

INSTALLATION GUIDELINES FOR CROSS-LINKED POLYETHYLENE TUBING

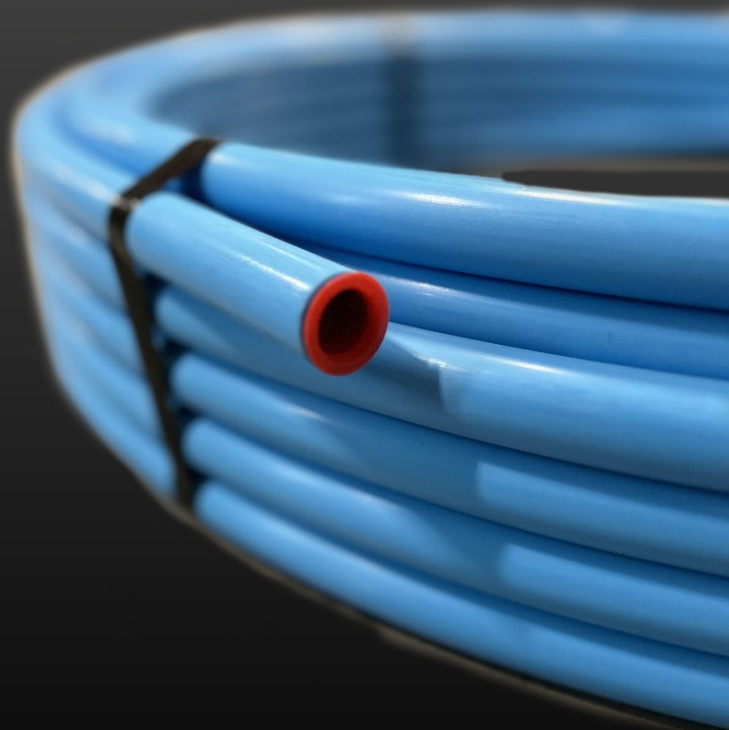


LYNX-PEX™

WATER SERVICE

FOR WATER SERVICE LINES MEETING ANSI/AWWA STANDARD C904

Revised June 23, 2023



INTRODUCTION

This guide is intended to assist appropriately licensed installers using LYNX-PEX™ Water Service Tubing in municipal service lines meeting ANSI/AWWA Standard C904.

Refer to American Water Works Association (AWWA) Committee report *Design and Installation of Crosslinked Polyethylene (PEX) Pipe Made in Accordance with AWWA C904* for additional information on the design and installation of PEX water service lines.

In the event of conflict or inconsistency between these installation guidelines and local building or plumbing codes, local codes should take precedence.

NOTE: Failure to follow installation instructions will void the CB Supplies LYNX-PEX™ warranty.

Nothing in this publication is intended to create any warranty beyond CB Supplies' applicable warranty. For additional information, contact CB Supplies Ltd. at 1.800.665.1851.

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CODES & STANDARDS

LYNX-PEX™ Water Service Tubing is certified to meet the following codes and standards:

- **ANSI/AWWA C904**, Crosslinked Polyethylene (PEX) Pressure Tubing, 1/2 In. (13 mm) Through 3 In. (76 mm), for Water Service
- **ASTM F876**, Standard Specification for Crosslinked Polyethylene (PEX)
- **ASTM F877**, Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
- **CSA B137.5**, Crosslinked polyethylene (PEX) tubing systems for pressure applications
- **NSF/ANSI/CAN 61**, Drinking Water System Components – Health Effects
- **NSF/ANSI 14**, Plastic Piping System Components and Related Materials
- **NSF/ANSI/CAN 372**, Drinking Water System Components – Lead Content
- **International Plumbing Code® (IPC)**
- **International Mechanical Code® (IMC)**
- **International Residential Code® (IRC)**
- **Uniform Plumbing Code® (UPC)**
- **Uniform Mechanical Code® (UMC)**

CHLORINE AND UV RESISTANCE

LYNX-PEX™ tubing is 3rd-party listed to a PEX 5306 Material Designation Code, reflecting the highest chlorine and UV resistance rating in the industry, in accordance with:

- **ASTM F2023**, Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Pipe, Tubing and Systems to Hot Chlorinated Water
- **ASTM F2657**, Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing

PRESSURE RATINGS

Design temperature and pressure ratings for LYNX-PEX™ Water Service Tubing are:

- 160 psi @ 73°F (ASTM F876 section 5.2)
- 100 psi @ 180°F (ASTM F876 section 5.2)
- 200 psi @ 73°F (CSA B137.0 section 6.6.3.2.2)

In accordance with:

- **ASTM D2837**, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Piping Materials.
- **PPI TR-3**, Policies and Procedures for Developing Hydrostatic Design Basis (HDB), Hydrostatic Design Stresses (HDS), Pressure Design Basis (PDB), Strength Design Basis (SDB), Minimum Required Strength (MRS) Ratings, and Categorized Required Strength (CRS) for Thermoplastic Piping Materials or Pipe

COMPATIBILITY

As a Copper Tube Size (CTS) SDR 9 tubing, LYNX-PEX™ Water Service Tubing is intended and recommended for use with ANSI/AWWA C800 Underground Service Line Valves and Fittings in municipal water distribution systems.

There are competing PEX tubing and fitting suppliers that also manufacture to the above standards. As such, the use of CB Supplies LYNX-PEX™ tubing system components with a competitor's components, provided they are appropriate for ANSI/AWWA C904 systems, will not affect CB Supplies' product warranty. However, CB Supplies warrants only those components that we manufacture or distribute.

MANUAL CONTENT AND USE

This book of installation guidelines contains information on the specifications and installation of LYNX- PEX™ SDR9 cross-linked polyethylene (PEX) tubing and water service line systems.

The installer shall be thoroughly familiar with the contents of this manual before proceeding. Consult local codes for additional installation requirements and/or CB Supplies Ltd. for additional, specific product information.

Important: LYNX-PEX™ systems are intended for municipal water service systems. Installation of a LYNX- PEX™ plumbing system for the purposes other than those recommended by CB Supplies is a misapplication of the product and voids product warranties. Contact CB Supplies Ltd. before applying this system for any use other than those recommended.

USES OF LYNX-PEX™ TUBING

LYNX-PEX™ SDR 9 PEX tubing, and components must be installed in accordance with good plumbing practices, applicable code requirements, and current installation instructions. It is the responsibility of the contractor or installer to appropriately design the system, determine that the selection of LYNX- PEX™ tubing and the joining system components are the proper ones for the intended application, and that they and/or their employees observe the installation practices recommended by CB Supplies. If there is any doubt whether conditions likely to be encountered in the intended application may be harmful to PEX components, call a CB Supplies representative on 1-800-665-1851.

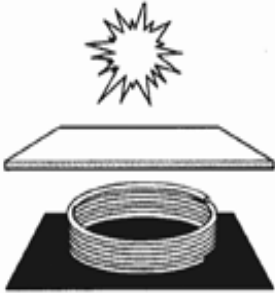


CAUTION!

Tubing that exhibits damage such as cuts, scratches, gouges, kinks, fading, or discoloration, evidence of grease, tar or any chemical exposure shall not be used.

A damp rag is all that should be required for cleaning the tubing. If any materials (other than those allowed in this publication) has adhered itself to the tubing and cannot be removed in this manner, do not use that section of tubing. NEVER use thinners, pipe sealants, solvent cements, fluxes, lubricants, other oxidizing agents or petroleum-based materials to seal or clean LYNX- PEX™ tubing.

KNOW YOUR MATERIALS



HANDLING & STORAGE

Do not install where exposed to direct or indirect sunlight for more than 60 days. PEX tubing shall be stored under cover, shielded from direct and indirect sunlight, when the material is stored for any length of time. If tubing is anticipated to be exposed to sunlight for more than 30 days, either leave it inside of its opaque packaging or sleeve it to protect against damage.

FITTINGS

LYNX-PEX™ is Copper Tube Size (CTS) tubing with Standard Dimension Ratio 9 (SDR-9) dimensions, which can be used with ANSI/AWWA C800 compression joint brass valves and fittings for underground connections, where an insert/liner is inserted in the end of the tube and then the brass fitting installed per the manufacturers' recommended instructions. Alternatively, other approved PEXb fittings may be used for connections to valves, saddles, taps or meter housings (check local codes and approvals).

Do not use:

- Fittings which have defects such as cuts, gouges, or abrasions
- Solvent cements
- Fittings that are not marked as compliant with NSF/ANSI/CAN 61 such as NSF pw G
- Lubricants of any kind on the tubing or fittings

TOOLS

No special tools are required for LYNX-PEX™ connections when making ANSI/AWWA C800 Underground Service Line Valves and Fittings connections. Standard pipe wrenches may be used with these valves and fittings, as per manufacturer's instructions. Use the appropriate size stainless steel or plastic insert as approved by the insert manufacturer for CTS SDR 9 tubing and water service line connections.

Tubing must be cut squarely and cleanly. Always use an approved plastic pipe cutter to cut LYNX-PEX™ to the desired length.

*CB Supplies Kwik Cutter
Model No. HAK67*



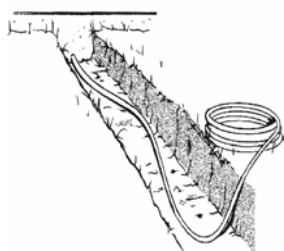
INSTALLING LYNX-PEX™ TUBING

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Safeguard against potential hazards by wearing Personal Protective Equipment (PPE).
Ensure proper selection, use, and maintenance of PPE to promote a secure and healthy environment.

TRENCHING

When installing LYNX-PEX™ in the ground and/or under-slab, the tubing should be snaked from side to side in the prepared trench. The trench bottom must be free of debris and provide stable, continuous support for the tubing. In rocky, muddy, or otherwise unstable soil conditions, it may be necessary to prepare the trench bottom using granular material to achieve a stable, smooth base. Lay the tube directly on the trench bottom.

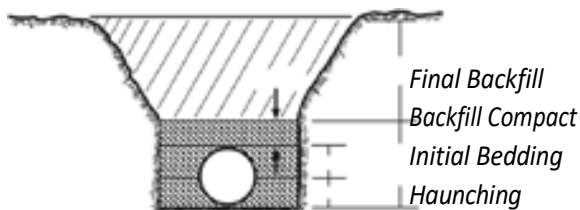


Snake tubing from side to side to allow for tube contraction.

Bed and haunch the tube with small, loose, easily compacted backfill material. Compact this material to at least 6" above the tube before final backfilling with any larger or coarser materials. For further information on proper backfill, consult ASTM D2774.

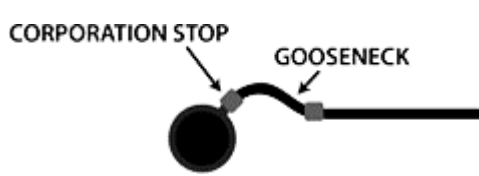
Use only continuous lengths of tubing (no fittings) in or under a concrete slab. Any connections shall be outside the slab or in an access box.

When direct burial of metallic water service fittings are used to connect water service tubing coming into the house, those fittings should be made from ASTM B62 UNS C83600 cast bronze (per AWWA standards) or ASTM B140 UNS C31400 "DZR" brass (check with fittings manufacturer). In those areas with aggressive soil, such as desert areas, wrapping securely with self-fusing silicone rubber tape (minimum 0.020 thickness) is recommended.



CAUTION!

LYNX-PEX™ tubing shall not be installed underground in areas of known chemical contamination of the soil, such as organic solvents or petroleum distillates, or where there is a high risk of chemical spills.



GOOSENECKS

At the connection between LYNX-PEX™ pipe and the water main, LYNX-PEX™ should leave the main at a 10-20° angle above the horizontal, to prevent stress on the connection. This will result in a 'gooseneck' in the pipe

that should be at least 4 ft (1.2 m) long. It is not required to use the higher 45° gooseneck common with copper water service lines.

ELECTRICAL GROUNDING

LYNX-PEX™ may not be used to ground an electrical system. Check with local authorities for proper practices.

INSTALLATION TEMPERATURE RANGE

The flexibility of LYNX-PEX™ tubing and the strength of the LYNX-PEX™ connections combine to provide a system that can be installed during any weather, in temperatures down to -30°C.

FREEZING

The flexibility of LYNX-PEX™ tubing makes it resistant to damage from freezing, but precautions to prevent freezing should be taken when low temperatures might be encountered.

Due to the lower thermal conductivity of PEX compared with metal pipes, heat transfer through LYNX-PEX™ is reduced. This may delay freezing of the water inside the pipe while the ground around it is below 32°F (0°C). However, water inside a pipe surrounded by frozen earth can eventually freeze.

Therefore, it is good design practice to install all service line pipes, including LYNX-PEX, at least 6 inches below the frost line.



PEX tubing systems should not be intentionally subjected to freezing. Do not use an open torch or excessive heat to thaw PEX tubing. Tubing failure or damage can result. Heat must be applied directly to the frozen tubing section. Temperature on tubing shall not exceed 180°F.

Several suitable methods exist to thaw PEX tubing. They include:

- Hot water
- Hand-held hair dryer
- Wet hot towels
- Low wattage electrical heating tape.

TRENCH BACKFILL

LYNX-PEX™ is to be covered with backfill as soon as possible to protect the tubing from shifting, UV exposure, and damage. It is recommended to pressurize the tubing prior to backfilling to reveal any damage. When backfilling the trench, use Class I or Class II fill for the first 6 inches above the top of the tubing. Initial backfill may consist of the native material of the trench, provided it is free from large stones, not frozen, and free of debris or other organic materials. Unless otherwise specified by local code requirements, trenches under pavements, sidewalks or roads should be backfilled and compacted to at least 90% Standard Proctor Density.

SYSTEM TESTING

1. Upon completion of the installation, the system should be filled and hydrostatically tested. Use only POTABLE water for testing.



Water testing shall be avoided during freezing conditions (see “Pressure Testing in Cold Conditions,” below).

2. Hydrostatic testing of the LYNX-PEX™ plumbing system is to be conducted according to local code requirements. Test pressure shall be not less than 100 psi nor greater than 225 psi.

NOTE: Some plumbing fixtures may not withstand test pressures greater than 80 psi. Consult fixture manufacturers’ instructions for pressure limitations or plug all distribution lines at the fixture end. The system shall, at a minimum, withstand the test pressure, without leaking, for a period of 15 minutes.



Warning! Pressures used in testing can blow unmade or incomplete connections apart with tremendous force!

This force is many times greater when air is used for a test media. To reduce the risk of personal injury, ensure that all connections are completed before testing. Use only the pressure and time required to determine that the system is leak free.

PRESSURE TESTING IN COLD CONDITIONS

Fluid testing the LYNX-PEX™ system at temperatures below freezing (less than 32°F, 0°C) may be performed using a solution of water and NON-TOXIC antifreeze such as propylene glycol (typically called RV antifreeze). If such a solution is used, the antifreeze solutions must be sufficiently concentrated to withstand the lowest temperature encountered while the testing fluid is in the system. Antifreeze solutions should be purged, and the system flushed with potable water prior to consumer use.

Air pressure testing of a LYNX-PEX™ plumbing system is acceptable and preferred to hydrostatic testing in areas where cold weather could freeze the system or where water is not available. CB Supplies recommends that the installer pressurize the system with compressed air or another acceptable test medium, such as dry nitrogen, after installing and capping distribution lines. Air testing shall utilize a pressure of not less than 40 psi and not greater than 100 psi. The system shall be tested for a minimum of 15 minutes. During the test, system pressure shall drop no more than 8 psi in the one-hour period.

If the pressure in the system declines more than 8 psi during the minimum 15-minute period, re-pressurize the system to the original test pressure, and retest. * If the system pressure declines more than 8 psi again during the test period, test the distribution line test plugs or any other fittings in the system with the approved leak detection solution. (Any connection found to be in question must be replaced or remade and the pressure test repeated.)

If it’s determined that the connections are leak free, then the tubing must be inspected for damage. Damaged sections must be cut out and repaired with a coupler or if feasible, the tubing section replaced.

For leak detection, use only a mixture of Original Palmolive Green™ dishwashing soap (#46100-46200) or Palmolive Ultra™ (#356140 or 46128) mixed with potable water at a ratio of 2 ounces of soap to one gallon of water (mix Ultra at a ratio of 1.5 ounces per gallon.)

** During the initial test pressurization period, the system pressure indicated on the gauge pressure drop is dependent on ambient temperature, system capacity, and test pressure but shall not be more than 8 psi in an hour.*



*Tests shall be conducted when significant changes to temperature **aren't** expected. Please note significant changes in ambient temperature also can affect system pressure.*



Water (not antifreeze solution) must be purged or drained from the system if temperatures are expected to fall below freezing (32°F, 0°C). Low pressure compressed air can be used for purging.



Follow the antifreeze manufacturer's instructions for concentrations. Use only non-toxic antifreeze approved for use in drinking water systems.



The water heater shall be isolated and not included in the system air test.

SYSTEM DISINFECTION

Local codes may require system disinfection. When no other method is available, follow the time limitations and exposure levels shown below:

1. Use a chlorine solution and one of the exposure durations listed below:

CONCENTRATION	PERIOD
200 PPM	3 HOURS
50 PPM	24 HOURS

2. Mix the disinfection solution thoroughly before adding it to the system.
3. The chlorine solution must reach all parts of the system. Open all fixtures (both sides) and flow water until a chlorine smell is present. As an alternative, chlorine test tablets can be used to detect chlorine at each fixture.
4. The chlorine source for the solution can be, but is not limited to, the following:

CHLORINE SOURCE	% ACTIVE CHLORINE	FORM	AMOUNT PER 100-GAL WATER FOR A 100 PPM SOLUTION
Laundry bleach	5.25	Liquid	1-1/2 pints (24 oz.)

5. After the solution has been in the system for the time required by the Authority Having Jurisdiction or the exposure durations listed in step 1 above, the system shall be flushed completely with potable water.
6. The system must be purged or drained of all water or protected from freezing.

NOTICE: To prevent reduced service life of system components, disinfection solutions shall not stand in the system longer than 24 hours. Thoroughly flush the system with potable water after disinfection.

CB SUPPLIES LIMITED WARRANTY LYNX-PEX™ TUBING

Subject to the conditions in this Limited Warranty, CB SUPPLIES LTD. warrants to licensed plumbers who purchase and properly install in a hot and cold potable water distribution systems its LYNX-PEX™ cross linked polyethylene pipe and tubing (PEX), meeting the specifications of CSA B137.5 and ASTM F876/877 as certified by a recognized third party, that the pipe or tubing under normal conditions of use, will be free from failure caused by manufacturing defects for a period of twenty five (25) years from date of installation.

Under this warranty, you only have a right to reimbursement if the failure or leak resulted from a manufacturing defect in the products covered by this warranty and occurred during the warranty period. You do not have a remedy or right of reimbursement under this warranty and this warranty does not apply if the failure or any resulting damage is caused by: (1) components in the plumbing systems other than those manufactured by CB Supplies Ltd.; (2) not designing, installing, inspecting or testing the systems in accordance with CB Supplies Ltd. installation instructions at the time of the installation, applicable code requirements, and good plumbing practices; (3) improper design of the system; (4) exposure to unauthorized antifreeze, rust inhibitor or other treatment fluids or concrete additives or by failure to provide recommended water temperature levels or other misuse or abuse of the tubing; (5) damage caused to the product prior to, during, or after installation, inadequate freeze protection, exposure to water pressures or temperatures in excess of the limitations on the pipe or tubing, or exposure to unauthorized solvents or chemicals; and (6) natural disasters such as fire, flood, wind, ground movement, or lightning.

In the event of a leak or other failure in the system, it is the responsibility of the property owner to contract and pay for the repairs. Only if the warranty applies will CB Supplies Ltd. be responsible for reimbursement under this warranty. The part or parts that you claim failed should be kept and CB Supplies Ltd. contacted in writing to the address below within thirty days (30) after the leak or failure and identifying yourself as having a warranty claim. You should be prepared to ship, at your expense, the product which you claim failed due to a manufacturing defect, document the date of installation, and the amount of any claimed bills which you wish to be reimbursed. Within a reasonable time after notification, CB Supplies Ltd. will investigate the reasons for the failure, which includes the right to inspect the product at CB Supplies Ltd. and reasonable access to the site of the damage in order to determine if the warranty applies. CB Supplies Ltd. will notify you in writing of the results of its review.

In the event that CB Supplies Ltd. determines that the failure or leak and any resulting damages were the result of a manufacturing defect in the products covered by this warranty, CB Supplies Ltd. will reimburse the property owner for reasonable repair or replacement charges to include drywall and painting or plastering costs, as well as damages to personal property resulting from the failure or leak. CB Supplies Ltd. shall not be liable for consequential economic loss damages under any legal theory and whether asserted by direct action, for contribution or indemnity or otherwise.

The above limited warranty is in lieu of all other warranties express or implied, including but not limited to, the implied warranties of the merchantability and fitness for a particular purpose. Other than this limited warranty, CB Supplies Ltd. does not authorize any person or firm to create for it any other obligation or liability in connection with any warranty extended by them to builders or owners of site-built construction.