



SharkBite®

PEX-A Installation Guide for
Expansion Fittings
Crimp Fittings
Clamp Fittings
EvoPEX Fittings
SharkBite Brass Push

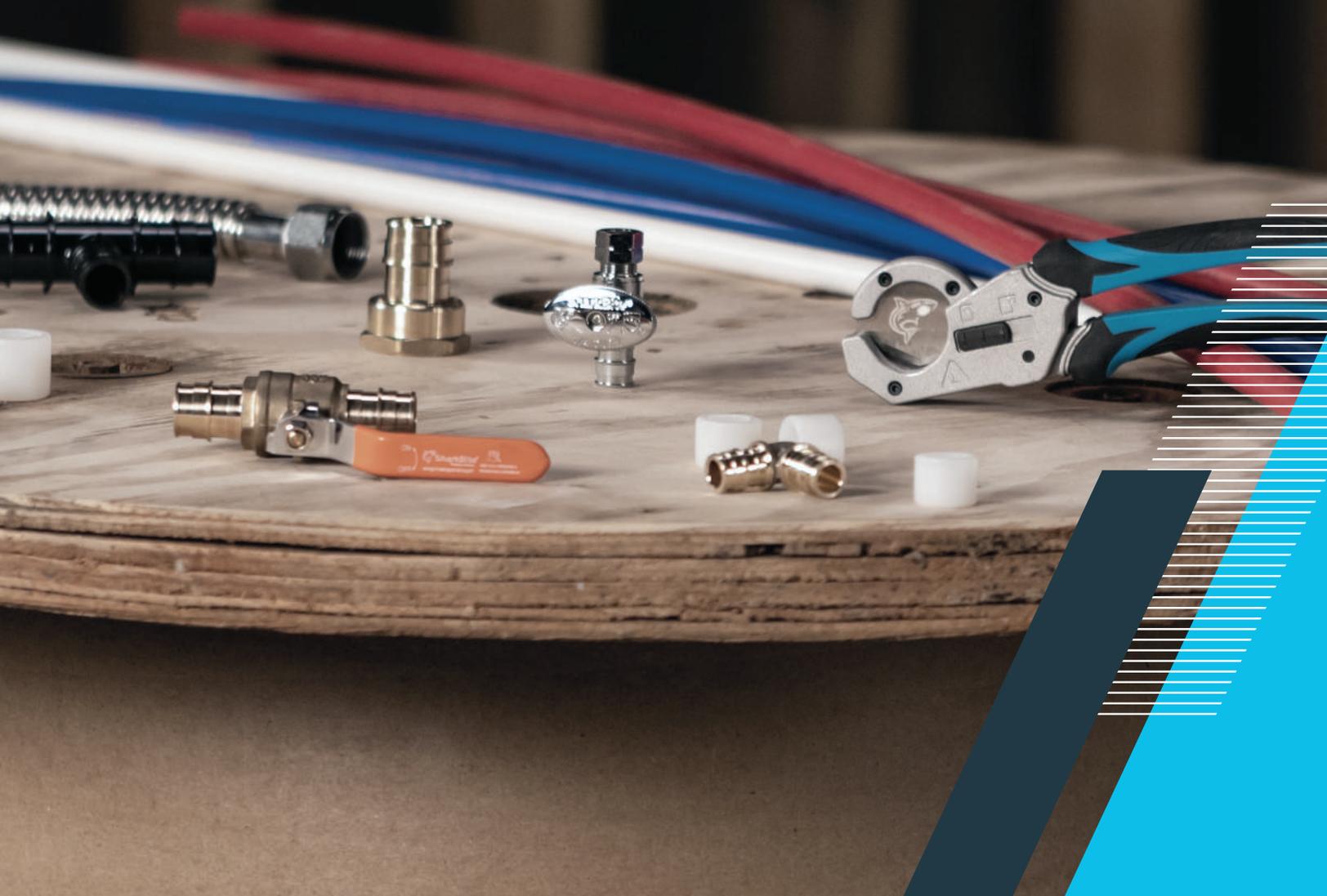


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The SharkBite® PEX-A Connection System Introduction

The purpose of this guide is to familiarize plumbing professionals with the SharkBite PEX-A pipe and expansion fitting connection system and the recommended method of installation.

SharkBite PEX-A pipe and expansion fittings are an excellent system for plumbing jobs, offering many more advantages than rigid pipe. This system has superior flexibility, eliminates missed connections and is compatible with expansion, crimp and push-to-connect fittings.

Features & Benefits

Expansion Fittings

No missed connections

- Expansion ring and pipe must be expanded to make a connection.

Pipe compatibility

- Expansion fittings must be used with PEX-A pipe and expansion rings.

Materials

- Fittings available in polymer and lead-free DZR material.

Expansion Tool

Approved tools

- Only use approved expansion tools when making an expansion joint.

PEX-A Pipe

Superior flexibility

- Easy to install and service.

Quieter

- Minimizes noise caused by water hammer.

Resists corrosion and scale buildup

- Improves the performance of the plumbing system.

Fewer fittings required

- Reduces total installation cost.

Fewer joints

- Reduces the chance of callbacks.

Pressure test immediately

- No waiting for glue to dry or joints to cool.

Making a SharkBite® Expansion Connection

Only expansion fittings listed to ASTM F1960 are approved for use on PEX-A pipe.



Step 1

Use pipe cutters to make a square cut of the pipe to length. A rough or uneven cut can result in a weakened joint.



Step 2

Slide your expansion ring over the PEX tubing until it overhangs the end of the tubing by no more than 1/8 inch or until the stop on the ring (if present) touches the tubing.



Step 3

Using an approved manual or cordless expansion tool, insert the tool into the PEX pipe and expand the pipe. Note that each pipe size requires a specific expander head, so ensure that it is the correct size before beginning. The number of expansions will be dictated by the tubing size (6 expansions for 1/2 in., 8 expansions for 3/4 in. and 5 expansions for 1 in.). It is important to make sure the expander head rotates after each expansion to prevent ridges on the inside of the tubing.



Step 4

Once the tubing is expanded, insert the fitting until it hits the shoulder and allow the PEX to contract around the fitting until secure. After several seconds, the tubing will secure around the fitting and your connection is made and ready for use.

Making a SharkBite Crimp/Barb Connection

Crimp/barb fittings listed to ASTM F1807 approved for PEX-A, PEX-B and PEX-C pipe.



Step 1

Use pipe cutters to make a square cut of the pipe to length. A rough or uneven cut can result in a weakened joint.



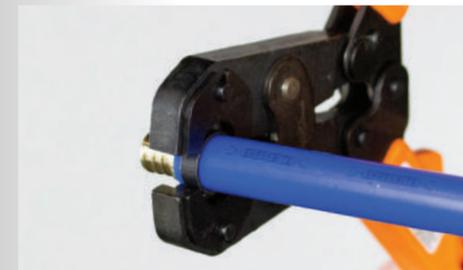
Step 2

Slide the appropriate clamp ring size over the pipe to about 2 inches from the end of the pipe.



Step 3

Push the pipe onto the barbed fitting until it touches the fitting shoulder. Position the clamp ring 1/8 to 1/4 inch from the end of the pipe. This distance ensures that the clamp ring is positioned directly over the barbs on the fitting.



Step 4

Position the open jaws of the crimp tool over the crimp ring and squeeze. The jaws are interchangeable and include sizes for 3/8-, 1/2-, 5/8-, 3/4- and 1-in. crimp rings.

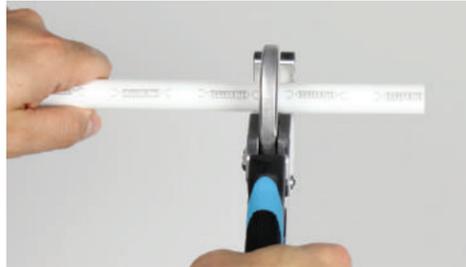


Step 5

Verify that the connection is secure by using the go/no-go gauge. The gauge slot that corresponds to the crimp ring size should easily slide onto the compressed crimp ring.

Making a SharkBite® Clamp/Barb Connection

Clamp/barb fittings listed to ASTM F2159 approved for PEX-A, PEX-B and PEX-C pipe.



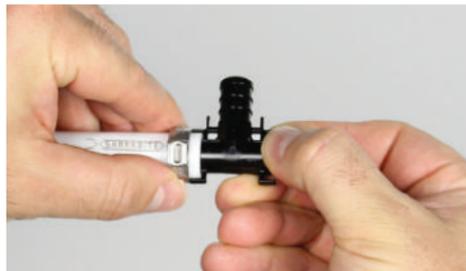
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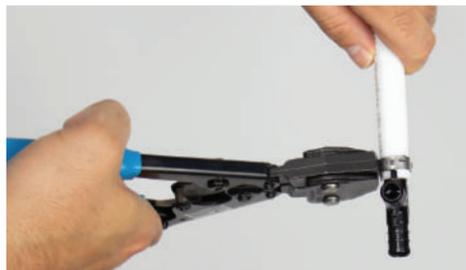
Step 2

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Step 3

Push the pipe onto the barbed fitting until it touches the fitting shoulder. Position the clamp ring 1/8 to 1/4 inch from the end of the pipe. This distance ensures that the clamp ring is positioned directly over the barbs on the fitting.



Step 4

Position the open jaws of the clamp tool over the raised tabs of the clamp ring and squeeze. One clamp tool fits all size clamp rings. It can be operated with one hand, leaving the other hand free to hold the clamp ring in position. The tool cannot be removed until the clamp ring is fully compressed. A properly calibrated clamp tool eliminates the need to check each fitting ring with a go/no-go gauge.



Step 5

Verify the connection is secure by visually checking the clamp tab.

Making a SharkBite EvoPEX® Connection

EvoPEX fittings listed to ASSE 1061 approved for PEX-A, PEX-B and PEX-C pipe.



Step 1

Cut the desired length of pipe.

- Make a square cut, perpendicular to length of tubing.
- Cut SharkBite PEX pipe using a quality PEX cutter with a sharp blade.



Step 2

Examine the EvoPEX fitting and SharkBite PEX tubing.

- Ensure that both are free of debris and damage in preparation for making a connection.



Step 3

Push the pipe into the fitting firmly.

- A twisting action reduces insertion force.
- Avoid inserting pipe at an angle.



Step 4

Verify that the pipe is pushed into the fitting fully and engaged properly.

- Check that the green indicator ring is fully visible.

Making a SharkBite® Connection

SharkBite push-to-connect fittings listed to ASSE 1061 approved for PEX-A, PEX-B and PEX-C pipe.

Making Connections (3/8 in. - 1 in.)

Cut the desired length of pipe.

- Make a square cut, perpendicular to the length of the pipe.



Deburr the end of copper or CPVC pipe to remove any sharp edges.

- Inspect fitting and pipe for damage, dirt and debris.



Mark the pipe using the depth gauge tool.

- Use the depth gauge opening that corresponds to the pipe outside diameter.



Push the pipe into the fitting.

- Mark from depth gauge should rest against the edge of the release collar.



Note: Install SharkBite fittings at least 1 inch apart to enable disassembly of the joint.

Disconnections (3/8 in. - 1 in.)

Remove fittings with **disconnect clips**.

- Place disconnect clip against the end of the fitting.
- Push the disconnect clip, compressing the release collar.
- Pull pipe away from fitting and twist slightly.



Disconnect tongs can also be used.

- Position smaller opening of tongs on pipe at release collar. Larger opening will go on body of fitting.
- Compress tongs handle.
- Pull pipe away from fitting and twist slightly.



SharkBite PEX-A Pipe Guidelines

For potable water and hydronic distribution.

What to do:

- Do install SharkBite PEX pipe to the appropriate plumbing code.
- Do use SharkBite PEX pipe for hot and cold water distribution only.
- Do keep hot and cold lines separate.
- Do use only fittings and accessories that have been tested and approved for the SharkBite PEX connection system.
- Do leave extra pipe at both ends of the run to make connections easier.
- Do ensure the pipe is supported properly to prevent undue stress, strain, thermal expansion and contraction.

What not to do:

- Do not use sharp instruments to open the SharkBite PEX packaging. You may damage the pipe.
- Do not use with natural gas, propane, fuel oil or any other fluid, chemical or product. SharkBite PEX pipe (non-oxygen barrier) is for use with **potable water only** and is not approved or intended for any other use.
- Do not freeze. SharkBite pipe is freeze resistant, but not freezeproof. Pipe embedded in concrete that is subjected to freezing conditions will likely damage both the concrete and the pipe. Pipe that is frozen and not embedded may damage joints or manifolds. Be sure to carefully pressure test, inspect and repair systems that have been subjected to a freeze before returning them to normal operation.
- Do not pressure test with water in freezing conditions.
- Do not store or install where pipe will be exposed to direct or indirect ultraviolet light (i.e. sunlight).
- Do not expose the pipe to direct flame. Do not install pipe near extreme heat.
- Do not use in excessive operating conditions inconsistent with pressure ratings that appear on pipe and applicable standards.
- Do not subject pipe to prolonged exposure to free chlorine concentrations greater than 4 ppm.
- Do not use in contaminated soils.
- Do not expose to materials that affect the basic properties of cross-linked PEX, brass or copper. Avoid contact with adhesives.
- Do not use with other fitting systems.
- Do not install through metal studs or concrete without using a protective sleeve.
- Do not install pipe that has defects such as: gouges, cuts, deep scratches, kinks, evidence of grease, tar or any chemical, exposure fading or discoloration.

- Do protect SharkBite PEX pipe from damage, both before and during the construction process.
- Do use SharkBite pipe liner with SharkBite fittings and SharkBite PEX joint. (exception - 1/4 in. fittings)
- Do use the following types of products when sealing between PEX tubing/fittings and slab penetration protection devices.
 - Latex caulk
 - Silicone sealant
 - Latex foam
 - Polyurethane expanding foam
- Note:** Do not use petroleum-based sealants on PEX tubing.
- Do pressure test the system upon completion.

- Do not use SharkBite brass or poly crimp fittings with stainless steel clamps when using PE-RT pipe in ambient temperature conditions of 32 F or less. If using SharkBite brass or poly crimp fittings with PE-RT pipe when conditions are 32 F or less, copper crimp rings should be used.
- Do not use defective fittings with the pipe.
- Do not use supports that may collapse or cut the pipe. Supports should **not** have sharp edges, which could damage the pipe.
- Do not use metal hangers with sharp or abrasive edges or hangers that may pinch or penetrate the pipe. Proper hangers, clamps and straps are available from your SharkBite supplier.
- Do not pull pipe tight at connections. Prevent unnecessary strain on the pipe, fittings and connections with straps or clamps.
- Do not drag the pipe over rough terrain, rocks or any other surface that could abrade, cut, puncture or damage the pipe wall in any way.
- Do not crush or kink the pipe.
- Do not heat kinked pipe to repair/reform. Inspect all pipe before and after installation. Damaged or kinked sections should be cut out and replaced. Keep the PEX pipe a **minimum** of 12 inches vertically and 6 inches horizontally from sources of high heat such as recessed light fixtures, gas flue vents, heating appliances or electric motors. Forced air heating ducts are not generally considered sources of high heat. These areas of installation should be rechecked after further construction and other mechanical systems have been installed. PEX can be run in return air plenums. Bend pipe 2 inches away from fitting. This prevents the fitting from being used as an anchor point.
- Do not exceed the minimum bend radius of the pipe. (see illustration on p.10)

Proper Support of SharkBite® PEX-A Pipe

SharkBite PEX must be properly supported to protect against excessive strain. For both vertical and horizontal applications we recommend the pipe be supported every 32 inches between supports, leaving a little slack (1/8-1/4 inch) in the pipe to allow for normal expansion and contraction. Always use approved PEX supports, and never use a support that has sharp edges.



Installing SharkBite PEX-A Pipe in Concrete

SharkBite PEX pipe can be submerged in concrete, but we recommend following these guidelines to ensure a long-lasting, maintenance-free installation.

- Protect the pipe with non-metallic sleeves when entering or exiting the concrete slab. A larger diameter piece of SharkBite PEX also works well in this application.
- Do not allow joints within the slab. Use a continuous length of SharkBite PEX within the slab and be sure to check for leaks before pouring concrete.

Cross-linking Methods

Cross-linking is a process that changes the chemical structure of high density polyethylene used to make PEX pipe so that the polymer chains are connected to each other in a three-dimensional net by chemical bonds. PEX-A, -B and -C are terms used to describe the different manufacturing methods used to produce PEX pipe.

Regardless of which manufacturing method is used, all PEX pipe meet the same standards for commercial and residential plumbing applications.

Classification of Cross-linked Polyethylene

	Typology	Method	Symbol
A	Chemical	Peroxide cross linking	PEX-A
B	Chemical	Silane cross linking	PEX-B
C	Physical	Radiation cross linking (beta)	PEX-C

Technical Data for SharkBite PEX-A

SharkBite PEX Pipe Marking. All SharkBite PEX Pipe is marked with:

Pipe Length	Manufacturer	Optional For Oxygen Barrier Pipe Only	Pipe Size & Identification	Manufacturing Location & Date
0025 ft	SHARKBITE	O2 BARRIER	1/2" SDR9 PEX5006 160PSI@73F - 100PSI@180F	C1 WG 6.12.14=16:00
Code Evaluation				
CSA B137.5 ANSI/AWWA C904 ASTM F876/877 (ASTM F1807, ASTM F2098, ASSE1061)				

Technical Data for SharkBite PEX-A

Certifications

The SharkBite PEX pipe is design certified to ASTM F876, ASTM F877, NSF/ANSI 14, NSF/ANSI/CAN 61, NSF/ANSI/CAN 372, ASTM F2023, ASTM F2657, CSA B137.5, ASTM E84CAN/ULC S102.2, ASTM E119CAN/ ULC S101 standards for use in potable water systems.

Maximum Working Pressure

160 psi @ 73.4°F (23°C)
100 psi @ 180°F (80°C)
80 psi @ 200°F (93°C)

Thermal Expansion

Since SharkBite PEX pipe will expand and contract during temperature changes, please allow slack when running the pipe through the building. SharkBite PEX will expand and contract at a rate of approximately 1 inch per 100 feet of pipe for each 10°F change in temperature (see equation below). We recommend that offsets and expansion loops be used as ways to compensate for expansion and contraction. The change of pipe length due to temperature increase can be calculated as follows:

$$\Delta L = \alpha(L \cdot \Delta T)$$

where: ΔL = change of length (inches)
 ΔT = change of temperature (°F)
 L = original pipe length (feet)
 α = coefficient of linear expansion = $(8 \times 10^{-5} @ 68^\circ\text{F})$

Example:
 $\Delta T = 10^\circ\text{F}$ $L = 100'$ $\Delta L = 0.08''$

Expansion/Contraction Loop Methods



SharkBite PEX Pipe Dimensions, Bend Radius and Fluid Capacity

Nominal Diameter	OD inches	ID inches	Bend Radius	Fluid Cap 100'/Gals
3/8"	0.5	0.35	4"	0.53
1/2"	0.625	0.475	5"	0.96
3/4"	0.875	0.671	7"	1.9
1"	1.125	0.885	10"	3.1

Pressure Loss Data

Flow Rate GPM	Pressure Loss psi/100 ft of pipe			
	3/8"	1/2"	3/4"	1"
0.2	0.427	0.099	0.019	0.006
0.3	0.880	0.204	0.039	0.012
0.4	1.470	0.341	0.065	0.019
0.5	2.189	0.508	0.097	0.029
0.6	3.032	0.703	0.135	0.040
0.7	3.993	0.926	0.177	0.053
0.8	5.069	1.175	0.225	0.067
0.9	6.258	1.450	0.278	0.082
1	7.555	1.751	0.335	0.099
1.1	8.960	2.076	0.397	0.118
1.2	10.470	2.425	0.464	0.138
1.3	12.080	2.799	0.535	0.159
1.4	13.800	3.195	0.611	0.181
1.5	15.610	3.615	0.691	0.205
1.6	17.520	4.058	0.776	0.230
1.7	19.530	4.523	0.865	0.256
1.8	21.640	5.010	0.958	0.284
1.9	23.840	5.519	1.055	0.313
2	26.140	6.050	1.157	0.343
2.5	39.000	9.024	1.724	0.511
3	54.100	12.510	2.390	0.708
3.5	71.360	16.500	3.150	0.933
4		20.970	4.002	1.185
4.5		25.900	4.943	1.463
5		31.300	5.972	1.768
6		43.440	8.284	2.451
7			10.930	3.232
8			13.890	4.108
9			17.170	5.076
10			20.750	6.134
11			24.630	7.281
12			28.810	8.514
13				9.832
14				11.240
15				12.720



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Certifications

The most up-to-date certifications can be found at sharkbite.com.

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