Pocket Guide Viega ProPress® Systems



Viega.

Connected in quality.

Building on Tradition

Founded 120 years ago, Viega is a privately owned, international group of companies. In the United States, Canada, Mexico, and Latin America, Viega specializes in plumbing, heating, and pipe joining technologies. The values of Viega's founder, Franz-Anselm Viegener, are just as present today as they were when he started the company in 1899. Courage, passion, and innovative spirit are still the basics of Viega's foundation.



ProPress 21/2" to 4" formerly ProPress XL-C®.

At Viega, safety is priority.

Safe, certain, and secure, Viega fittings are designed for peace of mind.





- In all ProPress ½" to 2" fittings, Viega's unique Smart Connect[®] technology helps installers ensure that they have pressed all connections.
- 2. The EPDM sealing element is suitable for many applications.
- Viega's distinctive hexagonal pressing pattern bonds the fitting and tube and provides the mechanical strength for the connection.
- Cylindrical guides help installers ensure proper insertion of the tube and protect the sealing element.
- In ProPress 2½" to 4" fittings, the 420 stainless steel grip ring's teeth bite into the tube and lock the fitting securely in place.
- A PBT (Polybutylene Terephthalate) separator ring protects the sealing element from damage by creating a physical separation during installation and later during pressing.
- The EPDM sealing element ensures water-tight or air-tight connections.

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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.**



DANGER!

Introduction

Read and understand all instructions for installing Viega ProPress fittings. Failure to follow all instructions may result in extensive property damage, serious injury, or death.

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Viega ProPress Systems

Viega ProPress systems are state-ofthe-art press fitting systems that provide economical and reliable installations for the commercial, industrial, and residential markets.

Viega ProPress are copper and Zero Lead bronze fittings and valves in copper tube size (CTS) ranging from 1/2" to 4". The fittings require no soldering or brazing and are installed with electro-hydraulic press tools (battery-powered or corded press tools).

The fittings feature a green dot representing Smart Connect technology with an EPDM sealing element suitable for many applications. Viega's unique Smart Connect technology helps

Smart Connect Technology – Security Under Pressure

Locating unpressed connections is an important step in the pressure testing process. Viega ProPress includes Smart Connect technology, providing guick and easy identification of unpressed connections during a pressure test.

Smart Connect technology is an integral part of the design of the fitting, providing a path for liquids and/or gases from inside the system past the sealing element of an unpressed connection. When pressed according to our Product Instructions, the fluid path is altered, creating a leak-proof, reliable connection.





Identify an unpressed connection during pressure testing when air fitting, making or water flows past the sealing leak-proof element.

identification. use the press a secure connection.

Upon

Viega **O** ProPress connections are tool to press the fast, flameless, and reliable.

installers ensure that they have pressed all connections.

Viega ProPress systems can help reduce installation time up to 60 percent compared to traditional methods of pipe joining. Soldering and brazing copper can be messy and time consuming, and connections are not always reliable. With Viega press technology, installers can make consistent, secure press connections in less than seven seconds without flame or heavy equipment.

For applications ranging from potable water to inert gases, Viega ProPress fittings can be customized for a wide variety of applications in industrial, commercial, or residential projects.

Unpressed connections are located by pressurizing the system with air or water. When testing with water the proper pressure range is 15 to 85 psi. Pressure testing with air can be dangerous at high pressures. When testing with compressed air the proper pressure range is 1/2 to 45 psi. Following a successful Smart Connect test, the system may be pressure tested up to 600 psi maximum for water and 200 psi maximum for air if required by local code requirements.

Testing for unpressed connections using Smart Connect is not a replacement for pressure testing requirements of local codes and standards.



Introduction



Cylindrical Guides



All Viega ProPress fittings are designed with cylindrical guides to keep the tube straight and protect the sealing element during assembly.



Fittings that do not have cylindrical guides risk making an unsecure connection and leave the sealing element vulnerable to damage prior to pressing.



Fittings are radially pressed around the sealing element in a single step.



Viega ProPress Fitting Systems

Viega ProPress may only be pressed onto copper tube in accordance with ASTM B88 or B75. When pressing onto B88 copper tube types, K, L, and M may be used. Tempers O60 and O50, known as "soft copper", are limited to nominal sizes ½" to 1¼". Temper H58, known as "hard copper", may be used with nominal sizes ½" to 4".

When pressing onto B75 copper tube, additional considerations apply. See Viega ProPress Copper Tube Compatibility Tech Data, page 7.

Viega ProPress fittings are available in elbows, couplings, reducers, tees, reducing tees, threaded adapters, unions, caps, and flanges.

Components

- Alloy: Copper alloy UNS C12200, Zero Lead silicon bronze alloy -C87710 (cast) or C8770 (machined)
- EPDM sealing element
- 420 stainless steel grip ring for 2½" to 4" fittings
- PBT separator ring for 2½" to 4" fittings

Operating Parameters

- Operating Pressure: 300 psi maximum
- Test Pressure: 600 psi maximum
- Operating Temperature: 0°F to 250°F

Listings and Certificates

NSF/ANSI 61
NSF/ANSI 372
IAPMO PS-117
UL/ANSI 213
FM Class 1920
ICC-ES LC1002
ABS

- CSA Low Lead Content
- ASME B16.51, B31.1, B31.3, B31.9
- NFPA 13, 13D, 13R

Compliant with:

- ASME B31
- ASTM B75
- ASTM B88
- IAPMO National Standard Plumbing Code (NSPC)
- IAPMO Uniform Mechanical Code (UMC)
- IAPMO Uniform Plumbing Code (UPC)
- ICC International Mechanical Code (IMC)
- ICC International Plumbing Code (IPC)
- ICC International Residential Code (IRC)
- NFPA 13, 13D, and 13R

Approved Applications:

- Hot and cold potable water
- Rainwater/gray water
- Fire sprinkler (175 psi maximum)
- Chilled water
- Hydronic heating (with glycol)
- Low pressure steam (15 psi maximum) with FKM sealing element swap
- Residential steam (5 psi maximum)
- Ethanol
- Compressed air
- Non-medical gases
- Vacuum (29.2" Hg maximum @ 68°F)

ProPress fittings are approved for installations in both above- and belowground applications. Per code, local inspector approval must be obtained prior to installation below ground.

Smart Connect Technology

ProPress fittings are manufactured with Viega's unique Smart Connect technology. Designed into the fitting itself, Viega Smart Connect technology allows identification of an unpressed fitting during pressure testing.



The use of the system for applications other than those listed or outside of these parameters must be approved by the Viega Technical Services Department.



Viega ProPress Copper Tube Compatibility



Description Viega ProPress may only be pressed onto copper tube in accordance with ASTM B88 or B75.

When pressing onto B88 copper tube, types K, L, and M may be used. Tempers O60 and O50, known as soft copper, are limited to nominal sizes ½" to 1¼". Temper H58, known as hard copper, may be used with nominal sizes ½" to 4". When pressing onto B75 copper tube, the tube dimensions must be in accordance with the tables below. Only tempers H58, O60, and O50 may be used with ProPress.

> It is the responsibility of the system designer to understand all applicable codes and standards.

B75 tubing may not conform to code compliance in all areas or under all Viega listings. These standards may include but are not limited to ASME B16.51.

B75 O60 Soft Anneal and O50 Light Anneal							
Nominal (in)	OD (in)	TOL _{op} (in)	Wall Max (in)	Wall Min (in)			
1/2	0.625	0.0025	0.054	0.025			
3⁄4	0.875	0.0030	0.071	0.029			
1	1.125	0.0035	0.071	0.031			
11/4	1.375	0.0040	0.071	0.038			

B75 Annealed Tube Dimensions Compatible with ProPress

B75 Drawn Tube Dimensions Compatible with ProPress

B75 H58 Drawn (General)							
Nominal (in)	OD (in)	TOL _{od} (in)	Wall Max (in)	Wall Min (in)			
1/2	0.625	0.0010	0.054	0.025			
3/4	0.875	0.0010	0.071	0.029			
1	1.125	0.0015	0.071	0.031			
11⁄4	1.375	0.0015	0.071	0.038			
11/2	1.625	0.0020	0.079	0.044			
2	2.125	0.0020	0.091	0.052			
21/2	2.625	0.0020	0.105	0.059			
3	3.125	0.0020	0.120	0.065			
4	4.125	0.0020	0.147	0.085			



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.



Viega ProPress 1/2" to 2" Fittings

For Hard Copper Tubing in 1/2" to 2" and Soft Copper Tubing in 1/2" to 11/4"



- Cut the tube square using a displacement-type cutter or fine-toothed steel saw. Note: Cut tubing a minimum of four inches away from the contact area of the vise to prevent possible damage to the tubing in the press area.
- 2 Deburr inside and outside of the tube to the proper insertion depths to prevent cutting of the sealing element.
- **3** Check the sealing element for correct fit. Do not use oils or lubricants.

For applications requiring Viega ProPress with FKM or HNBR sealing elements, remove the factory-installed EPDM sealing element and replace with an FKM or HNBR sealing element. See <u>Changing Sealing Elements</u> <u>Product Instructions</u>, page 10.

4 Mark the proper insertion depth on the outside of the tube (see table below). Improper insertion depth may result in improper seal.

Minimum Insertion Depth for ProPress							
Tube Size	1⁄2"	3⁄4 "	1"	1¼"	1½"	2"	
Insertion Depth	3⁄4 "	7⁄8"	7⁄8"	1"	17⁄16"	1 %16"	

Copper tubing must be free of surface imperfections, including metal stamped print lines, before a ProPress fitting is installed.

- While turning slightly, slide press fitting onto the tube to the marked insertion depth.
 End of tubing must contact stop.
- 6 Insert appropriate Viega ProPress jaw into the press tool and push in, holding pin until it locks in place.
- 7 Open the jaw and place at right angle on the fitting. Visually check insertion depth using mark on tubing.

WARNING!

Keep extremities and foreign objects away from press tool during pressing operation to prevent injury or incomplete press.

- 8 Hold trigger on press tool until press jaws have fully engaged the fitting. Jaws will automatically release after a full press is made.
- After pressing, open the jaw and remove the press tool.
- Pressure testing with Smart Connect: Unpressed connections are located by pressurizing the system with air or water. When testing with water, the proper pressure range is 15 psi to 85 psi. When testing with compressed air, the proper pressure range is ½ psi to 45 psi maximum. If testing with compressed air, use an approved leakdetect solution. Following a successful pressure test, the system may be pressure tested up to 200 psi with air or up to 600 psi with water.

Viega ProPress 21/2" to 4" Fittings

For Hard Copper Tubing in 21/2" to 4"







- 1 Cut tubing at right angles using displacementtype cutter or fine-toothed steel saw.
- 2 Keep end of tubing a minimum of 4" away from the contact area of the vise to prevent possible damage to the tubing in the press area.
- **3** Remove burr from inside and outside of tubing to prevent cutting sealing element.
- 4 Check seal and grip ring for correct fit. Ensure sealing element is free of cuts and damage. Do not use oils or lubricants.

For applications requiring Viega ProPress with FKM or HNBR sealing elements, remove the factory-installed EPDM sealing element and replace with an FKM or HNBR sealing element. See *Changing Sealing Elements*. *Product Instructions*, page 10.

- 5 Illustration demonstrates proper fit of grip ring, separation ring, and sealing element.
- 6 Mark proper insertion depth as indicated by the ProPress 2½" to 4" Insertion Depth Chart.

ProPress 21/2" to 4" Insertion Depth							
Tube Size 21/2" 3" 4"							
Insertion Depth	1 ¹¹ /16"	1 ¹⁵ /16"	2%"				

- While turning slightly, slide press fitting onto the tube to the marked insertion depth.
 End of tubing must contact stop.
- 8 Insert appropriate Viega ProPress jaw into the press tool and push in, holding pin until it locks in place. ProPress 2½" to 4" fitting connections must be performed with ProPress XL-C rings and V2 actuator.

CAUTION!



Use only rings that are compatible with ProPress $2\frac{1}{2}$ " to 4" fittings.

- 9 Open the XL-C ring and place at right angles on the fitting. Ensure that the XL-C ring is engaged on the fitting bead.
- 10 Open the V2 actuator and connect the V2 actuator to the XL-C ring. Visually check insertion depth using mark on tubing.
- 11 Hold trigger until the V2 actuator has fully engaged the XL-C ring. Release V2 actuator from XL-C ring and then remove the XL-C ring from the fitting.
- 12 Remove tag from fitting, indicating press has been performed.

Note: Pressure testing with Smart Connect: Unpressed connections are located by pressurizing the system with air or water. When testing with water, the proper pressure range is 15 psi to 85 psi. When testing with compressed air, the proper pressure range is ½ psi to 45 psi maximum. If testing with compressed air, use an approved leakdetect solution. Following a successful pressure test, the system may be pressure tested up to 200 psi with air or up to 600 psi with water.

Changing Sealing Elements

















Changing Sealing Elements

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.

WARNING! Do not use sharp objects to

remove the sealing element as this may damage the seal.

To change sealing elements for $\frac{1}{2}$ " to 2" fittings follow steps 1 and 2. For $2\frac{1}{2}$ " to 4" fittings follow steps 3 through 10.

1/2" to 2" Fittings

- Remove the sealing element from the bead using a blunt object such as a finger or an O-ring pick.
- 2 Insert new, undamaged sealing element into the bead. Check to make sure that the whole sealing element is in the bead.

21/2" to 4" Fittings

- **3** Insert o-ring pick between sealing element and separator ring.
- 4 Use o-ring pick to push the sealing element into the fitting below the grip ring.
- 5 Carefully reach past the grip ring, pinch and remove the sealing element from the fitting.

WARNING!

Grip ring is extremely sharp, use gloves or extreme caution when reaching into fitting.

CAUTION!

If reusing the sealing element ensure the sealing element does not make contact with grip ring as this can cause damage.

- 6 Visually inspect replacement sealing element. Ensure there are no defects, scratches, or burrs, is free of debris, and is coated with lubricant.
- 7 Pinch the sealing element and place it fully inside the fitting, below the separator and grip rings.
- 8 Carefully pull the sealing element up into the channel below the separator ring. Ensure proper, concentric seating of grip ring, separator ring and sealing element before installation.



Approved Applications

Media' Comments Max Pressure (rejaint) Range ("F)	e EPDM	Copper FKM	HNBR
Comments Max Pressure (seise	e EPDM	FKM	HNBR
Comments Max Pressure (psig) Temperature (psig) Temperature			
Water/Liquids	1		
Hot and cold potable water Test pressure 600 psi			
Rainwater / Fittings Fittings	· ·	1	
Chilled Water <a>So% Ethylene / Propylene 250 glycol <a>Valves	1	1	
Hydronic Heating <50% Ethylene / Propylene Water glycol	1	1	
Fire Sprinkler NFPA 13, 13D, 13R 175 Ambient ⁵	1		
Steam Low-pressure 15 Max 250°		\checkmark^4	
Residential 5 Max 227°	\checkmark^4	\checkmark^4	
Fuels/Oils/Lubricants			
Ethanol Pure grain alcohol Ambient ⁵	1		
Lube Oil Petroleum based Max 150°			1
Heating Fuel Oil 125 Max 100°			1
Diesel Fuel			1
Gases			
Compressed Air Oil Concentration ≤25 mg/m ³	1	1	1
Oil Concentration >25 mg/m ³		1	1
Nitrogen - N ₂	1	1	1
Carbon Dioxide Dry 200 Max 140°	1	1	1
Carbon Monoxide - CO	1	1	1
Argon - Ar	1	1	1
Oxygen - O ₂ Non-medical Keep free of oil and grease 140 Max 140°	1		
Hydrogen - H ₂ 125	1	1	1
Vacuum Minimum absolute pressure 750µm Hg Maximum differential pressure 29.2" Hg Max 160°	1	1	1
Special Media			
Acetone Liquid 70 -14° to 104	°		

¹ It is recommended that all systems be clearly labeled with the media being conveyed. For further information please consult Viega Technical Services.

² All Viega systems must be used with the manufacturer's recommended sealing element. Contact your local Viega representative or Viega Technical Services for specific application temperature, pressure, and concentration limits.

³ System pressure and temperature ranges depend on sealing element. Any ranges listed above will be overruled by the sealing element limits here:

^{3a} EPDM temperature ranges are typically 0°F to 250°F.

^{3b} FKM temperature ranges are typically 14°F to 284°F with temperature spikes (24hr) up to 356°F. ^{3c} HNBR temperature ranges are typically -40°F to 180°F.

⁴ System must contain adequate condensate drainage.

⁵ Ambient temperatures should be taken as normal operating conditions for the applications not to exceed sealing element limitations.



Minimum Clearance Between Two Viega Press Connections

	Viega ProPress	
Tubing Diameter (in)	Minimum Clearance (in)	Minimum Clearance (mm)
1/2	0	0
3⁄4	0	0
1	0	0
1¼	7/16	10
1½	5%8	15
2	3⁄4	20
21/2	5%	15
3	5%	15
4	5/8	15



Friction Loss in Equivalent Feet of Tube

Wrought — Copper Fittings						
Size	90° Elbow	45° Elbow	Tee Branch	Tee Run	Coupling	
1⁄2"	1.0	0.5	2.0	_	_	
3⁄4 "	2.0	0.5	3.0	—	—	
1"	2.5	1.0	4.5	_	_	
11⁄4"	3.0	1.0	5.5	0.5	0.5	
1½"	4.0	1.5	7.0	0.5	0.5	
2"	5.5	2.0	9.0	0.5	0.5	
21/2"	7.0	2.5	12.0	0.5	0.5	
3"	9.0	3.5	15.0	1.0	1.0	
4"	12.5	5.0	21.0	1.0	1.0	

Cast — Zero Lead Bronze Fittii	ngs
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		-	
Size	90° Elbow	Tee Run	Tee Branch
1/2"	1	1/2	2
3⁄4 "	2	1/2	3
1"	4	1/2	5
11/4"	5	1	7
11/2"	8	1	9
2"	11	2	12

Sealing Element Description

EPDM Sealing Element

ProPress fittings are manufactured with an EPDM sealing element installed at the factory. The EPDM sealing element is used mainly for potable water, hydronic heating, fire sprinkler, and compressed air installations.

Definition: EPDM

Ethylene-Propylene-Diene-Monomer, gloss black in color

Operating Temperature: 0°F to 250°F

The EPDM sealing element is a synthetically manufactured and peroxidically crosslinked general-purpose elastomer with a wide range of applications. It is resistant to aging, ozone, UV, weathering, environmental influences, chemicals, and most alkaline solutions.

The EPDM sealing element is recommended for drinking water applications. It is particularly resistant to hot water, making it ideal for seals and gaskets in heating systems, fittings, and household appliances (e.g., washing machines, pumps, and dishwashers). It is not resistant to hydrocarbon solvent solutions, oils, chlorinated hydrocarbons, turpentine, and gasoline.

FKM Sealing Element

ProPress fittings may be changed from the factory-installed EPDM sealing element to an FKM sealing element. See *Changing Sealing Elements Product Instructions*. FKM is well known for its excellent resistance to petroleum products and solvents as well as exceptional high-temperature performance, which make it ideal for seals and gaskets in solar, district heating, low-pressure steam, and compressed air system.

Definition: FKM

Fluoroelastomer, dull black in color

Operating Temperature: 14°F to 284°F (with temperature spikes up to 356°F)

The FKM sealing element is a specialpurpose elastomer typically installed where higher temperatures are required. It possesses excellent resistance to aging, ozone, UV, weathering, environmental influences, and oils and petroleum-based additives.

HNBR Sealing Element

ProPress press fittings may be changed from the factory-installed EPDM sealing element to an HNBR sealing element. See *Changing Sealing Elements Product Instructions*. The HNBR sealing element is used mainly for inert gas, liquid fuel, and lubricant oil. It is commonly used in fuel oil heating systems.

Definition: HNBR

Hydrogenated Nitrile Butadiene Rubber, yellow in color

Operating Temperature: -40°F to 180°F

HNBR is widely known for its physical strength and retention of its properties after long-term exposure to heat, oil, and chemicals.

The unique properties of the HNBR sealing element have resulted in the wide adoption of it in automotive, industrial, and assorted performance-demanding applications (e.g., engine seals, grommets, and gaskets; fuel system seals and hoses; transmission system bonded piston seals; chevron seals, oil field packers, and rotary shaft seals.)

The HNBR sealing element is not suitable for food contact applications and cannot be installed in drinking water applications.

Technical Information

No-Stop Couplings

No-stop couplings and extended no-stop couplings are often used to conduct repairs. Without a stop, these couplings can slide completely onto a tube and allow a connection to be made in tighter spaces. Unlike fittings with an integrated stop that have a minimum insertion depth, no-stop couplings have minimum and maximum allowable insertion depths. The minimum and the maximum insertion depths should be marked and a line should connect the two marks.



Viega ProPress No-Stop Couplings					
Tube	Minimum Maximur				
Diameter (in)	Inse	rtion	Insertion		
	in	mm	in	mm	
1/2	3⁄4	19	7⁄8	22	
3⁄4	7⁄8	23	11/8	28	
1	7⁄8	23	11/8	28	
1¼	1	26	1 3⁄16	30	
1½	1 7⁄16	37	1 9⁄16	40	
2	1 9⁄16	40	1¾	44	
21/2	1 ¹¹ /16	43	2%	67	
3	1 ¹⁵ /16	50	215/16	75	
4	23⁄8	60	37/16	87	

Viega ProPress Extended No-Stop Couplings Tube Minimum Maximum Diameter (in) Insertion Insertion					
	in	mm	in	mm	
1/2	3⁄4	19	21⁄4	57	
3⁄4	7⁄8	23	2%	67	
1	7⁄8	23	21⁄8	73	
11⁄4	1	26	31⁄8	80	
1½	1 7/16	37	35/16	84	
2	1 %16	40	3¾	95	

Soldering or Brazing

Using ProPress In Line with Existing Fittings

Maintain proper distances when installing a ProPress fitting near an existing soldered or brazed fitting.

Tube Diameter (in)	Minimum Distance from Soldered		Minimum Distance from Brazed	
	in	mm	in	mm
1/2	1⁄4	7	1	26
3⁄4	1⁄4	7	1½	38
1	7/16	11	2	51
1¼	7/16	11	21⁄2	64
1½	5⁄8	16	3	76
2	3⁄4	19	4	102
21/2	1⁄4	7	5	127
3	1⁄4	7	6	153
4	1⁄4	7	8	204

Soldering or Brazing In Line with Existing ProPress Fitting

To prevent damage to the sealing element and ensure proper sealing of the soldered/brazed joint and the press connection, maintain proper soldering/ brazing distances from the fitting.

Tube Diameter (in)	Soldering Minimum Distance		Brazed Minimum Distance	
	in	mm	in	mm
1/2	1½	38	41⁄2	114
3⁄4	21⁄4	57	6¾	172
1	3	76	9	229
1¼	3¾	95	11¼	286
1½	41⁄2	114	13½	343
2	6	153	18	457
21⁄2	7½	191	221/2	572
3	9	229	27	686
4	12	305	36	915