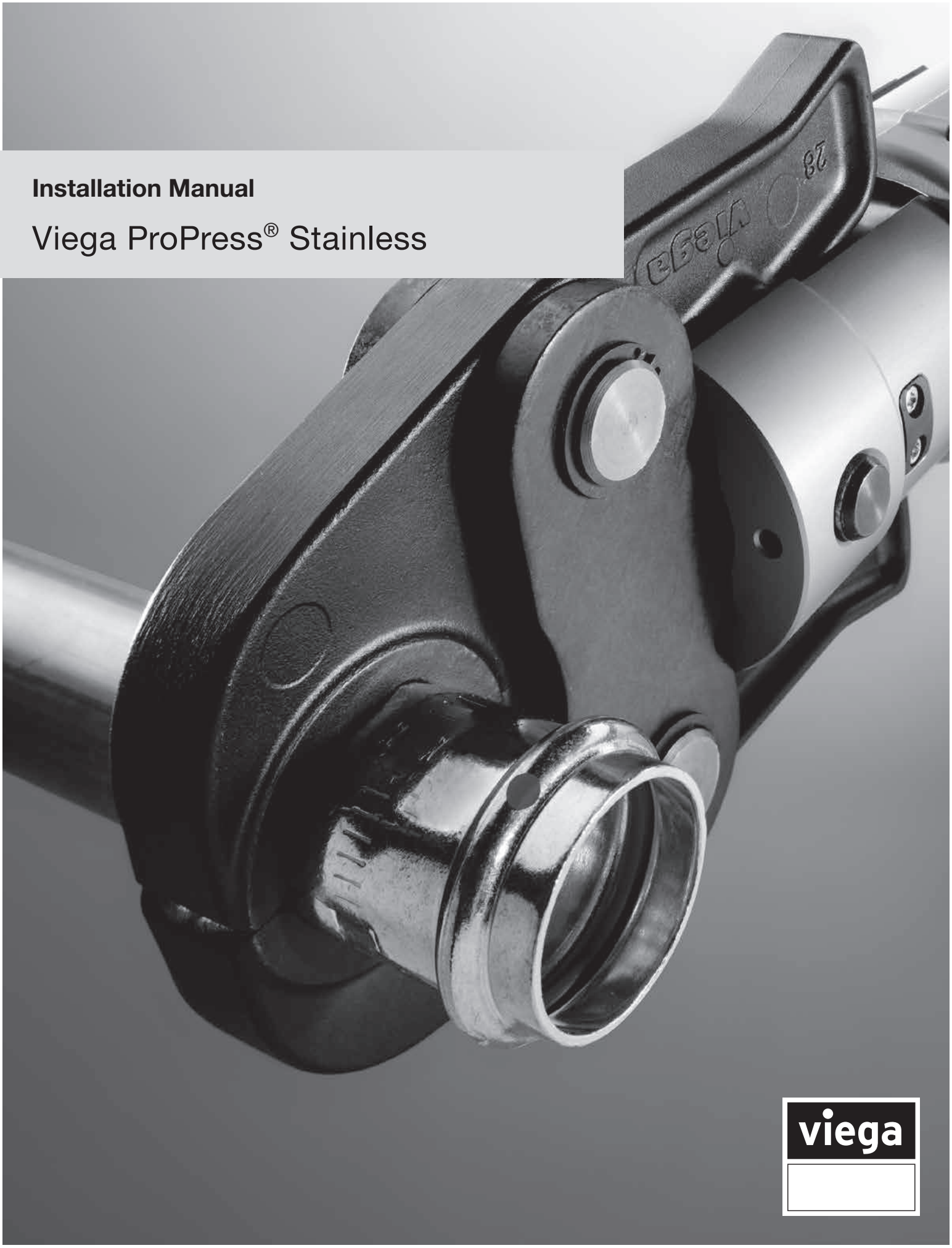
Installation Manual

Viega ProPress® Stainless



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1 About this Document

1.1 Disclaimer

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.**

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

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.

2 Product Information

2.1 ProPress Stainless 304 and 316 Systems

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

Viega ProPress Stainless 304 and 316 are stainless steel tube, fittings, and valves in copper tube size (CTS) ranging from ½ inch to 2 inches for ProPress Stainless fittings and 2½ inches to 4 inches for ProPress Stainless XL® fittings. The fittings require no brazing, threading, or welding and are installed with electro-hydraulic press tools (battery-powered or corded press tools).

Viega ProPress Stainless 304 fittings feature a white dot representing Smart Connect® technology with an FKM sealing element. Viega ProPress Stainless 316 fittings feature a green dot that represents Smart Connect technology with an EPDM sealing element. Viega's unique, patented Smart Connect technology helps installers ensure that they have pressed all connections.

Viega ProPress Stainless XL 304 and 316 fittings feature an FKM or EPDM sealing element, stainless steel grip ring, and PBT separator ring.

Stainless tubing is thicker than Schedule 5 inert gas welded pipes, meeting ASTM A312, A554 wall thickness requirements.

All dimensions are delivered in sticks that are nominal 20 feet in length, with a metallic bare exterior and interior surface. The sticks are free from annealing color and corrosion-promoting substances.

Only ProPress stainless steel tubing is approved for installation with ProPress stainless fittings. This ensures reliability and conformity with the stainless steel system.

2.2 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.

2.3 Areas of Use

DANGER!
Failure to verify suitability

Failure to verify suitability of the system for certain applications may cause serious personal injury or even death.

- It is the responsibility of designers to verify the suitability of type 304 or 316 stainless steel tubing for use with intended fluid media.
- The fluid's chemical composition, pH level, operation temperature, chloride level, oxygen level, and flow rate and their effects on AISI type 304 stainless steel and/or type 316 stainless steel must be evaluated by the material specifier to confirm adequate system life.

ProPress stainless 304 and 316 tubing and fittings are physically and chemically compatible with one another. Care must be taken to ensure that both alloys are compatible with the fluid and that the proper sealing elements are used throughout the system.

Type of Service	Comments	Pressure	Temperature
Chilled water	Ethylene glycol / propylene glycol	200 psi	0° to 250°F
Hydronic heating	Ethylene glycol / propylene glycol	200 psi	0° to 250°F
Cooling water	Up to 50% ethylene glycol or propylene glycol solution	200 psi	0° to 250°F
Low-pressure steam		≤ 15 psi	Max 250°F
Fire sprinklers	Listed with UL (½" to 2")	175 psi	32° to 250°F
Nitric acid	10%	200 psi	Ambient
Paraffin wax		200 psi	100°F
Wet chemical*	Listed with UL (½")	110 psi	32° to 250°F

Table 1: Fluids and water approved for use with ProPress Stainless 304

* Extinguishing systems per NFPA 17A and the system manufacturer's installation, operation, and maintenance manual. Pipe and fittings cannot be reused.

Type of Service	Comments	Pressure	Temperature
Chilled water	Ethylene glycol / propylene glycol	200 psi	0° to 250°F
Hydronic heating	Ethylene glycol / propylene glycol	200 psi	0° to 250°F
Cooling water	Up to 50% ethylene glycol or propylene glycol solution	200 psi	0° to 250°F
Low-pressure steam		≤ 15 psi	Max 250°F
Rainwater/gray water		200 psi	32° to 250°F
Deionized water		200 psi	250°F
Isopropyl alcohol		200 psi	75°F
Ethanol	Pure grain alcohol	200 psi	150°F
Latex paint		200 psi	32° to 250°F
Methyl ethyl ketone		200 psi	100°F
Nitric acid	10%	200 psi	Ambient
Phosphoric acid	25%	200 psi	Ambient

Table 2: Fluids and water approved for use with ProPress Stainless 316

Type of Service	Comments	Pressure	Temperature
Heating fuel oil		125 psi	100°F
Diesel fuel		125 psi	100°F
Kerosene		125 psi	Ambient
Lube oil	Petroleum based	200 psi	150°F

Table 3: Fuel, oil, and lubricant approved for use with ProPress Stainless 304 systems

Type of Service	Comments	Pressure	Temperature
Compressed air	Oil concentrate < 25 mg/m^3	200 psi	0° to 140°F
Compressed air	Oil concentrate > 25 mg/m^3	200 psi	0° to 140°F
Nitrogen - N_2		200 psi	0° to 140°F
Acetylene		20 psi	Ambient
Vacuum		29.2" of Hg	0° to 160°F

Table 4: Gases approved for use with ProPress Stainless 304

Type of Service	Comments	Pressure	Temperature
Compressed air	Oil concentrate < 25 mg/m^3	200 psi	0° to 140°F
Oxygen - O_2 (nonmedical)	Keep oil and fat free / non-liquid O_2	140 psi	0° to 140°F
Nitrogen - N_2		200 psi	0° to 140°F
Ammonia	Anhydrous	200 psi	122°F
Acetylene		20 psi	Ambient
Argon	Welding use	200 psi	0° to 140°F
Hydrogen - H_2		125 psi	0° to 140°F
Vacuum		29.2" of Hg	0° to 160°F

Table 5: Gases approved for use with ProPress Stainless 316

It is recommended that all systems be clearly labeled with the fluid or gas being conveyed. In the absence of local requirements, systems should be identified in accordance with ANSI/ASME A13.1.

All Viega systems must be used with the manufacturer's recommended sealing element.

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.

2.3.1 Commercial and Residential

ProPress Stainless systems are approved for numerous applications in commercial and residential markets.

2.3.2 Industrial and Plant Operations

ProPress Stainless systems are also suitable for use in industrial and plant processes.

Primary areas of application include:
- Utility systems
- Process piping
- Cooling water
- Fire sprinkler systems (304 only)

2.3.3 Fire Protection Systems

The system components may be installed in NFPA 13, 13R, and 13D fire sprinkler systems. They are certified for use in “wet” and “dry” fire protection systems in accordance with UL certifications:
- ANSI/UL 852: Standard for Metallic Sprinkler Pipe for Fire Protection Service
- ANSI/UL 213: Standard for Rubber Gasketed Fittings for Fire-Protection Services
- ULC ORD-C213: Canadian Standard for Rubber Gasketed Fittings for Fire-Protection Services
- UL VIZY.EX16017: Metallic Sprinkler Pipe
- UL VIZY7.EX16017: Metallic Sprinkler Pipe Certified for Canada

The pipe and fittings may be installed in NFPA 17A wet chemical extinguishing systems. The pipe and fittings are Recognized Components for use with the intended extinguishing system units when the compatibility has been determined as cross-referenced in the listed extinguishing system units’ installation, operation, and maintenance manual; and in accordance with UL recognitions:
- UL 1254F: Outline for Rubber-Gasketed Fittings and Metallic Pipe for Commercial Cooking Equipment Protection Extinguishing System Units (only for ProPress Stainless 304, ½" fittings)
- UL GOBQ2.EX28089: Extinguishing System Rubber-Gasketed Fittings and Metallic Pipe-Component (only for ProPress Stainless 304, ½" fittings)

2.3.4 Design Services

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

- 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

2.4 Product Description

2.4.1 Overview

ProPress Stainless 304 and 316 systems consists of stainless steel press fittings for stainless steel tubing and the corresponding press tools. Stainless fittings are designed to be used with only Viega's stainless steel tubing.

2.4.2 Listing, Certifications, and/or Recognitions

ProPress Stainless fittings have the following listings and certifications:

- ABS: American Bureau of Shipping Type Approval
- ASME B31.1: Power Piping
- ASME B31.3: Process Piping
- ASME B31.9: Building Services Piping
- BV: Bureau Veritas Type Approval
- Canadian Registration Number (CRN): 13492.5 A/B/C
- DNV GL: Det Norske Veritas Germanischer Lloyd Type Approval
- UL/ANSI 213: Standard for Rubber Gasketed Fittings for Fire-Protection Service
- ULC/ANSI ORD-C213: Canadian Standard for Rubber Gasketed Fittings for Fire-Protection Service
- LR: Lloyd's Register Type Approval
- UL/ANSI 852: Standard for Metallic Sprinkler Pipe for Fire Protection Services (304 only)
- UL 1254F: Outline of Investigation for Rubber-Gasketed Fittings and Metallic Pipe for Commercial Cooking Equipment Protection Extinguishing System Units (304, ½" fittings only) NKK: Nippon Kaija Kyokai Type Approval IAPMO PS-117: Press and Nail Connections (316 only)
- ICC-ES LC1002: Press-Connection Fittings for Potable Water Tube and Radiant Heating Systems (316 only)

2.4.3 Codes and Standards

ProPress Stainless 304 and 316 fittings comply with the following codes and standards:

- ASME B31: Code for Pressure Piping
- ASTM A312: Standard Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes
- ASTM A403: Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings (316 only)
- ASTM A554: Standard Specification for Welded Stainless Steel Mechanical Tubing
- IAPMO Uniform Mechanical Code (UMC) (316 only)
- ICC International Mechanical Code (IMC) (316 only)
- National Building Code of Canada (NBCC) (316 only)
- NFPA 13: Standard for the Installation of Sprinkler Systems (304 only)
- NFPA 13D: Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes (304 only)
- NFPA 13R: Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies (304 only)
- NFPA 17A: Standard for Wet Chemical Extinguishing Systems (304, ½" fittings only)

2.4.4 Tubing

Viega stainless steel tubing is offered in ½ inch to 4 inches size in either 304 stainless steel or 316 stainless steel to complement the Viega ProPress Stainless fittings and offer a complete system solution. Viega stainless steel tubing meets the requirement of ASTM A312 or ASTM A554 for Schedule 5 304 and 316 stainless steel pipe.

Only Viega stainless tubing is approved for installation with Viega ProPress for Stainless fittings. This is to ensure reliability and conformity with the stainless steel system.

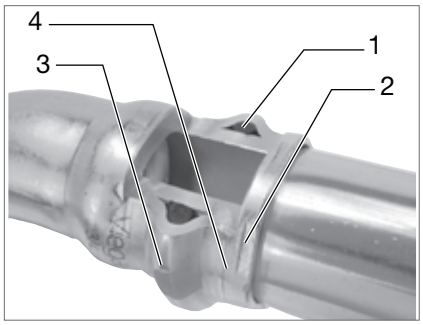
Viega ProPress for Stainless tubing is thicker than Schedule 5 inert gas welded pipes, meeting ASTM A312, A554, and DIN 1988 wall thickness requirements.

All dimensions are delivered in sticks that are nominal 20 feet in length, with a metallic bare exterior and interior surface. The sticks are free from annealing color and corrosion-promoting substances.

All tubing has been tested for leaks and is subject to continuous quality monitoring as well as external monitoring by the material testing office.

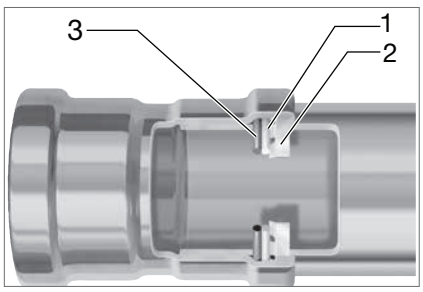
2.4.5 Press Fittings

2.4.5.1 Viega ProPress Stainless Fittings



1 Each fitting contains an application specific sealing element. A green dot on a Viega ProPress Stainless fitting indicates the presence of Smart Connect technology and an EPDM sealing element. A white dot on a Viega ProPress Stainless fitting indicates the presence indicates the presence of the Smart Connect feature and an FKM sealing element.
2 Viega's distinctive hexagonal pressing pattern bonds fitting and tube and provides the mechanical strength for the connection.
3 Color coded dots indicate the presence of Viega's unique, patented Smart Connect technology which helps installers ensure that they have pressed all connections.
4 Cylindrical guides ensure the proper insertion of the tube and protects the sealing element.

2.4.5.2 Viega ProPress Stainless XL Fittings



1 A 420 stainless steel grip ring's teeth cut into the tube and lock the fitting securely in place.
2 A PBT (Polybutylene Terephthalate) separator ring protects the sealing element from damage by creating a positive physical separation during installation and later during pressing.
3 An application specific sealing element (FKM or EPDM) ensures water-tight or air-tight connections.

ProPress Stainless XL fittings are designed to be pressed with ProPress XL-C press rings and V2 actuator to produce a non-detachable, secure connection.

2.4.5.3 FKM Sealing Element

Viega ProPress Stainless 304 fittings are manufactured with a high-quality, dull black FKM (Fluoroelastomer) sealing element installed at the factory. The molded sealing lips also seal tube surfaces with slightly uneven surfaces. Sealing elements are inserted into the fitting using a H1 food grade lubricant registered with NSF and the USDA, and is approved for use under FDA 21 CFR.

FKM possesses excellent resistance to aging, ozone, sunlight, weathering, environmental influences, and oils and petroleum-based additives. Its superb resistance to high temperatures and petroleum based additives makes it ideal for seals and gaskets in solar, district heating, low-pressure steam, and compressed air system fittings. It can withstand heat spikes up to 356°F.

The operating temperature of the FKM sealing element is 14° to 284°F (-10° to 140°C).

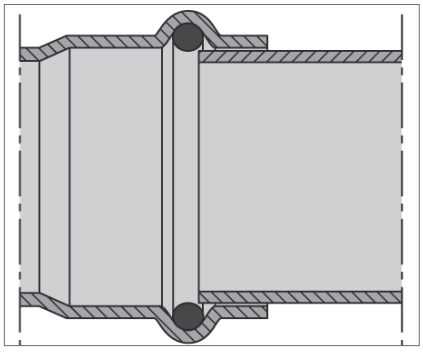
2.4.5.4 EPDM Sealing Element

Viega ProPress Stainless 316 fittings are manufactured with a high-quality, shiny black EPDM (Ethylene Propylene Diene Monomer) sealing element installed at the factory. The molded sealing lips also seal tube surfaces with slightly uneven surfaces. Sealing elements are inserted into the fitting using a H1 food grade lubricant registered with NSF and the USDA, and is approved for use under FDA 21 CFR.

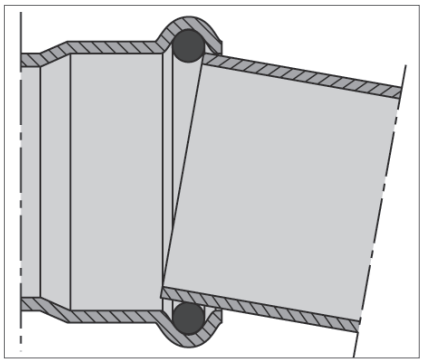
The EPDM sealing element possesses excellent resistance to aging, ozone, sunlight, weathering, environmental influences, and most alkaline solutions and chemicals used in a broad range of applications.

The operating temperature of the EPDM sealing element is 0° to 250°F (-18° to 120°C).

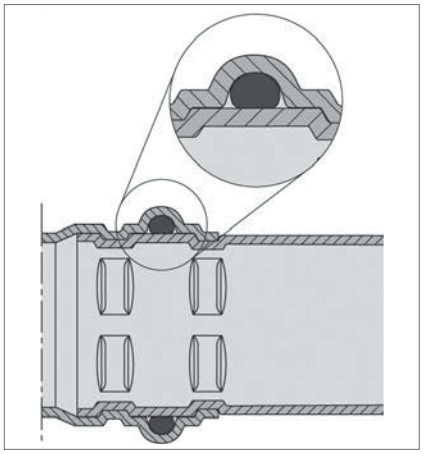
2.4.5.5 Cylindrical Guides



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

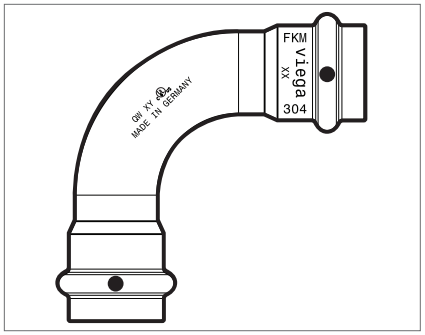


Fittings that do not have cylindrical guides risk making an unsecured connection. Without the guides, installers may damage the sealing element.

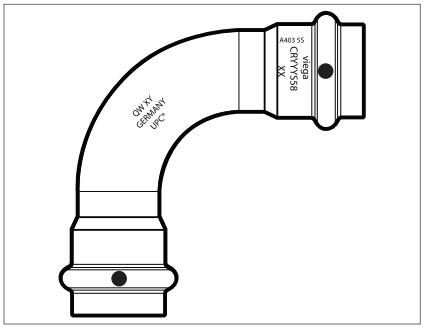


Fittings are pressed before, after, and on top of the sealing element in a single step. This distinctive hexagonal pressing pattern bonds fitting and tube.

2.4.5.6 Fitting Markings



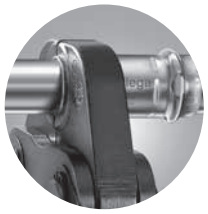
Each ProPress Stainless 304 fitting is marked with the following:
- White dot: FKM sealing element and Smart Connect technology
- Size of fitting
- Stainless steel alloy number
- Manufacturer name
- Manufacturer date code
- Country of origin
- UL® Certification Mark (only on ½" to 2" sizes)
- UL® Recognized Component Mark (only on ½" size)



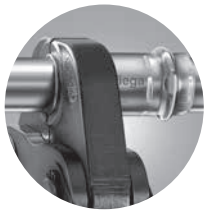
Each ProPress Stainless 316 fitting is marked with the following:
- Green dot: EPDM sealing element and Smart Connect technology
- Size of fitting
- Stainless steel alloy number
- Manufacturer name
- Manufacturer date code
- Country of origin
- UMC®

2.4.5.7 Viega Smart Connect Technology

1 Identify an unpressed connection during pressure testing when water flows past the sealing element.



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



3 Viega ProPress connections are fast, flameless, and reliable.

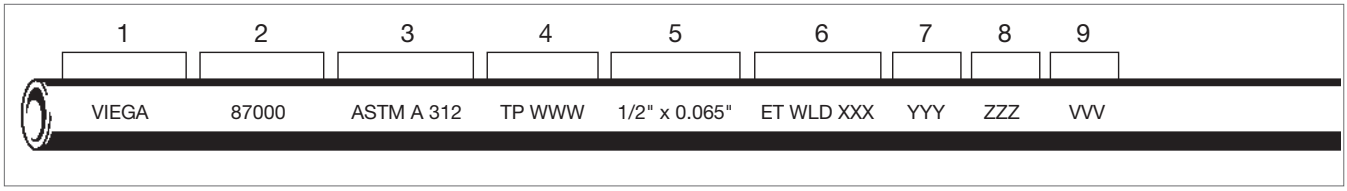
Viega Smart Connect technology provides the installer quick and easy identification of an unpressed fitting during a leak test. When the fitting is pressed, a secure, non-detachable, mechanical connection is created. Smart Connect technology provides the installer with an easy way to see connections 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.

2.4.6 Marking on Tubing

Viega ProPress Stainless tubing is marked with important information regarding the material configuration and manufacture of the tubing. It is labeled with the following information along its entire length:

1 Manufacturer
2 Stock code
3 Specification standard
4 Material type
5 Nominal diameter x wall thickness
6 Manufacturing information
7 Date of manufacture
8 Batch code
9 Country of origin



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.

2.5 General Installation Requirements

The Viega ProPress Stainless fitting system must be installed while considering the following general industry requirements.

2.5.1 Required Tools

The following tools are required for making a press connection:
- Pipe cutter or a fine-toothed hacksaw
- Deburring tool
- Marker for marking insertion depth on the tube
- Press machine with constant pressing force
- Press jaw or press ring with corresponding actuator suitable for the tube diameter and with the proper profile

Viega recommends RIDGID press tools, Viega ProPress jaws and ring sets, and RIDGID pipe preparation tools manufactured and sold by The Ridge Tool Company for use with Viega Systems.

Improper Tool/Material Damage

Only use press jaws and rings that are designed for use with ProPress fittings.

2.5.2 Expansion

Thermal expansion in installed systems generates stress on the tubing and appliance connectors. Compensation must be allowed for expansion and contraction that may occur within the system. Expansion joints or mechanical expansion compensators may be used to alleviate these stresses. ProPress Stainless systems do not require any additional protection when compared to a soldered system.

The following methods are effective:
- Fixed and sliding hangers
- Expansion equalization joints (expansion bends)
- Expansion compensators

2.5.3 Electrical Bonding

When properly installed, ProPress Stainless fittings comply with Section 1211.15 Electrical Bonding and Grounding of the Uniform Plumbing Code and Section 310 of the International Fuel Gas Code.

The mechanical press provides continuous metal-to-metal contact between fitting and tube. The press ensures the continuity of the bonding through this contact.

A qualified electrician is responsible for ensuring electrical bonding is tested and secured.

DANGER!
Electric Shock

An electric shock can cause burns, serious injury, and even death.

- Because all metallic tubing can conduct electricity, unintentional contact with a live wire can lead to the entire system and components connected to it to become energized. Metal tubing is not meant to conduct electricity.
- A properly bonded system creates a safe path for electricity to travel so that the system can't be energized.
- An unbonded or improperly bonded system can be a shock hazard.
- Always ensure bonding is in accordance with local codes.

2.5.4 Exposure to Freezing Temperatures

Viega ProPress Stainless systems with EPDM sealing elements can be installed in ambient temperatures down to 0° F and with FKM sealing element down to 14° F. Tubing exposed to freezing temperatures must be protected per acceptable engineering practices, codes, and as required by local code.

2.5.5 Underground Installations

Viega ProPress Stainless fitting systems are approved for underground installations. However, installations must meet all state and local codes, including those for underground. Proper authorization must be obtained prior to installation from the Authority Having Jurisdiction.

2.5.6 Concealed Spaces

The Viega ProPress Stainless fitting system has been approved for use in concealed spaces. Specific performance tests were conducted to evaluate the fittings for use in concealed spaces. Concealed tubing and fittings shall be protected from puncture threats.

2.5.7 Corrosion Protection

Viega ProPress Stainless fittings exposed to corrosive action, such as soil conditions or moisture, must be protected in an approved manner in accordance with NFPA 54 Section 404.8, NACE Standard RP0169-2002 Section 5, 2009 UPC Chapter 6 Section 609.3.1, 2009 UMC Chapter 13 Section 1312.1.3, or satisfying local code requirements. In addition, systems should be properly sized to minimize the risk of erosion corrosion resulting from excessive velocities.

2.5.7.1 Mixed Installations

- Stainless steel should not be directly connected to copper. Brass or bronze fittings are a suitable transition in most applications.
- ProPress Stainless dielectric unions should be used when connecting stainless steel to steel or galvanized steel pipe. Do not use dielectric unions intended for copper to steel transitions to connect stainless steel to copper or steel.
- Care should be taken to select hangers of suitable material that are galvanically compatible with the tubing.

Above ground tube and fittings do not normally require external corrosion protection.

Please contact the Viega Technical Services Department for questions on this subject.

2.5.8 Pressure Surges

- ProPress Stainless fittings should be isolated or separated by sufficient distance from pumps, fast-acting valves, and other sources of pressure transients.
- The maximum operating pressure in a ProPress Stainless system is 200 psi, which applies to general operation as well as pressure transients.
- Good engineering practices should be used to design the system in a way that minimizes sharp pressure surges.

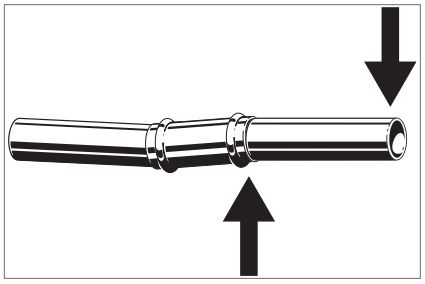
- Pressure surges or transients from fast-acting valves, pump surges, and other sources that result in water hammer may cause damage to many system components, including press fittings.
- When fast-acting valves and/or pumps are incorporated into a system, the designer and installer should isolate press fittings from sharp pressure surges.

2.5.9 Rotating a Pressed Fitting

Once a ProPress Stainless fitting has been pressed, it can be rotated (not by hand), but once rotated more than five degrees, the fitting should be repressed to restore resistance to rotational movement.

If the fitting is re-pressed, care should be taken to align the flat sides on the jaw with those on the fitting.

2.5.10 Deflection



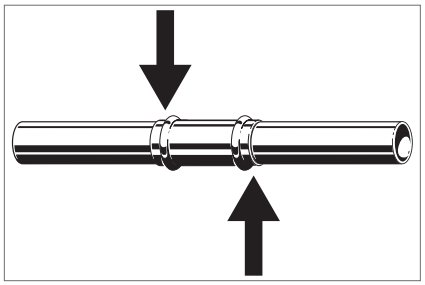
The pressing process can cause deflection (angular misalignment) to occur. When pressing Viega ProPress Stainless fittings in a system, the deformation of the fitting is constant. This allows for a consistent leak-free joint every time and is a result of the pressing technique.

Deflection occurs in the same way for every fitting. The fitting being pressed will move in the direction of the jaw or ring opening.

- Since the fitting will deflect toward the opening of the jaw or ring, the tube end will deflect in the opposite direction.
- By counteracting the fitting movement, one can minimize the deflection of the fitting and ultimately the tube.
- When using strut and clamps, deflection is minimized and nearly eliminated depending on clamp spacing.

2.5.10.1 Controlling Deflection

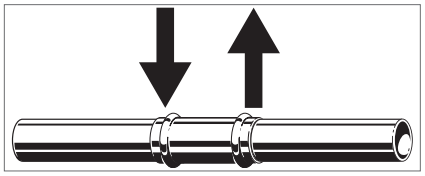
Deflection while pressing can be minimized by utilizing the following installation practices.



Alternate sides for presses

- Press one end of fitting.
- Make second press on other end of fitting from the opposite side.

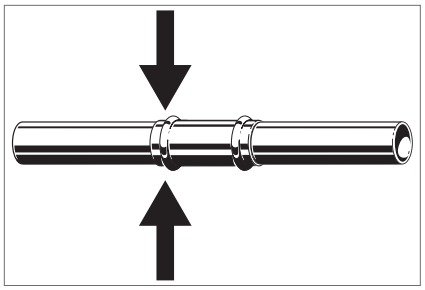
Site conditions permitting.



Push-pull method

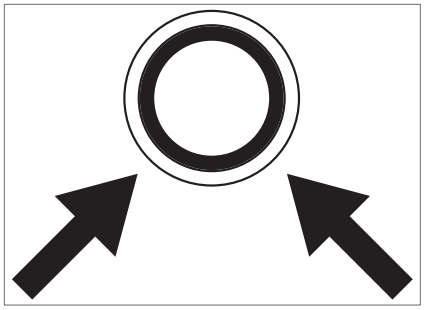
- Rings = Push on press tool.
- Jaws = Pull on press tool.

  The press tool can be feathered using the trigger as needed to apply pulling or pushing force to control deflection.



Re-Press

- Press the fitting, once on each side (that is, re-press the fitting a second time on the opposite side). Pressing the same connection from the opposite side will usually straighten misalignment between the tube and fitting.



- When pressing overhead piping, it may be inconvenient to alternate sides for each press.
- The natural weight of the piping plus pressing on opposite sides at a 45 degree angle should adequately eliminate deflection.
- This technique can also be used for any horizontal piping and also when working above the piping.

- As long as the tubing is properly prepped and marked and the fitting is installed according to Viega's ProPress Stainless Product Instructions, if there is any deflection present after the installation of the fitting, the connection is still acceptable and meets Viega's manufacturing specifications for proper installation and warranty.
- Deflection of a press connection has no effect on the integrity of the system, and it can be pressure tested in accordance with the ProPress Stainless Product Instructions.

2.6 ProPress Stainless Flow Data

Nominal Tube Size (inches)	Weight		
	Tube (lb./ft.)	Water (lb./ft.)	Total (lb./ft.)
½	0.41	0.06	0.47
¾	0.59	0.12	0.71
1	0.77	0.20	0.97
1¼	0.95	0.31	1.26
1½	1.13	0.43	1.56
2	1.50	0.76	2.26
2½	2.18	1.61	3.79
3	2.60	2.29	4.89
4	3.46	4.06	7.52

Table 6: Dimensional data

2.6.1 Flow Rate, Velocity, and Friction Loss (Water)

Friction loss state within the following tables is based on pipe dimensional data using the Darcy-Weisbach equation:

$$h_f = f \bullet \frac{L}{D} \bullet \frac{V^2}{2g}$$

Where:
h_f = friction loss
L = pipe length
D = pipe ID
V = velocity (ft./sec.)
g = gravity constant (32.174ft./sec.^{2})
f = pipe friction factor

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.065 ID = 0.50	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
1.00	1.63	0.95
2.00	3.27	3.79
3.00	4.90	8.54
4.00	6.54	15.18
5.00	8.17	23.71
6.00	9.80	34.15
7.00	11.44	46.48
8.00	13.07	60.71
9.00	14.71	76.83
10.00	16.34	94.86
11.00	17.97	114.77
12.00	19.61	136.59
13.00	21.24	160.31
14.00	22.88	185.92
15.00	24.51	213.42
16.00	26.14	242.83
17.00	27.78	274.13
18.00	29.41	307.33

Table 7: ½" Stainless Steel, ASTM A312 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.065 ID = 0.75	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
1.00	0.73	0.12
2.00	1.45	0.48
3.00	2.18	1.07
4.00	2.90	1.91
5.00	3.63	2.98
6.00	4.36	4.29
7.00	5.08	5.84
8.00	5.81	7.63
9.00	6.54	9.65
10.00	7.26	11.92
11.00	7.99	14.42
12.00	8.71	17.16
13.00	9.44	20.14
14.00	10.17	23.36
15.00	10.89	26.81
16.00	11.62	30.51
17.00	12.35	34.44
18.00	13.07	38.61
19.00	13.80	43.02
20.00	14.52	47.67
21.00	15.25	52.55
22.00	15.98	57.68
23.00	16.70	63.04
24.00	17.43	68.64
25.00	18.16	74.48
26.00	18.88	80.56
27.00	19.61	86.88
28.00	20.33	93.43
29.00	21.06	100.22
30.00	21.79	107.25

Table 8: ¾" Stainless Steel, ASTM A312 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.065 ID = 1.00	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
2.00	0.82	0.11
4.00	1.63	0.43
6.00	2.45	0.97
8.00	3.27	1.72
10.00	4.08	2.69
12.00	4.90	3.88
14.00	5.72	5.28
16.00	6.54	6.89
18.00	7.35	8.73
20.00	8.17	10.77
22.00	8.99	13.04
24.00	9.80	15.51
26.00	10.62	18.21
28.00	11.44	21.12
30.00	12.25	24.24
32.00	13.07	27.58
34.00	13.89	31.13
36.00	14.71	34.91
38.00	15.52	38.89
40.00	16.34	43.09
42.00	17.16	47.51
44.00	17.97	52.14
46.00	18.79	56.99

Table 9: 1" Stainless Steel, ASTM A312 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.06 ID = 1.26	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
5.00	1.29	0.21
8.00	2.06	0.54
11.00	2.83	1.03
14.00	3.60	1.66
17.00	4.37	2.45
20.00	5.15	3.39
23.00	5.92	4.49
26.00	6.69	5.73
29.00	7.46	7.13
32.00	8.23	8.68
35.00	9.01	10.39
38.00	9.78	12.25
41.00	10.55	14.26
44.00	11.32	16.42
47.00	12.09	18.73
50.00	12.87	21.20
53.00	13.64	23.82
56.00	14.41	26.60
59.00	15.18	29.52
62.00	15.95	32.60
65.00	16.72	35.83
68.00	17.50	39.21
71.00	18.27	42.75
74.00	19.04	46.44
77.00	19.81	50.28

Table 10: 1¼" Stainless Steel, ASTM A312 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.06 ID = 1.50	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
10.00	1.82	0.34
13.00	2.36	0.57
16.00	2.90	0.86
19.00	3.45	1.22
22.00	3.99	1.63
25.00	4.54	2.11
28.00	5.08	2.64
31.00	5.63	3.24
34.00	6.17	3.90
37.00	6.72	4.61
40.00	7.26	5.39
43.00	7.81	6.23
46.00	8.35	7.13
49.00	8.90	8.09
52.00	9.44	9.11
55.00	9.99	10.19
58.00	10.53	11.33
61.00	11.07	12.54
64.00	11.62	13.80
67.00	12.16	15.13
70.00	12.71	16.51
73.00	13.25	17.96
76.00	13.80	19.46
79.00	14.34	21.03
82.00	14.89	22.66
85.00	15.43	24.34
88.00	15.98	26.09
91.00	16.52	27.90

Table 11: 1½" Stainless Steel, ASTM A312 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.06 ID = 2.00	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
20.00	2.04	0.30
25.00	2.55	0.47
30.00	3.06	0.68
35.00	3.57	0.93
40.00	4.08	1.21
45.00	4.60	1.53
50.00	5.11	1.89
55.00	5.62	2.29
60.00	6.13	2.73
65.00	6.64	3.20
70.00	7.15	3.71
75.00	7.66	4.26
80.00	8.17	4.85
85.00	8.68	5.47
90.00	9.19	6.14
95.00	9.70	6.84
100.00	10.21	7.57
105.00	10.72	8.35
110.00	11.23	9.17
115.00	11.74	10.02
120.00	12.25	10.91
125.00	12.77	11.84
130.00	13.28	12.80
135.00	13.79	13.81
140.00	14.30	14.85
145.00	14.81	15.93
150.00	15.32	17.04
155.00	15.83	18.20
160.00	16.34	19.39
165.00	16.85	20.62

Table 12: 2" Stainless Steel, ASTM A312 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.08 ID = 2.470	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
50.00	3.35	0.62
55.00	3.68	0.75
60.00	4.02	0.90
65.00	4.35	1.05
70.00	4.69	1.22
75.00	5.02	1.40
80.00	5.36	1.59
85.00	5.69	1.80
90.00	6.03	2.02
95.00	6.36	2.25
100.00	6.70	2.49
105.00	7.03	2.75
110.00	7.37	3.01
115.00	7.70	3.30
120.00	8.03	3.59
125.00	8.37	3.89
130.00	8.70	4.21
135.00	9.04	4.54
140.00	9.37	4.88
145.00	9.71	5.24
150.00	10.04	5.61
155.00	10.38	5.99
160.00	10.71	6.38
165.00	11.05	6.78
170.00	11.38	7.20
175.00	11.72	7.63
180.00	12.05	8.07
185.00	12.39	8.53
190.00	12.72	8.99
195.00	13.06	9.47
200.00	13.39	9.97

Table 13: 2½" Stainless Steel, ASTM A554 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.08 ID = 2.970	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
50.00	2.32	0.25
60.00	2.78	0.36
70.00	3.24	0.49
80.00	3.70	0.63
90.00	4.17	0.80
100.00	4.63	0.99
110.00	5.09	1.20
120.00	5.56	1.43
130.00	6.02	1.68
140.00	6.48	1.94
150.00	6.95	2.23
160.00	7.41	2.54
170.00	7.87	2.86
180.00	8.34	3.21
190.00	8.80	3.58
200.00	9.26	3.96
210.00	9.73	4.37
220.00	10.19	4.80
230.00	10.65	5.24
240.00	11.11	5.71
250.00	11.58	6.20
260.00	12.04	6.70
270.00	12.50	7.23
280.00	12.97	7.77
290.00	13.43	8.34
300.00	13.89	8.92
310.00	14.36	9.53
320.00	14.82	10.15
330.00	15.28	10.79
340.00	15.75	11.46
350.00	16.21	12.14
360.00	16.67	12.85
370.00	17.13	13.57
380.00	17.60	14.31
390.00	18.06	15.08

Table 14: 3" Stainless Steel, ASTM A554 flow rate, velocity, loss

Flow Rate (gpm)	Schedule 5 Wall Thickness = 0.08 ID = 3.970	
	Velocity (ft./second)	Pressure Loss (psi/100 ft.)
200.00	5.18	0.93
220.00	5.70	1.12
240.00	6.22	1.34
260.00	6.74	1.57
280.00	7.26	1.82
300.00	7.78	2.09
320.00	8.29	2.38
340.00	8.81	2.69
360.00	9.33	3.01
380.00	9.85	3.35
400.00	10.37	3.72
420.00	10.89	4.10
440.00	11.40	4.50
460.00	11.92	4.91
480.00	12.44	5.35
500.00	12.96	5.81
520.00	13.48	6.28
540.00	14.00	6.77
560.00	14.51	7.28
580.00	15.03	7.81
600.00	15.55	8.36
620.00	16.07	8.93
640.00	16.59	9.51
660.00	17.11	10.12
680.00	17.62	10.74
700.00	18.14	11.38
720.00	18.66	12.04
740.00	19.18	12.72
760.00	19.70	13.42
780.00	20.22	14.13
800.00	20.73	14.87
820.00	21.25	15.62
840.00	21.77	16.39
860.00	22.29	17.18
880.00	22.81	17.99

Table 15: 4" Stainless Steel, ASTM A554 flow rate, velocity, loss

2.6.2 Fitting Friction Loss

Fitting Size (inches)	90° elbow (long radius)	45° elbow	tee (straight flow)	tee (branch outlet)	ball valve (full port)
½	0.66	0.66	0.82	2.46	6.15
¾	0.99	0.99	1.24	3.72	9.30
1	1.33	1.33	1.66	4.98	12.45
1¼	1.65	1.65	2.06	6.18	15.45
1½	1.98	1.98	2.48	7.44	18.60
2	2.66	2.66	3.32	9.96	24.90
2½	3.30	3.30	4.12	12.36	NA
3	3.97	3.97	4.96	14.88	NA
4	5.30	5.30	6.62	19.86	NA

Table 16: Fitting friction loss equivalent length of tube (feet)

2.6.3 Maximum Span/Minimum Rod Diameter

Nominal Tube Size (inches)	Stainless Steel Pipe Maximum Span (feet)	Minimum Rod Diameter (inches)
½	10	⅜
¾	10	⅜
1	10	⅜
1¼	10	⅜
1½	10	⅜
2	10	⅜
2½	11	½
3	12	½
4	14	⅝

Table 17: MSS SP-58 or the maximum spacing and minimum rod sizes

3 Handling Instructions

All Viega ProPress Stainless components and associated tubing shall be free from dirt, debris, or items that may interfere with the sealing element and the press connection. Viega ProPress Stainless sealing elements, separator rings, and grip rings are to be visually inspected prior to installation to ensure the seal is intact and properly located within the fitting.

3.1 Transport

When transporting fittings:

- Do not pull or drag the fittings or system components along other surfaces.
- Secure fittings, tube, and system components during transportation to keep them from shifting.
- Do not damage the protective cap on the components or tube ends.
- Do not remove protective caps until immediately before installing.

3.2 Storage

When storing materials:

- Store fittings, tube, and system components in a clean and dry place.
- Do not store components directly on the floor.
- Provide at least three points of support for the storage of tube.
- Where possible, store different sizes separately.
- Store small sizes on top of larger sizes if separate storage is not possible.
- Store fittings, tube, and system components of different materials separately to prevent contact corrosion.

4 Installation Instructions

4.1 Check System Components

System components may, in some cases, become damaged through transportation and storage.

- Check all parts.
- Replace damaged components.
- Do not repair damaged components.
- Contaminated components may not be installed.

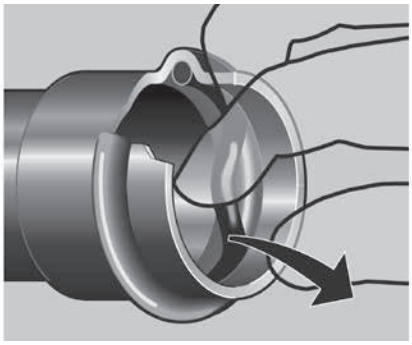
4.1.1 Replacing the Sealing Element

Damage to the Sealing Element

If damage to the sealing element, separator ring, or grip ring is discovered, contact a Viega District Manager for assistance.

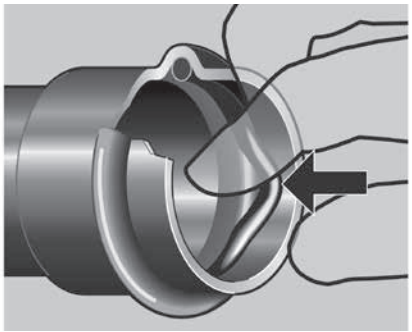
If the sealing element in the fitting is obviously damaged, it should be exchanged for a Viega replacement sealing element.

For applications requiring an FKM sealing element in ProPress Stainless 316, remove the factory-installed EPDM sealing elements using a wooden toothpick and replace with FKM sealing elements. For XL applications that require changing to an FKM sealing element, contact a Viega District Manager.



- Remove the sealing element from the bead.

Do not use metallic pointed or sharp objects during removal because they could damage the sealing element and/or bead. Try using a toothpick instead.



- Insert new, undamaged sealing element into the bead.
- Check to make sure that the whole sealing element is in the bead.

Use only Viega sealing elements. Using a non-Viega sealing elements will void the warranty.

4.2 Installing and Mounting the Tube

Observe the general rules of hanging and mounting:
- Fixed tube should not be used as support for other tubing and components.
- Do not use pipe hooks.
- Observe distance between fittings and mounting points.
- Observe the expansion direction – plan fixed and sliding mounts.

4.2.1 Pipe Hangers and Supports

Pipe supports perform two functions:
- To provide support for the tube.
- To guide the tube during thermal expansion and contraction.

Fittings must not be used as support

- System malfunction may result from additional stress and strain put on the fitting.
- At no point in the system should a fitting be the sole means of support. For example, when installing a tee, both the branch and the trunk must be properly supported.

Industry standard practices and guidelines shall be used for tube layout and support. Viega press connections require no special consideration for support.

Hangers and supports must conform to the local code requirements. In the absence of local code requirements, hangers and supports should conform to ANSI/MSS SP 58 Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application and Installation. For extinguishing systems per NFPA 17A and the system manufacturer's installation, operation, and maintenance manual, the maximum spacing is 10 feet.

4.3 Space Requirements and Intervals

Not enough space

Connectors may leak and/or ring/press gun may not fit around the connector.
- Adhere to minimum space requirements.
- Make sure that the space required for pressing tools is available if fittings will be pressed immediately upstream or downstream from wall or ceiling penetrations.
- Take the minimum required distances into consideration during the planning phase of the project whenever possible.

4.3.1 Transition Fittings

4.3.1.1 Threaded Connections

The Viega ProPress Stainless systems can be joined with off-the-shelf threaded fittings made of metal.

In this regard:
- The threaded connection is made first.
- The press connection is made second.

This process avoids unnecessary torsion on the press fitting.

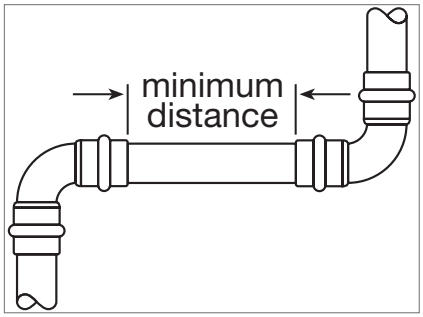
4.3.1.2 Flange Connections

When using Viega flanges, bolt the flange end in place prior to pressing the fitting to the tube.

4.3.2 Minimum Distance between Fittings

To ensure a correct press, a minimum distance between press fittings must be maintained. Failure to provide this distance may result in an improper seal.

For installations where the minimum distance is zero, it is particularly important to ensure the correct insertion depth of the tube into each fitting.



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)
½	0	0
¾		
1		
1¼	7⁄16	10
1½	⅝	15
2	¾	20
2½	⅝	15
3		
4		

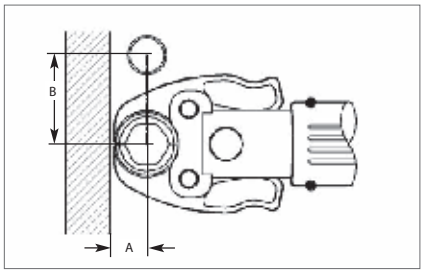
Table 18: Minimum distance between press fittings

4.3.3 ProPress Jaws Clearance Requirements

The minimum distance between tube, or the tube and the wall/ceiling construction, must be taken into consideration in the planning phase for a problem free work process. The following illustrate the clearance requirements for the jaws and fittings and the procedure for pressing fittings in tight quarters.

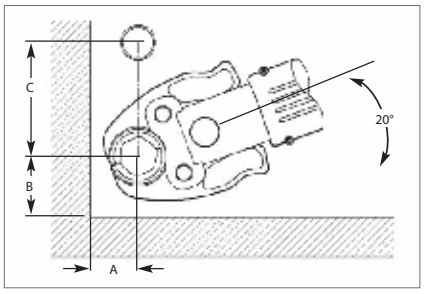
Tubing installed too closely together

Connection may leak
- Adhere to minimum intervals between fittings.
- Insert tube to full insertion depth before pressing.



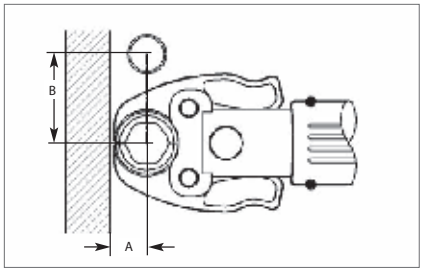
Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)
½	¾	19	1⅝	41
¾	⅞	22	2⅛	54
1	1	26	2½	64
1¼	1⅛	29	2⅞	73
1½	1¾	45	3½	89
2	2	51	4⅜	111

Table 19: ProPress standard jaws clearance requirements



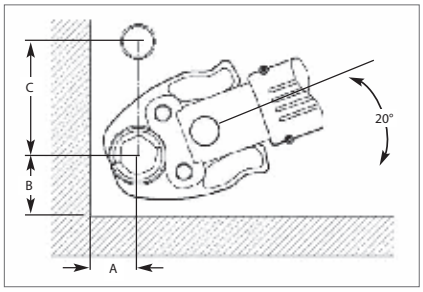
Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
½	⅞	23	1⅜	35	2½	64
¾	1	26	1½	38	2½	64
1	1⅛	29	1¾	45	3	76
1¼	1¼	32	2¼	57	3⅛	80
1½	1⅞	48	2½	64	3¾	95
2	2⅛	54	3⅛	80	5	127

Table 20: ProPress standard jaws clearance requirements between tube, wall, and floor



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)
½	¾	19	2	51
¾	⅞	22	2⅜	60
1		26	2⅝	67
1¼	1⅛	28	3⅛	85

Table 21: ProPress compact jaws clearance requirements

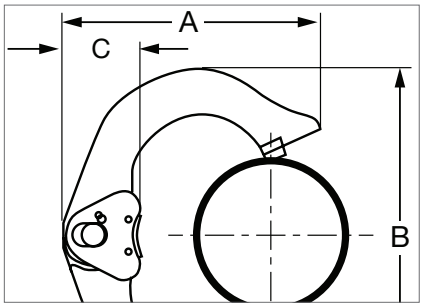


Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
½	⅞	23	1⅜	35	2½	64
¾	1	26	1½	38	2¾	70
1	1⅛	29	1⅝	41	3	76
1¼	1⅝	39	2⅛	53	3⅜	85

Table 22: ProPress compact jaws clearance requirements between tube, wall, and floor

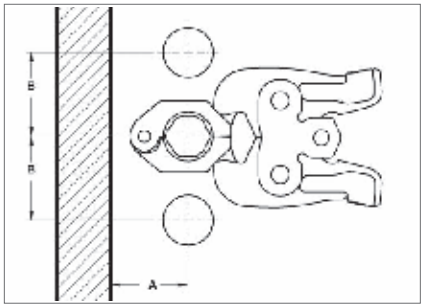
4.3.4 ProPress Rings Clearance Requirements

Ensure that the space required for system pressing tools is available if Viega ProPress Stainless fittings will be installed immediately upstream or downstream from ceiling penetrations.



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
½	2¼	57	2⅛	54	1 1/16	27
¾	2 11/16	68	2⅞	73	1⅛	28
1	2 15/16	75	3 5/16	84	1 3/16	30
1¼	3 5/16	84	3⅞	99		
1½	3 11/16	94	4 5/16	110		
2	4 7/16	113	5 7/16	139		

Table 23: ProPress Rings dimensions

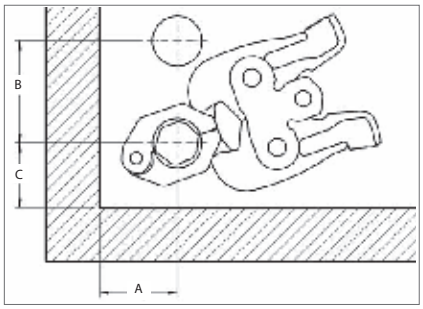


Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)
½	1⅝	41	2 3/16	71
¾	1¾	45	2 3/16	55
1	2	51	1⅝	42
1¼	2 3/16	55	2 15/16	75

Table 24: ProPress Rings with V1 Actuator clearance requirements

Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)
1½	2⅜	60	3 5/16	85
2	2 9/16	65	4⅛	105

Table 25: ProPress Rings with V2 Actuator clearance requirements



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
½	1⅝	41	3 9/16	90	2 5/16	59
¾	1¾	45	3⅝	92	2⅛	55
1	2	51	3 13/16	97	2 3/16	56
1¼	2 3/16	55	3¾	92	2⅛	55

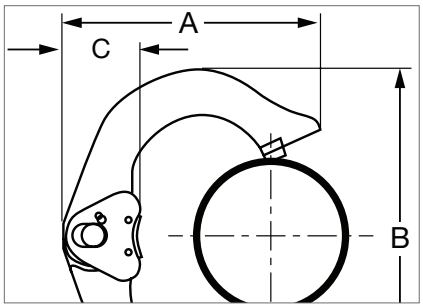
Table 26: ProPress Rings with V1 Actuator clearance requirements between tube, wall, and floor

Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
1½	2⅜	60	5	127	2 3⁄16	56
2	2 9⁄16	65	4¾	121	3 9⁄16	65

Table 27: ProPress Rings with V2 Actuator clearance requirements between tube, wall, and floor

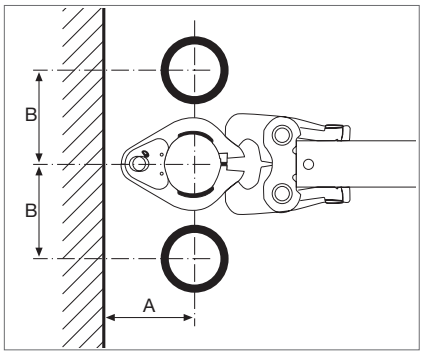
Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
½	1⅝	41	3¼	83	2	51
¾	1¾	45			1⅞	48
1	2	51				
1¼	2 3⁄16	55	3⅜	86		

Table 28: ProPress Rings with C1 Actuator clearance requirements between tube, wall, and floor



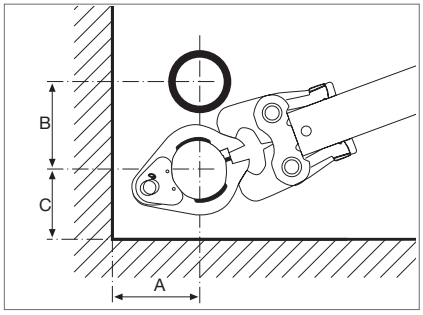
Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
2½	6 3⁄16	157	6 15⁄16	176	2 7⁄16	62
3	7 7⁄16	189	8 13⁄16	224		
4	8 1⁄16	205	10 7⁄16	265		

Table 29: ProPress XL-C rings dimensions



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)
2½	4⅛	105	6	152
3	4⅜	111	7	178
4	5	127	8	203

Table 30: ProPress XL-C rings clearance requirements



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
2½	4⅛	105	6	152	4½	114
3	4⅜	111	7	178	4⅞	124
4	5	127	8	203	5¾	146

Table 31: ProPress XL-C rings clearance requirements between tube, wall, and floor

4.4 Soldering or Brazing

4.4.1 Using ProPress Stainless In Line with Existing Fittings

- The minimum clearance requirement when pressing connections near an existing brazed connection is two tube diameters.
- To ensure proper sealing of both the soldered and press connections, a minimum distance when pressing connections near an existing soldered fitting must be maintained.

Refer to the table below.

Tube Diameter (inches)	Minimum distance from Soldered (inches)	Minimum distance from Soldered (mm)	Minimum distance from Brazed (inches)	Minimum distance from Brazed (mm)
½	¼	7	1	26
¾	¼	7	1½	38
1	7/16	11	2	51
1¼	7/16	11	2½	64
1½	⅝	16	3	76
2	¾	19	4	102
2½	¼	7	5	127
3	¼	7	6	153
4	¼	7	8	204

Table 32: Minimum distance between existing soldered or brazed fitting and ProPress fitting

Check the fitting to make sure there is no residual solder or other foreign debris on the tube that will be inserted into the Viega ProPress Stainless fitting.

4.4.2 Soldering or Brazing In Line with Existing ProPress Stainless 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:

- When soldering near a ProPress connection: three tube diameters.
- When brazing near a ProPress connection: nine tube diameters.

Refer to the table on the following page.

Tube Diameter (inches)	Soldering minimum distance (inches)	Soldering Minimum distance (mm)	Brazing minimum distance (inches)	Brazing Minimum distance (mm)
½	1½	38	4½	114
¾	2¼	57	6¾	172
1	3	76	9	229
1¼	3¾	95	11¼	286
1½	4½	114	13½	343
2	6	153	18	457
2½	7½	191	22½	572
3	9	229	27	686
4	12	305	36	915

Table 33: Minimum distance between soldered fitting and ProPress fitting

The installer should take precautions to keep the Viega ProPress Stainless connection cool:

- Wrap the connection with a cold wet rag.
- Protect the connection with a weld blanket.
- Prefabricate solder connections/welded fittings prior to installing the press fitting. (Ensure tube has cooled before installing the fitting).
- Apply heat sink gel or spray or spot freezing

4.5 Welding

4.5.1 Welding Adjacent to a Press Fitting

To prevent damage to the sealing element, maintain proper welding distances from the fitting. If welding adjacent to the connection, weld a minimum of four inches away.

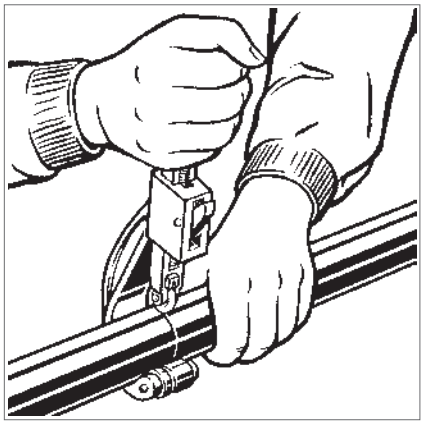
Installers should follow the precautions listed above to keep the Viega ProPress Stainless connection cool.

4.6 Cutting the Tube

Damaged tube and/or sealing element

Press fittings can form improper connections as the result of damaged tube and/or sealing elements.
- Do not use flame cutters when cutting the tube.
- Do not use grease or oils when cutting the tube.

Only cut stainless steel tube with an approved stainless steel pipe cutter.



- Cut the tube square using a displacement-type cutter or fine toothed saw.

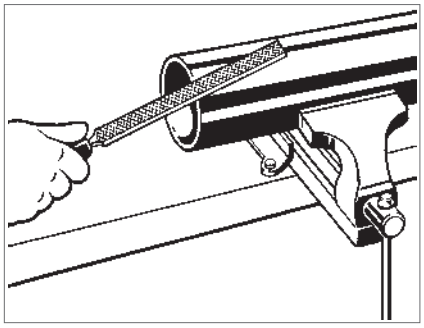
Note: Cut tubing a minimum of four inches away from the contact area of the vise to prevent possible damage to the tubing in the press area.

4.7 Deburring the Tube

Damage resulting from the wrong deburring tool

- Connections may leak if they are damaged by improper deburrer.
- Failure to deburr the tube will reduce the service life of the system and can cause premature leaks.

The tube ends must be thoroughly deburred after cutting. Damage to or twisting of the sealing element during installation is prevented by deburring.



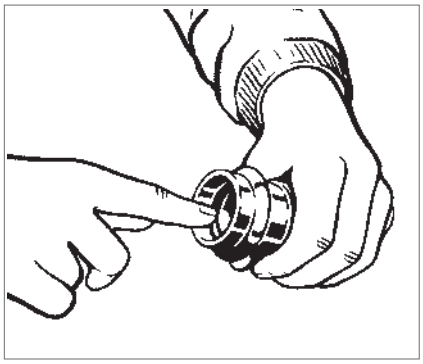
- Deburr inside and outside of the tube to the proper insertion depths.
- Use a wire brush, Scotchbrite pad, sand cloth, or sandpaper to remove loose dirt and rust particles from the pressing area.

4.8 Pressing the Fitting

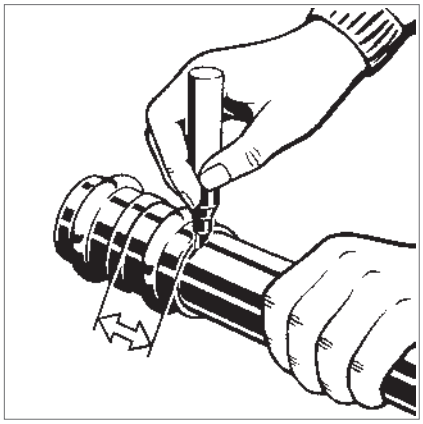
WARNING!
Read and understand all instructions for installing Viega ProPress Stainless fittings. Failure to follow all instructions may result in extensive property damage, serious injury, or death.

4.8.1 Viega ProPress Stainless Installation

For use with Viega stainless steel tubing in ½ inch to 2 inches.



- Check the sealing element for correct fit:
  - The tube end is not bent or damaged.
  - The tube is deburred.
  - The correct sealing element is in the fitting.
  - The sealing element is undamaged.
  - The complete sealing element is in the bead.



- Measure insertion depth (see table below).
- Mark the proper insertion depth on the outside of the tube.

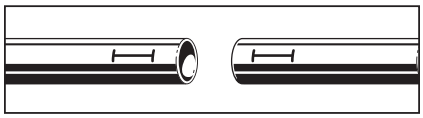
Improper insertion depth

Improper insertion depth may result in an improper seal.
- Be sure to mark the correct insertion depth on the tube before pressing the fitting.

Tube Diameter (inches)	Insertion Depth (inches)
½	¾
¾	⅞
1	⅞
1¼	1
1½	1 7/16
2	1 9/16

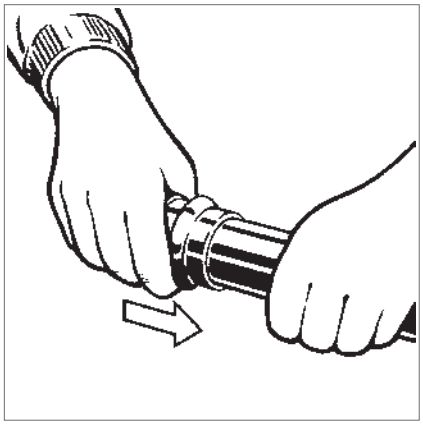
Table 34: Minimum insertion depths for ProPress Stainless

Non-stop couplings and extended non-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, non-stop couplings have minimum and maximum allowable insertion depths. Both the minimum and the maximum insertion depths must be marked and a line connecting the two marks. Drawing a line between the minimum and maximum insertion marks distinguishes a good connection on a non-stop fitting from a bad connection on a fitting with a stop.



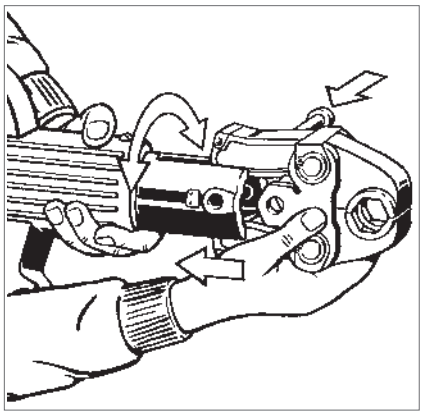
Tube Diameter (inches)	Minimum Insertion Depth (inches)	Minimum Insertion Depth (mm)	Maximum Insertion Depth (inches)	Maximum Insertion Depth (mm)
½	¾	19	⅞	22
¾	⅞	23	1⅛	28
1	⅞	23	1⅛	28
1¼	1	26	1 3/16	30
1½	1 7/16	37	1 9/16	40
2	1 9/16	40	1¾	44

Table 35: Insertion depths for ProPress non-stop couplings

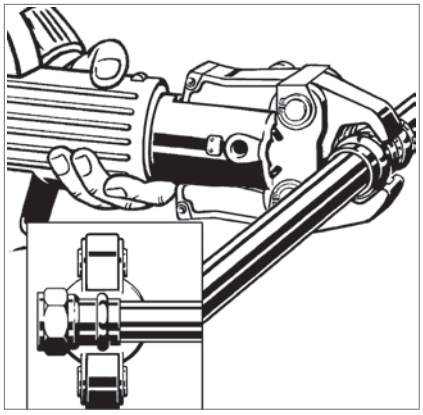


- While turning slightly, slide press fitting onto the tube to the marked insertion depth.

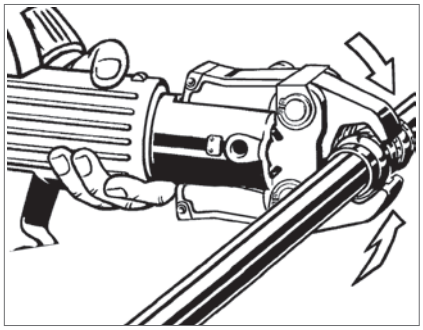
Note: End of tube must contact stop.



- Pull retaining pin out of press tool.
- Insert appropriate jaw.
- Push in retaining pin until it locks the jaw in place.



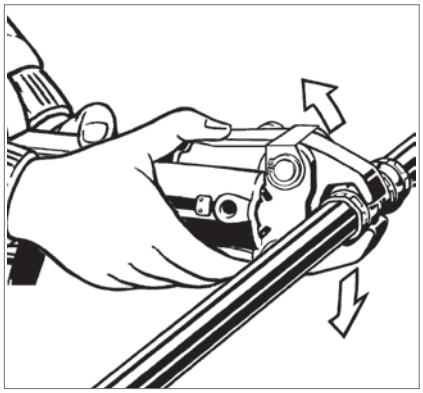
- Open the jaw and place at right angle on the fitting.
- Look at insertion depth mark on the tube to make sure that the tube is properly inserted into the fitting.



- Hold trigger on press tool until press jaws have fully engaged the fitting. Jaws will automatically release after a full press is made.

WARNING!

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



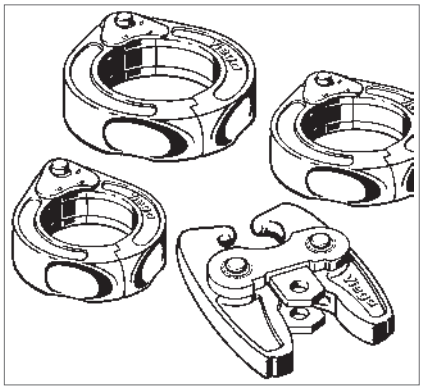
- After pressing, open the jaws.
- Remove the press tool.

  ▷ Fitting is securely pressed.

4.8.2 Viega ProPress Stainless XL Installation

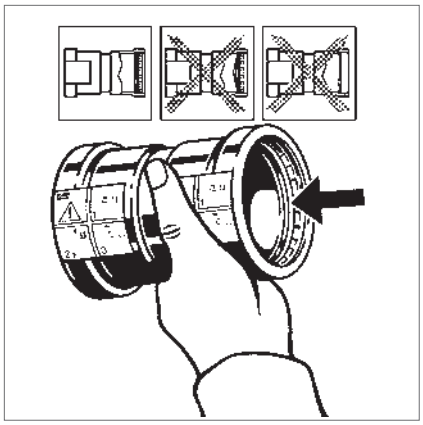
For use with Viega stainless steel tubing in 2½ inches to 4 inches.

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



Use only rings that are compatible with ProPress XL-C fittings.

- Use of incompatible rings will result in an improper connection.
- Do not mix actuators and rings from different manufacturers.
- Do not use rings intended for XL Bronze fittings.



- Check the sealing element, separator ring, and grip ring for correct fit:
  - The tube end is not bent or damaged.
  - The tube is deburred.
  - The correct sealing element is in the fitting: EPDM for 316 or FKM for 304.

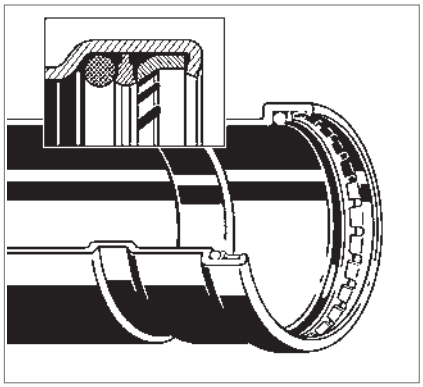
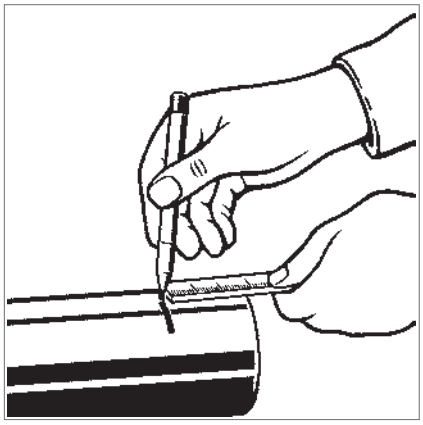


Illustration demonstrates proper fit of grip ring, separator ring, and sealing element.



- Measure insertion depth (see table below).
- Mark the proper insertion depth on the outside of the tube.

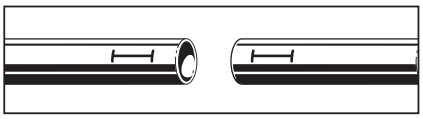
Improper insertion depth

Improper insertion depth may result in an improper seal.
- Be sure to mark the correct insertion depth on the tube before pressing the fitting.

Tube Diameter (inches)	Insertion Depth (inches)
2½	1 11⁄16
3	1 15⁄16
4	2 3⁄8

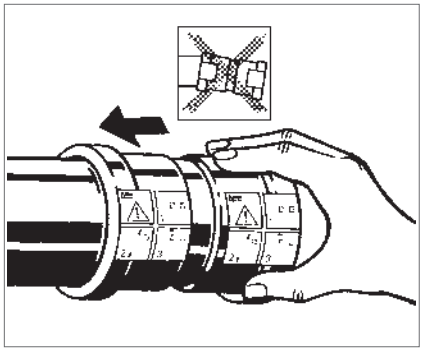
Table 36: Minimum insertion depths ProPress Stainless XL

Non-stop couplings and extended non-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, non-stop couplings have minimum and maximum allowable insertion depths. Both the minimum and the maximum insertion depths must be marked and a line connecting the two marks. Drawing a line between the minimum and maximum insertion marks distinguishes a good connection on a non-stop fitting from a bad connection on a fitting with a stop.



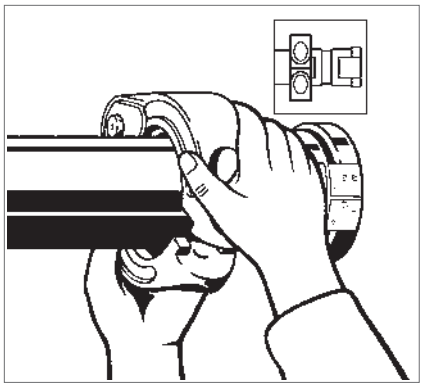
Tube Diameter (inches)	Minimum Insertion Depth (inches)	Minimum Insertion Depth (mm)	Maximum Insertion Depth (inches)	Maximum Insertion Depth (mm)
2½	1 11⁄16	43	2 5⁄8	67
3	1 15⁄16	50	2 15⁄16	75
4	2 3⁄8	60	3 7⁄16	87

Table 37: Insertion depths for ProPress XL-C non-stop couplings

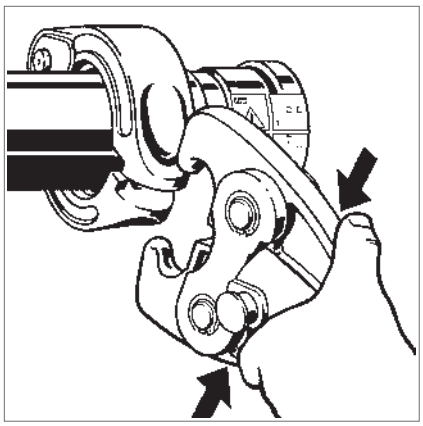


- While turning slightly, slide fitting onto the tube to marked insertion depth.

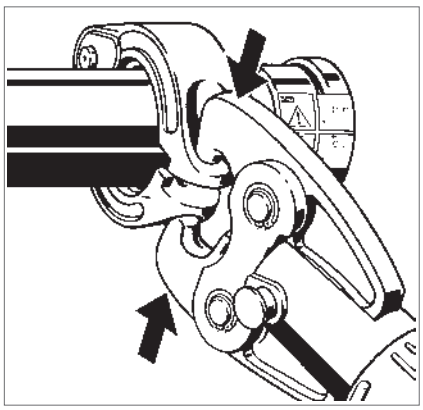
Note: End of tube must contact stop.



- Open XL-C ring and place at right angles on the fitting.
- Ensure that the XL-C ring is engaged on the fitting bead.



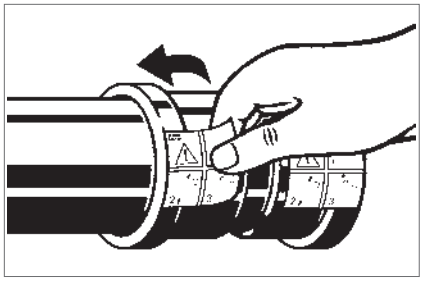
- With V2 Actuator inserted into the press tool, open the V2 Actuator.
- Connect the V2 Actuator to the XL-C Ring.
- Look at insertion depth mark on the tube to make sure that the tube is properly inserted into the fitting.



- Hold the trigger until the Actuator has engaged the XL-C ring.

WARNING!

Keep extremities and foreign objects away from XL-C Ring and V2 ACTUATOR during pressing operation to prevent injury or incomplete press.



- Upon completion of the press, release the V2 Actuator from XL-C ring.
- Remove the XL-C ring from fitting.
- Remove product instruction label from fitting to indicate that press has been completed.

4.9 Pressure Testing

Viega Smart Connect technology provides a quick and easy way for installers to identify connections that need to be pressed. Unpressed connections are located by pressurizing the system with air or water.

Pressure test all installed tubing in accordance with local codes.

Smart Connect Testing
- Testing for unpressed connections using Smart Connect is not a replacement for pressure testing requirements of local codes and standards.
- If testing with compressed air, use an approved leak-detect solution.

Water testing with Viega Smart Connect:
- Use a range of 15 to 85 psi.
- If an unpressed fitting is found, make sure the tube is fully inserted before completing the press.
- If the initial test is successful, system may be pressure tested as required up to 600 psi.

Testing with air can be dangerous at high pressures. When air testing with Viega Smart Connect:
- Use a range of ½ psi to 45 psi (static or dynamic).
- If an unpressed fitting is found, make sure the tube is fully inserted before completing the press.
- If the initial test is successful, system may be pressure tested as required up to 200 psi (static).

4.10 Disposal

Separate the product and packaging materials (e.g. paper, metal, plastic, non-ferrous metals) and dispose in accordance with all national, state, and regional requirements.

5 Limited warranty

5.1 Limited Warranty for Viega ProPress Fittings and Valves

Subject to the conditions and limitations in this Limited Warranty, Viega LLC (VIEGA) warrants to wholesalers and licensed plumbing and mechanical contractors in the United States and Canada that its ProPress fittings, when properly installed in non-industrial and non-marine applications and under normal conditions of use, will be free of failure from manufacturing defect for a period of fifty (50) years from date of installation and that its ProPress valves, when properly installed in non-industrial and non-marine applications and under normal conditions of use, will be free of failure from manufacturing defect for a period of two (2) years from date of installation.

Under this Limited Warranty, you only have a right to a remedy 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. You do not have a remedy under this warranty and the warranty does not apply if the failure or any resulting damage is caused by (1) components other than those manufactured or sold by Viega; (2) not designing, installing, inspecting, or testing the ProPress fittings or valves in accordance with Viega's installation instructions in effect at the time of the installation; applicable code requirements; and accepted industry practice; (3) improper handling and protection of the product prior to and during installation, inadequate freeze protection, exposure to water pressures or temperatures or in applications outside acceptable operating conditions; (4) acts of nature such as, but not limited to, earthquakes, fire, flood, or lightning, or (5) external environmental causes, such as water quality variations, aggressive water, or other external chemical or physical conditions.

In the event of a leak or other failure of the parts covered by this warranty, it is the responsibility of the property owner to obtain and pay for repairs. Only if the warranty applies will Viega be responsible for the remedy under this warranty. The part or parts which you claim failed should be kept and Viega contacted by writing to the address below or telephoning 1-800-976-9819 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 and document the date of installation. 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. Viega will notify you in writing of the results of its review.

In the event that Viega determines that the failure or leak as the result of a manufacturing defect in the part covered by this warranty and that this warranty applies, the EXCLUSIVE AND ONLY REMEDY under this warranty shall be the reimbursement for repair and/or replacement of

the part. VIEGA SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR OTHER DAMAGE (FOR EXAMPLE, WATER OR PROPERTY OR MOLD REMEDIATION) UNDER ANY LEGAL THEORY AND WHETHER ASSERTED BY DIRECT ACTION, FOR CONTRIBUTION OR INDEMNITY OR OTHERWISE.

THE ABOVE 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 a limited warranty shall be found to apply, such warranty is limited to four years. 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 Limited Warranty gives you specific legal rights and you also may have other rights which may vary from state to state. This warranty shall be interpreted and applied under the law of the state in which the product is installed and is intended as a Commercial Warranty.

5.2 Limited Warranty for Viega Metal Systems for Industrial Applications

Industrial applications are defined as non-residential and non-commercial applications not normally accessible to the general public, including manufacturing, mining, process or fabrication environments.

Subject to the terms and conditions of this Limited Warranty, Viega LLC (Viega) warrants to end users, installers and distribution houses that its Viega metal press products (Viega product) when properly installed in industrial applications shall be free from failure caused by manufacturing defects for a period of two (2) years from date of installation.

Under this Limited Warranty, you only have a right to a remedy if the failure or leak resulted from a manufacturing defect in the Viega product and the failure or leak occurs during the warranty period. You do not have a remedy under this warranty and the warranty remedy does not apply if the failure or any resulting damage is caused by (1) components other than those sold by Viega; (2) not designing, installing, inspecting, testing, or maintaining the Viega product in accordance with Viega's installation and product instructions in effect at the time of installation and other specifications and approvals applicable to the installation; (3) improper handling and protection of the Viega product prior to, during and after installation, inadequate freeze protection, or exposure to environmental or operating conditions not recommended for the application; or (4) acts of nature, such as, but not limited to earthquakes, fire, or weather damage. Final approval as to use compatibility to a specific process or fluid application is the responsibility of the engineer of record or responsible design/facilities personnel and this Limited Warranty only applies to manufacturing defects in the Viega Product.

In the event of a leak or other failure in the Viega product covered by this warranty, it is the responsibility of the end user to take appropriate measures to diminish any damage, to include making timely repairs. Only if the warranty applies will Viega be responsible for the remedy under this

warranty. The part or parts which you claim failed should be kept and Viega contacted by writing to the address below or telephoning 1-800-976-9819 within thirty (30) calendar 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 the repair or replacement if performed by you. 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 a Viega location and reasonable access to the site of damage. Viega will notify you in writing as to the results of its review.

In the event that Viega determines that the failure or leak was the result of a manufacturing defect in the Viega Product covered by this warranty and to which this warranty applies, the EXCLUSIVE AND ONLY REMEDY under this warranty shall be the reimbursement for reasonable charges for repair or replacement of the Viega Product itself. VIEGA SHALL NOT BE LIABLE FOR CONSEQUENTIAL OR OTHER DAMAGE (FOR EXAMPLE, ECONOMIC LOSS, WATER OR PROPERTY OR MOLD REMEDIATION) UNDER ANY LEGAL THEORY AND WHETHER ASSERTED BY DIRECT ACTION, FOR CONTRIBUTION OR INDEMNITY OR OTHERWISE.

THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR ANY STATUTE OF LIMITATIONS RELATING TO SUCH WARRANTIES. 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 Limited Warranty gives you specific legal rights and you also may have other rights which may vary from state to state. This warranty shall be interpreted and applied under the law of the state in which the product is installed and is intended as a Commercial Warranty.

5.3 Limited Warranty for Viega Marine Applications

Marine applications are defined as mobile structures used to navigate water or stationary structures in water.

Subject to the terms and conditions of this Limited Warranty, Viega LLC (Viega) warrants to end users, installers and distribution houses that its Viega metal press products (Viega product) when properly installed in approved marine applications and other products sold by Viega LLC when properly installed in marine applications in accordance with our listings shall be free from failure caused by manufacturing defects for a period of two (2) years from date of installation. This warranty applies only to approved applications. Installations that are not approved shall not be covered by this warranty and shall not be the responsibility of Viega LLC.

Under this Limited Warranty, you only have a right to a remedy if the failure or leak resulted from a manufacturing defect in the Viega product and the failure or leak occurs during the warranty period. You do not have a remedy under this warranty and the warranty remedy does not apply

if the failure or any resulting damage is caused by (1) components other than those sold by Viega; (2) not designing, installing, inspecting, testing, or maintaining the Viega product in accordance with Viega's installation and product instructions in effect at the time of installation and other specifications and approvals applicable to the installation; (3) improper handling and protection of the Viega product prior to, during and after installation, inadequate freeze protection, or exposure to environmental or operating conditions not recommended for the application; or (4) acts of nature, such as, but not limited to earthquakes, fire, or weather damage. Final approval as to use compatibility to a specific process or fluid application is the responsibility of the engineer of record or responsible design/facilities personnel and this Limited Warranty only applies to manufacturing defects in the Viega Product.

In the event of a leak or other failure in the Viega product covered by this warranty, it is the responsibility of the end user to take appropriate measures to diminish any damage, to include making timely repairs. Only if the warranty applies will Viega be responsible for the remedy under this warranty. The part or parts which you claim failed should be kept and Viega contacted by writing to the address below or telephoning 1-800-976-9819 within thirty (30) calendar 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 the repair or replacement if performed by you. 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 a Viega location and reasonable access to the site of damage. Viega will notify you in writing as to the results of its review.

In the event that Viega determines that the failure or leak was the result of a manufacturing defect in the Viega Product covered by this warranty and to which this warranty applies, the EXCLUSIVE AND ONLY REMEDY under this warranty shall be the reimbursement for reasonable charges for repair or replacement of the Viega Product itself. VIEGA SHALL NOT BE LIABLE FOR CONSEQUENTIAL OR OTHER DAMAGE (FOR EXAMPLE, ECONOMIC LOSS, WATER OR PROPERTY OR MOLD REMEDIATION) UNDER ANY LEGAL THEORY AND WHETHER ASSERTED BY DIRECT ACTION, FOR CONTRIBUTION OR INDEMNITY OR OTHERWISE.

THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR ANY STATUTE OF LIMITATIONS RELATING TO SUCH WARRANTIES. 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 Limited Warranty gives you specific legal rights and you also may have other rights which may vary from state to state. This warranty shall be interpreted and applied under the law of the state in which the product is installed and is intended as a Commercial Warranty.

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