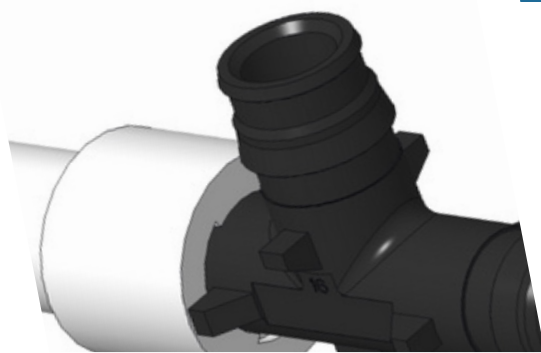
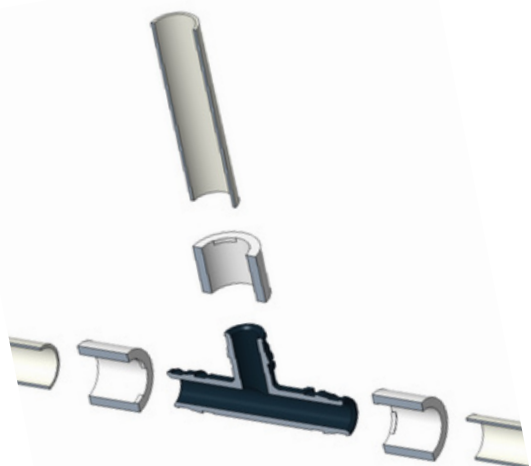


stream33[®]

INSTALLATION GUIDE

PEX-A F1960
COLD EXPANSION SYSTEM



**SCAN TO SEE MORE PEX
FITTINGS & TUBING**



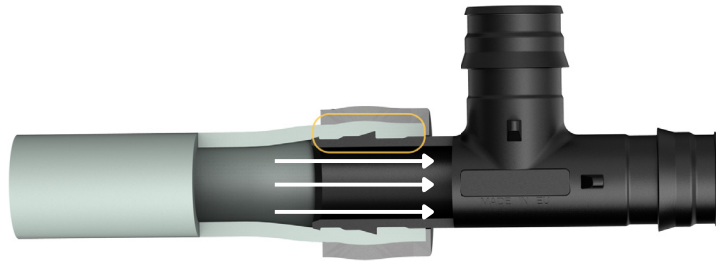
stream33.com

PEX F1960 SYSTEM DESCRIPTION

Stream33's F1960 pipe and fitting connection system is widely used in plumbing and heating applications. Due to its ease of installation and reliability, it is ideal for a wide range of applications, including potable and non-potable installations.

How it works:

After expanding the pipe and the expansion ring, Stream33 F1960 pipe & expansion rings revert to their initial dimension, contracting against the body of the fitting, achieving a secure, reliable connection.



Fittings compatible with PEX-A and PEX-A EVOH pipes SDR9 of the following dimensions:

Nominal Pipe Size	Pipe O.D. (inch)	Wall Thickness (inch)	Pipe I.D. (inch)	Weight of Pipe (lbs/ft)	Contents of Pipe (gal/ft)
1/2"	0.625	0.070	0.475	0.06	0.0092
3/4"	0.875	0.097	0.671	0.1	0.0184
1"	1.125	0.125	0.862	0.2	0.0303
1-1/4"	1.375	0.153	1.054	0.34	0.0453
1-1/2"	1.625	0.181	1.244	0.44	0.0632
2"	2.125	0.236	1.629	0.682	0.1083

Stream33 F1960 piping is manufactured to meet or exceed in accordance with according with ASTM F1960 and F2023.

Hydrostatic Design Stresses and Pressure ratings for SDR 9 PEX tubing for water according to ASTM F876.

Rated Temperature	Hydrostatic Design Stress	Pressure Rating for Water
73° F (23° C)	630 psi (4.33 MPa)	160 psi (1.10 MPa)
180° F (82° C)	400 psi (2.76 MPa)	100 psi (0.69 MPa)
200° F (93° C)	315 psi (2.17 MPa)	80 psi (0.55 MPa)

***Exceeding these ratings will void the warranty**

The F1960 Cold expansion fitting system is certified to the following standards:

- ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing
- NSF/ANSI 14 Plastic Piping System Components and Related Materials
- NSF/ANSI/CAN 61 Drinking Water System Components – Health Effects
- NSF/ANSI 372 Drinking Water System Components – Lead Content
- CAN/CSA B137.5 Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications
- ICC-ES PMG 1559

Certifications

All components of the **Stream33 PEX F1960** system have been designed and manufactured following requirements regulatory of the ASTM F1960 standard.

LISTING

- cNSFus-pw → PW/potable water
- cNSFus-rth → RFH/radiant floor heating



PMG-1559



NSF-61-G

STREAM33 F1960 INSTALLATION GUIDE

IMPORTANT: Read this manual PRIOR to installation. Failure to read, follow, and use this information may result in faulty and leaking connections, and will void any guarantee on the system or equipment. **SAVE THIS GUIDE FOR FUTURE REFERENCE.**

Stream33 **IS NOT LIABLE** for installation practices that deviate from this installation guide or are not acceptable practices based on local & state plumbing and mechanical code. Warranty details can be found online at stream33.com.

PRECAUTIONS:

Chemical Products

Avoid contact or exposure of PPSU fittings to PVC glues, gels, solvents, polyurethane foams, liquid metal sealants, mineral greases, lubricants, paints, disinfectants, bleach, etc. These contaminants can lead to product degeneration and result in failures and leaks.

Pipeline

When pipes are delivered in rolls, they should be unrolled evenly in the opposite direction of how they were rolled to avoid warping. Do not use any sections that are damaged. **Be careful to examine when unpackaging, ensuring no damage to the pipe surface.**

After assembly, pipes should not be damaged by other work carried out on-site. To ensure this, it is recommended to protect pipes with a protective insulation and/or stud guards. When embedding, it is recommended to always cover the pipes with a corrugated tube or insulation.

ASSEMBLY PROCESS

To achieve optimal connection, please follow the instructions below:

1. Cutting the Pipe

Cut the pipe with a pipe cutter designed for PEX-A pipe. Pipe should be cut cleanly and perpendicular, at a 90° angle, to the pipe axis. Make sure that there are no burrs inside or outside the tube.

IMPORTANT:

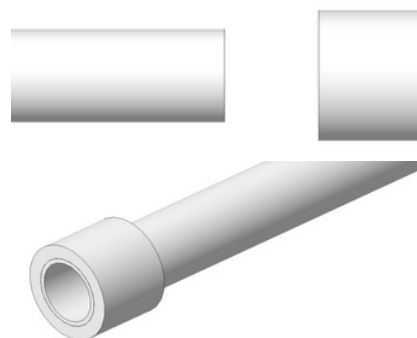
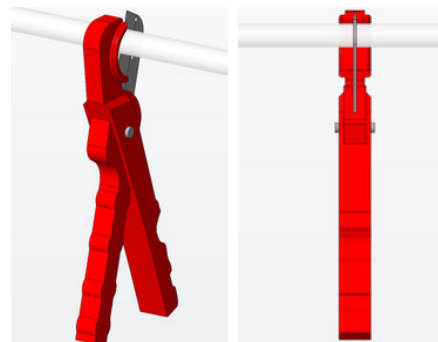
Do not use a hacksaw, pocket knife, copper pipe cutter, or any other similar tool.

2. Placing the ring on the Pipe

Slide the expansion ring onto the pipe. The expansion ring has a built-in stop. Insert the pipe into ring until it makes contact with the stop.

Do not push ring beyond the end of pipe. The ring must fit well on the pipe.

If it is loose, remove the ring from the pipe and slightly expand the end of pipe without the ring. Then, replace the ring onto the end of the pipe, ensuring a snug fit.



3. Expand the Pipe (Recommended Auto Rotation Heads).

Select the appropriate expander head for the pipe diameter. Remove the expander head from the tool and clear any dirt and debris. Put the head back on and firmly tighten the head on the tool. Using incorrectly sized expansion heads can produce faulty connections, resulting in leaks and property damage.

Follow the tool manufacturer's instructions. If the tool has a rotating head, ensure it rotates properly. If the head does not rotate automatically, rotate the pipe or tool after each expansion to avoid grooves inside the pipe and faulty connections, causing leaks and property damage. (See illustration)

Apply a thin layer of expander cone grease to the expander cone as needed and recommended by the tool manufacturer. Improper use of lubrication (too much or too little) on the expansion cone can produce pipe damage, and faulty connections, resulting in leaks and damage.

Expanding the pipe and inserting the fittings must be carried out in the same place since fittings must be installed immediately after expanding the pipe.

Using an electric or battery tool:

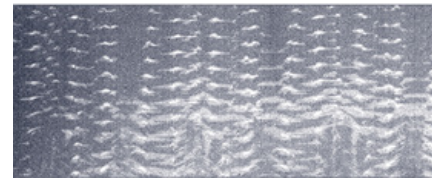
Insert the expansion head into the pipe as far as possible, holding the ring and the pipe, without forcing so that they do not rotate with the head. Start the expander. The expander head will perform the opening steps to widen the pipe.

At the end of each expansion, if the head is not rotatable, rotate the pipe, gently pushing the pipe further onto the expander head and rotating it 1/8 of a turn in either direction.

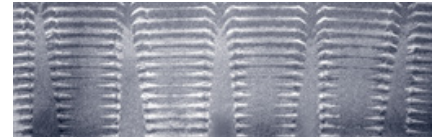
If a tool with a rotating head is used, after each expansion the tool must be removed from the inside of the pipe while the head is no longer expanded. During this process, the head will rotate on its own, so it is not necessary to rotate the tool. The expander head will expand, retract, and rotate slightly with each cycle.

Continue expanding and rotating until the piping and ring are snug against the shoulder on the expander head, then perform at least 2 more expansions. In the case of 1", 1¼", 1½" and 2" pipes, let the head continue expanding for about 3 seconds.

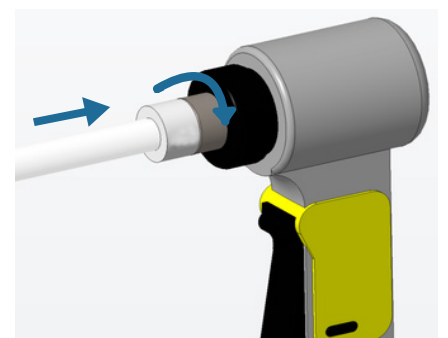
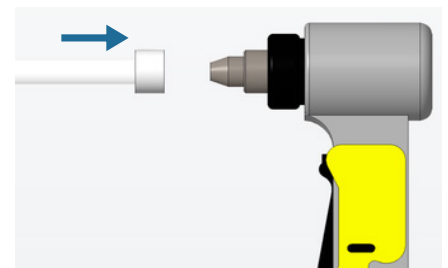
Avoid excessive expansion. The correct number of expansions is the amount necessary for the piping and the shoulder of the fitting to fit snugly together. Expand the PEX pipe only enough to insert the connector with some resistance, and do not hold the pipe in the expanded position.



Expansion with proper rotation



Expansion without proper rotation



Electric / Battery Expander

Perform expansions until the flat part of the expander head segments is completely inside the pipe and the edge of the pipe at the end of it. Hold the pipe when the segments are inserted into it.

If the process is interrupted during the widening phase, cutting the piece of pipe and the ring used is mandatory. Then make the joint using a new piece of pipe and a new ring.

NOTE: Temperatures affect the required time for the pipe and ring to shrink to the fitting. Follow the steps below when expanding in cold weather.

- Keep rings and fittings at 55° F (13° C) or warmer to reduce contraction time and ensure even expansion.
- Do not make expansion connections in temperatures below 5° F (-15° C).
- At temperatures below 40° F (4.4° C), fewer expansions are required.
- Make a test connection for each size of pipe when temperatures vary from day to day, noting the number of expansions necessary to make a tight connection.

3. Insert the fitting

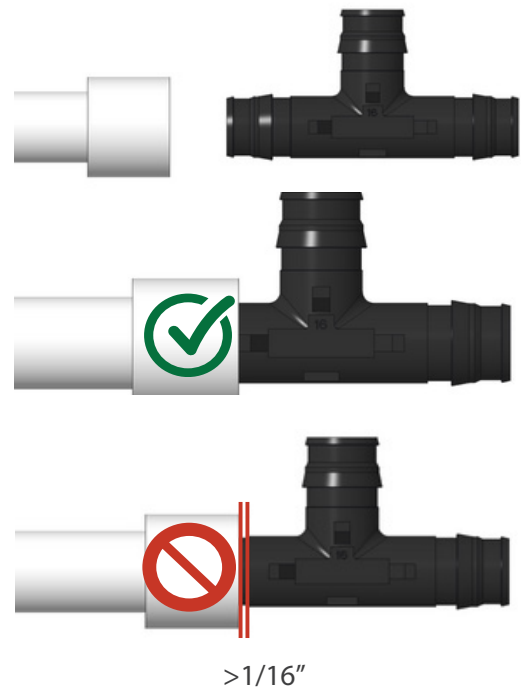
When pipe touches the shoulder of the expansion tool, the fitting is ready to be inserted without delay.

Hold the fitting for 30 - 60 seconds or until the pipe and ring contract and make a secure connection.

After this time the pipe will have contracted over the fitting, and another joint can be made.

If the fitting does not insert easily, remove and expand it once more without damaging the pipe. To avoid over-expanding the piping, do not hold the piping in the expanded position.

To obtain a secure connection, the ring and pipe must be firmly attached to the fitting. If there is a gap between fitting shoulder and ring greater than 1/16" (1 mm), the fitting must be removed and replaced with another one. Cut about 2" (50 mm) behind fitting, place a new ring, expand onto the pipe and repeat the insertion process.



RECOMMENDATIONS TO CONSIDER DURING INSTALLATION

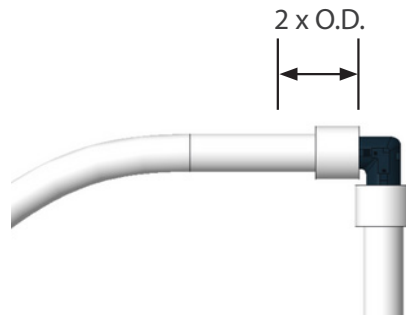
System Cleaning & Purging

All pipes should be thoroughly cleaned before initial use to ensure that foreign matter and substances inside the pipe are removed and that hygienic and corrosion damage are avoided.

NOTE: Potable water piping should be turned on as soon as possible after installation and pressure testing. Water of a quality close to drinking water should be used to install pipes to avoid any possible contamination of the pipes. Only activate water supply that is intended for the application and ratings of the pipe.

PEX Bend Radius

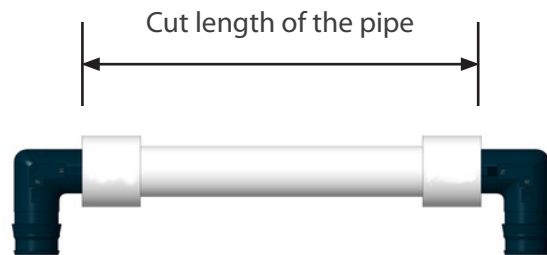
Avoid bending the pipe too close to the fitting; it is recommended a minimum of two times the outside diameter (O.D.) of the pipe as the minimum distance before changing direction. When a proper bend is not possible, use an elbow and consider bend supports.



Distance Between Fittings

Avoid joints that are very close to each other, to prevent damage to fittings during installation and to protect against elevated stress on the pipe and fitting.

Nominal Fitting Size	Cut Length of the Pipe
1/2"	2"
3/4"	3"
1"	3-1/2"
1-1/4"	4-1/2"
1-1/2"	4-1/2"
2"	6"



Protect PPSU fittings and PEX pipes from UV rays.



Protect PPSU fittings from contact with fire or excessive heat.



Avoid exposure or direct contact with vapors from PPSU fittings with the following products: PVC glues, gels and solvents, polyurethane foams, liquid metal sealants, mineral greases and lubricants, paints, disinfectants, and bleach.

DO NOT RECOVER STREAM33 PEX F1960 FITTINGS AFTER BEING ASSEMBLED

- Under no circumstances are PPSU fittings & expansion rings reusable.
- It is not advisable to attempt to recover the fitting by cutting the ring with scissors or a saw, as there is a high risk of damaging the nipple of the fitting, which could impact the integrity and cause leaks.

Problem Solving

If the connection is not sealed, check the following:

- Make sure expander head is securely screwed to expander tool head.
- Check that expander head does not have bent segments; if they are bent, replace head.
- If the segments remain open, verify that the segments are clean
- Is there too much grease in the expander cone? Use a clean cloth to clean the expansion cone and reapply a light coat of grease to lubricate the cone.

Expansion Tools

- Check if the expander head is rotatable or not.
- Follow the manufacturer's recommendations for lubrication of the expander cone.
- Choose the appropriate expander head for each pipe diameter, to achieve a correct connection.
- Avoid manual expansion tools for optimal expansion.



PRESSURE TEST

Once the plumbing rough-in is completed and the pipes are visible, it is mandatory to carry out a pressure test on the entire system according to local codes before putting it into operation.

Joints can be pressurized after 30 minutes, with temperatures over +41° F. Under lower temperature conditions, a longer time is necessary.

After 24 hours, the connection will be as strong as the pipe strength.

Perform the test using water at ambient temperature. Do not exceed 150 psi (1030 kPa) for the piping system. Verify that maximum pressure limits are not exceeded for all system components before performing the pressure test.

For residential applications, pressurize the system to 25 psi (1.7 bar) above working pressure or 100 psi (6.9 bar). Any installation elements that cannot withstand the test pressure must be disconnected. The pump used to check the leak must be able to work up to 230 psi (15.8 bar) and have intervals of 7 psi (0.5 bar).

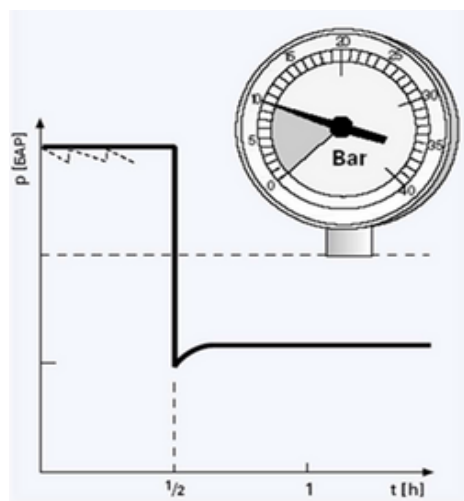
Time Until Pressure Testing	Temperature (°F)
1.5 hours	41 to 31
3 hours	32 to 25
4 hours	23 to 16
10 hours	94 to 5

Steps to Follow

- Water distribution networks must be cleaned internally before carrying out hydrostatic tests and commissioning to eliminate dust, scale, oils, or other foreign material from the installation assembly process.
- Once installation is complete, it will be filled with an aqueous solution of a detergent product. Next, the pump will be put into operation and the water will be allowed to circulate for two hours. Subsequently, network will be emptied and rinsed with water from supply network.
- Next, slowly fill installation with water to ensure the complete elimination of air pockets. Keep terminal taps open until you are sure that draining has been completed. With system drained, close taps that have been used for draining and the power supply tap.
- Perform a preliminary pressure test pressurizing the system to 1.5 times the maximum operating pressure not to exceed the maximum pressures defined above for 30 minutes.
- As the piping expands, restore pressure, first at 10 minutes into the test and again at 20 minutes. This will require constant pumping or cycling the valve and compressor to maintain a pressure of 1.5 times the test pressure. If cycling the valve and compressor, apply additional pressure once the psi has dropped 10 psi (0.7 bar). During this time check the entire installation for possible leaks.

Steps to Follow (Cont.)

- At the end of the 30-minute preliminary test, pressure must not fall by more than 5 psi from the maximum, and there should be no leakage.
- After performing the preliminary test, perform the main pressure test immediately. The main pressure test shall last at least 2 hours. The test pressure should be restored and must not fall more than 3 psi after 2 hours. No leakage should be detected.
- Test pressure recommended 80 psi (5.5 bar), unless local code dictates higher pressures. The pressure gauge will be placed at the lowest point of the installation.
- Visually check for leakage and monitor the pressure for the duration specified by local code. (A typical pressure test can range from 2 to 24 hours). If there is no reduction in pressure, the system is regarded as leak tight.
- Slight fluctuations of pressure are normal due to ambient temperature changes, especially during long durations.



Once the previous test has been satisfactory, installations equipped with boilers will be brought up to the set temperature of the safety parameters, having previously cancelled the operation of automatic regulation devices.

All materials used in pipes expand when heated and contract when cooled. Therefore, differences in length caused by temperature changes must always be taken into account. During the cooling of the installation and at the end of it, it will be verified that no visually noticeable deformations have occurred in any section of the pipe and that the expansion system has worked correctly.

It is recommended flushing the plumbing system and all potable water fixtures with fresh, potable water prior to occupancy. Consult local codes as additional requirements may apply.



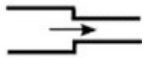

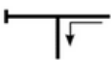

PRESSURE LOSS / PSI PER 100 FOOT OF SDR9 PEX PIPE

GPM	Pressure Loss 1/2"	Velocity (ft/sec)	Pressure Loss 3/4"	Velocity (ft/sec)	Pressure Loss 1"	Velocity (ft/sec)	Pressure Loss 1-1/4"	Velocity (ft/sec)	Pressure Loss 1- 1/2"	Velocity (ft/sec)	Pressure Loss 2"	Velocity (ft/sec)
1	1.52	1.7	0.30	0.9	0.09	0.5	0.04	0.4	0.02	0.3	<0.01	0.1
1.5	3.12	2.6	0.61	1.3								
2	5.18	3.5	1.01	1.8	0.31	1.1	0.12	0.7	0.05	0.5	0.01	0.3
2.5	7.76	4.4	1.51	2.2								
3	10.80	5.2	2.08	2.6	0.62	1.6	0.24	1.1	0.11	0.8	0.03	0.4
3.5	14.25	6.1	2.74	3.1								
4	18.20	6.9	3.48	3.5	1.04	2.1	0.4	1.4	0.18	1.0	0.05	0.6
4.5	22.65	7.8	4.31	4.0								
5	27.50	8.7	5.21	4.4	1.54	2.7	0.59	1.8	0.26	1.3	0.07	0.7
5.5	32.80	9.6	6.19	4.8								
6			7.24	5.3	2.14	3.2	0.82	2.1	0.37	1.5	0.1	0.9
6.5			8.40	5.7								
7			9.62	6.2	2.83	3.7	1.07	2.5	0.48	1.8	0.13	1.0
7.5			10.90	6.6								
8			12.30	7.0	3.61	4.3	1.37	2.9	0.61	2.0	0.17	1.2
8.5			13.70	7.5								
9			15.30	7.9	4.47	4.8	1.69	3.2	0.75	2.3	0.21	1.3
9.5			16.90	8.4								
10			18.60	8.8	5.42	5.3	2.04	3.6	0.91	2.6	0.25	1.5
11			22.20	9.7	6.45	5.9	2.43	3.9	1.08	2.8	0.3	1.6
12					7.57	6.4	2.84	4.3	1.27	3.1	0.35	1.8
13					8.77	6.9	3.29	4.6	1.46	3.3	0.4	1.9
14					10.1	7.5	3.77	5.0	1.67	3.6	0.46	2.1
15					11.4	8.0	4.27	5.4	1.9	3.8	0.52	2.2
16					12.9	8.5	4.81	5.7	2.13	4.1	0.58	2.4
17					14.4	9.1	5.38	6.1	2.38	4.4	0.65	2.5
18							5.97	6.4	2.64	4.6	0.72	2.7
19							6.6	6.8	2.92	4.9	0.79	2.8
20							7.26	7.1	3.2	5.1	0.87	3.0
22							8.65	7.9	3.82	5.6	1.03	3.3
24							10.2	8.6	4.48	6.1	1.2	3.6
26							11.8	9.3	5.19	6.7	1.39	3.9
28									5.95	7.2	1.6	4.2
30									6.76	7.7	1.81	4.5
32									7.62	8.2	2.04	4.8
34									8.53	8.7	2.28	5.1
36									9.49	9.2	2.53	5.4
38											2.79	5.7
40											3.07	6.0
42											3.36	6.3
44											3.66	6.6
46											3.97	6.9
48											4.3	7.2
50											4.64	7.5

(*) Temperature 120° F (49° C), 100% water

Flow velocity above 8 fps (2.5 m/s) might result in excessive pressure loss, erosion or noise of the system components.

FITTINGS LOSS (METERS OF PEX PIPE)

Figure		3/8"	1/2"	3/4"	1"
Elbow 90°		9.2	9.4	9.4	10.0
Straight Connection		2.9	2.0	0.6	1.3
Reduction (in 1 diameter)		3.0	2.0	0.7	1.3
T - Follow fluid line		2.9	2.2	1.9	2.3
T - Detour along the branch		9.4	10.4	8.9	11.0
T - Entry through the branch		9.6	11.0	9.1	11.3



WARRANTY

Stream33 Products LLC (Stream33®) warrants that its PEX Tubing and Fittings (F1960, F1807, F2159) shall be free from defects in material and workmanship under normal use and service FOR TWENTY FIVE (25) YEARS. By accepting and keeping this Product you agree to all of the warranty terms and limitations of liability described below.

In the event of such defects within the warranty period, Stream33 will, at its option, replace or recondition the product without charge.

WHAT IS NOT COVERED?

This remedy shall be effective only if the product was installed in accordance with supplied instructions, common installation or use practices and existing building and plumbing codes and legal requirements; has not been subjected to misuse or abuse; was at all times used in a manner consistent with its intended use; was at all times used in installations and environments acceptable to its material and design specifications; was never modified, altered or repaired by anyone other than Stream33; was properly subjected to and passed common testing methods (including pressure testing for potable water and drainage systems) immediately after the product's installation and before the product is put into service; was not damaged by freezing, corrosion, exposure to ultraviolet light, degradation or other adverse water, atmospheric or other natural conditions; was never subjected to improper protection during the installation or exposure to water pressures or temperatures outside acceptable operating conditions.

In addition, Stream33 shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, chemical or any other circumstances over which the Seller has no control. This warranty excludes all costs arising from routine maintenance, including the replacement of any parts required by such maintenance and the replacement of parts required by normal wear and tear.

At the option of Stream33, if it is determined that (i) property damage resulted directly from a failure or leak caused by product defects within the first ten (10) years of the applicable warranty period; (ii) reasonable steps were taken by the claimant to mitigate the damage due to failure; and (iii) the damage was caused solely by the failure of the product(s) covered by this warranty, then at its sole discretion, Stream33 may, but is not obligated to, elect as the claimant's sole and exclusive remedy to reimburse reasonable out-of-pocket, third-party costs paid by claimant for repair or replacement of damaged property, including painting, flooring, drywall or other damage caused solely by product failure. Stream33 will not pay for related expenses, including but not limited to, transportation and relocation, labor or repair costs associated with removal of defective product, loss of revenue and/or profits, personal property damage, mold damage, or installation of replacement products.

Stream33 also reserves the right to modify, alter or improve its product, or parts thereof, at any time without incurring an obligation to notify or modify, alter, improve or replace any product, or parts thereof, previously sold. If, on any occasion, Stream33 waives any term or condition, this waiver is not to be construed as a continuing waiver.

HOW TO OBTAIN WARRANTY SERVICE

Contact our warranty department at 740-314-1277 to report the defect. Return failed product with proof of purchase, your name, and address within 30 days of failure to:

Stream33 Products LLC
350 Courtney Road
Sebring, Ohio 44672 USA

LIMITATION OF LIABILITY

Stream33's liability on any claim of any kind, including, without limitation, warranty, negligence and/or breach of contract, shall in no case exceed the purchase price paid by the Customer. IN NO EVENT SHALL STREAM33 BE LIABLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO PROPERTY) OR PUNITIVE DAMAGES, DAMAGES IN THE NATURE OF PENALTIES OR SIMILAR OR RELATED DAMAGES OF ANY KIND.

DISCLAIMER OF WARRANTIES

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