

Max-Flo Utility Grade Polyethylene

Submittal Data Sheet



Job or Customer:
Engineer:
Contractor:
Submitted by:
Approved by:
Order No:
Specification:

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Polyethylene is flexible and easy to join, requiring minimal labor to install. It has strong chemical resistance and is not susceptible to rust, rot, or electrolysis.

Utility Grade Max-Flo polyethylene pipe meeting the dimensional requirements of ASTM D-2239. Primarily used in irrigation and agricultural irrigation.

Max-Flo pipe is offered in SIDR-15, 1/2" through 2", and SIDR-19, 3/4" through 2" with coil lengths of 100' through 500' size dependent.

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Pipe Availability

SIDR 19, Black

Nominal Size	Inside Diameter	Min. Wall Thickness	Outside Diameter	Max Working Pressure at 73°F	Wt/100'	Lengths Available				
						100'	200'	250'	300'	400'
3/4"	0.824	0.060	0.946	80 PSI	7	x				x
1"	1.049	0.060	1.171	80 PSI	10	x			x	
1-1/4"	1.380	0.073	1.526	80 PSI	15	x				
1-1/2"	1.610	0.085	1.780	80 PSI	20	x				

SIDR 15, Black

Nominal Size	Inside Diameter	Min. Wall Thickness	Outside Diameter	Max Working Pressure at 73°F	Wt/100'	Lengths Available					
						100'	200'	250'	300'	400'	500'
1/2"	0.622	0.060	0.744	100 PSI	6	x				x	
3/4"	0.824	0.060	0.946	100 PSI	7	x				x	x
1"	1.049	0.070	1.192	100 PSI	11	x			x		x
1-1/4"	1.380	0.092	1.568	100 PSI	19	x			x		
1-1/2"	1.610	0.107	1.828	100 PSI	25	x					x
2"	2.067	0.138	2.349	100 PSI	43	x	x				

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Handling & Installation Procedures

Installation

SIDR pipe made to the dimensional requirements of ASTM D2239 is an ID-controlled product designed for use with barbed insert fittings.

Make sure to understand and follow the joining equipment manufacturer's instructions and guidelines to ensure safe operation and quality joints.

Common Fitting Types

The table below shows common fitting types for joining polyethylene pipe.

Mechanical Fittings		
HDPE Pipe Category	Pipe	Fitting Type
SIDR PE Pipe (ID-controlled, D2239)	Max-Flo	Barbed Insert

Ensure all mechanical fittings are intended for use with the applicable pipe (ASTM D2239) by the fitting manufacturer.

NOTE:

When using mechanical fittings, consult the Fitting manufacturer's installation instructions. Some models require the use of an insert stiffener/liner, which are sold separately. If you experience difficulty inserting the fitting into the pipe, try placing the end of the pipe in hot water to soften it slightly. Never use oil or soap on pipe or fittings.

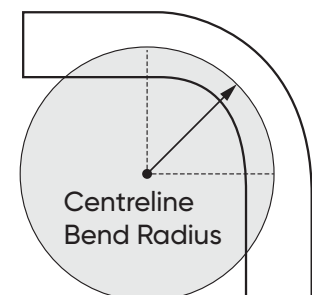
Installation – Bending

When bending polyethylene pipe:

- Minimum bending radius shall be not less than 30 pipe diameters, or the min. coil radius, whichever is greater
- When bending against the curvature of the coil, do not go beyond straight
- No bends within 10 pipe diameters of any fitting or valve

Max-Flo Pipe made to ASTM D2239 is ID-controlled, so its dimension ratio is determined by the pipe's ID (SIDR = ID/wall). The table has to be adjusted slightly to account for this:

Dimension Ratio (ID-controlled)	Pressure Rating, psi	Minimum Bend Radius
SIDR 15	125	27 x Pipe OD
SIDR 19	100	27 x Pipe OD
Fitting or flange present in the bend	—	100 x Pipe OD



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Flow Performance

Polyethylene SIDR pipe is made to the dimensional requirements of ASTM D2239 and is an ID-controlled product. It will have the same ID (and flow velocities) regardless of pressure rating.

Flow Velocity (ft/s) is calculated using the following equation:

$$v = 0.4085 \times (Q/d)$$

Where:

Q = flow rate in gallons per minute (GPM)

d = inside diameter of the pipe

Friction loss per 100' of pipe:

$$h_f = 0.2083 \times \left(\frac{100}{C}\right)^{1.85} \times \frac{Q^{1.85}}{d^{4.87}}$$

$$\Delta P \text{ (psi)} = h_f / 2.31$$

Where:

h_f = head loss in feet of water per 100' of pipe

Δp = pressure loss in psi per 100' of pipe

C = Hazen-Williams Friction Factor (equal to 150 for HDPE)

SIDR Poly Pipe Capacity

Pipe Size	Length in Feet per Gallon
1/2"	63.4
3/4"	36.1
1"	22.3
1-1/4"	12.9
1-1/2"	9.46
2"	5.74

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Max-Flo Pipe Flow Performance

Velocity of Flow (in. ft/sec) for SDR Poly Pipe

Flow GPM	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1	1.06					
2	2.11	1.20				
3	3.17	1.80	1.11			
4	4.22	2.41	1.48			
5	5.28	3.01	1.86	1.07		
6	6.34	3.61	2.23	1.29		
7	7.39	4.21	2.60	1.50	1.10	
8		4.81	2.97	1.72	1.26	
9		5.41	3.34	1.93	1.42	
10		6.02	3.71	2.15	1.58	
12		7.22	4.45	2.57	1.89	1.15
14			5.20	3.00	2.21	1.34
16			5.94	3.43	2.52	1.53
18			6.68	3.86	2.84	1.72
20			7.42	4.29	3.15	1.91
25				5.36	3.94	2.39
30				6.44	4.73	2.87
35				7.51	5.52	3.35
40					6.30	3.82
50					7.88	4.78
60						5.74
70						6.69
80						7.65

Pressure Loss (in. lbs per square inch)
per 100 feet of Poly DR-11 Pipe

Flow GPM	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1	0.43					
2	1.55	0.39				
3	3.28	0.83	0.26			
4	5.59	1.42	0.44			
5	8.45	2.15	0.66	0.17		
6	11.83	3.01	0.93	0.24		
7	15.74	4.00	1.23	0.32	0.15	
8		5.12	1.58	0.42	0.20	
9		6.37	1.97	0.52	0.24	
10		7.74	2.39	0.63	0.30	
12		10.84	3.35	0.88	0.42	0.12
14			4.45	1.17	0.55	0.16
16			5.70	1.50	0.71	0.21
18			7.09	1.86	0.88	0.26
20			8.61	2.26	1.07	0.32
25				3.42	1.62	0.48
30				4.79	2.26	0.67
35				6.38	3.01	0.89
40					3.85	1.14
50					5.82	1.72
60						2.42
70						3.21
80						4.11

Use with Caution: Flow Velocity above 5 ft/second may cause turbulence or create damaging surge pressures.

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System Testing with Water

Polyethylene pipe will slowly dilate in diameter (creep-strain) when pressure tested. When the internal volume of the pipe increases with the amount of water being fixed, the pressure will drop. This pressure drop doesn't mean that the pipe is leaking. This also means that if you were to hold the pipe at a constant pressure, you would need additional make-up water to maintain this pressure.

Pressure test methods have been developed to account for this creep-strain behavior, such as ASTM F2164 "Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure". In this test, the pipe is conditioned at a constant pressure for 4 hours (adding make-up water as necessary) before dropping the test pressure to inhibit (and slightly reverse) the diametric expansion and then monitoring for leakage. A summary of this method is below::

- **Determination of Test Pressure**
 - Maximum pressure may be set by the AHJ
 - Do not exceed the pressure rating of the lowest rated component in the system. Remove or isolate from the test section if needed.
 - Do not exceed more than 1.5x the pressure rating of PE piping. Account for temperatures above 73°F accordingly.
- **Test Duration**
 - If test pressure is between 1x and 1.5x the system design pressure, total time should not exceed 8 hours
 - If test pressure is 1x or less than the system design pressure, the total time should not exceed 72 hours.
 - If retesting, leave the system depressurized for 8 hours minimum
- **Test Procedure**
 - Fill the test section slowly, making sure to purge all air from the system. Entrapped air can cause inaccurate test results, as well as safety concerns due to the large amount of energy released during a rupture/failure. Allow the system to come to thermal equilibrium.

- Initial Expansion – Gradually bring the pipe up to the test pressure. Add make-up water as necessary to maintain this pressure for 4 hours.
- Test phase – Reduce the test pressure by 10psi & monitor for 1 hour. If no leakage is detected and the pressure stays within 5% of the test phase pressure during that 1 hour period, the section passes.

Notes for HDPE Water Pipe

- Additional information and best practices are provided in the Plastic Pipe Institute's TN-46 "Guidance for Field Hydrostatic Testing of High Density Polyethylene Pressure Pipelines: Owner's Considerations, Planning, Procedures, and Checklists".

References

- American Water Works Association
 - M55 PE Pipe - Design and Installation
- International Mechanical Code, Chapter 12 "Hydronic Piping"
- Plastic Pipe Institute
 - Handbook of Plastic Pipe, 2nd Edition

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Specifications

Max-Flo

Scope

This specification sheet covers the manufacturers' requirements for Max-Flo SIDR-15 and SIDR-19 polyethylene pipe. The pipe is suitable for use in irrigation and agricultural irrigation.

Materials

Max-Flo SIDR-15 and SIDR-19 pipe is made with high density polyethylene resin.

Dimensions

Physical dimensions and properties of Max-Flo SIDR-15 and SIDR-19 pipe shall meet the requirements of ASTM D2239.

Marking

Max-Flo pipe is marked as follows: includes the following: Nominal size, Max-Flo, and pressure rating.

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About IPEX

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- PVC, CPVC, PVCO, ABS, PE, PEX, PP and PVDF pipe and fittings

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