



**oiltech**

**ELECTRIC SUBMERSIBLE PUMPS**

quality integrity innovations

# Our Company

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OILTECHSYSTEMS OÜ 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>LOW ADHESIVE ESP</b>	<b>3</b>
<b>ESP features</b>	<b>6</b>
<b>ESP advantages</b>	<b>8</b>
<b>ESP economic efficiency</b>	<b>10</b>
<b>ESP energy efficiency</b>	<b>12</b>
<b>Contact information</b>	<b>14</b>



# Our product



The main product line includes LOW ADHESIVE ELECTRIC SUBMERSIBLE PUMPS with heat/acid resistant polymer composite materials (PCM) stages.

Low-adhesive ESP provide higher operational and economic efficiency as compared with pumps with metal working parts when used in wells with medium flow rate and in marginal wells (less than 50 m<sup>3</sup>/day) under the following complicating factors:

- High water cut (>80%);
- Salts deposits, asphaltene-resin-paraffin deposits;
- Increased viscosity of formation fluid (over 10 cSt), viscous emulsions;
- High content of non-abrasive mechanical impurities (clay, ets);
- High content of non-associated gas on pump suction, up to 55% (without additional gas regulating devices).



# Our product



Pumps are made in basic, gas-resistant, corrosion-resistant and abrasion-resistant versions, as well as in their different combinations.

Today there are produced low-adhesive electric submersible pumps of the following types and versions:

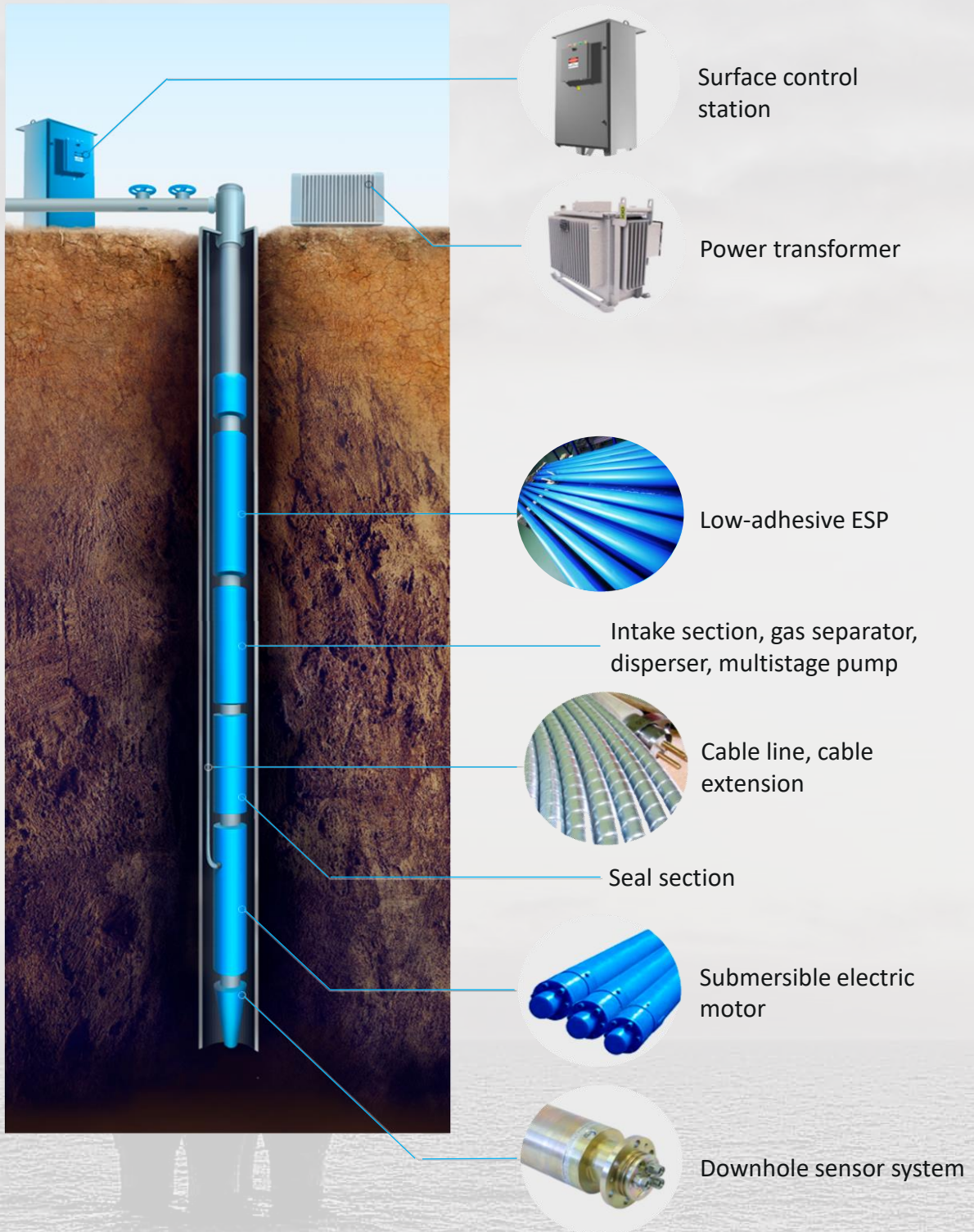
Min Casing ID, mm	Pump size	Housing OD, mm	Operating Range and Recommended Operating Range			
			50 Hz		60 Hz	
			m3/day	BPD	m3/day	BPD
100	3	81	40	250	48	300
126	5	92	15-125; 400	93-781; 2500	18-150; 480	112-937; 3000
130	5A	103	35; 60	219; 375	42; 72	263; 450



# Our product



ESP units can be delivered both in full complete set and by their separate elements.



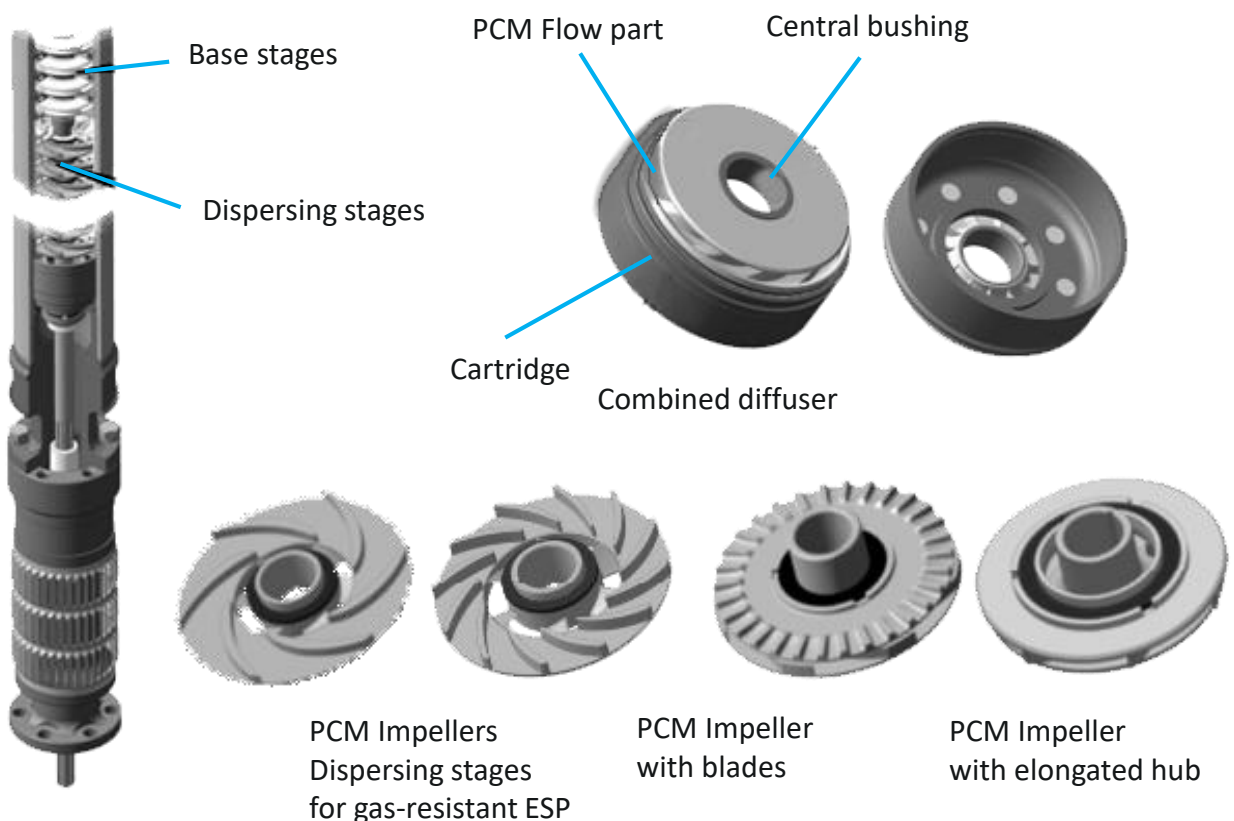
# Product features



Now company produces low-adhesive electric submersible centrifugal pumps (ESP) with working parts made of heat- and acid-resistant polymer composite materials (PCM).

Modern PCM used in pump manufacture impart unique properties to low-adhesive ESP and allow our customers reducing oil production costs for its main elements:

- Expenses for equipment purchase;
- Operating expenses;
- Costs of ESP repair;
- Expenses for additional necessary well repair and idle time.



# Product features



Complete set of low-adhesive ESP:

1. Working stages of low-adhesive ESP of “Combi” series consist of polymer impellers and combined diffusers with polymer flow part. Working stages of low-adhesive ESP of “Base” series consist of polymer impellers and solid powdered-metal or cast diffusers.



2. In order to reduce vibration during shaft rotation, intermediate bearings are used. They are set in points of maximum amplitude of shaft sinusoidal vibrations.

3. Gas-resistant ESP in the beginning of the first section are completed with dispersing stages with open-type polymer radiaxial impellers.



# Advantages



Low-adhesive ESP pumps have many advantages. Here are some of them:

- ✓ High corrosion resistance and purity of polymer flow channels, low adhesion and non-magnetic properties of the material, as well as the lack of the possibility of formation of galvanic pairs provide a reduction in the deposition rate of salts and ASPO at least 3 times compared with metal working bodies. And reduce the likelihood of clogging and non-abrasive mechanical impurities.
- ✓ The high precision and light weight polymer runners (4-5 times less metal) in combination with intermediate bearings ensure high balance of the rotation of the shaft throughout the range of adjustment frequency of the engine, which allows to reduce wear of radial friction pairs.



# Advantages



- ✓ The low weight of the rotor (2.5 times less than that of the ESP with metal impellers) provides a reduction in starting currents and a smooth start of the engine. The high precision and light weight polymer runners (4-5 times less metal) in combination with intermediate bearings ensure high balance of the rotation of the shaft throughout the range of adjustment frequency of the engine, which allows to reduce wear of radial friction pairs.
- ✓ High purity of flow channels, low adhesion and high corrosion resistance of the material provide a decrease in the heating temperature of the formation fluid, which reduces the probability of salt precipitation.
- ✓ The use of impellers with an elongated hub due to the low adhesion of the polymer surface to the salts reduces the likelihood of jamming in the area of radial friction pairs and reduces their friction wear.
- ✓ The use of gas-resistant impeller impellers and pre-connected stages in the pumps ensures stable operation of the ESP with free gas content. And this in turn increases the reliability of the ESP at unstable dynamic levels.

The use of low-adhesion ESP allows the oil company to reduce the cost of oil production by its main components:

- costs for the purchase of equipment;
- operating costs;
- the cost of repair ESP;
- the costs associated with the reliability of the equipment [increase in low-adhesion ESP of the overhaul period and the average time between failures in the target funds of wells reduces the cost of ongoing underground repairs, additional repairs and purchase of equipment, reduces the loss of oil production associated with forced well downtime].

## 1. Costs for the purchase of equipment

- The cost of low-adhesion ESP abrasive-resistant performance is about 10% lower than the cost of ESP wear-resistant performance of ni-resist.
- The cost of low-adhesion ESP gas-abrasion performance is about 20% below the ESP wear-resistant performance of ni-resist with the gas tank.

## 2. Operating costs

The use of low-adhesion ESP in the funds simultaneously complicated by salts (ASPO), non-abrasive mixtures and high gas factor, allows to achieve a reduction in power consumption up to 35% in relation to the ESP with metal working bodies.

### 3. Repair costs of ESP

The cost of repairs of low-adhesion ESP is directly related to the maintainability, which in turn largely depends on the funds in which the pumps are operated.

When operating in non-abrasive funds, the impellers of the PCM are maintainable. The percentage of rejection fits into the standards of companies. When replacing 30% of the impellers, the cost of repairs of low-adhesion ESP is lower by 25-30%.

### 4. Costs associated with the reliability of the equipment

Low adhesion, high purity and corrosion resistance of the polymer flow channels of the working bodies allow to increase the time between failures of low-adhesion ESP, compared with ESP with metal working bodies.

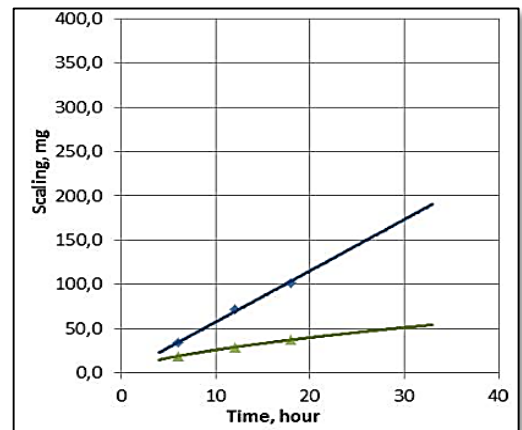
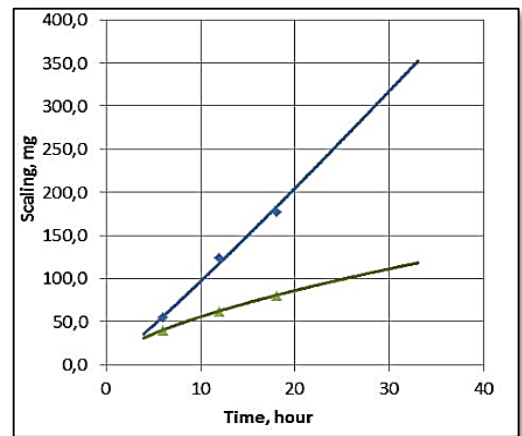
Increase of low-adhesion ESP the turnaround time and mean time between failure in trust funds wells:

- reduces the number of ongoing underground repairs;
- reduces the number of ESP repairs and purchased equipment;
- provides additional oil produced by reducing the number of forced downtime wells.

# Energy efficiency

Use of low-adhesive ESP allows reducing unit costs for energy consumption in comparison with ESP with solid metal working parts:

- ✓ Up to 20% due to less degradation of efficiency factor in time; degradation of efficiency factor occurs because flowing channels are obstructed with salts, asphaltene-resin-paraffin deposits, and non-abrasive mechanical impurities (in wells with abnormal operating conditions – with salt deposition, asphaltene-resin-paraffin deposition, and obstruction with non-abrasive mechanical impurities). *[See the chart of results of scaling process research].*
- ✓ Up to 30% because dispersing stages of gas-resistant low-adhesive ESP create gaslift effect (in wells with increased gas factor in comparison with using of gas separator)

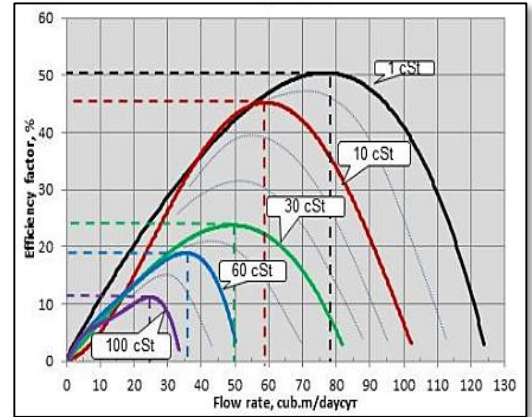


- ◆ Ni-resist stages
- ▲ PCM impeller, combined diffuser

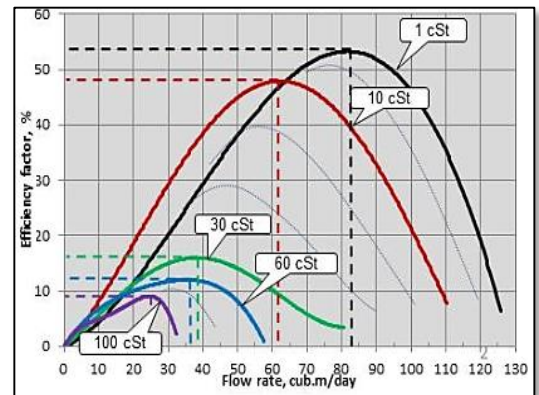
# Energy efficiency

- ✓ Up to 10% due to higher efficiency factor during lifting of formation fluid (in wells with viscosity at a pump intake from 10 to 40 cSt). *[See the chart of behavior of head and rate in pump stages].*
- ✓ Up to 15% due to less friction wear and less friction forces (because of less weight – in 2.5 times, and impeller balance) in radial friction couples (in non-abrasive wells with high water cut).

For PCM stages



For Ni-resist stages



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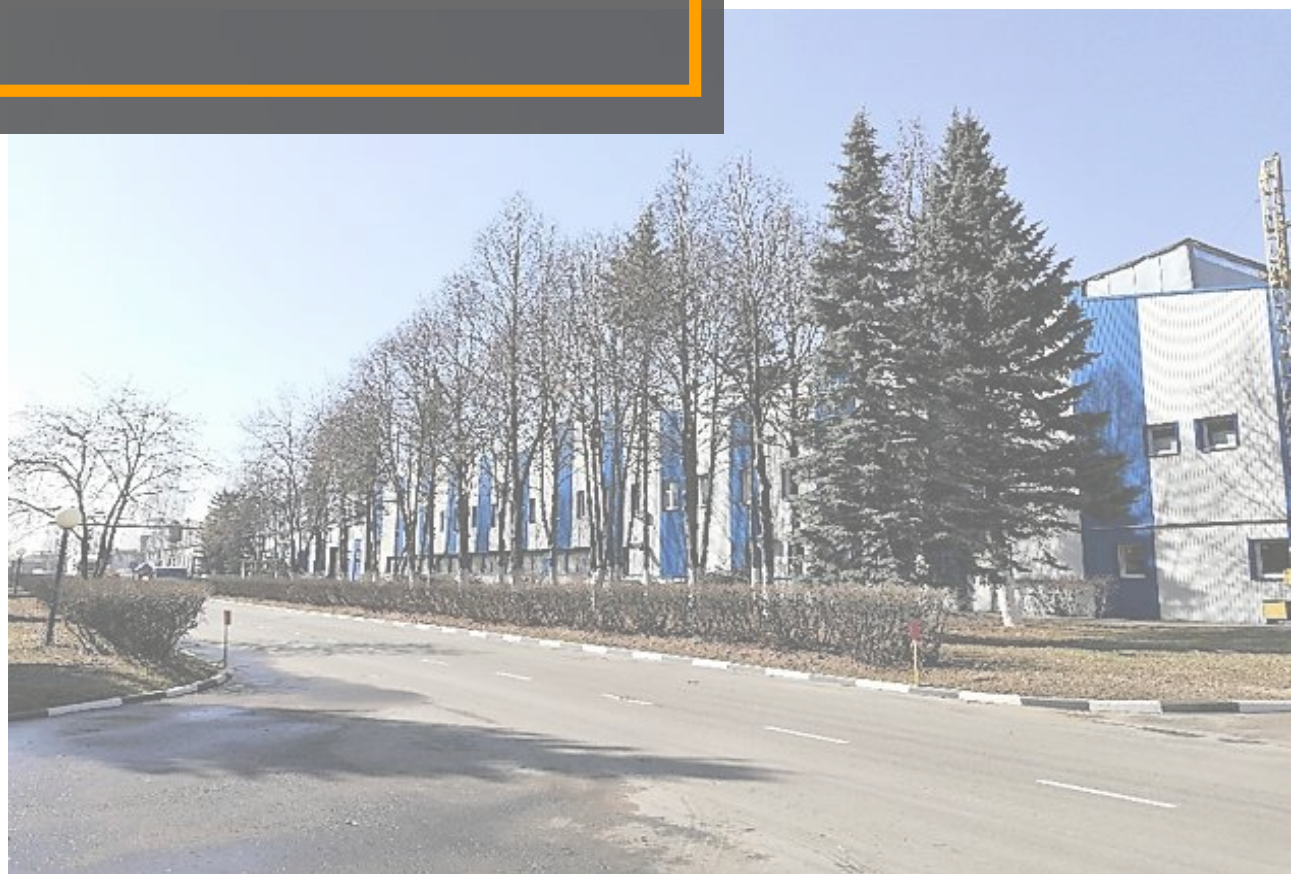
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