

Hydro-Air Systems, Inc.

Advanced Technology for Water Distribution



Installation Guide

Hydro-Flex PEX-AL-PEX

Hydro-PEX Tubing

Hydro-PEX tubing systems are designed to provide flexibility and alternatives to the builder or installing contractor. We offer three tubing and fitting systems. This installation guide addresses Hydro-Flex PEX-AL-PEX products only. For installation requirements for Hydro-Plumb Plus and Hydro-Heat PEX systems, please consult their installation handbook. Hydro-Flex PEX-AL-PEX tubing is a composite tubing with a layer of aluminum sandwiched between two layers of cross linked polyethylene, for use in either heating or plumbing applications.

Hydro-PEX Standards and Approvals

Hydro-Flex PEX-AL-PEX tubing is manufactured in accordance with ASTM F1281 and CSA B137.10. Hydro-Flex tubing is NSF certified to NSF Standards 14 and 61 for portable water and radiant heating use, along with IAPMO and UPC. Hydro-Flex press fittings are manufactured to ASTM F1281 and are NSF certified to NSF Standards 14 and 61 for potable water and radiant heating use, CSA B 137.1, along with IAPMO and UPC. Hydro-Flex compression fittings are manufactured to ASTM F1281 and are NSF certified to NSF Standard 14 for radiant heating use.

Consult with state and local code officials to be sure these products meet the necessary codes.

Tubing Dimensions

Hydro-Flex PEX-AL-PEX Tubing (Available in Blue/Red/White)

Nominal Size	Nom. I.D.	Nom. O.D.	Available Lengths Coils per ft.	Fluid Capacity Per 100'
1/2"	.47 in.	.63 in.	100/250/300/1000 20'/90 per bundle	.91 gal.
5/8"	.63 in.	.79 in.	450/100	1.62 gal.
3/4"	.79 in.	.96 in.	100/300/500 20'/35 per bundle	2.53 gal.
1"	.98 in.	1.26 in.	100/300/500 20'/20 per bundle	3.95 gal.

Handling

Hydro-Flex PEX-AL-PEX tubing comes boxed in plastic bags for added protection. All Hydro-Flex PEX-AL-PEX tubing should be stored in a clean dry environment. Care should be maintained in exposure of Hydro-Flex PEX-AL-PEX tubing to ultraviolet light. Maximum exposure to ultraviolet light should be no more than 4 - 6 weeks.

All Hydro-PEX tubing's should be drained when freezing may occur. Care should be maintained to protect Hydro-PEX tubing that is exposed on the job site. When tubing is installed close to a nailing surface it should be protected with a steel plate. When tubing is installed through studs, masonry walls or joists it should be protected from rough edges and abrasions by using plastic sleeves, metal or plastic bend supports, grommets or other means.

Hydro-Flex Fittings

The Hydro-Flex product offers two complete fitting systems designed specifically for Hydro-Flex PEX-AL-PEX tubing.

Hydro-Flex Press fittings are designed for use with Hydro-Flex PEX-AL-PEX tubing in potable water and radiant heating applications. These fittings are manufactured to ASTM F1281 standard out of approved brass for potable water applications. The Hydro-Flex Press fitting features a barbed brass body with double o-rings for insertion into the tubing, a stainless steel sleeve with view holes for proper insertion over the tubing, and a polymer insulator against the tubing end. The pressing process creates a permanent leak-proof connection utilizing the pressed stainless steel sleeve externally and the double o-ring barbed insert internally. Instructions for installing Hydro-Flex Press fittings are included in this manual.

Hydro-Flex Compression fittings are designed for use with Hydro-Flex PEX-AL-PEX tubing in radiant heating applications only. These fittings are manufactured to ASTM F1281 and approved to NSF 14 for radiant floor heating. The Hydro-Press Compression fitting features a barbed brass body with double o-rings for insertion into the tubing, a brass split compression ring, and a brass nut. Tightening the nut with a wrench creates a permanent leak-proof connection through compression of the split o-ring externally and the double o-ring barbed insert internally. Instructions for installing Hydro-Flex Compression fittings are included in this manual.

Installation Instructions for Hydro-Flex Press Fittings



Cut the tubing squarely. Be sure you have an even cut without any burrs or irregular shape. An uneven cut will not allow the fitting to seal properly.



Slide the proper size reamer tool into the cut end of the tubing. Turn the reamer at least 2 revolutions. The reamer is performing two functions; rounding the cut end of the tubing and cutting a small chamfer groove on the upper inside of the tubing end. This groove allows the fitting to slide into the pipe with out rolling the o-rings.



Insert the fitting body into the end of the tubing all the way to the fitting shoulder. Use the small peep holes at the end of the stainless steel sleeve to sight the tubing. If tubing does not cover the entire sight hole, the fitting is not seated properly.



Using the proper size pressing jaw from either the manual or battery pressing tool, position the jaw entirely over the stainless steel sleeve. The pressing tool and jaw must be in a 90⁰ angle to the fitting and tubing.



Press the fitting completely. With the manual-pressing tool fully close both handles until the handles open freely. With the battery-pressing tool complete the pressing operation until the tool makes a snapping sound. Inspect the fitting. If the fitting does not appear to have pressed completely around the tubing, cut the fitting off of the end of the tubing and re-do the complete process. Never re-press a fitting a second time.

Installation Instructions for Hydro-Flex Compression Fittings



Cut the tubing squarely. Be sure you have an even cut without any burrs or irregular shape. An uneven cut will not allow the fitting to seal properly.



Slide the proper size reamer tool into the cut end of the tubing. Turn the reamer at least 2 revolutions. The reamer is performing two functions; rounding the cut end of the tubing and cutting a small chamfer groove on the upper inside of the tubing end. This groove allows the fitting to slide into the pipe with out rolling the o-rings.



Slide the nut and compression crimp ring over the cut end of the tubing. Insert the fitting body into the end of the tubing all the way to the fitting shoulder.



Slide the nut and compression crimp ring over the inserted fitting body and tighten.



Using a wrench tighten the nut onto the fitting body until no threads are showing.

Bending

All Hydro-PEX tubing can be bent to a maximum radius of 5x the tubing O.D. when using a Hydro-PEX bend support. Hydro-Flex PEX-AL-PEX can be bent 6x the tubing O.D. when free hand bent. If a fitting is installed within 12" from a bend, it is best to support the tubing with a bend support or talon to reduce stress on the fitting.

Tubing Supports

Use plastic tubing supports to keep from damaging tubing, also follow all codes for use of approved fastening devices. Tubing supports should standoff tubing from structure to prevent tubing noise. When using tubing supports, tubing must be allowed to move through thermal expansion and contraction. Be sure to allow adequate excess tubing to compensate for the expansion and contraction of the tubing being supported, as it heats up and cools down.

Horizontal Runs: Hydro-Flex PEX-AL-PEX tubing should be fastened every 30" to 48".

Vertical Runs: Hydro-Flex PEX-AL-PEX tubing should be fastened every 48" and at each ceiling and floor penetration.

Expansion & Contraction

Expansion and contraction of PEX tubing must be designed into any plumbing system to avoid excessive stress on fittings. Hydro-Flex PEX-AL-PEX tubing has an expansion rate of approximately .16" for every 10⁰F rise per 100 feet of tubing. Hydro-Flex PEX-AL-PEX exhibits thermal expansion characteristics similar to copper pipe, so it becomes an ideal tubing to use when expansion and contraction of the tubing could be an issue.

Repairing Damaged Tubing

Any Hydro-Flex PEX-AL-PEX tubing that is damaged through severe kinking, buckling, gouging or slicing should be repaired by removing the damaged tubing and reconnected using a repair coupling. If the repaired splice will be in an inaccessible space the repair coupling should be wrapped with heat shrink or other form of coverage to protect the metal fitting from possible stress and corrosion.

Freezing

The flexibility of Hydro-Flex PEX-AL-PEX tubing makes it more resistant to freeze damage than metal pipes, however precautions should be taken to avoid freezing conditions. If water within Hydro-Flex PEX-AL-PEX tubing should freeze use a hand-held hair dryer to unfreeze the tubing. Hot water or hot wet towels may also be used. Never use a torch on the tubing surface, and attempt to keep the tubing surface temperature under 180⁰F with any method used.

Fastening / Terminating / Clearances

Stub-outs: When exiting Hydro-Flex PEX-AL-PEX tubing from a wall, use a bend support or a stub out. The Hydro-Flex system provides a variety of stub out options, straight or 90° with press ends, and a closed end for pressure testing. Drop ear elbows provide another option for exiting a wall. These fittings provide for a direct connection to Hydro-Flex tubing with a Female NPT threaded connection. A drop ear elbow also has a fastening support for affixing the fitting directly to a wall stud.

Copper Connections: The Hydro-Flex system includes a variety of fittings for connecting directly to copper pipe or to a copper fitting. When connecting Hydro-Flex tubing to a copper-fitting adapter, always solder the adapter to the copper pipe first, to avoid any damage to the tubing. Hydro-Flex press and compression copper fitting adapters have o-rings in the fitting that require special attention when soldering the adapter to copper pipe. When soldering a Hydro-Flex compression fitting: remove the nut and split crimp ring, either remove the o-rings or wrap a damp cloth around the fitting o-rings, solder the fitting using only the necessary amount of heat to melt the solder. When soldering a Hydro-Flex press fitting: remove the stainless steel sleeve, either remove the o-rings or wrap a damp cloth around the fitting o-rings, and solder the fitting using only the necessary amount of heat to melt the solder.

Threaded Connection: When using a Hydro-Flex threaded fitting adapter, always attach the fitting to the threaded pipe first to avoid twisting on the Hydro-PEX tubing.

Hose Bibb Connections: Hose bibs must be firmly supported or anchored before attaching any Hydro-Flex tubing.

Water heaters / boilers: Use a minimum of 18" of metallic pipe from a water heater or boiler, before connecting to Hydro-Flex PEX-AL-PEX tubing. Hydro-Flex tubing should never be installed within 6" of a gas appliance vent, or installed within a stud cavity containing an appliance vent. Check local codes for direct connection of Hydro-Flex tubing to an instantaneous water heater.

Recessed light fixtures: A minimum clearance of 12" should be maintained between recessed light fixtures and Hydro-Flex PEX-AL-PEX tubing, unless otherwise specified by local/state codes.

Gas appliance vents: Hydro-Flex PEX-AL-PEX tubing should always maintain a minimum of 6" from any gas appliance vent and should never be install within the same stud cavity or confined space of an appliance vent.

Plumbing Installation Methods

How a residential or commercial system is plumbed using Hydro-Flex tubing is left to the discretion of the plumber, as long as all local, state and national codes are followed. The following are some common plumbing practices.

Conventional Plumbing: Hydro-Flex tubing can be installed using conventional plumbing practices, similar to plumbing with copper pipe. In a conventional plumbing system, one larger trunk line feeds smaller branches that service individual fixtures within the building. When plumbing in a conventional plumbing system care must be given to properly size the tubing per fixture.

Homerun Plumbing: A homerun plumbing system uses a manifold, typically near the water source, and distributes hot and cold water lines out to individual fixtures from the manifolds. With a homerun plumbing system fewer fittings are used since each fixture connection has its own tubing line from the manifold.

Combination Homerun/Conventional Plumbing: Combining the homerun and conventional plumbing system can take advantage of both plumbing installation methods. In this combination system larger feeder or trunk lines, supply hot and cold water to remote manifold locations. These remote manifolds then supply water to individual fixtures.

Slab Construction: When plumbing for a slab construction building using Hydro-Flex tubing no protective sleeving is required. Consult local codes about protective sleeving the tubing where it penetrates the slab. If tubing is damaged in the slab it must be cut out and reconnected using a repair coupling. Completely cover the repair coupling with an oversized piece of heat shrink or other approved materials.

Trenching for Service Lines

When developing a trench for Hydro-Flex PEX-AL-PEX tubing always be aware that the surrounding trench material if sharp could damage the tubing. The bottom of the trench should not have any sharp rocks or objects. If this is the case excavate the trench a minimum of 6" and backfill with sand or an appropriate material to provide a stable and unobtrusive base. The same consideration should be given to back filling the trench. Always use materials that will not damage the tubing, while providing the necessary support for the expected traffic. Compact the top trench material a minimum of 6" above the tubing and ensure that the trench is deep enough to not deform the tubing from any traffic over the trench. To allow for thermal expansion and contraction of the tubing in the trench, install the tubing in a snake like (side to side) configuration. Never trench Hydro-Flex tubing above or below septic tanks or fields, or anywhere the ground may be or may become contaminated. For additional information referencing trenching of plastic tubing consult ASTM D2774 Standard, "Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping."

Electrical Grounding

Hydro-Flex tubing may not be used as an electrical ground. Consult the NEC and/or any local codes for proper grounding methods.

Pressure Testing the System

Before any Hydro-Flex tubing is encased in concrete or enclosed within a wall cavity, it should be pressure tested using either water or air. Always follow applicable codes for pressure testing if they exist. If no code requirements exist follow the following procedures. Fill the system with pressure between 50 and 80 psi. Maintain pressure for a minimum of 1 hour, however it is always a good idea to keep the system pressurized during a concrete pour. During the pressure test the system should not experience a decrease in pressure of greater than 10%. If the system pressure decreases by more than 10% during the pressure test, the system must be inspected for leaks. Inspect all tubing for damage or fittings for leaks. If a leak is detected, repair the leaking component and re-do the pressure test. If pressure testing using water, be sure to completely drain the system after the test if any chance of freezing may occur.

Flushing & Disinfecting

Flush the system thoroughly after installation. Some local codes may require disinfection of the water lines. In this case follow the local code requirements. To avoid adversely affecting the product life through high chlorine concentrations, the system must be flushed immediately after disinfecting, or within 24 hours.

Hydro-PEX Systems Limited Warranty

Subject to the terms of this Limited Warranty, Hydro-PEX Systems or Hydro-Air Systems, Inc. hereafter referred to as Hydro-PEX Systems, warrants solely and specifically to the owner of the applicable real property at the time of the installation and the first transferee thereafter of such real property that: (i) Hydro-PEX System's PEXc tubing, marketed as "Hydro-Plumb Plus" or "Hydro-Heat", and Hydro-PEX System's PEX-AL-PEX tubing, marketed as Hydro-Flex PEX-AL-PEX shall be free of defects in material and workmanship for a period of twenty-five (25) years; and (ii) brass ASTM F 2080 fittings marketed as "Sherlock Fittings" and F1281 fittings marketed as "Hydro-Press" shall be free of defects in material and workmanship for a period of twenty-five (25) years; and (iii) brass ASTM F 1807 fittings marketed as "Hydro-Plumb Fittings" using either a Hydro-PEX System copper crimp ring or stainless steel cinch clamp shall be free of defects in material and workmanship for a period of two (2) years; and (iv) Hydro-Plumb Polymer barbed fittings using either a Hydro-PEX System copper crimp ring or stainless steel cinch clamp shall be free of defects in material and workmanship for a period of one (1) year; and (v) the associated hardware, including manifolds, distribution headers, valve actuators, and other accessories marketed and provided by Hydro-PEX Systems shall be free of defects in material and workmanship for a period of one (1) year; and (vi) tools used for "Sherlock Fittings", "Hydro-Press" or "Hydro-Plumb Fittings" sold by Hydro-PEX Systems shall be free of defects in material and workmanship for a period of one (1) year. The warranty period will begin with the date of the sale of the product in question. For the purpose of this Limited Warranty all of the products referred to above hereafter will be referred to as a "product" or collectively as the "products".

For this Limited Warranty to apply: (i) all "products" must be installed in conformance with Hydro-PEX Systems applicable installation instructions and technical bulletins including but not limited to the testing under pressure of the system after installation; and (ii) the installation of "products" must be carried out by a registered and licensed installer; and (iii) all "products" must have been installed in accordance with all local and applicable building, plumbing, mechanical, electrical and fire protection codes; and (iv) the "products" have not been exposed to harmful chemicals; and (v) the "products" have not been exposed to excessive ultraviolet light, in accordance with published UV exposure limits; and (vi) the "products" are not damaged do to freezing or any other circumstances beyond the control of Hydro-PEX Systems; and (vii) the "products" are not damaged by tear, break or other stress cracks.

THE LIMITED WARRANTY HEREIN PROVIDED IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED ON THE PART OF HYDRO-PEX SYSTEMS. HYDRO-PEX SYSTEMS DISCLAIMS ANY WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE OR OF HABITABILITY.

The Limited Warranty will not be valid and Hydro-PEX Systems will not be liable in the event that: (i) "products" are not installed in conformance with Hydro-PEX Systems applicable installation instructions and technical bulletins including the lack of testing under pressure of the system after installation; and (ii) the installation of "products" were not carried out by a registered and licensed installer; and (iii) the "products" were not installed in accordance with all local and applicable building, plumbing, mechanical, electrical and fire protection codes; and (iv) the "products" have been exposed to harmful chemicals; and (v) the "products" have been exposed to excessive ultraviolet light, in accordance with published UV exposure limits; and (vi) the "products" were damaged do to freezing or other circumstances beyond the control of Hydro-PEX Systems; and (vii) the "products" were damaged by tear, break or other stress cracks.

In order to make a claim under this Limited Warranty, Hydro-PEX Systems must be informed immediately and no later than thirty (30) days after the occurrence of an event giving rise to a breach of the Limited Warranty and while the damaged portion of the Project is still open and available for inspection by a Representative of Hydro-PEX Systems to enable Hydro-PEX Systems to determine whether Hydro-PEX Systems has any liability for defective product. IF THIS NOTICE IS NOT GIVEN, AND INSPECTION IS NOT POSSIBLE, THEN THIS LIMITED WARRANTY IS VOID. Additionally, at the request of Hydro-PEX Systems, in order for this Limited Warranty to be valid, the claimant will provide a sample of the allegedly defective product to Hydro-PEX Systems for evaluation.

If after a full evaluation a defect exists within the "products", Hydro-PEX System's liability shall be limited, at Hydro-PEX System's option, of replacing or repairing the defective "product" in question or providing a refund of the defective "products" purchase price. Hydro-PEX Systems will not be liable for any costs of labor, removal, reinstallation, transportation, or any other charges that may arise in connection with the warranty claim. THE SOLE AND EXCLUSIVE REMEDY PURSUANT TO ANY CLAIM OF ANY KIND, INCLUDING BUT NOT LIMITED TO A CLAIM IN CONTRACT, NEGLIGENCE OR STRICT LIABILITY, AGAINST HYDRO-PEX SYSTEMS OR ANY OF HYDRO-PEX SYSTEM'S AFFILIATES, SHALL BE LIMITED TO THE LIMITED LIABILITY OF HYDRO-PEX SYSTEMS DESCRIBED IN THIS SECTION. HYDRO-PEX SYSTEMS SHALL NOT BE HELD RESPONSIBLE FOR DAMAGE TO PERSON OR PROPERTY, INCIDENTAL OR CONSEQUENTIAL LOSS, LOSS OF PROFIT, LOSSES ON GOODS IN STORE OR THE LIKE, IRRESPECTIVE OF THE CAUSE. Some States do not allow the exclusion of limitation of incidental or consequential damages and some States do not allow limitations on how long implied warranties may last. Therefore, the limitations or exclusions above may not apply to you. This Limited Warranty gives you specific rights and you may also have other legal rights, which vary, by State. Any action of breach of warranty must be commenced within one (1) year of the date of the breach of warranty, unless law bars such limitation. This warranty applies to the United States.

This warranty is effective July 1, 2009

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