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ViegaPEX Barrier Tubing

Scope

This specification designates the requirements for ViegaPEX Barrier cross-linked polyethylene (PEX) tubing for use in hydronic heating and cooling systems. ViegaPEX Barrier includes an oxygen barrier layer that helps restrict the passage of oxygen through the wall of the tubing. All ViegaPEX is manufactured and tested to the requirements of ASTM F876, F877, CSA B137.5 and is CTS-OD (copper tube size outer dimension controlled) with an SDR - (standard dimension ratio) 9 wall thickness. ViegaPEX Barrier is compatible with both ViegaPEX 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

ViegaPEX Barrier 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). ViegaPEX Barrier includes four (4) 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.

Marking and Certification

Tubing is marked with manufacturer, ViegaPEX Barrier, nominal size, rating, codes and standards, approvals, date, material code and location of production (i.e., xxxxFT Viega ViegaPEX Barrier ½" SDR-9 CTS PEX5306 100 PSI @ 180F [cNSF®us-pw-rfh ASTM F876/F877 CSA B137.5] FS/SD 25/50 CAN/ULC S102.2 ICC ES-PMG™-1015/1038 HUD MR 1276 Date Code Material Code MADE IN THE USA 0005FT. 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. ViegaPEX Barrier tubing is certified to NSF 61 and 14 for use as part of, or connected to a potable water system.

Recommended Uses

Install ViegaPEX Barrier 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. ViegaPEX Barrier comes with a 6 month UV protection. For information on the suitability for other applications, contact your Viega representative.

Handling and Installation

ViegaPEX Barrier tubing is recommended for hydronic heating, cooling and snow melting systems using water or a water/glycol mix as the heat transfer media. 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. ViegaPEX Barrier 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 ViegaPEX Barrier tubing is installed horizontally in slab applications, the tubing shall be fastened every 2' and 3 times at each U-turn.

Hydronic Piping Applications

Where ViegaPEX Barrier 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.

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

Property	ASTM Test Method	Typical Values	
		English Units	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/m2
Tensile Strength @ Yield (2 in/min)	D 638	3,900 psi	26 MN/m2
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/ft²/°F	1.1 x 10^{-3} cal/sec/cm/˚C

1. Before Cross-linking
2. 73°F

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

Certifications
NSF-pw - Tested for health effects to ANSI/NSF standard 61 and performance to ANSI/NSF standard 14.

NSF-rfh - 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**

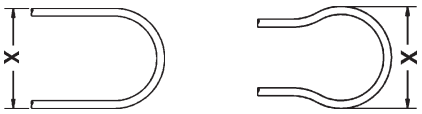
- **ICC ES-PMG™ 1015** Hydronic Piping

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

- **Certified to ASTM E84 and CAN/ULC S102.2 FS/SD (25/50)** (US & Canadian plenum rating)
- **Certified to UL 263 & CAN/ULC S101** (US & Canadian Assembly Rating)

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.



Dimension X

Tubing Size	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.

SDR-9 PEX Tubing
ASTM F876/F877/CTS-OD SDR-9

Tubing Size	O.D.	Wall Thickness	Nom. I.D.	Weight Per Ft	Vol. (gal.)/ 100 Ft
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

NOTE: Dimensions are in English units. Tolerances shown are ASTM requirements. ViegaPEX is manufactured within these specifications.

ViegaPEX Barrier tubing is available in both straight lengths and coils.

ViegaPEX Barrier Oxygen Permeation
All sizes have less than 0.1 gram/m³/day

Note: ViegaPEX Barrier tubing meets DIN 4726 requirements for oxygen tight pipes.

Pressure Drop Table Expressed as psi/ft.
SIZE

GPM	5/16"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
.1	.002	.001							
.2	.009	.004	.001						
.3	.018	.008	.002	.001					
.4	.031	.013	.003	.001					
.5	.047	.020	.004	.002					
.6	.066	.027	.006	.003	.001				
.7	.088	.036	.008	.003	.002				
.8		.047	.011	.004	.002				
.9		.058	.013	.005	.002				
1		.070	.016	.007	.003	.001			
1.5			.034	.014	.006	.002			
2			.058	.024	.011	.003			
3				.050	.023	.007			
4				.085	.039	.011			
6				.181	.082	.024			
8					.140	.041			
10					.211	.062	.023		
12					.296	.087	.032		
14							.042		
16							.053	.022	
18							.065	.027	
20							.078	.033	
22							.093	.039	
24							.108	.045	
26								.052	
28								.060	
30								.067	
32								.075	.021
34									.023
36									.026
38									.028
40									.031
45									.038
50									.046
55									.055
60									.064
65									.075
70									.085
75									.097

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