

Tech Data Sheets

PureFlow PEX Tubing

Scope

This material specification designates the requirements for Viega PureFlow PEX tubing. All Viega PureFlow PEX tubing is copper tube size dimension (CTS), SDR-9 wall thickness, and meets the requirements of ASTM F876 and F877.

Materials

Viega PureFlow PEX tubing is manufactured from a cross-linkable, high-density polyethylene produced by grafting organo-silanes onto a polyethylene base. A catalyst (accelerator) added to the cross-linkable polyethylene during extrusion initiates the cross-linking process. Cross-linking is completed with hot water or steam. The antioxidant blend and UV stabilizers within the resin are responsible for ensuring that the tubing will not lose its physical strength as well as its long term Chlorine/ORP resistance, which are the highest in the industry today, when exposed to UV light within the stated duration.

Marking and Certification

All Viega PureFlow PEX tubing is marked with:

- Manufacturer name: Viega
- Nominal size
- Plastic tubing material designation code:
PEX 5306 for red, blue, white, and black PEX or
PEX 5006 for purple PEX
- Chlorine resistance rating: NSF-pw (CL5)
- Design pressure and temperature ratings
- Relevant ASTM standards
- Manufacturing date and production code

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 Viega PureFlow PEX tubing for compliance with physical, performance, and toxicological standards.

Viega PureFlow PEX is also certified to meet the Uniform Plumbing Code, IAPMO UPC®, UL (Underwriters Laboratories) UL 1821 (cULus) (*Black Viega PureFlow PEX sized 3/4" through 2" only*), CSA (Canadian Standards Association) B137.5 (cNSFus) the ICC (International Code Council) Evaluation Service, and HUD (Housing and Urban Development).

Recommended Uses

- Viega PureFlow PEX red, blue, and white tubing comes in 3/8" to 1" sizes and is intended and recommended for use in hot and cold potable water distribution systems. Viega PureFlow PEX red, blue, and white tubing can also be used in “continuously recirculating” plumbing systems at temperatures of up to 140°F while still maintaining excellent chlorine resistance.
- Viega PureFlow PEX black tubing comes in 1/2" to 2" sizes with the 3/4" to 2" sizes intended and recommended for use in residential fire sprinkler systems per NFPA 13D, meeting the requirements of ASTM F876 and UL 1821 (130 psi @ 120°F).
- Viega PureFlow PEX purple tubing is offered in sizes 1/2" to 1" sizes and is intended for non-potable, reclaimed water applications.
- Design temperature and pressure ratings for Viega PureFlow PEX 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 your Viega representative.

Handling and Installation

Viega PureFlow PEX tubing is tough yet flexible. However, it is softer than metals and may be damaged by abrasion or by objects with cutting edges. 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. Viega PureFlow PEX 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	–	0.946 g/cc
Melt Index ^{*1} (190°C/2.16 kg)	D 1238	–	0.7g/10 min
Flexural Modulus ^{*2}	D 790	120,000 psi	830 MPa
Tensile Strength @ Yield (2 in/min)	D 638	2,900 psi	20 MPa
Coefficient of Linear Thermal Expansion @ 68°F	D 696	9.2 x 10 ⁻⁵ /°F	15x10 ⁻⁵ /°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	2.86 Btu•in/(ft ² •hr•°F)	0.41 W/(m•°K)

^{*1} Before cross-linking

^{*2} 73°F

SDR-9 PEX Tubing ASTM F876/F877/CTS-OD SDR-9					
Table Size	O.D.	Wall Thickness	Nom. I.D.	Weight per 100 ft.	Vol. (gal) per 100 ft.
¼"	0.375±.003	0.062+.010	0.241	3.21	0.24
⅜"	0.500±.003	0.070+.010	0.350	4.13	0.50
½"	0.625±.004	0.070+.010	0.475	5.35	0.92
¾"	0.875±.004	0.097+.010	0.671	10.23	1.82
1"	1.125±.005	0.125+.013	0.862	16.89	3.04
1¼"	1.375±.005	0.153+.015	1.054	25.23	4.52
1½"	1.625±.006	0.181+.019	1.244	35.36	6.30
2"	2.125±.006	0.236+.024	1.629	60.26	10.83

Quality Assurance

When the product is marked with the ASTM F876/F877 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

Tested for health effects to ANSI/NSF standard 61 and **NSF-pw** 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 (up to a 140°F water temperature) and has a maximum UV exposure rating of 6 months.

PEX 5006 - 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 5006 NSF-pw (CL5) designation, it affirms the product is approved for use in continuous domestic hot water circulation systems (up to a 140°F water temperature).



IAPMO Certified



ICC ES-PMG™ 1038
(Plumbing applications)



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



UL certified to UL 1821 listing
(130psi @ 120°F) for use in residential fire sprinkler systems per NFPA 13D¹

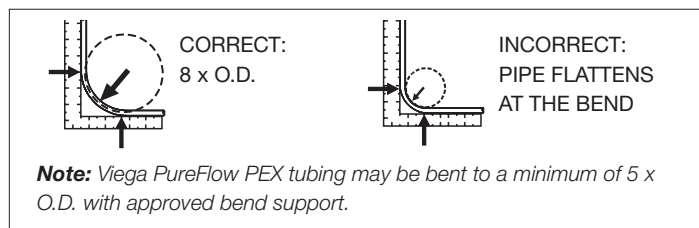


Certified to UL 263 & CAN/ULC S101
(US and Canadian fire resistance ratings)
Certified to ASTM E84 and CAN/ULC S102.2²
FS/SD (25/50) (U.S. and Canadian plenum rating)

HUD (Housing and Urban Development) – MR 1276

^{*1} Black Viega PureFlow PEX sized ¾" through 2" only.
^{*2} Listings cover 2" and smaller tube sizes when wrapped with ½" to 1" thick E84 rated insulation, ½" and smaller with no insulation per ULC S102.2 listing. Tubing may include fitting connections when wrapped.

Minimum Bend Radius



Minimum Burst Pressure (psi) per ASTM F876/F877

Size	73°F (23°C)	180°F (82°C)
3/8"	620	275
1/2"	480	215
3/4"	475	210
1"	475	210
1 1/4"	475	210
1 1/2"	475	210
2"	475	210

Flow Velocity Table

Flow Rate GPM	Flow Velocity ft/sec						
	3/8	1/2	3/4	1	1 1/4	1 1/2	2
0.5	1.7	0.9			Velocity < 0.5 ft/sec		
0.75	2.5	1.4	0.7				
1.0	3.3	1.8	0.9	0.5			
1.5	5.0	2.7	1.4	0.8	0.6		
2.0	6.7	3.6	1.8	1.1	0.7	0.5	
2.5	8.3	4.5	2.3	1.4	0.9	0.7	
3.0	10.0	5.4	2.7	1.6	1.1	0.8	
3.5		6.3	3.2	1.9	1.3	0.9	0.5
4.0		7.2	3.6	2.2	1.5	1.1	0.6
4.5		8.1	4.1	2.5	1.7	1.2	0.7
5.0		9.1	4.5	2.7	1.8	1.3	0.8
6.0		10.9	5.4	3.3	2.2	1.6	0.9
7.0			6.4	3.8	2.6	1.8	1.1
8.0			7.3	4.4	2.9	2.1	1.2
9.0			8.2	4.9	3.3	2.4	1.4
10.0			9.1	5.5	3.7	2.6	1.5
11.0			10.0	6.0	4.0	2.9	1.7
12.0			10.9	6.6	4.4	3.2	1.8
13.0			11.8	7.1	4.8	3.4	2.0
14.0				7.7	5.1	3.7	2.2
15.0				8.2	5.5	4.0	2.3
16.0				8.8	5.9	4.2	2.5
17.0				9.3	6.3	4.5	2.6
18.0				9.9	6.6	4.8	2.8
19.0				10.4	7.0	5.0	2.9
20.0				11.0	7.4	5.3	3.1
25.0					9.2	6.6	3.8
30.0					11.0	7.9	4.6
35.0		Velocity > 12 ft/sec				9.2	5.4
40.0						10.6	6.2
45.0						11.9	6.9
50.0							7.7
55.0							8.5
60.0							9.2
65.0							10.0
70.0							10.8
75.0							11.5

Pressure Loss Table

Flow Rate GPM	60°F (16°C) Water						
	Pressure Loss psi/ 100 ft. of Pipe						
	3/8	1/2	3/4	1	1 1/4	1 1/2	2
0.5	2.0						
0.75	4.1						
1.0	7.0	1.6		Pressure Loss <1 psi			
1.5	14.9	3.4					
2.0	25.4	5.8	1.1				
2.5	38.5	8.7	1.6				
3.0	53.9	12.2	2.3				
3.5		16.2	3.0				
4.0		20.8	3.9	1.1			
4.5		25.8	4.8	1.4			
5.0		31.4	5.9	1.7			
6.0		44.0	8.2	2.4			
7.0			10.9	3.2	1.2		
8.0			14.0	4.1	1.6		
9.0			17.4	5.1	1.9		
10.0			21.1	6.2	2.3	1.0	
11.0			25.2	7.4	2.8	1.2	
12.0			29.6	8.8	3.3	1.5	
13.0			34.3	10.1	3.8	1.7	
14.0				11.6	4.4	2.0	
15.0				13.2	5.0	2.2	
16.0				14.9	5.6	2.5	
17.0				16.7	6.3	2.8	
18.0				18.5	7.0	3.1	
19.0				20.5	7.7	3.4	
20.0				22.5	8.5	3.8	1.0
25.0					12.8	5.7	1.5
30.0					18.0	8.0	2.2
35.0		Pressure Loss Excessive as Flow velocity is > 12 ft/sec				10.7	2.9
40.0						13.7	3.7
45.0						17.0	4.6
50.0							5.6
55.0							6.6
60.0							7.8
65.0							9.0
70.0							10.4
75.0							11.8

Note: Pressure loss based on Hazen-Williams formula ($C = 150$).

Pressure loss for actual length can be calculated by the following formula: actual length / 100 ft. x value from chart above.