

FostaPEX High Density Cross-linked Polyethylene (PEX)

Scope

This material specification designates the requirements for Viega FostaPEX multilayer pressure pipe for hot and cold water distribution tubing and hydronic radiant heating applications. All FostaPEX tubing has a fully dimensioned inner PEX core to the copper tube size dimension (CTS), SDR-9 wall thickness and meets the respective requirements of ASTM Standard F876 and F877.

Materials

The multi-layered construction of the FostaPEX tubing is made from one full dimensional inner PEX core with an aluminum and outer PE layer surrounding it. This construction allows the inner layer alone to meet all temperature and pressure requirements of the system. Using the prep tool to remove the outer layers allows the use of the standard Viega PEX Press fitting system.

Marking and Certification

All FostaPEX tubing is marked with the name Viega as the manufacturer, nominal size, plastic tubing material designation code PEX 5306, Chlorine resistance rating NSF-pw (CL5), design pressure and temperature ratings, relevant ASTM standards, manufacturing date and production code, as well as the NSF-pw stamps indicating third-party certification by NSF International for meeting and exceeding performance and toxicological standards, as well as achieving the highest chlorine resistance rating in the PEX industry. NSF conducts random on-site inspections of Viega manufacturing facilities and independently tests FostaPEX tubing for compliance with physical, performance and toxicological standards. FostaPEX is also certified to meet the Uniform Plumbing Code, IAPMO UPC®, CSA (Canadian Standards Association) B137.5, the ICC (International Code Council) Evaluation Service, and HUD (Housing and Urban Development).

Recommended Uses

FostaPEX tubing is intended and recommended for use in hot and cold potable water distribution systems and hydronic radiant heating and cooling systems. Like ViegaPEX Barrier, which has a barrier layer that resists the passage of oxygen through the wall of the tubing, the aluminum layer in FostaPEX offers even higher resistance to oxygen permeation in radiant heating applications. FostaPEX tubing can also be used in water service applications and is virtually impermeable to any soil contaminants. Design temperature and pressure ratings for FostaPEX are 160 psi @ 73°F, 100 psi @ 180°F, and 80 psi @ 200°F. For information on the suitability for other hot and cold water applications not listed here, consult with your Viega representative.

Handling and Installation

FostaPEX cross-linked polyethylene tubing is tough yet flexible. The aluminum layer allows tubing to be bent into position and remain in position when released. However, use of these materials in hot and cold water distribution systems must be in accordance with good plumbing practices, applicable code requirements, and current installation practices available from Viega. FostaPEX is manufactured to meet written national standards. Contact a Viega representative or the applicable code enforcement bureau for information about approvals for specific applications.

| Property | ASTM Test Method | Typical Values | |
|---|------------------|-------------------------------|-------------------------------|
| | | English Units | SI Units |
| Density | D 792 | – | 0.944 g/cc |
| Melt Index ¹ (190° C/2.16 kg) | D 1238 | – | 8.5g/10 min |
| Coefficient of Linear Thermal Expansion @ 68° F | D 696 | 1.3x10 ⁻⁵ in/in/°F | 2.4x10 ⁻⁵ mm/mm/°C |
| Hydrostatic Design Basis @ 73°F (23°C) | D 2837 | 1250 psi | 8.6 MPa |
| Hydrostatic Design Basis @ 180°F (82°C) | D 2837 | 800 psi | 5.5 MPa |

1. Before Cross-linking

Quality Assurance

When the product is marked with the ASTM F876 designation, it affirms that the product was manufactured, inspected, sampled and tested in accordance with these specifications and has been found to meet the specified requirements.

Certifications

NSF-pw - Tested for health effects to ANSI/NSF standard 61 and performance to ANSI/NSF 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 and has a maximum UV rating of 6 months. This UV rating is based on the product's inner PEX layer, but when combined with its outer aluminum and PE layers, it has an extended UV rating.



- **IAPMO Certified**



- **ICC ES-PMG™ 1038/1015**
plumbing and heating systems



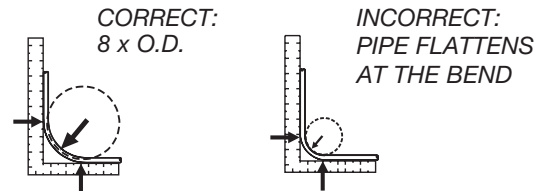
- **NSF certified to CSA B137.5**
(Canadian Standards Association)



- **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)

HUD (Housing and Urban Development) - MR 1276

Minimum Bend Radius



Note: FostaPEX tubing may be bent to a minimum of 3.5 x O.D. with use of a Viega pipe bender.

Minimum Burst Pressure (PSI) Per ASTM F876/F877

| SIZE | 73°F (23°C) | 180°F (82°C) |
|------|-------------|--------------|
| 1/2" | 480 | 215 |
| 5/8" | 475 | 200 |
| 3/4" | 475 | 210 |
| 1" | 475 | 210 |

Thermal Conductivity

| SIZE | BTU/(Ft*hr*°F) | W(m*°K) |
|------|----------------|---------|
| 1/2" | .484 | .838 |
| 5/8" | .516 | .892 |
| 3/4" | .547 | .946 |
| 1" | .711 | 1.230 |

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

| Part No | Tubing Size | Wall O.D. | Nom. Thickness | I.D. | Weight Per Ft | Volume(Gal.) Per 100 Ft |
|---------|-------------|------------|----------------|-------|---------------|-------------------------|
| 35020 | 1/2" | 0.625±.004 | 0.070+.010 | 0.475 | .0600 | 0.92 |
| 35030 | 5/8" | 0.750±.004 | 0.083+.010 | 0.574 | .0900 | 1.34 |
| 35040 | 3/4" | 0.875±.004 | 0.097+.010 | 0.671 | .1200 | 1.82 |
| 35060 | 1" | 1.125±.005 | 0.125+.013 | 0.863 | .2000 | 3.04 |

NOTE: Dimensions are in English units. Tolerances shown are ASTM requirements. Viega FostaPEX is manufactured within these specifications. (These dimensions do not reflect the outer aluminum and PE layers.)



Flow Velocity Table

| Flow Rate GPM | Flow Velocity ft/Sec | | | | |
|------------------|----------------------|------|------|------|--|
| | ½ | ¾ | 1 | 1 ¼ | |
| 0.5 | 0.9 | 0.6 | | | |
| 0.75 | 1.4 | 0.9 | 0.7 | | |
| 1.0 | 1.8 | 1.2 | 0.9 | 0.5 | |
| 1.5 | 2.7 | 1.9 | 1.4 | 0.8 | |
| 2.0 | 3.6 | 2.5 | 1.8 | 1.1 | |
| 2.5 | 4.5 | 3.1 | 2.3 | 1.4 | |
| 3.0 | 5.4 | 3.7 | 2.7 | 1.6 | |
| 3.5 | 6.3 | 4.3 | 3.2 | 1.9 | |
| 4.0 | 7.2 | 5.0 | 3.6 | 2.2 | |
| 4.5 | 8.1 | 5.6 | 4.1 | 2.5 | |
| 5.0 | 9.1 | 6.2 | 4.5 | 2.7 | |
| 6.0 | 10.9 | 7.4 | 5.4 | 3.3 | |
| 7.0 | | 8.7 | 6.4 | 3.8 | |
| 8.0 | | 9.9 | 7.3 | 4.4 | |
| 9.0 | | 11.2 | 8.2 | 4.9 | |
| 10.0 | | | 9.1 | 5.5 | |
| 11.0 | | | 10.0 | 6.0 | |
| 12.0 | | | 10.9 | 6.6 | |
| 13.0 | | | 11.8 | 7.1 | |
| 14.0 | | | | 7.7 | |
| 15.0 | | | | 8.2 | |
| 16.0 | | | | 8.8 | |
| 17.0 | | | | 9.3 | |
| 18.0 | | | | 9.9 | |
| 19.0 | | | | 10.4 | |
| 20.0 | | | | 11.0 | |
| 25.0 | | | | | |
| 30.0 | Velocity > 12 ft/Sec | | | | |
| 35.0 | | | | | |
| 40.0 | | | | | |
| 45.0 | | | | | |
| 50.0 | | | | | |
| 55.0 | | | | | |
| 60.0 | | | | | |
| 65.0 | | | | | |
| 70.0 | | | | | |
| 75.0 | | | | | |

Pressure Loss Table

| Flow Rate GPM | 60°F (16°C) Water | | | | |
|------------------|--|------|------|-------------------------|--|
| | Pressure Loss PSI/ 100 ft of Pipe | | | | |
| | ½ | ¾ | 1 | 1 ¼ | |
| 0.5 | | | | | |
| 0.75 | | | | | |
| 1.0 | 1.6 | | | Pressure Loss <1 PSI | |
| 1.5 | 3.4 | 1.3 | | | |
| 2.0 | 5.8 | 2.3 | 1.1 | | |
| 2.5 | 8.7 | 3.5 | 1.6 | | |
| 3.0 | 12.2 | 4.9 | 2.3 | | |
| 3.5 | 16.2 | 6.5 | 3.0 | | |
| 4.0 | 20.8 | 8.3 | 3.9 | 1.1 | |
| 4.5 | 25.8 | 10.3 | 4.8 | 1.4 | |
| 5.0 | 31.4 | 12.5 | 5.9 | 1.7 | |
| 6.0 | 44.0 | 17.5 | 8.2 | 2.4 | |
| 7.0 | | 23.3 | 10.9 | 3.2 | |
| 8.0 | | 29.9 | 14.0 | 4.1 | |
| 9.0 | | 37.1 | 17.4 | 5.1 | |
| 10.0 | | | 21.1 | 6.2 | |
| 11.0 | | | 25.2 | 7.4 | |
| 12.0 | | | 29.6 | 8.8 | |
| 13.0 | | | 34.3 | 10.1 | |
| 14.0 | | | | 11.6 | |
| 15.0 | | | | 13.2 | |
| 16.0 | | | | 14.9 | |
| 17.0 | | | | 16.7 | |
| 18.0 | | | | 18.5 | |
| 19.0 | | | | 20.5 | |
| 20.0 | | | | 22.5 | |
| 25.0 | | | | | |
| 30.0 | Pressure Loss Excessive as Flow velocity is > 12 ft/Sec | | | | |
| 35.0 | | | | | |
| 40.0 | | | | | |
| 45.0 | | | | | |
| 50.0 | | | | | |
| 55.0 | | | | | |
| 60.0 | | | | | |
| 65.0 | | | | | |
| 70.0 | | | | | |
| 75.0 | | | | | |

NOTE: Pressure Loss based on Hazen-Williams Formula (C = 150)
 Pressure Loss for Actual Length can be calculated by following formula:
 Actual Length / 100 ft X Value from chart above

This document subject to updates. For the most current Viega technical literature please visit www.viega.us.
 Click Services -> Click Electronic Literature Downloads -> Select Product Line -> Select Desired Document

Viega LLC, 100 N. Broadway, 6th Floor • Wichita, KS 67202 • Ph: 800-976-9819 • Fax: 316-425-7618