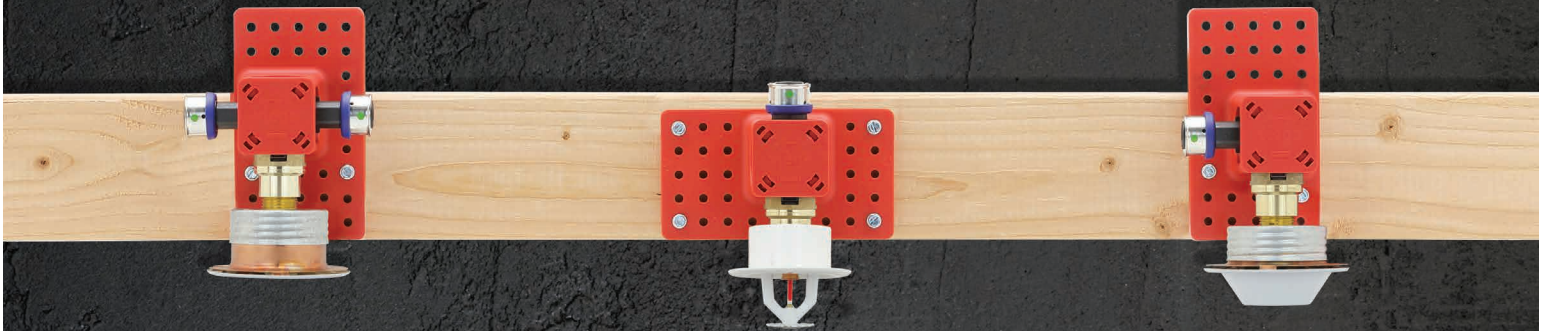


Installation Manual

Viega PureFlow® Fire Sprinkler System for Residential Applications



viega

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1 About this Document

1.1 Disclaimers



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.**



It is the responsibility of the contractor, specifying engineer, or installer to appropriately design the PureFlow system, determine that the selection of components in the system are the proper ones for the intended application in the locale in which they will operate and that employees working on the job site observe the proper installation practices.



This installation guide is intended to assist in the design and installation of Viega multipurpose fire protection sprinkler/plumbing systems. System installation shall be done by installers trained through industry recognized or approved programs.



References to Viega PureFlow PEX tubing made throughout this publication include Black Viega Pureflow PEX and Viega Pureflow Press Fittings with attached sleeves.



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).



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



Failure to follow the installation instructions will void the Viega PureFlow Limited Warranty. Nothing in this publication is intended to create any warranty beyond Viega's applicable limited warranty. For additional information, contact Viega at 800-976-9819.

1.2 Symbols Used

The following symbols may be used within this document:



DANGER!

This symbol warns of possible life-threatening injury.



WARNING!

This symbol warns of possible serious injury.



CAUTION!

This symbol warns of possible injury.



NOTICE!

This symbol warns of possible damage to property.



Notes give additional helpful tips.



Limit direct UV exposure (sunlight) to products that have this warning symbol present. Maximum UV exposure durations may vary based on the type of product being installed. Review the warning and/or limitation listed with the product being installed.



Do not expose Viega products to any foreign substance that includes but is not limited to VOC (Volatile Organic Chemical) compounds, paints, solvents, glues, cleaners, and disinfectants.



Viega products that are exposed to these types of substances are at risk of having failures (leaks).

2 Product Information

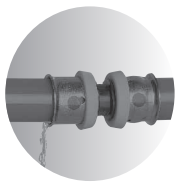
2.1 PureFlow Systems

Viega PureFlow systems are the most complete potable water solutions available in the North American market. With tubing, fittings, and distribution manifolds, Viega provides everything you need for a total plumbing system that is not only easy to install but also helps reduce energy costs and water waste.

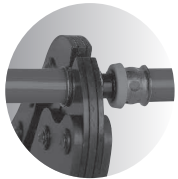
Viega provides the highest-quality PEX tubing with the best UV and chlorine ratings in the industry. Viega PureFlow Press fittings allow installers to make secure press connections in seconds. With Viega press technology, pressure testing can be completed immediately after connections are made without waiting for glues or solvents to dry or for expansions to contract. Viega PureFlow Press fittings are approved for fire sprinkler systems in sizes ranging from 3/4" through 2" in both zero lead and high-grade polymer materials. With a 25 year limited warranty and unmatched quality in the industry, Viega offers a complete system solution for all your plumbing needs.

Viega press technology is consistent and reliable, providing the same quality pipe connections every time. Viega PureFlow Press polymer fittings incorporate Viega Smart Connect® technology, which helps installers identify unpressed connections easily. Viega PureFlow PEX tubing and Viega PureFlow Press polymer fittings are manufactured in the United States and provide secure, reliable connections for residential and light commercial projects, ranging from potable water to snow melting applications.

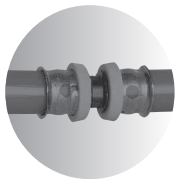
2.2 Viega Smart Connect Technology



1 Identify an unpressed connection during pressure testing



2 Upon identification, use the press tool to press the fitting, making a secure leak-proof connection.



3 Viega PureFlow press connections are fast, flameless, and reliable.

Viega Smart Connect technology provides the installer quick and easy identification of an unpressed fitting during a leak test. When the fitting is pressed, a secure, non-detachable, mechanical connection is created. Smart Connect technology provides the installer with an easy way to see connections that have not been pressed before putting the system into operation.



Testing for leaks using Viega Smart Connect is not a replacement for testing requirements of local codes and standards. If testing with compressed air, it is necessary to use an approved leak-detect solution.

2.3 PureFlow System Concepts

Viega PureFlow is a high-quality, flexible PEX system for hot and cold potable water distribution.

The Viega PureFlow plumbing system offers maximum security thanks to press and full-circle crimp fitting techniques. These fittings ensure the plumber quick installation, suitability for use in all types of applications at the construction site and vast reductions in the required number of fittings and necessary installation time.

Top quality materials such as brass, bronze, stainless steel, and durable, environmentally-compatible polymers provide the basis for the very highest standards of quality at Viega. It is able to withstand high levels of thermal and mechanical stress.

The systems incorporate:

- Viega PureFlow PEX Black tubing ($\frac{3}{4}$ " - 2"): UL 1821 listed for use in multipurpose one- and two-family fire sprinkler systems per NFPA 13D
- A range of zero lead bronze, Eco Brass[®], or polymer fittings for PureFlow Press fitting systems
- A range of inline, manifold, and stop valves for Viega PureFlow fitting systems
- Viega press tools and jaws for the PureFlow Press fitting systems



Viega PureFlow systems are not rated to be utilized in unfinished basement applications.

2.4 Safety

Please read and understand the instructions before beginning installation to eliminate safety concerns and reduce risks associated with use and handling of Viega products.

2.5 Design Services

Viega offers many tools to assist the specifying engineer, engineer, contractor, and installer to ensure Viega PureFlow systems are properly designed and installed. This can be done by referring to one of the resources listed below:

- Engineering Specifications are available at www.viega.us.
- Viega guide specifications in Master Spec format are available upon request at 1(800) 976-9819.
- Contact your local Viega field sales representative.

Consult Viega's Technical Services Department for information on applications not listed or applications outside listed temperature and pressure ranges.

- Viega Technical Services Department: Techsupport@viega.us
- Design Service: For more information on fire protection system design, radiant system design, and plumbing design services: Design@viega.us

2.6 PureFlow Listings and Certifications

The Viega PureFlow system has the following listings and certifications:

- **Plastic Pipe Institute (PPI)**
 - TR 4 Listed Materials: Listing of Hydrostatic Design Bases (HDB), Strength Design Bases (SDB), Pressure Design Bases (PDB), and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe. Pressure/Temperature Ratings: 160 psi at 73.4° F, 100 psi at 180° F (*does not apply to fire sprinkler system*), 80 psi at 200° F
- **NSF International**
 - NSF-pw certification mark: Product meets all applicable performance standards for pressure-rated potable water applications required in ANSI/NSF Standard 14 and complies with ANSI/NSF Standard 61 for health effects.
 - cNSF®us pw-G: Product meets zero lead listing meeting California AB 1953 and Vermont Act 193
 - CSA B137.5: This standard specifies requirements for thermoplastic pressure piping.
 - NSF U.P. Code: Product meets requirements of the Uniform Plumbing Code™.
 - PEX 5306: Tested and certified to the NSF-pw 5306 chlorine resistance rating for an end-use condition of 100% @ 140° F per ASTM F876, which is the highest chlorine resistance rating available through ASTM. When the product is marked with the PEX 5306 designation it affirms the product is approved for use in continuous domestic hot-water circulation systems with up to 140° F water temperatures and has a maximum UV rating of six months.
- **Underwriters Laboratories Inc. (UL)**
 - UL1821: Standard for Safety for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service (NFPA 13D systems only)
 - ANSI/UL 263: Standard for Safety for Fire Tests for Building Construction and Materials
- **Underwriters Laboratories of Canada Inc. (cUL)**
 - CAN/ULC S101: Standard Methods of Fire Endurance Tests of Building Construction and Materials
 - CAN/ULC S102.2: Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies
 - CAN/ULC S115: Standard Method of Fire Tests of Firestop Systems
 - CAN/ULC/ORD/C199P: Combustible Piping for Sprinkler Systems
- **International Association of Plumbing and Mechanical Officials Research and Testing (IAPMO R&T)**
 - Certificate of Listing: Product meets the requirements of the Uniform Plumbing Code™
- **International Code Council - Evaluation Services (ICC ES)**
 - ICC ES-PMG™: Product complies with International Plumbing Code



Certifications available at:

www.nsf.org,
www.spec-direct.com (Intertek),
www.ul.com,
www.canada.ul.com

2.7 PureFlow Codes and Standards

The Viega PureFlow system conforms to the following codes:

- ICC – International Code Council
- IPC – International Plumbing Code
- IMC – International Mechanical Code
- IRC – International Residential Code
- UPC – Uniform Plumbing Code
- UMC – Uniform Mechanical Code
- NSPC – National Standard Plumbing Code
- HUD – Housing for Urban Development
- NPCC – National Plumbing Code of Canada
- NBCC – National Building Code of Canada
- NFPA - National Fire Protection Association

The Viega PureFlow system conforms to the following standards:

- **ASTM — American Society for Testing and Materials**
 - ASTM E119: Standard Test Method for Fire Testing of Building Construction and Materials
 - ASTM E814: Standard Test Method for Fire Test of Through-Penetration Firestop Systems
 - ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
 - ASTM F876: Standard Specification for Cross-linked Polyethylene (PEX) Tubing
 - ASTM F877: Standard Specification for Cross-linked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
 - ASTM F2023: Standard Test Method for Evaluating the Oxidative Resistance of Cross-linked Polyethylene (PEX) Pipe, Tubing and Systems to Hot Chlorinated Water
 - 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
- **NSF International**
 - ANSI/NSF 14: Plastics Piping System Components and Related Materials.
 - ANSI/NSF 61: Drinking Water System Components – Health Effects.
- **American Water Works Association (AWWA)**
 - AWWA C904: Cross-linked Polyethylene (PEX) Pressure Pipe, ½" through 2" for Water Service
- **International Standards Organization (ISO)**
 - ISO 9001



It is the responsibility of the installer or any other parties to adhere to all applicable local rules and regulations governing the nature of the installation.

3 Viega PureFlow Fittings

3.1 Viega PureFlow Press Fittings

Viega PureFlow Press fittings are available in zero lead bronze and polymer and include a factory-assembled, stainless steel sleeve with three viewing holes and a tool locator ring to ensure a proper press connection. The following design criteria make Viega PureFlow Press fittings ideal for use in potable water applications:

- High corrosion resistance
- Excellent strength properties
- Resistant to stress corrosion
- Superior wear properties
- Compatible with all materials

All Viega PureFlow tubing, fittings and manifolds are NSF certified for use in potable water systems.

3.1.2 PureFlow Press Bronze

Viega PureFlow Press bronze fittings are manufactured from a high-quality zero lead material specifically designed for press technology meeting or exceeding all manufacturing requirements.

3.1.3 PureFlow Press Polymer

Viega PureFlow Press polymer fittings are manufactured from polyphenylsulfone and incorporate Viega Smart Connect technology, which is designed to identify unpressed connections.

3.1.1 PureFlow Press Fitting Markings

Each Viega PureFlow Press fitting is marked where space permits with the following information:

Manufacturer	Viega
ASTM Standard	ASTM F877 / F3347 (ZL Bronze) / 3348 (Polymer)
Temperature Rating	180° F (potable) 200° F (hydronic heating)
Certifications	cNSF [®] us pw-G, CSA B137.5, UPC [®] or UP Code, cULus [®] , ICC-ES PMG [™] 1038 / 1015

Note: All fittings may not be listed with every organization shown.



Use only Viega stainless steel attached PureFlow Press sleeves and press tools with Viega PureFlow Press fittings.



Viega PureFlow Press polymer fittings must be protected from UV exposure, which can damage them. In the event of incidental UV exposure during storage, installation and handling, combined exposure of PureFlow Press fittings shall not exceed 15 days.



Do not expose Viega products to any foreign substance that includes but is not limited to VOC (Volatile Organic Chemical) compounds, paints, solvents, glues, cleaners, and disinfectants.



Viega products that are exposed to these types of substances are at risk of having failures (leaks).

3.2 Viega PureFlow Press Tools

3.2.1 PureFlow Press Hand Tools



The Viega PureFlow Press connection must always be carried out with the aid of a Viega PureFlow Press tool. The hand tool incorporates a forced compression mechanism to complete a secure connection each time. A ratchet inside the tool prevents the tool from being opened until the proper force has been applied to the press sleeve. A safety release screw allows the tool to be opened at any time, but any connection made without full tool compression must be repressed. The tool handles are color coded to match the PureFlow Press tool locator rings.

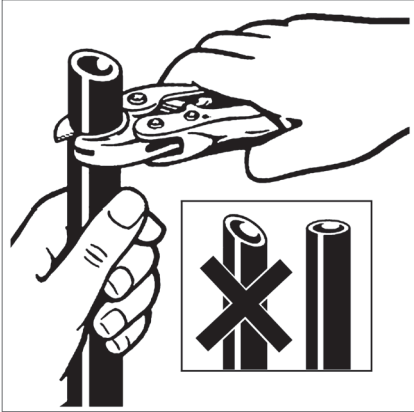
The reduced grip feature permits one-handed operation, making the Viega PureFlow Press system ideal for tight spaces and awkward locations. The compression of the tool also allows press connections to be made in temperatures as low as -4°F .

3.2.2 PureFlow Press Power Tools



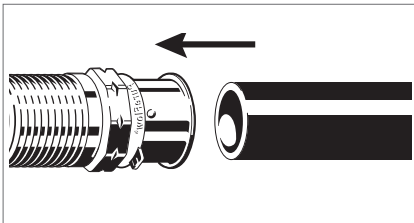
The Viega PureFlow Press connection may also be carried out with a Viega power tool. These tools are designed to make the same consistent press as the Viega PureFlow Press hand tools. The compression of the tool also allows press connections to be made in temperatures as low as 23°F .

3.3 Preparing the Tubing

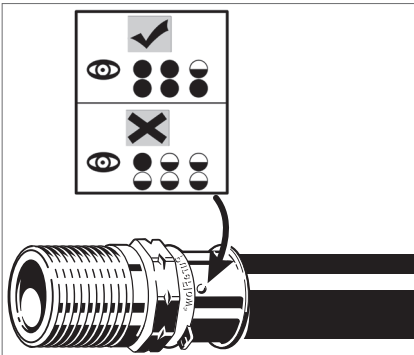


- Square off tubing to proper length. Uneven, jagged, or irregular cuts will produce unsatisfactory connections.

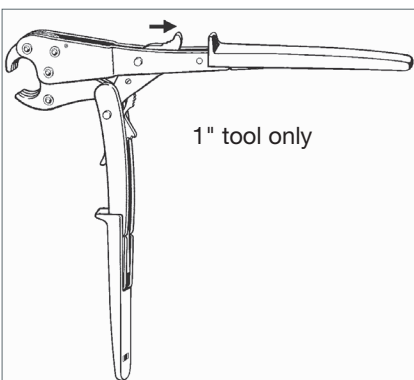
3.4 Making Connections with the PureFlow Hand Tool



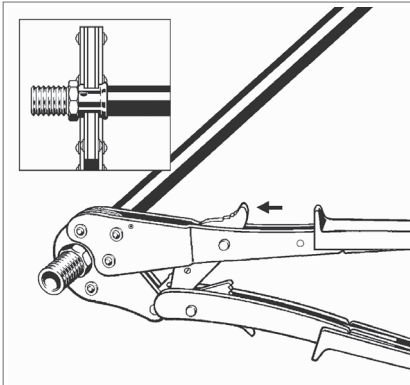
- Insert PureFlow Press fitting with attached sleeve into tubing and engage fully.



- Ensure full tubing insertion at view holes in attached press sleeve. Full insertion means tubing must be completely visible in at least two view holes and partially visible in the one.



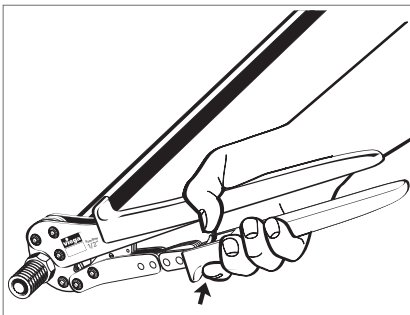
- For the 1" tool, open the tool handles fully (thumb grip is available to maintain open jaw). Then close tool jaws to engage ratchet (ensure that thumb grip is returned fully forward before closing jaws). For other tools, go to the next step.



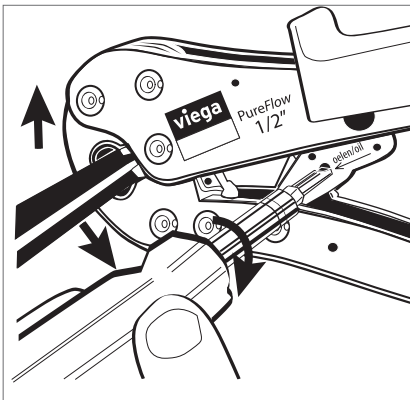
- Position the PureFlow press tool perpendicular over the press sleeve, resting it against the tool locator ring. For 1" tool, close tool jaws to engage ratchet (ensure that thumb grip is returned fully forward before closing jaws). Make sure the PureFlow press tool is properly aligned.



The tool locator ring must be in the factory-installed position while making a press to ensure a consistent leak-proof connection. It may be necessary to rotate the tool locator ring to avoid interference between the ring and tool.



- Close handles, using trigger to reduce grip span if desired.

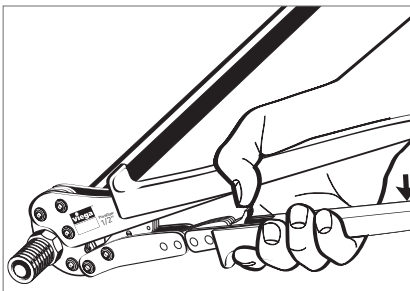


- If the PureFlow press tool is not properly aligned with the locator ring, use the emergency release (using a screw driver to turn the emergency release) to open the press tool. Once released, align the PureFlow press tool properly and go back to the previous step.



WARNING!

The connection is not leak-proof when the tool has been opened by emergency release. The tool locator ring must be present to ensure a proper PureFlow Press connection.



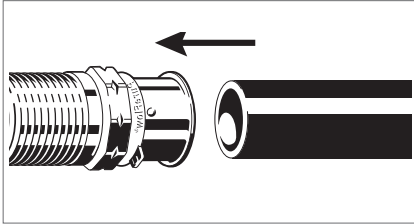
- Extend the PureFlow press tool handle and continue ratcheting until automatic tool release occurs at the proper compression force.



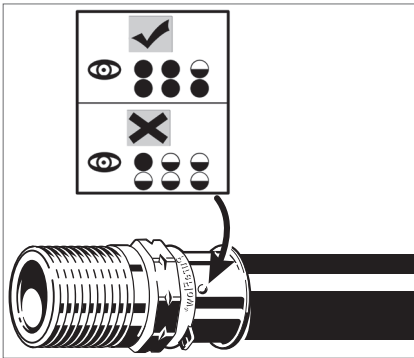
CAUTION!

Do not press twice.

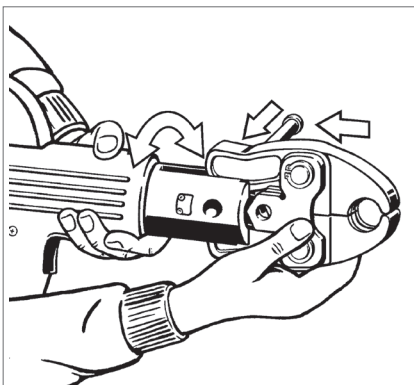
3.5 Making Connections with the PureFlow Press Power Tool



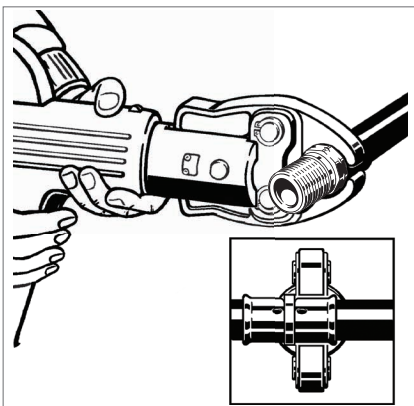
- Insert PureFlow Press fitting with attached sleeve into tubing and engage fully.



- Ensure full tubing insertion at view holes in attached press sleeve. Full insertion means tubing must be completely visible in at least two view holes and partially visible in the one.



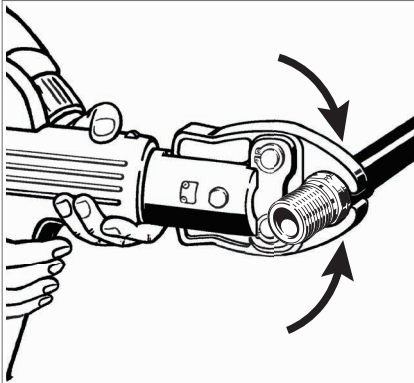
- Insert the appropriate PureFlow press jaw into the press tool and push in the holding pin until it locks.



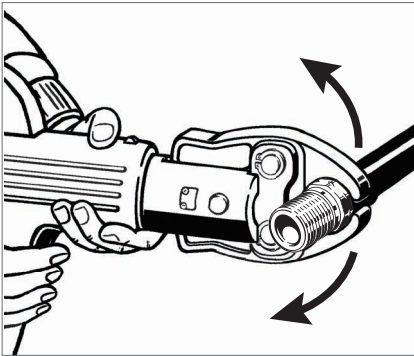
- Open jaw and position perpendicular over press sleeve, resting it against the tool locator ring.



The tool locator ring must be in the factory-installed position while making a press to ensure a consistent leak-proof connection. It may be necessary to rotate the tool locator ring to avoid interference between the ring and tool.



- Start the pressing process; hold the trigger until the jaw has automatically released.



- When press connection is complete, open and remove the jaw.

**WARNING!**

The tool locator ring must be present to ensure a proper PureFlow Press connection.

**CAUTION!**

Do not press twice.

4 Sprinklers

Automatic sprinkler heads are heat-actuated suppression devices that when exposed to temperatures at or above its thermal rating, automatically allow water to flow through the sprinkler head which disperses water onto the heat source. Residential fire sprinklers are primarily designed to save lives by providing adequate time for occupants to exit the area experiencing the fire.

Viega only recommends listed residential fire sprinkler heads as defined by their ratings (temperature / flow rate). Installation of these heads shall be per the manufacturer's specified listings and or limitations.

4.1 Types of Sprinklers

Residential fire sprinkler installations primarily have four types of sprinkler heads: flush concealed, concealed recessed pendent, recessed pendent, and horizontal sidewall sprinklers.

Each type of sprinkler head is intended for a specific mounting application and has distinct advantages focused mostly on aesthetic in the home. Cover plates are also available and may come in various colors direct from the manufacturer.

Sprinkler head design typically utilizes either a fusible link or a heat-sensitive glass bulb that upon sensing heat, expands and bursts, triggering the water to flow.

Residential fire sprinkler heads must have all appropriate listings and must comply with the appropriate model and local codes as well as NFPA 13D "Installation of One- and Two- Family Dwellings and Manufactured Homes".

4.2 Sprinkler Temperature Ratings

There are two types of sprinkler head temperature ratings, defined as ordinary or intermediate.

Recessed pendants and horizontal side wall type heads are considered ordinary having a rating of 155° F (68° C). These shall not be installed where ceiling temperatures can exceed 100° F (38° C). Cover plate assemblies on concealed pendent sprinklers shall have a temperature rating of 135° F (57° C).

Flush concealed sprinkler heads have a temperature rating of 140° F (60° C) and their cover plate assembly is rated at 135° F (57° C).

Intermediate sprinkler heads have a temperature rating of 175° F (79 ° C) and shall be installed when ceiling temperature range from 101° F (39° C) and 150° F (66° C). Temperatures shall not exceed 120° F (49° C) to be in accordance with the UL and C-UL Listing.

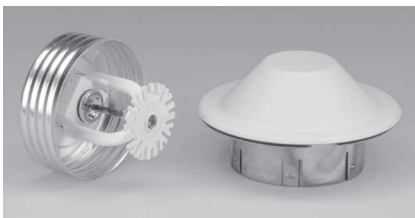
Sprinkler heads shall not be stored in areas that could experience temperatures above 100° F (38° C).

Each type of sprinkler head and associated cover plate has a maximum application temperature rating that must be specified within the design. Ambient temperature exposure must be taken into account during the design of the fire sprinklers system.



Flush concealed sprinklers with components

Flush concealed sprinklers are designed to be concealed behind a ceiling surface. A cover plate mounts flush with the ceiling.



Concealed recessed pendent sprinklers with components

Concealed recessed pendent sprinklers typically have a conical shaped trim plate cover that extends down from the finished ceiling surface.



Recessed pendent sprinklers with components

Recessed pendent sprinklers remain visible once installed (no cover plate).



Horizontal sidewall sprinklers with components

Horizontal sidewall sprinklers remain visible once installed in the wall (no cover plate).

4.3 Sprinkler Orifice Size (K-Factor)

Sprinkler flow rates are typically expressed using a K-factor, and this is used to calculate the sprinklers flow rate based on a specific pressure. The size of a sprinklers orifice is proportional to the size of its K-factor and the larger the orifice the higher the K-factor. Typical residential fire sprinkler heads have K-factors ranging between 5.5, 5.2, 4.9, 4.3, and 4.1. This relation can be shown in the formula below:

$$P = (F/K)^2$$

Where:

P = pressure (psi)

F = flow from sprinkler (gpm)

K = K-factor of sprinkler head

4.4 Additional Requirements

It is important to handle the sprinkler heads with extreme care, protecting them from any type of damage. As these are life safety devices, never install a sprinkler head that has been damaged in any way if suspicion of damage has occurred. Some examples of damage include prolonged exposed to maximum ambient temperatures and cracked glass bulbs. If a damage is head is found, it should be disposed of permanently.

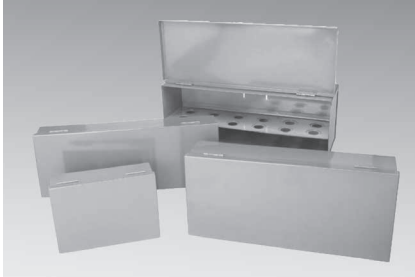
4.4.1 Sprinkler Protection



Keep heads within protective shell during installation

Sprinkler heads are generally shipped with a removable cover that protects the heat-sensing element from damage. It is recommended that this plastic cover be kept in place during all phases of construction including painting or texturing of the ceiling and walls. Removal of these plastic shells must be done prior to placing the system in service. It may be helpful to keep spare protective caps in the sprinkler cabinet for future use.

4.4.2 Spare Sprinkler



Storage cabinets for spare heads and wrenches

While spare sprinklers are not typically required to be left on site, consult with the Authority Having Jurisdiction (AHJ) as local requirements may differ.

4.4.3 Sprinkler Wrenches

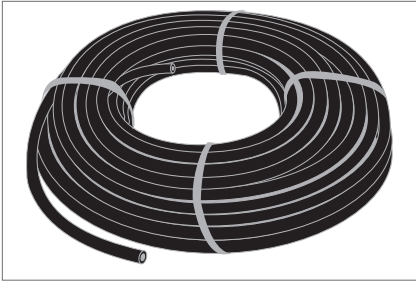


Sprinkler wrenches

As with any specialty system, special tools are required. Residential fire sprinkler systems utilize various wrenches designed for each type of head. These wrenches are essential to proper installation by ensuring proper leverage and minimizing slippage. The use of standard wrenches will increase the potential of damage to the head. Check with your sprinkler head manufacturer/supplier for the appropriate installation tool required. Sprinkler pendants should be tightened to the manufacturer's recommended torque rating (ft/lb). Higher levels of torque may compromise the integrity of the sprinkler and/or bend the frame, causing leakage or impairment of the sprinkler.

5 Viega PureFlow Tubing

5.1 Viega PureFlow PEX Black Tubing



Viega PureFlow PEX tubing is a high-density cross-linked polyethylene tubing (PEX). Cross-linking produces a strong, durable tubing ideal for both hot and cold potable water systems. Compared to ordinary polyethylene tubing (PE), cross-linked tubing has higher temperature resistance and higher burst pressure.

Viega Pureflow PEX tubing is manufactured to ASTM F876/F877 standards and listed to ANSI/NSF standards 14 and 61. It is PEX 5306 (CL5) chlorine resistance rated for both traditional and continuous recirculation applications. In addition, the smooth walls of Viega Pureflow PEX tubing are resistant to corrosion and scaling.

Viega Pureflow PEX Black tubing is the only Viega Pureflow PEX tubing approved for NFPA 13D fire sprinkler systems. The UV resistance of this tubing enables exposure of up to 6 months. It also blocks transmission of visible light, preventing most types of algae growth from occurring.

5.1.1 PureFlow PEX Properties and Performance

Linear Expansion Coefficient:

- 1.1 inch per 100 feet per 10° F

Temperature and Pressure Ratings:

- 100 psi at 180° F (does not apply to fire sprinkler systems)
- 130 psi at 120° F
- 160 psi at 73.4° F

UV Resistance:

- Maximum exposure 6 months

Bend Radius:

- Viega PureFlow PEX can be easily bent by hand, or with the use of Viega-approved bend supports, to a radius 8 times the tubing outer diameter (O.D.).

5.1.2 PureFlow PEX Markings

Viega PureFlow PEX tubing is marked every 5 feet with the following representative information.

Print Line Markings	
Length Marker	000 feet
Company	Viega
Product Name	Viega PureFlow PEX
Nominal Tubing Size	½"
Standard Dimension Ratio Tube Size	SDR 9 CTS (copper tube size)
Material Designation Code	PEX 5306
Temperature & Pressure Rating	100 psi @ 180° F 160 psi @ 73° F
NSF Listing (Potable)	cNSF [®] us-pw
NSF Chlorine Listing	CL5
ASTM Tubing Standards Certification	F876/F877
Canadian Standard Assoc	CSA B137.5
Fittings System Compatibility	PureFlow - ASTM F877/F1807/F2159/ F3347/F3348
IAPMO Listing	UPC [®]
UL Listing Rating*	cULus 3SAV UL1821 130 psi @ 120° F
Plenum Rating**	FS/SD 25/50 ASTM E84 CAN/ULC S102.2
Fire Resistance Ratings	CAN/ULC S101 ANSI/UL 263
ICC Listing	ES-PMG™ - 1038
AWWA Listing	C904
HUD Listing	MR 1276
Manufacturer's Date Code	1/1/2010
Material Code	X14.2
Country of Manufacture	Made in the USA

* ¾" through 2" Black Viega PureFlow PEX only

** 2" and smaller tube sizes when wrapped with ½" - 1" thick E84 rated insulation, ½" and smaller with no insulation per ULC S102.2 listing. Tubing may include fitting connections when wrapped

5.1.3 PureFlow PEX Tubing Dimensions

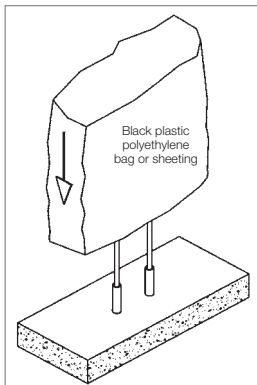
Nominal Size	Inner Diameter	Outer Diameter	Wall Thickness	Capacity gal/ft
¾"	.671	.875	.102	0.18
1"	.863	1.125	.131	0.30
1¼"	1.053	1.375	.160	0.45
1½"	1.243	1.625	.190	0.63
2"	1.629	2.125	.248	1.08

Dimensions are in English units. Tolerances shown are ASTM requirements. Viega Pureflow PEX is manufactured within these specifications.

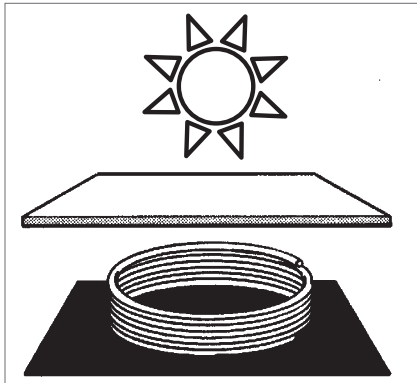
5.2 Protecting Viega PureFlow PEX Tubing



Protect tubing and fittings from UV exposure.



To prevent damage from UV exposure, all Viega PureFlow PEX tubing shall be protected with an opaque covering (black plastic polyethylene bag or sheeting) immediately after they have been installed.



PEX tubing shall be stored under cover, shielded from direct and indirect sunlight when the material is stored for any length of time. Short exposure times of Viega PureFlow PEX not exceeding the total accumulated recommended exposure time are permissible.

Informing the other trades of the presence of the lines may help prevent damage.

6 Sprinkler System Planning and Design

6.1 System Sizing and Calculations

6.1.1 General

The Viega PureFlow system should be designed following standard plumbing engineering practice. Follow local codes to determine minimum tubing size and required fixture pressures.

Pressure drop through fittings can be estimated from the charts below. Values are expressed in equivalent length of tubing, so add the values for the relevant fittings to the length of tubing in the run, and then determine the total pressure drop from the charts on the following page.

To determine the pressure drop through runs of Viega PureFlow PEX tubing, refer to the pressure drop chart on the following page. For a known flow rate, tubing size and tubing length, the pressure drop through the run can be easily determined.

6.1.2 Viega PureFlow Fittings Sizing

6.1.2.1 Viega PureFlow Press Friction Loss

Hydraulic calculations for the sizing of Viega Pureflow PEX pipe and Viega Pureflow Press fittings shall be calculated by using the Hazen-Williams C-value of 150. Pipe friction loss calculations shall be made according to NFPA Standard 13. The following table shows the allowance of friction loss for fittings, expressed as equivalent length of pipe.

Friction loss equivalent feet of SDR9 PEX tubing:

Size	Coupling	PureFlow Press Polymer Fittings			
		90° Elbow	Tee Run	Tee Branch	Sprinkler Tee
¾"	2.5	18.9	3.6	19.1	4.6
1"	3.1	17.7	3.8	18.4	5.6
1¼"	4.0	18.6	6.4	18.7	
1½"	5.2	29.4	7.9	28.3	
2"	8.9	36.4	10.2	37.5	

This information is based on tubing nominal flow rate (@ 8 fps flow velocity).



6.1.3 Viega PureFlow PEX Tubing Sizing

6.1.3.1 Flow Velocity

Flow Rate GPM	Flow Velocity ft/sec				
	¾	1	1¼	1½	2
0.5					
0.75	0.7		Velocity < 0.5 ft/sec		
1.0	0.9	0.5			
1.5	1.4	0.8	0.6		
2.0	1.8	1.1	0.7	0.5	
2.5	2.3	1.4	0.9	0.7	
3.0	2.7	1.6	1.1	0.8	
3.5	3.2	1.9	1.3	0.9	0.5
4.0	3.6	2.2	1.5	1.1	0.6
4.5	4.1	2.5	1.7	1.2	0.7
5.0	4.5	2.7	1.8	1.3	0.8
6.0	5.4	3.3	2.2	1.6	0.9
7.0	6.4	3.8	2.6	1.8	1.1
8.0	7.3	4.4	2.9	2.1	1.2
9.0	8.2	4.9	3.3	2.4	1.4
10.0	9.1	5.5	3.7	2.6	1.5
11.0	10.0	6.0	4.0	2.9	1.7
12.0	10.9	6.6	4.4	3.2	1.8
13.0	11.8	7.1	4.8	3.4	2.0
14.0		7.7	5.1	3.7	2.2
15.0		8.2	5.5	4.0	2.3
16.0		8.8	5.9	4.2	2.5
17.0		9.3	6.3	4.5	2.6
18.0		9.9	6.6	4.8	2.8
19.0		10.4	7.0	5.0	2.9
20.0		11.0	7.4	5.3	3.1
25.0			9.2	6.6	3.8
30.0			11.0	7.9	4.6
35.0	Velocity > 12 ft/sec			9.2	5.4
40.0				10.6	6.2
45.0				11.9	6.9
50.0					7.7
55.0					8.5
60.0					9.2
65.0					10.0
70.0					10.8
75.0					11.5



6.1.3.2 Pressure Loss

Viega Pureflow PEX pipe has a Hazen-Williams coefficient C-value of 150. Pipe friction loss calculations shall be performed according to the NFPA standards. The following table lists pressure loss in psi/ft of pipe for various flow rates.

The flow velocity through Viega's PEX fittings does not fall under these limitations. The equivalent length of PEX tube for Viega PureFlow fittings is available from Viega to assist in system sizing where applicable (refer to "6.1.2 Viega PureFlow Fittings Sizing" on page 25).

Flow Rate GPM	60° F (16° C) Water Pressure Loss PSI/100 ft of Pipe				
	¾	1	1¼	1½	2
0.5					
0.75					
1.0					
1.5					
2.0	1.1	Pressure Loss <1 psi			
2.5	1.6				
3.0	2.3				
3.5	3.0				
4.0	3.9	1.1			
4.5	4.8	1.4			
5.0	5.9	1.7			
6.0	8.2	2.4			
7.0	10.9	3.2	1.2		
8.0	14.0	4.1	1.6		
9.0	17.4	5.1	1.9		
10.0	21.1	6.2	2.3	1.0	
11.0	25.2	7.4	2.8	1.2	
12.0	29.6	8.8	3.3	1.5	
13.0	34.3	10.1	3.8	1.7	
14.0		11.6	4.4	2.0	
15.0		13.2	5.0	2.2	
16.0		14.9	5.6	2.5	
17.0		16.7	6.3	2.8	
18.0		18.5	7.0	3.1	
19.0		20.5	7.7	3.4	
20.0		22.5	8.5	3.8	1.0
25.0			12.8	5.7	1.5
30.0	Pressure Loss Excessive as Flow velocity is > 12 ft/sec		18.0	8.0	2.2
35.0				10.7	2.9
40.0				13.7	3.7
45.0				17.0	4.6
50.0					5.6
55.0					6.6
60.0					7.8
65.0					9.0
70.0					10.4
75.0					11.8

Pressure Loss based on Hazen-Williams Formula (C = 150).

Pressure Loss for Actual Length can be calculated by following formula:

Actual Length / 100 ft X Value from chart above.

½" PureFlow fitting connections are only to be used downstream of the sprinkler system to feed non-sprinkler applications.

6.2 System Planning and Design

6.2.1 General

Prior to the installation of the system, the building plans outlining the piping layout, hydraulic flow/pressure demand (expressed in GPM and PSI), and sprinkler head locations shall be submitted to, and approved by the Authority Having Jurisdiction (AHJ). All deviations from the approved plans will require permission from local authorities. The system design, including the piping layout, sprinkler head location, and hydraulic demand calculations, shall conform to the NFPA 13D Standard.

The following steps will assist in proper planning and design of your system:

- Identify local jurisdiction requirements, including determination of pertinent building codes, fire protection codes, and plumbing codes.
- Obtain information on the residence including “Use Group Classification” and specifics on the type of residence in which the system will be installed.
- Identify the water supply source and available flow in gallons per minute and supply pressure in psi.
- Identify the water supply service line including elevation difference between connections and routing of the service line into the residence.
- Determine the specifications for the sprinkler heads, including water flow and operating pressure requirements and coverage area specifications.
- Lay out the piping system in the residence as a looped or gridded system.
- Lay out the piping system for the cold water distribution and hot water distribution.
- Perform the hydraulic calculations on the system to determine system performance.

6.2.2 Local Jurisdiction Requirements

The first step in starting a sprinkler system design is to determine the local authorities requirements, to include getting clarification of which pertinent plumbing codes and NFPA sprinkler installation standards are being followed by the AHJ. This also includes identifying the required licensing needed to be a qualified sprinkler system installer.



Fire sprinkler plans for NFPA 13D systems are reviewed by the local AHJ, therefore, it is the responsibility of a qualified sprinkler designer to be familiar with all local requirements for the system design and layout.

6.2.3 Residence Information

The next step is to ensure the residence characteristics qualify for being protected by an NFPA 13D sprinkler system. These are typically categorized as being one-family dwellings, two-family dwellings, multiple single-family dwellings, modular homes and manufactured housing.



Confirm with the local AHJ as to whether any local building codes requirements, such as the use of fire separation walls, could allow more than two dwelling units to be protected by a NFPA 13D sprinkler system.

After verifying that the residence qualifies to be protected by an NFPA 13D system, the remaining construction details of the residence must be identified. This encompasses being familiar with every level of home as identified on the building plan for the overall layout, room sizes, and ceiling heights (type, pitch, and/or slope), including crawl space, basement, garages, attics, and individual levels.

6.2.4 Water Supply Source

All multipurpose systems shall have at least one automatic water supply as identified by the NFPA 13D standard. Any of the following automatic water supply systems are acceptable:

- A connection to a reliable waterworks system (with or without automatic pump)
- An elevated water storage tank
- A pressure tank designed to ASME standards for a pressure vessel and connected to a reliable pressure source
- A stored water source with an automatically operated pump

For systems using stored water as the sole source supply, the minimum water volume required to be stored in the supply shall be equal to the maximum system flow demand rate multiplied by 10 minutes, which includes 5 GPM for domestic use. The total capacity typically works out to be 350 gallons. This is based off the flow demand of two sprinkler heads at 15 GPM each plus the 5 GPM domestic (35 GPM total) multiplied by 10 minutes. Refer to NFPA 13D for additional stored water supply requirements.

Upon identifying the type of water supply source being used, the next step is to determine its available gallons per minute flow and pressure. This can be measured at a nearby hydrant or obtained by contacting the local water works authority.

When determining the system supply pressure, minimum pressure conditions occurring during periods of heavy use, such as overnight or summer, must be considered. An accurate assessment of the available flow and supply pressure is critical for proper design and layout of the sprinkler system.

The desirable range for available water flow to the systems is 30 to 50 GPM. The desirable range for system supply pressure is 60 to 80 psi. Hydraulic calculations are required to determine the exact requirements for each system.

6.2.5 Water Supply Service Line

Use standard sizing practices per local code to identify your water service supply, then determine the layout of the piping. This should include all typical pressure losses associated with both the plumbing and fire sprinkler system demand.

Using standard code sizing practices for service line sizing includes pressure drop caused by any elevation (0.433 psi/ft) differences between the service system, and shall include other conditions affecting pressure as follows.

6.2.5.1 Shut-Off Valve

The NFPA requires that a single control valve in the main service supply line be present to shut off both the plumbing and sprinkler systems. If separate valves are used for these systems, the sprinkler valve shall be locked in the open position or observed by a monitoring system.

The main shut off valve shall have an attached sign adjacent to it with lettering ¼" or larger stating the following:

"Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict flow, decrease pressure, or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems, and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign."

This requirement may vary based on local codes. Contact the AHJ for clarification.

6.2.5.2 Water Meters

When sizing water meters for multipurpose systems, always take into consideration their pressure and flow limitations, exceeding these could result in poor or improper system operation.

It is the responsibility of the installer to verify that the pressure loss and flow rate through the selected meter is within the acceptable limits. Refer to the below table for general water meter pressure losses

Common Pressure Loss through Water Meters at Various Flows Shown in PSI						
Meter	18 GPM	23 GPM	26 GPM	31 GPM	39 GPM	52 GPM
¾"	7	11	14	22	35	-
1"	2	3	3	4	6	10
1½"	1	1	2	2	4	7
2"	1	1	1	1	2	3

6.2.5.3 Pressure Reducing Valves

Use a pressure reducing valve (PRV) for systems exceeding a supply pressure above 80 psi. To insure proper system operation, it is the responsibility of the installer to account for any pressure and/or flow losses associated with the PRV.

6.2.5.4 Backflow Requirements

Back flow prevention is not required for service lines supplying both domestic and sprinkler systems. It is the responsibility of the installer to check with the local AHJ for any additional back flow requirements.

6.2.5.5 Water Softeners

It is the responsibility of the installer to account for any additional pressure loss or flow restriction caused by a water softener present in the water supply system. Improper operation of the fire sprinkler system could result if the softener is not properly accounted for in the system design.

6.2.5.6 Smoke Detectors and Waterflow Alarms

A waterflow alarm on a multipurpose piping system is not required under the NFPA standard when the dwelling has smoke detectors installed in accordance with NFPA 72, National Fire Alarm and Signaling Code.

6.2.5.7 Sprinkler Head Requirements

Viega does not currently offer sprinklers, therefore, installers are welcome to source any brand they prefer.

Sprinkler head performance requirements are designated by the amount of coverage area they can achieve based on available water flow and operating pressure. Its recommended practice to source a sprinkler head with the lowest flow providing the greatest coverage area. A favorable sprinkler coverage area ranges from 12' x 12' to 20' x 20' at 13 to 15 gpm with a 7 to 9 psi operating pressure. Refer to the NFPA13D standard and the residential sprinkler head manufacturers listing for proper minimum and maximum head spacing. If the heads are mounted too close, the spray from one hitting the other can interfere with the heads ability to operate properly. Do not exceed the maximum spacing requirements of the sprinklers listing.



Consider proper clearance from ceiling fans, duct work, DWV piping, fireplaces, lights, and registers when locating the sprinkler heads.

6.2.6 Piping System Layout

NFPA 13D defines several types of wet pipe system layouts, these include multipurpose, passive purge, and stand alone. Viega Pureflow can be used in these types of systems.

Multipurpose

A piping system intended to serve both domestic needs in excess of a single fixture and fire protection needs from one common piping system throughout the dwelling unit(s).

Passive Purge

A type of sprinkler system that serves a single toilet in addition to the fire sprinklers.

Stand Alone

A sprinkler system where the above ground piping serves only fire sprinklers.

Check with the local AHJ for acceptability and restrictions when using PEX tubing.

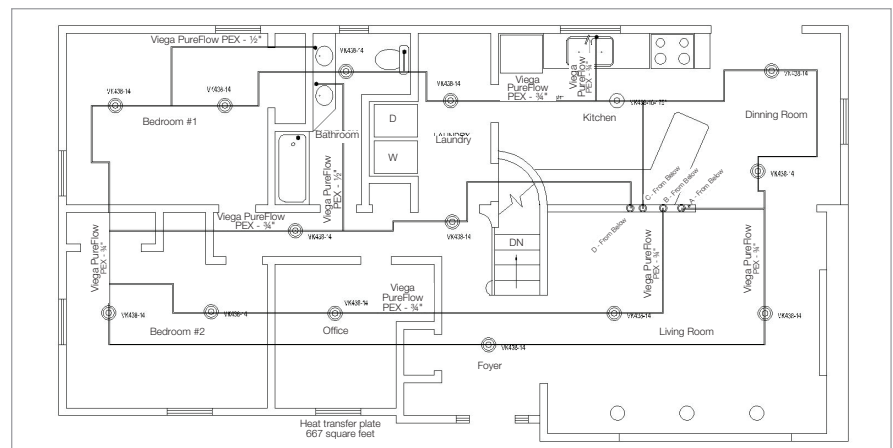
The fire sprinkler system shall be appropriately sized, taking into account system flow and pressure requirements utilizing 3/4" as the minimum pipe size per NFPA 13D.

6.2.6.1 Piping Configurations

The NFPA 13D Standard allows three types of multipurpose sprinkler system configurations to be used in residential occupancies: gridded, looped, straight run, or combinations thereof.

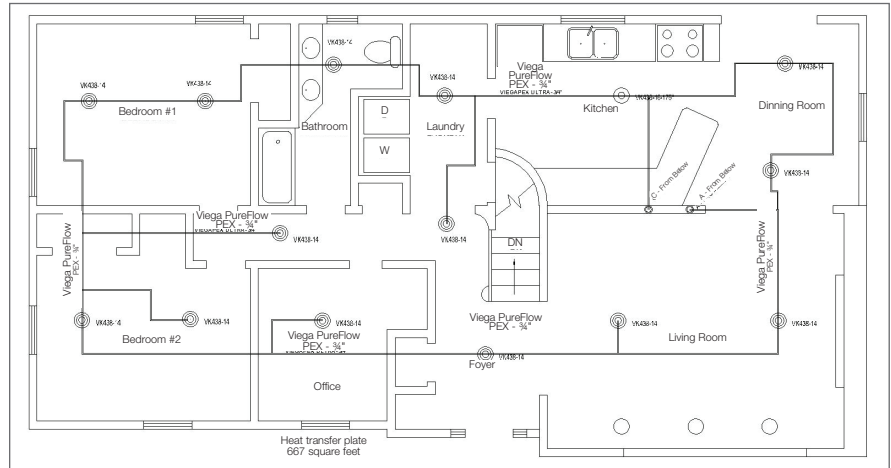
Gridded

This system is connected by multiple branch lines. An activated sprinkler is provided with water from both sides, while other branch lines help transfer the water. This method is not commonly used due to the complexity of its design.



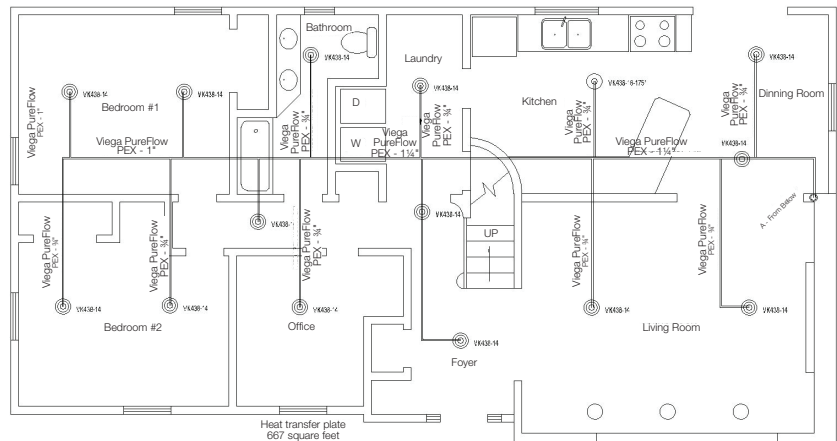
Looped

In this system, multiple cross mains are connected, but the branch lines are not. This method improves the hydraulic characteristics of the system by providing additional water paths through the main piping.



Straight Run

In this system, also known as a tree-type system, each sprinkler head is served by only one water flow path. This piping method is most common for stand alone systems. Due to its inefficiency, it can require larger supply lines.



6.2.6.2 Plumbing System Connections

Piping systems intended to serve both fire protection and domestic plumbing needs are defined as a multipurpose piping system in NFPA 13D.

Local plumbing codes may apply to these types of systems. Consult your local AHJ for applicable requirements.

6.2.6.3 System Pressure Gauge

Although not mandatory, a system pressure gauge can be installed to monitor system pressure. This pressure is considered to be the working (static pressure) or non-flowing pressure.

6.2.6.4 Connections to Domestic Cold Water Plumbing Systems

If allowed by the AHJ, Viega Pureflow Press tees may be installed in the Viega Pureflow PEX fire sprinkler main for connecting potable water fixture supplies. It is required by NFPA 13D that the plumbing supply piping comply with local plumbing codes. Viega Pureflow PEX tubing and Viega fittings meet all requirements for domestic plumbing applications.

6.2.6.5 Hot Water Distribution System Layout

The domestic hot water system sizing and layout is to be determined by the governing local plumbing codes. Viega Pureflow Press Polymer fire sprinkler adapters are for use in domestic cold water systems only.



CAUTION!

Do not use in hot water systems.

6.2.6.6 Required Hydraulic Calculations

In order to ensure proper sprinkler head operation, hydraulic calculations must be performed. NFPA 13D establishes required design criteria. The layout, calculations, and installation of systems installed in accordance with this standard shall only be performed by knowledgeable people trained through industry recognized or approved programs. Check with the local AHJ whether specific credentials are required (NICET III or PE). Viega Technical Services provide fire sprinkler designs. Please call: 877-843-4262.

The following information is required prior to obtaining a fire sprinkler design:

Service Line/Source:

- Street pressure (PSI)
- Distance from street to house (ft)
- Distance from meter to house (ft)
- Material for service (copper/PEX PVC)
- Service line size
- Location of service, where entering house
- Additional in line devices adding pressure drop
- Elevation change from street to base of house
- Water supply type (city/well)

Approval/System Design:

- Material AHJ approved?
- Type of installer AHJ approved?
- Is plumbing integrated?
- Is a NICET III stamp required on design?
- Preferred head type (concealed, pendent, sidewall)
- Brand preference for heads (Tyco, Viking, Reliable)

Construction Details:

- Ceiling height (ft)
- Architectural features on plans (tray ceilings, knee walls, etc.)
- Vaulted ceilings/stairs (peak location and pitch)
- Plans available in AutoCAD?
- Are appliances and heat sources shown on plans?
- Should areas not required to have sprinklers be considered (baths under 55 sq ft., all closets)?

7 Installing the Viega PureFlow PEX Tubing System

7.1 Installation

Black Viega Pureflow PEX is available in sizes $\frac{3}{4}$ " to 2" and is UL and cUL listed for use in residential fire protection systems per NFPA 13D. Viega Pureflow PEX is also listed for potable water applications. Consult the local AHJ for any additional requirements.

7.2 Additional Information/Guidelines

Below are important guidelines that must be followed when using Viega Pureflow PEX and Pureflow Press fittings:

1. Viega Pureflow PEX (black only) and Pureflow Press fittings, sizes $\frac{3}{4}$ " to 2" are approved for use in potable water applications and have a UL listing for use in residential fire sprinkler systems per NFPA 13D.
2. Viega fire sprinkler fittings are intended for use in residential fire sprinkler applications only per NFPA 13D. Installations should not include a fire department connection and shall be designed to withstand a maximum working pressure and temperature of 130 psi at 120° F.
3. Adequate protection must be provided for the Viega tubing and fittings and must include a minimum of $\frac{3}{8}$ " gypsum wallboard, a metal gridded suspended ceiling utilizing lay-in tiles having a weight of not less than 0.35 lbs/sq ft, or $\frac{1}{2}$ " plywood soffits. Viega offers a ProPress® fitting system for copper tubing that may be acceptable for use in exposed areas. Consult with the AHJ for approval and/or any additional requirements for this type of installation.
4. For remodels, adequate protection must be provided for all Viega tubing and fittings to prevent damage.
5. Viega fire sprinkler systems shall not be used in concealed combustible areas where sprinklers are required by NFPA 13D.
6. Maintain 24" minimum clearance from openings in the ceiling such as return grilles.
7. Viega fire sprinkler systems are not intended for outdoor use and are intended for wet pipe systems only.



For detailed information, please consult NFPA 13D, the local building codes, and the AHJ.

7.3 Handling PureFlow PEX Tubing

The properties of Viega PureFlow PEX tubing make it easy to work with and install in most types of construction. Some care must be taken to prevent damage to the tubing before and during installation:

- Use care to protect Viega PureFlow PEX tubing from physical damage during storage and installation. Keep the tubing away from sharp objects, open flames, etc., and do not place heavy objects on the tubing.
- Damaged sections of tubing should be cut out and discarded.
- Do not expose Viega PureFlow PEX tubing to sunlight or any UV source for extended periods of time exceeding six months.
- Do not store Viega PureFlow PEX tubing outdoors where it may be exposed to UV light.



7.4 Decoiling PureFlow PEX Tubing

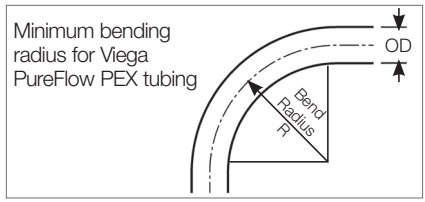


A decoiler should be used to prevent twisting when removing tubing from $\frac{3}{4}$ " to 1" coils. Roll coils out and use care to avoid twisting $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", and 2" coils or when a decoiler is unavailable. If larger diameter tubing is used for short run sections, straight lengths are also available which can assist in this type of installation.

7.5 Bending PureFlow PEX Tubing

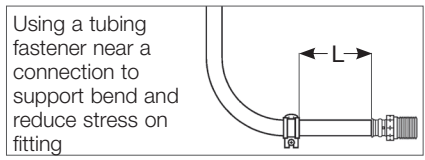
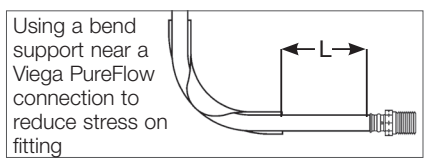
UL listed Viega Pureflow PEX tubing can be free bent (unsupported bend) to a minimum radius of 8 times the actual tubing O.D. The tubing O.D. can be calculated by adding $\frac{1}{8}$ " to the PEX nominal size (e.g., 1" PEX + $\frac{1}{8}$ " = $1\frac{1}{8}$ " O.D.). Viega does not allow the practice of "hot bending" Viega PureFlow PEX tubing to make a tighter bend radius.

To calculate the minimum bend radius multiply the O.D. dimension by the bend factor (8) (e.g., $1\frac{1}{8}$ " x 8 = 9" bend radius). If bending against a PEX coil bend direction, the bending radius is 24 times the tubing O.D.



Viega PureFlow PEX Nominal Size*	Minimum Radius	
	Free Bend (8 x O.D.)	Supported (5 x O.D.)
3/4"	7"	4.4"
1"	9"	5.6"
1 1/4"	11"	6.75"
1 1/2"	13"	8.1"
2"	17"	10.6"

*Viega PureFlow PEX bend radius values were calculated using standard CTS O.D. dimensions, which are 1/8" larger than the nominal tube size listed.



To reduce damaging stress on Viega PureFlow fittings, bend supports must be used to anchor all bends made close to fittings. Support must be provided for tubing bends located closer to fittings than distance "L" in table below. (See the diagrams to the left for typical installation examples.) This will ensure the fire sprinkler fitting stays aligned within the mounting bracket and the pendants remain even with the finished ceiling.

Tubing Size	Maximum distance from fitting to bend
3/4" PEX	L = 10 inches
1" PEX	L = 12 inches
1 1/4" PEX	L = 14 inches
1 1/2" PEX	L = 16 inches
2" PEX	L = 18 inches

7.6 Installation Temperature Range

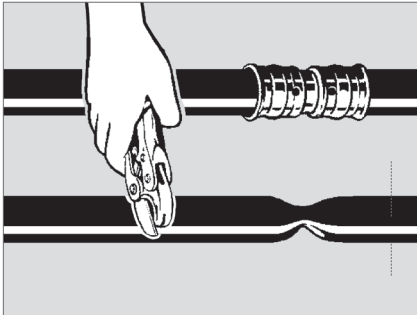
The flexibility of Viega Pureflow PEX tubing and the strength of the Viega Pureflow connections combine to provide a system that can be installed during any weather. The positive compression provided by the Viega Pureflow Press hand tools allow installation in temperatures down to 32° F (23° F for power tools).

7.7 Removing PureFlow Connections

Should a mistake be made, simply cut out the PureFlow fitting and replace with a new one.

CAUTION!
Do not reuse Viega PureFlow fittings

7.8 Repairs



Sections of kinked tubing should be repaired by cutting out the damaged section and installing a repair coupling.

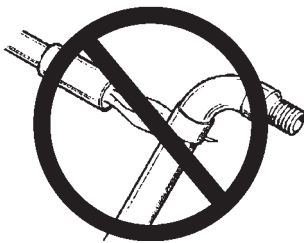
7.9 Freezing

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

Insulating each PEX tube individually or as a group is not generally necessary if the PEX tubing is installed within the insulation envelope of the structure, i.e., the heated area. For example, the tubing may be installed under the insulation in the attic or within an interior wall of a heated space.

Typically, local codes dictate the type and amount of insulation required in ceiling spaces. All piping, fittings, and sprinkler heads shall be installed within the building insulation envelope on the “warm side” of the insulation. Installation of the insulation shall follow the guidelines of the insulation manufacturer.

PureFlow PEX tubing should not be intentionally installed in areas subjected to freezing.



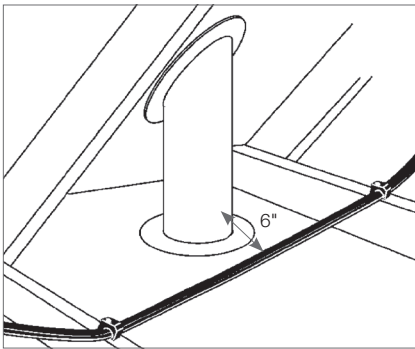
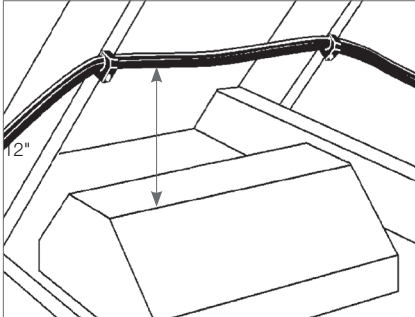
Do not use an open torch or excessive heat to thaw PureFlow PEX tubing. Tubing failure or damage can result.

Heat (DO NOT USE A TORCH) must be applied directly to the frozen tubing section. Temperature on tubing shall not exceed 180° F.

If freezing occurs, several suitable methods exist to thaw PureFlow PEX tubing:

- Hot water
- Wet, hot towels
- Hand-held hair dryer
- Low-wattage electrical heating tape (self limiting)
- A commercial system that pumps heated water through a tube to the ice blockage and returns the cooled water for reheating

7.10 Heaters, Flues, Vents, and Recessed Lights



Keep Viega PureFlow PEX tubing a **MINIMUM of 12" vertically and 6" horizontally** from sources of high heat such as gas flue vents, heating appliances or electric motors.

Concerning recessed lighting (including low-voltage types) and proper installation clearance, Viega recognizes the following types of lighting fixtures: Type IC or Inherently Protected, which allow direct contact with thermal insulation and other combustible materials, and Type Non-IC, which require a minimum clearance of 3" to thermal insulation. If room does not allow for the minimum clearance spacing specified by Viega, then the PEX tubing must be insulated with a suitable pipe insulation capable of withstanding the specific maximum temperatures generated by the fixture. Minimum clearance between any pipe insulation and fixture shall be per the requirements of the fixture type and local building codes.

Forced air heating ducts and PVC power vent flues are not generally considered sources of high heat. These areas of installation should be rechecked after further construction and other mechanical systems have been installed.

In cases where light leakage (direct beam) from a UV-generating light source (special lighting or heating-type lamps) is possible, tubing must be adequately protected with light-blocking insulation.

7.11 Insulation Procedures

If expanding spray foam is being installed for the purpose of insulation, ensure that the insulation is a compatible, water-based, or urethane-based open cell insulation only. Do not use closed-cell spray foams as they are capable of generating high temperatures during their expansion process, which can damage the tubing, fittings, and components.

Viega recommends covering the fire sprinkler fitting during the installation of insulation to ensure that the fire sprinkler system does not become compromised.

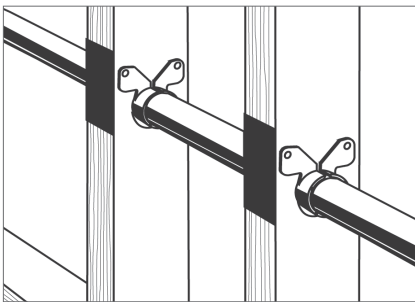
8 Fastening the Viega PureFlow System

8.1 Wood Frame Construction

Viega PureFlow PEX tubing is ideal for use in wood frame construction. The ability to bend the tubing around corners and obstacles greatly simplifies installation. This system eliminates the expensive and time-consuming use of fittings where tubing turns within a wall, and it eliminates the potential fire hazard of soldering close to exposed framing members.

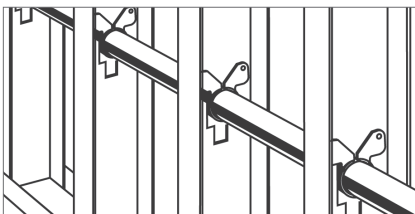
A few rules should be followed when running Viega PureFlow PEX tubing in wood frame construction:

- Use nailing plates to protect the tubing from nails and screws where it passes through studs.
- Suspension clips are required for metal studs and optional for wooden studs but can reduce the potential for noise.
- When turning tubing sharply to exit from a wall, a bend support must be provided. Either use a drop-ear bend support, drop-ear elbow, or a stub out. Neglecting to use a support will place excessive stress on the fitting, and the tubing will not exit perpendicular to the wall.



Nailing plates protect tubing passing through studs and joists from nails.

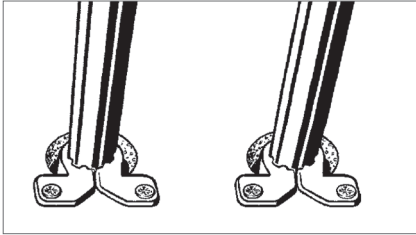
8.2 Steel Construction



Suspension clip fasteners used to protect tubing from abrasion when passing through steel studs

The Viega PureFlow system works as well in steel frame construction as it does in wood. Where tubing runs through metal studs, suspension clip fasteners must be used to protect tubing from sharp stud edges (see illustration to the left). Follow the same guidelines for fastening and supporting the tubing as for wood frame construction.

8.3 Supporting PureFlow PEX Tubing

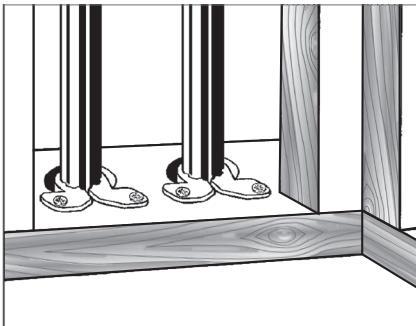


Suspension clips support tubing in joist penetrations or anywhere abrasion is a concern.

Use only plastic or plastic-coated tubing supports. Metal supports may damage tubing.

When running tubing, leave a small amount of slack between fasteners to account for tubing contraction.

Note that Viega PureFlow PEX tubing will expand or contract 1.1" per 100' for every 10° F of temperature change. In long straight runs, allow adequate clearance for this (see "Tubing Expansion" on page 45).



Suspension clip fasteners used at floor plate

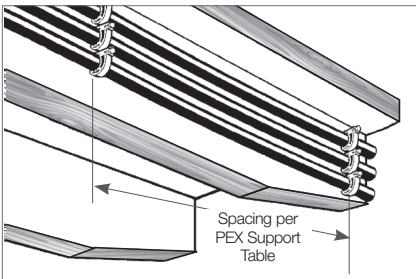
Tubing should be allowed freedom to move slightly as it expands. Do not clip it tightly into place or locate it where it will be tightly constrained. Use suspension clips or an approved plastic insulator where tubing passes through studs or joists where abrasion and noise is a concern (see illustrations to left).

Local codes typically define the maximum distances between support devices. As a requirement per the UL Listing, supports shall be installed every 32" for horizontal pipe runs. For vertical runs, supports shall be installed every 48" as well as at each floor and mid-story guide.

Viega PureFlow PEX tubing must be fastened at a minimum interval noted in the table below for vertical and horizontal support.

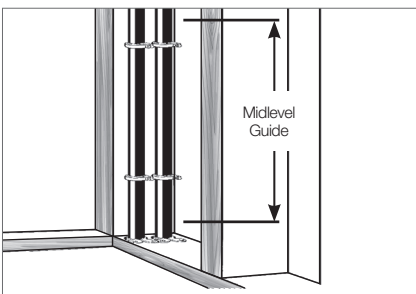
	PEX Size	Horizontal	Vertical
Viega PureFlow PEX	¾" - 1"	32" O.C.	Base of each floor with midlevel guide
	1¼" - 2"	48" O.C.	

PEX Support



Tubing supported with U-clip or lock clip fasteners on horizontal runs

In risers or vertical runs, Viega PureFlow PEX tubing should be attached with suspension clips or an approved plastic insulator at each floor or ceiling penetration, and every four feet in between.



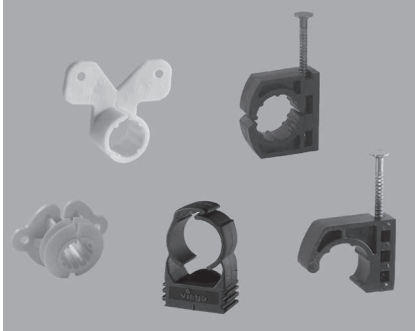
J-clamp or lock clip fasteners used to support tubing in vertical runs between floors



WARNING!

Some model codes may allow greater support spacing intervals for plastic tubing. Always refer to local code for approved spacing requirements that exceed the ones referenced in this manual.

8.3.1 Fixed Support Points



Supports and hangers

Appropriate support is required on all residential fire sprinkler systems. All piping near a Viega Pureflow plug or transition fitting shall be supported at the location. Either a locking clip, where Viega Pureflow PEX pipe snaps in place when pushed into the clip, or a full clamp, which completely encircles the pipe, can be used to support Viega Pureflow PEX. Locking clips require a #6 panhead wood screw (1" length) for mounting.



Support points should not be directly on the fitting or the associated sleeve.

Residential fire sprinkler fitting supports have additional limitations which are outlined in the table below.

Description	Support and Hanger Mounting		
	Horizontal	Vertical	Inverted
Lock Clip			
Full Clamp			
J-Clamp			

8.3.2 Sliding Sleeve Support Device

Adequate expansion and contraction must be accommodated in the fire sprinkler piping. Appropriate sized supports shall be utilized maintaining safe distances away from objects that could damage the pipe such as sharp edges or abrasive surfaces.

Additional support accessories are also available for a variety of applications such as wood or metal framework. Choose the right support device appropriate for the intended application.

8.4 Electrical Grounding

Viega PureFlow PEX tubing may not be used as an electrical ground. Consult the NEC for recommended grounding method when plastic pipe is used.

8.5 Expanding Foams

When penetrations must be sealed for air infiltration purposes, there are several options available. Use a good grade of silicone, acrylic or siliconized acrylic caulking. **DO NOT use oil-based caulks.** Most canned expanding foams and open- or closed-cell pipe insulation are good sealing materials and may be used in direct contact with PEX tubing. Other materials may be used provided they do not cause short- or long-term damage to the PEX tubing.



WARNING!

When using expanding spray foam to insulate walls in a structure, there are several options available. Viega suggests using water-based or urethane-based open-cell insulation only. **DO NOT use closed-cell spray foams.** Closed-cell spray foams have the potential to generate high temperatures during their expansion process, especially when not applied properly, which can damage PEX tubing. Always follow the spray foam manufacturer's installation instructions and warnings.



Do not expose Viega products to any foreign substance that includes but is not limited to VOC (Volatile Organic Chemical) compounds, paints, solvents, glues, cleaners, and disinfectants.



Viega products that are exposed to these types of substances are at risk of having failures (leaks).

8.6 Fire Stop Compounds

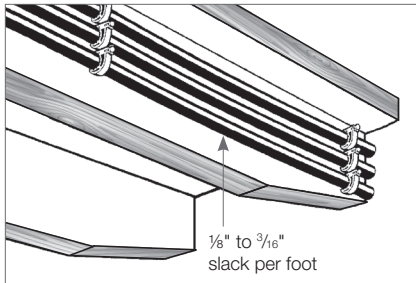
Most building codes require the use of a fire-stopping compound when tubing penetrates a fire-rated wall. There are a number of fire-stopping compounds identified as water based, acrylic or latex that have been listed for use with PEX tubing that include but are not limited to the following.

- 3M Fire Protection: CP 25WB+ Caulk
- Tremco, Inc.: TREMstop® IA
- Specified Technologies, Inc.: SpecSeal® SSS 100 / SSS 102
- Passive Fire Protection Partners: Fire Stop™ 4800 DW / 4100 DW / 4100 NS / 3600 EX

It is the responsibility of the user to determine the suitability of these or any products for the intended application and install the compounds in accordance with the product's installation instructions and listing.

8.7 Tubing Expansion

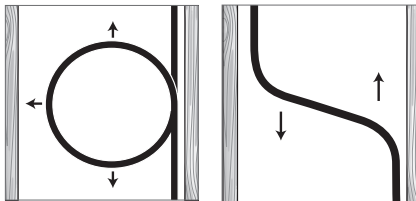
Viega PureFlow PEX tubing, as with any PEX tubing, expands and contracts with temperature changes in the environment or the fluid inside the tubing. The longer the tubing run and the higher the temperature change, the more linear expansion the system will experience. This expansion and contraction can affect the appearance as well as integrity of the system by putting stress on the tubing, fittings, valves, and fasteners.



Allow some slack in all runs to prevent damage from tubing contraction.

When installing Pureflow PEX tubing, expansion and contraction of the material must be considered. Viega Pureflow PEX tubing should not be pulled tight when installed, as cold water will cause tubing to shrink slightly as the system is filled. A slight amount of slack should be left in each run to allow for this contraction without stressing the fittings.

Expansion of the tubing should be accommodated by using expansion loops or offsets. This can be accomplished at a corner or by using offsets or loops on straight tubing runs. Expansion compensators should be installed at the midway point of tubing runs and should be spaced no more than 50 feet apart. Expansion loops or offsets will give tubing a place to grow without stressing fittings.



Using a loop to accommodate tubing expansion

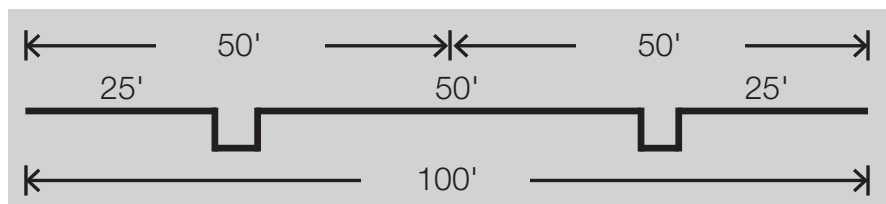
Offsets also provide room for tubing expansion.

Using suspension clip fasteners at all penetrations will allow tubing to move without creating noise. Fasteners should not grip tubing tightly so that it can move slightly as expansion takes place.

Tubing fasteners perform two functions: providing support for the tubing and guiding the tubing during expansion and contraction. It is important to keep this in mind when installing fasteners. An expansion compensator will not be effective if the fasteners prevent linear movement of the piping system.

Viega Pureflow PEX expands or contracts 1.1" in length per 100 feet of tubing for every 10°F change in temperature.

Below is an example of required offsets for a 100-foot tubing run. Note that the expansion compensators are no more than 50 feet apart.



8.8 Calculating Expansion Loops and Offsets

There are three types of expansion offsets recommended for use with large-diameter tubing: the corner expansion offset, the Z-type expansion offset and the U-type expansion loop. A description, illustration and dimensions chart for each type of offset is on the next few pages.

8.8.1 Linear Expansion

To calculate linear expansion for PEX tubing, use the following formula:

$$\Delta L = \frac{\text{PEX expansion rate}}{100' \times 10^\circ \text{ F}} \times \Delta T \times \text{LT}$$

Where:

Viega PureFlow PEX expansion rate = 1.1" per 100' per 10° F

ΔT = Change in temperature (in ° F)

LT = Length of tube between fixed points (in ft.)

For example:

40' of 1" Viega PureFlow PEX tubing going from 70° F to 130° F

$$\Delta L = \frac{1.1''}{1000} \times 60^\circ \times 40' = 2.64''$$

$$\Delta L = 2.64''$$

8.8.2 Compensation Distance

To calculate the dimensions of the expansion compensation offset needed, use the following formula:

$$L = C/\text{OD} \times \Delta L$$

Where:

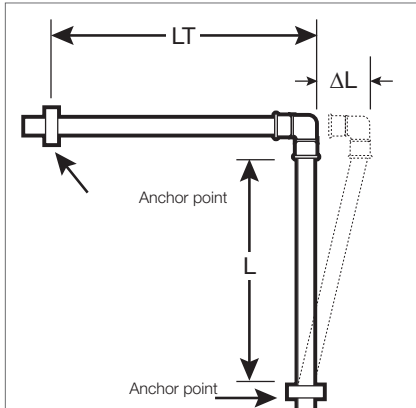
L = length of compensation distance

C = 12 (PEX material specific constant)

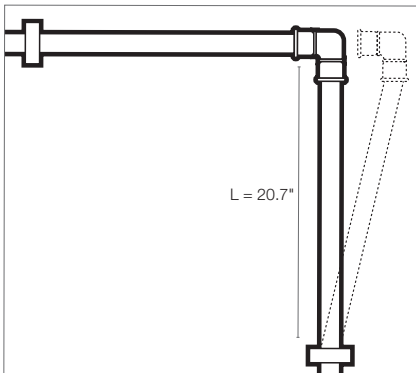
OD = outer tubing diameter ($\frac{1}{8}$ " + nominal tube size)

ΔL = change in length from temperature change

8.8.3 Corner Expansion Offset



Corner Offset



Corner Expansion Example

Where piping takes a corner after a long straight run, a simple 90° elbow in the piping will allow for the absorption of expansion.

Calculate the necessary “L” dimension between elbow and nearest fastener or use the chart below, which was figured using the maximum run for a single expansion compensator (50 feet).

Following the previous example:

$$L = C/\text{OD} \times \Delta L$$

Where:

$$C = 12$$

$$\text{OD} = 1.125 \text{ (1" PEX)}$$

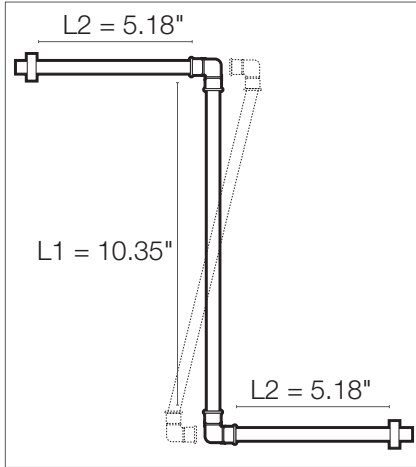
$$\Delta L = 2.64"$$

$$L = 12/1.125" \times 2.64" = 20.7"$$

$$L = 20.7"$$

		Corner Expansion Offset (L, inches) per 50 linear feet of run							
Tubing	$\Delta T(^{\circ} F)$	60	80	100	120	140	160	180	200
	Tube nom.								
Viega PureFlow PEX	¾"	20.4	23.6	26.4	28.9	31.2	33.4	35.4	37.3
	1"	23.2	26.7	29.9	32.8	35.4	37.8	40.1	42.3
	1¼"	25.6	29.6	33.1	36.2	39.1	41.8	44.4	46.8
	1½"	27.8	32.1	35.9	39.4	42.5	45.5	48.2	50.8
	2"	31.8	36.8	41.1	45.0	48.6	52.0	55.1	58.1

8.8.4 Z-Type Expansion Offset



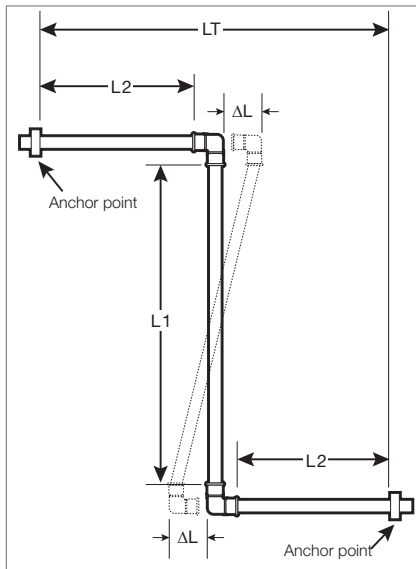
Z-Type Expansion Example

The Z-type expansion offset integrates two 90° elbows that form a “Z” pattern.

With this type of configuration ½ of the “L” dimension is applied to the center area of the “Z” (represented as L1 in the table and illustration) while ¼ of the “L” dimension would be applied to each of the top and bottom areas (represented as L2).

Calculate the necessary L1 and L2 dimensions or use the chart below, which was figured using the maximum run for a single expansion compensator (50 feet).

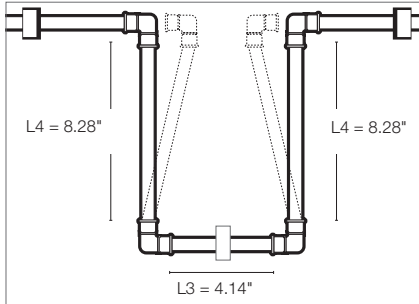
- L = 20.7"
- L1 = ½ (L)
- L1 = 20.7"/2 = 10.35"
- L1 = 10.35"
- L2 = ¼ (L)
- L2 = 20.7"/4 = 5.18"
- L2 = 5.18"



Z-Type Offset

		Z-Type Expansion Offset (inch) per 50 linear feet of run															
Tubing	ΔT(° F) Tube nom.	60		80		100		120		140		160		180		200	
		L1	L2	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2		
Viega PureFlow PEX	¾"	10.2	5.1	11.8	5.9	13.2	6.6	14.4	7.2	15.6	7.8	16.7	8.3	17.7	8.8	18.6	9.3
	1"	11.6	5.8	13.4	6.7	15.0	7.5	16.4	8.2	17.7	8.8	18.9	9.5	20.1	10.0	21.1	10.6
	1¼"	12.8	6.4	14.8	7.4	16.5	8.3	18.1	9.1	19.6	9.8	20.9	10.5	22.2	11.1	23.4	11.7
	1½"	13.9	7.0	16.1	8.0	18.0	9.0	19.7	9.8	21.3	10.6	22.7	11.4	24.1	12.1	25.4	12.7
	2"	15.9	8.0	18.4	9.2	20.5	10.3	22.5	11.3	24.3	12.2	26.0	13.0	27.6	13.8	29.1	14.5

8.8.5 U-Type Expansion Offset



U-Type Expansion

The U-type expansion loop integrates four 90° elbows that form a “U” pattern.

With this arrangement $\frac{1}{5}$ of the “L” dimension is applied as the width (represented as L3) while $\frac{2}{5}$ of “L” is applied as each leg in the other dimension (represented as L4).

Calculate the necessary L3 and L4 dimensions or use the chart below, which was figured using the maximum run for a single expansion compensator (50 feet).

$$L = 20.7''$$

$$L3 = \frac{1}{5} (L)$$

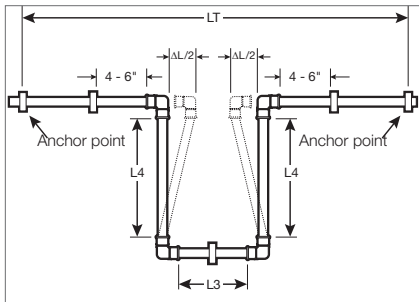
$$L3 = 20.7''/5 = 4.14''$$

$$L3 = 4.14''$$

$$L4 = \frac{2}{5} (L)$$

$$L4 = 2(20.7'')/5 = 8.28''$$

$$L4 = 8.28''$$



U-Type Looped Offset

		U-Type Expansion Offset (inch) per 50 linear feet of run																
Tubing	Tube nom.	$\Delta T (^{\circ} F)$	60		80		100		120		140		160		180		200	
		L3	L4	L3	L4	L3	L4	L3	L4	L3	L4	L3	L4	L3	L4	L3	L4	
Viega PureFlow PEX	$\frac{3}{4}''$		4.1	8.2	4.7	9.4	5.3	10.5	5.8	11.6	6.2	12.5	6.7	13.3	7.0	14.2	7.5	14.9
	1"		4.6	9.3	5.3	10.7	6.0	12.0	6.6	13.1	7.1	14.2	7.6	15.1	8.0	16.0	8.5	16.9
	1 $\frac{1}{4}''$		5.1	10.2	5.9	11.8	6.6	13.2	7.2	14.5	7.8	15.6	8.4	16.7	8.9	17.7	9.4	18.7
	1 $\frac{1}{2}''$		5.6	11.1	6.4	12.9	7.2	14.4	7.9	15.7	8.5	17.0	9.1	18.2	9.6	19.3	10.2	20.3
	2"		6.4	12.7	7.4	14.7	8.2	16.4	9.0	18.0	9.7	19.5	10.4	20.8	11.0	22.1	11.6	23.2

The fastener shown on the L3 leg may be required to provide additional support depending on how the expansion loop is installed (horizontal/vertical).

9 Viega Fire Sprinkler Brackets

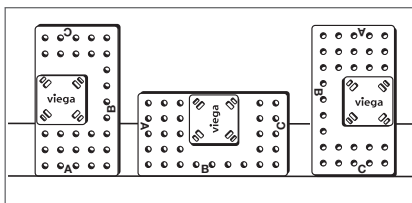
Viega's plastic fire sprinkler brackets incorporate mounting reference designators to assist in their proper installation for each pendent type. These designators (A, B, or C) should be oriented per the mounting details outlined in section "10 Mounting Sprinkler Fittings" on page 56. While this bracket has not been evaluated by UL, nor is it covered by Viega's listing, it is an acceptable method for mounting Viega's fire sprinkler adapters in NFPA 13D systems.

9.1 PureFlow Press Fire Sprinkler Adapter

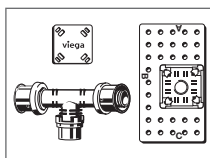


CAUTION!

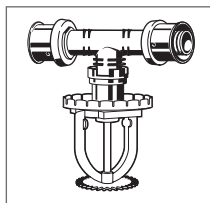
Do not remove factory packaging until ready to install fittings



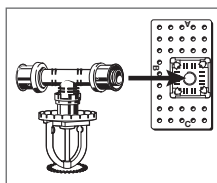
- Select the desired mounting orientation for the Fire Sprinkler Bracket based on the construction type present.



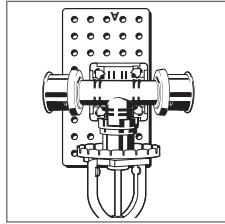
- Remove the bracket cover and any plastic wrapping from the fire sprinkler adapter.



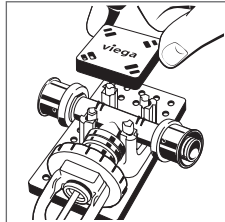
- Attach fire sprinkler head to fire sprinkler adapter according to manufacturer's instructions.



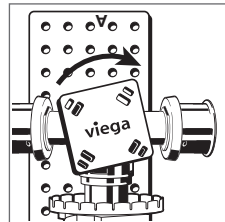
- Place the fire sprinkler adapter into the bracket as shown.



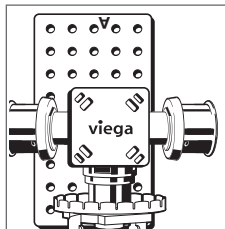
- Ensure the fire sprinkler adapter is fully inserted into the bracket before installing the bracket cover.



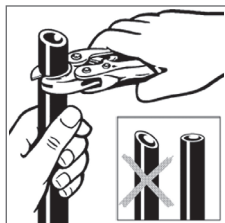
- Place the bracket cover onto the locking lugs.



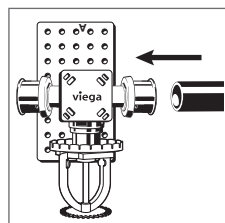
- Turn the cover clock wise $\frac{1}{8}$ th of a turn until it snaps into place.



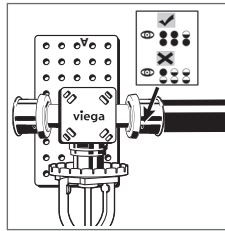
- Verify the cover sets flush with the installed fire sprinkler adapter and is square with the bracket.



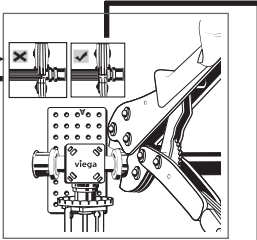
- Square off tubing to proper length. Uneven, jagged, or irregular cuts will produce unsatisfactory connections.



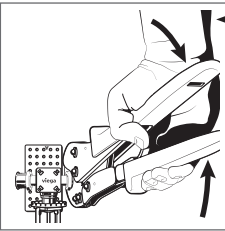
- Insert Pureflow Press fitting with attached sleeve into tubing and engage fully.



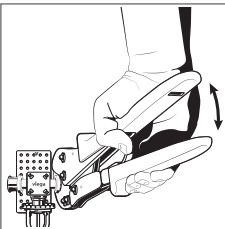
- Ensure full tubing insertion at view holes in attached press sleeve. Full insertion means tubing must be completely visible in at least two view holes and partially visible in the one.



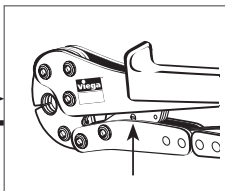
- Position press tool perpendicular over press sleeve and close tool jaws to engage ratchet.



- Close handles, using trigger to reduce grip span if desired.



- Extend handle and continue ratcheting until automatic tool release occurs at proper compression force.



- Turn screw for emergency release.



WARNING!

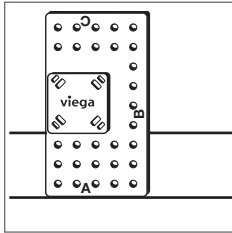
The connection is not leakproof when the tool has been opened by emergency release.

9.2 Fire Sprinkler Bracket with Straight Adapter

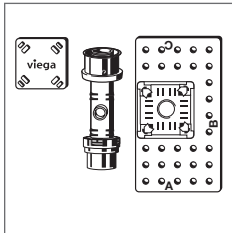


CAUTION!

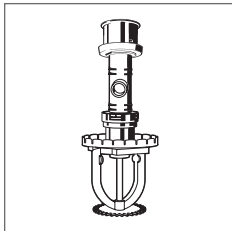
Do not remove factory packaging until ready to install fittings



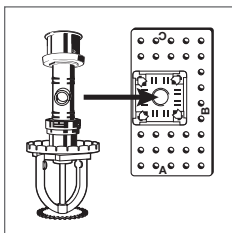
- Select the desired mounting orientation for the fire sprinkler bracket based on the construction type present.



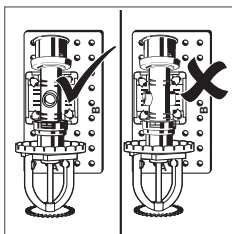
- Remove the bracket cover and any plastic wrapping from the fire sprinkler adapter.



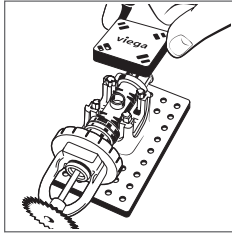
- Attach sprinkler head according to manufacturer's instructions.



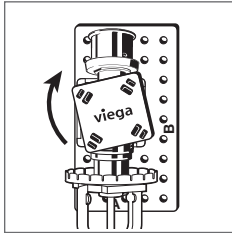
- Place the fire sprinkler straight adapter into the bracket as shown.



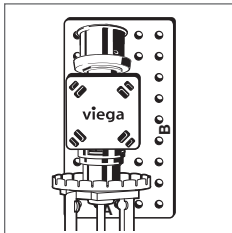
- Ensure that the anchoring studs on the straight adapter are inserted properly before installing the bracket cover.



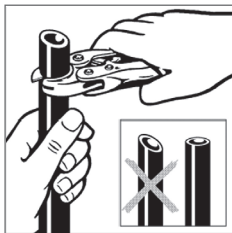
- Place the bracket cover onto the locking lugs.



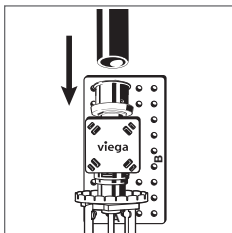
- Turn the cover clock wise $\frac{1}{8}$ th of a turn until it snaps into place.



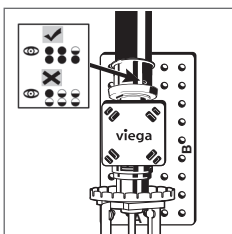
- Verify the cover sets flush with the installed fire sprinkler adapter and is square with the bracket.



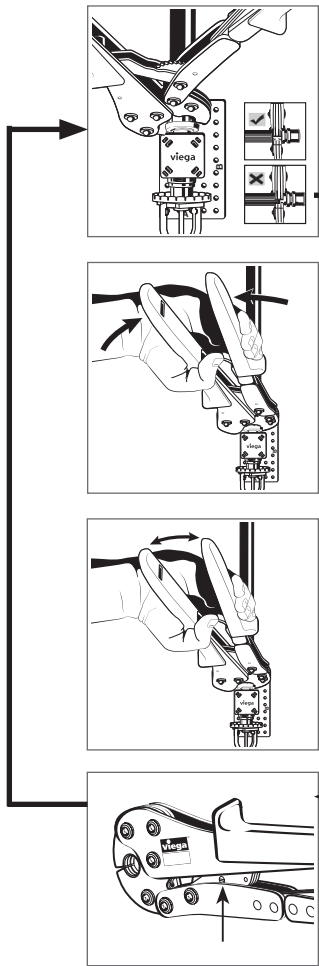
- Square off tubing to proper length. Uneven, jagged, or irregular cuts will produce unsatisfactory connections.




- Insert Pureflow Press fitting with attached sleeve into tubing and engage fully.



- Ensure full tubing insertion at view holes in attached press sleeve. Full insertion means tubing must be completely visible in at least two view holes and partially visible in the one.



- Position press tool perpendicular over press sleeve and close tool jaws to engage ratchet.
- Close handles, using trigger to reduce grip span if desired.
- Extend handle and continue ratcheting until automatic tool release occurs at proper compression force.
- Turn screw for emergency release.

 **WARNING!**
The connection is not leakproof when the tool has been opened by emergency release.

10 Mounting Sprinkler Fittings

Sprinkler heads must be connected to Viega Fire Sprinkler fittings that have mounting flanges for attachment. These fittings must be fastened as described below to prevent movement of the sprinkler head upon system activation. Viega recommends fastening sprinkler heads to Viega fire sprinkler fittings prior to mounting in order to ensure that the sprinkler heads have been properly tightened perpendicular to the fitting.

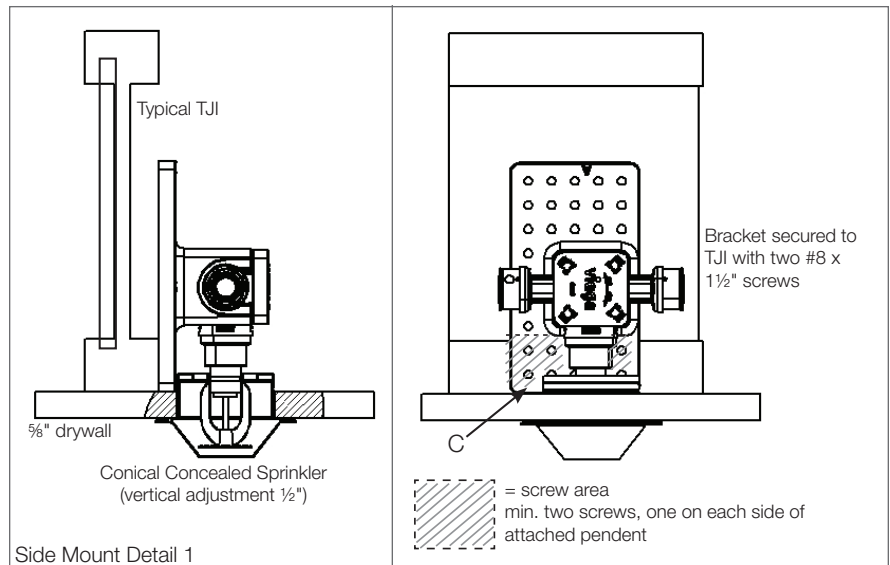
Viega fire sprinkler fittings must be affixed to solid supports using #8 x 1½" or longer flat-head wood or hex head screws. Installing fittings with the plastic bracket requires a minimum of two screws, one on each side of the attached pendent. Any fitting incorporating an integral mounting bracket must use a minimum of 3 screws.

The mounting details shown are typical TJI installations but also apply for other construction methods.

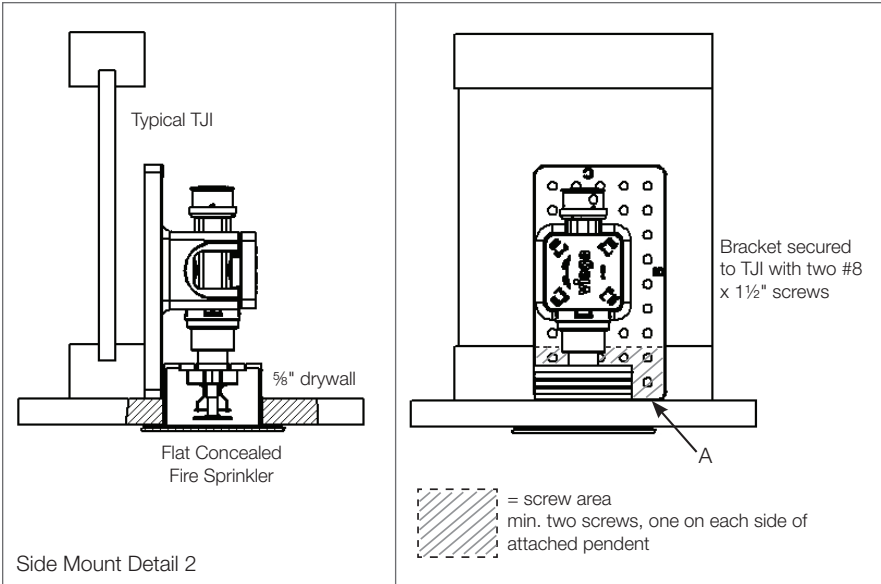
Each standard fitting (without mounting flange) must have approved fasteners placed on the tubing on all connections directly adjacent to the fitting. Affix the fasteners to the tubing, not over the fitting or press sleeves.

In addition, the Viega sprinkler fittings are specially designed to affix the sprinkler head in place so that during activation, the reaction forces caused by the flow of water through the sprinkler head will not displace the sprinkler head.

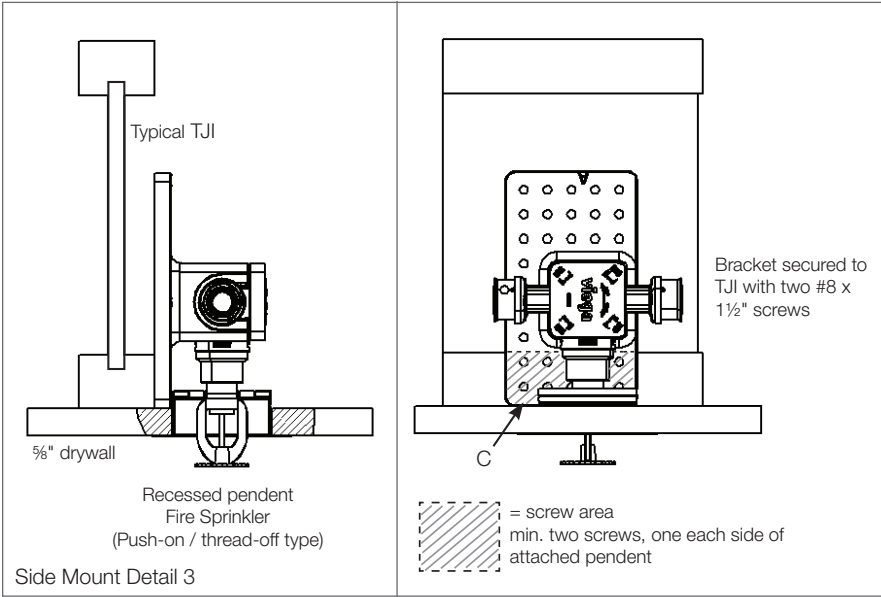
10.1 Plastic Brackets



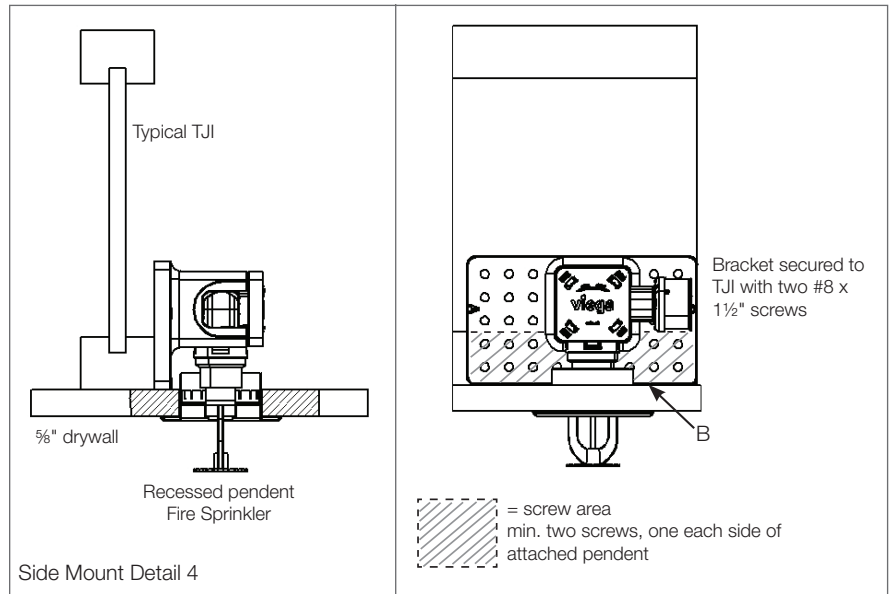
Place side "C" of the plastic bracket flush with the bottom edge of the TJI to ensure proper mounting depth for conical concealed pendants.



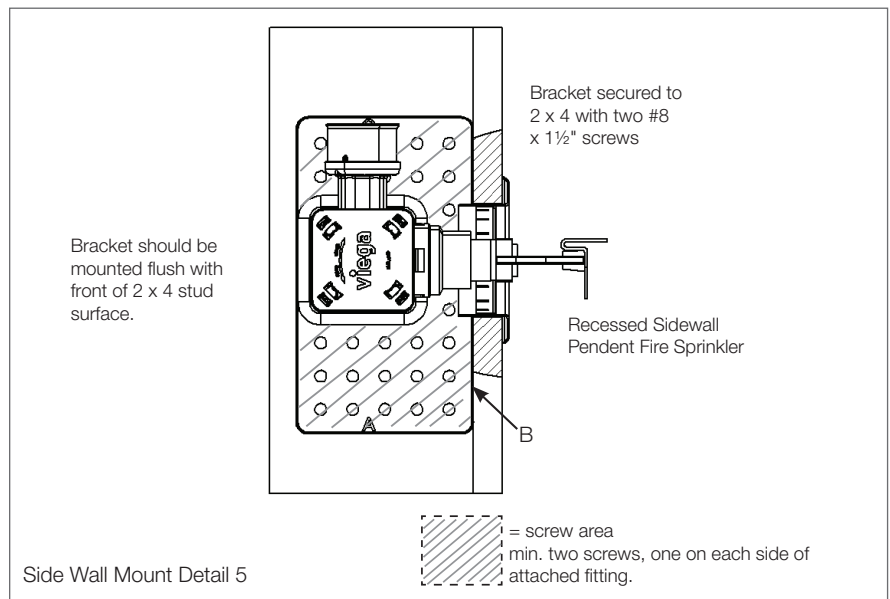
Place side "A" of the plastic bracket flush with the bottom edge of the TJI to ensure proper mounting depth for flat concealed pendants.



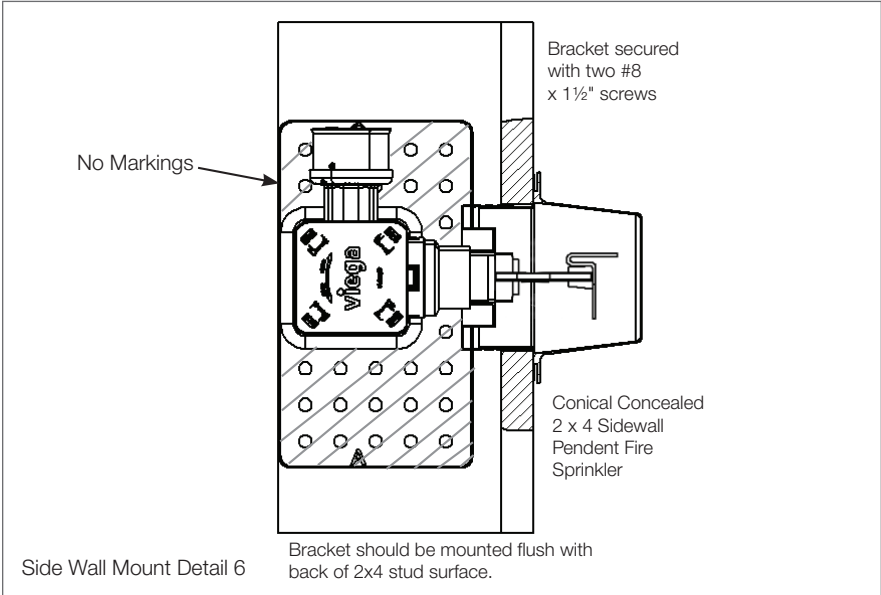
Place side "C" of the plastic bracket flush with the bottom of the TJI to ensure proper mounting depth for recessed pendant installations.



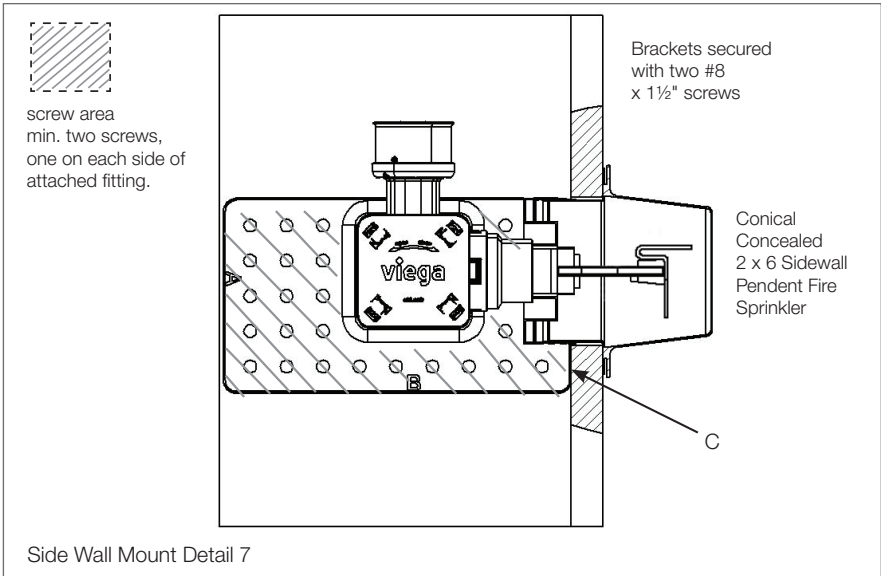
Place side "B" of the plastic bracket flush with the bottom of the TJI to ensure proper mounting depth for recessed pendent installations.



Place side "B" of the plastic bracket flush with the facing edge of the stud to ensure proper mounting depth for recessed sidewall pendants.

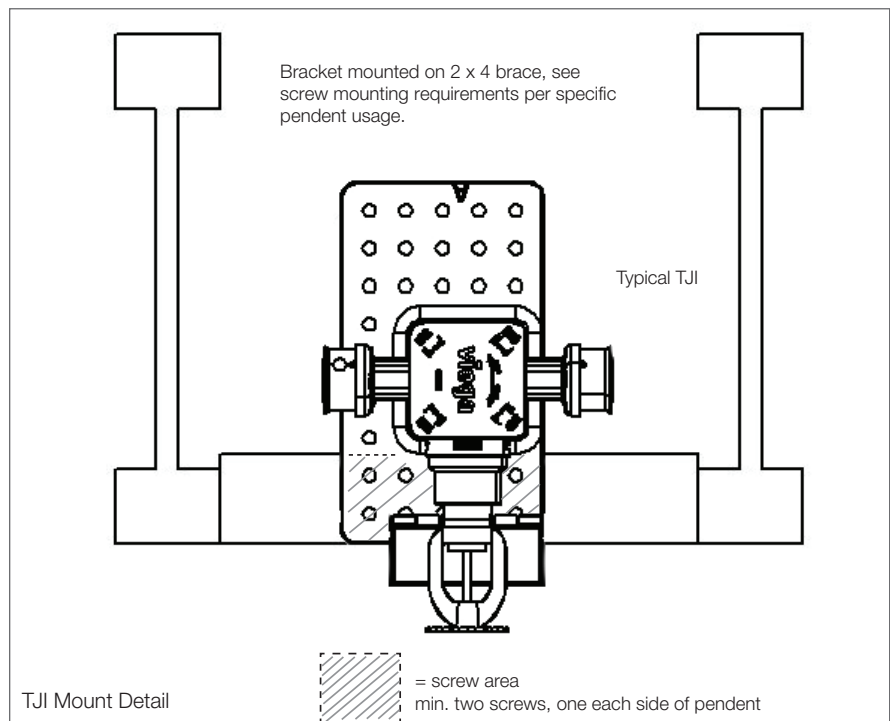
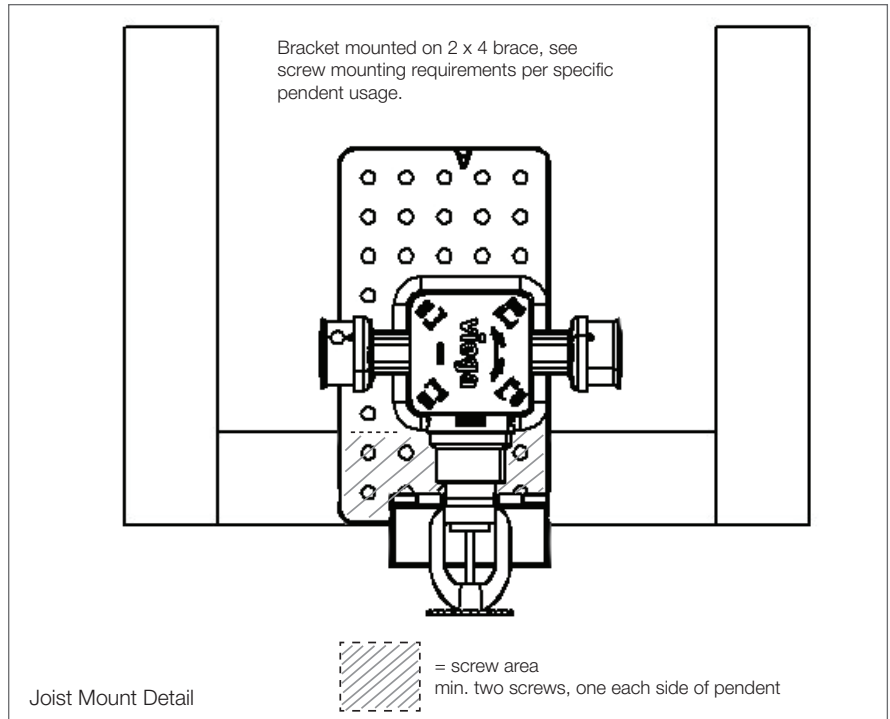


Place side of bracket with no reference marks flush with the back edge of the stud to ensure proper mounting depths for conical concealed sidewall pendants.

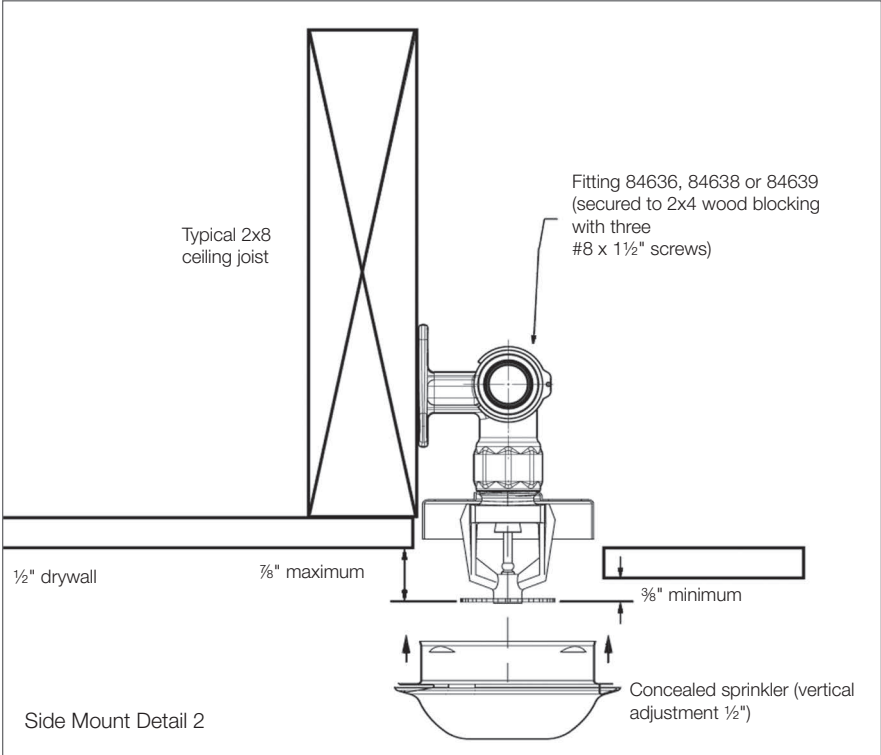
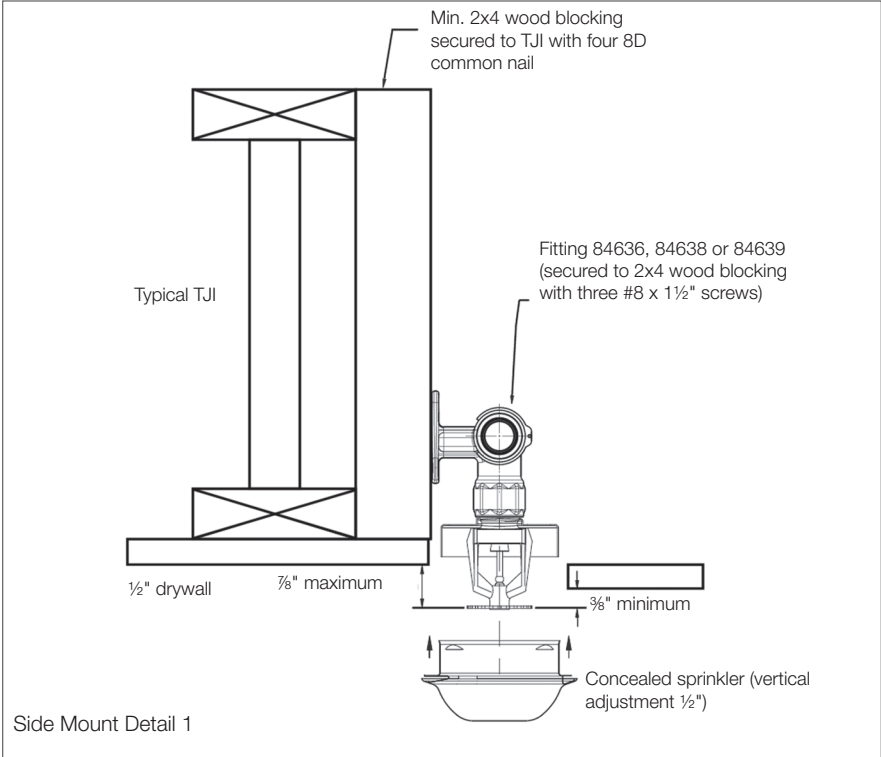


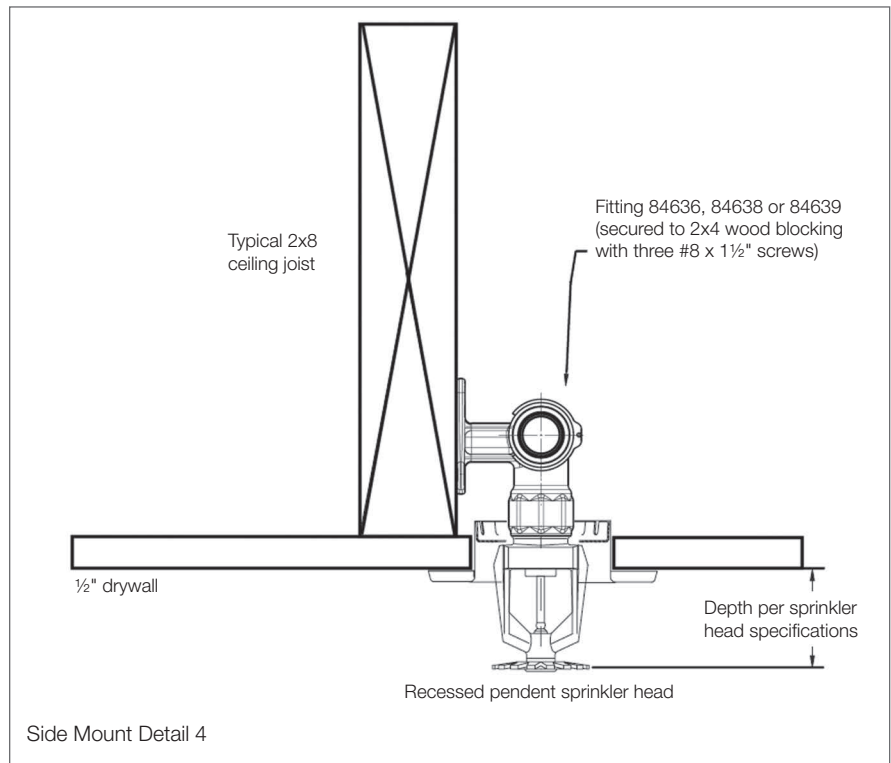
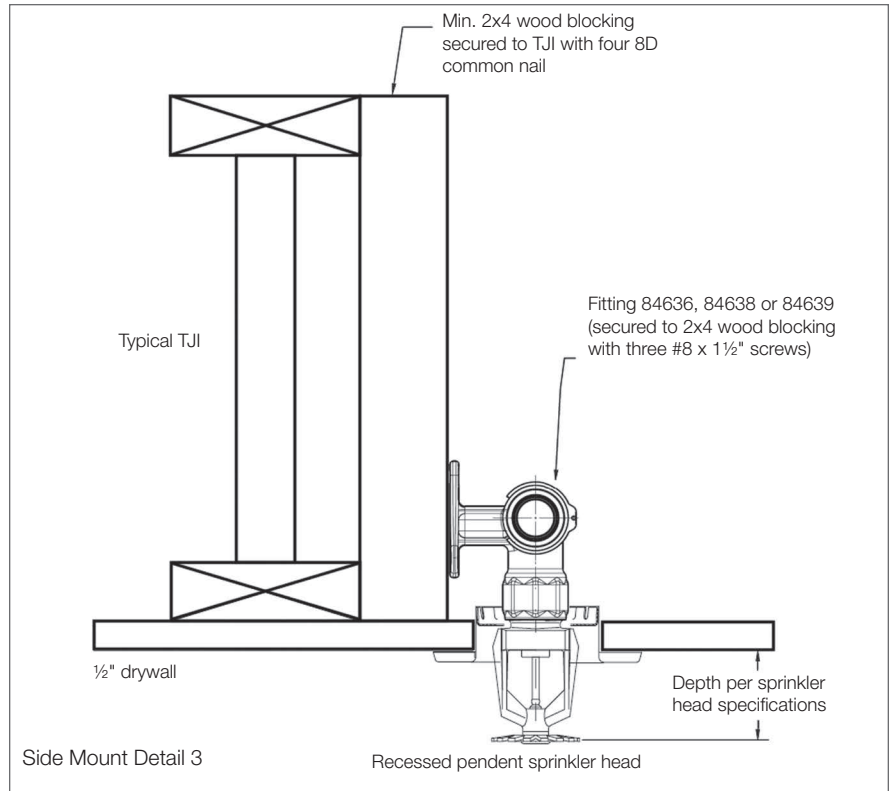
Place side "C" of the plastic bracket flush with the front edge of the stud to ensure proper mounting depth of conical concealed sidewall pendants.

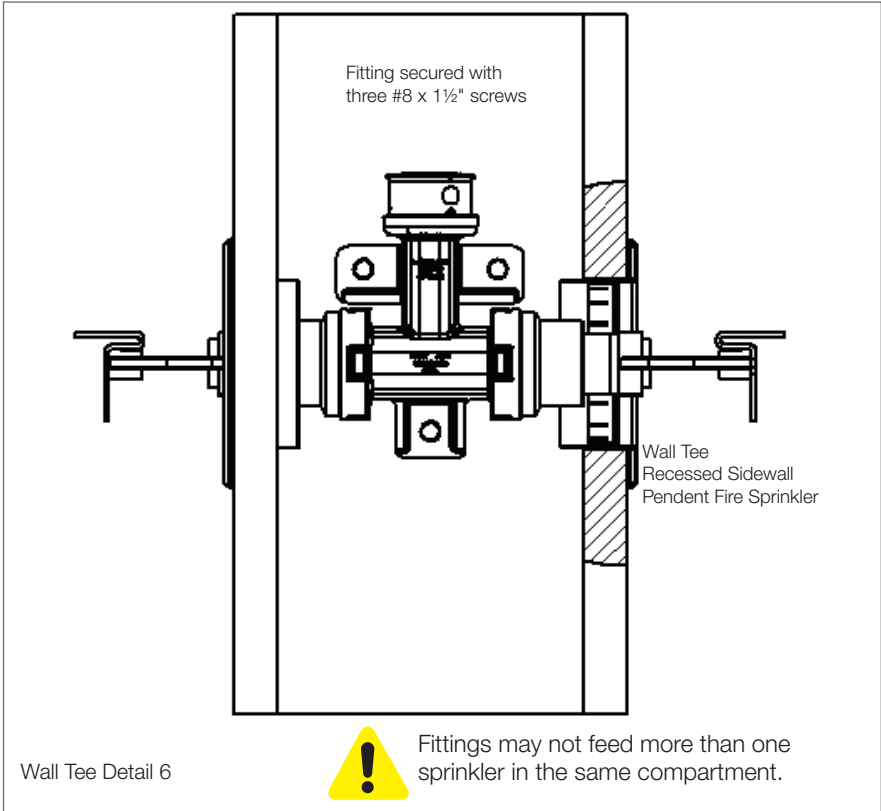
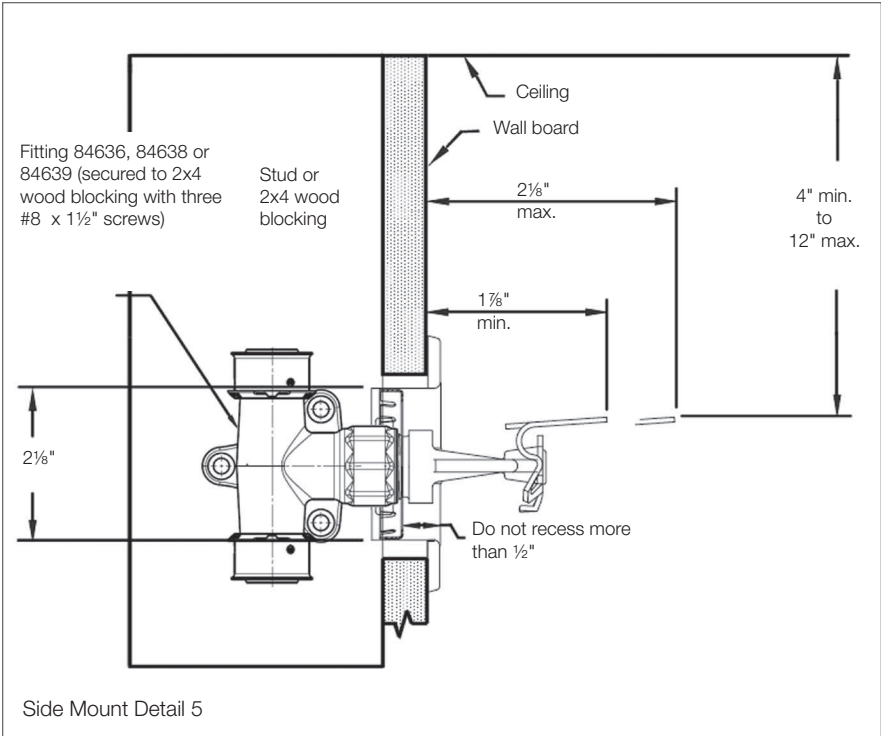
Occasionally sprinkler designs may require pendants to be located between support structures (TJI/Joist). For these instances, a cross brace shall be used. Below are examples of how these braces can be mounted. Keep in mind the fire sprinkler needs to be mounted in the predetermined orientation noted in the earlier details dictated by the type of pendant that is being used.



10.2 Fittings with Integral Mounting Bracket







Place wall tee centered on stud to ensure proper mounting depth for recessed side wall pendants.

11 System Management

11.1 Pressure Testing

Upon completion of the fire sprinkler system, a pressure test is required. Refer to model, local, and NFPA 13D requirements for additional information.

11.1.1 Leak Detection

Viega has identified the leak detect solutions listed below as being compatible for use with Viega Pureflow Press system components. Consult leak detect manufacturer for proper application and product instructions. To determine the compatibility of other leak detect solutions not listed below, contact Viega Technical Services prior to their use.

- megabubble® Leak Detector
- Oatey® All Purpose Leak Detector
- Snoop Liquid Leak Detector

As an alternative leak detect solution, a mixture of original Palmolive Green™ dishwashing soap (#46100-46200) or Palmolive Ultra™ (#356140 or 46128) mixed with potable water at a ratio of 2 ounces of soap to 1 gallon of water (mix Ultra at a ratio of 1.5 ounces per gallon) may be used.

11.2 Flow Testing

After a successful completion of the pressure test, a flow test is required. Refer to the AHJ for additional information. This test ensures that the most hydraulically remote sprinkler head operates as intended in the design. The AHJ must be notified of the test and is typically required to witness all tests.

11.3 System Flushing

Viega recommends flushing the piping system with water prior to head installation. This should eliminate debris left behind in the pipe during installation.

11.4 Visual Inspection

All Viega PureFlow Systems must be visibly inspected prior to being concealed behind the walls. If any damage is visible, or there is a suspicion of damage, the section of pipe and fittings will need to be replaced.

11.5 System Maintenance

It is the responsibility of the property owner to adequately maintain and understand the operation of the fire sprinkler system as a life safety system. NFPA 13D recommends a monthly inspection with the following actions:

- Complete visual inspection
- Smoke alarm testing
- Inspect sprinkler head integrity
- Check system pressure
- Ensure main shut-off valve position is “open”
- Water supply flow verification
- If booster pumps are present, visible inspection is required

12 Limited Warranty

12.1 Limited Warranty for Viega PureFlow Fire Sprinkler for Residential System

Subject to the conditions and limitations in this Limited Warranty, VIEGA LLC (Viega) warrants to owners of real property in the United States (including its territories) and Canada that the components in its PEX Residential Fire Sprinkler System (as described below) when properly installed in residential fire sprinkler applications by installers trained through industry recognized or approved programs, under normal conditions of use, shall be free from failure caused by manufacturing defects for a period of twenty-five (25) years from date of installation.

Viega Pureflow Fire Sprinkler components (products) covered by this twenty-five (25) year warranty are:

Viega Pureflow PEX cross-linked polyethylene (PEX) tubing and Viega Pureflow Press fittings listed for use in NFPA 13D residential fire sprinkler applications by Underwriters Laboratory (UL) or an equivalent third party certification agency

Hangers and clips sold by Viega for required use with the above tubing and fittings to comply with the UL listing for Viega Residential Fire Sprinkler systems

Power tools and jaws used with Pureflow Press fittings are warranted by the manufacturer and Viega extends no separate warranty on those tools or jaws. Viega warrants that Pureflow Press hand tools sold by Viega, under normal conditions of use, shall be free from failure caused by manufacturing defects for a period of two (2) years from date of sale.

Viega does not extend any warranty on its components used in systems with tubing, fittings, manifolds, or press sleeves not sold by Viega or installed in residential fire sprinkler applications by installers trained through industry recognized or approved programs.

Under this limited warranty, right to reimbursement is available only if the failure or leak resulted from a manufacturing defect in the products covered by this warranty and the failure or leak occurred during the warranty period. Remedy or right of reimbursement under this warranty and the warranty does not apply if the failure or resulting damage is caused by (1) components in the fire sprinkler system other than those manufactured or sold by Viega (for example, sprinkler heads); (2) not designing, installing, inspecting or testing the system in accordance with applicable code requirements, Viega's installation instructions at the time of the installation, and accepted industry installation practices (for example, NFPA 13D); (3) improper handling and protection of the product prior to and during installation, exposure to ultraviolet light, inadequate

freeze protection, exposure to water pressures or temperatures in excess of the limitations on the tubing or application of unauthorized or harmful solvents or chemicals; (4) chemical corrosive or aggressive water conditions; or (5) acts of nature such as earthquakes, fire, flood or lightning.

In the event of a leak or other failure in the system, it is the responsibility of the property owner to obtain and pay for repairs. Only if the warranty applies will Viega be responsible for reimbursement under this warranty. The part or parts which you claim failed should be kept and Viega contacted at the address below* or by telephoning 800-976-9819 within thirty (30) days after the leak or other failure and identifying yourself as having a warranty claim. You should be prepared to ship, at your expense, the product which you claim failed due to a manufacturing defect, document the date of installation, and the amount of any claimed bills for which you claim reimbursement. Within a reasonable time after receiving the product, Viega will investigate the reasons for the failure, which includes the right to inspect the product at Viega and reasonable access to the site of damage in order to determine whether the warranty applies. Viega will notify you in writing of the results of this review.

In the event that Viega determines that the failure or leak and any resulting damages were the result of a manufacturing defect in the products covered by 10-year or 25-year limited warranties and occurred during the first ten (10) years covered by this warranty, Viega will reimburse the property owner for reasonable repair or replacement charges to include drywall, flooring and painting costs as well as damages to personal property resulting from the failure or leak. The remaining 15 year limited warranty for products covered by the 25-year limited warranty will cover material cost for pipe and fittings only, sold by Viega, not inclusive of any labor or installation cost. Any change in property ownership after the first ten years will nullify any remaining warranty coverage.

THE ABOVE LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF FOUND APPLICABLE, ANY IMPLIED WARRANTIES ARE LIMITED TO THE DURATION OF THE TIME LIMITS SET OUT IN THIS WRITTEN WARRANTY. Other than this limited warranty, Viega does not authorize any person or firm to create for it any other obligation or liability in connection with its products. This written warranty applies for the first 10 years of the applicable warranty regardless of any change of ownership in the property.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on the duration of implied warranties in certain types of transactions, so the above exclusion or limitations may not apply to you. This limited warranty gives you specific legal rights and you also may have other rights which vary from state to state. This warranty shall be interpreted and applied under the law of the state in which the product is installed.

> Viega LLC
585 Interlocken Blvd.
Broomfield, CO 80021

Phone (800) 976-9819
www.viega.us

IM-PF 724572 1021 Fire Sprinkler System (EN)

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