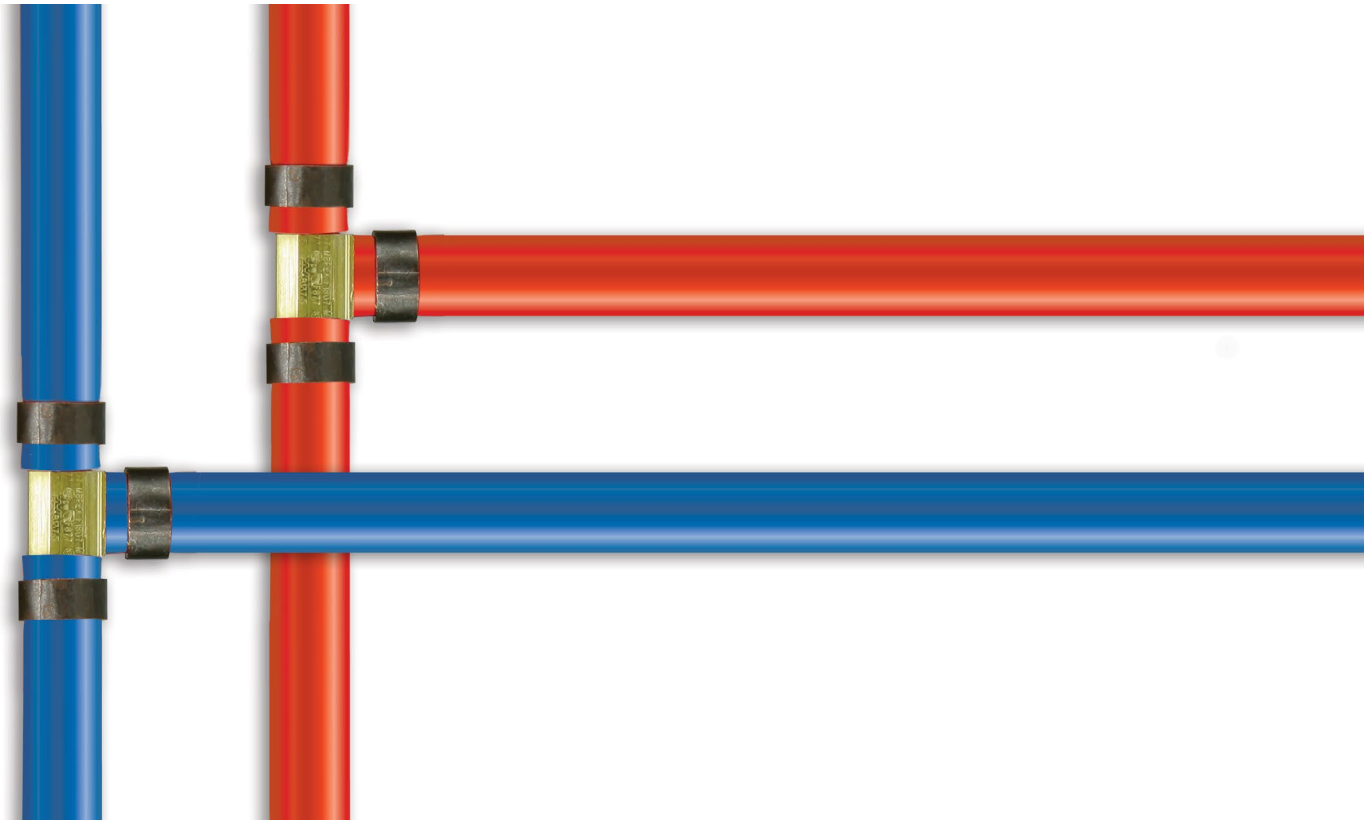
Submittal Package

Viega PureFlow® Crimp



Project _____ **Date** _____

Engineer _____ **Contractor** _____

Submitted by _____

Approved by _____ **Date** _____ **Approved by** _____ **Date** _____

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This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

Viega products are designed to be installed by licensed and trained plumbing and mechanical professionals who are familiar with Viega products and their installation. **Installation by non-professionals may void Viega LLC's warranty.**

Zero Lead identifies Viega products meeting the lead free requirements of NSF 61-G through testing under NSF/ANSI 372 (0.25% or less maximum weighted average lead content.)

1 System Data Sheet

PureFlow Crimp

Viega PureFlow Crimp fittings are available in ECO Brass and polymer materials with excellent chlorine- and corrosion resistant properties.

PureFlow Crimp fittings are available in sizes ⅜", ½", ¾" and 1" in elbows, tees, adapters, couplings, PolyAlloy manifolds, and valves.

Components

- Eco Brass fittings use zero-lead alloy
- PolyAlloy fittings use performance-grade polymer (polyphenylsulfone)
- Copper crimp rings

Operating Parameters

- Operating Temperature: 180°F max (potable)
- Operating Pressure: 160 psi max at 73°F
  100 psi max at 180°F
- Test Pressure: Recommended: 100 psi
  Maximum: 160 psi

Listings and Certifications

- ASTM E84
- ASTM F1807
- ASTM F2159
- CAN/ULC S101/S102.2
- CSA B137.5
- HUD MR-1276
- ICC-ES PMG 1038/1015
- NSF-pw 372

Compliant With

- International Mechanical Code (IMC)
- International Plumbing Code (IPC)
- International Residential Code (IRC)
- National Fire Protection Association - 13D (NFPA)
- National Standard Plumbing Code (NSPC)
- Uniform Mechanical Code (UMC)
- Uniform Plumbing Code (UPC)
- Housing for Urban Development (HUD)
- Canadian Standards Association (CSA)
- National Plumbing Code of Canada (NPCC)
- National Building Code of Canada (NBCC)

Approved Applications

- Hot and cold potable water
- Rainwater/gray water

For more specific information on applications for PureFlow systems, contact Viega Technical Services at 1-800-976-9819.

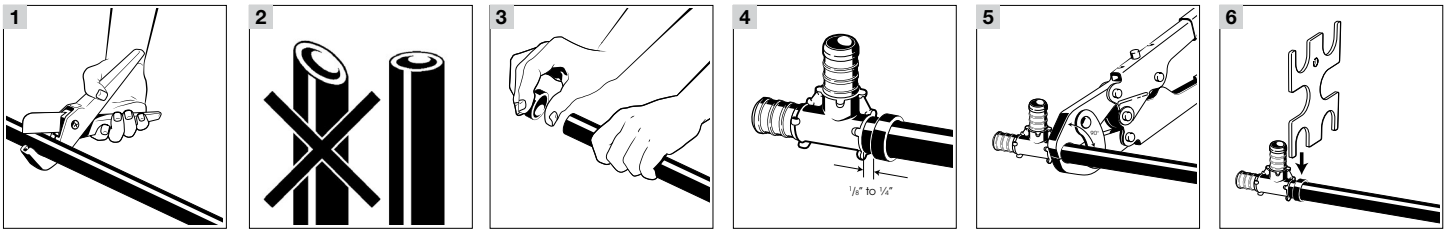
Viega's PureFlow systems meet or exceed all requirements of ASTM F876/877 and are approved for installations above and below ground.

Recommended Tools

- Viega PureFlow Crimp Hand Tools (⅜" to 1")

2 Product Instructions

PureFlow Crimp Connections



Making Viega PureFlow Crimp Connections

1 The tubing should be cut squarely and evenly without burrs. Uneven, jagged or irregular cuts will produce unsatisfactory connections.

2 The diagram shows a correctly cut tube compared with an incorrectly cut tube.

3 Slide the crimp ring onto the tubing and insert the fitting into the tube to the shoulder or tube stop.

4 Position the ring ⅛" to ¼" from the end of the tubing.

5 The ring must be attached straight. Center the crimping tool jaws exactly over the ring. Keep the tool at 90° and close the handles completely.

CAUTION!
Do not crimp twice!

6 When checking crimp connections with a caliper (GO/NO GO gauge), push the gauge STRAIGHT DOWN over the crimped ring. NEVER slide the gauge in from the side. Do not attempt to gauge the crimp at the jaw overlap area. The overlap area is indicated by a slight removal of the blackening treatment. A **crimp is acceptable** if the GO gauge fits the ring and the NO GO does not. A **crimp is unacceptable** if the GO gauge does not fit the ring or the NO GO gauge does fit. An incorrect crimp must be cut out of the tubing and replaced. If you check the crimp connections with a micrometer or caliper, use the dimensions shown in the table.

Crimp outside diameters should fall within the dimensions listed in the table below when measured with a micrometer or caliper.

Crimp Diameter Dimensions

Ring Size (in)	Minimum (in)	Maximum (in)
⅜	0.58	0.60
½	0.70	0.72
¾	0.95	0.96
1	1.18	1.19

3 Engineering Specifications
PureFlow System

Part 1: General

1.1 Summary
This specification covers branch and main, parallel water distribution systems (ManaBloc), cross-linked polyethylene tubing, and fittings using PureFlow press and PureFlow crimp technology for hot and cold water distribution systems. The system is assembled when the fitting barb is inserted fully into the tubing and either a stainless press sleeve or copper crimp ring is pressed/crimped over the tubing and fitting using the appropriate tool to create a leak proof permanent joint.

1.2 References
ANSI/UL 263: Fire test of building construction and materials.
Standard methods of fire endurance tests of building construction and materials.
ASTM E84: surface burning characteristics of building materials
ASTM F1807: specification for metal insert fittings utilizing a copper crimp ring for SDR9 cross-linked polyethylene (PEX) tubing
ASTM F2023: test method for evaluating the oxidative resistance of cross-linked (PEX) tubing and systems to hot chlorinated water.
ASTM F2159: specification for plastic insert fittings utilizing a copper crimp ring for SDR9 cross-linked polyethylene (PEX) tubing
ASTM F3347: Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing
ASTM F3348: Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing
ASTM F876: specification for cross-linked polyethylene (PEX) tubing
ASTM F877: specification for cross-linked polyethylene (PEX) plastic hot and cold water distribution systems.
AWWA C904: cross-linked polyethylene (PEX) pressure pipe, ½ in. (12 mm) through 3 in. (76 mm), for water service.
CAN/ULC S102.2: standard method of testing for surface burning characteristics of flooring, floor covering and miscellaneous materials and assemblies.
CSA CAN/CSA B137.5: cross-linked polyethylene (PEX) tubing systems for pressure applications.
cULus - UL 1821: listing for multipurpose residential fire sprinkler systems (Viega Pureflow PEX black with PureFlow press bronze and polymer fittings in sizes ¾ to 2)
IAPMO Uniform Mechanical Code
IAPMO Uniform Plumbing Code
ICC International Mechanical Code
ICC International Plumbing Code
NAPHCC National Standard Plumbing Code
NSF 14: plastic piping component and related materials
NSF 61: drinking water system components – health effects

1.3 Quality Assurance
A. The installer shall be a qualified installer, licensed within the jurisdiction, and familiar with the installation of cross-linked polyethylene (PEX) tubing systems.
B. The installation of cross-linked polyethylene (PEX) tubing for hot and cold water distribution systems shall conform to the requirements of the ICC International Plumbing Code or IAPMO Uniform Plumbing Code.

1.4 Delivery, Storage, And Handling

A. The cross-linked polyethylene (PEX) tubing shall be shipped to the job site on truck or in such a manner to protect the tubing. The cross-linked polyethylene fittings and manifolds shall not be handled roughly during shipment. The tubing and fittings shall be unloaded with reasonable care.
B. Cross-linked polyethylene plastic tubing and fittings shall be stored in a flat, dry, well ventilated location, not exposed to direct sunlight. Normal care in handling shall be exercised to avoid abuse of the tubing. The tubing and fittings shall not be thrown or dropped on the ground, walked on, or dragged.

1.5 Project Conditions

A. The location of a manifold with valves shall be accessible and in an area not subject to freezing. Proper support of the manifold shall be provided.
B. PEX tubing should not be left exposed in direct sunlight for extended periods of time – short periods not to exceed 6 months are permissible.
C. Plastic manifolds and fittings should not be left exposed in direct sunlight for extended periods of time — short periods not to exceed 15 days are permissible.

1.6 Warranty

A. The tubing and fittings manufacturer shall warrant that the tubing and fittings are free from defects and conform to the designated standard. The warranty shall only be applicable to tubing and fittings installed in accordance with the manufacturer's installation instructions.
B. The manufacturer of the tubing and fittings shall not be responsible for improper use, handling, or installation of the products.

Part 2: Products

2.1 Manufacturer

Viega LLC
585 Interlocken Blvd.
Broomfield CO, 80021
Phone: (800) 976-9819
www.viega.us

2.2 Material

A. Tubing Standard: Viega PureFlow PEX high-density cross-linked polyethylene tubing shall be manufactured to the requirements of ASTM F876 and meet the standard grade hydrostatic pressure ratings from Plastic Pipe Institute in accordance with TR-4/03. The following three standard grade ratings are required:
   - 200 degrees F (93 degrees C) at 80 psig (551 kPa)
   - 180 degrees F (82 degrees C) at 100 psig (689 kPa)
   - 73.4 degrees F (23 degrees C) at 160 psig (1102 kPa)

   1. Chlorine testing: According to ASTM F876 shall meet or exceed the following end use condition.
      a. End use conditions of : 100% @ 140°F. Per PEX 5306 (CL5).
   2. UV testing: According to ASTM F876 PEX tubing products shall meet or exceed the following exposure limits.
      a. Viega PureFlow PEX 6 months.

B. Fitting Standard: PureFlow Press fittings shall be manufactured from UNS, C87700, C87710 bronze or polyphenylsulfone, meeting the requirements of ASTM F877 and ASTM F3347 (metallic) or ASTM F3348 (polymer) tested as a system with Viega PureFlow PEX tubing. The PureFlow Press sleeve shall be manufactured out of a 304 grade or better stainless steel and have three view holes (attached sleeve) to ensure proper PEX tubing insertion. The attached sleeve fitting will incorporate a tool locator ring that shall be in place while making a proper press connection. The PureFlow Press connection shall be made with a Viega supplied ratcheting PureFlow Press hand tool or PureFlow Press power tool.

C. Fitting Standard: PureFlow Crimp fittings for use with copper crimp rings shall be manufactured from UNS C69300 or C87850 Brass / Eco Brass® meeting the requirements of ASTM F1807 and or PolyAlloy polymer meeting the requirements of ASTM F2159. The PureFlow Crimp connection shall be made by use of a full circle crimp tool designed to crimp F1807 copper crimp rings.
D. Manifolds: Acceptable manifolds shall include:
   - Copper Manifolds: Shall be copper material having a male or female solder, ProPress or PureFlow Crimp inlets. All outlets shall be PureFlow Press, PureFlow Crimp or ProPress fittings. Shall be provided by the Cross-linked Polyethylene system manufacturer.
   - Polymer Manifolds: Shall be plastic material having a male NPSM thread, PureFlow Press or PureFlow Crimp inlets. All outlets shall be PureFlow Press or PureFlow Crimp connections provided by the PEX system manufacturer.
E. Adapter Fittings: PEX adapter fittings shall conform to one of the following ASTM standards; F877, F1807, F2159, or ASME B1.20.1 and be listed to the CSA B137.5. The adapter fittings shall mate to NPT threads, copper tubing, copper fittings or ProPress fittings.

2.3 Source Quality Control

A. The PEX tubing and fitting manufacturer shall maintain a third party listing of the tubing and fittings. The tubing and fittings shall be certified in accordance with ANSI/NSF 14/61 to verify suitability to transport potable water. The tubing and fittings shall have the mark “NSF-pw”, “cNSF® us pw-G”, or “NSF 61” permanently marked on the product to verify the material listing.
B. The manufacturer of the PEX tubing and fittings shall maintain a quality control program in accordance with ISO 9001 or NSF International in the manufacturing plant to assure that the tubing and fittings are continually being produced to the required standard. The tubing and fittings shall be certified as complying with NSF 14.

Part 3: Execution

3.1 Examination

The installing contractor shall carefully examine the PEX tubing for defects, cuts, abrasions, cracks, fading color, or blemishes. There shall be no cracks or heavy deformations of the tubing. Fittings and manifolds shall be checked for any signs of abuse. Any damaged tubing or fittings shall be rejected.

3.2 Preparation

Viega PureFlow PEX tubing: Cross-linked polyethylene tubing shall be cut with a PEX tubing cutter. The tubing shall be cut squarely and neatly to permit a proper connection between the tubing and fitting.

3.3 Installation General Locations

Plans indicate general location and arrangement of PEX system. Identified locations and arrangements are used to size pipe and calculate friction and loss and other design considerations. Install PEX tubing as indicated, except where deviations to layout are approved on coordination drawings.

3.4 Installation, PEX Tubing

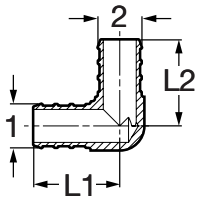
A. Pressure rating: Install components having a pressure rating equal to or greater than the system operating pressure.
B. Install PEX tubing that is free of blemishes, cuts, gouges, kinks or noticeable fading of color.
C. Changes in direction: PEX tubing shall not exceed an eight times the tubing outside diameter (OD) free bend radius or a five times the tubing OD supported bend radius, with use of a Viega approved bend support. Install fittings for changes in direction where any minimum bend radius is exceeded and branch connections.

D. PureFlow Press connections: PureFlow Press fittings shall be made in accordance with the manufacturer's installation instructions. The Stainless press sleeve shall be placed over the end of the squared off PureFlow PEX tubing while fully inserting the fitting barb into the tubing. Full tubing insertion shall be verified by a visual confirmation of PEX being present through the view holes before engaging a press connection. Full insertion for an attached sleeve connection means tubing must be completely visible in at least two view holes and partially visible in the final view hole. The PureFlow Press connection shall be made with a Viega supplied ratcheting PureFlow Press hand tool or PureFlow Press power tool.
E. PureFlow Crimp connections: PureFlow Crimp fittings shall be made in accordance with the manufacturer's installation instructions. The copper crimp ring shall be placed over the end of the squared off PEX tubing then the PureFlow Crimp fitting fully inserted into the tubing. Position the crimp ring ⅛" to ¼" from the end of the tubing before engaging a crimp connection. The PureFlow Crimp connection shall be made with a Viega supplied full circle crimp tool or equivalent.
F. Threaded joints: Threaded joints shall have a potable water listed joint sealant tape applied to the male threads only. Tighten joint with a wrench and backup wrench as required.
G. PEX tubing protection: Protect PEX tubing from exposure to direct and indirect sunlight exposure. PEX tubing shall be stored under cover, shielded from direct and indirect sunlight when material is stored for any length of time.
H. Penetration protection: Provide allowance for thermal expansion and contraction of PEX tubing passing through a wall, floor, ceiling or partition by wrapping with pipe insulation, or by installing through an appropriately sized sleeve. Penetrations of fire resistance rated assemblies shall maintain the rating of the assembly.
I. Backfill material: Back fill material must be free of large rocks, glass, or other sharp objects which can damage the PEX tubing.
J. Horizontal support: PEX tubing must be supported every 32" horizontally with Viega approved suspension clips or plastic insulators.
K. Vertical support: PEX tubing must be supported at each floor or ceiling penetration and every four feet in between.

4 Dimensional Documents

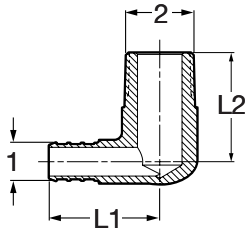
PureFlow Crimp Fittings

Viega PureFlow Crimp 90° Elbow Zero Lead Brass - Model V5016ZL



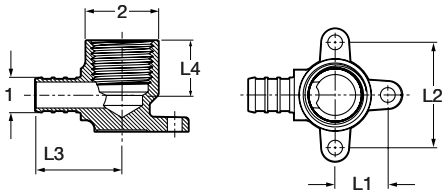
Part No.	Size (in) 1 2	L1 (in)	L2 (in)
46922	⅜ x ⅜	0.89	0.87
46933	½ x ½	0.95	0.87
46243	¾ x ½	1.06	1.01
46944	¾ x ¾	1.06	1.00
46955	1 x 1	1.36	1.36

Viega PureFlow Crimp 90° Elbow Zero Lead Brass Crimp x MPT - Model V5014ZL



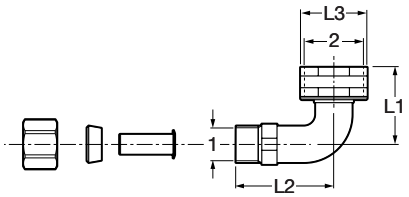
Part No.	Size (in) 1 2	L1 (in)	L2 (in)
46822	⅜ x ⅜ MPT	1.03	0.96
46232	½ x ⅜ MPT	1.29	0.96
46821	½ x ½ MPT	1.11	1.19
46245	¾ x ¾ MPT	1.50	1.26

Viega PureFlow Crimp 90° Elbow Drop Ear Zero Lead Brass Crimp x FPT - Model V5027ZL



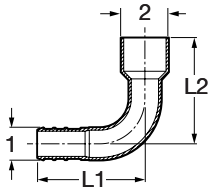
Part No.	Size (in) 1 2	L1 (in)	L2 (in)	L3 (in)	L4 (in)
46233	½ x ½ FPT	0.79	1.58	1.39	0.72
46244	¾ x ¾ FPT	0.99	1.98	1.46	1.05

Viega PureFlow Compression 90° Elbow For Dishwasher Zero Lead Copper CTS x Hose - Model V5053



Part No.	Size (in) 1 2	L1 (in)	L2 (in)	L3 (in)
46743	⅜ CTS (½ O.D.) Comp x ¾ Hose	1.32	1.67	1.14

Viega PureFlow Crimp 90° Elbow Zero Lead Copper Crimp x C - Model V5021



Part No.	Size (in) 1 2	L1 (in)	L2 (in)
44305	⅜ x ½ C	1.68	1.46
44325	½ x ½ C	1.43	1.58
44345	¾ x ¾ C	2.05	2.01