stream33®

COMPLETE PEX-B GUIDE

JANUARY 2021

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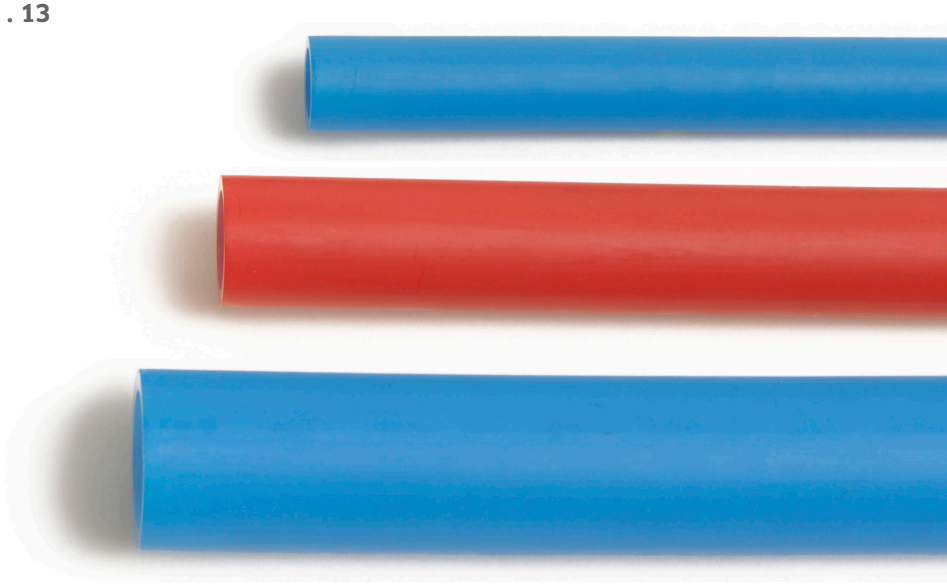


PEX-B Tubing

Flexible, Durable, Quality Tubing Made in America

Stream33 PEX Tubing - PEX-B

Stream33 PEX-B tube is made using the Sioplas method. This involves a 2 component extrusion with the base material comprising 95% of the end product and the catalyst to start the reaction accounting for the remaining 5%. The reaction begins at extrusion and is accelerated by curing at elevated temperatures and with moisture exposure.

PEX-B Tubing

TUBE SIZE	STANDARD	DESIGNATION CODE & TUBE TYPE
Non-Barrier Tube		
1/2"	ASTM F876/F877	5306 (PEX-B)
3/4"	ASTM F876/F877	5306 (PEX-B)
1"	ASTM F876/F877	5306 (PEX-B)
1-1/4"	ASTM F876/F877	5306 (PEX-B)
1-1/2"	ASTM F876/F877	
2"	ASTM F876/F877	

PEX-B Fitting Size Availability

	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
F1807 Crimp	■	■	■	■	■		
F877 Crimp						■	■
F2159		■	■	■			
F877 Crimp					■	■	■

PEX-B Tube & Fitting System Compliance

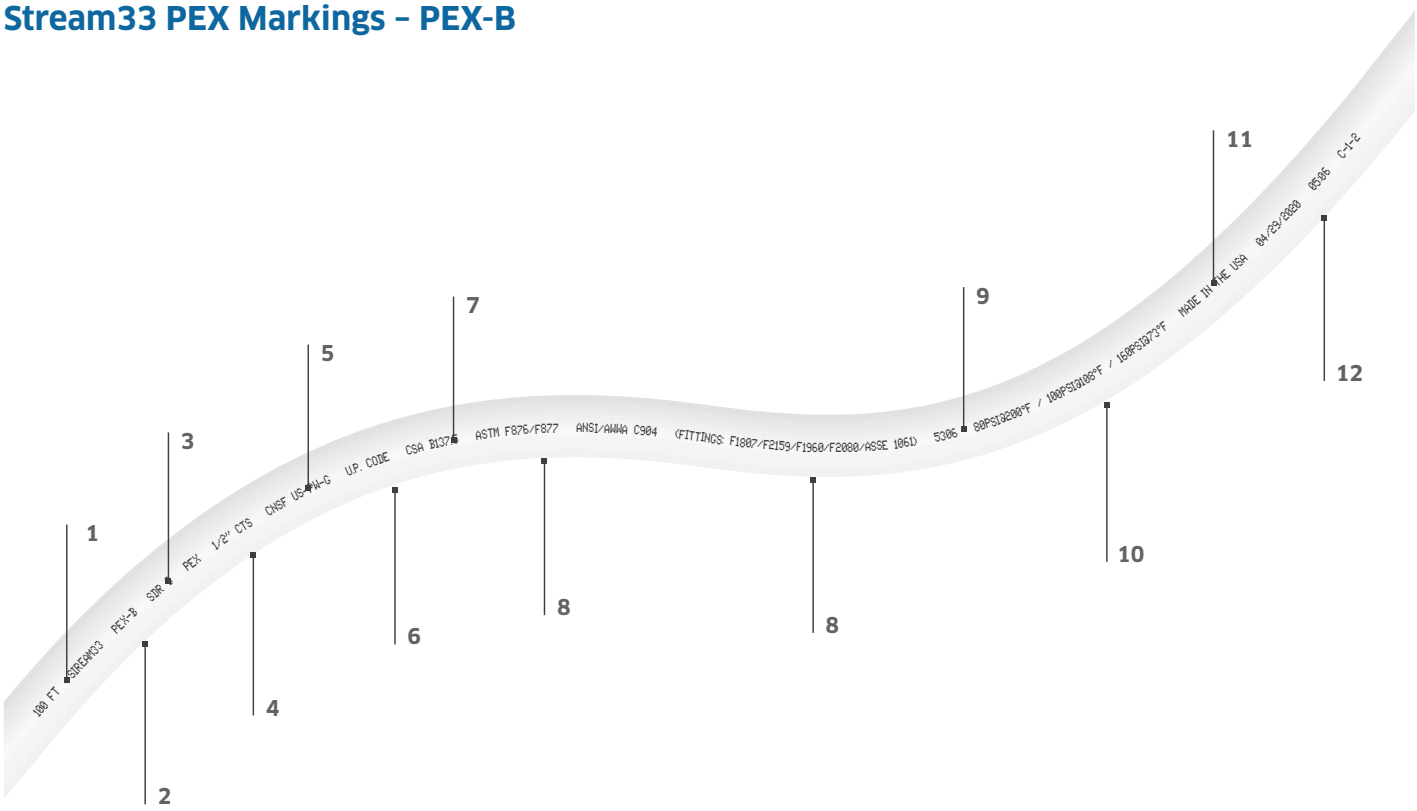
	PEX-B TUBING
F1807 Crimp	■
F2159 AccuCrimp	■
F2080 Lock	■

ASTM F1807 / F2159

ASSE 1060

ASTM F3348

Stream33 PEX Markings – PEX-B



PRINTED MARKINGS ON TUBING		EXPLANATION
1	STREAM33	Company Name
2	PEX TUBING	Product Name
3	SDR9 PEX	Standard Dimensional Ratio For Fitting Size Acceptance
4	1/2" CTS	Tubing Size
5	CNSF US-PW-G	National Sanitation Foundation Mark for Toxicity & Performance Certification
6	UP. CODE	IAPMO Listing = Model Plumbing Code Body
7	CSA B137.5	CSA Listing & Canadian Certification
8	ASTM F876/F877 FITTINGS: F1807/F2159/F2080/ASSE 1061	Applicable ASTM Standard Certifications for Performance & Manufacturers
9	5306	Chlorine & UV Resistance Per Standard
10	160PSI@73.4°F / 100PSI@180°F / 80PSI@200°F	Pressure & Temperature Rating
11	MADE IN THE USA	Country of Origin
12	04/29/2020 05:06 C-1-2	Date Stamp, Time Stamp & Manufacturer's Line Tracking Number

PEX-B Tube Identification Mark Example: 5306 or 1006

Integer 1: (chlorine resistance) PER ASTM F2023

0 = Not tested for Chlorine resistance
1 = 25% use @ 140°F & 75% use @ 73°F
3 = 50% use @ 140°F & 50% use @ 73°F
5 = 100% use @ 140°F

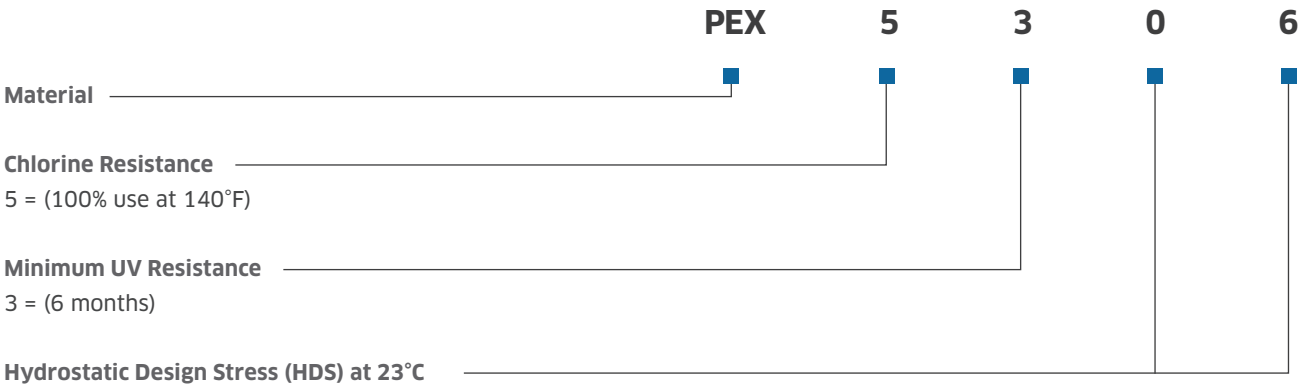
Integer 2: (min. UV resistance) PER ASTM F2657

0 = Not tested for UV exposure
1 = Max. exposure of 1 month
2 = Max. exposure of 3 months
3 = Max. exposure of 6 months

Integer 3 & 4: (HDS @ 73°F) × 100 psi.

06 = 630 psi.

PEX-B Tube: Chlorine Resistance and UV Inhibition



Stream33 PEX-B Production Tests and Continuous Compliance Tests

TEST	STANDARD	FREQUENCY
Density	ASTM D1505	Each Tubing Run
Hydrostatic Sustained Pressure	ASTM D1598	Random Continuous Samples
Hydrostatic Burst Pressure	ASTM D1599	Each Tubing Run
Environmental Stress Cracking	ASTM F876	Annually
UV Inhibition	ASTM F2657	During Certification
Degree of Cross-linking	ASTM D2765	Each Tubing Run
Stabilizer Functionality	ASTM D1598	During Certification
Oxidative Stability	ASTM F2023	During Certification
Bent Tube Sustained Pressure	ASTM D1598	Annually
Excessive Temp + Pressure Capability	ASTM D1598	Each Random Continuous Samples
Melt Flow Index	ASTM D1238	Each Receipt
Ongoing Dimensional Checks (OD, ID, Wall Thickness, Homogeneity, Etc.)	ASTM F876/877	Continuous
Ongoing Dimensional Checks - Fittings (Copper, Brass, Plastic)	ASTM FITTING STANDARD	Each Run
Rockwell Tests for Copper Crimp Rings	ASTM F1807	Each Run
Alloy Material Test (X-Ray Florescence Analyzer)	ASTM FITTING STANDARD	Each Receipt
Certificate of Resin Compliance	PER MSDS SHEET	Each Receipt
Crush Test (for PPSU Fittings)	ASTM F2159	Random Continuous Samples

PEX-B Tubing Product Standards

ASTM F876: Standard Specification for Cross-linked Polyethylene (PEX) Tubing

ASTM F877: Standard Specification for Cross-linked Polyethylene (PEX) Hot and Cold-Water Distribution Systems

CSA B137.5: Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications

Code Acceptance

PEX-B Tubing Code Compliance. Below is a list of commonly referenced and recognized plumbing model codes, which recognize PEX tubing installation and reference standards for application and installation compliance. Individual standards can be referenced in section 6.

Area / Region. Many cities, states, counties or other jurisdictions may employ and determine what standards, specifications, and plumbing/heating practices are satisfactory. Check with all local and state codes prior to any installation.

National Sanitation Foundation

International Plumbing Code

International Residential Code

Uniform Plumbing Code

Material Benefits of PEX-B Tubing

Corrosion Resistant. Smooth inner walls inhibit mineral build up and scaling - resists pitting or stress-corrosion more than other types of tube. PEX-B is also more resistant to the harmful effects of chemicals such as chlorine.

Quiet. Flow characteristics are increased and system noise is decreased when compared to metal tubing systems.

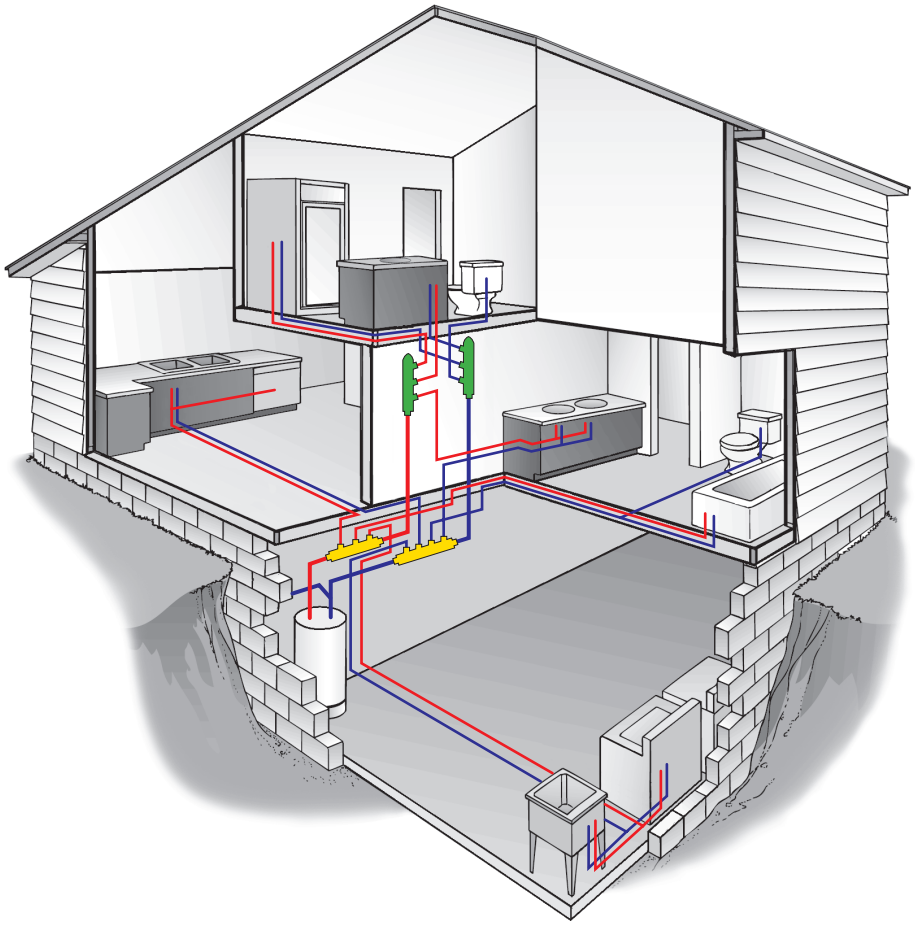
Freeze Resistant. While it is always recommended to follow code requirements and common practices to protect from freezing, PEX-B tubing can expand and contract more easily (often without damage) than copper and CPVC tubing.

Reduced Turbulence / Increased Flow. The smooth interior wall of the tube reduces turbulence during water demand thereby increasing the overall flow characteristics to the fixture being supplied.

Thermal Conductivity. Lower heat transfer compared to metal tube, saving energy and money.

Installation Flexibility. PEX-B tube bends easily and can be plumbed around building members or through floors/ walls. Using flexible tubing means reduces the overall fittings used, brackets needed, joints behind the wall, labor to install and liability of leaks.

CORROSION RESISTANT | QUIET | FREEZE RESISTANT | FLEXIBLE



Installation Tips

- When servicing a line, Stream33 recommends using valved manifolds whenever possible. Primary manifolds should always be valved.
- Branchmaster manifolds can always be coupled together with other manifolds and PEX-B tube to achieve the desired number of branches.

Secondary Manifolds

Primary Manifolds

Material Properties of PEX-B Tubing

Water Temperature + Water Pressure. PEX-B tubing shall not be used in applications where temperature and pressure ratings are not regulated or are known to evidence exposures beyond the tested and certified limit of the tube.

Tube Operating Pressure / Temperatures

TEMPERATURE	HYDROSTATIC PSI (MAX)	OPERATING PSI WATER
73.4° F / 23° C	630	160
180° F / 82.2° C	400	100
200° F / 93.3° C	315	80

Minimum Bend Radius*

TUBE SIZE (CTS)	BEND RADIUS
1/2"	3.75"
3/4"	5.25"
1"	6.75"
1-1/4"	8.25"
1-1/2"	9.75"
2"	12.75"

*Additional information found within Stream33 tubing limitations

Flow Characteristics

GPM	1/2" PRESSURE DROP @ 60°F (PSI/100FT)	VELOCITY (FT/SEC)	3/4" PRESSURE DROP @ 60°F (PSI/) 100FT	VELOCITY (FT/SEC)	1" PRESSURE DROP @ 60°F (PSI/100FT)	VELOCITY (FT/SEC)
1	1.8	1.7	1.2	1.8	.4	1
2	5.9	3.5	2.4	2.7	.7	1.6
3	12.1	5.2	4.0	3.5	1.2	2.1
4	20.1	7	5.7	4.4	1.8	2.7
5			8.1	5.3	2.5	3.2
6			10.7	6.2	3.2	3.7
7			13.5	7.1	4.1	4.3
8					5.0	4.8
9					6.0	5.3

Support + Spacing

TUBE SIZE	HORIZONTAL SUPPORT SPACING	VERTICAL SUPPORT SPACING
1/2"	32"	Once Per Floor Penetration @ floor level. Once at midpoint of floor expanse or every 48"
3/4"	32"	
1"	32"	
1-1/4"	32"*	
1-1/2"	32"*	
2"	32"*	

*See individual mfg. instructions for continuous pipe support systems for large diameter horizontal arterial water mains.

PPSU Fittings - Special Considerations

Handling and Use

Petroleum based products, solvents, PVC glues and primers, gels, lubricants, pipe dopes, ethylene glycol, thread oils and paste or other volatile compounds should not come in contact with PPSU fittings. Store fittings away from harmful chemicals and direct sunlight (UV exposure). The maximum short-term working temperature (30 days) of fittings: 210 ºF (99 ºC) @ 150 PSI. Constant Working Temperature: 140 ºF (60 ºC) @ 55 PSI. PPSU should not be used in any installation within mechanical systems that may have oil or solvent residue. Do not impact PPSU polymer fittings. Do not subject fittings to torque limits exceeding 100 lbs. of force. Fittings should be kept free of mechanical stress. Each joint should be properly supported. Limit torque on connections which puts undue stress on molded fittings. Try to support the tubing within 4" of a fitting especially when tubing is changing direction directly after the connection and thereby putting the connection in a torqued application

PPSU fittings are suitable for radiant heating and cooling under the following conditions:

1. Use only propylene glycol (food grade) to maximum 60% by volume

2. DO NOT USE ETHYLENE GLYCOL WITH PPSU FITTINGS

3. Maximum temp: 194˚F (90˚C) at 44 PSI

4. Recommended Corrosion Inhibitors: Metal Guard™

- H50 6% by volume
- H60 4% by volume
- H80 4% by volume

Do not subject PPSU material to an open flame or solder within 18" of polymer fittings. Flame or heating sources beyond material tolerances must be avoided.

Glue/Primers/Chemicals: PPSU fittings should be protected from harmful chemical exposure. Do not allow any oils to contact PPSU fittings.

Fittings that have been exposed to solvents (PVC primers/glues included) MUST be removed from service. See CAUTION section in ASTM F2159 Standard

General Installation Guidelines

Layouts, Examples, Manifold Systems and Common Problems to Avoid

Hybrid Systems/Combination Install

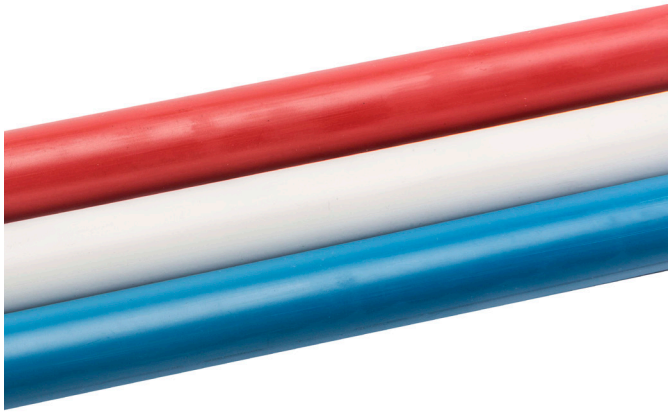
Hybrid Systems

WHAT: Hybrid systems combine multiple plumbing connection types within one system. Example: A branch run may be plumbed in F1807 whereas an arterial water main may be plumbed in copper or CPVC.

HOW: Stream33 PEX-B Tubing offers quality tube and quality fittings. Each is independently warranted regardless of system installation as long as they are in a compliant tube + fitting mix.

WHEN: Hybrid applications work perfectly in applications where a header is plumbed in a more thermally stable tubing offering while branching off to a more flexible and cost-effective connection system solution.

WHY: A plumber or building owner should not be restricted from choosing the strongest connection system that an application may require, or a connection system they are not comfortable with, or that does not allow them to compete.



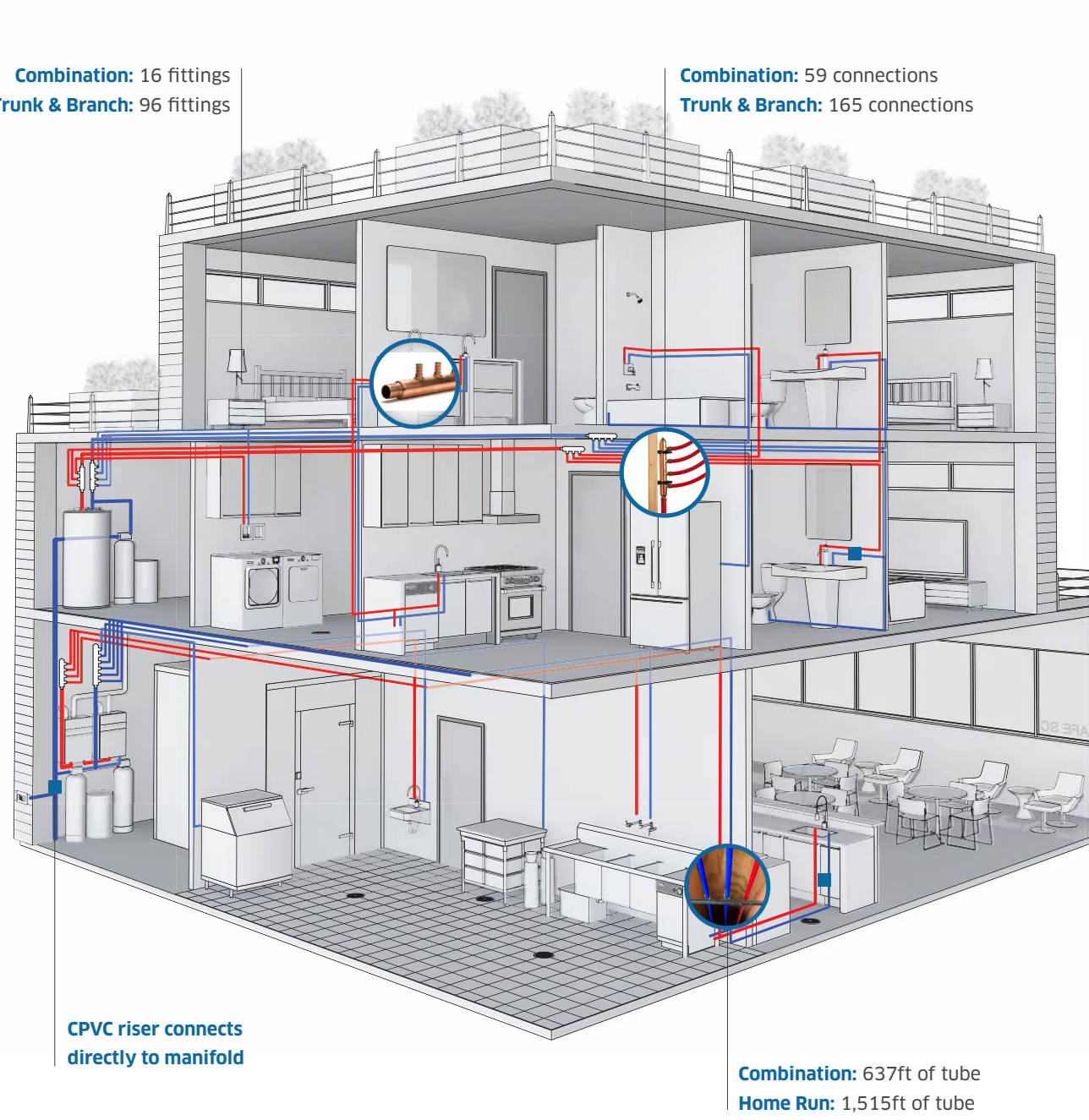
Hybrid Systems/Combination Install

Continued

Combination Systems. Combine the best features of a home run plumbing system with the best features of a trunk and branch plumbing system.

This smarter choice:

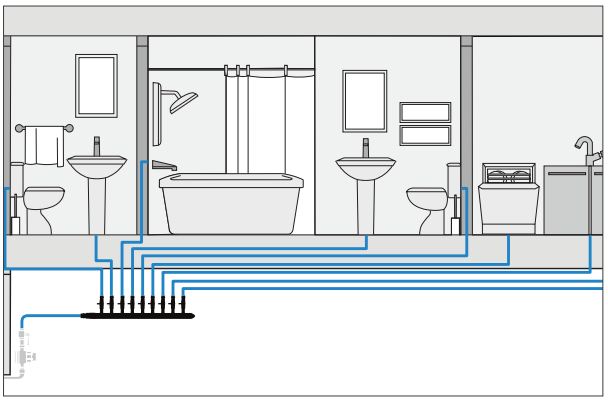
- Saves material expense, especially in No Lead compliant systems. Requires half the installation time of traditional systems.
- Requires fewer connections, which translates to fewer leak possibilities, fewer callbacks and fewer claims.
- Exhibits increased flow characteristics, decreased hot water wait times and a decrease in system noise.



System Installation Options

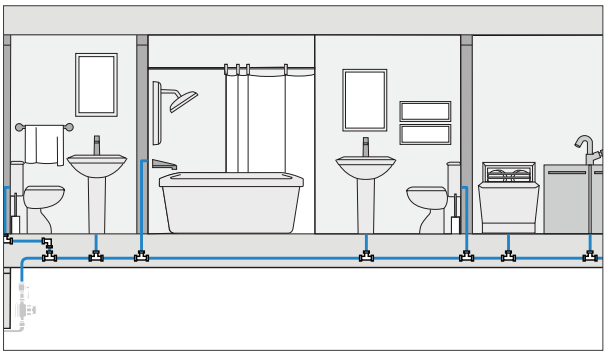
Home Run

Fixture outlets are serviced from a central distribution point(s) similar to an electrical panel or breaker box. These manifolds are often referred to as primary manifolds and when used in this manner, can isolate a fixture for repair or service, and can assure proper flow characteristics at the fixture by providing an individual supply line. Primary manifolds for home run plumbing typically incorporate valves for proper line segregation and service.



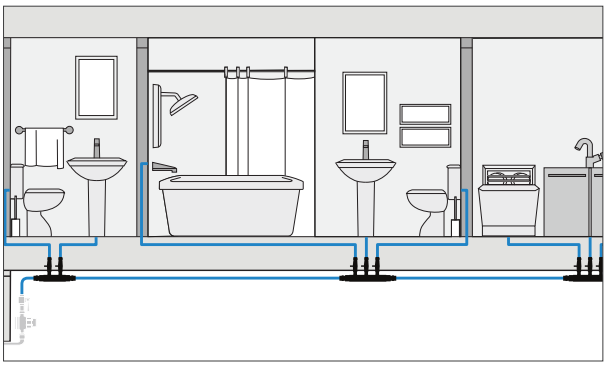
Standard / Trunk & Branch

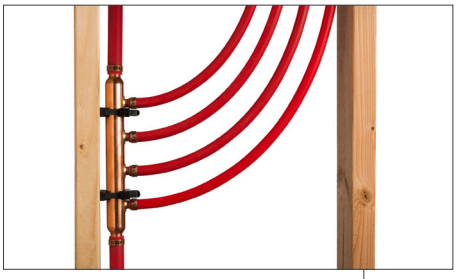
A network of supply tube and fittings service fixtures and are put together like conventional copper or CPVC systems. For every change in direction within the system, an elbow or tee is used (directionals). There is typically more volume of water within a system of this nature and stagnant water must be purged before hot water is realized.



Combination

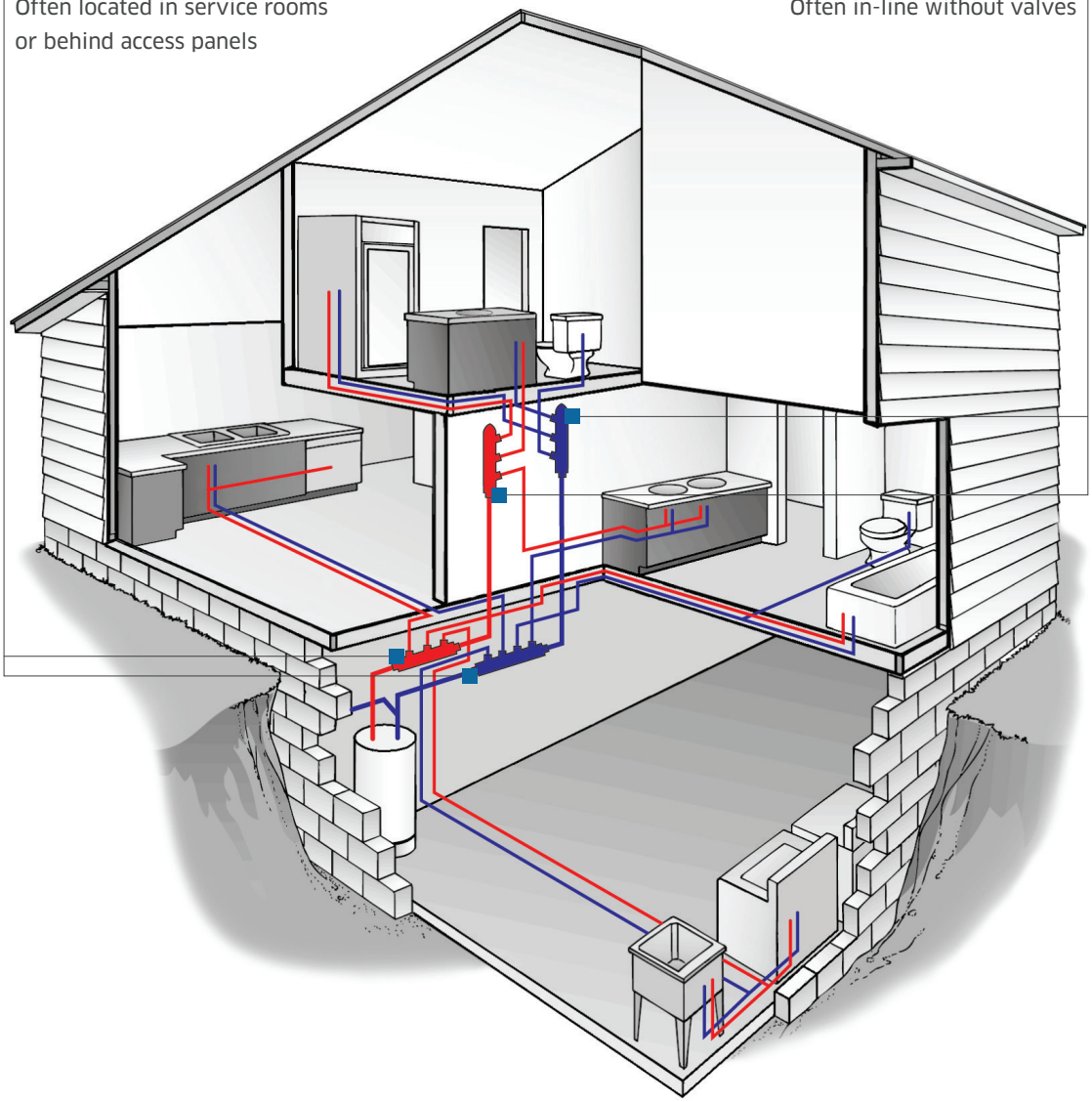
Fixture outlets are serviced from a manifold with a line being directly plumbed from a primary manifold or a secondary manifold. Secondary manifolds are either with valve or without valve and can be installed in-line. Manifolds with valves typically require access, so manifolds without valves are more often used as secondary manifolds and can be hidden in walls. Often, the manifold is marked with the fixture it supplies and a plumbing layout schematic marks the manifold location as well as the fixture it provides. **Stream33 recommends this plumbing system approach.**





Manifolds with Valve
Often located in service rooms or behind access panels

Manifolds, Flow-Through
Often in-line without valves



Tubing Installation Requirements & Limitations

Tube Protection

- Protect tube with properly regulated and certified stud guards and metal plating where tube protrudes through building members. See tubing insulation requirements below.
- When undue stress will be placed on a connection joint, use an appropriate fitting with strapping means (drop ear elbow, eared stub out) and make connection to secured fitting.

Example: Shower arm installations. Hydrant installations.

Tube Support

- Reference mandated support length intervals through local code regulations. Typically horizontal spacing shall be every 32" and vertical spacing shall be 48" and at each floor penetration.
- Tube supports should be used to support a long tubing length/run in addition to regular tube support intervals.
- Supports should be used to secure any expansion loop or tubing offset.
- PEX-B bend supports can be used to assure proper bend radius requirements are being met.

Tube Insulation

- Proper tube insulation shall be used when a tube protrudes through wood or metal studs. Insulating tube is typically a practice used to guard the tube from:

1. Potential harm as in the case of metal stud insulators.

2. Thermal dissipation protection. Do not bundle hot and cold tubes together.

3. Noise dampening. PEX-B has a higher modulus of elasticity whereby noise/acoustic transmission is less likely. Insulators further guard against this phenomenon.

Slab Installation

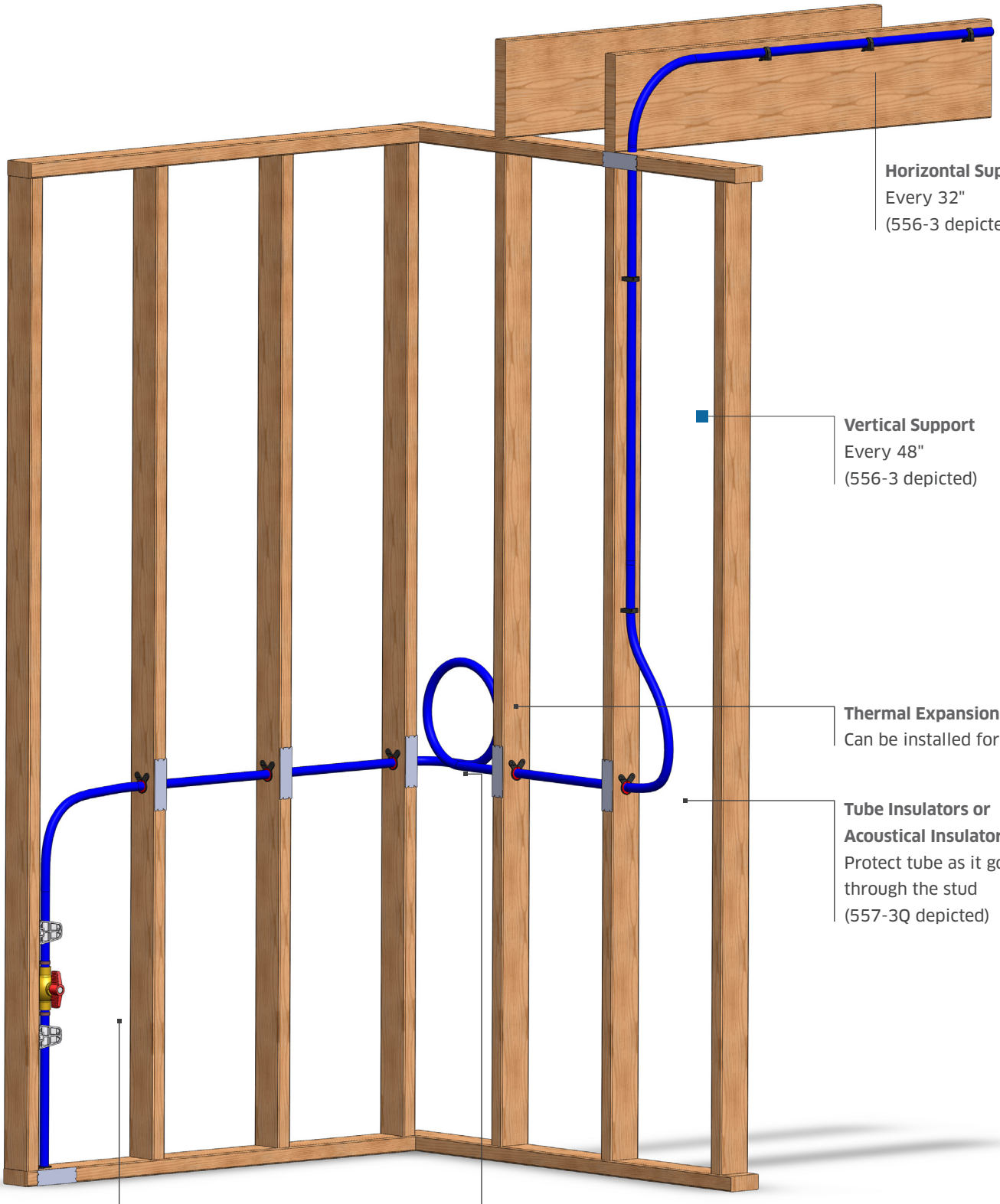
- Use a tube sleeve material when penetrating a slab or concrete floor.

Note: Stream33 recommends a rigid tube support/sleeve when entering and exiting a concrete installation for proper protection during construction and placement of tubing.

- Do not make any fitting connections under slab (Install PEX-B in a continuous length).

Inspection & Pressure Test

- Ensure all tube is free of defects and harm.
- Inspect all connections to assure they are leak-free and properly supported.
- Proper tube anchors and fasteners must be used.
- Test the system as code dictates. Where the code is absent, test to 100 psi for no less than 12 hours before covering any connection or tubing underground or behind walls.
- If testing with water, protect from freezing.
- If more than 10% pressure is lost during hydrostatic or air tests, add more and test for another 12 hours.



Horizontal Support
Every 32"
(556-3 depicted)

Vertical Support
Every 48"
(556-3 depicted)

Thermal Expansion Loops/Coils
Can be installed for hot tubing

Tube Insulators or Acoustical Insulators
Protect tube as it goes through the stud
(557-3Q depicted)

Joint/Valve Support
Proper support enables a rigid installation
(525-33 depicted)

Stud Guard or Metal Plates
Protect tube from possible nail penetration
(530-3 depicted)

Tubing Installation Requirements & Limitations

Continued

Sleeving Service Main

- Where Stream33 PEX-B tubing enters foundation walls, rigid tubing shall be used to protect tube from shearing due to ground settlement or other earth movement. The rigid sleeve shall protrude into the earth minimally 12" and pass through to the interior of the building. Backer rod (closed-cell foam rod or mineral wool) can be used to seal the gap around the tube and capped with water based caulking as filler.
- Where Stream33 PEX-B tubing enters concrete floors, follow referenced slab penetration sleeve recommendations

Expansion Joint Protection (Concrete)

When Stream33 PEX-B tubing is being run below an eventual radiant-type expansion joint, tubing shall be protected from the possibility of being cut using a metal sleeve material and/or by assuring that the tubing is suitably set below the eventual cut.

Repairs in Service Work

If damage occurs to tubing while in the service stage, it is recommended that the area be replaced (if at all possible) without the use of a fitting below grade. When a fitting must be installed below grade, use a fitting made from C69300 brass for maximum dezincification resistance and stress corrosion cracking resistance. Sleeve and insulate the entire connection for protection from possible corrosion and from any mechanical stress that may occur. Test the assembly. Assure proper slack has been left in the line and proper backfill compaction has been obtained to limit movement on the connection.

Water System Disinfection

AWWA C651-86 shall be referenced when disinfecting Stream33 PEX-B tube installations and/or practices outlined by local codes.

- Do not allow solutions to remain in tubing for more than 24 hours
- Upon disinfection completion, flush all systems with potable water.
- Cover tube ends whenever not in use, preventing debris from entering tube.
- Only use disinfecting agents appropriate for PEX-B water service as well as possible use of PPSU PEX fittings.

Pressure Testing Water Mains

Water service tubing should have pressure applied throughout the installation. Air should be bled off the line prior to pressurizing fully hydrostatically. Stream33 recommends continuous pressure throughout the installation process to evidence any leaks or damage that may cause tube/connection failure. Testing water pressures should be set higher than the expected service pressure within the system. Do not test beyond 225 PSI for extended periods of time. 150 PSI water testing pressure is recommended for service mains throughout the construction phase.

Pressure Testing Water Tubing

Water: (recommended). When using water to test distribution tubing, it is important to follow local codes. It is important not to exceed the pressure limit of the tubing. Reference the continuous use pressures and hydrostatic pressure limitations in section 2.4.

Air: When using air to test pipe, there may be a need to condition the pipe especially when testing in hotter weather. B tubing does not need to be conditioned to the extent that A tubing should due to physical characteristics of the two tubing types.

Conditioning: Conditioning the pipe is a process used to slightly expand the tubing ID beyond what the test will effectively expand it to in an effort to maintain the desired test pressure without a 'false negative' of decreased pressure due to normal tubing expansion. Expanding the tube by using 40 psi beyond the testing pressure would be recommended. Stream33 would suggest testing with air up to 80 psi.

Procedure:

1) Fill system with air or water.
2) Remove all plumbing fixtures or appurtenances that may harm a pressure test and/or should not be exposed to excessive pressures.
3) Increase pressure over desired testing pressure for a period of about 30 minutes while maintaining the higher PSI. IE: 100 psi if testing pressure will be 60.
4) After the 30-min conditioning time, relieve pressure down to 60. The PSI may climb slightly above 60 as the pipe shrinks due to relieved pressure. After witnessing the final pressure (which may take about 5 minutes depending on ambient temperature

Tubing Installation Requirements & Limitations

Continued

and may increase to around 63-65 PSI), determine if the system is air tight over the necessary code mandated testing time.

Water Service Installation & Limitations

Getting Started. Local codes should be referenced for acceptable pressures as well as special precautions on use of PEX-B, system fittings, layout and installation requirements for service piping. Typical water service pressure requirements often mandate that the service is capable of withstanding 1.5x the operating pressure of the system it is supplying. See listed PEX-B pressure ratings. Ensure the fittings and tubing being installed are acceptable for potential pressures, stresses, and application requirements.

Preparation. Check all tubing and fittings for proper listings. Check all tubing and fittings for structural and manufacturing integrity as well as issues that may have arisen from transport or initial installation. Remove any fitting or tube section that has been subjected to cuts, gouges or other excessive installation hazards. Make sure proper analysis of soil and soil chemistry has been completed. Make sure trench is prepared according to guidelines.

Soil Analysis. Do not install PEX-B tube or fittings in areas where known chemical spills have occurred or where a likely chemical spill can occur. Do not install Stream33 tubing in soils contaminated with solvents, fuels, organic solvents, pesticides or other harmful materials for plastic tubing or its fitting systems. Local plumbing code authorities and Stream33 should be contacted if there is a question on the installation or area of installation.

Note 1: Do not allow backfill weight to cause tube to become out-of-round beyond 5%. Do not over compact backfill.
Note 2: Stream33 recommends using a sleeve material for the entire length of the buried service main.

Trench Layout Guidelines. If the soil has been graded and deemed acceptable, the next step is to gauge the type of soil so that proper installation can proceed. Installations shall be made in an acceptable soil condition or prepared soil condition that supports the tube against future settlement. ASTM D2774 and AWWA report TR31 shall be additionally referenced for plastic tube used for service work.

Installation In Different Soil Types

Good Soils. Tube may be directly installed on the trench bottom. Code should be referenced for embedment practices and necessary spacing requirements of the tube in the ground. Tube should be laid into trench with slack. Trench bottom is to be clear of any pits or humps as well as sharp objects. Test tube. Compact initial backfill to prevent settlement. Test after backfill.

Rocky Soils + Solid Rock. Tube shall have an additional 6” of trench dug below desired level of service tubing. Prepared trench bottom shall have a 6” layer of pea gravel or other non-sharp substrate trench base installed (pea gravel suggested). Prevent humps or pits where tubing will be laid. Test tube. Compact initial backfill to prevent settlement. Backfill with 6” of the substrate used for the base. Test after backfill.

Unstable Soils. Tube shall have an additional 4” of trench dug below the desired level of the service tubing. Prepared trench bottom shall have a 4” layer of pea gravel or other non-sharp substrate trench base installed (pea gravel suggested). Prevent humps or pits where tubing will be laid. Test tube. Compact initial backfill to prevent settlement. Backfill with 6” of the substrate used for the base.

Tubing Installation Requirements & Limitations

Continued

External Temperature

Soldering. Soldering shall be performed minimally 18" from installed Stream33 PEX-B tubing unless a heat-trapping device is employed. Make all sweat connections and allow cooling prior to making PEX-B connections to Stream33 PEX-B tubing.

Duct Work - Heating. Tubing shall be insulated from direct contact with heat transmission ductwork that has a possibility to exceed the maximum tubing working temperature of **180°F**. Tubing shall be kept 6" from gas appliance vents except those vents with a thermal protection approved for installation near plastic (PEX) tubing as explicitly called out by the manufacturer. In horizontal tube installations, keep tube 6" away from heat source.

Water Heater Connections. Connections to tubing shall be made minimally 18" from the water heater hot and cold connections on gas water heaters. Connections to tubing shall be made with metal transition fittings.

Heat Lamp + Lighting. Tubing shall be kept minimally 12" from heat source and proper protection shall be used to avoid overheating tubing. Keep tube protected and 12" from recessed lighting when installed in vertical alignment to heat source. If 12" distance is not available, proper insulation should be used to protect tubing where insulation maintains the necessary heating certifications for the application. PEX-B must be protected from any UV light-producing device.

Frozen Tubing. PEX-B tubing should not intentionally be frozen. The frozen section of tubing and the general area should be protected from further exposure to inadvisable installations. Heat the affected area or the blockage assuring that tubing does not overheat. Use a hand to test surface. Space heaters, warm towels, or warm water submersion are acceptable means to thaw tube.

Welding. Do not attempt to weld or fuse tubing.

Kinked Tube. Remove kinked sections or sections of pipe that have exceeded maximum out-of-roundness.

Tubing Installation Requirements & Limitations

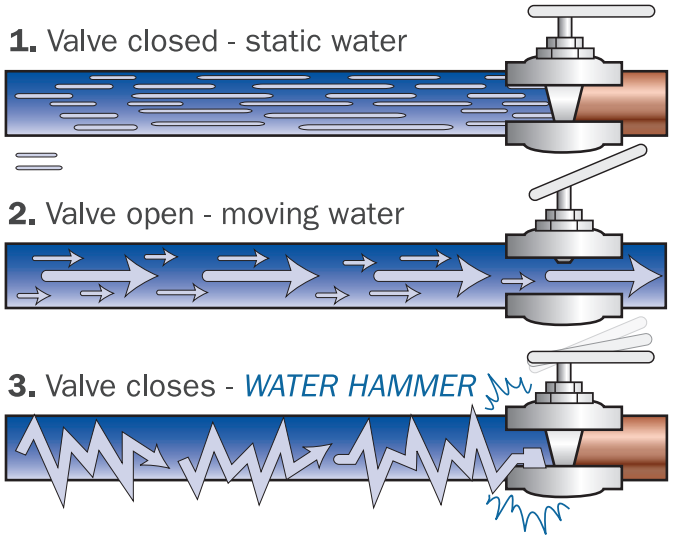
Continued

Vermin Protection

Protect tube from exposure to rodents or other nuisances that may damage the tubing.

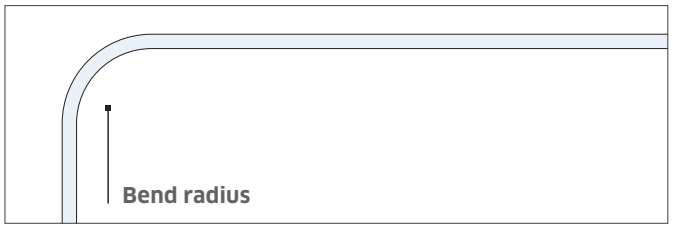
Water Hammer Exposure

Water Hammer is generally defined as the damaging pressure surge and banging noise caused by the quick stoppage of the water column when a valve or faucet is turned off abruptly. PEX-B tubing, like all other materials, needs to be protected from water hammer by the installation of certified water hammer arresters. If left uncontrolled, the water hammer pressure surge can exceed the pressure ratings for the tube, causing damage to the system and/or system components. Both the UPC and IPC model codes require the installation of ASSE 1010 water hammer arresters, regardless of tubing material.



Bend Radius

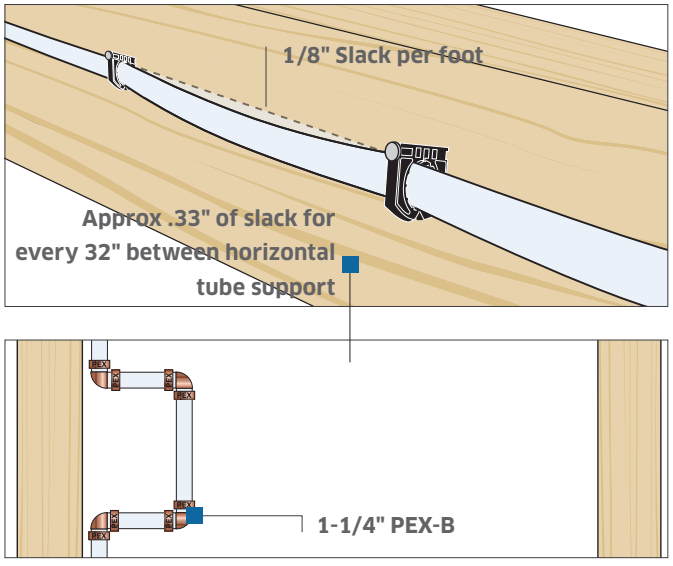
TUBE	STANDARD BEND RADIUS	BETTER BEND RADIUS	AGAINST COIL SET BEND RADIUS
1/2"	3.75"	5"	11.25"
3/4"	5.25"	7"	15.75"



If coiled tubing is being used and the bend direction is against the coil direction, multiply noted bend radius by a factor of 3. Warmer tubing bends more easily. Generally a bend radius of 8x tube diameter should be sufficient. Using a manufactured PEX-B bend support will aid in assuring the proper bend radius.

Thermal Expansion

- Linear expansion of Stream33 PEX-B tubing is approximately 1 inch per 100 feet of tubing for every 10°F change in temperature.
- Do not install tube supports or hangers too tightly. Allow for expansion of tube when bracketing and supporting PEX-B by allowing 1/8" slack for every 1 foot of linear installation.
- For large tubing runs, a tube loop can be installed to allow for proper expansion and contraction.



Avoiding Common Problems

Mechanical

- Stream33 PEX-B tubing should not be scratched, gouged or cut along tube length. Handle with care.
- Metal tubing hangers with sharp edges and corners should be avoided. Metal, vinyl-coated tubing hangers specifically designed for uses with PEX-B tube are acceptable. A better option would be to use an approved plastic hanger from Stream33's extensive line of CTS hanging options.

Note: Acceptable metal hangers may include PEX-B bend supports and straight-thru floor sleeves. Plastic PEX-B bend supports should be used when size and offering permit.

- Tubing hangers that can easily pinch the tube should not be used. Limit the 'ovaling' of the tube a hanger may cause. Tubing shall not be crushed or bent beyond the materials min. bend radius and/or beyond 5% out-of round by tubing hangers.

Chemical

Stream33 PEX-B tubing is a durable, safe and chemically resistant material that has exceeded the requirements of potable drinking water systems with the highest chlorine testing certifications possible. Tubing that exhibits damage caused by contact with the following should not be used: grease, tar, adhesive tapes, thinners, fuels, sealants, tube cements, fluxes, bleaches, other oxidizing agents and/or petroleum products.

- Do not allow adhesives to continuously contact tubing. Remove any residue left by temporary or unintentional exposure to product tube and fittings.
- Do not use solvent-based paints or petroleum products on or in Stream33 PEX-B tubing.
- Only use water-soluble fire caulking for fire suppression systems and penetration methods.
- Do not allow contact with acids or strong bases.
- Keep pesticides and other organic chemicals free of tube.
- Do not glue or attempt to fuse to Stream33 PEX-B tubing.

Electrical

Tube and tube/fitting system shall not be used as an electric ground.

Gas Use

Only use Stream33 PEX-B tube in a manner consistent with the tubing identification marking and certifications. Only use Stream33 PEX-B in applications presented within this manual and accepted through local and jurisdictional codes. Contact Stream33 with questions.

Ultraviolet (UV) Exposure

Do not store PEX-B tubing unprotected outdoors. Keep PEX-B tubing in the original packaging or under protective cover until time of installation. Ensure that exposure to sunlight during installation does not exceed the maximum recommended UV exposure time for the tube being installed. See Section 2.2 for a tube's identification marking.

Leak Testing Solutions

All leak-testing agents must be approved for PEX-B tubing. Some chemicals found in leak-detecting formulations can cause premature PEX-B tubing failure by developing micro-fracturing of the tube wall.

Avoiding Common Problems

Continued

PPSU (polyphenylsulfone) or Polymer Fitting Limitations

PPSU/Polymer fittings shall not be used in applications where temperature and pressure ratings are not regulated or are known to evidence exposures beyond those listed within this manual. See F2159 & F1960 installation instructions and application problems. Stream33 PPSU fittings use engineered resin to achieve substantial strength and chemical resistance. PPSU must be installed carefully and should adhere to the guidelines laid out in application installation and problem sections for each ASTM system standard and reiterated below:

- Fittings shall be stored away from and not installed with exposure to direct sunlight, open flame/heat source or volatile compounds (including PVC glues, primers or other solvents).
- Do not impact PPSU/Poly fittings or subject fittings to torque limits exceeding 100 lbs of force.
- Do not use PPSU fittings in radiant systems with glycol that has not expressly been listed nor in concentrations above established limits.

Brass Fitting Limitations

Stream33's PEX-B fittings, valves and connectors/adapters are made from multiple materials. These fittings should be installed where allowed by code for hot/cold plumbing applications. For aggressive water jurisdictions prone to dezincification or for areas requiring no-lead fittings, Stream33 carries a line of dezincification resistant brass and copper fittings. Fittings should not be buried directly in soils. Proper wraps must be used when fittings are buried in soil. Stream33 recommends limiting all connections underground if possible. Wrap should generally cover the fitting and tubing sections connected to the fitting in an water tight manner. The complete fitting and at least 3" of PEX-B tube should be wrapped sufficiently.

Do not allow PEX-B fitting barbs and fitting ends to be deformed or damaged. A fitting that exhibits a damaged sealing barb or sealing surface should be removed from service.

Copper Fitting Limitations

Stream's capability as a world leading engineered copper-fitting provider allows Stream33 the option of offering naturally no-lead and dezincification resistant copper fittings for PEX F1807 applications.

These fittings are:

- Economical
- Accepted
- Listed
- Historically proven
- Robust metal

Do not bury copper fittings or connections directly in soil. Proper wraps must be used when fittings are buried in soil. Do not install copper fittings in areas prone to copper deterioration.

Do not allow PEX-B fitting barbs and fitting ends to be deformed or damaged. A fitting that exhibits a damaged sealing barb or sealing surface should be removed from service.

Stainless Steel Fitting Limitations

Stream33 sells some PEX fittings in stainless alloys or as an assembly with stainless alloys. Assure these fittings are used as potable water fittings for the referenced applications within this manual. Stainless steel products should generally be protected from caustic environments that are known to degrade stainless materials including, but not limited to, high chlorine or bromine environments and/or other environments that produce halogens.

Certifications & Listings

Stream33 PEX-B is Trusted, Tested and Listed

Stream33 PEX-B tubing and various PEX fitting systems have been certified and listed to the below. The following third party testing and listing agencies assure product is made to national standards and adhere to certain requirements set forth by those standards.

The installation instructions (section 3) should be referenced for each system type. Stream33 offers PEX-B tubing and various PEX fitting systems that conform to one or more of the following referenced PEX Standards:

CSA B137.5
CSA B137 SERIES-13
Thermoplastic pressure piping compendium

ANSI / NSF 14
Plastics Piping System Components and Related Materials

ANSI / NSF 61
Drinking Water System Components - Health Effects.

NSF / PPI
PEX 5306 (exceeds oxidative stability requirements for hot water re-circulating systems (CL-5) per ASTM F876) (meets requirements of ASTM F876 for outdoor exposure of up to 6 months while maintaining Cl-5 oxidative stability)

IAPMO (UPC)
Stream33 File Number: 8214
Cross-linked Polyethylene (PEX)

ASTM F876
American Society for Testing and Materials Standard Specification for Cross-linked Polyethylene (PEX)

ASTM F877
American Society for Testing and Materials
Standard Specification for Cross-linked Polyethylene (PEX) Hot- and Cold- Water Distribution Systems

ASTM F2023
American Society for Testing and Materials Standard Test Method for Evaluating the Oxidative Resistance of Cross-linked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water

ASTM C904
American Water Works Association Standard for Cross-linked Polyethylene (PEX) Pressure Tubes, 1/2 In. (12mm) Through 3 In. (76 mm) for Water Service C904

Note: Individual fitting standards (ASTM F1807, F2159, F2080) are used in conjunction with Stream33 PEX-B tubing and should be referenced for specifics on fitting dimensions and materials per each standard.

Stream33 PEX-B

ASTM F1807/F2159 Copper Crimp Ring Connection Guide

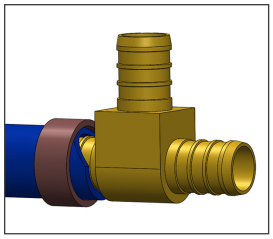
1. Cut tube at 90-degrees. Do not crush OD of tubing with cutters. Hint: Slightly rotate cutter during blade engagement.

2. Install PEX-B Crimp Ring onto OD of tubing. Install PEX-B fitting fully into tube end.

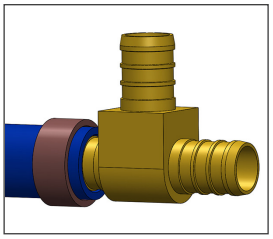
3. Position ring over sealing barbs of the fitting. The ring should be positioned approximately 1/8" to 1/4" from the end of the tube.

4. Compress tool perpendicular to tube. Compress only once. Remove defective connections. Use a gauge to assure a proper joint. Test all completed joints.

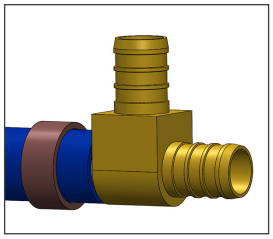
Installation Problems: Take care to avoid the below issues when making joints with copper crimp rings



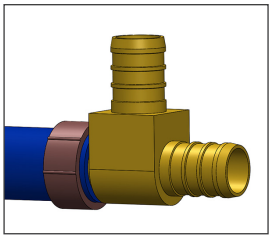
Tube not cut squarely – ring not compressing tube for a secure seal.



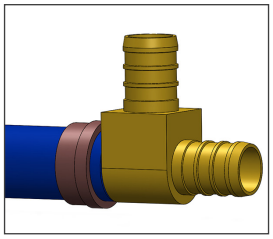
Fitting not inserted completely into tube end.



Ring placed too far forward or too far back & not positioned over sealing barbs of fitting.



Improperly calibrated tool - not enough compression. Rings compressed multiple times may develop a leak path.



Crimp Tool did not engage the Crimp Ring over the entire surface of the ring.

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4625 Foster Ave., Ashtabula, OH 44004
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26201 Richmond Rd., Bedford Heights, OH 44146
After Hours Emergency: 330-219-7749

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412-835-8043
3131 Industrial Blvd., Bethel Park, PA 15102
After Hours Emergency: 412-527-6846

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740-421-4758
354 West Main (Rt. 209), Byesville, OH 43723
After Hours Emergency: 740-398-8653

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330-456-4508
1215 McKinley Ave., SW. Canton, OH 44707
After Hours Emergency: 330-933-5598

Cleveland East U
216-881-5700
6420 Woodland Ave., Cleveland, OH 44104
After Hours Emergency: 216-570-8974

Cleveland West U
216-529-1010
11200 Madison Ave., Cleveland, OH 44102
After Hours Emergency: 216-570-8974

Columbus East U
614-294-3500
1356 Cleveland Ave., Columbus, OH 43211
After Hours Emergency: 614-582-7832

Columbus West RDC ✱
614-503-0875
4300 Roberts Rd., Columbus, OH 43228
After Hours Emergency: 614-582-7832

Fremont ✱
419-332-2636
641 South Front St., Fremont, OH 43420
After Hours Emergency: 419-455-5996

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440-245-6874
125 East 20th St., Lorain, OH 44052
After Hours Emergency: 440-343-2010

Mansfield U
419-524-0411
83 Smith Ave., Mansfield, OH 44905
After Hours Emergency: 419-571-4828

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412-622-8100
434 Melwood Ave., Pittsburgh, PA 15213
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724-335-8343
419 Hileman Dr., New Kensington, PA 15068
After Hours Emergency: 412-527-6831

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740-345-9617
25 South 11th St., Newark, OH 43055
After Hours Emergency: 740-219-9623

North Hills
412-366-3143
331 Rochester Rd., Pittsburgh, PA 15237
After Hours Emergency: 330-604-7372

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72 E. Hillis St., Youngwood, PA 15697
After Hours Emergency: 724-221-0149

Sandusky U
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1341 Olds St., Sandusky, OH 44870
After Hours Emergency: 419-656-0566

Sebring CDC
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934 W. Adams St., Steubenville, OH 43952
After Hours Emergency: 304-914-1689

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220 Matzinger Rd., Toledo, OH 43612
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1110 W. Chestnut St., Washington, PA 15301
After Hours Emergency: 330-604-7372

Wheeling U ✱
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