

## REINFORCED POLYETHYLENE PIPELINES FOR HIGH PRESSURE WATER SUPPLY

Tekhnologiya Kompozitov OOO has mastered production of high-pressure (up to 4 MPa) polyethylene pipes, reinforced with synthetic yarns, intended for utility and drinking water supply and industrial pipelines, and high-pressure (up to 1.2 MPa) gas pipelines connecting populated areas. Use of such pipes permitted to solve some problems common to steel pipelines, such as corrosion, mineral buildup in the flow cross-section, and hydroabrasive wear.

Water supply to residential areas and to industrial facilities remote from sweet water sources often requires laying of long-distance high-pressure (up to 4.0 MPa) water lines. Polyethylene pipes as per GOST 18599-2001 can be used in pipelines of up to 1.6 MPa working pressure only. The best engineering solution to this problem can be to use polyethylene pipes reinforced with polyester (polyethylene terephthalate) yarns. That permits to increase working pressure up to 4.0 MPa, as well as to maintain almost all advantages of polyethylene pipes.

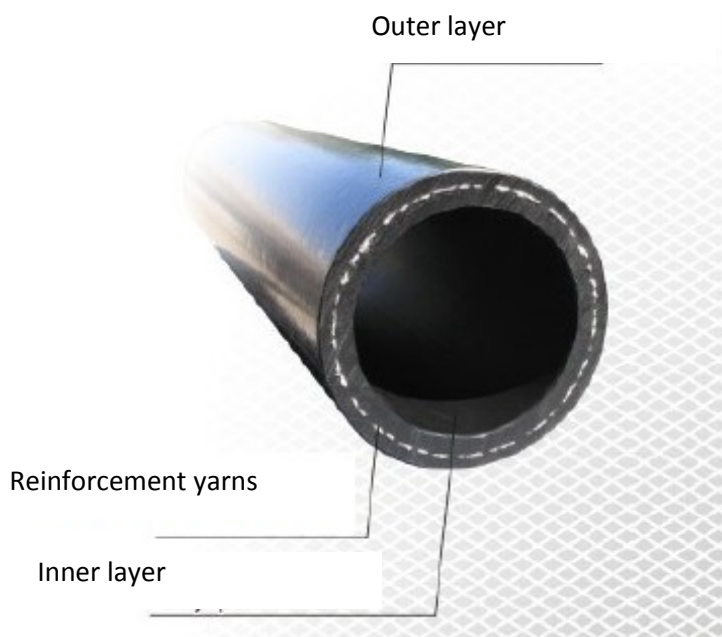
Moreover, polyethylene and reinforcement yarns are extremely resistant to oxygen, mineral salts, inorganic acids, most liquid hydrocarbons, gas hydrocarbons, and to microorganisms.

Polyethylene pipes are not prone to mineral buildup on the inner surface and are extremely resistant to hydroabrasive wear.

Their service life can reach 50 years.

Due to high deformability and low Young's modulus the pipes are very flexible; that permits to reel them into reels of up to 500 m and, when the pipeline route direction changes, that permits to easily cope with such situations by laying the pipes by means of elastic bending at the radius equal to at least 25 outer diameters of the pipe. Moreover, freezing of water in the pipeline does not lead to irreversible changes in the pipe and enables to continue operation of the pipeline after defrost.

Reinforced polyethylene pipes are 3...4 times lighter than steel pipes; that permits to do without heavy lifting equipment in the process of laying a polyethylene pipeline.





The pipes are coupled by welding in two steps: the pipes are butt-welded by heated tool and the flash is removed, then the welded joint is reinforced by means of an electrofusion sleeve. As a result, the joint is tight and it is stronger than the pipe itself.

When the pipes are delivered in reels, the speed of pipelining is 1...2 km in a shift depending on the pipe diameter. Taking into account a relatively low cost of the reinforced polyethylene pipes, ease of assembly, high speed of pipelining, and small number of joints, the cost of the polyethylene pipeline is lower than that of the steel pipeline.

Specialists of Tekhnologiya Kompozitov have developed, manufactured, and brought into practice a line to produce polyethylene pipes reinforced with polyester yarns; the capacity of the line is up to 500 km of 110 mm diameter pipe per annum. The line produces 63, 90, 110, 125, 140, and 160 mm outer diameter pipes.

The State Sanitary and Epidemiological Service of the Russian Federation for Permsky Kray issued a Sanitary and Epidemiological Certificate for use of the pipes in the systems of utility and drinking water supply.

TU-2248-001-5503886-01 Certificate of Conformity was issued for the pipes.

The most important water supply facility constructed of reinforced polyethylene pipes is the 22 km long water line branch leading from the main line of drinking water supply to the distribution control station of Oporny town in Mangyshlaks kaya oblast in Kazakhstan.

Tekhnologiya Kompozitov produces pipes as per GOST 18599-2011 for water supply systems as well.

Reinforced polyethylene pipes became common use in construction of high-pressure (1.2 MPa) gas pipelines connecting populated areas and at oilfields in construction of oil flow lines, low-pressure reservoir pressure maintenance systems, etc.

Permits of the Federal Service for Environmental, Technological, and Nuclear Supervision for use of the reinforced polyethylene pipes in gas distribution systems and in oil and gas industry are available.

Limited Liability Company

Tekhnologiya Kompozitov

ul. Promyshlennaya 87, Perm,

Tel.: +7 (342) 294 63 93, 296 32 44

Tel./Fax: +7 (342) 296 32 44

Email: [admin@tk.perm.ru](mailto:admin@tk.perm.ru)

[www.tk.perm.ru](http://www.tk.perm.ru)