

1 Viega Barrier PEX Tubing

Description

Viega Barrier PEX designates the requirements for Viega Barrier cross-linked polyethylene (PEX) tubing for use in hydronic heating and cooling systems. Viega Barrier PEX includes an oxygen barrier layer that helps restrict the passage of oxygen through the wall of the tubing. All Viega PEX is manufactured and tested to the requirements of ASTM F876, F877, F3253, F3348, and CSA B137.5 and is CTS-OD (copper tube size - outer dimension controlled) with an SDR (standard dimension ratio) 9 wall thickness. Viega Barrier PEX is compatible with both Viega PEX press fittings and F1807 PEX crimp fittings. Viega has no control over the quality of other manufacturers, therefore, we do not extend any warranty to those components that are not supplied by Viega.

Materials

Viega Barrier PEX tubing is produced from cross-linkable, high density polyethylene resin. This cross-linkable resin is produced by grafting organo-silane molecules onto a base polyethylene chain. A catalyst that initiates the cross-linking process is blended with the resin before extrusion. Cross-linking is conducted after extrusion by exposing the tubing to heat and moisture (steam). Viega Barrier PEX includes four layers. The first layer is cross-linked, high density polyethylene. The second layer is an adhesive for the third layer, the ethylene vinyl alcohol layer (EVOH oxygen barrier). The fourth layer is another thin layer of polyethylene, applied on the outside to protect the EVOH layer from damage. EVOH is highly resistant to the passage of oxygen.

Markings

Tubing is marked with manufacturer, Viega Barrier, nominal size, rating, codes and standards, approvals, date, material code, and location of production (i.e., xxxxFT Viega Oxygen Barrier PEX {size} SDR-9 CTS PEX5306 100 PSI @ 180° F / 160 PSI @ 73° F [cNSF®us-pw-rfh ASTM F876/F877/F3253]; Fitting Systems: PureFlow - ASTM F877/F3347/F3348 NonMetalic Plumbing System Components LISTED FOR FIRE RESISTANCE R27634; FS/SD 25/50 ASTM E84 CAN/ULC S102.2 AND S101 ANSI/UL263, ICC ES - PMG™ - 1015/1038 HUD MR 1276 Date Code Material Code MADE IN THE USA 0005 ft.). Tubing is third party tested to the requirements of the stated ASTM and CSA standards. Tubing includes incremental footage markings to assist with loop layout. Viega Barrier PEX tubing is certified to NSF 61 and 14 for use as part of, or connected to, a potable water system.

Recommended Uses

Install Viega Barrier PEX in accordance with installation manuals provided by manufacturer and applicable code requirements. Water or air can be used to pressure test the system. Please follow manufacturer's requirements on pressure and length of time. Viega Barrier PEX is rated for six months UV protection. For information on the suitability for other applications, contact your Viega representative.

Handling and Installation

Viega Barrier PEX tubing is recommended for hydronic heating, cooling, and snow melting systems using water or a water/glycol mix as the heat transfer media. The tubing is also NSF rated safe for potable water. Tubing may be installed in concrete, gypsum based lightweight concrete, sand, asphalt (in accordance with special guidelines), in or under wood flooring, or behind wallboard or plaster. Viega Barrier PEX may also be used as transfer lines for baseboard heating systems with a maximum operating temperature of 200° F @ 80 psi.

Hanger Spacing

Slab Applications

Where Viega Barrier PEX tubing is installed horizontally in slab applications, the tubing shall be fastened every 2 feet and 3 times at each U-turn.

Hydronic Piping Applications

Where Viega Barrier PEX tubing is used for fluid transfer piping outside of a slab, the tubing shall be fastened horizontally at intervals of 32" and vertically at intervals of 48".

Fastener Makeup

In situations where the fastener will attach directly to the tubing, plastic or plastic coated fasteners that allow the tubing to move slightly as it expands and contracts shall be used.



These are manufacturers suggestions, local code should be followed in areas where something different is specified.

Quality Assurance

Viega Barrier PEX tubing is manufactured and tested to the requirements of ASTM F876, F877, F3253, F3348, and CSA B137.5. The degree of cross-linking of finished tubing is determined by method ASTM D2765.

Property	ASTM Test Method	Typical Values	
		English Unit	SI Units
Density	D 792	–	0.952 g/cc
Melt Index ¹	D 1238	–	0.7g/10 min
Flexural Modulus ²	D 638	150,000 psi	1000 MN/m ²
Tensile Strength @ Yield (2 in/min)	D 638	3,900 psi	26 MN/m ²
Coefficient of Linear Thermal Expansion @ 68° F	D 696	9.2 x 10 ⁻⁵ /°F	1.4 x 10 ⁻⁴ /°C
Hydrostatic Design Basis @ 73° F (23° C)	D 2837	1,250 psi	8.6 MPa
Hydrostatic Design Basis @ 180° F (82° C)	D 2837	800 psi	5.5 MPa
Vicat Softening Point	D 1525	255°F	124°C
Thermal Conductivity	D 177	2.7 BTU/hr/ft ² /°F	1.1 x 10 ⁻³ cal/sec/cm ² /°C

¹ Before Cross-linking

² 73° F

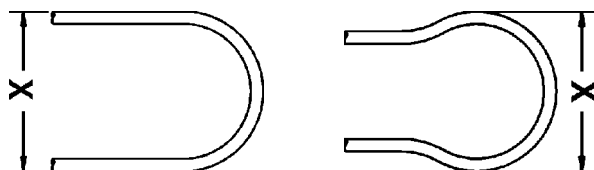
Viega Barrier PEX Oxygen Permeation

Oxygen permeation is less than 4.588x10⁻⁴ grains/(ft²*day) at 104° F (0.32mg/(m² *day) at 40° C) when tested in accordance with ISO 17455.

Tube Spacing

When the tube spacing is less than the minimum recommended bending dimension, the loops ends should be swept out to at least the dimensions shown.

Otherwise, if tube spacing is equal or greater than “X”, a standard loop may be used.



Tube Spacing Dimension X	
Tubing Size (in)	With the Coil
5/16	7
3/8	8
1/2	10
5/8	12
3/4	14
1	18
1 1/4	22
1 1/2	26
2	34

Minimum Bend Radius: 8 x O.D.

Certifications

NSF-pw

NSF-rfh

- Tested for health effects to ANSI/NSF standard 61 and performance to ANSI/NSF standard 14.
- Products meet all applicable performance requirements for a pressure rated floor heating application specified in NSF/ANSI Standard 14.
- PEX 5306 - Tested and listed to the NSF-pw (CL5) chlorine resistance rating for an end use condition of 100% @ 140° F per ASTM F876, which is the highest chlorine resistance rating available through ASTM. When the product is marked with the PEX 5306 NSF-pw (CL5) designation, it affirms the product is approved for use in continuous domestic hot water circulation systems with up to 140° F water temperatures.



- IAPMO Certified



- ICC ES-PMG™ 1015 Hydronic Piping



- NSF certified to CSA B137.5 (Canadian Standards Association)



- Certified to UL 263 & CAN/ULC S101 (US & Canadian fire resistance ratings)
- Certified to ASTM E84 and CAN/ULC S102.2 FS/SD (25/50) (U.S. & Canadian plenum rating)
- ASTM F876: Standard Specification for Crosslinked PEX Tubing
- ASTM F877: Standard Specification for PEX Hot- and Cold-Water Distribution
- ASTM F3253: Standard Specification for PEX Tubing with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems
- ASTM F3348: Standard Specification for Plastic Press Insert Fittings

SDR-9 PEX Tubing ASTM F876/F877/CTS-OD SDR-9					
Tubing Size (in)	O.D. (in)	Wall Thickness (in)	Nom. I.D. (in)	Weight Per Ft (lb.)	Volume Per 100 Ft (Gal.)
5/16	.430±.003	.064±.010	0.292	.0340	0.34
3/8	.500±.003	.070±.010	0.350	.0413	0.50
1/2	.625±.004	.070±.010	0.475	.0535	0.92
5/8	.750±.004	.083±.010	0.574	.0752	1.34
3/4	.875±.004	.097±.010	0.671	.1023	1.82
1	1.125±.005	.125±.010	0.862	.1689	3.04
1 1/4	1.375±.005	.153±.015	1.053	.2523	4.52
1 1/2	1.625±.006	.181±.019	1.243	.3536	6.30
2	2.125±.006	.236±.024	1.629	.6026	10.8

Dimensions are in English units. Tolerances shown are ASTM requirements. Viega PEX is manufactured within these specifications. Viega Barrier PEX tubing is available in both straight lengths and coils.

Pressure Drop Table Expressed as psi/ft.

GPM	5/16"	3/8"	1/2"	5/8"	Size 3/4"	1"	1 1/4"	1 1/2"	2"
0.1	.002	.001							
0.2	.009	.004	.001						
0.3	.018	.008	.002	.001					
0.4	.031	.013	.003	.001					
0.5	.047	.020	.004	.002					
0.6	.066	.027	.006	.003	.001				
0.7	.088	.036	.008	.003	.002				
0.8		.047	.011	.004	.002				
0.9		.058	.013	.005	.002				
1.0		.070	.016	.007	.003	.001			
1.5			.034	.014	.006	.002			
2.0			.058	.024	.011	.003			
3.0				.050	.023	.007			
4.0				.085	.039	.011			
6.0				.181	.082	.024			
8.0					.140	.041			
10.0					.211	.062	.023		
12.0					.296	.087	.032		
14.0							.041		
16.0							.053	.022	
18.0							.065	.027	
20.0							.078	.033	
22.0							.093	.039	
24.0							.108	.045	
26.0								.052	
28.0								.060	
30.0								.067	
32.0								.075	.021
34.0									.023
36.0									.026
38.0									.028
40.0									.031
45.0									.038
50.0									.046
55.0									.055
60.0									.064
65.0									.075
70.0									.085
75.0									.097