TECHNICAL SHEET

GEOPERFORMX® V2

High Efficiency Polyethylene Pipe for Geothermal Applications

Manufactured from PE4710 Filled with Highly Thermally Conductive Nanoparticles

Scope

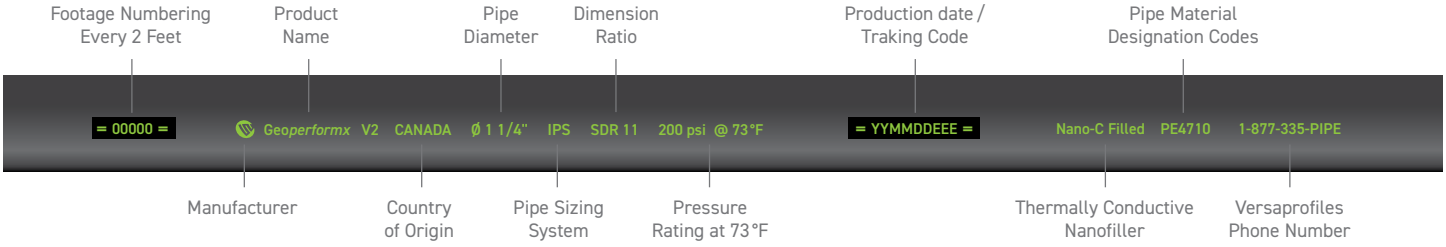
This technical data sheet designates the properties of the thermally enhanced **GEOPERFORMX® V2** pipe for use in geothermal applications. It describes the minimum requirements established by **Versaprofiles** for the design and manufacture of a pipe specially created for vertical, horizontal or coaxial closed-loop heat exchanger applications.

Raw Material

The **GEOPERFORMX® V2** thermally enhanced compound is made from PE4710 high density polyethylene resin listed in the Plastics Pipe Institute (PPI) TR-4 listing and meeting the cell classification 445574, or equivalent, as per ASTM D3350. The exclusive mix of PE4710 and nanoparticles meets the requirements of PE4710 cell class. The thermally conductive filler compounded in the base resin provides to the pipe an increased transverse thermal conductivity of 0,70 W/(m K) (0,41 BTU/[h pi °F]). It acts also as an ultraviolet inhibitor, so the pipe can be stored outside. In addition, the formulation offers good protection against chemical heat carrier such as glycol and methanol used in geothermal fluids. (See the tables below for more information.)

Printline

Versaprofiles GEOPERFORMX® V2 pipe is identified with permanent marking and sequential footage numbering every two (2) feet.



Handling, joining and installation

All **Versaprofiles** geothermal loops are manufactured according to the requirements of 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. **GEOPERFORMX® V2** pipe can be connected by heat fusions in accordance with **GEOPERFORMX® V2** Socket Fusion/Heating Time chart below.

To ensure complete integrity of the piping system, **GEOPERFORMX® V2** pipes must be handled with care. Do not drag or roll pipe across rocks or rough ground. Installation and backfill practices for **GEOPERFORMX® V2** pipe 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)[1], and according to the installation recommendations found in ANSI/CSA/IGSHPA C448 and CSA B137.1 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.

[1]http://plasticpipe.org/pdf/chapter12.pdf

CONTACT US

info@versaprofiles.com 1 877 335 7473

VERSAPROFILES
TUBES, PROFILES, COMPLEX SOLUTIONS MADE SIMPLE

MATERIAL PROPERTIES AND CELL CLASSIFICATION (PER ASTM D3350)

GEOPERFORMX® V2 properties[1]		Cell Classification (445574E)	ASTM Test Method	Typical Values	
				Imperial Units	SI Units
Density (base resin)		4	D 4883	0,949 g / cm³	0,949 g / cm³
Density (compound)		-	-	0,958 g / cm³	0,958 g / cm³
Melt Index (190 °C / 2,16 kg)		4	D 1238	0,033 g / 10 min	0,033 g / 10 min
Flexural Modulus (2 % secant, method 1)		5	D 790	155 335 psi	1 071 MPa
Tensile Strength at Yield		5	D 638	3 670 psi	25,0 MPa
Resistance to Slow Crack Growth (SCG), h (PENT)		7	F 1473	> 2 000 h	> 2 000 h
Thermal Conductivity		-	D 5334	0,41 BTU / (h pi °F)	0,70 W / (m °K)
Hydrostatic Design Basis[1]	At 73 °F (23 °C), E-4 Level	4	D 2837 and PPI TR-3	1 600 psi	11,0 MPa
	At 140 °F (60 °C), E-6 Level			1 000 psi	7,0 MPa

STANDAR PRODUCT SIZES (PER ASTM D3035 AND F714)

Nominal Pipe Size in [2]	Outside Diameter in (mm)	Tolerance ± in (mm)	SDR 13,5 (160 psi)		SDR 11 (200 psi)	
			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	10,6	0,095	12,5
	(26,67)	(0,10)	(1,98)	(4,81)	(2,41)	(5,67)
1	1,315	0,005	0,097	16,8	0,120	19,6
	(33,40)	(0,13)	(2,46)	(7,62)	(3,05)	(8,89)
1 ¼	1,660	0,005	0,123	25,9	0,151	31,2
	(42,16)	(0,13)	(3,12)	(11,75)	(3,84)	(14,15)
1 ½	1,900	0,006	0,141	34,0	0,173	40,9
	(48,26)	(0,15)	(3,58)	(15,42)	(4,39)	(18,55)
4	4,500	0,009	0,333	190,6	0,409	138,7
	(114,30)	(0,23)	(8,46)	(86,46)	(10,39)	(62,91)
6	6,625	0,011	0,491	418,0	0,602	497,1
	(168,28)	(0,28)	(12,47)	(187,34)	(15,29)	(225,48)

[1] Testing conducted by an ISO17025 laboratory as per PPI TR-3. The test matrix is approved by the PPI HSB. Properties reported reflect the results obtained so far on the first replicate (out of a triplicate).
[2] Ask your account manager about the availability of the displayed sizes. Versaprofiles may also offer options that are not listed in this document.

CONTACT US

info@versaprofiles.com 1 877 335 7473

HEATING TIME

The **GEOPERFORMX®V2** shall be welded by socket fusion with the same fittings and tools used for conventional PE4710 pipe systems. Since the **GEOPERFORMX®V2** has a higher thermal conductivity than conventional PE4710, the heating time must be slightly reduced. Therefore, when pipe and fitting of different materials are welded together, different heating time shall be used for each component. Please refer to the heating time chart below for **GEOPERFORMX®V2** and conventional PE4710. It is recommended to set the heating plate at 220 °C (425 °F). For more details regarding fusion practices, you may also refer to ASTM D2657.

SOCKET FUSION - HEATING TIME

Pipe Size (SDR 11) in	Heating Time Under Normal Temperature[1] seconds		Minimum Holdind Time Under Pressure seconds
	GEOPERFORMX® V2	PE4710	
3/4	5 - 7	8 - 10	30
1	8 - 10	12 - 14	30
1 ¼	9 - 11	14 - 16	60
1 ½	10 - 12	15 - 17	60

[1] 20 °C (68 °F). For heating time at other temperatures please contact us.

CONTACT US

info@versaprofiles.com 1 877 335 7473

VERSAPROFILES
TUBES, PROFILES, COMPLEX SOLUTIONS MADE SIMPLE

PACKAGING TYPE AND STANDARD LENGTHS - GEOTHERMAL PRODUCTS

VERTICALOOP™

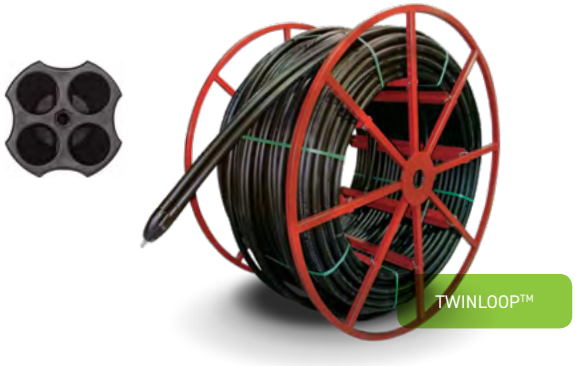
Single U-bend

Nominal Diameter in	GEO-GLIDE U-POINT	U-BEND	U-bend Lenght ft (5 feet increment)
3/4	●	-	300 to 675
1	●	-	
1 ¼	●	-	
1 ½	-	●	300 to 600

TWINLOOP™

Double U-bend

Nominal Diameter in	U-bend Lenght ft (5 feet increment)
1 ¼	300 to 1 000
1 ½	300 to 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.

STICKS

Nominal Diameter in	Lenght ft [1]
1/2 à 10	20, 40, 50

TITAN™ REEL

Nominal Diameter in	Lenght ft [1]
3/4	15 000
1	12 000
1 ¼	7 000
1 ½	5 500
2	3 000

[1] Other stick, roll and coil lengths available on request.

References: ASTM Standards D2657, D2683, D3035, D3261, D3350 and F2620 — ANSI/CSA/IGSHPA C448 and B137.1 Standards — Plastics Pipe Institute (PPI), http://plasticpipe.org/publications/pe_handbook.html

CONTACT US

info@versaprofiles.com 1 877 335 7473

VERSAPROFILES
TUBES, PROFILES, COMPLEX SOLUTIONS MADE SIMPLE

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.

MEMBER OF

Ontario Geothermal Association

IGSHPA

Plastics Pipe Institute®

CONTACT US

info@versaprofiles.com 1 877 335 7473

VERSAPROFILES

TUBES, PROFILES, COMPLEX SOLUTIONS MADE SIMPLE