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MATERIAL SPECIFICATION SHEET

VIPERT™ *Potable Tubing*

SCOPE:

This material specification designates the requirements for VIPERT™ Potable hot and cold water distribution tubing. All VIPERT™ Potable tubing is copper tube size dimension (CTS), SDR-9 wall thickness and meets the requirements of ASTM F2769, CSA B137.18, CAN/ULC S101 UL263, and CAN/ULC S102.

MATERIALS:

All VIPERT™ Potable tubing is manufactured from a Bimodal Polyethylene with a Cell Classification of PE445574A, a high-density polyethylene of raised temperature (PE-RT) which does not require cross-linking to achieve the superior strength to withstand high temperatures; the Bimodal Polyethylene does this with tie chain molecules which connect the crystalline structure. The 2-layer product is provided in the colors red, white and blue for easy identification of hot and cold lines.

MARKING & CERTIFICATION:

All VIPERT™ Potable tubing is marked with the name CB Supplies as the manufacturer, nominal size, plastic tubing material designation code PE 4710, oxidative resistance classification code CL5 (indicating that the PE-RT tubing has been tested and meets the ASTM F2769 requirements for the highest chlorine resistance rating in the industry), design pressure and temperature ratings, relevant ASTM standards, manufacturing date and production code, as well as NSF-pw stamps (indicating third-party certification by NSF International for meeting and exceeding performance and toxicological standards, as well as achieving the chlorine resistance rating). NSF conducts random onsite inspections of the manufacturing facilities and independently tests VIPERT™ Potable tubing for compliance with physical, performance, and toxicological standards. VIPERT™ Potable Tubing is also certified to meet the Uniform Plumbing Code®, Uniform Mechanical Code®, International Plumbing Code®, International Residential Code®, International Mechanical Code®, NSF 14 and 61, NSF/ANSI 372 (Lead Free), CSA (Canadian Standards Association) B137.18 (cNSFus), CAN/ULC (Underwriters Laboratory) S101/UL263 and CAN/ULC S102.2 and ASTM E84 through Warnock Hersey.

RECOMMENDED USES:

PLUMBING

VIPERT™ Potable tubing is intended and recommended for use in hot and cold potable water distribution systems. Design temperature and pressure ratings for VIPERT™ Potable are 200 psi @ 73˚F and 100 psi @ 180˚F. VIPERT™ Potable tubing can be used in “continuously recirculating hot water 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 CB Supplies representative.

HANDLING AND INSTALLATION:

VIPERT™ Potable 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 CB Supplies. VIPERT™ Potable tubing is manufactured to meet written national standards. VIPERT™ Potable tubing is compatible with ASTM F1960 cold expansion. Contact a CB Supplies representative or the applicable code enforcement bureau for information about approvals for specific applications.

MATERIAL PROPERTIES:

Property	Test Method	English Units	SI Units
Density	ASTM D1505	–	0.950 g/cc
Melt Index (190°C/2.16 k g)	ASTM D1238	–	0.1 g/10 min
Flexural Modulus[1]	ASTM D790B	152,000 psi	1050 MPa
Tensile Strength (Yield)	ASTM D638	>3,500 psi	>24.1 MPa
Coefficient of Linear Thermal Expansion (20-70°C)	DIN 53752A	8x102/°F	1.95×10^{-4}/°K
Hydrostatic Design Basis @ 73°F (23°C)	ASTM D2837	1600 psi	11 MPa
Hydrostatic Design Basis @ 180°F (82°C)	ASTM D2837	800 psi	5.5 MPa
Thermal Conductivity	ISO 22007-2.2	3.15 Btu in/(hr)(ft^2)(°F)	0.46 Watts/(m^2)(°C)

1. 73°F

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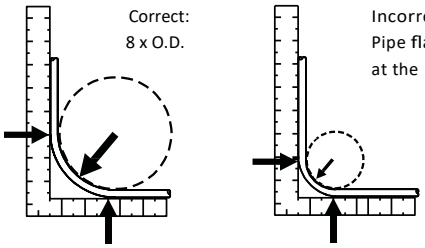
VIPERT™ Potable Tubing

QUALITY ASSURANCE

When the product is marked with ASTM F2769 and CSA B137.18 designations, it affirms that the product was manufactured, inspected, sampled and tested in accordance with these specifications and it has been found to meet the specified requirements.

CERTIFICATIONS

Oxidative resistance classification code CL5 indicates that the tubing has been tested and meets the F2769 requirements for minimum chlorine resistance at the end use condition of 100% 140˚F (60˚C). NSF tested according to ASTM Standard F2023, evaluating the oxidative resistance of cross-linked polyethylene (PEX) tubing and systems to hot chlorinated water greatly exceeding the minimum chlorine resistance requirements of ASTM F2769.



NOTE: Tubing may be bent to a minimum of 5 x O.D. with approved bend support.

MINIMUM BURST PRESSURE (PSI)

ASTM F2769 (CTS-OD) SDR-9

Size	73.4˚ (23˚C)	180˚ (82.2˚C)
3/8"	945	345
1/2"	730	270
3/4"	720	265
1"	720	265
1-1/4"	720	265
1-1/2"	720	265
2"	720	265

NSF-pw — NSF International Performance and Health Effects (Standards NSF 14, 61 & NSF/ANSI 372)

CAN/ULC S101/UL 263 Listed for Fire Resistant & Firestop Products & Systems

NSF Certified to ASTM F2769

Listed International Plumbing Code

Warnock Hersey Certified to CAN/ULC S102.2 & ASTM E84

PRESSURE DROP TABLE

Expressed as PSI/FT Pressure Drop (US Gallons / Minute and Nominal I. D. used for calculation)

	Size						
GPM	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1	.061	.014					
1.5	.130	.030					
2.2	.264	.062					
2.5	.334*	.078					
3	.468	.110	.021				
3.5	.623	.146	.028				
4		.187*	.036				
5		.283	.054				
6		.396	.076	.022			
7		.528	.101	.030			
8			.130	.038			
9			.161*	.048			
10			.196	.058	.022		
11			.234	.069	.026		
12			.275	.081	.031		
13			.381	.094	.035		
14				.108*	.041		
16				.138	.052	.023	
18				.172	.065	.029	
20				.209	.079	.035	
22				.249	.094*	.042	
24					.110	.049	
26					.128	.057	
28					.147	.065	
30					.167	.074*	
32					.188	.084	.023
34						.094	.025
36						.104	.028
38						.115	.031
40						.126	.034
46						.164	.044
52							.055*
80							.123

EXAMPLE: To calculate the pressure drop of a 1/2" line, 40 ft. long, with a 3 gpm flow rate, calculate .110 psi x 40 ft. = 4.4 psi pressure drop. Most plumbing codes require 8 psi residual pressure at the fixture. Refer to your local code requirements.

*Indicates 8 fps maximum velocity allowed by some plumbing codes.

NOTE: Maximum flow for each size based on 12 fps velocity. PSI x 2.307 = head loss.

SDR-9 VIPERT POTABLE TUBING

ASTM F2769 (CTS-OD) SDR-9

Stock Code	Tubing Size	O. D.	Wall Thickness	Nom. I. D.	Weight Per Ft. (lbs)	Volume (Gal)/100 ft.
PRT2	3/8	0.500" ± .003"	0.070" + .010"	0.360	0.0413	0.53
PRT3	1/2	0.625" ± .004"	0.070" + .010"	0.485	0.0535	0.97
PRT4	3/4	0.875" ± .004"	0.097" + .010"	0.681	0.1023	1.90
PRT5	1	1.125" ± .005"	0.125" + .013"	0.875	0.1689	3.13
PRT6	1 1/4	1.375" ± .005"	0.153" + .015"	1.069	0.251	4.5
PRT7	1 1/2	1.625" ± .006"	0.181" + .019"	1.263	0.352	6.3
PRT8	2	2.125" ± .006"	0.236" + .024"	1.653	0.599	10.8

Note: Dimensions are in English units. Tolerances shown are ASTM requirements. VIPERT™ Potable is manufactured to within these specifications.

CB SUPPLIES

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