



Flame Retardant Polyethylene Tubing

Classified Under U.L. 1820.



Bulletin: PP 700

PLEXCO® 2600 Instube®

Flame Retardant (FR) Polyethylene Tubing
For Pneumatic Instrument Controls

Performance Pipe

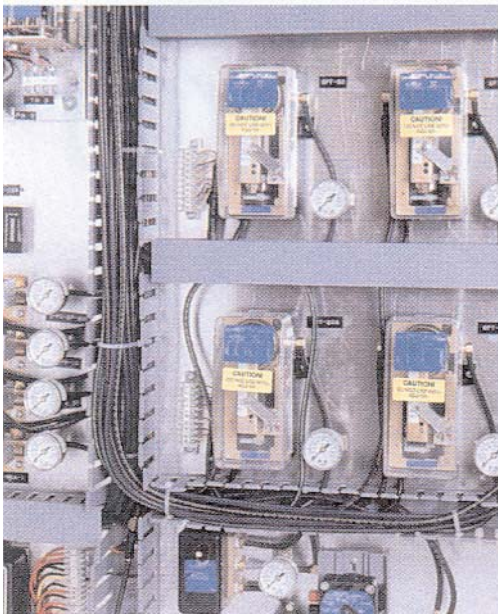
PERFORMANCE PIPE is the successor to Plexco¹ and Driscopipe². On July 1, 2000, Chevron Chemical Company and Phillips Chemical Company joined to form Chevron Phillips Chemical Company LP. Performance Pipe, a division of Chevron Phillips Chemical Company LP, succeeds Plexco and Driscopipe as North America's largest producer of polyethylene piping products for gas, industrial, municipal, mining, oilfield, and utility applications.

Performance Pipe tenders more than forty years of polyethylene pipe manufacturing experience with nine manufacturing facilities ISO certified in eight states.

The unmatched quality and performance of Performance Pipe polyethylene piping products is enhanced and strengthened with over four decades of quality polyolefin plastic resin production from Chevron Phillips Chemical Company LP.

A Commitment to Quality and Performance

Flame Retardant (FR) Polyethylene Tubing



Application

Performance Pipe PLEXCO® 2600 Instube® Flame Retardant Polyethylene Tubing is a superior quality, flame retardant, stress crack resistant, exclusively compounded polyethylene tubing product for use in pneumatic instrument control applications.

Marking

PLEXCO® 2600 Instube® is marked with a white ink numbering system over the full length of the tubing. Bright color stripes are extruded directly into the outside surface of the tubing and provide permanent color-coding that will not wear or fade.

Identification

When color-coded, the combination of color stripes and printline numbering provides for up to 210 pneumatic circuit lines without duplicating a color stripe-number combination.

¹ Formerly - Plexco, a Division of Chevron Chemical Company

² Formerly - Phillips Driscopipe, A Division of Phillips Petroleum Company

NOTICE. This publication is for informational purposes and is intended for use as a reference guide. It should not be used in place of the advice of a professional engineer. This publication does not contain or confer any warranty or guarantee of any kind. Performance Pipe has made every reasonable effort towards the accuracy of the information contained in this publication, but it may not provide all necessary information, particularly with respect to special or unusual applications. This publication may be changed from time to time without notice. Contact Performance Pipe to ensure that you have the most current edition.

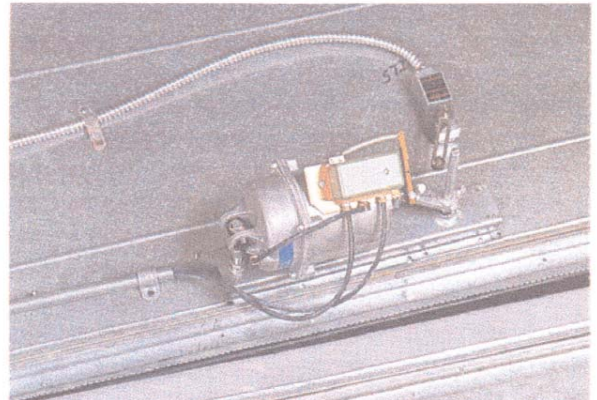
Stress Crack Resistance

Resistance to stress cracking is critical. The possibility of tubing failure occurring behind skyscraper walls 10 or 15 years in the future is of great concern. Since stress crack resistance is one of the most important physical properties of polyethylene instrumentations tubing, Performance Pipe has devised its own test to determine its true value. ESCR test is patterned after the ASTM D1693 test for "Environmental Stress Cracking of Ethylene plastics" but is a much tougher and more stringent test than ASTM D1693. Our 48-hour, 70°C accelerated aging test produces crystal developments within the polymer that would otherwise take years to develop. Tubing samples are then bent into a "V" shape and aged in a chemical stress cracking solution at 50°C for 200 hours. Stress cracking tests are conducted on every production lot of tubing. PLEXCO® 2600 Instube® is recertified annually for conformance with ESCR requirements.

Flame Retardant

"Flame Retardant" or "self-extinguishing" means that the tubing material has the ability to retard burning and extinguish the flame once the flame source is removed.

Industry tests are used to evaluate the burning characteristics of pneumatic tubing materials. ASTM D 635 Standard Test Method for Rate of Burning and/or Extent/Time of Burning of Plastics in a Horizontal Position test materials for horizontal burn rate. PLEXCO® 2600 Instube® meets or exceeds the requirements of ASTM D 635.



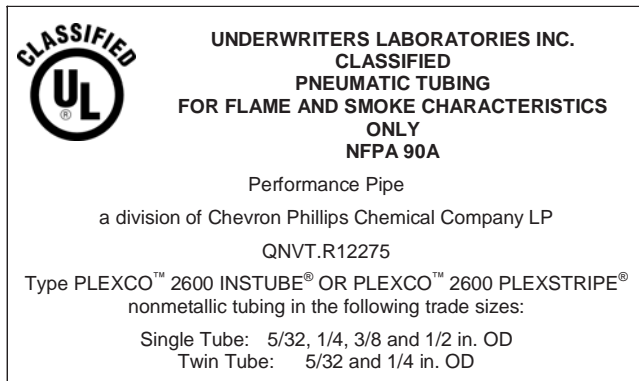
PLEXCO® 2600 Instube® is classified by Underwriters Laboratories. Under UL94 tests conducted by UL to analyze vertical burn characteristics of polymeric materials, PLEXCO® 2600 Instube® has a vertical burn rating of 94V-2.

Plenum Rated Pneumatic Tubing

NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems, permits pneumatic tubing for control systems in ceiling cavity plenums (§2-3.10.1) and raised floor plenums (§2-3.10.5) when it is "listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with the specified test method." The specified test method is UL1820 Standard for Safety Fire Test of Pneumatic Tubing for Flame and Smoke Characteristics. When pneumatic tubing is listed in accordance with NFPA 90A requirements, it is a "plenum rated" material.

<i>Property</i>	<i>Test Method</i>	<i>Value</i>
<i>Maximum peak optical density</i>	UL 1820	< 0.5
<i>Average optical density</i>	UL 1820	< 0.15
<i>Maximum flame spread distance</i>	UL 1820	< 5 ft (< 1.5 m)

PLEXCO® 2600 Instube® and PLEXCO® 2600 Plexstripe® are listed as "UL Classified" by Underwriters Laboratories, UL, under UL 1820 as follows:



PLEXCO® 2600 Instube® meet the requirements of the Uniform Building Code, Uniform Mechanical Code, Southern Building Code and B.O.C.A.

Pneumatic Tubing Products

PLEXCO® 2600 Instube® is a high quality, flame retardant pneumatic control tubing with superior stress crack resistance for reliable, long-term performance. PLEXCO® 2600 Instube® tubing is lightweight and flexible for easy handling and installation.

PLEXCO® 2600 Instube® is marked with a white ink numbering system over the full length of the tubing. Cut the lead end at any given number (from 1 to 30) for easy identification of individual pneumatic circuit tubes. Color-coding is available in seven stripe colors. Up to 210 different pneumatic control circuits can be individually identified without repeating a stripe color-number combination.

PLEXCO® 2600 Instube® is produced in the following sizes and coils for pneumatic control applications.

PLEXCO® 2600 Instube® Product Sizes

Color Coding for PLEXCO® 2600 Instube® † Product Sizes

Nominal Size	Nominal OD	Nominal ID	Nominal Wall	Weight/CLF	Coil Length	Master Pack
5/32" OD	0.156"	0.096"	0.030"	0.60#	500'	2000'
1/4" OD	0.250"	0.170"	0.040"	1.32#	250'/1000'	1000'/2000'
3/8" OD	0.375"	0.250"	0.062"	3.04#	250'/500'	1000'
1/2" OD	0.500"	0.375"	0.062"	4.25#	250'	500'
5/32" Twintube	–	0.096"	0.030"	1.20#	500'	1000'
1/4" Twintube	–	0.170"	0.040"	2.86#	250'	500'

Available in black only.

Nominal Size	Nominal OD	Nominal ID	Nominal Wall	Weight/CLF	Coil Length	Master Pack
5/32" OD	0.156"	0.096"	0.030"	0.60#	500'	2000'
1/4" OD	0.250"	0.170"	0.040"	1.32#	250'/1000'	1000'/2000'
3/8" OD	0.375"	0.250"	0.062"	3.04#	250'/500'	1000'
1/2" OD‡	0.500"	0.375"	0.062"	4.25#	250'	500'

† Available stripe colors: red, white, blue, green, yellow, orange and violet. ‡ Available stripe colors: red, white, blue and green only.

Material and Tubing Specifications

Specifications for PLEXCO™ 2600 Instube® Pneumatic Control Tubing

Property	Test Method	Typical Value
Flame Retardant Compound		
Melt Index	ASTM D 1238	0.6 ± 0.1 g/10 min
Density	ASTM D 792	1.1 ± 0.005 g/cm ³
Tensile Strength – ultimate (20 in./min)	ASTM D 638	> 2000 psi (> 1.8 MPa)
Tensile Elongation – ultimate (20 in./min.)	ASTM D 638	> 800 %
Flexural Modulus	ASTM D 747	45,000 psi (3,103)
Shore A Hardness	ASTM D 1700	97 ± 3
Shore D Hardness	ASTM D 1700	45 ± 3
Water Absorption	ASTM D 570	5% maximum
Polyethylene Classification	ASTM D 3350	PE 11 or PE 12
Stress-Crack Resistance	ASTM D 1693	> 200 hours non -failure
Brittleness Temperature	ASTM D 745	< -104.8°F (< -76°C)
Pneumatic Instrument Control Tubing		
Burst Pressure	ASTM D 1599	5/32" – > 500 psi (> 3.4 MPa) 1/4" – > 500 psi (> 3.4 MPa) 3/8" – > 500 psi (> 3.4 MPa) 1/2" – > 350 psi (> 3.4 MPa)
Minimum Bend Radius	–	5/32" – 0.50 in. (13 mm) 1/4" – 0.75 in. (19 mm) 3/8" – 1.50 in. (38 mm) 1/2" – 1.88 in. (48 mm)
Maximum Allowable Pulling Load During Installation	–	5/32" – 15 lb. (66 N) 1/4" – 33 lb. (147 N) 3/8" – 76 lb. (338 N) 1/2" – 106 lb. (472 N) 5/32" Twintube – 30 lb. (133 N) 1/4" Twintube – 65 lb. (289 N)
Flammability	UL 94 UL 910	V-2 UL Classified (NFPA 90A)
Flame Propagation	UL 1820	< 5 ft (< 1.5 m)
Smoke Density – Peak Optical Density	UL 1820	< 0.5
Smoke Density – Average Optical Density	UL 1820	< 0.15
<p>NOTICE – This table provides typical physical property information for polyethylene compounds used to manufacture PLEXCO® 2600 Instube® tubing products. It is intended for comparing compounds and tubing. It is not a product specification, and it does not establish minimum or maximum values or manufacturing tolerances for compounds or tubing. The typical property values for compound were determined using compression -molded plaques prepared from compound. Values obtained from tests of specimens taken from tubing can vary from these typical values. Performance Pipe has made every reasonable effort to ensure the accuracy of this information, but this table may not provide all necessary information, particularly with respect to special or unusual applications. This information may be changed from time to time without notice. Contact Performance Pipe to determine if you have the most recent edition.</p>		



CONTACT INFORMATION:

PERFORMANCE PIPE, a division of
Chevron Phillips Chemical Company LP
PO Box 269006
Plano, TX 75026-9006

To secure product information
or technical assistance:

Phone: 800-527-0662
Fax: 972-599-7348
www.performancepipe.com