

VERSA PIPE® HD80 PW



High Density Polyethylene IPS and SDR Pipe for Potable Applications

Manufactured from PE3408/3608, certified to NSF pw, CSA B137.1, ANSI/AWWA C901/C906 and NSF 14/61

SCOPE

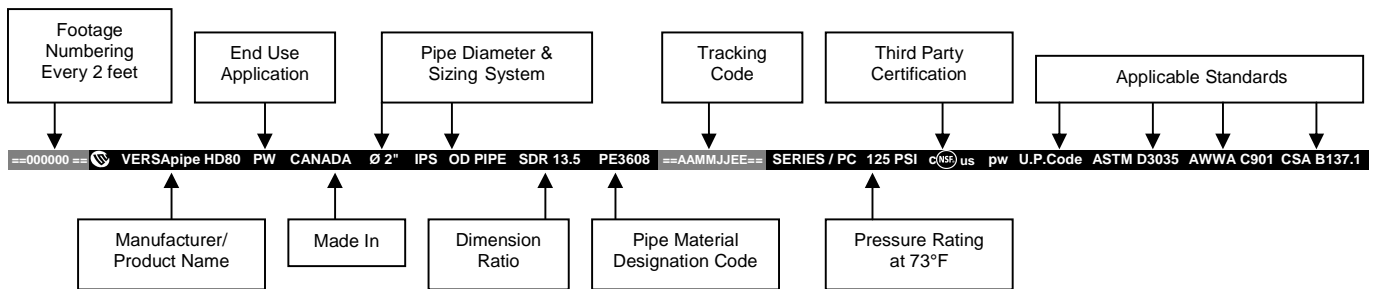
This specification sheet designates the requirements for **VERSA PIPE® HD80 PW** high density polyethylene pipe for use in potable water and wastewater transport applications and third party certified by NSF to CSA B137.1 and ANSI/AWWA C901/C906 standards. It describes the minimum requirements for the design and manufacture of all **VERSA PIPE® HD80 PW** high density polyethylene pipe. Our products also meet the main applicable standards such as ASTM D-3035 and D-2239. The maximum recommended operating temperature for pressure service is 60°C (140°F). (See the tables below for more information.)

RAW MATERIAL

All **VERSA PIPE® HD80 PW** high density polyethylene pipes are manufactured from PE3408/3608 high density polyethylene resin meeting the cell classification 345464, or equivalent, as per ASTM D-3350. The raw material is filled with a certified carbon black as an ultra violet inhibitor and can be stored outside. In addition, this pipe is also available in a certified solid blue color and is protected against UV rays with a high quality color blend. (See the tables below for more information.)

PRINTLINE

Versaprofiles **VERSA PIPE® HD80 PW** pipe is identified with permanent marking and sequential footage numbering every two (2) feet.*



*The example shown here represents the 2" SDR13.5 pipe. Some classifications may vary depending of the pipe application.

HANDLING, JOINING AND INSTALLATION

Do not drag or roll **VERSA PIPE® HD80 PW** pipe across rocks or rough ground. Installation and backfill practices for **VERSA PIPE® HD80 PW** pipe in trench should comply with guidelines prepared by the Plastic Pipe Institute (PPI)¹, and according to the installation recommendations found in CSA B137.1 standards. **VERSA PIPE® HD80 PW** pipe is connected by heat fusions in accordance with ASTM F2620 and Plastic Pipe Institute (PPI)² recommendations. The fittings must be made with the same polyethylene used in the pipe.

1 : <http://plasticpipe.org/pdf/chapter07.pdf>
2 : <http://plasticpipe.org/pdf/chapter09.pdf>

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RAW MATERIAL PROPERTIES AND CELL CLASSIFICATION AS PER ASTM D3350

Properties	Cell Classification (345464)	ASTM Test Method	Typical Values	
			Imperial Units	SI Units
Density (natural)	3	D 792	-	0.945 g/cm ³
Melt Index	4	D 1238	-	0.08 g/10min.
Flexural Modulus	5	D 790	125,000 psi	861 MPa
Tensile Strength at Yield	4	D 638	3,300 psi	22.7 MPa
Resistance to Slow Crack Growth of compound (SCG), hrs. (PENT)	6	F 1473	>100 h	>100 h
Hydrostatic Design Basis @ 73°F (23°C)	4	D 2837	1,600 psi	11.0 MPa
Carbon Black Weight Concentration (black option)	C	-	-	2%
UV Stabilizer (blue option)	E	-	Yes	Yes
Elongation at Break		D 638	> 800%	> 800%
IZOD Impact Strength, notched		D 256	> 11.0 ft-lb./in.	> 590 J/m
Brittleness Temperature		D 746	<100°F	<78°C
Environmental Stress Crack Resistance		D 1693	>1,000 h	>1,000 h
(C Condition)				
Thermal conductivity			0.24 BTU/hr ft °F	0.42 W/m °K
Specific heat capacity			0.55 BTU/ lb °F	2,300 JK/g °K

STANDARD PRODUCT SIZES* SDR¹ AS PER ASTM D3035 AND F714

Nominal Pipe Size, IN	Outside Diameter, IN (mm)	Tolerance, IN (mm)	SDR 17		SDR 15.5		SDR 13.5		SDR 11	
			Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)	Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)	Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)	Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)
¾	1.050	± 0.004	0.072	9.20	0.078	9.90	0.088	10.99	0.105	12.89
	(26.67)	(0.10)	(1.83)	(4.17)	(1.98)	(4.49)	(2.24)	(4.99)	(2.67)	(5.85)
1	1.315	± 0.005	0.087	13.95	0.094	14.99	0.107	16.79	0.130	20.02
	(33.40)	(0.13)	(2.21)	(6.33)	(2.39)	(6.80)	(2.72)	(7.62)	(3.30)	(9.08)
1 ¼	1.660	± 0.005	0.108	21.89	0.117	23.58	0.133	26.39	0.161	31.36
	(42.16)	(0.13)	(2.74)	(9.93)	(2.97)	(10.70)	(3.38)	(11.97)	(4.09)	(14.23)
1 ½	1.900	± 0.006	0.122	28.33	0.133	30.70	0.151	34.32	0.184	41.03
	(48.26)	(0.15)	(3.10)	(12.85)	(3.38)	(13.93)	(3.84)	(15.57)	(4.67)	(18.61)
2	2.375	± 0.006	0.150	43.59	0.163	47.09	0.187	53.16	0.229	63.85
	(60.31)	(0.15)	(3.81)	(19.77)	(4.14)	(21.36)	(4.75)	(24.11)	(5.82)	(28.96)
3	3.500	± 0.008	0.219	93.65	0.240	101.99	0.275	115.04	0.337	138.50
	(88.90)	(0.20)	(5.56)	(42.48)	(6.08)	(46.26)	(6.99)	(52.18)	(8.56)	(62.82)
4	4.500	± 0.009	0.281	154.85	0.308	168.38	0.353	190.21	0.434	227.39
	(114.30)	(0.23)	(7.14)	(70.24)	(7.81)	(76.38)	(8.97)	(86.28)	(11.01)	(103.14)
6	6.625	± 0.011	0.414	335.47	0.453	364.81	0.521	412.84	0.638	492.12
	(168.28)	(0.28)	(10.52)	(152.17)	(11.49)	(165.48)	(13.23)	(187.26)	(16.21)	(223.22)
8	8.625	± 0.013	0.538	567.77	0.590	618.70	0.678	699.60	0.831	841.54
	(219.08)	(0.33)	(13.67)	(257.54)	(14.97)	(280.64)	(17.22)	(317.34)	(21.11)	(381.72)

*Ask your account manager about the availability of the displayed sizes. Versaprofiles may also offer options that are not listed in this document.

1 : IPS (Iron Pipe Size) SDR (Outside diameter controlled pipe) pipe dimensions.

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STANDARD PRODUCT SIZES* SIDR² AS PER ASTM D2239

Nominal Pipe Size, IN	Inside Diameter, IN (mm)	Tolerance, IN (mm)	SIDR 11.5		SIDR 9		SIDR 7		SIDR 5.3	
			Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)	Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)	Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)	Average Wall Thickness, IN (mm)	Weight for 100 Ft. LBS (Kg)
¾	0.824 (20.93)	+0.010 -0.015 (+0.25) (-0.38)	0.082 (2.08)	9.65 (4.38)	0.102 (2.59)	12.27 (5.57)	0.128 (3.25)	15.83 (7.18)	0.165 (4.19)	20.99 (9.52)
1	1.049 (26.64)	+0.010 -0.020 (+0.25) (-0.51)	0.101 (2.57)	15.09 (6.84)	0.127 (3.23)	19.40 (8.80)	0.160 (4.06)	25.13 (11.40)	0.210 (5.33)	34.01 (15.43)
1 ¼	1.380 (35.05)	+0.010 -0.020 (+0.25) (-0.51)	0.130 (3.30)	25.51 (11.57)	0.163 (4.14)	32.68 (14.82)	0.209 (5.31)	43.15 (19.57)	0.276 (7.01)	58.79 (26.67)
1 ½	1.610 (40.89)	+0.015 -0.020 (+0.38) (-0.51)	0.150 (3.81)	34.30 (15.56)	0.189 (4.80)	44.18 (20.04)	0.244 (6.20)	58.78 (26.66)	0.322 (8.18)	80.03 (36.30)
2	2.067 (52.50)	+0.015 -0.020 (+0.38) (-0.51)	0.191 (4.85)	56.04 (25.42)	0.244 (6.20)	73.27 (33.23)	0.313 (7.95)	96.62 (43.83)	0.414 (10.52)	132.13 (59.93)

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2 : SIDR (Inside diameter controlled pipe) pipe dimensions.

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PRESSURE RATING SDR

Pipe Standard Diameter Ratio (SDR)	Standard Pressure Rating (PSIG @ 73°F (23°C))
21	80
17	100
15.5	110
13.5	125
11	160
9	200

PRESSURE RATING SIDR

Pipe Standard Diameter Ratio (SIDR)	Standard Pressure Rating (PSIG @ 73°F (23°C))
19	80
15	100
11.5	125
9	160
7	200
5.3	250

TEMPERATURE COMPENSATING MULTIPLIER

Maximum Pipe Sustained Temperature °F (°C)	Compensating Multiplier
-20 (-29)	2.54
-10 (-23)	2.36
0 (-18)	2.18
10 (-12)	2.00
20 (-7)	1.81
30 (-1)	1.65
40 (4)	1.49
50 (10)	1.32
60 (16)	1.18
73.4 (23)	1.00
80 (27)	0.93
90 (32)	0.82
100 (38)	0.73
110 (43)	0.64
120 (49)	0.58
130 (54)	0.50
140 (60)	0.43

THERMAL EXPANSION CALCULATION

$$\Delta L = L \alpha \Delta T$$

Where

ΔL = pipeline length variation, ft
 L = pipe length, ft
 α = 10^{-6} 67 (thermal expansion coefficient, in/in/°F)
 ΔT = temperature variation, °F

FLUID VOLUME CALCULATION

$$V = \pi r^2 L$$

Where

V = volume, ft³ (m³)
 π = 3.1416...
 r = pipe inside radius (ID/2), ft (m)
 L = pipe length, ft (m)

Note : For weight calculation, $W = V D$

Where

W = weight, lb
 V = calculated volume, ft³
 D = fluid density, lb/ft³

MINIMUM BENDING RADIUS

Pipe Diameter Ratio (DR)	Minimum Long Term Cold Bending Radius
9 or less	20 X OD
11, 13.5	25 X OD
15.5, 17, 21	27 X OD

OD = Pipe outside diameter.

References :

- ASTM Standards D3035, D3350, D2239, F2620 and F714
- CSA Standards B137.1
- Plastic Pipe Institute (PPI), http://plasticpipe.org/publications/pe_handbook.html

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