



Earth-Line Product Suite

# Renewables Market Products



**UNITED**  
POLY SYSTEMS



# Bio-Line™ High Density Polyethylene Pipe for Methane Capture and Transmission

United Poly Systems Bio-Line of HDPE pipe is used primarily for capture and transmission of methane produced on farms and bio-gas produced in landfills. Bio-Line is identified by a solid green color or a green stripe which helps protect the integrity of the system by identifying the pipe. Bio-Line can be shipped on coils and reels or as sticks.

Bio-Line is part of United Poly Systems Earth-Line™ suite of products and is ideal for many renewable-related pipeline applications. United Poly Systems is committed to using sustainable material for a sustainable future.

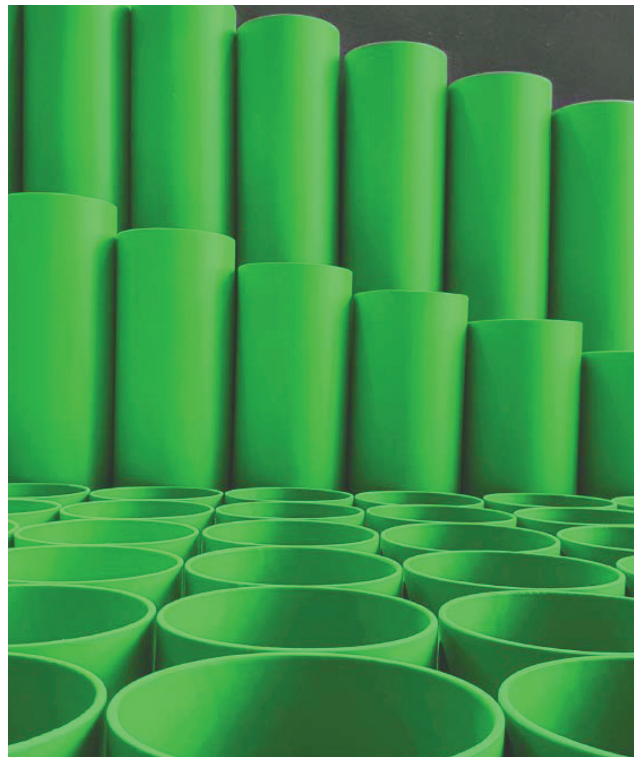
- No corrosion when compared to copper pipe
- HDPE fusion joints are stronger than solder joints
- Lower cost Longer life span, 50 to 100 years
- Flexibility of HDPE pipe, compared to metal pipe, aids in installation
- More installation methods available for HDPE (open cut, directional drilling) compared to copper pipe
- Easier shipping, HDPE can be shipped on coils or reels or as straight sticks

## Product Information

Bio-Line can be installed in existing conduit or via plow, direct burial or HDD (horizontal directional drilling) methods.

The product is typically a solid green color and can be stiped for additional identification.

Bio-Line is manufactured in IPS (iron pipe size) from 2- to 26-inch diameter and DIPS (ductile iron pipe size) from 4- to 26-inch diameter.



The material requirements for Bio-Line meets or exceeds ASTM Standard D 3350

“Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.” ASTM D 3350 defines physical properties of HDPE materials into ranges, or cell classes, so that each property can be defined within a range that is appropriate for the application.



## Print Line Information

Bio-Line is sequentially marked and identified along its outer length in contrasting color.

The print interval is every 2 ft and includes the following:

- MANUFACTURER'S NAME: United Poly Systems PRODUCT SIZE/SDR
- PRODUCTION CODE: Date, Location, Period
- REQUIRED MATERIAL SPECIFICATION
- LENGTH OF CONDUIT (in feet)

Custom print lines are available and may include customer name, project name and application.

## PE4710 Typical Physical Properties

PROPERTY	TYPICAL VALUE	UNITS	TEST METHOD
Density with minimum 2% carbon black	0.960	g / cc	ASTM D 792 or 1 505
High Load Melt Index	8.5	g / 10 minutes	ASTM D 1238
Melt Index	0.08	g / 10 minutes	ASTM D 1238
Flexural Modulus	160,000	psi	ASTM D 790
Tensile Strength @ yield (2 in / min)	3600	psi	ASTM D 638
Tensile Elongation @ Break	740%		ASTM D 638
Thermal expansion	1.0 x 10 <sup>-4</sup>	in / in / 0	ASTM D 696
HDB 73.4°F (23°C)	1600	psi	ASTM D 2837
HDB 140°F (60°C)	1000	psi	ASTM D 2837
PENT	> 500	hr	ASTM F1473
Brittleness Temperature	< -103°F (-75°C)	°F	ASTM D 746
Cell Classification	445574C (black only)		ASTM D 3350

*These are nominal values and used as guidelines only.*

*This is not a product specification and does not indicate minimum or maximum operating values.*

## Pro-Line PVC Replacement

Pro-Line is United Poly Systems PVC replacement product for power utility, electrical, telecom, energy and infrastructure applications and can also be used for water flow line/water transmission. Pro-Line is UL listed and is available in 20-, 40- and 50-ft lengths.

Pro-Line is manufactured in IPS (Iron Pipe Size) size from  $\frac{3}{4}$ - to 8-in. diameter. Pro-Line is manufactured in grey or black with striping options. It is available with a factory-attached coupler, so the product is ready for installation once delivered to the project site.

### Benefits

- Flexibility
- More installation methods available for Pro-Line when compared to copper pipe
- Better resistance to cold/ultra-cold temperatures  
Durable; crush and impact resistant
- No corrosion when compared to copper pipe
- No solder joints when installing. HDPE fusion joints are stronger than solder joints.
- Lower cost
- Longer life span of HDPE, 50 to 100 years



### Installation Methods

Pro-Line can be installed in existing conduit or via plow, direct burial or HDD (horizontal directional drilling) installation methods.

### Print Line Information

Pro-Line is sequentially marked and identified along its outer length in contrasting color. The print interval is every 2 ft and includes the following:

MANUFACTURER'S NAME: United Poly Systems PRODUCT SIZE/SDR

PRODUCTION CODE Date, Location, Period SPECIFICATION

LENGTH OF CONDUIT (in feet) on reel

Optional custom print lines are available and may include customer name, project name, and application.

### Options

Optional custom print lines are available and may include customer name, project name, application and lightning bolt.

Pull tape is offered in several tensile strengths. United Poly Systems standard pull tape is 1130 lb strength, while other options include strengths from 200 to 2500 lb.

### HDPE conduit material definition according to ASTM F2160

PROPERTY	RANGE OR MINIMUM REQUIREMENT	UNITS	CELL CLASS	TEST METHOD
Density	0.941 - 0.955	g/cc	3	ASTM D 792 or 1505
Melt Index	< 0.25 - 0.40	g/10 minutes	3 or 4	ASTM D 1238
Flexural Modulus	110,000 - 160,000	psi	4 or 5	ASTM D 790
Tensile Strength	3000 - 4000	psi	4 or 5	ASTM D 638
Environmental Stress Crack Resistance	F20 > 192	Hours (condition C)	3 or 4	ASTM D 1693
HDB	Not Defined		0, 1, 2, 3 or 4	ASTM D 2837

*These are nominal values and used as guidelines only.  
This is not a product specification and does not indicate minimum or maximum operating values.*

The material requirements for HDPE conduit are classified in accordance with ASTM Standard D3350 “Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.” ASTM D3350 defines important physical properties of HDPE materials into ranges, or cell classes, so that each property can be defined within a range that is appropriate for the application. The product has been NSF international tested to assure compliance with UL 651A on applicable sizes.





## Thermal-Line High Density Polyethylene Pipe for Geothermal Applications

Thermal-Line is used for general geothermal applications, such as the piping used when heating water circulated in underground geothermal circulation systems. Thermal-Line can also be used as the pipe of choice in installing these systems in residential housing and other developments. A blue strip is used to identify Thermal-Line and special type can be added in the print line. Upon request, A U-bend connection can be added during manufacturing, making it ready to connect to the coil system, once delivered to the project site. Thermal-Line is almost always shipped as coils.

Thermal-Line is part of United Poly Systems Earth-Line™ suite of products and is ideal for many renewable-related pipeline applications. United Poly Systems is committed to using sustainable material for a sustainable future.

- No corrosion when compared to copper pipe
- HDPE fusion joints are stronger than solder joints
- Lower cost Longer life span, 50 to 100 years
- Flexibility of HDPE pipe, compared to metal pipe, aids in installation
- More installation methods available for HDPE (open cut, directional drilling) compared to copper pipe



### Product Information

Thermal-Line is manufactured to meet or exceed the below standards and specifications:

- Potable water – NSF
- AWWA C901 (¾ to 3 in.)
- AWWA C906 (4 in. and up)

Thermal-Line is manufactured in IPS (iron pipe size) and DIPS (ductile iron pipe size), 4 inches and up.



Material requirements for Thermal-Line meets or exceeds ASTM Standard D3350 requirements. Materials produced for water application must meet or exceed ASTM D3035.

## Print line Information

Thermal-Line typically contains a blue stripe to identify water use.

The product may include "GEO" or other variant within the printline for identification.

## PE4710 Typical Physical Properties

PROPERTY	TYPICAL VALUE	UNITS	TEST METHOD
Density with minimum 2% carbon black	0.960	g / cc	ASTM D 792 or 1 505
High Load Melt Index	8.5	g / 10 minutes	ASTM D 1238
Melt Index	0.08	g / 10 minutes	ASTM D 1238
Flexural Modulus	160,000	psi	ASTM D 790
Tensile Strength @ yield (2 in / min)	3600	psi	ASTM D 638
Tensile Elongation @ Break	740%		ASTM D 638
Thermal expansion	1.0 x 10 <sup>-4</sup>	in / in / 0	ASTM D 696
HDB 73.4°F (23°C)	1600	psi	ASTM D 2837
HDB 140°F (60°C)	1000	psi	ASTM D 2837
PENT	> 500	hr	ASTM F1473
Brittleness Temperature	< -103°F (-75°C)	°F	ASTM D 746
Cell Classification	445574C (black only)		ASTM D 3350

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## Wind-Line High Density Polyethylene Pipe for Wind Farm Infrastructure

Wind-Line is a large-diameter conduit, typically used on wind farms for high-voltage transfer lines. Since wind farms typically cover sizable areas, large amounts of conduit are needed to protect the high-voltage lines transferring power from each turbine to the storage center. Wind-Line is available in 4-in. through 16-in. diameter sizes. Red color or a red stripe on the pipe is used to identify the product. Wind-Line is almost always shipped as sticks.

Wind-Line is part of United Poly Systems Earth-Line™ suite of products and is ideal for many renewable related pipeline applications. United Poly Systems is committed to using sustainable material for a sustainable future.

- No corrosion when compared to copper pipe
- HDPE fusion joints are stronger than solder joints
- Lower cost Longer life span, 50 to 100 years
- Flexibility of HDPE pipe, compared to metal pipe, aids in installation
- More installation methods available for HDPE (open cut, directional drilling) compared to copper pipe
- Lengths available in 20-, 40- and 50 ft sticks



### Product Information

Wind-Line can be installed in existing conduit or via plow, direct burial or HDD (horizontal directional drilling) methods. The product is typically a solid red color and can be striped for additional identification. Wind-Line is manufactured in IPS (iron pipe size) from 2- to 26-inch diameter and DIPS (ductile iron pipe size) from 4- to 26-inch diameter.

The material requirements for Wind-Line meets or exceeds ASTM Standard D 3350 "Standard Specification for Polyethylene Plastic Pipe and Fittings Materials." ASTM D 3350 defines physical properties of HDPE materials into ranges, or cell classes, so that each property can be defined within a range that is appropriate for the application.





## Print line Information

The duct product is sequentially marked and identified along its outer length in contrasting color.

The print interval is every 2 ft and includes the following:

MANUFACTURER'S NAME: United Poly Systems PRODUCT SIZE/SDR

PRODUCTION CODE: Date, Location, Period

REQUIRED MATERIAL SPECIFICATION

LENGTH OF CONDUIT (in feet)

Custom print lines are available and may include customer name, project name and application.

## Options

- Uniform straight internal ribs span the length of the pipe.  
Straight longitudinal internal ribbing is available for all pipes 2-in. and below.
- Pull tape is offered in several tensile strengths. United Poly Systems standard pull tape is 1130 lb strength. Other options include strengths from 200 to 2500 lb.
- Color and stripe options are offered to customize the product to customer needs. United Poly Systems offers orange, blue, black, red, gray, white, green, yellow, terracotta, violet, brown, lilac and custom colors upon customer's request.
- Lengths available in 20-, 40- and 50-ft sticks.

## High Density Polyethylene conduit material specifications according to ASTM F2160

PROPERTY	RANGE OR MINIMUM REQUIREMENT	UNITS	TEST METHOD	TEST METHOD
Density	0.941 - 0.955	g / cc	3	ASTM D 792 or 1505
Melt Index	< 0.25 - 0.40	g / 10 minutes	3 or 4	ASTM D 1238
Flexural Modulus	110,000 - 160,000	psi	4 or 5	ASTM D 790
Tensile Strength	3000- 4000	psi	4 or 5	ASTM D 639
Environmental Stress Crack Resistance	F20 > 192	Hours (condition C)	3 or 4	ASTM D 1693
HDB	Not Defined		0, 1, 2, 3 or 4	ASTM D 2837

*These are nominal values and used as guidelines only.*

*This is not a product specification and does not indicate minimum or maximum operating values.*



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