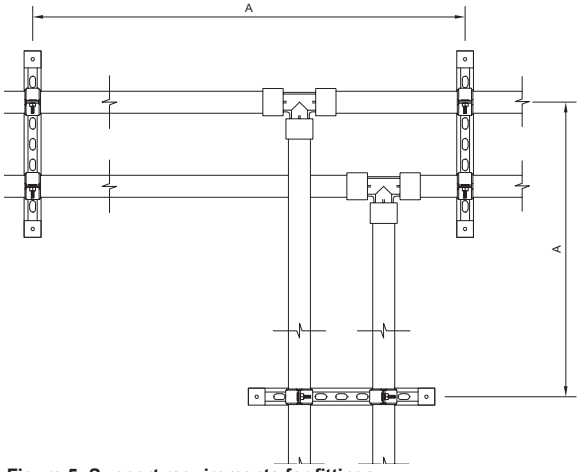


Figure 5: Support requirements for fittings

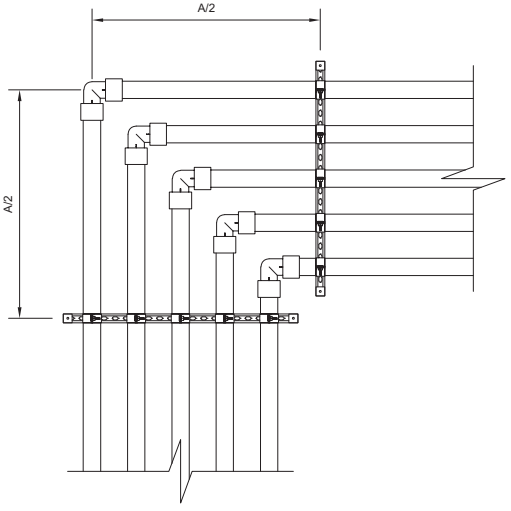


Figure 6: Support requirements for fittings at corners

If distance "A/2" is not attainable in **Figure 6**, an additional support is required as shown in **Figure 7**.

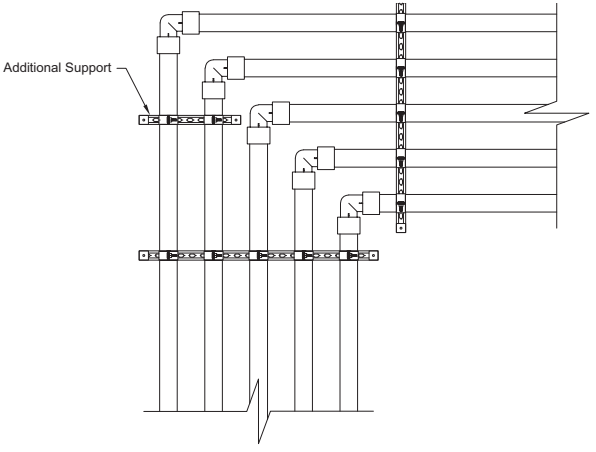


Figure 7: Additional support requirements for fittings at corners

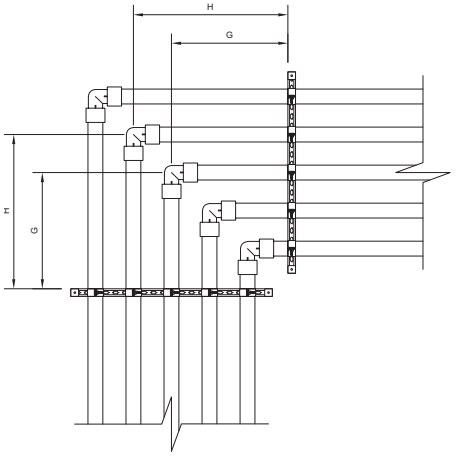


Figure 8: Corner support example

Distance G = 16"
Total distance for segment G = 32" (16 + 16)
Distance H = >16"
Total distance for segment H = >32"

Therefore, segments H require additional support like the one shown in **Figure 7**.

Nominal pipe size	Spacing for bare PEX (Dimension A)			Dimension B
	International Codes (IPC, IMC)	Uniform Codes (UPC, UMC)	National Plumbing Code of Canada (NPCC)	All codes
½"	32"	32"	32"	Anywhere[1]
¾"	32"	32"	32"	Anywhere[1]
1"	32"	32"	32"	Anywhere[1]
1¼"	32"	48"	32"	18"[2]
1½"	32"	48"	32"	18"[2]
2"	32"	48"	32"	18"[2]
2½"	32"	48"	32"	7"[3]
3"	32"	48"	32"	7"[3]

Table 6: Support requirements for valves

[1]Place ½" to 1" ball valves anywhere within Dimension A.
[2]Based on a ProPEX Ball Valve or similar
[3]Based on ductile-iron butterfly valves or similar

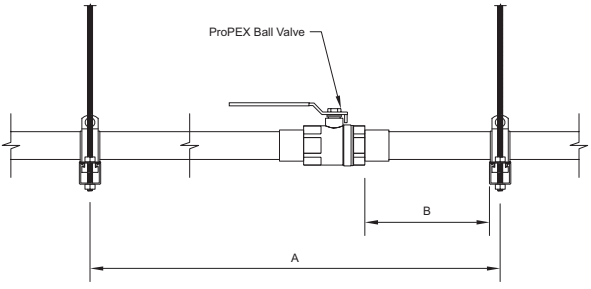


Figure 9: Supporting 1¼" to 2" ball valves

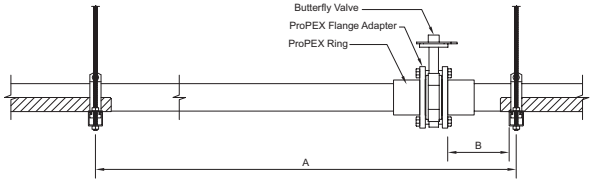


Figure 10: Supporting 2½" to 3" butterfly valves

When distance “B” in the previous example is not attainable, additional support of the valve is required as shown in **Figure 11**.

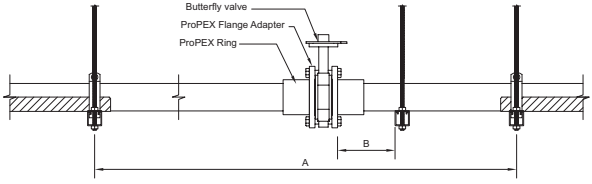


Figure 11: Additional support for butterfly valves

General requirements for PEX-a Pipe Support

- PEX-a Pipe Support can be used to achieve greater spans than those shown in Dimension A in the table below.
- Segments of PEX-a Pipe Support require a minimum of two supports.

Nominal pipe size	Spacing for bare PEX (Dimension A)			Spacing with PEX-a Pipe Support (Dimension B)		
	International Codes (IPC, IMC)	Uniform Codes (UPC, UMC)	National Plumbing Code of Canada (NPCC)	International Codes (IPC, IMC)	Uniform Codes (UPC, UMC)	National Plumbing Code of Canada (NPCC)
½"	32"	32"	32"	6 ft.	6 ft.	6 ft.
¾"	32"	32"	32"	6 ft.	6 ft.	6 ft.
1"	32"	32"	32"	8 ft.	8 ft.	8 ft.
1¼"	32"	48"	32"	8 ft.	8 ft.	8 ft.
1½"	32"	48"	32"	8 ft.	8 ft.	8 ft.
2"	32"	48"	32"	8 ft.	8 ft.	8 ft.
2½"	32"	48"	32"	8 ft.	8 ft.	8 ft.
3"	32"	48"	32"	8 ft.	8 ft.	8 ft.

Table 7: Maximum allowable support spacing for PEX pipe

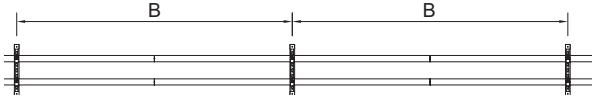


Figure 12: PEX-a Pipe Support without fittings

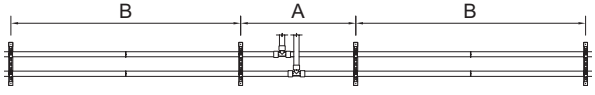


Figure 13: PEX-a Pipe Support with fittings

Nominal pipe size	Maximum support spacing (A)	Maximum cantilever (B)	Minimum overlap (C)	Minimum distance to fitting (D)	Minimum overhang (E)
½"	6 ft.	18"	6"	1¼"	1"
¾"				1¾"	
1"	8 ft.			2¼"	
1¼"				2¾"	
1½"				3"	
2"				4"	
2½"				5"	
3"				6"	

Table 8: Uponor PEX-a Pipe Support installation requirements

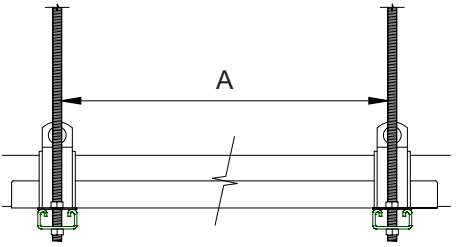


Figure 14: Maximum support spacing

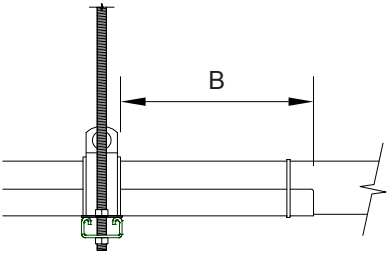


Figure 15: Maximum overhang

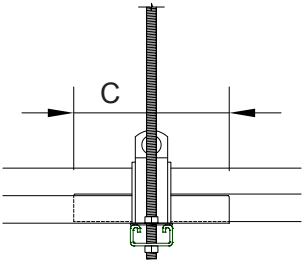


Figure 16: Minimum overlap

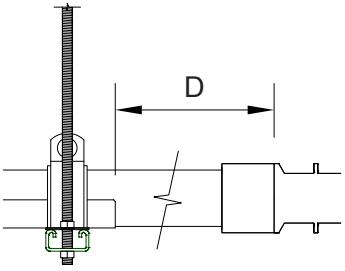


Figure 17: Minimum distance to fitting

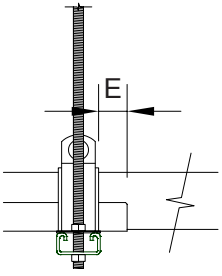


Figure 18: Minimum overhang

Strapping requirements for PEX-a Pipe Support

Uponor requires PEX-a Pipe Support to be strapped with a minimum 300-lb., tensile-rated, stainless-steel strap that is suitable for the application (e.g., UV, high temperature).

Note: Uponor includes required stainless-steel straps with the PEX-a Pipe Support. If the included straps are misplaced, use a stainless-steel strap of equal or greater strength.

Application	Maximum distance
Strut clamps	Greater than 48" = 1 strap mid-span
Clevis or loop hangers	• Less than 48" = 2 straps equally spaced • Greater than 48" = 3 straps (1 mid-span and 1 on each end placed 2" from end of support)

Table 9: Strapping requirements for clamps and hangers

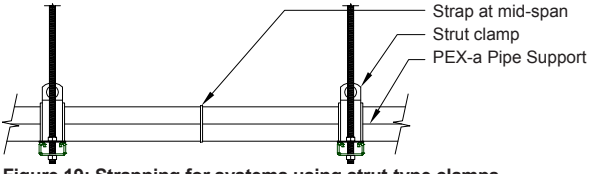


Figure 19: Strapping for systems using strut-type clamps or equivalent

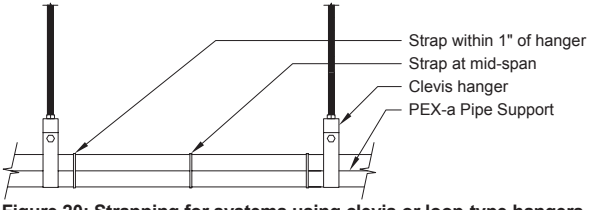


Figure 20: Strapping for systems using clevis or loop-type hangers or equivalent

Figure 21: PEX-a Pipe Support with stainless-steel strapping

ASTM E84 requirements for PEX-a Pipe Support

Uponor PEX-a Pipe Support has been tested and approved for use in ASTM E84 applications. To meet the requirements, PEX-a Pipe Support must be installed per the following requirements:

- Pipe or fittings without PEX-a Pipe Support shall be covered with a minimum ½" thick 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".

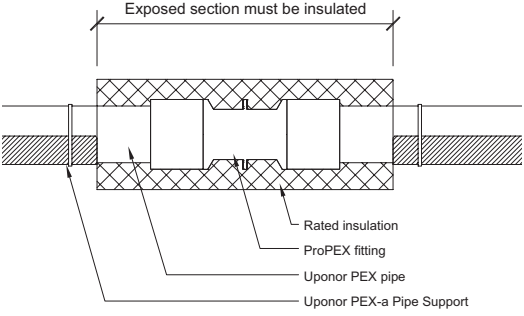


Figure 22: PEX-a Pipe Support installations in ASTM E84 applications

Supporting Uponor multiport tees

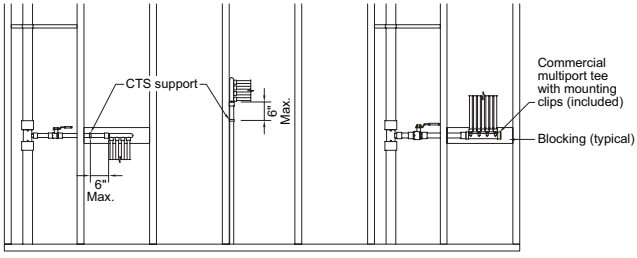


Figure 23: In-wall supports for multiport tees

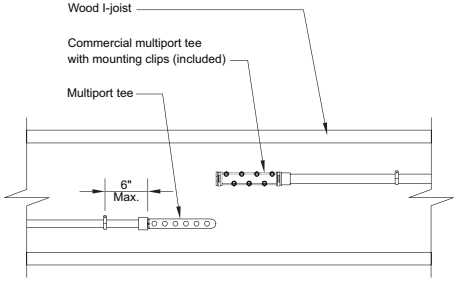


Figure 24: Supporting multiport tees on wood I-joists

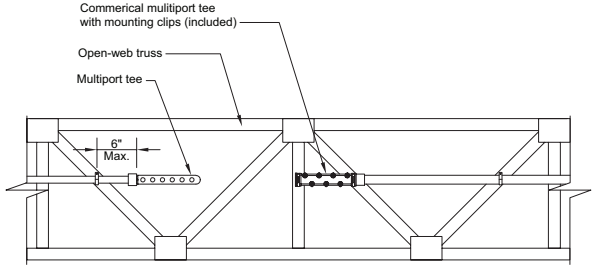


Figure 25: Supporting multiport tees on open-web wood trusses

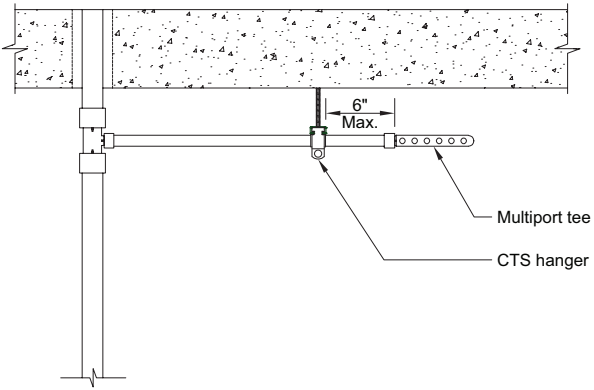


Figure 26: Supporting multiport tees in suspended applications

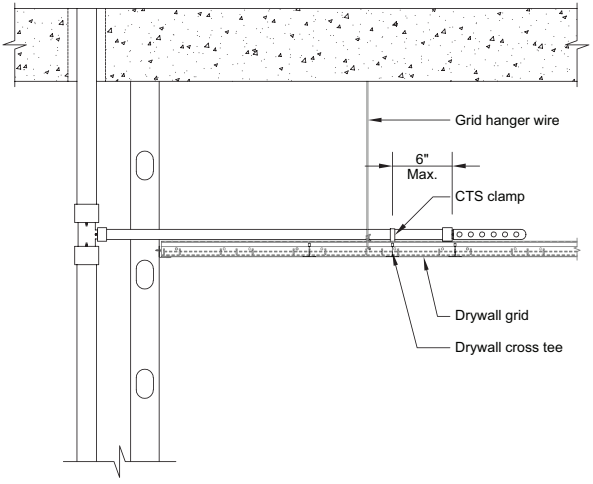


Figure 27: Supporting multiport tees on drywall grid

Vertical support requirements

Vertical runs of pipe can be divided into two categories: in wall and risers.

In-wall piping is typically smaller in diameter (<1"), and does not pass through multiple stories 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 stories, often requiring fire-penetration sealants.

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

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

Table 10: Vertical support requirements for PEX pipe

Note: Maximum spacing of mid-story guides is 5 ft. (1.5 m). Structures with ceiling heights greater than 10 ft. require multiple mid-story guides.

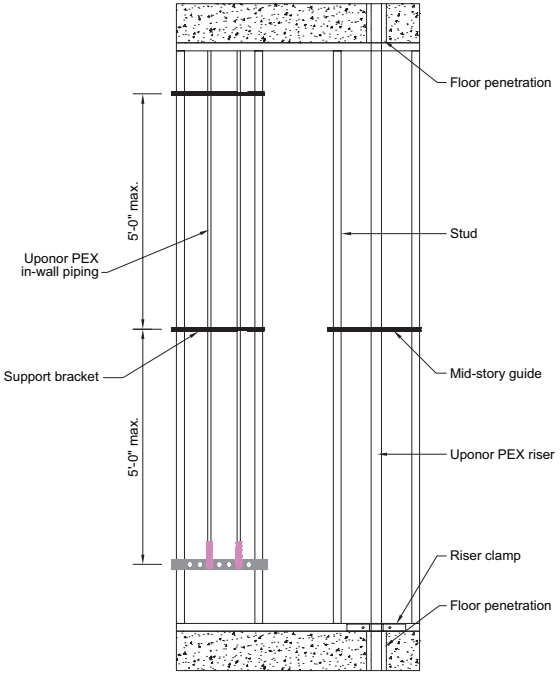


Figure 28: In-wall versus riser piping

Expansion and contraction

Best practice for controlling expansion forces is to continuously restrain the pipe by installing Uponor PEX-a Pipe Support. For best results, Uponor PEX-a Pipe Support segments should terminate only at fitting locations.

Proper use of strapping is critical when using this technique. Strapping shall be:

- 300-lb., tensile-rated, stainless-steel strap
- Rated for operating temperature ranges, including high temperatures
- UV-resistant to withstand expected life of the piping system

Fixed anchor points

To account for expansion, use anchor points to restrict piping movement (see **Figure 29**).

Anchor points shall be:

- Spaced at the proper distance for the application (see **Table 11**)
- Constructed with materials that provide rigidity
- Reinforced with a pipe clamp that will restrain the piping material
- Installed within 18" of a fire-rated wall penetration (see **Figure 30**)

Fixed anchor point requirements

Application	Maximum distance
Horizontal	
Heating hot water	65 ft. (19.8 m)
Domestic hot water	65 ft. (19.8 m)
Domestic cold water	150 ft. (45.7 m)
Chilled water	65 ft. (19.8 m)
Fire-rated wall penetration	18" (45.7 cm)
Vertical	
Hydronic riser (heating hot water; chilled water)	Riser clamp at top and bottom of every floor
Domestic hot-water riser	Riser clamp at bottom of every floor and riser clamp at top of every-other floor
Domestic cold-water riser	Riser clamp at the bottom of every floor and riser clamp at top of every fourth floor

Table 11: Fixed anchor point requirements

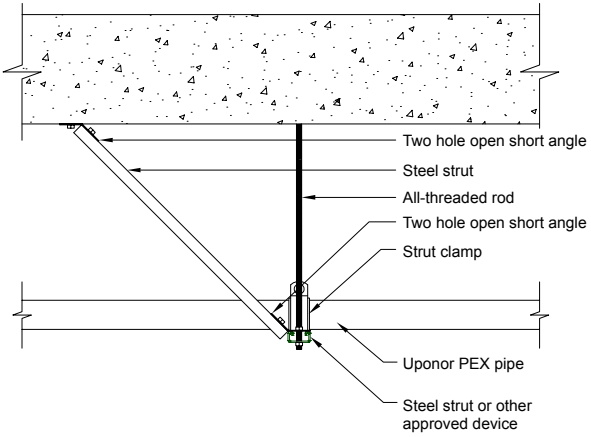


Figure 29: Fixed anchor point detail

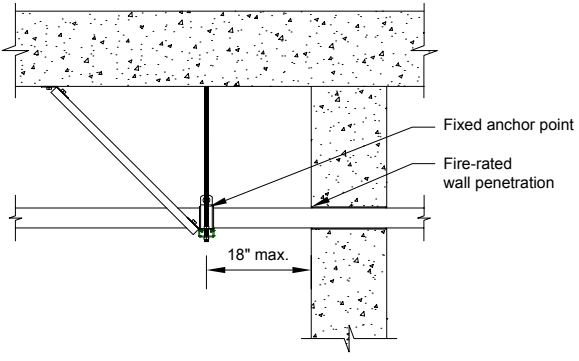


Figure 30: Fixed anchor point near fire-rated wall

Risers

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

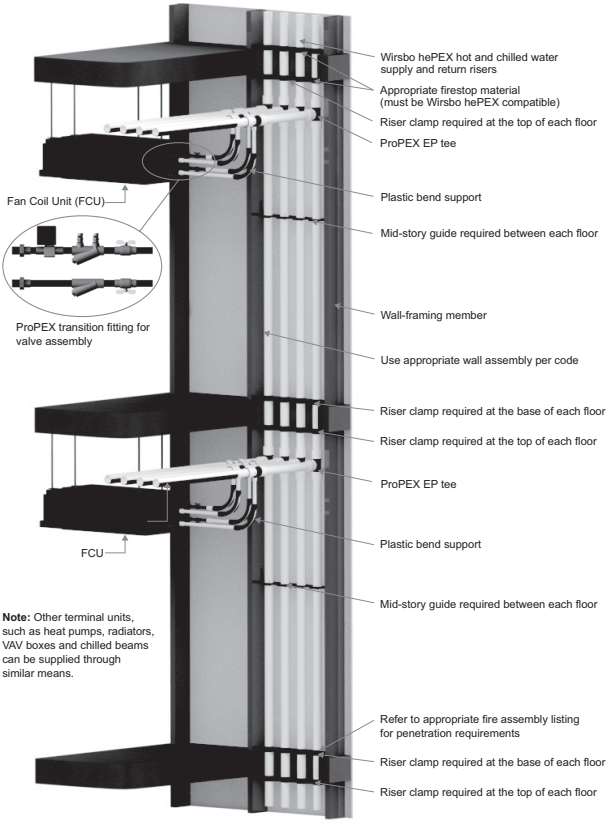


Figure 31: Hydronic piping riser detail

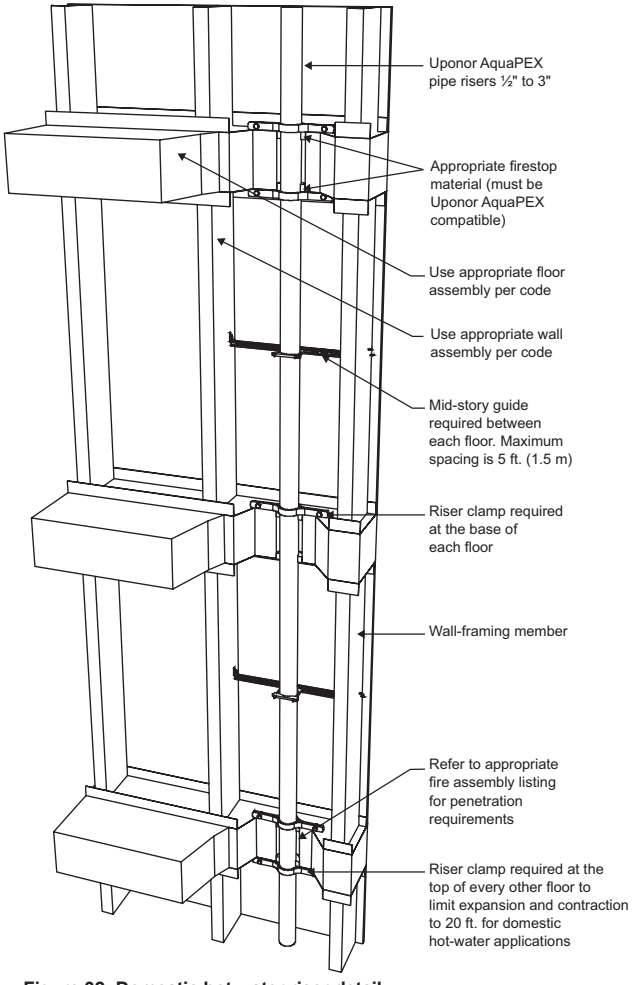


Figure 32: Domestic hot water riser detail

Fire-resistant construction

United States–ASTM E84

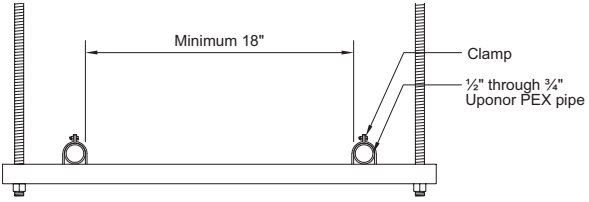


Figure 33: QAI P321-1

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

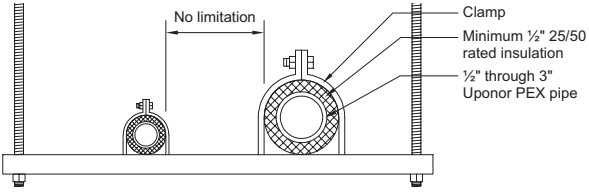


Figure 34: QAI P321-1

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

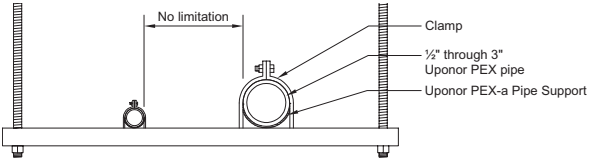


Figure 35: QAI P321-2

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.

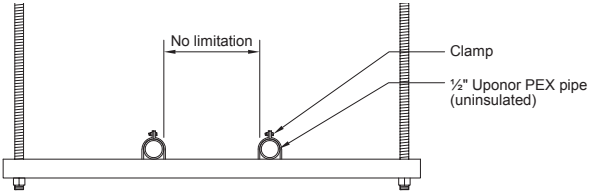


Figure 36: QAI P321-1

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

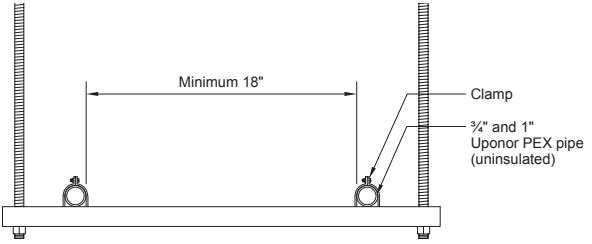


Figure 37: QAI P321-1

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

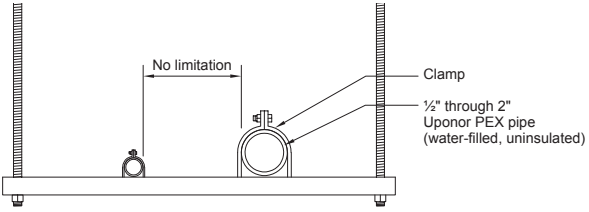


Figure 38: QAI P321-3

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

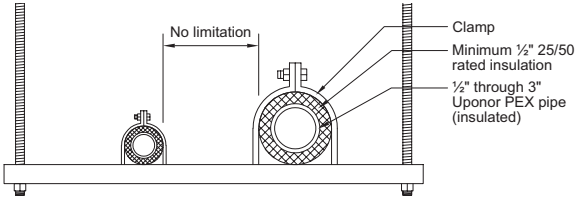


Figure 39: QAI P321-1

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

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

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

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

Assembly types					
		3M™		Hilti®	
		Wall	Floor/clg	Wall	Floor/clg
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		F-C-8038
		W-L-2448	F-E-2002		F-C-8044
		W-L-2483	F-E-2012		
		W-L-2543	F-E-2040		
		W-L-2547	PHV-120-04		
	2-hour	PHV-120-04	PHV-120-04	W-L-2186	F-C-2081
		C-AJ-2510		W-L-2235	F-C-2310
		PHV-120-11		W-L-2466	
		W-L-2090		W-L-2474	
		W-L-2091			
		W-L-2146			
		W-L-2448			
		W-L-2483			
		W-L-2543			
		W-L-2547			

Table 13: Fire assemblies per manufacturer

Note: This table is not meant to address every compatible fire assembly or firestop documentation being used is approved and current for the specific application.

Manufacturer			
RectorSeal®		STI	
Wall	Floor/clg	Wall	Floor/clg
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		W-L-2242	
W-L-2121		W-L-2423	
W-L-2209		W-L-2508	
W-L-2528		W-L-2548	
W-L-2402		W-L-2549	
		W-L-7193	
W-L-2342		W-L-2100	
W-L-2262		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	

manufacturer. It is the end user's responsibility to ensure that the fire assembly
Please refer to the respective manufacturer's website for detailed listing information.

Assembly types					
		3M™		Hilti®	
		Wall	Floor/clg	Wall	Floor/clg
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
		PH-120-10	F-A-2115	C-AJ-2647	C-AJ-2647
		PHV-120-04	PH-120-10		F-B-2040
		PHV-120-11	PHV-120-04		F-B-2041
		C-AJ-2213	PHV-120-11		F-A-2142
		C-AJ-2378	C-AJ-2076		W-J-2071
		W-J-2231			
		W-J-2110			
	3-hour			C-BJ-2028	C-BJ-2028
				C-BJ-2040	C-BJ-2040
				C-BJ-2041	C-BJ-2041

Table 14: Fire assemblies per manufacturer

Note: This table is not meant to address every compatible fire assembly or firestop documentation being used is approved and current for the specific application.

Manufacturer			
RectorSeal®		STI	
Wall	Floor/clg	Wall	Floor/clg
W-J-2162	C-AJ-2628	W-J-2021	C-AJ-2031
W-J-2122	F-A-2171	W-J-2043	C-AJ-2140
W-J-2180	F-A-8033	W-J-2076	C-AJ-2291
W-J-2025	C-AJ-2701	W-J-2077	F-A-2186
C-AJ-2628		W-J-2232	F-A-2225
C-AJ-2679		W-J-2233	
C-AJ-2701		W-J-5148	
C-AJ-2176	C-AJ-2176		C-AJ-2578
			F-A-2203
			F-A-2204

manufacturer. It is the end user's responsibility to ensure that the fire assembly
Please refer to the respective manufacturer's website for detailed listing information.

Appendix A: Dimensions and physical characteristics of Uponor PEX pipe

Dimensions and physical characteristics of SDR9 Uponor PEX pipe				
Nominal pipe size	**Pipe I.D.**	**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"	0.241	0.04 (0.06)	0.0024 (0.03)	0.06 (0.089)
⅜"	0.35	0.05 (0.074)	0.005 (0.062)	0.09 (0.136)
½"	0.475	0.06 (0.089)	0.0092 (0.114)	0.14 (0.203)
¾"	0.671	0.1 (0.149)	0.0184 (0.229)	0.25 (0.377)
1"	0.862	0.2 (0.298)	0.0303 (0.376)	0.45 (0.673)
1¼"	1.054	0.34 (0.506)	0.0453 (0.563)	0.72 (1.071)
1½"	1.244	0.44 (0.655)	0.0632 (0.785)	0.96 (1.428)
2"	1.629	0.682 (1.015)	0.1083 (1.345)	1.58 (2.351)
2½"	2.011	0.93 (1.384)	0.1649 (2.048)	2.3 (3.423)
3"	2.4	1.28 (1.905)	0.2351 (2.92)	3.24 (4.821)

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

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.

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).

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
180°F/82°C	400	100
200°F/93°C	315	80

Table B-1: 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

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

Appendix C:
ProPEX fitting dimensions

Determining cut length

When installing Uponor PEX commercial piping systems, it is important to ensure the installation is aesthetically similar to any other rigid piping system.

The following information can be used to properly calculate the cut length of PEX to ensure the piping is installed per the dimensions called out on the plans. Since the ProPEX Ring is not flush with the end of the pipe, the dimensions in the following tables include the tolerance for the ring.

Example 1 uses the data from the ProPEX fitting dimensions in Appendix C to determine the appropriate cut length of the PEX pipe.

Example 1:

Determine the cut length of 1" PEX to ensure a 12" distance of transition.

Transition distance = 12"

B = Elbow on-center length

Cut length = Transition - (B+B)

Cut length = 12 - (1+1)

Cut length = 10"

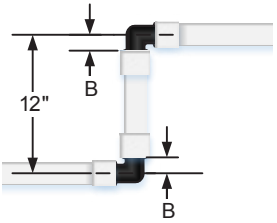
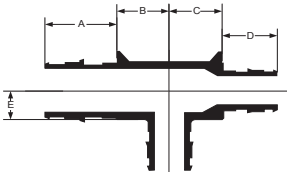
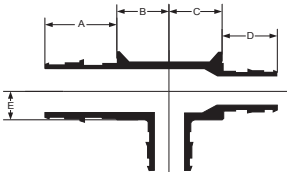


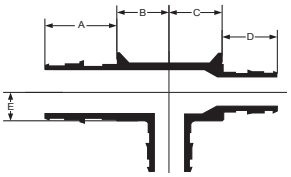
Figure C-1: Cut length example



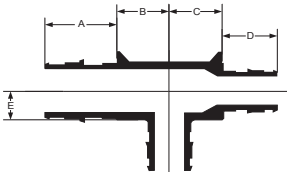
ProPEX EP reducing tees		Edge to stop	O.C. to stop + ring	O.C. to stop + ring	Edge to stop	O.C. to stop + ring
		A	B	C	D	E
Description	Part no.	in/mm	in/mm	in/mm	in/mm	in/mm
½" x ½" x ¾"	Q4755575	0.719	0.790	0.790	0.719	0.600
		18	20	20	18	15
¾" x ½" x ½"	Q4757555	0.955	0.640	0.770	0.719	0.620
		24	16	20	18	16
¾" x ½" x ¾"	Q4757557	0.955	0.620	0.780	0.719	0.620
		24	16	20	18	16
¾" x ¾" x ⅝"	Q4757563	0.955	0.640	0.790	0.955	0.620
		24	16	20	24	16
¾" x ¾" x ½"	Q4757550	0.955	0.640	0.790	0.955	0.620
		24	16	20	24	16
¾" x ¾" x 1"	Q4757710	0.955	0.790	0.965	0.955	0.830
		24	20	25	24	21
1" x ¾" x ¾"	Q4751775	1.191	0.830	0.965	0.955	0.790
		31	21	25	24	20
1" x ¾" x 1"	Q4751751	1.191	0.830	0.965	0.955	0.830
		31	21	25	24	21
1" x 1" x ½"	Q4751150	1.191	0.830	1.005	1.191	0.770
		31	21	26	31	20
1" x 1" x ¾"	Q4751175	1.191	0.830	1.005	1.191	0.790
		31	21	26	31	20
1¼" x 1" x ¾"	Q4751317	1.445	1.070	1.105	1.191	1.030
		37	27	28	31	26
1¼" x 1" x 1"	Q4751311	1.445	1.070	1.105	1.191	1.070
		37	27	28	31	27
1¼" x 1¼" x ½"	Q4751350	1.445	0.870	0.890	1.445	0.810
		37	22	23	37	21
1¼" x 1¼" x ¾"	Q4751337	1.445	0.890	1.040	1.445	0.850
		37	23	27	37	22
1¼" x 1¼" x 1"	Q4751331	1.445	1.070	1.105	1.445	1.070
		37	27	28	37	27
1½" x 1" x ¾"	Q4751517	1.714	1.250	1.310	1.191	1.210
		44	32	34	31	31
1½" x 1" x 1"	Q4751511	1.714	1.250	1.310	1.191	1.250
		44	32	34	31	32



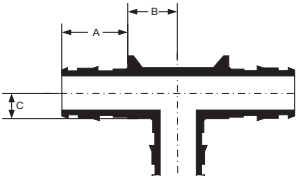
ProPEX EP reducing tees		Edge to stop	O.C. to stop + ring	O.C. to stop + ring	Edge to stop	O.C. to stop + ring
		A	B	C	D	E
Description	Part no.	in/mm	in/mm	in/mm	in/mm	in/mm
1½" x 1" x 1½"	Q4751505	1.714	1.250	1.390	1.191	1.080
		44	32	36	31	28
1½" x 1¼" x ¾"	Q4751537	1.714	1.150	1.290	1.445	1.000
		44	29	33	37	26
1½" x 1¼" x 1"	Q4751531	1.714	1.150	1.290	1.445	1.040
		44	29	33	37	27
1½" x 1¼" x 1¼"	Q4751533	1.714	1.150	1.290	1.445	1.040
		44	29	33	37	27
1½" x 1½" x ½"	Q4751550	1.714	0.750	0.890	1.714	0.910
		44	19	23	44	23
1½" x 1½" x ¾"	Q4751557	1.714	1.170	1.310	1.714	1.210
		44	30	34	44	31
1½" x 1½" x 1"	Q4751551	1.714	1.170	1.310	1.714	1.250
		44	30	34	44	32
1½" x 1½" x 1¼"	Q4751553	1.714	1.170	1.310	1.714	1.250
		44	30	34	44	32
2" x 1½" x ¾"	Q4752575	2.157	1.320	1.460	1.714	1.405
		55	34	37	44	36
2" x 1½" x 1"	Q4752051	2.157	1.320	1.460	1.714	1.445
		55	34	37	44	37
2" x 1½" x 1¼"	Q4752053	2.157	1.375	1.515	1.714	1.445
		55	35	39	44	37
2" x 1½" x 1½"	Q4752055	2.157	1.375	1.515	1.714	1.445
		55	35	39	44	37
2" x 1½" x 2"	Q4752152	2.157	1.750	1.890	1.714	1.210
		55	45	48	44	31
2" x 2" x ½"	Q4752250	2.157	0.750	0.950	2.157	1.120
		55	19	24	55	29



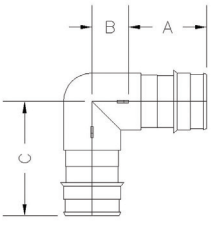
ProPEX EP reducing tees		Edge to stop	O.C. to stop + ring	O.C. to stop + ring	Edge to stop	O.C. to stop + ring
		A	B	C	D	E
Description	Part no.	in/mm	in/mm	in/mm	in/mm	in/mm
2" x 2" x ¾"	Q4752275	2.157	1.320	1.520	2.157	1.405
		55	34	39	55	36
2" x 2" x 1"	Q4752210	2.157	1.320	1.520	2.157	1.445
		55	34	39	55	37
2" x 2" x 1¼"	Q4752213	2.157	1.320	1.520	2.157	1.445
		55	34	39	55	37
2" x 2" x 1½"	Q4752215	2.157	1.320	1.520	2.157	1.445
		55	34	39	55	37
2½" x 2" x 1½"	Q4752525	2.83	1.85	1.85	2.157	1.46
		73	47	47	55	37
2½" x 2" x 2"	Q4752522	2.83	2.25	2.25	2.157	1.46
		73	58	58	55	37
2½" x 2½" x ¾"	Q4752557	2.83	1.4	1.4	2.83	1.46
		73	36	36	73	37
2½" x 2½" x 1"	Q4752510	2.83	1.5	1.5	2.83	1.46
		73	38	38	73	37
2½" x 2½" x 1¼"	Q4752513	2.83	1.75	1.75	2.83	1.46
		73	45	45	73	37
2½" x 2½" x 1½"	Q4752515	2.83	1.85	1.85	2.83	1.46
		73	47	47	73	37
2½" x 2½" x 2"	Q4752520	2.83	2.25	2.25	2.83	1.46
		73	58	58	73	37
3" x 2" x 2"	Q4753220	3.38	2.25	2.25	2.157	1.7
		87	58	58	55	44
3" x 2½" x 1½"	Q4753215	3.38	1.85	1.85	2.83	1.7
		87	47	47	73	44
3" x 2½" x 2"	Q4753252	3.38	2.25	2.25	2.83	1.7
		87	58	58	73	44
3" x 3" x ¾"	Q4753375	3.38	1.4	1.4	3.38	1.7
		87	36	36	87	44

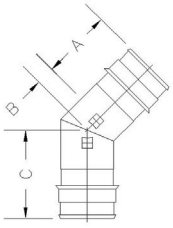


ProPEX EP reducing tees		Edge to stop	O.C. to stop + ring	O.C. to stop + ring	Edge to stop	O.C. to stop + ring
		A	B	C	D	E
Description	Part no.	in/mm	in/mm	in/mm	in/mm	in/mm
3" x 3" x 1"	Q4753310	3.38	1.5	1.5	3.38	1.7
		87	38	38	87	44
3" x 3" x 1¼"	Q4753313	3.38	1.75	1.75	3.38	1.7
		87	45	45	87	44
3" x 3" x 1½"	Q4753315	3.38	1.85	1.85	3.38	1.7
		87	47	47	87	44
3" x 3" x 2"	Q4753320	3.38	2.25	2.25	3.38	1.7
		87	58	58	87	44
3" x 3" x 2½"	Q4753325	3.38	2.75	2.75	3.38	1.7
		87	71	71	87	44



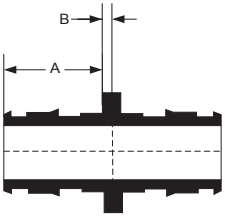
ProPEX EP and LF brass tees		Edge to stop	O.C. to stop + ring	O.C. to stop + ring
		A	B	C
Description	**Part no.**	**in/mm**	**in/mm**	**in/mm**
½" x ½" x ½" EP Tee	Q4755050	0.72	0.660	0.48
		18	17	12
¾" x ¾" x ¾" EP Tee	Q4757575	0.96	0.790	0.65
		24	20	20
1" x 1" x 1" EP Tee	Q4751010	1.19	1.005	0.83
		31	26	21
1¼" x 1¼" x 1¼" EP Tee	Q4751313	1.45	1.105	1.07
		37	28	27
1½" x 1½" x 1½" EP Tee	Q4751515	1.71	1.310	1.25
		44	34	32
2" x 2" x 2" EP Tee	Q4752000	2.16	1.770	1.80
		55	45	46
2½" x 2½" x 2½" EP Tee	Q4752500	2.83	2.7	1.46
		73	69	37
3" x 3" x 3" EP Tee	Q4753000	3.38	2.75	1.7
		87	71	44
½" x ½" x ½" LF Brass Tee	LF4705050	0.71	0.630	0.380
		18	1	1
¾" x ¾" x ¾" LF Brass Tee	LF4707575	0.95	0.789	0.460
		24	20	12
1" x 1" x 1" LF Brass Tee	LF4701010	1.18	1.005	0.699
		30	26	18



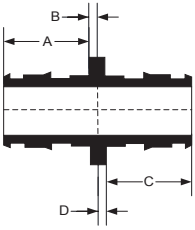


ProPEX EP 45 elbows		Edge to pipe stop	O.C. to stop + ring	O.C. to edge
		A	B	C
Description	Part no.	in/mm	in/mm	in/mm
1½" x 1½"	Q4761515	2.314	0.74	1.714
		59	19	44
2" x 2"	Q4762020	2.907	0.95	2.157
		75	24	55
2½" x 2½"	Q4762525	3.83	1.25	2.83
		98	32	73
3" x 3"	Q4763030	4.48	1.35	3.38
		115	35	87

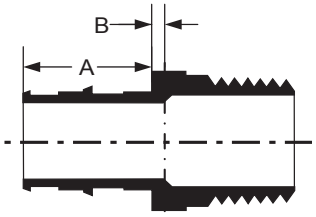
ProPEX EP and LF brass elbows		Edge to pipe stop	O.C. to stop + ring	O.C. to edge
		A	B	C
Description	Part no.	in/mm	in/mm	in/mm
½" x ½" EP Elbow	Q4760500	1.269	0.63	0.719
		33	16	18
¾" x ¾" EP Elbow	Q4760750	1.63	0.775	0.955
		42	20	24
1" x 1" EP Elbow	Q4761000	2.051	1	1.191
		53	26	31
1¼" x 1¼" EP Elbow	Q4761250	2.445	1.14	1.445
		63	29	37
1½" x 1½" EP Elbow	Q4761500	2.77	1.34	1.714
		71	34	44
2" x 2" EP Elbow	Q4762000	3.757	1.8	2.157
		96	46	55
2½" x 2½" EP Elbow	Q4762500	4.93	2.35	2.83
		126	60	73
3" x 3" EP Elbow	Q4763000	5.88	2.75	3.38
		151	71	87
¾" x ¾" LF Brass Elbow	LF4710750	1.64	0.795	0.955
		42	20	24
1" x 1" LF Brass Elbow	LF4711000	2.06	1.02	1.191
		53	26	31



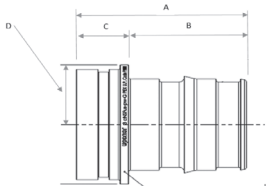
ProPEX EP and LF brass couplings		Edge to pipe stop	O.C. to pipe stop + ring chamfer
		A	B
Description	Part no.	in/mm	in/mm
½" x ½" EP Coupling	Q4775050	0.72	0.14
		18	4
¾" x ¾" EP Coupling	Q4777575	0.96	0.16
		25	4
1" x 1" EP Coupling	Q4771010	1.19	0.20
		31	5
1¼" x 1¼" EP Coupling	Q4771313	1.45	0.22
		37	6
1½" x 1½" EP Coupling	Q4771515	1.72	0.22
		44	6
2" x 2" EP Coupling	Q4772020	2.16	0.33
		55	8
2½" x 2½" EP Coupling	Q4772525	2.83	0.375
		73	10
3" x 3" EP Coupling	Q4773030	3.38	0.375
		87	10
½" x ½" LF Brass Coupling	LF4545050	0.65	0.21
		17	
¾" x ¾" LF Brass Coupling	LF4547575	0.95	0.16
		24	4
1" x 1" LF Brass Coupling	LF4541010	1.18	0.20
		30	5



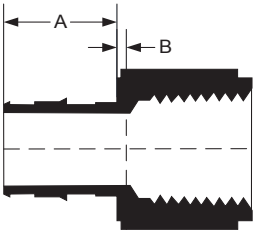
ProPEX EP and LF brass reducing couplings		Edge to pipe stop	O.C. to pipe stop + ring chamfer	Edge to pipe stop	O.C. to pipe stop + ring chamfer
		A	B	C	D
Description	**Part no.**	**in/mm**	**in/mm**	**in/mm**	**in/mm**
½" x ¾" EP Reducing Coupling	Q4775075	0.96	0.1425	0.72	0.1625
		25	2	18	4
¾" x 1" EP Reducing Coupling	Q4777510	0.96	0.1625	1.19	0.2025
		25	2	31	5
1¼" x ¾" EP Reducing Coupling	Q4771307	0.96	0.215	1.45	0.175
		25	2	37	4
1¼" x 1" EP Reducing Coupling	Q4771310	1.20	0.215	1.45	0.215
		31	2	37	6
1½" x ¾" EP Reducing Coupling	Q4771507	0.75	0.215	1.72	0.175
		19	2	44	4
1½" x 1" EP Reducing Coupling	Q4771510	1.20	0.215	1.72	0.215
		31	2	44	6
1½" x 1¼" EP Reducing Coupling	Q4771513	1.45	0.215	1.72	0.215
		37	2	44	6
2" x 1½" EP Reducing Coupling	Q4772015	1.77	0.325	2.16	0.265
		3	3	55	7
2½" x 1¼" EP Reducing Coupling	Q4772513	2.83	0.375	1.458	0.125
		73	10	37	3
2½" x 1½" EP Reducing Coupling	Q4772515	2.83	0.375	1.715	0.125
		73	10	44	3
2½" x 2" EP Reducing Coupling	Q4772520	2.83	0.375	2.16	0.125
		73	10	55	3
3" x 2" EP Reducing Coupling	Q4773020	3.38	0.375	2.159	0.125
		87	10	55	3
3" x 2½" EP Reducing Coupling	Q4773025	3.38	0.375	2.83	0.125
		87	10	73	3
¾" x 1" LF Brass Reducing Coupling	LF4547510	0.95	0.1625	1.16	0.2025
		24	2	30	5



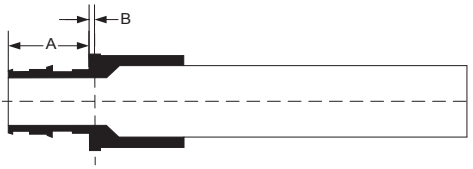
ProPEX LF brass male threaded adapters		Edge to pipe stop	O.C. to pipe stop + ring
		A	B
Description	Part no.	in/mm	in/mm
⅜" PEX x ½" NPT	LF4523850	0.591	0.205
		15	5
½" PEX x ½" NPT	LF4525050	0.748	0.195
		19	5
½" PEX x ¾" NPT	LF4525075	0.709	0.205
		18	5
¾" PEX x ¾" NPT*	LF4527575	0.93	0.215
		24	6
¾" PEX x 1" NPT*	LF4527510	0.945	0.225
		24	6
1" PEX x ¾" NPT	LF4521075	1.181	0.265
		30	6
1" PEX x 1" NPT*	LF4521010	1.214	0.255
		31	7
1¼" PEX x 1¼" NPT*	LF4521313	1.478	0.255
		38	7
1½" PEX x 1½" NPT*	LF4521515	1.704	0.265
		44	7
2" PEX x 2" NPT*	LF4522020	2.172	0.4
		56	10
2½" PEX x 2½" NPT	LF4522525	2.83	0.375
		73	10
3" PEX x 3" NPT	LF4523030	3.38	0.375
		87	10



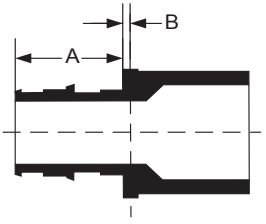
ProPEX LF brass roll-groove adapters		Overall length	ProPEX end to stop	Groove end to stop	O.C. to edge
		A	B	C	D
Description	Part no.	in/mm	in/mm	in/mm	in/mm
2" PEX x 2" CTS groove	LFV2962020	3.65	2.15	1.5	1.34
		92.71	54.61	38.10	34.04
2" PEX x 2½" CTS groove	LFV2962025	3.65	2.15	1.5	1.34
		92.71	54.61	38.10	34.04
2½" PEX x 2½" CTS groove	LFV2962525	4.33	2.83	1.5	1.68
		109.98	71.88	38.10	42.67
3" PEX x 3" CTS groove	LFV2963030	4.88	3.38	1.5	1.895
		123.95	85.85	38.10	48.13
2" PEX x 2" IPS groove	Q2962020	3.647	2.147	1.5	1.34
		92.63	54.53	38.10	34.04
2" PEX x 2½" IPS groove	Q2962025	3.65	2.15	1.5	1.68
		92.71	54.61	38.10	42.67
2½" PEX x 2" IPS groove	Q2962520	4.33	2.83	1.5	1.68
		109.98	71.88	38.10	42.67
2½" PEX x 2½" IPS groove	Q2962525	4.33	2.83	1.5	1.68
		109.98	71.88	38.10	42.67
2½" PEX x 3" IPS groove	Q2962530	4.33	2.83	1.5	1.895
		109.98	71.88	38.10	48.13
3" PEX x 2½" IPS groove	Q2963025	4.88	3.38	1.5	1.895
		123.95	85.85	38.10	48.13
3" PEX x 3" IPS groove	Q2963030	4.88	3.38	1.5	1.895
		123.95	85.85	38.10	48.13



ProPEX LF brass female threaded adapters		Edge to pipe stop	O.C. to pipe stop + ring
		A	B
Description	Part no.	in/mm	in/mm
½" PEX x ½" NPT	LF4575050	0.709	0.155
		18	4
½" PEX x ¾" NPT	LF4575075	0.709	0.155
		18	4
¾" PEX x ¾" NPT*	LF4577575	0.945	0.175
		24	4
¾" PEX x 1" NPT	LF4577510	0.945	0.205
		24	5
1" PEX x 1" NPT*	LF4571010	1.181	0.245
		30	6
1¼" PEX x 1¼" NPT*	LF4571313	1.445	0.24
		37	6
1½" PEX x 1½" NPT	LF4571515	1.704	0.24
		44	6
2" PEX x 2" NPT*	LF4572020	2.146	0.3
		55	8

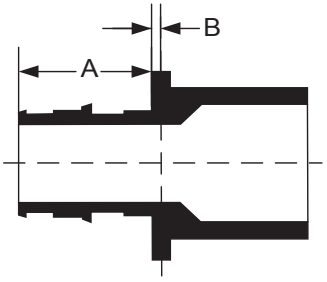


ProPEX LF copper straight stubs		Edge to pipe stop	O.C. to pipe stop + ring
		A	B
Description	Part no.	in/mm	in/mm
2½" x 2½"	LF2962525	2.83	0.475
		73	12
3" x 2"	LF2963030	3	0.5
		87	13



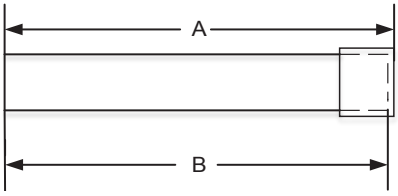
ProPEX LF brass sweat adapters*		Edge to pipe stop	O.C. to pipe stop + ring
		A	B
Description	Part no.	in/mm	in/mm
⅜" PEX x ½" Copper	LF4513850	0.591	0.1425
		15	4
½" PEX x ½" Copper	LF4515050	0.709	0.1425
		18	4
½" PEX x ¾" Copper	LF4515075	0.709	0.1425
		18	4
¾" PEX x ½" Copper	LF4517550	0.945	0.1625
		24	4
¾" PEX x ¾" NPT*	LF4517575	0.945	0.1625
		24	4
¾" PEX x 1" NPT	LF4517510	0.945	0.1625
		24	4
1" PEX x 1" NPT*	LF4511010	1.181	0.2025
		30	5
1¼" PEX x 1¼" NPT*	LF4511313	1.4455	0.2025
		37	5
1½" PEX x 1½" NPT	LF4511515	1.704	0.2025
		44	5
2" PEX x 2" NPT*	LF4512020	2.147	0.3
		55	8
2½" PEX x 2½" NPT	LF4512525	2.83	0.125
		73	3
3" PEX x 3" NPT	LF4513030	3.38	0.125
		87	3

*Sweated onto copper stub

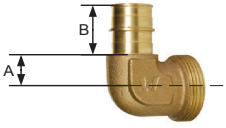


ProPEX LF brass fitting adapters*		Edge to pipe stop	O.C. to pipe stop + ring
		A	B
Description	Part no.	in/mm	in/mm
½" PEX x ½" Copper	LF4505050	0.709	0.1425
		18	4
½" PEX x ¾" Copper	LF4505075	0.709	0.1425
		18	4
¾" PEX x ½" Copper	LF4507550	0.945	0.1625
		24	4
¾" PEX x ¾" NPT*	LF4507575	0.9455	0.1625
		24	4
¾" PEX x 1" NPT	LF4507510	0.9455	0.1625
		24	4
1" PEX x 1" NPT*	LF4501010	1.181	0.2025
		30	5
1¼" PEX x 1¼" NPT*	LF4501313	1.4455	0.2025
		37	5
1½" PEX x 1½" NPT	LF4501515	1.704	0.2025
		44	5
2" PEX x 2" NPT*	LF4502020	2.147	0.325
		55	8

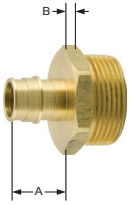
*Sweated into hub-end of fitting



ProPEX rings		Delta A & B
		A
Description	Part no.	in/mm
½" ProPEX Ring with Stop	Q4690512	0.08
		2
¾" ProPEX Ring with Stop	Q4690756	0.1
		2.54
1" ProPEX Ring with Stop	Q4691000	0.14
		3.556
1¼" ProPEX Ring with Stop	Q4691250	0.14
		3.556
1½" ProPEX Ring with Stop	Q4691500	0.14
		3.556
2" ProPEX Ring with Stop	Q4692000	0.2
		5.08
2½" ProPEX Ring with Stop	Q4692500	0.2
		5.08
3" ProPEX Ring with Stop	Q4693000	0.2
		5.08



ProPEX brass R32 manifold elbows		O.C. to pipe stop + ring	Edge to pipe stop
		A	B
Description	Part no.	in/mm	in/mm
R32 x ¾" ProPEX Elbow	Q4153275	1.00	0.945
		26	24
R32 x 1" ProPEX Elbow	Q4153210	1.04	1.181
		27	30
R32 x 1¼" ProPEX Elbow	Q4153213	0.99	1.445
		25	37
R32 x 1½" ProPEX Elbow	Q4153215	0.99	1.704
		25	44



ProPEX brass R32 manifold fittings		Edge to pipe stop	O.C. to pipe stop + ring
		A	B
Description	Part no.	in/mm	in/mm
R32 x ¾" ProPEX	Q4143275	0.95	0.275
		24	7
R32 x 1" ProPEX	Q4143210	1.18	0.315
		30	8
R32 x 1¼" ProPEX	Q4143213	1.45	0.315
		37	8
R32 x 1½" ProPEX	Q4143215	1.70	0.315
		44	8

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