Why Use PolyPipe®?

PolyPipe® offers a complete range of extra high molecular weight (EHMW), high-density polyethylene (HDPE) pipe. We are known for state-of-the-art facilities, and a team of people dedicated to the industry and to the customers we serve.

PolyPipe® is one of the largest manufacturers of pressure-rated polyethylene pipe. PolyPipe® uses only select resins that meet our demanding standard of excellence and quality. As a result, you can count on the performance of any PolyPipe® system as specified.

PolyPipe® is strategically positioned to be your single source provider of polyethylene pipeline assistance. With extrusion facilities and a national network of key distributors covering all regions of the United States, Mexico and Canada, PolyPipe® can be your pipeline to the world. Our products are in service all over North and South America, as well as Europe, the Middle East and Southeast Asia.

Understanding your objective is our first priority.
Our ability to match specific products and systems to a wide range of client needs has been recognized as outstanding in the industry.

We produce millions of feet of polyethylene pipe, year in... year out, for a variety of customers all over the globe.

- PolyPipe® has six plant locations throughout North America and a licensing agreement in Mexico for the best possible geographic location to meet your needs.
- PolyPipe® is nimble enough to satisfy your most demanding requirements. Our customer service attitude is recognized as “best in class”.
- PolyPipe® is an active member of the Plastics Pipe Institute (PPI). We also sit or chair many associations and standard committee groups.

- Feel free to contact our Technical Services Department, staffed by licensed Professional Engineers who are always ready to address your questions. (940) 668-4419

Major Industries Served

- Natural Gas Distribution
- Pipeline Rehabilitation
- Gas Gathering
- Water & Sewer
- Oilfield Applications
- Landfill
- Power Plants
- Industrial & Mining
- Chemical
- Hazardous & Solid Waste

Quality Assurance in Product Design and Materials

We define quality as an inherent value that results in superior performance. PolyPipe® is the engineering leader in the field, offering knowledgeable, enthusiastic technical support, exacting laboratory procedures and testing methods, and a constant quest for manufacturing excellence. Quality leadership also demands innovation and improving services that are always customer-based.

PolyPipe® is continually striving to meet the demands of the market today. Our qualification as an ISO 9001 company has given us great confidence in our quality system to ensure quality products are manufactured on a consistent basis. It is the policy of PolyPipe® to achieve total quality system performance by understanding and meeting its customer requirements without error, on time, every time.

At PolyPipe®, quality throughout the manufacturing process is an inherent value that assures the highest performance. Our manufacturing facilities start with only superior grade, polyethylene resins that have been specifically formulated for long-term integrity and performance. Computer controlled extrusion techniques are utilized in the manufacture of our pipe to ensure quality.

Contact PolyPipe® and ask us about the specific advantages we may offer to your unique requirements in your particular industry. We can assure you PolyPipe® offers the best in pipe and services.

Versatile Product Line

PolyPipe® products are ideal for many oil, gas, industrial, mining, municipal and specialty applications.

PolyPipe® offers a versatile product line to meet specific application requirements.

- PolyPipe® offers a unique printline combining both water and industrial applications into one piping product. Inquire about Water/Industrial pipe to reduce your inventory burden and provide the same quality and certifications as if the pipe was application specific.
- Our NSF approved potable water pipe is manufactured in accordance with ASTM and AWWA standards. Our standard product line meets the requirements of NSF-61. Products certified by NSF to Standard-14 are available upon request.
- Lightview™, available in natural and gray, is manufactured in accordance with ASTM F714 to meet specific wastewater requirements. For size and availability, please contact a Customer Service Representative.
- When specifying a piping system for underground fire main and loops, choose PolyPipe® Factory Mutual (FM) approved pipe. FM approved pipe is available in sizes from 4" - 24" IPS, Pressure Class (PC) 150 or 200.
- Perforated pipe is available in a multitude of configurations and is perfect for leachate collections, drainage and landfills.
- PolyPipe® can be produced in metric, iron pipe sizes (IPS) and ductile iron pipe sizes (DIPS).

Advantages of PolyPipe® HDPE EHMW Products

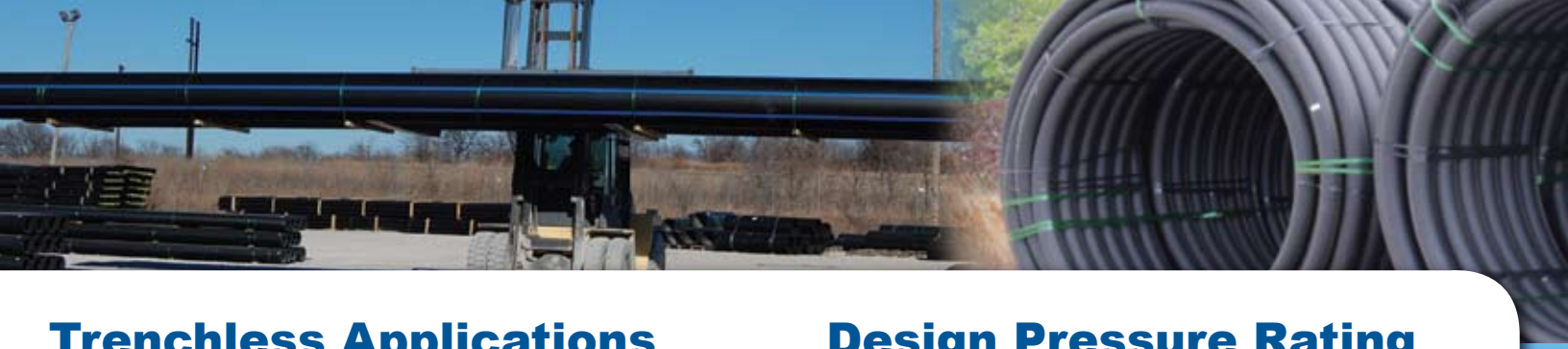
- Durable, long-term strength and integrity
- Flexible and lightweight
- Superior corrosion, chemical and abrasion resistance
- Non-toxic environmentally safe (interior and exterior)
- Indent print for easy long-term identification
- Heat fused, fully restrained, leak proof joints *(Absolutely, zero leakage)*
- Improved flow rates over non-HDPE piping materials
- Cost advantages
- Continuous coiled pipe available from 1/2" to 6" diameter
- Straight length pipe available from 2" to 65" OD
- Available in IPS, DIPS and metric sizes

Polystripe™ pipe can be produced in diameters from 1/2" IPS to 65" OD, is manufactured in accordance with striping codes developed by the Utility Location & Coordination Council of the American Public Works Association (APWA) and can be produced in accordance with the following standards/specifications:

- ASTM D2513
- ASTM F714 Industrial
- ASTM D3035 Industrial
- AWWA C-901 Water Pipe
- AWWA C-906 Water Pipe
- API 15LE Oil Patch Pipe

Polystripe™ Standard Color Designations

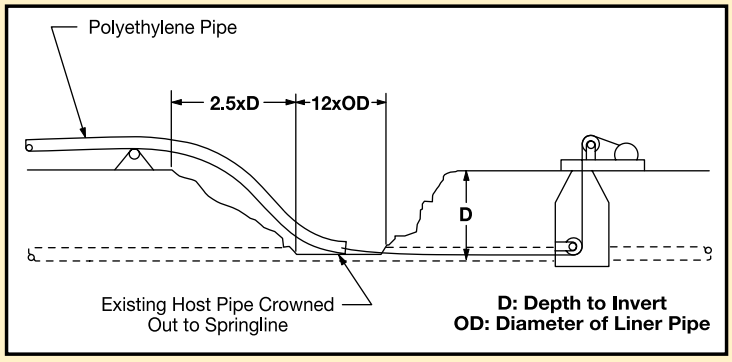
- ***Red*** **-** Electric power lines, conduit lighting cables, and FM approved underground fire mains
- ***Orange*** **-** Communications, alarm or signal lines, cables or conduits
- ***Yellow*** **-** Gas distribution
- ***Blue*** **-** Potable water lines
- ***Green*** **-** Sewer and drain lines
- ***Purple*** **-** Reclaim water lines



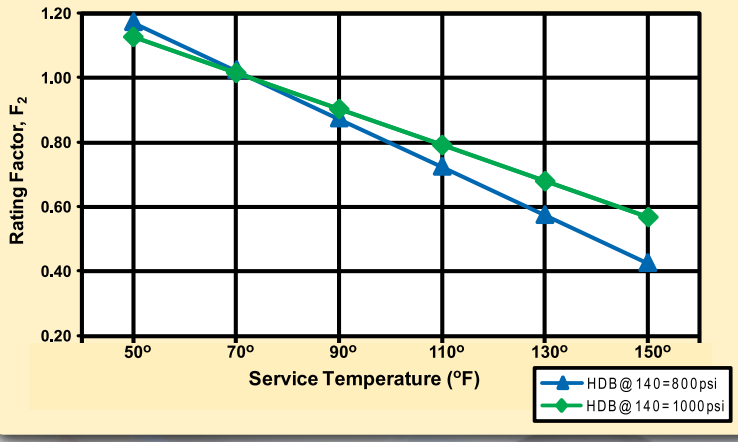
Trenchless Applications

PolyPipe® PE3608 and PE4710 products are excellent choices for horizontal and directional drilling applications. The inherent properties of HDPE accommodate all of the desired performance characteristics of these demanding applications. HDPE can be installed with trenchless technology for a variety of applications including new pipe installation, replacement pipe installation incorporating pipe bursting technology, and lining applications for pipeline rehabilitation. Trenchless applications are a cost effective alternative to open-cut installation. In addition, trenchless applications have minimal surface disruption and can be applied in environments with limited access.

Typical Slip-Lining Access Pit for Pre-Fused Lengths of Solid Wall Polyethylene Liner



Temperature Rating Factors Based Upon HDB@140°F



Design Pressure Rating

The pressure rating of PolyPipe® is determined in accordance with the Plastics Pipe Institute (PPI) recommended hydrostatic design basis (HDB) for the material, the physical dimensions of the pipe and the appropriate design and service factors.

Pressure design calculations are based on the following formula, which relates the stress on the pipe wall to the internal pressure:

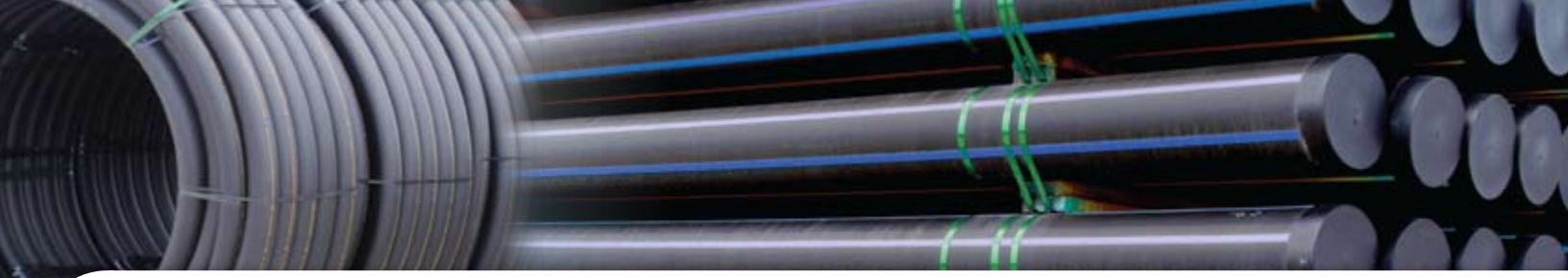
$$P = \frac{2 \cdot S}{DR - 1} \cdot DF \cdot F_1 \cdot F_2$$

Where,

P	=	*Internal pressure, psig*
S^*	=	*Long term hydrostatic strength, psi (1,600 for PolyPipe® PE3608)*
DR	=	*Dimension Ratio (OD/t)*
OD	=	*Outside diameter, inches*
t	=	*Minimum wall thickness, inches*
DF	=	*Design factor, 0.5 for PE3608, 0.63 for PE4710*
F_1	=	*Service factor (see table)*
F_2	=	*Temperature correction factor*

**Certain standards allow for the use of higher HDS values for PE4710 materials*

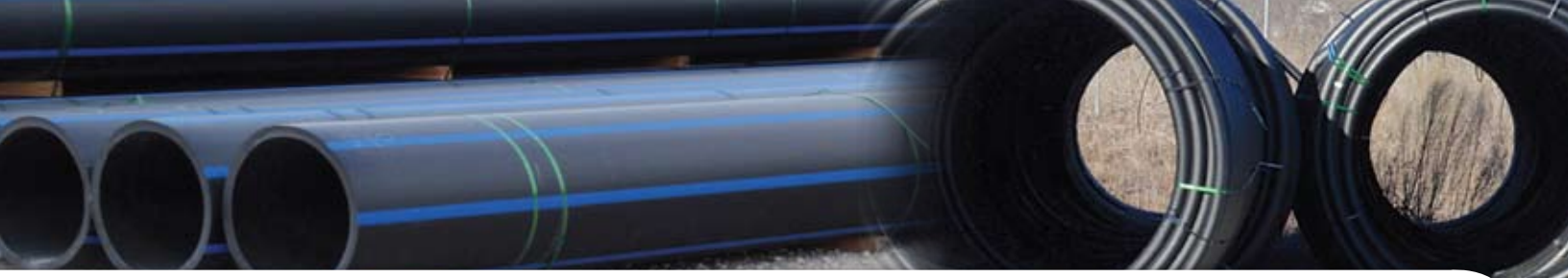
Substance	Service Factor, F_1
Water	1.0
Dry Natural Gas	1.0
Federally Regulated Dry Natural Gas	0.64
Wet Natural Gas	0.5
Crude Oil	0.5



Internal Pressure Ratings* (psig) for PolyPipe® PE4710 HDPE Pipe at Various Temperatures and Time in Service for Water

TEMP, °F	Time in Service, Years	DIMENSION RATIO (DR)							
		7	9	11	13.5	17	21	26	32.5
50°	1	439	368	276	221	177	138	110	88
	5	414	347	260	208	167	130	104	83
	10	402	340	255	204	163	127	102	81
	20	394	330	248	198	158	124	99	79
	50	378	317	238	190	152	119	95	76
73.4°	50	335	265	200	160	130	100	80	65
100°	1	330	251	188	150	120	94	75	60
	5	311	236	177	142	113	89	71	57
	10	302	231	173	139	111	87	69	55
	20	296	225	168	135	108	84	67	54
	50	284	216	162	130	104	81	65	52
125°	1	275	192	144	115	92	72	58	46
	5	260	181	136	109	87	68	54	43
	10	253	177	133	106	85	66	53	42
	20	248	172	129	103	83	64	52	41
	50	238	165	124	99	79	62	50	40
140°	1	245	156	117	93	75	58	47	37
	5	231	147	110	88	70	55	44	35
	10	224	142	106	85	68	53	43	34
	20	220	140	104	83	67	52	42	33
	50	211	134	100	80	64	50	40	32

**Multiply these values by 0.5 to obtain pressure ratings for wet natural gas or crude oil applications.*



Basic Features and Benefits of PolyPipe®

PolyPipe® offers substantial advantages in products and services:

Lightweight

PolyPipe® is lighter than traditional piping material, which results in substantial savings for handling and faster, less costly installation.

Flexible

Polyethylene pipe is produced in straight lengths or in coils. Since PE is not a brittle material, it can be installed with bends and over uneven terrain easily in continuous lengths without additional welds or couplings.

An inherent advantage of PolyPipe® is its flexibility and resiliency. The minimum-bending radius is based upon the Dimension Ratio (DR) of the pipe. This radius is determined by multiplying the outside diameter of the pipe (in feet) by the radius factor for the corresponding DR.

DR	Radius Factor
32.5	Diameter x 40
26	Diameter x 36
21	Diameter x 32
17	Diameter x 26
15.5	Diameter x 24
11 or lower	Diameter x 20

**Diameter in feet*

Tough

PE pipe and fittings are well suited for use in slurry applications where its inherent toughness and abrasion resistance can be fully utilized. PE pipe is very resilient and resistant to damage caused by external loads, vibrations and from pressure surges such as water hammer.

Corrosion, Biological and Chemical Resistance

Polyethylene offers highly desirable properties that make it the preferred choice of pipeline material. The inherent properties of polyethylene make it extremely resistant to scale build-up, thus maintaining its flow rates long term. It is impervious to most aggressive chemicals and corrosive elements.

Superior Flow Characteristics

The exceptionally smooth inner surface of PE offers minimal resistance to flow. Unlike other materials, the flow remains relatively constant for the life of the pipe. When using PolyPipe®, a higher maximum flow rate for a given size can be expected compared to other types of piping materials.

Weatherability

The maximum unprotected above ground storage time for PolyPipe® products is dependent upon the color of polyethylene pipe.

PolyPipe® black PE is suitable for long term above ground storage with a 50 year maximum storage time. Further, these products are suitable for long-term service in above ground applications.

For PolyPipe® PE2708 medium density pipe, typically yellow for gas distribution applications, the recommended above ground storage should not exceed four years.

PolyPipe® Lightview™ products, available in gray or natural, and PolyStripe™ products are suitable for outdoor storage for a period of two years.

Joining

PolyPipe® can be joined by a variety of methods. The preferred method is heat fusion: butt, saddle, socket and electrofusion. This type of connection offers a completely leak-proof, fully restrained joint. Polyethylene can also be joined by use of mechanical fittings.

PolyPipe®'s Recommended Heat Fusion Joining Procedures provide guidelines for performing butt, saddle and socket fusions. The manufacturer should be contacted for recommended procedures for electrofusion.

The integrity and versatility of the joining techniques used for polyethylene pipe allow the designer to take advantage of the performance benefits of polyethylene in a wide variety of applications.

TYPICAL PHYSICAL PROPERTIES

Property	ASTM Test Method	*Nominal Values		
		PE4710	PE3608	PE2708
		PolyPlus™, EHMW Plus & GB50	EHMW, PW & GB30	GDY20
Density, Natural	D1505	0.949 gm/cc	0.946 gm/cc	0.940 gm/cc
Density, Black	D1505	0.960 gm/cc	0.955 gm/cc	---
Density, Yellow	D1505	---	---	0.943 gm/cc
Melt Index (190°C/2.16 kg)	D1238	0.08 gm/10 min.	0.07 gm/10 min.	0.20 gm/10 min.
Flow Rate (190°C/21.6 kg)	D1238	7.5 gm/10 min.	8.5 gm/10 min.	20.0 gm/10 min.
Tensile Strength @ Ultimate	D638	35.1 MPa (5,100 psi)	34.5 MPa (5,000 psi)	31.0 MPa (4,500 psi)
Tensile Strength @ Yield	D638	24.8 MPa (3,600 psi)	24.1 MPa (3,500 psi)	19.3 MPa (2,800 psi)
Ultimate Elongation	D638	>800%	>800%	>800%
Flexural Modulus 2% Secant	D790	1,034 MPa (150,000 psi)	938 MPa (136,000 psi)	938 MPa (100,000 psi)
Environmental Stress Crack Resistance (ESCR)				
F_0, Condition C	D1693	---	>10,000 hrs	>10,000 hrs
PENT	F1473	>3,000 hrs	>100 hrs	>15,000 hrs
Brittleness Temperature	D746	<-117°C (<-180°F)	<-117°C (<-180°F)	<-117°C (<-180°F)
Hardness, Shore D	D2240	64	64	64
Vicat Softening Temperature	D1525	124°C (255°F)	124°C (255°F)	124°C (230°F)
Izod Impact Strength (Notched)	D256	0.42 KJ/m (8 ft-lb_f/in)	0.37 KJ/m (7 ft-lb_f/in)	0.53 KJ/m (7 ft-lb_f/in)
Volume Resistivity	D991	$>10^{15}$ ohm-cm	$>10^{15}$ ohm-cm	$>10^{15}$ ohm-cm
Thermal Expansion Coefficient	D696	2×10^{-4} cm/cm/°C (1.0×10^{-4} in/in/°F)	2×10^{-4} cm/cm/°C (1.0×10^{-4} in/in/°F)	2×10^{-4} cm/cm/°C (1.0×10^{-4} in/in/°F)
Cell Classification	D3350	445574C	345464C	234373E
Material Classification	D1248	Type III Category 5	Type III Category 5	Type II Category 5
PPI HDB *(AS listed in PPI TR-4)*	D2837	11.0 MPa (1,600 psi) at 23°C (73.4°F)	11.0 MPa (1,600 psi) at 23°C (73.4°F)	8.6 MPa (1,250 psi) at 23°C (73.4°F)
		6.9 MPa (1,000 psi) @ 60°C (140°F)	5.5 MPa (800 psi) @ 60°C (140°F)	6.9 MPa (1,000 psi) @ 60°C (140°F)