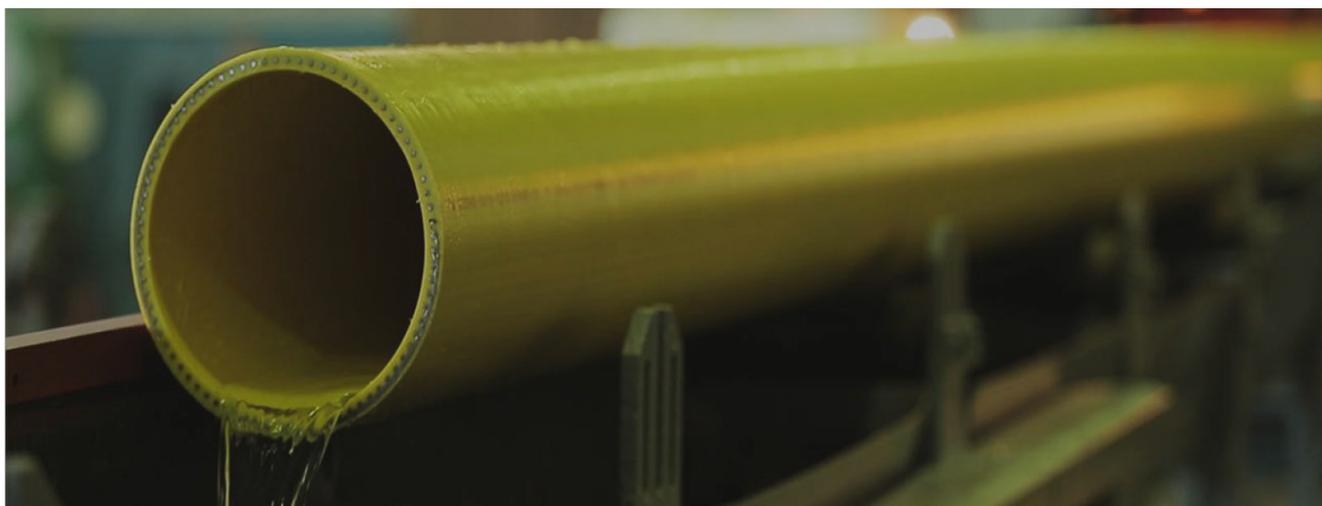




**REINFORCED COMPOSITE LINEPIPE**

quality integrity innovations



# Our Company

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Pipeline Systems OILTECH, LLC is a part of a group of companies working in oil and gas industry which produce, engineer and develop systems with the most advanced plastic technologies for the conduction free of corrosion of all kind of fluids at high pressures and temperatures.

The group is working worldwide providing services, installations, products and performing turn key projects.



# Content



<b>OILTECHPIPE</b>	<b>3</b>
<b>Technical parameters</b>	<b>5</b>
<b>OILTECHPIPE advantages</b>	<b>6</b>
<b>OILTECHPIPE joint types</b>	<b>7</b>
<b>OILTECHPIPE joining solutions</b>	<b>8</b>
<b>OILTECHPIPE installation</b>	<b>9</b>
<b>OILTECHPIPE field experiences</b>	<b>10</b>
<b>Supporting products</b>	<b>11</b>
<b>OILTECHPIPE material use</b>	<b>12</b>
<b>OILTECHPIPE implementation</b>	<b>13</b>
<b>Contact information</b>	<b>14</b>

# Our product

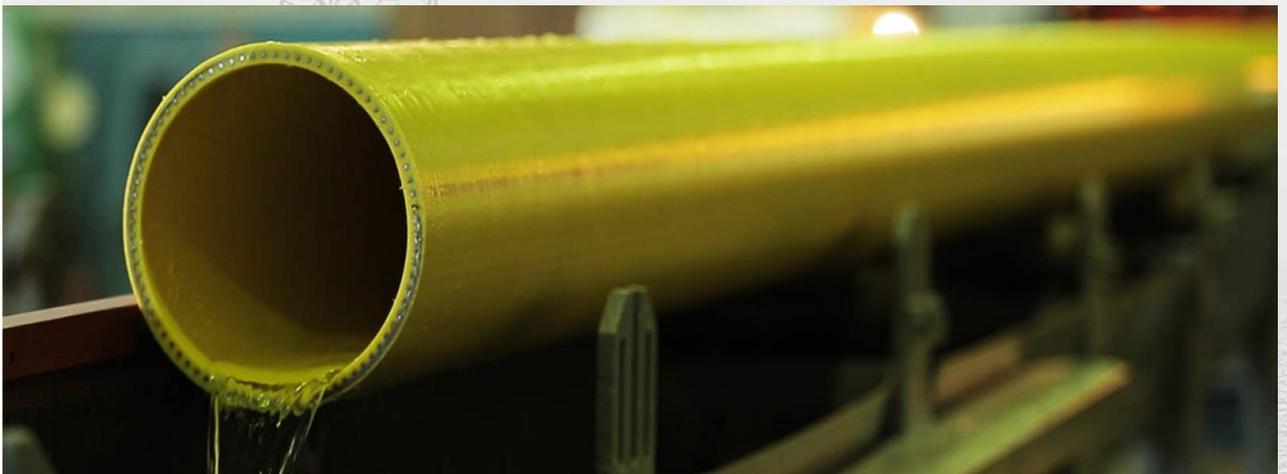


RCLP is a composite pipe reinforced by a rigid metal carcass made of steel wire. There can be several different variations of polymers used. These can be polyethylene, polypropylene etc. Such a variability provides the final product with different individual characteristics.

A rigidity of the steel carcass plus chemical resistance and specific qualities of the polymer used provide our final product with unique multifunctionality.

## Industries of application:

- Oil and gas transportation
- Hydrometallurgy
- Mineral fertilizers production
- Water transportation
- Artesian boring



# Our product



RCLP is a polymer pipe, reinforced with a steel metal frame. A rigid lattice frame welded from steel wire shapes an RCLP. This frame is surrounded by a layer of polymer material, which forms inner and outer surfaces of an RCLP. The frame increases pipe strength and is corrosion resistant as it is isolated from the external environment by the polymer.

RCLP combines the qualities of metal and polymer pipes, where rigid metal frame provides strength close to that of steel pipes, and polymer provides its unique qualities of resistance to aggressive environments.



RCLP implementation reduces substantially the costs for service and rehabilitation of pipelines throughout its 50+ years of operating lifetime.

RCLP have already shown 20+ years in operation at 600 psi pressure as infield pipelines for transportation of bottom water and oilwell product.

# Our product



## Technical parameters

All main characteristics of the OILTECHPIPE: dimensions, thermal properties, pressure, weight can be found in the table below.

Dimensions					Physical-mechanical properties			
Product	External diameter, mm	External diameter, in	Inner diameter, mm (in)	Wire diameter, in	Weight, lbs/ft	Draft-end load, kipf (kN), not less than	Hermeticity under constant pressure for 1 hour, psi, not less than	Operating pressure, psi
3,5" RCLP 95	95	3.7	83.5 (3.248)	0.118	4.38	24.3 (110)	1667	750
4" RCLP 115	115	4.5	103.5 (4.048)	0.118	5.72	30.9 (140)	1667	750
5" RCLP 125	125	4.9	113.0 (4.428)	0.118	6.15	33.1 (150)	1667	750
6" RCLP 160	160	6.3	148.0 (5.828)	0.118	8.31	44.1 (200)	1087	600
8" RCLP 200	200	7.9	187.5 (7.408)	0.118	10.32	52.9 (240)	1015	600
10" RCLP 250	250	9.8	237.0 (9.288)	0.138x0.118	14.11	68.4 (310)	1015	600
11" RCLP 275	275	10.8	260.5 (10.229)	0.157x0.118	18.15	86.0 (390)	1015	600
12" RCLP 300	300	12.0	297.18 (11.7)	0.176x0.118	23.03	106.0 (480)	1015	600

Physical-mechanical properties (continued)					
Product	Impact strength, kj/m <sup>2</sup>	Fatigue ration, 1*10 <sup>7</sup> cycles	Amount of cyclic loads under 4 bar (58 psi) & 25 Hz	Thermal expansion coefficient	Burst pressure, psi, not less than
3,5" RCLP 95	427.4	0.46	3x10 <sup>6</sup>	2x10 <sup>-5</sup>	2755
4" RCLP 115					2175
5" RCLP 125					2030
6" RCLP 160					1667
8" RCLP 200					1305
10" RCLP 250					1160
11" RCLP 275					1160
12" RCLP 300					1160

We can increase operating parameters of pressure and temperature by using different polymers.

# Advantages



OILTECHPIPE has a number of advantages compared with the traditionally used steel pipes :

- The rigidity of our pipes is comparable to the rigidity of steel pipes but RCLP is more resistant to aggressive media
- Thermal expansion coefficient is equal to that of a steel pipe
- The RCLP longevity exceeds all analogues' operating life
- RCLP does not require cathodic protection
- RCLP does not require anticorrosive protection
- RCLP is three times lighter than steel pipes which allows to avoid the use of special equipment during the pipe laying
- Compared to regular polymeric pipes RCLP allows to raise working pressure by more than four times which makes possible the use of 2-3 times smaller pipe diameter
- RCLP's abrasive resistance coefficient is four times higher than that of the steel pipes



# Joint types



**Welded joint**

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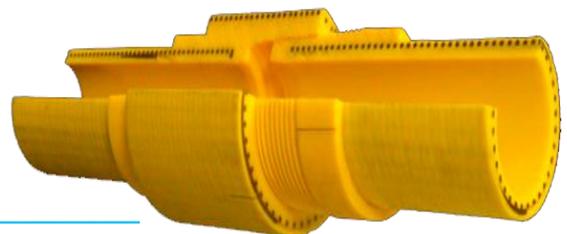


**Flange joint**

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**Screw joint**

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According to a wide variety of our customers' needs, we produce RCLP for different joint types. According to specific needs, pipe joints can be detachable or indetachable. We prepare RCLP for butt-welding connection, threaded joint, flange joint (also used for valves installation) and special indetachable joint with steel pipe.

## Welded joint

- Protects the metal frame from corrosion
- As easy to maintain as regular polymer pipes
- Regular equipment used
- Joint is as strong as the pipe body
- Easy to check the quality of the joint



## Flange joint



- Regular steel flanges applied
- Flexibility of flanges for different purposes
- Flanges are placed before the edge tip is welded to a pipe
- Easy connection with valves and other equipment
- Possible to use for joining different types of pipes

## Reinforced threaded joint

- Can be produced with conic and cylindrical thread
- Detachable and indetachable
- Possibility of multiple use
- Easy to handle with standard thread equipment
- Successful application in casing, lifting and injection pipelines
- Perfect durability



# Installation



In most cases our pipes are prepared for the butt-welding connections as this enables for the easiest pipelining. Standard equipment for polymer pipes welding is applied and no special requirements for the welding operator are needed in order to perform a safe and reliable connection.



In order to make pipes ready for connection and protect the metal frame from corrosion on the edge of the pipe, we weld a special edge tip with friction welding. The edge tip is thicker than the pipe body and its length and thickness are calculated according to requirements for the pipe joint to withstand pressure. This specific know-how provides assurance that the welding connection is at least as strong as the pipe body.

# Field experiences



## MINING

Installation of a vertical pipeline in Russian Copper Company.



## MINING

Vertical pipeline in South Urals Cryolite Plant.



## OIL EXTRACTION

Bottom water transportation pipeline construction.



## GAS EXTRACTION

Gas extraction pipeline construction for Tomskgazprom.



## HEATING

Heat transportation pipeline construction in the city of Yugorsk.



Pipes are ready for installation at the NNK-Pechoraneft facility near Usinsk.

# Supporting products

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- Pipe bends
- T-like fittings
- All types of pipe joints



Elbows

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Equal and unequal T-like fittings

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Indetachable switch to metal pipe

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# Material use



RCLP production technology allows to change the final product characteristics depending on specific requirements. With possibility to change the steel wire diameter and shape, as well as the cell dimensions, RCLP can withstand a much higher pressure.

In case of implementation of specific polymers (polyether ketone, polyamide), operating temperature conditions can vary significantly (up to 300°C [572°F]).

By substituting the expensive polymer with a much cheaper steel, we are able to limit the use of polymer and manage the final product price, making RCLP the most effective and reliable solution.



Being both strong and flexible, RCLP can be successfully applied in regions with high seismic activity, lowering the risks of leakages and negative environmental impacts.

Our tests for the pipeline that was in operation for 15 years on the oilwell product at 600 psi pressure and temperature of 60°C [140°F] with presence of sulfur hydrogen, showed that there are no statistically significant changes in pipe material characteristics that may somehow influence the pipe performance.

# Implementation



<p>OIL AND GAS INDUSTRY</p>	<p>Oil extraction and gas distribution systems. Transportation of oilwell product and bottom water.</p>
<p>CHEMICAL INDUSTRY</p>	<p>Transportation of acids, alkali, brine and brine slurry.</p>
<p>HOUSING AND PUBLIC UTILITIES</p>	<p>Transportation of hot and cold drinking water, heat supply and sewage.</p>
<p>RARE EARTH METALS EXTRACTION AND MINING INDUSTRY</p>	<p>Underground and heap leaching of nonferrous and rare earth metals. Transportation of aggressive pulp (ore with water) under high pressure conditions.</p>
<p>ARTESIAN BORING AND SALT EXTRACTION</p>	<p>Casing and lifting pipes in artesian boring and salt extraction processes.</p>
<p>SEASHORE INFRASTRUCTURE</p>	<p>Construction of ports and docks, seashore strengthening, transportation of seawater and desalination plants.</p>

# OILTECHSYSTEMS OÜ

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Tallinn, Estonia

+ 372 617-04-31

[info@oiltechservices.net](mailto:info@oiltechservices.net)

[www.oiltechsystems.com](http://www.oiltechsystems.com)



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