TECHNICAL SHEET

VERSAPIPE® HD100 PW

High Density Polyethylene IPS and SIDR Pipe for Potable Water Applications

Manufactured from PE4710. Certified to NSF pw, CSA B137.1, ANSI/AWWA C901/C906 and NSF 14.

Scope

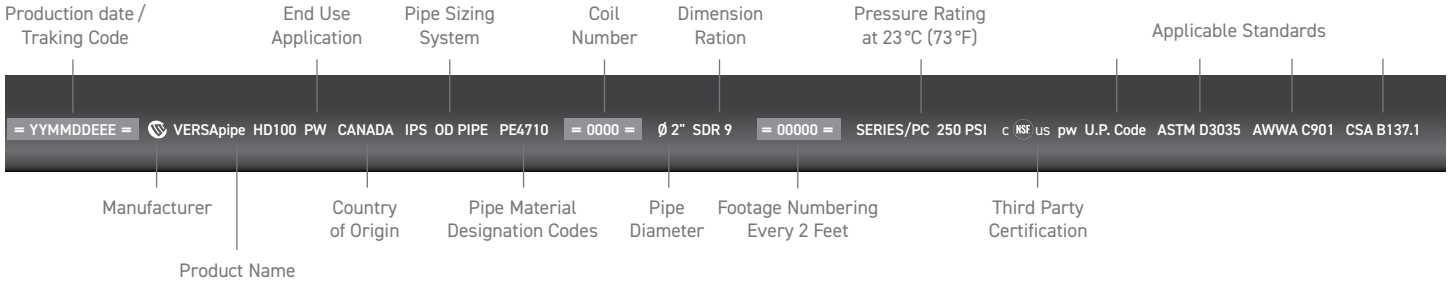
This specification sheet designates the requirements of **VERSAPIPE® HD100 PW** high density polyethylene water pipe based on outside diameter "Iron Pipe Size" (IPS) SDR and on inside diameter "Standard Inside Dimension Ratios" (SIDR) and third party certified to CSA B137.1, ANSI/AWWA C901/C906 and NSF 14 standards. It describes the minimum requirements for the fabrication of **VERSAPIPE® HD100 PW** pipe for potable water and wastewater transport applications at operating pressure up to 2,3 MPa (333 psi). The maximum recommended operating temperature for pressure service is 60 °C (140 °F).

Raw Material

All **VERSAPIPE® HD100 PW** high density polyethylene pipe are manufactured from PE4710 high density polyethylene resin listed in the Plastics Pipe Institute (PPI) TR-4 listing and meeting the cell classification PE445574, or equivalent, as per ASTM D3350. The raw material is filled with carbon black or blue UV additive allowing the pipe to be stored outside. These formulation have a high oxidative resistance (CC2 for the black pipe and CC3 for the blue pipe). See the tables below for more information.

Printline

Versaprofiles VERSAPIPE® HD100 PW pipe is identified with permanent marking and sequential footage numbering every two (2) feet.



Handling, joining and installation

Do not drag or roll **VERSAPIPE® HD100 PW** pipe across rocks or rough ground. Installation and backfill practices for **VERSAPIPE® HD100 PW** pipe in trenched should comply with guidelines prepared by the Plastics Pipe Institute (PPI)[1], and according to the installation recommendations found in CSA B137.1 standards. **VERSAPIPE® HD100 PW** pipe is connected by heat fusions in accordance with ASTM F2620 and Plastics Pipe Institute (PPI)[2] recommendations. The fittings have to be made of the same type of polyethylene as the pipe itself.

[1] http://plasticpipe.org/pdf/chapter07.pdf [2] http://plasticpipe.org/pdf/chapter09.pdf

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RAW MATERIAL PROPERTIES AND CELL CLASSIFICATION[1] (PER ASTM D3350)

Properties	Cell Classification (445574)	ASTM Test Method	Typical Values	
			Imperial Units	SI Units
Density (natural)	4	D792	0,949 g / cm³	0,949 g / cm³
Melt Index (190 °C / 21,6 kg)	4	D1238	7 g / 10 min	7 g / 10 min
Flexural Modulus	5	D790B	150 000 psi	1 030 MPa
Tensile Strength at Yield	5	D638	> 3 500 psi	> 24,1 MPa
Elongation at Break	-	D638	> 500 %	> 500 %
Resistance to Slow Crack Growth (SCG), h (PENT)	7	F1473	> 10 000 h	> 10 000 h
Hydrostatic Design Basis @ 23 °C (73 °F)	4	D2837	1 600 psi	11 MPa
Hydrostatic Design Basis @ 60 °c (140 °F)			1 000 psi	6,9 MPa
Carbon Black Concentration (Black Option)	C	-	2 %	2 %
UV Stabilizer (Blue Option)	E	-	1 %	1 %
Brittleness Temperature		D746A	< -103°F	< -75 °C
Thermal Stability		D3350	> 428 °F	> 220 °C
Oxidative resistance class	BLACK	D3350	CC2	CC2
	BLUE	D3350	CC3	CC3

[1] Material listed in the Plastic Pipe Institute TR-4 listing.

STANDARD PRODUCT SIZES IPS SDR[2] (PER ASTM D3035 ET F714)

Certified : NSF PW | CSA B137.1 (3/4 to 6 in) | NSF 14 | ANSI / AWWA C906 (4 in and above) Color : Black

Nominal Pipe Size in (IPS) [3]	Outside Diameter in (mm)	Tolerance ± in (mm)	SDR 32,5		SDR 26		SDR 21		SDR 17	
			Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)	Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)	Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)	Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)
3/4	1,050	0,004	-	-	-	-	-	-	0,062	9,2
	(26,7)	(0,10)	-	-	-	-	-	-	(1,57)	(4,2)
1	1,315	0,005	-	-	0,062	11,7	0,063	11,8	0,077	14,0
	(33,4)	(0,13)	-	-	(1,57)	(5,3)	(1,60)	(5,4)	(1,96)	(6,3)
1 ¼	1,660	0,005	-	-	0,064	15,3	0,079	18,3	0,098	21,9
	(42,2)	(0,13)	-	-	(1,63)	(7,0)	(2,01)	(8,3)	(2,49)	(10,0)
1 ½	1,900	0,006	0,062	17,2	0,073	19,7	0,090	23,5	0,112	28,3
	(48,3)	(0,15)	(1,57)	(7,8)	(1,85)	(9,0)	(2,29)	(10,7)	(2,84)	(12,8)
2	2,375	0,006	0,073	24,8	0,091	30,0	0,113	36,2	0,140	43,6
	(60,3)	(0,15)	(1,85)	(11,3)	(2,31)	(13,6)	(2,87)	(16,4)	(3,56)	(19,8)
3	3,500	0,008	0,108	52,1	1,135	63,5	0,167	76,8	0,206	93,6
	(88,9)	(0,20)	(2,74)	(23,7)	(3,43)	(28,9)	(4,24)	(34,9)	(5,23)	(42,6)
4	4,500	0,009	0,138	84,1	0,173	103,5	0,214	126,7	0,265	154,8
	(114,3)	(0,23)	(3,51)	(38,2)	(4,39)	(47,0)	(5,44)	(57,6)	(6,73)	(70,4)
6	6,625	0,011	0,204	180,8	0,255	224,5	0,315	274,4	0,390	335,5
	(168,28)	(0,28)	(5,18)	(82,2)	(6,48)	(102,0)	(8,00)	(124,7)	(9,91)	(152,5)
8	8,625	0,013	0,265	306,2	0,332	380,4	0,411	465,8	0,507	567,8
	(219,08)	(0,33)	(6,73)	(139,2)	(8,43)	(172,9)	(10,44)	(211,7)	(12,88)	(258,1)
10	10,750	0,015	0,331	476,7	0,413	589,9	0,512	723,3	0,632	857,5
	(273,05)	(0,38)	(8,41)	(216,7)	(10,49)	(268,1)	(13,00)	(328,8)	(16,05)	(389,8)

[2] IPS (Iron Pipe Size) SDR (outside diameter controlled pipe) pipe dimensions.
[3] Ask your account manager about the availability of the displayed sizes. Versaprofiles may also offer options that are not listed in this document.

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STANDARD PRODUCT SIZES IPS SDR[1] (PER ASTM D3035 ET F714) - CONTINUED

Certified : NSF PW | CSA B137.1 (3/4 to 6 in) | NSF 14 | * AWWA C901 | ANSI / AWWA C906 (4 in and above)

Color : Black

Nominal Pipe Size in (IPS) [2]	Outside Diameter in (mm)	Tolerance ± in (mm)	SDR 13,5		SDR 11		SDR 9		SDR 7	
			Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)	Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)	Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)	Minimum Wall Thickness in (mm)	Weight for 100 ft lb (kg)
3/4	1,050	0,004	0,078	11,1	0,095	13,0	0,117 *	15,3	-	-
	(26,7)	(0,10)	(1,98)	(5,0)	(2,41)	(5,9)	(2,97) *	(7,0)	-	-
1	1,315	0,005	0,097	16,9	0,120	20,1	0,146 *	23,6	-	-
	(33,4)	(0,13)	(2,46)	(7,7)	(3,05)	(9,1)	(3,71) *	(10,7)	-	-
1 ¼	1,660	0,005	0,123	26,5	0,151	31,5	0,184 *	37,3	-	-
	(42,2)	(0,13)	(3,12)	(12,1)	(3,48)	(14,3)	(4,67) *	(17,0)	-	-
1 ½	1,900	0,006	0,141	34,5	0,173	41,1	0,211 *	48,9	-	-
	(48,3)	(0,15)	(3,58)	(15,7)	(4,39)	(18,7)	(5,36) *	(22,2)	-	-
2	2,375	0,006	0,176	53,3	0,216	64,2	0,264 *	76,6	0,339	94,6
	(60,3)	(0,15)	(4,47)	(24,2)	(5,49)	(29,2)	(6,71) *	(34,8)	(8,61)	(43,0)
3	3,500	0,008	0,259	115,6	0,318	139,2	0,389 *	166,3	0,500	205,6
	(88,9)	(0,20)	(6,58)	(52,6)	(8,08)	(63,3)	(9,88) *	(75,6)	(12,70)	(93,5)
4	4,500	0,009	0,333	191,2	0,409	230,2	0,500	274,8	0,643	339,9
	(114,3)	(0,23)	(8,46)	(86,9)	(10,39)	(104,7)	(12,70)	(124,9)	(16,33)	(154,5)
6	6,625	0,011	0,491	415,0	0,602	498,9	0,736	595,5	0,946	736,5
	(168,28)	(0,28)	(12,47)	(188,6)	(15,29)	(226,8)	(18,69)	(270,7)	(24,03)	(334,8)
8	8,625	0,013	0,639	703,3	0,784	845,9	0,958	1 009,3	1,232	1 248,5
	(219,08)	(0,33)	(16,23)	(319,7)	(19,91)	(384,5)	(24,33)	(458,8)	(31,29)	(567,5)
10	10,750	0,015	0,796	1 092,0	0,977	1 313,9	1,194	1 567,7	1,536	1 939,7
	(273,05)	(0,38)	(20,22)	(496,4)	(24,82)	(597,2)	(30,33)	(712,6)	(39,01)	(881,7)

STANDARD PRODUCT SIZES SIDR[3] (PER ASTM D2239)

Certified : NSF PW | CSA B137.1 | NSF 14 | *AWWA C901

Color : Blue | Black

Nominal Pipe Size in [2]	Inside Diameter in	Tolerance in	SIDR 15		SIDR 11,5		SIDR 9		SIDR 7	
			Minimum Wall Thickness in	Weight for 100 ft lb (kg)	Minimum Wall Thickness in	Weight for 100 ft lb (kg)	Minimum Wall Thickness in	Weight for 100 ft lb (kg)	Minimum Wall Thickness in	Weight for 100 ft lb (kg)
1/2	0,622	+ 0,010	0,060	6,1	0,060	6,1	0,069	7,1	0,089	9,1
		- 0,010		(2,77)		(2,77)		(3,22)		(4,13)
3/4	0,824	+ 0,010	0,060	7,1	0,072	9,1	0,092	12,1	0,118 *	15,2
		- 0,015		(3,22)		(4,13)		(5,49)		(6,90)
1	1,049	+ 0,010	0,070	11,0	0,091	14,1	0,117	19,2	0,150 *	25,1
		- 0,020		(4,99)		(6,40)		(8,71)		(11,39)
1 ¼	1,380	+ 0,010	0,092	19,0	0,120	25,1	0,153	33,2	0,197 *	43,3
		- 0,020		(8,62)		(11,39)		(15,06)		(19,64)
1 ½	1,610	+ 0,015	0,107	24,9	0,140	34,2	0,179	44,3	0,230 *	59,3
		- 0,020		(11,30)		(15,51)		(20,09)		(26,90)
2	2,067	+ 0,015	0,138	42,1	0,180	56,3	0,230	73,3	0,295 *	97,4
		- 0,030		(19,10)		(25,54)		(33,25)		(44,18)

[1] IPS (Iron Pipe Size) SDR (outside diameter controlled pipe) pipe dimensions.
[2] Ask your account manager about the availability of the displayed sizes. Versaprofiles may also offer options that are not listed in this document.
[3] SIDR (inside diameter controlled pipe) pipe dimensions.

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PRESSURE RATING IPS PIPE

Pipe Standard Dimension Ratio (SDR)	Standard Pressure Rating (PSIG @ 23°C [73°F])	
	psi	kPa
32,5	63	400
26	80	600
21	100	700
17	125	900
15,5	138	1 000
13,5	160	1 100
11	200	1 380
9	250	1 725
7	333	2 300

PRESSURE RATING SIDR PIPE

Pipe Standard Dimension Ratio (SIDR)	Standard Pressure Rating (PSIG @ 23°C [73°F])	
	psi	kPa
15	125	860
11,5	160	1 100
9	200	1 380
7	250	1 725

MINIMUM BENDING RADIUS

Pipe Standard Dimension Ratio (SDR and SIDR)	Minimum Long Term Cold Bending Radius
9 or less	20 x OD
11 et 13,5	25 x OD
17 et 21	27 x OD
26	34 x OD
32,5	41 x OD

OD = Pipe outside diameter.

THERMAL EXPANSION CALCULATION

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

Where
ΔL = Pipeline Lenght Variation, ft
L = Pipe Length, ft
α = 12×10^{-5} (Linear Thermal Expansion cœfficient, in / [in °F])
ΔT = Temperature Variation, °F

TEMPERATURE COMPENSATING MULTIPLIER

Maximum Pipe Sustained Temperature		Compensating Multiplier
°F	°C	
-20	-29	2,54
-10	-23	2,36
0	-18	2,18
10	-12	2,00
20t	-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

FLUID VOLUME CALCULATION

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

Where
V = Volume, ft^3 (m^3)
π = 3,1416...
r = Pipe Inside Radius (ID/2), ft (m)
L = Pipe Length, ft (m)

For Weight Calculation, W = V D

Where
W = Weight, lb
V = Calculated Volume, ft^3
D = Fluid Density, lb/ft^3

References: ASTM Standards D3035, D3350, D2239, F2620 and F714 — CSA B137.1 and ANSI/AWWA C901/C906 Standards — NSF 14 — Plastics Pipe Institute (PPI), http://plasticpipe.org/publications/pe_handbook.html

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PACKAGING TYPE AND STANDARD LENGTHS[1]

Nominal Diameter in [2]	Stick ft	
1/2 to 10	20, 40, 50	
Nominal Diameter in [2]	**Coil ft**	**TITAN[MC] Reel ft**
1/2	100, 250, 500, 1 000	-
3/4	100, 250, 500, 1 000	15 000
1	100, 250, 500, 1 000	12 000
1 ¼	100, 250, 500, 1 000	7 000
1 ½	100, 250, 500, 1 000	5 500
2	100, 250, 500, 1 000, 1500	3 000
3	100, 250, 500	-
4	100, 300	-
Nominal Diameter in [2]	**Reel ft (m)**	
4	884 (270)	
6	951 (290)	

[1] Other stick, roll and coil lengths available on request. [2] Other diameters & DR available on request.

Stick bundle of 8"

Coil of 3"

Reel of 6"

1 1/4" on TITAN™ reel

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About Versaprofiles

With over 50 years of experience in thermoplastic extrusion, **Versaprofiles** offers innovation to make your job easier and lighten your workload. We are producing pipe and tubing for maple sap, geothermal, water and natural gas distribution applications in addition of specializing into custom made profiles. With our collective expertise in various sectors and our versatile equipment, we can bring your projects to higher level. We work closely and in a friendly atmosphere with each partner to deliver products that meet expectations and provide dedicated customer service.

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