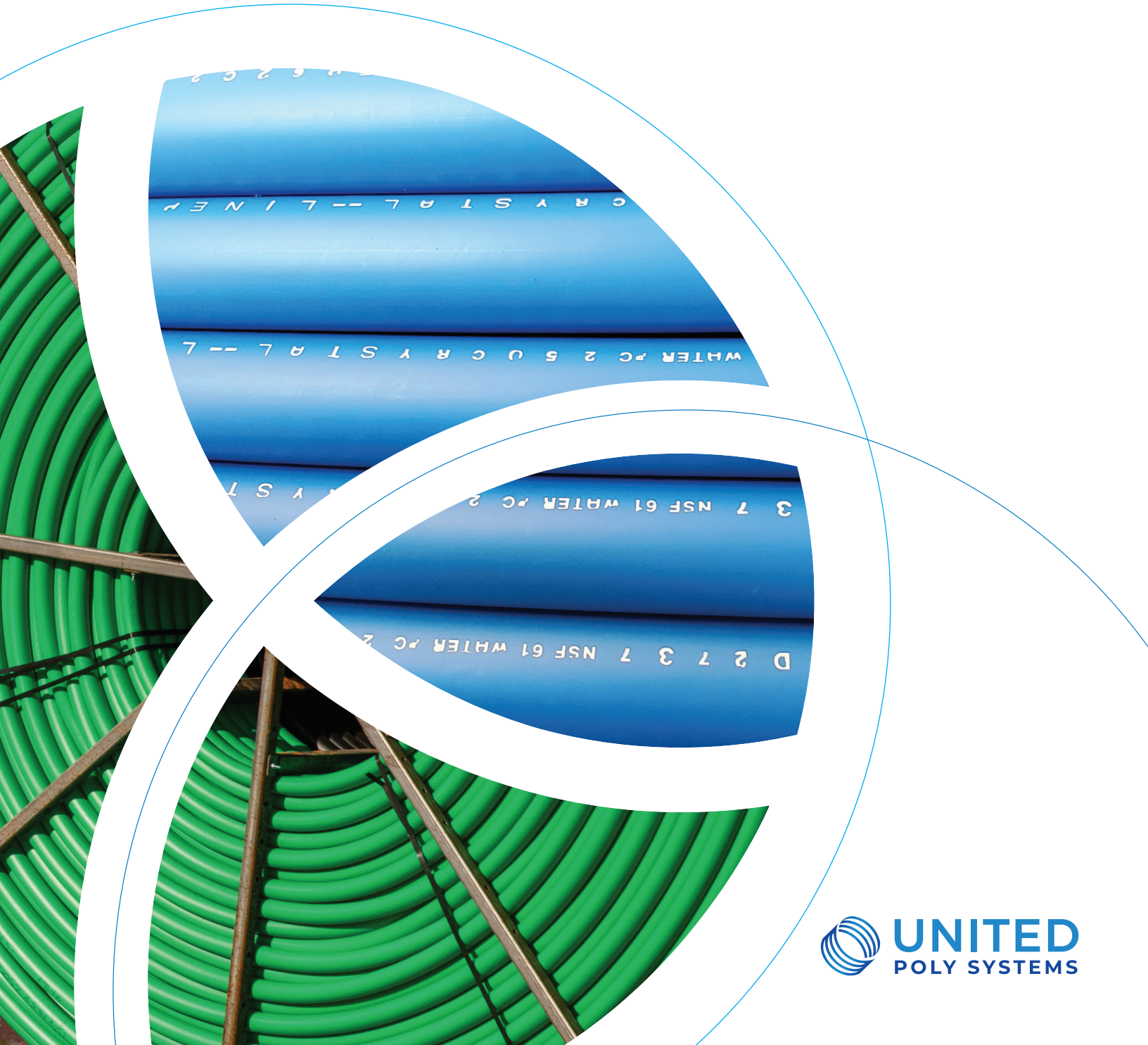




Water-Line Product Suite

Water Infrastructure Market Products



UNITED
POLY SYSTEMS



Base-Line HDPE Pipe for Mining Operations

Base-line is United Poly Systems HDPE pipe specifically suited for mining operations. The large amounts of water necessary in mining operations must be transported to different points in the mining site, which can be miles across. The easy installation, flexibility and customization of HDPE allow the water lines to be deployed where necessary.

The fusion-joint properties of HDPE means that the joint is stronger than the pipe itself. And the material characteristics properties (high ductility and ability to resist deflections from ground movement) provide flexibility not found in rigid iron or steel pipe, meaning it can withstand soil subsidence and shifting over time or major seismic events such as earthquakes. The abrasion resistance of polyethylene means it is well suited for solids transmission, common in mining.



Industrial and mining applications include:

- Tailings Transportation
- Dust Suppression
- Mine Dewatering
- Pit Dewatering
- Depressurization
- Odor Control
- Solution Mining
- Heap Leaching
- Process Water
- Process Slurry
- Water Transportation

Advantages of HDPE for mining applications

- Chemical and Abrasion Resistance
- Pressure Surge Resistance
- Affordability
- Ease of installation



Product Information

Base-Line is manufactured in ¾-in. through 24-in. diameter sizes
 Dual striping is available for SDR indication (8 in. through 24 in.)
 Product is manufactured in IPS (iron pipe size) and DIPS (ductile iron pipe size, 4 in. and up)
 Base-Line material meets or exceeds ASTM Standard D 3350 requirements

SDR Strip Color Identification

SDR 6: Brown	SDR 15.5: Orange
SDR 7: White	SDR 17: Blue
SDR 9: Red	SDR 21: Purple
SDR 11: Gold	SDR 26: Green
SDR 13.5: Grey	SDR 32.5: Pink

PE4710 Typical Physical Properties

PROPERTY	TYPICAL VALUE	UNITS	TEST METHOD
Density with minimum 2% carbon black	0.960	g/cc	ASTM D 792 or 1505
High Load Melt Index	8.5	g/10 minutes	ASTM D 1238
Melt Index	0.08	g/10 minutes	ASTM D 1238
Flexural Modulus	110,000 < 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 10-4	in. / in. / °F	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.*



Crystal Line™ HDPE Pipe

United Poly Systems expands its line of HDPE pipe with introduction of CTS sizes

Primarily for water and sewer applications, the new Copper Tube Size (CTS) line adds to and complements the current line of UPS pressure pipe and conduit. The CTS line is specially color-coded for use in potable water, reclaimed water and sewer applications. Special modifications to the UPS manufacturing line provide the capability to fabricate the tighter tolerances and smaller sizes necessary for CTS pipe.

- Available in CTS sizes ¾-in. to 2-in. diameter. Iron Pipe Size (IPS) sizes above 2 inches also available.
- CTS tolerances are tighter than standard IPS or Ductile Iron Pipe Size (DIPS) parameters.
- Print line can be customized for additional information such as project name, distributor, customer or municipality.
- Specially fabricated, high-end extruders produce tighter tolerances and smaller sizes necessary for CTS pipe.



Figure 1. UPS can package Crystal Line HDPE pipe in coils, reels or straight line.

Ideal for water and sewer applications

- No corrosion as 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
- Flexibility of HDPE pipe, compared to copper pipe, aids in installation
- More installation methods available for HDPE (open cut, directional drilling) as compared to copper pipe
- Easier shipping – flexible HDPE can be shipped on coils or reels
- UPS has extensive experience working with the base material (resin) for CTS-size HDPE pipe



The industry leading customer service and quality you have come to expect from UPS when providing DIPS and IPS pipe size is now available for CTS pipe. Applications include potable water, reclaimed water and sewer.

In all three applications, HDPE pipe meets or exceeds the following standards and specifications:

- AWWA C901
- ASTM D2737
- Product is manufactured in IPS and CTS
- For PE pressure pipe, the material requirements meet or exceed ASTM Standard D3350

For water applications, the materials requirements meet or exceed ASTM D3035

Potable Water

Applications include the transport of drinking water for municipalities, utilities, neighborhood and building water lines, or any other freshwater application.

- Manufactured in solid blue for supreme indicator.
Product may be striped for additional indicator.
- Meets or exceeds potable water standard NSF 61

Reclaimed Water

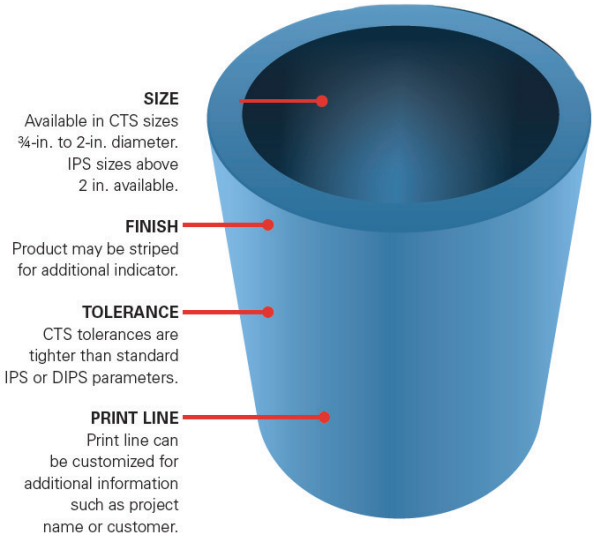
Reclaimed wastewater that has been decontaminated or processed. Water is not for drinking but can be used for agriculture or recharging the water table.

- Manufactured in solid lavender for supreme indicator.
Product may be striped for additional indicator.
- Meets or exceeds standards AWWA C906 and C901
- Meets or exceeds standard ASTM F714

Sewer

Applications include sewer systems for municipalities, cities, and other large infrastructure projects.

- Manufactured in solid green for supreme indicator. Product may be striped for additional indicator.
- Meets or exceeds standards AWWA C906 and C901
- Meets or exceeds standard ASTM F714





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PENT	> 500	hrs	ASTM F1473
Brittleness Temperature	< -103°F (-75°C)	° F	ASTM D 746
Cell Classification	445574C (black only)		ASTM D 3350

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CTS Sizes

ASTM D2737			¾ in.	1 in.	1¼ in.	1½ in.	2 in.
250 psi	SDR 9 CTS	OD	0.875 in.	1.125 in.	1.375 in.	1.625 in.	2.125 in.
		ID	0.681 in.	0.875 in.	1.069 in.	1.263 in.	1.653 in.
		Wall	0.097 in.	0.125 in.	0.153 in.	0.181 in.	0.236 in.
AWWA C901	wt./f		0.103 lb	0.170 lb	0.254 lb	0.35 lb	0.602 lb



IPS Sizing

IPS SIZE	AVG. OD	SDR PSI	7 335	90 250	11 200	13.5 160	15.5 139	17 130	19 110	21 100
¾ in.	1.05	Min Wall Avg ID Weight p/ft	0.150	0.117	0.095	0.078				
			0.732	0.802	0.849	0.885				
			0.180	0.150	0.120	0.100				
1 in.	1.315	Min Wall Avg ID Weight p/ft	0.188	0.146	0.120	0.097				
			0.916	1.005	1.061	1.109				
			0.288	0.230	0.200	0.160				
1-¼ in.	1.66	Min Wall Avg ID Weight p/ft	0.237	0.184	0.151	0.123	0.107	0.107		
			0.157	1.292	1.358	1.414	1.446	1.465		
			0.459	0.370	0.310	0.250	0.224	0.206		
1-½ in.	1.90	Min Wall Avg ID Weight p/ft	0.271	0.211	0.173	0.141	0.123	0.112		
			1.325	1.478	1.554	1.618	1.654	1.676		
			0.600	0.480	0.400	0.330	0.295	0.270		
2 in.	2.375	Min Wall Avg ID Weight p/ft	0.339	0.264	0.213	0.176	0.153	0.140	0.125	0.113
			1.656	1.815	1.917	2.002	2.069	2.078	2.110	2.135
			0.939	0.760	0.640	0.530	0.458	0.430	0.390	0.350
2-½ in.	2.875	Min Wall Avg ID Weight p/ft	0.411	0.319	0.262	0.213	0.213	0.169		
			2.004	2.198	2.351	2.449	2.424	2.516		
			1.377	1.109	0.930	0.764	0.771	0.622		
3 in.	3.50	Min Wall Avg ID Weight p/ft	0.500	0.389	0.318	0.259	0.226	0.206	0.184	0.167
			2.44	2.675	2.826	2.951	3.048	3.063	3.110	3.146
			2.040	1.660	1.390	1.150	0.997	0.932	0.840	0.770
4 in.	4.50	Min Wall Avg ID Weight p/ft	0.643	0.500	0.409	0.333	0.290	0.265	0.237	0.214
			3.137	3.440	3.633	3.794	3.920	3.938	3.998	4.046
			3.372	2.740	2.290	1.900	1.645	1.514	1.390	1.260
5 in.	5.563	Min Wall Avg ID Weight p/ft	0.795	0.618	0.506	0.412	0.359	0.327	0.293	0.265
			3.878	4.253	4.490	4.690	4.844	4.870	4.942	5.001
			5.170	4.180	3.510	2.910	2.517	2.352	2.120	1.930
6 in.	6.625	Min Wall Avg ID Weight p/ft	0.946	0.736	0.602	0.491	0.427	0.390	0.349	0.315
			4.619	5.065	5.349	5.584	5.771	5.798	5.885	5.957
			7.330	5.93	4.970	4.130	3.566	3.340	3.010	2.730

Hard-Line™

Hard-Line is United Poly Systems HPDE pipe for high pressure, high corrosive and heavy wall applications. Hard-Line is rated for higher operating pressure and has a thicker wall than standard pipes. It is available in IPS (Iron Pipe Size) size from 1¼- to 10-in. diameter. Typical product lines include SDR5, SDR6 and SDR7. Specific products can be de-rated for certain applications. Hard-Line can be striped to indicate different applications.



Applications

- Railroad crossings
- Bore installations under waterway (lake, river, etc.)
- Nuclear sites
- Oil and gas sites
- Mines
- Any application where high pressure and/or high corrosive use is necessary

PE4710 Typical Physical Properties

PROPERTY	TYPICAL VALUE	UNITS	TEST METHOD
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High Load Melt Index	8.5	g /10 minutes	ASTM D 1238
Melt Index	0.08	g/10 minutes	ASTM D 1238
Flexural Modulus	110,000 <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 ⁻⁴	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.

The material requirements for Hard-Line pressure pipe meets or exceeds 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.

IPS Sizes

IPS SIZE	AVG. OD	SDR PSI	5 500	6 400	7 335
1¼ in.	1.66	Min Wall Avg ID Weight p/ft	0.332 0.956 0.600	0.277 1.073 0.520	0.237 1.157 0.459
1½ in.	1.90	Min Wall Avg ID Weight p/ft	0.380 1.094 0.785	0.317 1.229 0.682	0.271 1.325 0.600
2 in.	2.375	Min Wall Avg ID Weight p/ft	0.475 1.368 1.227	0.396 1.536 1.065	0.339 1.656 0.939
3 in.	3.50	Min Wall Avg ID Weight p/ft	0.700 2.016 2.665	0.583 2.263 2.314	0.500 2.440 2.040
4 in.	4.50	Min Wall Avg ID Weight p/ft		0.750 2.910 3.824	0.643 3.137 3.372
6 in.	6.625	Min Wall Avg ID Weight p/ft		1.104 4.284 8.289	0.262 2.351 0.930
8 in.	8.625	Min Wall Avg ID Weight p/ft		1.438 5.578 14.049	0.946 4.619 7.330
10 in.	10.75	Min Wall Avg ID Weight p/ft		1.792 6.952 21.825	1.536 7.494 19.245

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