

# TECHNICAL SHEET

# VERSAPIPE® HD100 GEO

## High Density Polyethylene IPS Pipe for Geothermal Applications

Manufactured from PE4710. Certified to NSF-358-1, ANSI/CSA/IGSHPA C448, ASTM D3035 and CSA137.1



Certified to NSF/ANSI 358

### Scope

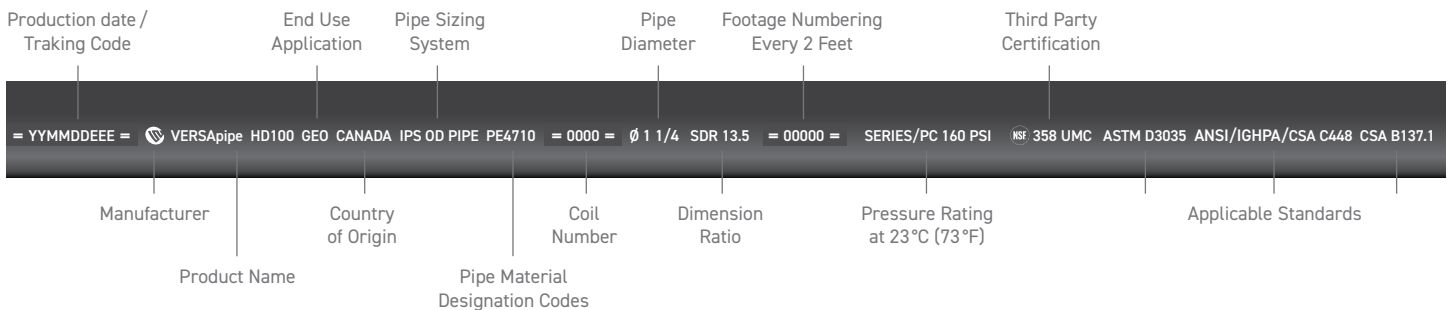
This technical data sheet designates the properties of the **VERSAPIPE® HD100 GEO** pipe for use in ground source heat pump exchanger applications. It describes the minimum requirements established by **Versaprofiles** for the design and manufacture of a pipe especially created for various closed-loop heat exchanger purposes, like vertical, horizontal and pond installations.

### Raw Material

All **VERSAPIPE® HD100 GEO** geothermal high density polyethylene pipes are manufactured from PE4710 high density polyethylene resin meeting the cell classification 445574C, or equivalent, as per ASTM D3350. The raw material is filled with carbon black as an ultra violet inhibitor and can be stored outside. This formulation is also classified "CC2" for its resistance to oxidation and offers good protection against chemical products such as glycol and methanol. See the tables below for more information.

### Printline

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






### Handling, joining and installation

All **VERSAPIPE® HD100 GEO** geothermal loops and pipes are manufactured according to the requirements of NSF/ANSI 358 and ASTM F2620 standards, with heat fusion fittings meeting the requirements of ASTM D2683 or ASTM D3261. The fittings must be made of PE4710 high density polyethylene.

To ensure complete integrity of the piping system, **VERSAPIPE® HD100 GEO** pipes must be handled with care. Do not drag or roll pipe across rocks or rough ground. Installation and backfill practices for **VERSAPIPE® HD100 GEO** pipes in trenched, vertical bore or pond applications, should comply with guidelines prepared by the International Ground Source Heat Pump Association (IGSHPA), Plastics Pipe Institute (PPI)<sup>1</sup>, and according to the installation recommendations found in ANSI/CSA/IGSHPA C448 standards. Before being buried, the loops should be tested using pressurized water at a maximum 150% of the nominal pressure related to the dimension ratio. This test should never be done using air or compressed gas.

<sup>1</sup><http://plasticpipe.org/pdf/chapter12.pdf> <sup>2</sup> <http://plasticpipe.org/pdf/chapter09.pdf>

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RAW MATERIAL PROPERTIES AND CELL CLASSIFICATION (PER ASTM D3350)

| Properties                                      | Cell Classification (445574C) | ASTM Test Method | Typical Values            |                           |
|---|-------------------------------|------------------|---------------------------|---------------------------|
|   |                               |                  | Imperial Units            | SI Units                  |
| Density (natural)                               | 4                             | D792             | 0,949 g / cm <sup>3</sup> | 0,949 g / cm <sup>3</sup> |
| Melt Index (190 °C / 2,16 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                      | C                             | -                | 2%                        | 2%                        |
| Brittleness Temperature                         |                               | D746A            | < -103 °F                 | < -75 °C                  |
| Thermal Stability                               |                               | D3350            | > 428 °F                  | > 220 °C                  |
| Thermal Conductivity                            |                               | -                | 0,23 BTU / (h ft °F)      | 0,40W/m °C                |
| Oxidative Resistance Classification             |                               | D3350            | CC2                       | CC2                       |

STANDARD PRODUCT SIZES IPS SDR1 (PER ASTM D3035)

ANSI / CSA / IGSHPA C448

CSA B137,1 (3/4 to 6 in)

\*NSF / ANSI 358-1

Color : Black

| Nominal Pipe Size in (IPS) <sup>2</sup> | Outside Diameter in (mm) | Tolerance ± in (mm) | SDR 17 (125 psi)               |                           | SDR 13,5 (160 psi)             |                           | SDR 11 (200 psi)               |                           | SDR 9 (250 psi)                |                           |
|---|--------------------------|---------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|
|   |                          |                     | 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                       | 0,078                          | 11,1                      | 0,095 *                        | 13,0                      | 0,117 *                        | 15,3                      |
|   | (26,67)                  | (0,10)              | (1,57)                         | (4,2)                     | (1,98)                         | (5,0)                     | (2,41) *                       | (5,9)                     | (2,97) *                       | (7,0)                     |
| 1                                       | 1,315                    | 0,005               | 0,077                          | 14,0                      | 0,097                          | 16,9                      | 0,120 *                        | 20,1                      | 0,146 *                        | 23,6                      |
|   | (33,40)                  | (0,13)              | (1,96)                         | (6,3)                     | (2,46)                         | (7,7)                     | (3,05) *                       | (9,1)                     | (3,71) *                       | (10,7)                    |
| 1 ¼                                     | 1,660                    | 0,005               | 0,098                          | 21,9                      | 0,123                          | 26,5                      | 0,151 *                        | 31,5                      | 0,184 *                        | 37,3                      |
|   | (42,16)                  | (0,13)              | (2,49)                         | (10,0)                    | (3,12)                         | (12,1)                    | (3,84) *                       | (14,3)                    | (4,67) *                       | (17,0)                    |
| 1 ½                                     | 1,900                    | 0,006               | 0,112                          | 28,3                      | 0,141                          | 34,5                      | 0,173 *                        | 41,1                      | 0,211 *                        | 48,9                      |
|   | (48,26)                  | (0,15)              | (2,84)                         | (12,8)                    | (3,58)                         | (15,7)                    | (4,39) *                       | (18,7)                    | (5,36) *                       | (22,2)                    |
| 2                                       | 2,375                    | 0,006               | 0,140                          | 43,6                      | 0,176                          | 53,3                      | 0,216 *                        | 64,2                      | 0,264 *                        | 76,6                      |
|   | (60,31)                  | (0,15)              | (3,56)                         | (19,8)                    | (4,47)                         | (24,2)                    | (5,49) *                       | (29,2)                    | (6,71) *                       | (34,8)                    |
| 3                                       | 3,500                    | 0,008               | 0,206*                         | 93,6                      | 0,259 *                        | 115,6                     | 0,318 *                        | 139,2                     | 0,389 *                        | 166,3                     |
|   | (88,90)                  | (0,20)              | (5,23)*                        | (42,6)                    | (6,58) *                       | (52,6)                    | (8,08) *                       | (63,3)                    | (9,88) *                       | (75,6)                    |
| 4                                       | 4,500                    | 0,009               | 0,265*                         | 154,8                     | 0,333 *                        | 191,2                     | 0,409 *                        | 230,2                     | 0,500 *                        | 274,8                     |
|   | (114,30)                 | (0,23)              | (6,73)*                        | (70,4)                    | (8,46) *                       | (86,9)                    | (10,39) *                      | (104,7)                   | (12,70) *                      | (124,9)                   |
| 6                                       | 6,625                    | 0,011               | 0,390*                         | 335,5                     | 0,491 *                        | 415,0                     | 0,602 *                        | 498,9                     | 0,736 *                        | 595,5                     |
|   | (168,28)                 | (0,28)              | (9,91)*                        | (152,5)                   | (12,47) *                      | (188,6)                   | (15,29) *                      | (226,8)                   | (18,69) *                      | (270,7)                   |
| 8                                       | 8,625                    | 0,013               | 0,507*                         | 567,8                     | 0,639 *                        | 703,3                     | 0,784 *                        | 845,9                     | 0,958 *                        | 1 009,3                   |
|   | (219,08)                 | (0,33)              | (12,88)*                       | (258,1)                   | (16,23) *                      | (319,7)                   | (19,91) *                      | (384,5)                   | (24,33) *                      | (458,8)                   |
| 10                                      | 10,750                   | 0,015               | 0,632*                         | 857,5                     | 0,796 *                        | 1 092,0                   | 0,977 *                        | 1 313,9                   | 1,194 *                        | 1 567,7                   |
|   | (273,05)                 | (0,38)              | (16,05)*                       | (389,8)                   | (20,22) *                      | (496,4)                   | (24,82) *                      | (597,2)                   | (30,33) *                      | (712,6)                   |

<sup>1</sup> IPS (Iron Pipe Size) SDR (outside diameter controlled pipe) pipe dimensions.

<sup>2</sup> 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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**VERSAPROFILES**  
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DIAMETERS AND AVAILABLE PACKAGING - GEOTHERMAL PRODUCTS

VERTICALOOP™ — Single U-bend

| Nominal Diameter (in) | VERTICALOOP™ | Loop | U-bend Length ft (5 feet increment) | GEO-GLIDE U-POINT | U-BEND | VERSAPOINT |
|-----------------------|--------------|------|-------------------------------------|-------------------|--------|------------|
| 3/4                   | ●            | -    | 300 to 900                          | ●                 | -      | -          |
| 1                     | ●            | -    | 300 to 900                          | ●                 | -      | -          |
| 1 1/4                 | ●            | -    | 300 to 900                          | -                 | -      | ● NEW      |
| 1 1/2                 | ●            | -    | 400 to 900                          | -                 | -      | ● NEW      |
| 2                     | ●            | -    | 400 to 750                          | -                 | ●      | -          |
| 2                     | -            | ●    | 400 to 1 500                        | -                 | ●      | -          |



GEO-GLIDE U-POINT



NEW VERSAPOINT



UNIQUE U-BEND



TWINLOOP™ — Double U-bend

| Nominal Diameter (in) | Dimension (in) | Maximum TWINLOOP Loop Length* (ft) |
|-----------------------|----------------|------------------------------------|
| 1 1/4                 | 4.25"          | 1 000                              |
| 1 1/2                 | 4.75"          | 900                                |



VERTICALOOP™ and TWINLOOP™ are manufactured according to the requirements of ASTM F2620 standards, with heat fusion fittings meeting the requirements of ASTM D2683 or ASTM D3261.

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STICKS

| Nominal Diameter<br>in | Length<br>ft <sup>1</sup> |
|------------------------|---------------------------|
| 1/2 à 10               | 20, 40, 50                |

Stick bundle  
of 8"



TITAN™ REEL

| Nominal Diameter<br>in | Length<br>ft <sup>1</sup> |
|------------------------|---------------------------|
| 3/4                    | 15 000                    |
| 1                      | 12 000                    |
| 1 ¼                    | 7 000                     |
| 1 ½                    | 5 500                     |
| 2                      | 2 500                     |

1-1/4" on  
TITAN™ reel



<sup>1</sup> Other stick, roll and coil lengths available on request.

References: ASTM Standards D2683, D3035, D3261, D3350 and F2620 – ANSI/CSA/IGSHPA C448 and B137.1 Standards – NSF/ANSI 358 Standards – Plastics Pipe Institute (PPI), [http://plasticpipe.org/publications/pe\\_handbook.html](http://plasticpipe.org/publications/pe_handbook.html)

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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