TECHNOLOGIES AND EQUIPMENT for wastewater treatment

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THE EQUIPMENT WE TRUST

AIR DIFFUSERS

EQUIPMENT FOR CLARIFIERS

DAF-UNITS

MECHANICAL Dewatering

MECHANICAL TREATMENT
OUR ADVANTAGES:

» High capabilities in efficient and innovative equipment design. Ekoton’s product line consists of more than 30 products, which covers some 80% of typical WWTP need in technological equipment;

» One of the best aftersales service on the market: by the customer’s costs for services, by the rapidness of the services providing;

» Efficient production technology and low labor costs allow Ekoton to produce high quality equipment for the medium price.
EKOTON INDUSTRIAL GROUP

is a leading manufacturer of equipment for wastewater treatment. Our company produces more than 35 different types of equipment for mechanical treatment, biological treatment and sludge dewatering. A wide range of EKOTON brand products allows us to offer our customers complex solutions using equipment we produce.

EKOTON Industrial Group focuses in development, production and implementation of modern high quality technological equipment dedicated to municipal wastewater treatment as well as industrial applications in food process, cement, chemicals, coal and metal process enterprises.
ONE PRODUCER FOR DIFFERENT WASTEWATER TREATMENT STAGES

NOWADAYS EKOTON EQUIPMENT OPERATES IN 29 COUNTRIES WORLDWIDE: BANGLADESH, BELARUS, BULGARIA, CANADA, CHINA, CHILE, COLUMBIA, GERMANY, HUNGARY, INDIA, ITALY, ISRAEL, KAZAKHSTAN, LATVIA, LITHUANIA, MOLDOVA, PHILIPPINES, POLAND, RUSSIA, SAUDI ARABIA, SINGAPORE, NETHERLANDS, TURKMENISTAN, UKRAINE, UNITED ARAB EMIRATES, USA, UZBEKISTAN AND VIETNAM.
ONE PRODUCER FOR DIFFERENT WASTEWATER TREATMENT STAGES

Equipment for mechanical, biological, physicochemical wastewater treatment as well as sludge dewatering equipment is produced on the EKOTON manufacturing plants.

- Sewage mechanized screens (rake bar screens, step screens, screw screens, drum screens, grinder screens, wastes grinders);
- Screw conveyors and screw compacting presses;
- Grit chambers;
- Sludge scrapers and suction sludge scrapers, V-notched weirs, feed wells, scum baffles for equipment of the primary and secondary clarifier;
- Penstocks;
- Tube air diffusers;
- Mechanical dewatering complexes on the base of belt and chamber filter presses, thickeners, multi-disc dehydrators;
- DAF-units and polymer solution preparation units.
The retention of mechanical contaminants and the wastewater preparation to the biological treatment are carried out at the stage of the mechanical wastewater treatment.

It is extremely important to prevent the ingress of the large scale waste at the following treatment stages. The waste occurred in sedimentation tanks and aerotanks, can disable the equipment at the following treatment stages.

The use of the EKOTON equipment helps to ensure the high level of wastewater treatment from mechanical impurities at any stage of the wastewater treatment and allows using the mechanical treatment both as an independent method and as one of the wastewater treatment stages.
RAKE BAR SCREENS

“STRONG DEFENSE IN A CHANNEL WITH SIMPLE OPERATION AND MAINTENANCE”

Rake bar screens are designed for extraction of large and medium size particles from wastewater and recommended to be used for preliminary mechanical treatment at sewage pumping stations. High reliability and possibility of using the 5 mm bar spacing makes the rake bar screens a good solution for the fine screening on the base of wastewater treatment plant.

ADVANTAGES:

» Use of special tear drop bar profile allows to decrease hydraulic resistance in 15-30%;
» Screen’s cleaning efficiency is increased due to tear drop bar shape. It is easy to remove wastes from the gaps between bars;
» Rake bar screen is made of stainless steel; the motion path of the chain is protected with abrasion-proof polymer material. It ensures long service life of rake bar screens;
» There are no rotating parts at a submerged screen’s part, thereby increases its reliability;
» ‘Floating’ construction of rake mounting allows perfect cleaning of the filtering mesh and prevents screenings from sliding off the rake;
» Rake bar screen is maintenance friendly: main units are easy accessible in operation and demounting is not required to lift up the rake bar screen from the channel;
» Rake bar screen is equipped with protective device that actuates when rake jams and mechanical damages occurs;
» Automation of screen operation allows saving energy and reduces influence of human factor impact.
EXTRACT FROM THE REFERENCE OF WASTEWATER TREATMENT PLANT (AUGUSTÓW, POLAND)

“Water Distribution and Sewerage Company Ltd. Augustów (ZWIK Sp. z o.o.) as Main Investor of investment task called “Selection, delivery and installation of a set of equipment for mechanical raw wastewater treatment from solid fraction at Wastewater Treatment Plant in Augustów” confirms, that PRODEKO-ELK company from October 2016 till January 2017 was Main Contractor of this project and delivered, installed and commissioned following equipment:

- rake bar screen RKE 1142 type of spacing s = mm – 1 pc,
- screw compacting press type SCP 2013 for compacting and transporting screenings – 1 pc,
- control cabinet with system for controlling of RKE screen and screw compacting press SCP – 1 pc,
- penstocks ZSg-I - 2 pc.

PRODEKO-ELK Ltd. has realized assigned tasks in totally professional way which emphasizes the fact that the company has great technical experience in terms of manufacturing equipment for specialist objects.

In our opinion PRODEKO-ELK as producer and contractor can be recommended as a partner for executive companies that seek adequate and reliable delivers.”

EXTRACT FROM REFERENCE OF WASTEWATER TREATMENT PLANT (BISKUPIEC, POLAND)

“Water Distribution and Sewerage Company Ltd. (PWIK Sp. z o.o.) as Main Investor confirms, that PRODEKO-ELK company located in Ełk (Poland) in 2015 delivered, installed and commissioned following equipment on pumping station in Biskupiec:

- Rake bar screens type RKE 0842
- Screw compacting press type PVO 2011
- Control panel
- Slide gate type ZK-I 900x2400(1200) with manual drive

Delivered and installed devices were manufactured professionally, which emphasizes the fact that PRODEKO-ELK has a great technical experience in the field of wastewater treatment equipment production. That is why the installation procedure was very quick and efficient.

It is worth to notice that any mechanical defects have been removed regardless of their causes. Service team have responded and taken appropriate actions according to our requests calls.

We claim with all responsibility that PRODEKO-ELK has appropriate technical potential as well as qualified and active personnel proper for realization of similar projects.

In our opinion PRODEKO-ELK as producer can be recommended as a partner for executive companies that seek adequate and reliable delivers.”
The screen design allows retaining fine contaminants by means of filtering layer of the screenings, which is created on the surface of the filtering mesh; Screen is made of stainless steel, this ensures long service life of equipment; The filtering mesh design allows to avoid reeling of the screenings, therefore this screen is perfectly suitable for the treatment of wastewater containing rags, wool and other fibrous contaminants; Step screen is maintenance friendly: main units are easy accessible in operation and demounting is not required to lift up the step screen from the channel; Automation of screen operation allows saving energy and reduces influence of human factor impact.

ADVANTAGES:

Step screens are designed for extraction of large and medium screenings from wastewater and recommended for fine treatment of domestic and industrial wastewater.
MINI RAKE BAR SCREEN

SOLUTION FOR THE SMALLEST CHANNELS AND CHAMBERS. SLOT WIDTH FROM 1 TO 5 MM BY YOUR CHOICE

Using of mini rake bar screen is an effective and reliable solution for coarse and fine screening at low volume of wastewater.

MINI RAKE BAR SCREENS ARE USED:

» To protect the pumps from breakings due to the coarse screenings;
» For the fine screening of municipal sewage on the small wastewater treatment plants;
» For the local mechanical wastewater treatment of the individual objects.

ADVANTAGES:

» Long service life of equipment due to the stainless steel design and absence of the rotary elements;
» Screen openings from 1 to 5 mm provide the fine wastewater treatment;
» Features of the screen filtering mesh allow avoiding of the rake jamming;
» Mini rake bar screen is maintenance friendly and require minimum capital and operational costs.

ROTARY DRUM SCREEN INSIDE-OUT

FINE FILTRATION 1MM PERFORATION FOR HEAVY SOLIDS LOADING

Rotary drum screens inside-out are used for fine mechanical treatment of domestic and industrial wastewater

ADVANTAGES:

» Extended filtering surface provides a possibility to efficiently deal with the most diverse tasks, such as fine mechanical treatment of municipal wastewater and thickening of slurry, separation of feathers;
» A large inner diameter of a drum and its design ensure reliable operation in case if large objects or objects containing fibrous and woven inclusions get into the drum;
» Regeneration of the filtering mesh by means of washing and a rotary brush ensures stable screen capacity and allows using it for wastewater with high FOG concentration;
» Fully enclosed design with a ventilation pipe helps to solve odors spreading throughout premises.
The screen is made of stainless steel that ensures the long service life of the screen;

Small openings of the perforated filtering mesh ensures fine wastewater treatment retaining even such hard-to-retain contaminants as hair;

The screenings retaining mesh is cleaned inside a drum by means of brushes. Additional filtering mesh washing with water under the pressure is also possible;

The cover on the top of the screen prevents from splashing and odour spreading, also ensures easy access for maintenance and visual control;

The screen is compact, this allows using it at small wastewater treatment facilities.

The screen is used at wastewater treatment plants of municipal and industrial enterprises, which wastewater flow rate is up to 150 m³/h. It is installed directly on a pipe and removes inclusions, which size is above 0.8 mm.

ADVANTAGES:

- The screen is made of stainless steel that ensures the long service life of the screen;
- Small openings of the perforated filtering mesh ensures fine wastewater treatment retaining even such hard-to-retain contaminants as hair;
- The screenings retaining mesh is cleaned inside a drum by means of brushes. Additional filtering mesh washing with water under the pressure is also possible;
- The cover on the top of the screen prevents from splashing and odour spreading, also ensures easy access for maintenance and visual control;
- The screen is compact, this allows using it at small wastewater treatment facilities.

The screen is used for mechanical treatment of food processing industry wastewater with high content of feather, wool, and fat.

ADVANTAGES:

- The screen is made of stainless steel that ensures the long service life of the screen;
- The mesh formed using the method of winding a triangle profile ensures fine treatment of wastes with the retention of such hard-to-retain contaminants as hair. It also excludes contaminants stick in the mesh openings;
- High quality of the mesh cleaning is ensured by two-stage washing with a flow of treated wastewater and hot water under pressure.
SCREW SCREEN

The screen is designed for removal, washing and pressing of solid particles with fine size from wastewater. It is recommended to use it in domestic wastewater, as well as effluents of pulp-and-paper and cardboard mills, textile and food productions.

ADVANTAGES:

» The perforated mesh ensures the high efficiency of filtration. A brush, located on the edges of the screw, ensure the optimal mesh cleaning in the filtration zone.

» The filtering mesh of the screw screen is made of stainless steel as a perforated sieve; it has an increased filtration area due to inclined arrangement of the screen in a channel;

» Screenings, retained on the filtering mesh, are removed by the revolving axial screw; this solves the problem of fibrous inclusions winding up;

» Organic compounds are washed off while screenings move along the transporter. Screenings are compacted due to the screw pitch decrease.

SCREW SCREEN COMBINES FUNCTIONS OF SCREENINGS RETENTION, ITS WASHING, COMPACTION AND TRANSPORT. THIS MEANS THAT IN INDIVIDUAL CASES IT CAN REPLACE A MECHANICAL TREATMENT MODULE.
Grinding screens are designed for grinding of coarse screenings in domestic and industrial wastewater.

**ADVANTAGES:**

- The grinding screen housing is made of stainless steel. Material of shafts and cutters is the hardened tool steel. This ensures the long service life of the screen;
- The screen is maintenance friendly. Auxiliary mounting facilities allow lifting the screen from the channel, not emptying the latter. The grinding mechanism and drum are made as separate modules, which allows removing them from the equipment separately, not lifting up the screen from the channel;
- Efficient grinding of coarse waste by means of shafts rotating at a different speed towards to each other;
- The special design of drums, which does not allow waste to accumulate inside the screen ensures high capacity and reliability of the screen operation;
- The use of grinding screen RKD allows reducing the needs in operating personnel at pump stations and costs for the screenings disposal;
- An automatic reverse gear is provided to eliminate possible jamming. This increases considerably the level of equipment independence.
WASTES GRINDER

Wastes grinders are used for grinding fine and medium screenings discharged from the mechanized screens at sewage pumping stations.

ADVANTAGES:

- The wastes grinder housing is made of stainless steel.
- Shafts and cutters are made of hardened tool steel. This ensures the long service life of the screen;
- In case of the grinder sticking with solids, the automated protection system switches on the reverse gear and restarts the grinder cutters;
- The use of the wastes grinder retains organic compounds in wastewater and facilitates the process of their further biological treatment.

EXTRACT FROM THE REFERENCE OF ‘MOSVODOKANAL’ JSC:

‘...The grinders are installed at the sewage pumping stations. Installation of equipment did not caused any difficulties. The commissioning operations were carried out by the personnel of the company.

Screenings are grinded quickly and qualitatively. A bucket of screenings (0.015 m³) is processed for 1.5 minutes.

0.5 t/h capacity hammer grinders earlier used at the sewage pumping stations were equipped with 22 kW gearmotors.

The power of gearmotor, which is now used for EKOTON grinder, is 5.5 kW that leads to considerable energy saving.’

EQUIPPING THE SEWAGE PUMPING STATION WITH EKOTON WASTES GRINDER NOT ONLY OBVIATES THE NEED OF SCREENING DISPOSAL, BUT ALSO ALLOWS REDUCING THE NUMBER OF OPERATING PERSONNEL OR TRANSFERRING TREATMENT FACILITIES COMPLETELY TO THE AUTOMATIC OPERATION MODE.
The screw is made of wear-resistant carbon steel. Other elements are made of corrosion-resistant steel AISI 304 that guarantees the long service life of the screen;

The shaftless screw of conveyor prevents it from clogging with transported screenings and sludge and allows reducing the load onto the drive as compared to axial screw mechanisms;

The closed-type design of the transporter prevents from splashing and odour spreading and thus improves the sanitary and hygienic condition of a premise;

An automatic reverse gear is provided in the conveyor mechanism for possible jamming elimination. This allows refusing from permanent stay of operating personnel;

The possibility of the conveyor operation synchronization with mechanized screens saves the energy resources consumption.

Screw conveyor is used for screenings transportation or dewatered sludge transportation at wastewater treatment plants. The transportation is performed in a horizontal or inclined plane to a distance up to 30 m by one conveyor.

ADVANTAGES:

- The screw is made of wear-resistant carbon steel. Other elements are made of corrosion-resistant steel AISI 304 that guarantees the long service life of the screen;
- The shaftless screw of conveyor prevents it from clogging with transported screenings and sludge and allows reducing the load onto the drive as compared to axial screw mechanisms;
- The closed-type design of the transporter prevents from splashing and odour spreading and thus improves the sanitary and hygienic condition of a premise;
- An automatic reverse gear is provided in the conveyor mechanism for possible jamming elimination. This allows refusing from permanent stay of operating personnel;
- The possibility of the conveyor operation synchronization with mechanized screens saves the energy resources consumption.

EXTRACT FROM THE REFERENCE OF ‘VODOKANAL’ SRUE (MOGILEV, BELARUS):

‘...The rake shop of the Main Sewage Pumping Station in Mogilev was reconstructed along with the installation of an automated mechanical treatment complex: 3 mechanized sewage screens RKE, screw conveyor KVE-230, screw compacting press SCP-2007.

The screw conveyor operation analysis for the last year showed the high quality of your equipment and this had a positive effect on the fail-safe operation of the pumping station and thus improved the operation of the wastewater treatment plant in Mogilev.’
The screw compacting press is designed for compacting and washing of screenings retained on mechanized sewage screens.

**ADVANTAGES:**

- The press is made of stainless steel and the operating screw is made of special wear-resistant carbon steel. This guarantees the long service life of the press;
- The waste washing function allows keeping organic compounds in wastewater. This facilitates the process of their further biological treatment;
- The screenings compaction reduces costs for its transportation in multiple times;
- An automatic reverse gear is provided in the press mechanism for possible jamming elimination. This allows refusing from permanent stay of operating personnel;
- The possibility of the press operation synchronization with the conveyor and mechanized screens saves the energy resources consumption.

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**EXTRACT FROM THE REFERENCE OF 'KREMENCHUGVODOKANAL' ME (POLTAVA DISTRICT, UKRAINE):**

‘…From the beginning the equipment operates in a stable mode ensuring the qualitative treatment of wastewater. The screens retain a big quantity of impurities from wastewater and this had a positive effect on the operation of the secondary clarifiers and wastewater treatment plant as a whole. The operation efficiency increase is as follows:

The use of the screw conveyor allowed collecting screenings in a concentrated manner and the use of the screw compacting press with screenings washing allowed reducing the release of smells from screenings reducing their quantity 3-5 times.’
TANGENTIAL GRIT CHAMBER

Grit chambers are designed for retaining and removing grit from industrial and domestic wastewater, its further washing, compaction and unloading to a container for grit.

ADVANTAGES:

- Collected grit is additionally washed from organic compounds by means of water under pressure and grit mixing ensures more qualitative washing;
- The housing of the inclined screw transporter is protected against abrasion by a wear-resistant polymer insert.

THE CIRCULATING LIQUID FLOW IS GENERATED IN THE GRIT CHAMBER. THIS ALLOWS REMOVING FINE GRIT FRACTION MORE EFFICIENTLY, PREVENTING FROM ORGANICS SEDIMENTATION

CHAIN SCRAPER

Chain scrapers are designed to remove the sludge and scum from the clarifiers and for the grit removal from the grit chambers. It is mounted in horizontal rectangular clarifiers or in horizontal grit chambers. It can be produced in 2, 3 or 4-shaft performance.

ADVANTAGES:

- Using of high quality plastic ensures high construction reliability while working in the absence of lubricant;
- Low capital and operating costs;
- The use of plastic chains increases the product lifetime in 2-5 times compared to analogues;
- Low noise level during the operation of the equipment;
- Individual approach to the manufacturing of equipment with non-standard dimensions by request of the customer.

Material – stainless steel and aluminium alloys
**COMBINED MECHANICAL TREATMENT MODULE M-COMBY**

*(FINE SCREEN COMBINED WITH AERATED GRIT CHAMBER)*

**COMPACT SOLUTION INTEGRATES SEVERAL STAGES OF MECHANICAL TREATMENT IN ONE UNIT!**

Combined Mechanical Treatment Module M-Comby is used for mechanical treatment of domestic and industrial wastewater.

**ADVANTAGES:**

- High hydraulic load is ensured by spiral movement of liquid inside the complex as a result of the flow aeration;
- Equipment is made of stainless steel AISI 304 (AISI 316); conveyor housings are protected against abrasion by wear-resistant polymer inserts. This ensures the long service life of the module M-Comby;
- Screenings and grit washing allows retaining organic compounds in wastewaters, which facilitates the process of their further biological treatment;
- Compact arrangement of equipment allows considerably reducing space required for its location;
- The complex operation automation allows reducing costs for operating personnel.

**OPERATION OF THE MULTI-FUNCTIONAL COMPLEX ALLOWS CONSIDERABLY REDUCING COSTS FOR CONSTRUCTION OF WASTEWATER TREATMENT PLANT!**

5 FUNCTIONS IN ONE UNIT:

- **FINE MECHANICAL TREATMENT;**
- **WASHING AND DEWATERING OF THE SCREENINGS;**
- **GRIT SEPARATION AND WASHING;**
- **GRIT DEWATERING AND DISCHARGE;**
- **GREASE SEPARATION AND REMOVAL.**
Penstocks are designed for complete or partial closing of channels. Penstocks can be completed with manual or electric drives.

**ADVANTAGES:**

- Penstocks are made completely of stainless steel and this ensures their long service life;
- A sealing along the perimeter of the board, which is resistant to aggressive environment effects, ensures the water tightness of the design when closed;
- The slip-type pressing mechanism of the sealing is made of wear-resistant polymer which excludes ‘adhesion’ of wedges to each other; when the penstock stay in closed position for a long time;
- The leakproof casing protects the lifting spindle against contamination and oil drying when the penstock is opened.

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**EXTRACT FROM THE REFERENCE OF ‘ASTROVODOKANAL’ MUE:**

‘The penstock made of stainless steel with the size of 2,330*2,200 mm was installed on the inlet well of the primary clarifiers at the Northern Wastewater Treatment Plant in May 2009. During the operation the operating personnel marked such characteristics as the convenient installation, easy manual control, resistance of the gate material to aggressive environment impact, sealing ensuring leakproof closing of the channel, simple maintenance, and reliable operation’
EQUIPMENT FOR CLARIFIERS

EKOTON INDUSTRIAL GROUP
has delivered more than 500 suction sludge scrapers and sludge scrapers.

» SLUDGE SCRAPERS;
» SUCTION SLUDGE SCRAPERS;
» PICKET TYPE STIRRER;
» EFFLUENT LAUNDER;
» WEIRS;
» FEED WELL

Radial clarifiers are designed for separation of the treated water from suspended solids, scum, oil products, active sludge.

A wide range of equipment and static elements are used for the primary and secondary clarifiers. They are used to provide laminar liquid movement conditions, equal collection of the sludge and scum, prevention of the ingress of impurities into the treated water.
Radial sludge scrapers are designed for sludge removal from the bottom of clarifiers. They feature a strong mechanism with high corrosion protection and modern aesthetic.

Material – stainless steel and aluminium alloys
Electric wheels based on planetary gearboxes option is available

RADIAL SLUDGE SCRAPERS
Ashgabat, Turkmenistan

ADVANTAGES:

- Sludge scrapers are made completely of corrosion-resistant materials: stainless steel AISI 304, aluminium alloys and polymers. This ensures the long service life of equipment;
- Scrapers are equipped with a rubber apron. The apron movement reproduces completely the relief of the clarifier bottom and ensures qualitative collection of the sludge even from hollows;
- A bar arrangement is used for better sedimentation of the sludge in the sludge well;
- The trolley travel speed is adjusted smoothly by a frequency converter and this allows adjusting the unloaded sludge humidity, reducing the construction part wear, increasing the process equipment service life and using energy resources in a more economical manner;
- The central support in the form of a rotating bearing unit facilitates considerably equipment installation and maintenance;
- The full two wheel drive (optional) of the trolley and edge cleaning mechanism ensure protection against wheel slip in winter when the clarifier side wall is iced.
SUCTION SLUDGE SCRAPERS

Suction sludge scrapers are designed for activated sludge removal from the bottom of secondary clarifiers.

**ADVANTAGES:**

- They are made of corrosion-resistant materials: steel AISI 304, aluminium alloys and polymers. This ensures the long service life of suction sludge scrapers;
- Individually set hydraulic characteristics for each clarifier by means of the flow control in separate suction units;
- Ensuring the complete sludge removal from the clarifier bottom by means of special design of the suction unit;
- The central support on the base of a rotating bearing unit considerably facilitates equipment installation and maintenance;
- The full 2 wheel drive (optional) excludes wheel slip in winter;
- The option of the sludge collector mobility in the vertical plane compensates the clarifier bottom irregularities.

DURING THE DEVELOPMENT OF EQUIPMENT DESIGNERS FOCUSED ON MAXIMUM INCREASE OF RELIABILITY, EASY MAINTENANCE, REDUCTION OF SUCTION SLUDGE SCRAPER COST.
EXTRACT FROM THE REFERENCE OF WABRA CONTRACTOR, ZAHRAN, KINGDOM OF SAUDI ARABIA

‘By here with we WABRA CONTRACTOR EST note that during the cooperation with the company EKOTON it has acquired a reputation as the organization of highly professional specialists, which knows subtleties of the operation of wastewater treatment facilities and develops technologies of the highest world level. We, as main contractor, are glad to work with products that are manufactured at this enterprise.

In July 2016, 2ZSP sludge scrapers with the diameter of 10+8 m were delivered, installed and put into operation in wastewater treatment plant 1500 m³/day for Air Forces Defense in Zahran, Kingdom of Saudi Arabia.

All installed equipment has been operating stably and smoothly from 2016. One of the main advantages of this type of equipment is the serviceability and reliability. Sludge scrapers are structurally designed for a long-term trouble-free operation. No wear of moving parts are observed.

The suggested design is proved to be stable, rigid and reliable in operation. Bridge on the sludge scrapers has central drive and mounted on two independent supports that are placed out of the clarifiers. Such construction allows not carrying and weight on GLS tank where scrapers must operate. The cleaners of walls and edges of sludge scrapers are well designed, convenient in adjustment and don’t cause dissatisfaction. All the electric part of the drive runs smoothly in various temperature conditions.

WABRA CONTRACTOR EST thanks the team of EKOTON for the high quality equipment and careful attention to the needs and requirements of our enterprise during the production, delivery and adjustment of sludge scrapers.’
The stirrer is made of corrosion-resistant materials ensuring the long-term service life of equipment; the form of stirring pickets and the distance between them are such that drainage channels are generated in the sludge when they move; void water and gases is extracted from the sludge by means of pickets. Equipment is controlled from an electrical control cabinet. This allows switching on or off a scraper in a remote manner and send a signal of operation or failure.

**THE PICKET TYPE STIRRER**

The picket type stirrer is intended for intensification thickening process in sludge thickeners.

**ADVANTAGES:**

- The stirrer is made of corrosion-resistant materials ensuring the long-term service life of equipment;
- The form of stirring pickets and the distance between them are such that drainage channels are generated in the sludge when they move; void water and gases is extracted from the sludge by means of pickets.
- Equipment is controlled from an electrical control cabinet. This allows switching on or off a scraper in a remote manner and send a signal of operation or failure.

**EFFLUENT LAUNDER**

EKOTON Industrial Group produces launders of both linear and radial configuration. Launders for radial clarifiers are made of parts coupled exactly in a circumferential direction, without any angles formation between the planes of adjacent elements’ walls.

**WEIRS**

Weirs are intended for horizontal levelling of the liquid level in clarifiers for the purpose of uniform water distribution along the perimeter of a water collection launder and saturation of clarified water with atmospheric oxygen. Weirs are used for equipping of primary and secondary clarifiers at the site of wastewater treatment plants.
SCUM BAFFLES

Scum baffles are designed for the scum entrapping from the surface of wastewater in primary clarifiers. They are used for equipping of primary clarifiers at the site of wastewater treatment plants.

FEED WELLS

Feed wells are designed to distribute the flow equally in all directions. They are used for equipping of primary and secondary radial clarifier at the site of wastewater treatment plants.

HANDRAILS AND WALKWAYS

Walkways and safety handrails are made of aluminium alloy noted for high strength and corrosion resistance characteristics, therefore no complex and expensive coating is required (this alloy is used particularly in ship-building, air, food and chemical industries).
Dissolved air flotation is one of the most efficient physicochemical methods of industrial wastewater treatment. Separation of liquid and solid phases by means of floating microbubbles is the base of the flotation process. Suspended solids, grease, oils and petroleum derivatives are removed from wastewater during the flotation process; the concentration of BOD and COD is reduced.

Application of this technology allows reducing the load onto biological treatment facilities and reach the maximum allowable concentration (MAC) for effluents discharge to the sewage in case of their absence.
Original form of the flotation tank ensures a sufficient period of time for the flotation process (the period required to reach the liquid surface for the “particle-bubble” flotation complex) without increasing the size of the DAF unit. Such form allows ensuring the most efficient route of liquid movement, at which no ’dead’ zone occurs. It also provides a possibility of convenient removal of precipitated sludge.

Design features of EKOTON DAF unit allow saturating liquid with air directly in a circulation pump, therefore additional costs for a saturator purchase are excluded;

High quality and reliability of DAF units are ensured by use of components produced by the leading European companies;

The operation of the whole complex is completely automated, including the chemicals preparation and dosing equipment.

Equipment is made of corrosion-resistant steel AISI 304, this ensures long service life of DAF unit;

EXTRACT FROM THE REFERENCE OF ‘BELGORODSKY ABRASIVE PLANT’ OJSC:

‘The removal efficiency of resin-oil admixtures, petroleum derivatives and grease reaches up to 98.5 %; the reduction of COD and suspended solids as a result of treatment reaches 80%. The average monthly consumption rate of flocculants does not exceed 25 kg and coagulant – does not exceed 3.5 m3 of 30% solution’.
AUTOMATIC POLYMER SOLUTION PREPARATION UNIT “SMART MIX”

Automatic Polymer Solution Preparation Units “SMART Mix” are used for cyclic preparation of polymer solutions from dry and liquid concentrates, if such preparation process requires certain preparation time.

ADVANTAGES:

» **Ability to prepare solutions from corrosion-active chemical agents.** Only corrosion-resistant materials are used for production of the unit.

» **Operation both in periodical and cyclic mode.** The unit can be operated as in periodic mode (single preparation of a solution dose), as in cyclic mode of solution preparation without interference of operating personnel.

» **Simplicity and low cost of assembling.** The unit is supplied as ready to use system (all components are already mounted on a unit housing), to start operation it only has to be mounted on a foundation and connected to supply lines.

» **Tightness.** The unit is supplied to a customer fully enclosed, but all protective parts can be easily removed upon necessity of maintenance.

» **Easy to operate.** The unit is equipped with a control system based on PLC Siemens and Weintek (HMI) graphical panel, which allows operating the unit in a fully automatic mode with minimum interference of an operator. Simple and intuitive interface of control system allows operating the unit without high qualified personnel.

» **High reliability.** Only high-quality reliable component kits are used for production of equipment. The unit is also equipped with a small amount of movable parts, it reduces a list of wear components and spare parts to a minimum.

» **Ability to connect the unit to SCADA system.** Control system gives a possibility to transmit data and remotely control the unit from an operator’s work seat by using SCADA data transmission system.

» **Units are produced with one, two or three chambers.**

» **Unit capacity: from 250 l/h to 6000 l/h.**

» **Solution concentration: from 0.05% to 0.5%.**

» **Solution retention time – depends on the capacity.**

APPLICATION:

» **Water treatment;**

» **Wastewater treatment;**

» **Industrial wastewater treatment;**

» **Dewatering of municipal and industrial sludges;**

» **Biogas production.**
Aeration in wastewater treatment is intended for artificial saturation of sludge mixture in bioreactors with dissolved oxygen used by microorganisms for oxidizing organic and biogenous contaminants.

Generally the so-called pneumatic aeration is used in aerobic bioreactors; its operating rationale is compressed air delivery to the tank bottom with activated sludge and its advancing through aeration elements that facilitate bubbles generation.

EKOTON INDUSTRIAL GROUP has delivered more than 800,000 lin m of aerator units and continues increasing this value.
Air diffusers are designed for equable distribution of air supplied from a compressor or air blower in the water. Air diffusers are used in aerotanks, at the biological wastewater treatment site. Air diffusers can be also used in aerobic sludge stabilizers and basins.

**ADVANTAGES:**

- Absence of maintenance necessity (flushing, cleaning) during the whole period of operation;
- Air diffusers generate bubbles 2-3 mm in diameter, this is the optimal size both in terms of mass transfer surface and sludge mixture mixing;
- Air diffusers ensure uniform air distribution throughout the corridor by means of using an air gap in the air diffusers design;
- The special design of air diffusers ensures their resistance to hydraulic impacts and mechanical exposures and thus ensures high reliability of air diffusers;
- Air diffusers are installed in an easy and convenient way. Also there is a possibility of replacing the external pore pipe leaving the basic air diffuser structure;
- Low capital costs - cost of a structure purchase is 2.5 times less than other types of air diffusers.
AIR DIFFUSER DESIGN:

The design of air diffuser represents two pipes inserted into each other with an air gap between them.

The air is supplied through an internal perforated pipe made of PVC or HDPE and it enters the shell side through radial holes. An external pipe is made of LDPE, which is resistant to aggressive environments and has a porous basis ensuring the flow of fine bubbles in the aerotank. Diameter of bubbles generated by the external dispersing layer of aerators is 2-3 mm. This conditions high mass transfer characteristics and sufficient mixing of the sludge mixture.

The functions of equable air distribution along the unit length and its dispergation are separated by means of the air gap between tubes and this ensures considerable reduction of air head loss in the aerator. The availability of ring inserts in the shell side of air diffusers ensures not only equable discharge of the aeration unit, but also the maximum operating surface of the external porous-fibre layer. This increases the quantity of air bubbles.

The disperser and frame are fixed by means of male and female couplings, having a completely modular construction, which ensures easy installation and allows replacing separate elements during operation.

**Oxygen transfer efficiency**

**Pressure loss characteristics**
**MECHANICAL SLUDGE DEWATERING**

- Belt Filter Presses;
- Chamber Filter Presses;
- Sludge Belt Thickener;
- Dehydrators.

**EKOTON INDUSTRIAL GROUP**

has delivered more than 200 belt-filter presses, thickeners and dehydrators.

The mechanical dewatering of wastewater sludge and industrial slurries is intended for decreasing their volumes by separating liquid phase from suspended substances dissolved in it.

After dewatering process, liquid sludge and slurries turn into substances with considerably higher concentrations of suspended solids and have the consistency of damp soil. Such consistency allows dewatered sludge to be transported in a truck body.
Belt filter presses are designed for mechanical dewatering of wastewater sludge, as well as water purification sludge and industrial slurries.

**ADVANTAGES:**

- High dewatering efficiency due to the sequence and special configuration geometry of the shafts with different diameters;
- High corrosion protection level. The frame is made of stainless steel AISI 304, and high-loaded shafts made of carbon structural steel are protected by the polymer coating;
- Low energy consumption;
- Low polymer consumption;
- Reliability of the filter press is also ensured by high quality components, which are produced by the leading European manufacturers;
- Automated intelligent belt control system completed with protection system against the belt misalignment;
- Compactness of the equipment, in particular, of COMBI version.
EXTRACT FROM THE REFERENCE OF ‘MOZYR OIL REFINERY’ JSC:

'During a half-year operation the equipment delivered by 'EKOTON' showed the reliable, stable and efficient work, simplicity in operation and maintenance, high corrosion resistance, low energy consumption (installed capacity of electric drives of PL-12 C with the thickener is 3.3 kW), sufficient process efficiency (dewatered cake moisture ranges from 81% to 84%). The actual capacity for mineralized thickened excess activated sludge was up to 15 m³/h'.
The sludge belt thickener is designed for use as the first stage of sludge dewatering before its supplying to a filter press to in order to increase of theits hydraulic productivitycapacity of the latter, as well as an independent unit for sludge preparation for digestion in anaerobic reactors digestion or reduction of load onto sludge fields, etc.

ADVANTAGES:

- High corrosion protection level: The frame is made of stainless steel AISI 304 and shafts made of carbon structural steel are protected by the polymer coating;
- High efficiency of sludge thickening due to the special system of ‘plows’;
- Automated intelligent belt control system completed with protection system against the belt misalignment.
MOBILE SLUDGE DEWATERING UNITS

The mobile unit is designed for mechanical dewatering of wastewater sludge, as well as water purification sludge and industrial slurries at treatment facilities with the capacity up to 6 m³/h by the initial sludge.

CAN BE USED FOR:

» Selection of optimal operation parameters of a sludge dewatering department equipment, for example, selection of polymer type and dose for different actual samples of sludge;

» Carrying out of scientific researches and experiments with different types of sludge;

» Dewatering of sludge accumulations located at a distance outside treatment facilities;

» Dewatering of bottom sludge in different basins;

» Dewatering of sludge at local wastewater treatment plants.

MOBILE MECHANICAL SLUDGE DEWATERING UNIT IS A FULL-FEATURED FUNCTIONAL MODULE. IT CAN BE USED BOTH AS A MOBILE AND PERMANENT-SET COMPLEX.
CHAMBER FILTER PRESS

MULTI-PURPOSE MACHINE FOR THE DRIEST CAKE REACHING

Chamber filter press is intended for dewatering of industrial suspensions and municipal wastewater sludge. Its usage allows reaching a maximum level of solid and liquid phases separation by means of high pressure of sludge filtering, washing, pressing and drying.

ADVANTAGES:

» Use of high-density filtering materials ensures high purity of filtrate;
» Low sludge moisture is ensured by means of high pressure of sludge filtering, pressing and drying of sludge;
» Low remaining content of a primary filtrate in cake is achieved by means of sludge washing and drying;
» Due to multi-stage washing, filtrate dilution with a washing filtrate is kept to a minimum;
» Low consumption of washing liquids and air during drying process due to combination of mentioned operations with compacting operations.
» High performance;
» Energy saving;
» Simple in operation due to small number of movable parts;
» Simple sludge cake discharge due to vertical arrangement of filter plates;
» Simple filtrate drainage through collector system;
» Separation of operating fluids by means of advanced valve-collector system;
» Long life of filtering materials due to their immobility during operation and regeneration processes;
» Advanced control system.

AREAS OF APPLICATION OF CHAMBER FILTER PRESSES:

» METALLURGY;
» FOOD INDUSTRY;
» CHEMICAL INDUSTRY;
» COAL MINING INDUSTRY;
» CEMENT INDUSTRY;
» KAOLIN, POTTERY AND PORCELAIN MANUFACTURE;
» DEWATERING OF INDUSTRIAL SUSPENSIONS;
» MUNICIPAL WASTEWATER TREATMENT.

Material – stainless steel and aluminium alloys
IF NECESSARY, A FILTER PRESS CAN BE MADE WITH MEMBRANE PLATES, IT PROVIDES ADDITIONAL TECHNOLOGICAL ADVANTAGES:

- Increase of filtering efficiency due to cancellation of filtering operation in case of sudden reduction of filtering efficiency;
- Possibility to get a discharged cake in case of deterioration of filtration properties of a suspension;
- Additional reduction of moisture under the high pressure extraction;
- Reduced consumption of washing fluids and air for drying cycle comparing with a chamber version.
EFFICIENT, ECONOMICAL AND AUTOMATED DEWATERING. VERY LOW ENERGY, WASH WATER AND POLYMER CONSUMPTION.

Dehydrators are designed for mechanical dewatering of industrial and domestic wastewater sludge. They are recommended for dewatering sludge at small-capacity utility treatment facilities, as well as enterprises of food, pulp-and-paper, textile, chemical, oil refining and other branches of industry. Screw dehydrators suit good for DAF sludge dewatering.

ADVANTAGES:

- Compactness;
- Low energy consumption;
- Flocculant consumption is consistent with flocculant consumption for dewatering on a belt filter press;
- Low consumption of washing water;
- Dewatering of grease and oil-containing sludge;
- Dewatering of sludge containing grit and other mineral abrasive materials;
- Almost noiseless;
- Made completely of stainless steel AISI 304;
- Operated in the automatic mode.
Compact and easy to install. Major components such as dehydration unit with a set of rotating discs, flocculation tank, washing water tank, control cabinet, and etc. are compactly housed in a unit. The space required is minimal, and it is easy to install.

Possibility to treat oil-contained sludge. Since the dehydration unit has a “hard to clog” structure, it can be used for treatment of oily sludge or DAF froth. Acceptable range of the initial sludge concentration is between 0.5% and 10.0%.

Energy efficiency. The dehydrator is operated by a very small total output power. The installed capacity of the largest model is only 2.6 kW.

Low wash-water consumption. During operation disc drums are regularly washed after a certain period of time with a minimum amount of water.

No secondary pollution. Since the dehydration unit is fully closed, and the disc drums rotate at a very low speed, it does not scatter the sludge or emits many vapors to the surrounding environment, and the operating noise and vibration are extremely low.

Simple maintenance. The installation design is really simple, so maintenance operations can be carried out easily and performed rarely.
OUR SERVICES

PILOT AND TEST
We make your decision process easy. If you have any questions how our equipment works you can test it at your WWTP.

COMMISSIONING EQUIPMENT
We take responsibility for launching the equipment and putting it into operation.

AFTER-SALES SERVICES
We offer you the best aftersales service on the market: by the customer’s costs for services, by the rapidness of the services providing.

RENTAL SOLUTION
We can help you in meeting short-term demands and unexpected situations.

SUPPORT
We offer you 24/7 on-line Support Service with our best engineers.
TECHNOLOGIES AND EQUIPMENT for wastewater treatment

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