

STEKON WASTE WATER TREATMENT FACILITIES

Stormwater drain

Water legislation of the Russian Federation bans dumping drainfall and snowmelt waters which are drained from habitable territories and manufacturing sites and has not been purified to established quality targets into water catchment areas. Treatment facilities for surface-water flow ensure purification of waste waters to necessary regulatory values and prevent pollution of environment with various naturally occurring and industry-related impurities.

Both single-body and modular-type (as separate bodies) versions of STEKON stormwater treatment facilities can be supplied.



Technical performance

Name		STEKON stormwater treatment facilities
Rated output, l/s		1-150
Running temperature of waste waters, °C		+5...+40
Type of wastes on the inlet		stormwaters, oilcontaining
Pollutions	Petroleum products	not more than 100, mg/l
	Suspended materials	not more than 1 000, mg/l
Technology of purification		Sedimentation (in the sand separator), coalescence (in the oil-and-petrol-separator), sorption afterpurification (in the sorption filter)
Degree of purification	Petroleum products	not more than 0.05, mg/l
	Suspended materials	not more than 3, mg/l
Operating mode		Continuous, seasonally recurring
Attending personnel		1
Service life, years		Not less than 25
Design alternates		Single body, separate bodies, for underground installation
Accessory equipment		Pumping machinery, UV-sanification facilities, slurry decantation facilities, ventilation, heating, instrumentation and controls

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Application areas

Waste waters treatment facilities are used in rain-water drainage systems for purifying storm/rain petroleum- and oil-containing surface water flows coming from habitable areas, motorroads, gas stations, car parkings and garages, as well as from residential homes and public amenities.

Composition of an over-the-surface flow which undergoes purification at waste water treatment facilities is regulated with regulatory-technical documents adopted when designing and calculating basic technical parameters of purifying facilities: СП 32.13330.2012. Recommended guidelines on considering requirements to protection of environment when designing motorroads and bridge crossings.

The facilities may be of various heights and diameters and rigged with process equipment (pumps, UV-sanification facilities, slurry decantation facilities) and utility systems (exhaust ventilation, heating systems), instrumentation and controls upon agreeing with a customer.



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Sand separator



A sand separator is a cylinder-shaped vessel with connection pipes for intaking and discharging waste waters. A level-monitoring device may be inbuilt to check accumulation of sand. Maintenance of the sand separator is carried out through a service manhole.

Waste waters come inside the sand separator through an inlet connection pipe, flow through a thin-layer module (optional scope of supply) and are discharged through an outlet connection pipe.

Mechanical impurities over 1 500 kg/m in density and petroleum products are extracted from waste waters by gravity separation, by means of laminary flow of water and difference in density of pollutions. The outlet connection pipe cuts off supernatant petroleum products to flow over to the next stage of purification.

Concentration of pollutions on the inlet to the sand separator is:

- Suspended materials up to 1 000 mg/l
- Petroleum products up to 100 mg/l.

Degree of purifying waste waters downstream the sand separator:

- Suspended materials up to 800 mg/l
- Petroleum products up to 100 mg/l.

Technical performance

Flow rate (Q), l/s	Diameter (D), mm	Length (L), mm	Height of the inlet pipe (A), mm	Height of the outlet pipe (B), mm	Diameter of the inlet/outlet pipe (Din/out), mm	Weight, kg
10	2000	5000	1400	1350	160	510
15	2000	5800	1600	1550	200	740
20	2000	6200	1800	1750	200	974
25	2000	7600	1750	1700	250	1190
30	2400	6100	2150	2100	250	1820
40	2400	7800	2150	2100	315	1910
50	2400	9700	2150	2100	315	2300
60	2400	11500	2150	2100	315	2820
70	3200	8800	2800	2750	315	3530
80	3200	9900	2800	2750	400	3980
90	3200	11000	2800	2750	400	4400
100	3200	12100	2800	2750	400	4840

Manufacture of a sand separator with other dimensions is accepted upon agreeing with a customer.

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Oil-and-petrol separator



An oil-and-petrol separator is intended for trapping and accumulating petroleum products and suspended from surface waster waters.

There are in-built coalescent modules which are thin PVC-plates. Thanks to inherent design, the modules facilitate coarsening of oil particles and speed up emersion thereof.

Waste waters, upon entering oil-and-petrol separator chamber, are partially precipitated, and then flow through thin-layer coalescent modules designed as counter-flow systems eliminating light impurities.

By means of the coalescent modules, efficiency of space usage in increased thus making possible reduction of oil-and-petrol separator dimensions.

Coalescent module ensures separation of emerging oil products with size of particles 0.2 mm and greater, and separation of light suspended materials exceeding 1 500 kg/m in density.

The oil-and-petrol separator may be equipped with a control device which would control thickness of floating oil layer. Once an ultimate level of oil volume is reached, the device gives a relevant signal indicating due time for discharging the separator.

Concentration of pollutions on the inlet to the oil-and-gas separator is:

- Suspended materials up to 200 mg/l
- Petroleum products up to 16 mg/l.

Degree of purifying waste waters downstream the oil-and-gas separator:

- Suspended materials up to 20 mg/l
- Petroleum products up to 0,3 mg/l.

Technical performance

Flow rate (Q), l/s	Diameter (D), mm	Length (L), mm	Height of the inlet pipe (A), mm	Height of the outlet pipe (B), mm	Diameter of the inlet/outlet pipe (Din/out), mm	Weight, kg
10	2000	2700	1400	1370	160	340
15	2000	3100	1600	1530	200	470
20	2000	3300	1800	1730	200	620
25	2000	4000	1750	1680	250	750
30	2000	4600	1750	1680	250	870
40	2000	6000	2150	2070	315	1130
50	2400	5000	2150	2070	315	1470
60	2400	6000	2150	2070	315	1750
70	3200	4800	2800	2730	400	2300
80	3200	5300	2800	2730	400	2540
90	3200	5900	2800	2730	400	2830
100	3200	6400	2800	2730	400	3070

Manufacture of an oil-and-petrol separator with other dimensions is accepted upon agreeing with a customer.

Sorption filter



Sorption filters are intended for afterpurification of surface waste waters from fine-dispersed suspended materials highly-emulsified petroleum products.

Waste waters are delivered to distributing area, and filtered out of it with an upward current at a certain speed through a rated layer of sorbent agent. On the outlet from the plant, water is almost colorless and odorless, concentrations of polluting substances conform to regulatory values of dumping to fishery and recreational and service pools. Schungite or activated carbon are used as the sorbent agent. Schungite features capability to purify water almost from all organic substances, from many metals and non-metals, bacteria and microorganisms.

Schungite is used in the sorption filter for uniform distribution of flow and stopping suspended substances, it also stops petroleum products partially. For final afterpurification of petroleum products activated carbon is used. Flow of water through a cascade of filters ensures effective purification from emulsified petroleum products and suspended materials.

Concentration of pollutions on the inlet to the sorption filter is:

- Suspended materials up to 10 mg/l
- Petroleum products up to 0.3 mg/l.

Degree of purifying waste waters downstream the sorption filter is:

- Suspended materials up to 3 mg/l
- Petroleum products up to 0,05 mg/l.

Technical performance

Flow rate (Q), l/s	Diameter (D), mm	Length (L), mm	Height of the inlet pipe (A), mm	Height of the outlet pipe (B), mm	Diameter of the inlet/outlet pipe (Din/out), mm	Weight, kg
3	1600	1900	1250	1050	110	390
6	1600	2300	1400	1200	160	380
10	2000	2800	1400	1370	160	450
15	2000	3500	1600	1530	200	710
20	2000	4100	1800	1730	200	1020
25	2000	4100	1800	1730	200	1020
30	2000	5900	1750	1680	250	1480
40	2000	7700	2150	2070	315	1930
50	2400	7800	2150	2070	315	3050
60	2400	9200	2150	2070	315	3600
70	3200	8900	2800	2730	315	4490
80	3200	10000	2800	2730	400	5590
90	3200	11200	2800	2730	400	6860
100	3200	12250	2800	2730	400	7100

Manufacture of a sorption filter with other dimensions is accepted upon agreeing with a customer.

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The systems in a single body



Treatment facilities in a single body are designed for purifying surface flows and intended for use on territories with lots of amenities. The treatment facilities are released from factory in a maximally prefabricated state. The body is made of reinforced fiberglass, a light and durable, not corrosion prone material. The main advantage is small size at high performance, 1.5 – 70 l/s. Higher-performance systems consist of several lines of treatment facilities. Flow-through treatment systems do not require electro energy.

The most effective for purifying surface flows are facilities with performance up to 30 l/s.

Concentration of pollutions on the inlet to the treatment facility is:

- Suspended materials up to 500 mg/l
- Petroleum products up to 100 mg/l.

Degree of purifying waste waters downstream the single-body treatment facility is:

- Suspended materials up to 3 mg/l
- Petroleum products up to 0,05 mg/l.

Technical performance

Flow rate (Q), l/s	Diameter (D), mm	Length (L), mm	Height of the inlet pipe (A), mm	Height of the outlet pipe (B), mm	Diameter of the inlet/outlet pipe (Din/out), mm	Weight, kg
1.5	1600	3200	1400	1200	110	470
3	1600	4500	1400	1200	110	730
6	1600	5800	1400	1200	160	1300
8	1600	6200	1600	1400	160	1700
10	2000	5400	1800	1600	160	2200
15	2000	7300	1750	1530	200	2900
25	2000	10000	1800	1600	200	3970

Manufacture of a system with other dimensions is accepted upon agreeing with a customer.

Distribution well (optional equipment)



A distribution well is used in a flow-through design of purifying waste waters.

When a distribution well is used, concentrated part of rainwaters comes to treatment facility, and conditionally pure part of flow moves to a by-pass line. According to building codes and regulations SNiP, in a storm water drainage system it is necessary to ensure purification of the most polluted part of surface flow which is formed during rains, snow melting and road pavement cleaning.

Technical performance

Flow rate (Q), l/s	Diameter (D), mm	Diameter of the inlet pipe (Din), mm	Diameter of bypass line (Dout1), mm	Diameter of the outlet pipe (Dout2), mm	Height of the inlet pipe (A), mm
1.5	1600	3200	1400	1200	110
3	1600	4500	1400	1200	110
6	1600	5800	1400	1200	160
8	1600	6200	1600	1400	160
10	2000	5400	1800	1600	160
15	2000	7300	1750	1530	200
25	2000	10000	1800	1600	200

Manufacture of a distribution well with other dimensions is accepted upon agreeing with a customer.

Regulatory documents

- STO 00204961-019-2015
- Declaration of conformity TP TC N RU Д-РУ.AB24.B.02986
- Expert's report Nr 134 (of the Customs union).