Tech Data

Viega PureFlow® PEX

Scope
This material specification designates the requirements for Viega PureFlow PEX hot and cold water distribution 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. Viega PureFlow PEX is provided in the colors black, red, white, and blue for easy identification of hot and cold lines.

Marking and Certification
All Viega PureFlow PEX 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 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 ¾" 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 tubing is intended and recommended for use in hot and cold potable water distribution systems and residential fire sprinkler systems per NFPA 13D with Black Viega PureFlow PEX tubing in ¾" to 2" sizes meeting the requirements of ASTM F876 and UL 1821 (130 psi @ 120°F). Design temperature and pressure ratings for Viega PureFlow PEX are 160 psi @ 73°F and 100 psi @ 180°F. Viega PureFlow PEX tubing can also be used in “continuously recirculating” plumbing systems at temperatures of up to 140°F while still maintaining excellent chlorine resistance. For information on the suitability for other hot and cold water applications not listed here, consult with your Viega representative.

Handling and Installation
Viega PureFlow PEX cross-linked polyethylene 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.

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

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.

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/(ft²•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 ft.	Vol. (gal) per ft.
⅜"	0.500±.003	0.070+.010	0.350	.0413	0.50
½"	0.625±.004	0.070+.010	0.475	.0535	0.92
¾"	0.875±.004	0.097+.010	0.671	.1023	1.82
1"	1.125±.005	0.125+.013	0.862	.1689	3.04
1¼"	1.375±.005	0.153+.015	1.054	.2523	4.52
1½"	1.625±.006	0.181+.019	1.244	.3536	6.30
2"	2.125±.006	0.236+.024	1.629	.6026	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

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 (up to a 140°F water temperature) and has a maximum UV exposure rating of 6 months.

IAPMO Certified

ICC ES-PMG™ 1038
(Plumbing applications)

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

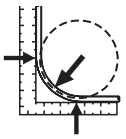
UL certified to UL 1821 listing
(130psi @ 120°F) for use in residential fire sprinkler systems per NFPA 13D*1

Certified to UL 263 & CAN/ULC S101
(US and Canadian fire resistance ratings)
Certified to ASTM E84 and CAN/ULC S102.2*2
FS/SD (25/50) (U.S. and Canadian plenum rating)

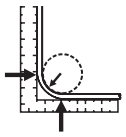
HUD (Housing and Urban Development) – MR 1276

**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



CORRECT:
8 x O.D.



INCORRECT:
PIPE FLATTENS
AT THE BEND

Note: *Viega PureFlow PEX tubing may be bent to a minimum of 5 x O.D. with approved bend support.*

Minimum Burst Pressure (psi) per ASTM F876/F877		
Size	**73°F (23°C)**	**180°F (82°C)**
⅜"	620	275
½"	480	215
¾"	475	210
1"	475	210
1¼"	475	210
1½"	475	210
2"	475	210

Flow Velocity Table

Flow Rate	Flow Velocity ft/sec						
GPM	**⅜**	**½**	**¾**	**1**	**1¼**	**1½**	**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		Velocity > 12 ft/sec			11.0	7.9	4.6
35.0						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						
	⅜	½	¾	1	1¼	1½	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		Pressure Loss Excessive as Flow velocity is > 12 ft/sec			18.0	8.0	2.2
35.0						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.

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