

December 4, 2007

City of Jonesboro
Public Works Committee
515 W Washington Avenue
Jonesboro, AR 72403

Attn: Mr. John Street, Chairman

Dear Mr. Street,

At our new project in Jonesboro, The Grove, the city rejected our submittal of PEX piping for our domestic potable water supply plumbing. This is based upon the city's current plumbing code prohibiting non-metallic piping and/or fittings. Our request to appear before the Public Works Committee is to seek the committee's support and approval to amend the city plumbing code to allow what is commonly known as PEX piping for domestic water supply. Campus Crest is not endorsing one manufacturer of PEX Tubing over another. We are endorsing the PEX system to be accepted as an alternate to rigid and non-corrosion resistant water distribution materials such as steel pipe and copper tubing. The State of Arkansas statute was passed in March, 2007 approving the use of PEX tubing for under slab and above slab domestic water supply.

Enclosed is a brief description of PEX Piping along with Campus Crest pictures of PEX installations on recently completed projects. Also include is the Zurn PEX manufacturer basic consumer information as well as the ASTM Standards met and or exceeded by the PEX products.

During our brief presentation we would like to enlighten the PWC on the advantages to the PEX Tubing and Plumbing systems. I will be requesting a formal vote to bring this issue in front of the City Council. The presenters include John Harville of WIRSBO, Jim Gulley of Gulley Plumbing, and me.

Thank you for your consideration. If the committee needs additional information or has further questions please do not hesitate to contact me.

Sincerely,



Dan Norman
Vice President

Pex Piping Summary

What is PEX?

PEX is an acronym, which stands for cross-linked polyethylene. PEX is essentially polyethylene (PE) material (a thermoplastic) which has undergone a chemical or physical reaction that causes the molecular structure of the PE chains to link together. This reaction creates a three dimensional structure which has superior resistance to high temperature and pressure. PEX tubing demonstrates superior characteristics at elevated temperatures and pressures in the areas of tensile strength, resistance to deformation, resistance to corrosion and mineral build-up, creep resistance, abrasion resistance, impact strength and chemical resistance.

PEX was developed to replace rigid and non-corrosion resistant fluid distribution materials such as steel pipe, copper tubing, CPVC – among other products.

The PEX system demonstrates these advantages over rigid piping systems:

- Requires up to 90% less fittings – reducing installation time.
- More Sanitary – no fluxes or chemicals. (flux will eat a hole in stainless gas connectors)
- Encrustation resistant – no mineral and lime build-up like other materials.
- Corrosion resistant – tubing can be installed directly in concrete.
- Resistant to electrolysis and poor water quality.
- Freeze damage resistant – able to expand and avoid costly ruptures.
- Water hammer resistant – absorbs water hammer in flexible pipe walls.
- Pricing is very stable, unlike copper.
- Lightweight and flexible – easy to handle and work with.
- Flexibility in installation techniques – branch and supply or manifold installations.
- Reduced exposure to liability because open flames are not necessary.
- Approved by major plumbing codes
- Third party certified to meet health & safety standards

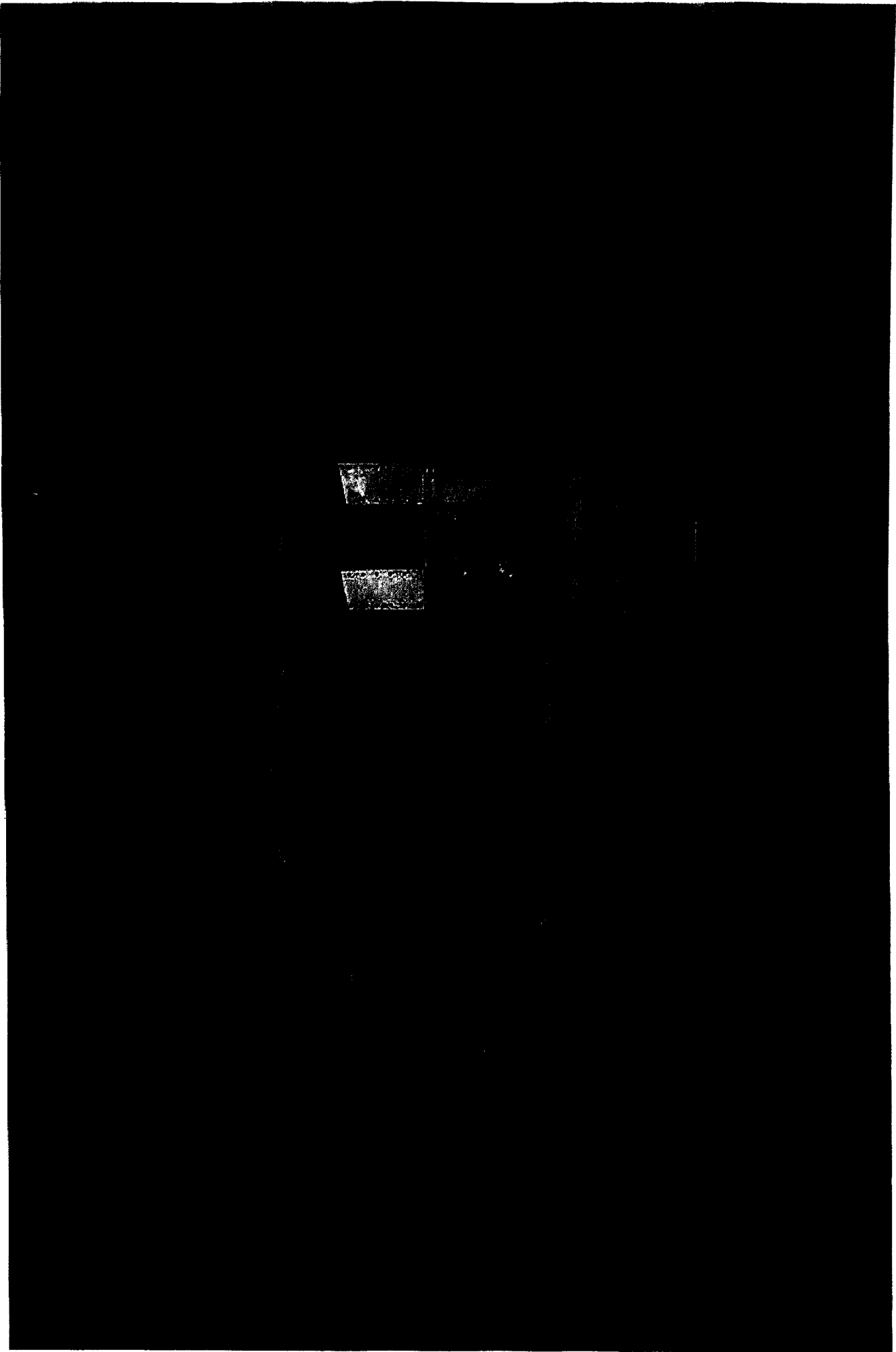


PHOTO # 1, date 10/29/2009

PHOTO #3, dated 10/29/2007

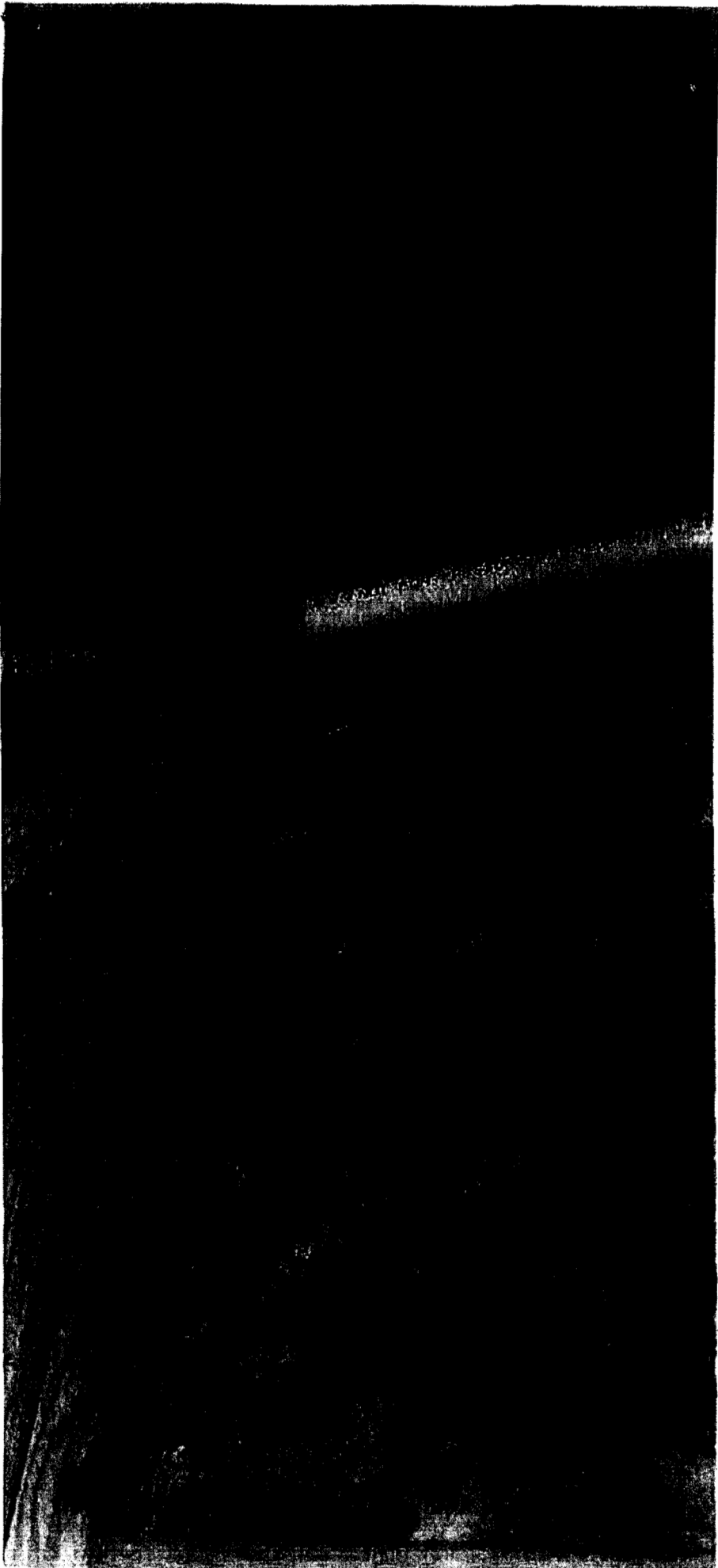
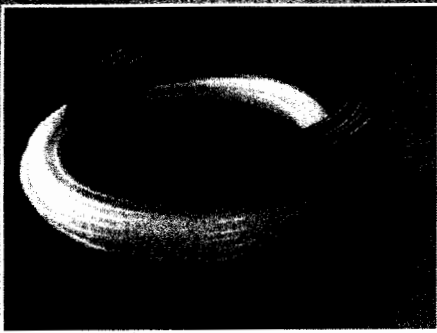


PHOTO #2, date 10/29/2007



Zurn PEX ... The Safe Choice

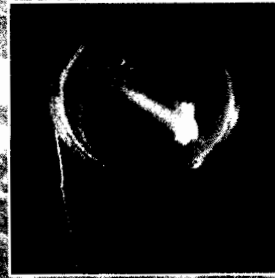
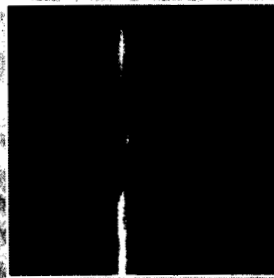
When you install Zurn PEX, you choose a sanitary plumbing system free of chemicals and contaminants.

Because it uses a crimp-fitting system designed for easy installation, Zurn PEX eliminates the need for dangerous solvents, fluxes and solder. And, with PEX's proven track record, there's no risk to you.

In addition to the installation benefits, Zurn PEX Plumbing Systems offers:

Zurn PEX

- Safe installation – no solvents or flame
- Freeze tolerant
- Lead-free
- Resists mineral build-up
- Quiet flow – no water hammer
- Prevents corrosion from electrolysis
- Flexible design:
Less fittings, less joints, less labor



Copper

... is a brittle material that is difficult to install. It is expensive, and it is not as quiet as PEX. It is also more susceptible to electrolysis and mineral build-up. It is not as flexible as PEX, and it is not as sanitary as PEX.

Zurn
ONE
Canada

How's the water?

You wouldn't let your loved ones drink from copper drinking straws – so why would you consider an old fashioned copper piping system?

The quality of water we use in our homes today is a major concern to all of us. But one of the most overlooked features in a new home is the piping system that delivers the drinking water. Frequently we filter our water, only to have metals and chlorine leach into the water.

Zurn PEV piping systems are flexible and deliver clean water.

**25 YEAR
Warranty**

Zurn PEV Piping Systems . . .

- Clean • Safe • Quiet • Durable • Reliable • Risk-Free
- Time Tested and Proven • Water Hammer Resistant
- Freeze Damage Resistant • Corrosion Resistant
- Resistant to mineral and lime build up
- Will not leach taste, odor, metals or chemicals

ZURN

ZURN PEV PIPING SYSTEMS HIGHWAY 11 EAST • COMMERCE, TX 75428
PHONE: 214-872-7277 FAX: 1-800-209-2148 WEBSITE: www.zurn.com

A division of **JACUZZI
BRANDS**



ZURN® PEX PLUMBING SYSTEMS

Plumbing Innovations with a Purpose

Zurn PEX ... Your Plumbing Solution

There has been a lot of focus placed on the quality of the water we drink but very little on the antiquated materials used in the past to supply it throughout our homes. When fluid sits dormant in plumbing lines, metals and other substances naturally migrate into the water which can create unhealthy conditions. Plastics have long been used in the medical industry to ensure complete sanitation, and they provide the plumbing solution for the 21st century. The National Sanitation Foundation (NSF) certifies that Zurn PEX tubing is free of harmful toxins, lead, and other substances so you can enjoy the highest purity in your drinking water.

- More Sanitary – does not require acid flux or chemical adhesives
- Encrustation and Corrosion Resistant – because of Zurn PEX's smooth interior walls, minerals do not build up as with copper tubing
- Resistant to the harmful effects of aggressive chemicals such as chlorine. Zurn PEX tubing passes the difficult NSF P-171 (NSF-CL-TD) protocol for chlorine resistance.

Zurn has more than thirty years of experience in the flexible piping industry. With billions of feet of tubing and more than 170 million Zurn PEX fittings in operation in this country, we are the time tested and proven leader.


The life span of Zurn PEX tubing calculated from long term testing is in excess of 100 years.

Zurn PEX Plumbing Systems can be installed in either a conventional branch and tee system or manifold system using QuickPort manifolds, where each fixture in the home receives a dedicated water source. This allows your plumbing contractor the flexibility to design a system that is perfect for your new home.

Every time you turn on a hot water line in your home you have to wait for the hot water to be delivered from the water heater. When you turn the line off, the heat in those lines rapidly cools down in a copper and CPVC plumbing system requiring you to redeliver hot water from the water heater. This is known as standby loss. Standby loss of heat is a major loss of efficiency in a plumbing system. Zurn PEX tubing has a higher R-value than copper and CPVC, and is more resistant to heat loss which means that the hot water lines stay hotter longer than copper and CPVC systems.

Zurn PEX tubing does not amplify sounds like copper systems. And because it is flexible it will expand to absorb the annoying effects of water hammer prevalent in rigid piping systems. This results in a system that is quiet during operation.





In the past, freezing conditions marked the demise of rigid piping systems like copper and CPVC. When a copper or CPVC system freezes, there are typically multiple breaks in the system resulting in thousands of dollars of damage to your home or building. Zurn PEX tubing will expand up to 300% of its original size without damage allowing it to resist the damaging effects of freezing. Once it is thawed out, your Zurn PEX plumbing system will be just like new.

Zurn, a leader in the plumbing industry for over 100 years, backs the Zurn PEX plumbing system with a 25-year warranty. Unlike other manufacturers, Zurn guarantees the Zurn PEX tubing AND the QickSert I fitting system, and even covers any incidental damages that may be caused to the structure in the event of a manufacturing defect. Please ask your builder or plumber to see our Zurn PEX Plumbing System warranty for more details.

- Tested and listed to NSF 61 for water purity.
- Tested and listed in accordance with NSF 14, ASTM F876, F877 and F1807.
- Listed with IAPMO, CSA and NSF.
- Permitted for use by the following model codes: IPC, IRC, NSPC and UPC.

Zurn PEX Plumbing Systems

Over the past four decades, the use of plastics has dramatically changed the way Americans live. Therefore, it's only logical that we look to flexible plastic tubing to deliver our hot and cold water in today's new homes and buildings. In fact, flexible PEX plumbing systems are the fastest growing product available today as more and more homeowners realize the problems with copper and CPVC and the advantages of Zurn. Zurn PEX Plumbing Systems, as in the past, are at the forefront of this evolutionary process.

Zurn pioneered the first flexible residential plumbing system in the early 1970s. The heart of our system lies with our Zurn PEX tubing and QickSert I fitting system.

PEX is an innovative product that was developed in the 1960s to address the problems associated with rigid plumbing systems that use materials like copper, steel, and CPVC.

PEX ... Cross-Linked Polyethylene

PEX stands for cross-linked polyethylene. It is essentially polyethylene, a material used in many everyday products, that undergoes a reaction during the manufacturing process which links the molecules together in a three dimensional pattern making it incredibly strong, flexible and resistant to temperature and pressure. This change in the materials properties makes it ideally suited for fluid distribution especially in plumbing and heating applications. The American Society for Testing and Measurements (ASTM) has developed stringent performance standards (F876) to ensure PEX's suitability for water distribution. Zurn's patented Silane cross-linking process far surpasses the quality requirements set forth by ASTM (160 PSI @ 73.4°F, 100 PSI @ 180 °F and 80 PSI @ 200 °F).

Zurn utilizes the latest technology in plastics engineering to ensure our customers receive safe, reliable, quiet, and energy efficient operation from their plumbing system.

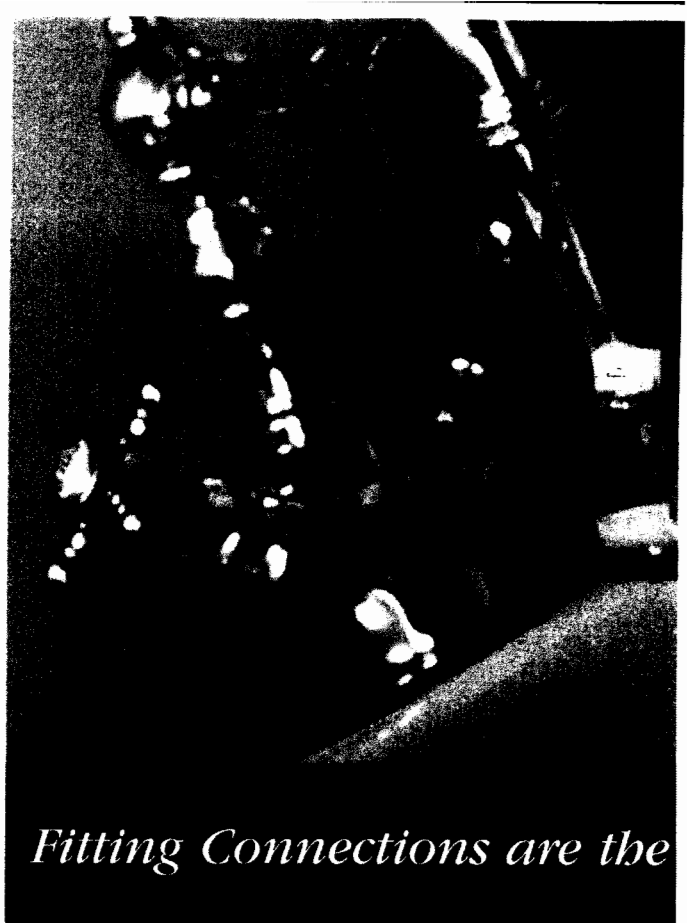


Additionally, all Zurn PEX tubing is 'MADE IN THE USA' in state-of-the-art manufacturing facilities.

Zurn PEX Strength

Zurn PEX tubing has been tested by independent laboratories which confirmed the following:

- Tensile yield strength –
2922 PSI @ 73° F and 1806 PSI @ 180° F
- Quick burst testing analysis –
1000 PSI @ 73° F and 375 PSI @ 180° F
- Hydrostatic testing results well in excess of the ASTM standard.

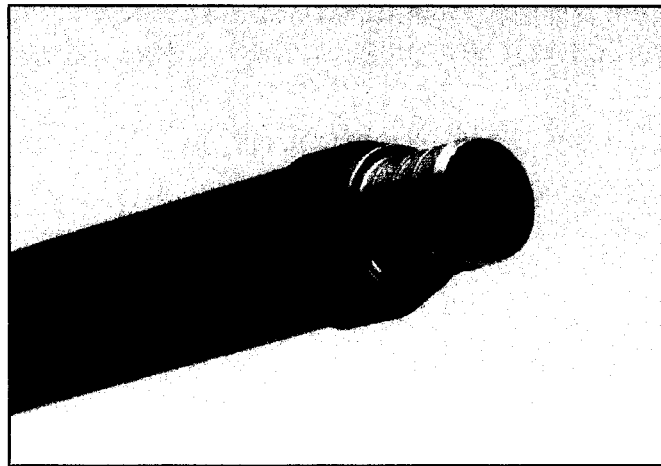


Zurn developed the QuickSert I PEX joining system over thirty years ago. Since then it has become the standard for the professional plumber in the PEX plumbing industry. With more than 170 million Zurn QuickSert I PEX fittings in service, you can rest assured that it is the most time tested and reliable fitting system available. The fittings are actually stronger than the pipe itself and once crimped they can not be pulled apart or blown out. The tubing will fail before the fittings, which requires many times more pressure than your plumbing system will ever encounter. Its efficient design and ease of installation ensures a perfect connection every time, giving you a plumbing system that will be worry free for a lifetime.



Key

15



Zurn PEX Plumbing & Radiant Heating Systems

Highway 11 East • Commerce, TX 75429 • (903) 886-2580

Date: September 28, 2006
To: Zurn PEX Customers
From: Gary Runyan
Subject: ASTM Standards and Zurn PEX Plumbing Systems

PEX plumbing systems are frequently described in one or more different ASTM Standards. Zurn PEX has different PEX systems and components of each system may be described different ASTM standards.

ASTM F 876 is the standard that specifies the material properties and the dimensions for PEX tube. This tubing is "copper tube size" meaning that the PEX tube has the same outside diameter as copper tube. All of the tube made to this standard has the same pressure-temperature ratings of 160 psi @ 73° F and 100 psi @ 180° F. For heating applications, the standard also has a pressure-temperature rating of 80 psi @ 200° F. Zurn PEX tube meets the requirements of ASTM F 876.

ASTM F 877 is the standard that specifies the performance requirements for a PEX system, tube and fittings together. It has requirements for Minimum Burst at 73° F and 180° F, Sustained Pressure Test (1000 hours) at 73° F and 180° F, Thermocycling at 100 psi and Excessive Temperature and Pressure for 30 days to simulate a water heater malfunction. The Zurn PEX systems meet the requirements of ASTM F 877.

ASTM F 1807 is the standard for brass or copper insert and crimp fittings. This standard specifies acceptable materials for these fitting and specifies the dimensions for the insert or barbed portion of the fittings. It also gives the dimensions and the material specifications for the copper crimp rings and the finished crimp dimensions. These fittings, when tested with PEX tube have to meet the performance requirements for PEX systems as required in ASTM F 877. Zurn PEX brass insert fittings and copper crimp rings meet the requirements of ASTM F 1807.

ASTM F 2159 is the standard for plastic insert and crimp fittings. This standard specifies the acceptable materials and dimensions for the fittings. It also has some test requirements for evaluating the quality of the molding process that was used to make the fittings. These fittings, when tested with PEX tube have to meet the performance requirements for PEX systems as required in ASTM F 877. Zurn PEX plastic insert fittings meet the requirements of ASTM F 2159.

Other ASTM Fitting Standards

ASTM F 1960 is the standard for "Cold Expansion Fittings" as sold by Wirsbo/Uponor. Zurn PEX tube can be used with these fittings so the standard number is included in the print string on our tube but the system is not covered by the Zurn PEX warranty.

ASTM F 2080 is the standard for "Cold Expansion Fittings with Metal Compression Sleeves" as sold by Rehau. Zurn PEX tube can be used with these fittings so the standard number is included in the print string on our tube but the system is not covered by the Zurn PEX warranty.

ASTM F 2098 is the standard for a "Stainless Steel Clamp" to be used in place of a copper crimp ring for brass or copper insert fittings meeting the requirements of F 1807 or plastic insert fittings

meeting the requirements of ASTM F 2159. Zurn PEX does sell rings meeting the requirements of this standard and they are covered by a special, limited time warranty.

Detailed description of the test requirements of ASTM F 877 for PEX Plumbing Systems

Burst Test at Room Temperature and 180° F

In this test, sample assemblies are subjected to a constantly increasing pressure until something fails. The minimum acceptable pressure depends on the size of the tube but it is a minimum of 620 psi at room temperature and 275 psi at 180° F. The pressure is increased at a rate that will cause failure in about 1 minute.

The significance of this test is that it demonstrates that the short term strength of the connection exceeds the strength of the tube.

Sustained Pressure Test at 180° F

In this test, sample assemblies are placed on a continuous pressure test while in an oven or water bath at 180° F. The pressure depends on the size of tube but it is a minimum of 190 psi. These samples are kept on test for 1000 hours (six weeks) and they must not leak or come apart.

The significance of this test is that it shows that at elevated temperature, the connection is capable of holding the same elevated test pressure that is required of the tube. Water pressure in homes is typically between 40 and 60 psi so this test pressure is at least 3 times the usual pressure in a plumbing system.

Thermocycle Test

In this test, sample assemblies are pressurized to 100 psi with Nitrogen gas. They are then immersed in a hot water bath at 180° F and held there for a minimum of 2 minutes. After that the samples are moved to a cold water bath and held there for 2 minutes. This cycle is repeated 1000 times and the samples must not leak.

This test demonstrates that the connection between the tube and fitting will remain leak free even as the temperature changes. This test is very harsh because Nitrogen gas is a much smaller molecule than water and it will leak in situations where water would not.

Excessive Temperature and Pressure Test

In this test, sample assemblies are pressurized to 150 psi and kept in an oven at 210° F. The samples are maintained at this condition for 720 hours (30 days) and they must not leak or come apart.

Most domestic water heaters have temperature/pressure relief valve that operate when the temperature exceeds 210° F or the pressure exceeds 150 psi. This test demonstrates that even at the extreme conditions of a water heater malfunction, the system is capable handling the pressure and temperature without leaking or coming apart.

Other Tests

In addition to the required ASTM tests, Zurn PEX has some in-house tests that our systems are expected to pass.

Even though water hammer is typically not an issue with PEX plumbing, there are instances when PEX may be used in combination with a rigid piping material such as copper. In this instance, the PEX system may be subjected to pressure surges from water hammer in the rigid material. Zurn PEX systems are subjected to a minimum of 250,000 water hammer shocks with pressure surges up to 400 psi. They must withstand this without leaking or blowing apart.

250,000 water hammer shocks is equivalent to 25 shocks a day for 25 years. This test demonstrates that the connections do not fail or fatigue with repeated pressure shocks.

PEX tube, like all tubes, expands and contracts with changes in the air temperature and the water temperature in the tube. Because of this, connections are subjected to some flexing as the tube expands and contracts. Zurn PEX systems are subjected a flexing test for 250,000 cycles while being pressurized at 200 psi.

This test is intended to demonstrate that the connections do not leak even when there is flexing in the system caused by expansion and contraction of the tube.

A Summary of Zurn PEX Systems, components and applicable ASTM Standards

Zurn PEX Tube
ASTM F 876, F 877

Zurn PEX Brass and Copper Insert Fittings
ASTM F 1807

Zurn PEX Plastic Insert Fittings
ASTM F 2159

Zurn PEX Quickclamp
ASTM F 877 as a system with Zurn PEX tube and Zurn PEX copper and brass insert fittings.

Zurn PEX SSC
ASTM F 2098



Gary Runyan
Manager, Product Development Engineering

gr6075-Zurn PEX Customers-ASTM Standards and Zurn PEX

PEX PLUMBING SYSTEMS

ZURN *The Zurn PEX Advantage*



PEX tubing must feature high strength and endurance, high resistance to freeze-thaw damage, and a high degree of corrosion resistance. Lightweight and flexibility are also assets during installation.

ZURN PEX TUBING HAS ALL OF THESE CHARACTERISTICS



What is PEX?

PEX is an acronym, which stands for cross-linked polyethylene. PEX is essentially polyethylene (PE) material (a thermoplastic that consists of a series of ethylene hydrocarbon chains) which has undergone a chemical or physical reaction that causes the molecular structure of the PE chains to link together. This reaction creates a three dimensional structure which has superior resistance to high temperature and pressure. Properly manufactured PEX tubing demonstrates superior characteristics at elevated temperatures and pressures (as compared to uncross-linked polyethylene) in the areas of tensile strength, resistance to deformation, resistance to corrosion and mineral build-up, creep resistance, abrasion resistance, impact strength and chemical resistance. This makes PEX a perfect product for high temperature and pressure fluid distribution piping. There are three primary commercial methods for producing PEX tubing: Silane method, Peroxide (or Engel) method and Radiation (or E-beam) method.

The American Society for Testing and Measurements (ASTM) has developed minimum performance standards to determine PEX tubing's suitability for high temperature/pressure fluid distribution applications (F876) at three different temperature and pressure ranges (160 psi @ 73.4°F, 100 psi @ 180°F and 80 psi @ 200°F). All PEX tubing that is manufactured in accordance with the ASTM F876 standard is perfectly suited for use in hot water fluid applications at these temperature and pressure ranges if they are marked on the tubing by the manufacturer.

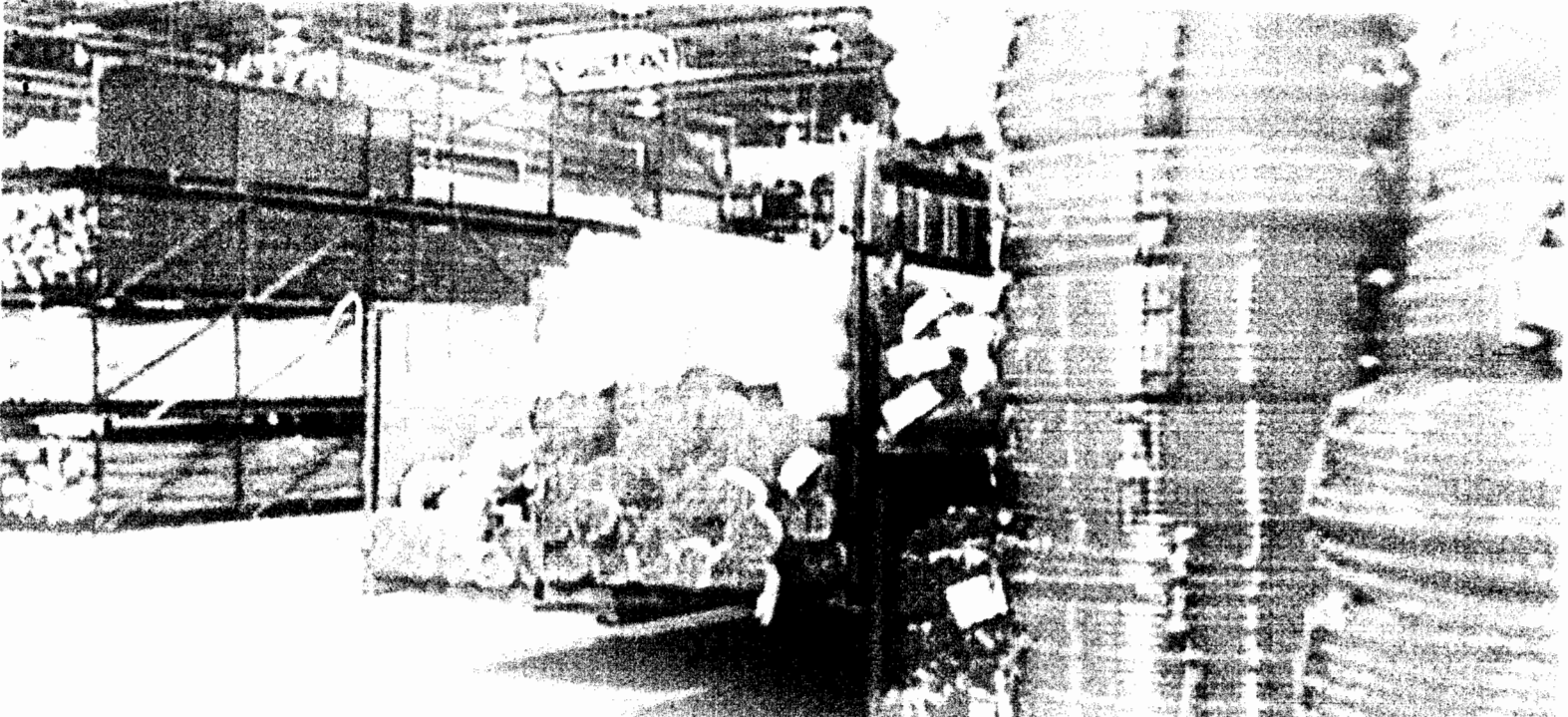
PEX was developed to replace rigid and non-corrosion resistant fluid distribution materials such as steel pipe, copper tubing, CPVC – among other products. The Zurn PEX system demonstrates these advantages over rigid piping systems:

- Requires up to 90% less fittings – reducing installation time.
- More Sanitary – no fluxes or chemicals.
- Encrustation resistant – no mineral and lime build-up like other materials.
- Corrosion resistant – tubing can be installed directly in concrete.
- Resistant to electrolysis and poor water quality.
- Freeze damage resistant – able to expand and avoid costly ruptures.
- Water hammer resistant – absorbs water hammer in flexible pipe walls.
- Quieter than copper or CPVC systems – does not amplify noise.
- Pricing is very stable, unlike copper.
- Lightweight and flexible – easy to handle and work with.
- Flexibility in installation techniques – branch and supply or manifold installations.
- Reduced exposure to liability because open flames are not necessary.
- No solvents with potentially harmful fumes are needed and no flux acids are required which can corrode other plumbing items (flux will eat a hole in stainless gas connectors).

Silane Method PEX

Zurn utilizes the Silane method of production which was developed by DOW Corning in the late 1960s. It is initiated by grafting vinyl silane onto the backbone of the polyethylene. This material is then mixed with the optimal levels of antioxidant stabilizers, initiators, colorant dyes and a catalyst during extrusion. A standard thermoplastic extruder is used to form the tubing. Although the mixture would cross-link on its own, the extruded tubing is then run through a water or steam bath to speed the curing time. The compound formulation is the determining factor in the degree of cross-linking so precise control is achieved (71-74%). Higher degrees of cross-linking are achievable (up to 90%) by simply grafting more silane molecules onto the polyethylene. This is not necessary though because the starting density of the base polyethylene used in Silane production can be and is typically higher than the other two methods. The starting density of Zurn PEX is 0.952 g/cm³ which gives Zurn PEX the highest burst pressure ratings and highest tensile strength in the industry. Unlike the Peroxide/Engel and Radiation/E-beam methods, Zurn PEX/Silane produced pipes will continue to cross-link to completion, if necessary, even after the extrusion process is completed. This ensures a perfectly cross-linked product every time. Every foot of Zurn PEX tubing is placed in high temperature steam chambers to drive the cross-linking of the tubing to completion before it ever leaves our production plants.

Zurn chose the Silane method of production for very significant reasons. Although all PEX tubing that is manufactured in accordance with the ASTM standard is a quality product, Silane method Zurn PEX far surpasses the quality standards of ASTM, more than any other commercial production method.



Tensile Yield Strength Testing Results

| | | |
|------------------|------|-------|
| Material | 73°F | 180°F |
| Zurn PEX | 2922 | 1806 |
| Peroxide/Engel | 2438 | 1647 |
| Radiation/E-beam | 2753 | 1501 |

Tensile Yield Strength (psi) testing performed at an independent laboratory. Yield strength is the stress point at which the material becomes permanently deformed.

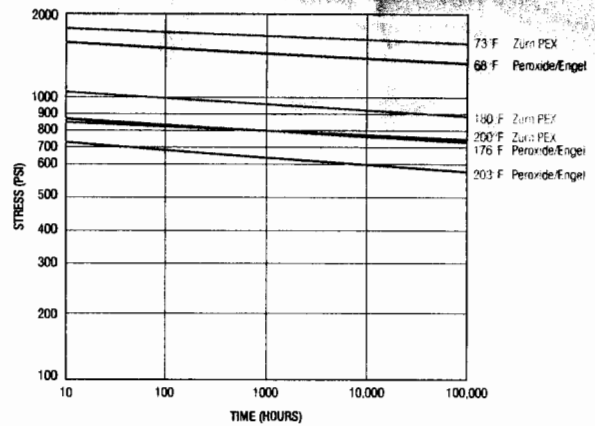
Quick Burst Testing Results

| | |
|------------------|-------|
| Material | 180°F |
| Zurn PEX | 375 |
| Peroxide/Engel | 305 |
| Radiation/E-beam | 315 |

Quick Burst (psi) testing performed at an independent laboratory. Average quick burst pressure at 180°F in accordance with ASTM requirements.

Additionally, the Silane method affords greater flexibility and efficiency than other methods. Additives like dyes (for producing colored tubing), antioxidant stabilizers and ultraviolet (UV) stabilizers are critical to the benefits and overall quality of our tubing. During Silane production, these additives do not interfere with the material's ability to cross-link (as in other methods) so the optimal levels of each of these products are in every inch of Zurn PEX that is installed, ensuring long term resistance to chemical and oxidative degradation and very good service life for our products. Because the Silane method relies on a chemical mixture and not high temperature and pressure to cause the material to cross-link, the dimensional stability is much more consistent as well. This consistency allows us to utilize our QUICKSERT I insert and crimp fitting for permanent, worry-free connections every time – and we back it with a 25-year limited warranty (the best in the industry)! Special tools that stretch the tubing to a consistent diameter are not necessary.

Zurn PEX Hydrostatic Data reviewed by the Hydrostatic Stress Board of the Plastic Pipe Institute. Peroxide data is derived from a peroxide manufacturer's published literature.*



Silane Method Zurn PEX demonstrates superior performance in these areas:

- High temperature and pressure resistance
- Life expectancy at elevated temperatures and pressures
- Resistance to UV degradation (up to 6 months of direct exposure)
- Flexibility and impact resistance to stand up to tough job site conditions and allow for easy installations
- Available in colors – Red, White and Blue
- Backed by a 25 year limited warranty on the tubing and QUICKSERT I fittings (when installed as a system).

When you choose Silane method Zurn PEX, you will enjoy all of the benefits of an engineered plumbing and heating tubing as well as the highest quality PEX tubing available.

* Source: "Rehau RauPEX™ Radiant Floor Heating Systems Technical Information" booklet.



Frequently Asked Questions:

Is all PEX tubing created equal?

Yes and No! ASTM has developed stringent standards to measure the quality of PEX tubing (ASTM F876 and F877). All PEX tubing that passes these tests is a high quality product and perfectly suitable for fluid distribution applications. All three methods of commercial production produce quality tubing, but Silane method Zurn PEX is the highest quality when considering the features that are important to fluid distribution (burst ratings, long term life expectancy at elevated temperatures and pressures, chemical resistance, impact resistance, etc.).

Does the PEX-a designation mean that it is better than PEX-b or PEX-c?

No! The a, b, and c designations are used in Europe to distinguish between manufacturing methods but they are not a rating method. We fought to keep this designation out of the ASTM standards because we thought competitors would try to imply it was a rating. All PEX's that meet the ASTM standard will give good service in plumbing and heating applications.

Is Zurn PEX tubing resistant to chlorine?

Yes! Based on tests we have performed and ongoing testing by NSF, Zurn PEX may be used in recirculating plumbing systems at temperatures up to 140°F and chlorine levels up to 2 ppm. (Most municipalities are between 0.5 and 1.4 ppm.)

Can Zurn PEX be stored and/or installed outdoors?

No. All plastic pipes can break down when exposed to ultraviolet rays (sunlight) unless they contain certain pigments or stabilizers intended to prevent the damage. Exposure of unstabilized pipe to ultraviolet rays (UV) causes the molecular structure to break down and oxidize causing the pipe to become brittle and eventually rupture. Zurn PEX contains UV stabilizers that are intended to protect it for 6 months of exposure, which is intended for protection on the job site in case the project is delayed. Most other PEX tubing has only 30-60 day protection. If it must be installed outside it must be sheathed in a protective sleeve. Zurn PEX should not be stored outdoors.

Is a Carbon-Carbon bond (Peroxide/Engel) stronger than Carbon-Silane bond (Silane)?

No! There is much more to tube strength than the strength of the molecular bond. Some relative bond energies are:

| | |
|-----------------------|--------------|
| C-C (Carbon-Carbon) | 144 Kcal/mol |
| C-Si (Carbon-Silane) | 104 Kcal/mol |
| Cu-Cu (Copper-Copper) | 44 Kcal/mol |

It is apparent that molecular bond strength is not necessarily related to material strength.

How well does Zurn PEX tubing resist freeze damage?

Very well! Zurn PEX will expand before rupture, typically allowing enough room for freeze expansion. Rigid products like copper and CPVC rupture when expanded causing expensive repairs. Zurn PEX that is buried in concrete or otherwise restrained to prevent uniform expansion should be protected from freezing.

Does having a higher degree of cross-linking make a PEX tubing better?

No! The density of the base polyethylene (PE) material chosen for production determines the needed percentage or degree of cross-linking. The lower the density of the base PE the higher the percentage of molecules that must be linked together to achieve the necessary strength to meet the requirements of the ASTM standard. Other manufacturing processes require lower density PE due to their manufacturing method. If they did not cross-link to very high levels they would not pass the ASTM standard. It is possible to formulate Silane method Zurn PEX at the same high levels of cross-linking but it is not necessary or desirable.

Does bending PEX back and forth (kinking it) until it breaks show strength?

No! Bending back and forth merely demonstrates a material's elastic behavior. Because other methods for producing PEX require a lower PE material density, they are more elastic – not stronger! (It's like comparing clear vinyl tubing or a plastic straw to a copper pipe. Because the clear vinyl and the straw are a lower density material it can't be easily broken in two but it does not have as high of temperature/pressure strength as copper pipe.)

How is Zurn PEX tubing connected?

The QUICKSERT I insert and crimp fitting system were developed more than 30 years ago. With more than 100 million QUICKSERT I fittings in service it is by far the most widely used system to connect PEX tubing. An annealed copper ring designed specifically for PEX tubing (black in color) is first slid over the Zurn PEX tubing. The QUICKSERT I insert and crimp fittings are then inserted into the Zurn PEX tubing and our crimping tool compresses the ring, permanently sealing the joint. Tensile strength tests show that our QUICKSERT I connection is stronger than our Zurn PEX tubing so we have backed our tube and fittings with a 25 year warranty when installed together as a system.

Can I use my polybutylene crimping tool with QUICKSERT I fittings?

Yes. Polybutylene crimping tools are suitable for use with QUICKSERT I fittings as long as they are not worn and will crimp within specification, as determined by the "Go/No Go" gauge.

Do QUICKSERT I fittings require time for curing or shrinkage before pressure can be applied and are they affected by cold weather?

No. Zurn's QUICKSERT I fittings are full strength as soon as they are crimped and they are not affected by cold weather. QUICKSERT I fittings do not rely on solvents, chemicals or the memory of PEX to seal our connections. The compressive strength of the copper crimp ring guarantees a uniform, high strength connection every time. With QUICKSERT I there is no more frozen glue or waiting for the PEX to shrink before system pressure testing.



ZURN PLUMBING PRODUCTS GROUP PEX PLUMBING AND RADIANT HEATING SYSTEMS
HIGHWAY 11 E, COMMERCE, TX 75428, PHONE: 1-800-872-7277, FAX: 1-800-209-2148, WEBSITE: www.zurn.com

In Canada: **ZURN INDUSTRIES LIMITED**
3544 NASHUA DRIVE, MISSISSAUGA, ON L4V 1L2, PHONE: 905-405-8272, FAX: 905-405-1292



Zurn PEX Plumbing and Radiant Heating Systems PROFESSIONAL INSTALLATION LIMITED WARRANTY

Subject to the terms and conditions of this Limited Warranty, Zurn PEX Plumbing and Radiant Heating Systems warrants only to the owner of the real property when installed by licensed professional contractors or authorized distributors who purchase and properly install in a potable plumbing system and/or radiant heating system its:

- (1) Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX) and Gick/Sert® brass insert fittings, and poly alloy insert fittings, and Zurn PEX copper crimp rings when installed as a system with Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX), for a period of twenty-five (25) years, and
- (2) Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX) and Gick/Sert® brass insert fittings, and poly alloy insert fittings, and Zurn PEX GickClamp™ crimp rings when installed as a system with Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX), for a period of twenty-five (25) years, and
- (3) Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX) and Gick/Sert® brass insert fittings, and Oetiker® clamps when installed as a system with Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX), for a period of fifteen (15) years, and
- (4) Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX) for a period of twenty-five (25) years, and
- (5) Gick/Sert® brass insert and poly alloy insert fittings when not installed with Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX) and installed with PEX tubing that meets the ASTM F876 requirements for a period of five (5) years, and
- (6) GickClamp™ crimp rings when not installed with Zurn PEX Non-Barrier and Barrier cross-linked polyethylene tubing (PEX) and installed with PEX tubing that meets the ASTM F876 requirements, for a period of five (5) years, and
- (7) GickPort™ plumbing manifolds, under normal conditions of use, for a period of ten (10) years, and
- (8) Zurn PEX riser tubes and supplies, if installed properly, for a period of one (1) year from the date of installation, and
- (9) The associated hardware and accessories, including manifolds, distribution headers, valves, electrical controls, tools, and miscellaneous fittings, for a period of two (2) years from the date of installation.

In order for this Limited Warranty to apply, the above referenced products must be installed by a licensed professional meeting all applicable code requirements and good plumbing practices. FAILURE TO INSTALL ZURN PRODUCTS ACCORDING TO MANUFACTURER'S INSTRUCTIONS WILL VOID ALL APPLICABLE WARRANTIES AND MAY RESULT IN SEVERE WATER DAMAGE. Under this warranty, you only have a right to reimbursement if the alleged failure or leak is determined to be a direct result of the product(s) as covered in this warranty and occurred during the warranty period. This warranty does not apply and you do not have a right of reimbursement if the failure or resulting damage is caused by:

- (I) freezing during or after the installation or inadequate freeze protection;

- (II) damage due to tear, breaks or other external damages before, during, or after installation;
- (III) components not manufactured or sold by Zurn;
- (IV) exposure to temperatures and pressures beyond the specified range for Zurn products as specified on the product in the Zurn Design Manual;
- (V) exposure to harmful, unauthorized, or unanticipated chemicals or substances or corrosive water conditions;
- (VI) exposure to ultraviolet light;
- (VII) damage or wear from abnormal operating conditions, accident, abuse, misuse, or unauthorized alterations or repair.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR OBLIGATIONS, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ZURN DOES NOT GUARANTEE OR IN ANY WAY WARRANT THE INSTALLATION OF ZURN PEX PRODUCTS DUE TO THE WIDE VARIANCE IN INSTALLATION PRACTICES AND OTHER CONDITIONS BEYOND OUR CONTROL.

If you believe that a product fails to meet the above Limited Warranty, you should notify us in writing within 30 days of an alleged failure and prior to expiration of the applicable warranty period set forth above, at the following address:

Zurn Industries, Inc.
PEX Plumbing and Radiant Heating Systems
1801 Pittsburgh Avenue
Erie, PA 16502
Attention: Claims Department

Notification should include a description of the product, the failed part, model number (if available), date of purchase and/or date of installation, and how the product fails to meet the above warranty. Upon receipt of a written claim under this Limited Warranty and evidence/identification of the date of manufacture of product, and after inspection by an authorized Zurn representative and determination of a manufacturing defect, Zurn will reimburse the property owner for reasonable repair or replacement charges, to include drywall and painting as well as damages to real property and the premises within which the product is installed, resulting from the failure or leak. At our option, and in our sole discretion, we will either repair or replace the product with a Zurn product of the same or similar type, size, and like quantity. In order to qualify for a labor allowance to repair or replace defective material, you must contact Zurn Industries in advance and receive written authorization for this allowance. Except as specified above, we will not pay any costs (labor or otherwise) associated with removing previously installed product(s), installing replacement product(s) or return of a product. If, as determined by Zurn, repair or replacement of the product is not commercially practicable, or cannot be completed in a timely manner, we may refund the ultimate purchase price paid for the product upon verification by providing a copy of your purchase order, invoice, receipt, or bill of sale. No action on the part of Zurn PEX under this warranty shall be construed as an admission of liability or that the product is not fit for its intended use.

For more information, call Zurn toll free at 1-800-872-7277.

Form No. ZPM06173-R, 12/06