EKOTON
INDUSTRIAL GROUP

One producer for different stages

SCREENING
Screens, grinders, grit chambers, conveyors, presses

Rake type bar screen RKE
(Herzliya, Israel)

GRIT REMOVAL


Grit Chamber
(Bytom-Radzionków, Polska)

SEDIMENTATION


Sludge scraper
(Kępno, Polska)

AERATION


Aeration system assembling
(Shanin, China)

SLUDGE DEWATERING


Sludge dewatering workshop
(Belgorod, Russia)

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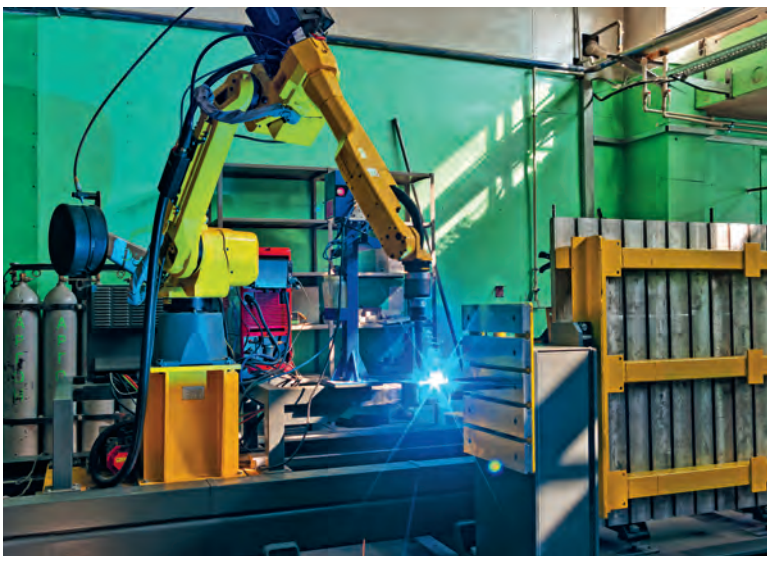
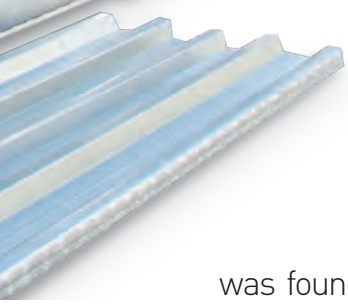
“ The base of each offer of the EKOTON Industrial Group is examination of the wastewater treatment facility and professional selection of the effective decision. ”

We work to help people who make water clean. We develop and produce for them reliable technological equipment, never forget them after sale, maintaining their plants in good and easy operation conditions. Because the main value we have is relations between people: our customers, our staff, our suppliers, our neighbours.

Director
EKOTON Industrial Group

PETR TRUNOV





The EKOTON Company

was found in 1995 by specialists in the field of wastewater treatment. Having started with the production of only aeration systems and 8 employees, the Company has begun to produce the mechanized equipment already in 1999, increasing its production capabilities and involving new specialists in its team with each year.

More than 300 people work in the EKOTON Industrial Group in 2015.

The plants of the Company are located in Poland, Ukraine and Russia and they produce more than 30 kinds of the proprietary wastewater treatment equipment.

Now, the EKOTON equipment operates at treatment facilities in 13 countries in the world: Belorus, Bulgaria, Hungary, Israel, Kazakhstan, China, Moldova, Netherlands, Poland, Russia, Turkmenistan, Uzbekistan and Ukraine.

The enterprise is certified for the compliance with ISO international standards and has standards of the IQNet ISO 9001:2008, QualityAustria ISO 9001:2008, GOST R ISO 9001-2008 and GOST R ISO 14001-2007 Quality Management Systems and environmental protection, as well as is the owner of more than 30 patents for manufactured products.

01 MECHANICAL WASTEWATER TREATMENT

- mechanized screens;
- grinding screens;
- waste grinders;
- conveyors;
- press compactors;
- grit chambers;
- slide gates.

The retention of mechanical contaminants and the wastewater preparation to the biological treatment is carried out at the stage of the mechanical treatment of wastewater.

It is extremely important to prevent the ingress of the large scale waste at the following treatment stages. The waste caught 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 the treatment of wastewater from mechanical impurities at any stage of the wastewater disposal and allows using the mechanical treatment both as an independent method and as one of stages of the wastewater treatment.

The EKOTON Industrial Group

has delivered more than **1000 units of equipment** for the mechanical treatment (which include 750 mechanized screens) and more than **3000 slide gates.**

Cr.Ni inside STAINLESS

Material - stainless steel

RAKE TYPE BAR SCREENS RKE

Rake type bar screens are intended for extraction of large and medium waste solids from wastewater and recommended to be used for preliminary mechanical treatment at sewage pumping stations. Rake screens can be used also for fine treatment at sewage pumping stations or at wastewater treatment plants.

RAKE TYPE BAR SCREEN ADVANTAGES:

- Use of special tear-shaped profile allows to decrease hydraulical resistance for 15-30%;
- Screen's cleaning efficiency is increased due to tear-drop bar shape. It is easily to remove wastes from the gaps beween bars.
- Rake screen is made of stainless steel; the path of chain movement is protected with abrasion-proof polymer material. It ensures long service life of rake screens;
- There are no rotating parts at a submerged screen's submerged part that increases its reliability;
- 'Floating' construction of rake fastening allows to clean the filtering screen very good and prevents wastes from sliding off the rake;
- Rake screen is serviceable: main units are easy accessible in operation and demounting is not required to lift up the rake screen from channel;
- Rake screen is equipped with protective device that actuates when rake stalls and mechanical damages occurs;
- Automation of screen operation allows to saving energy and reduces influence of human factor.

The range of bar spacing consists **from 5 to 70** — Depending on purpose of screen, consumption and composition of wastewater, channel size and other factors.

Mechanical treatment complex based on rake type bar screens

(Kremenchug, Ukraine)

From comments of 'Water supply and sewage utilities' JSC

'.... Rake type bar screens produced by EKOTON RPC CJSC meet all up-to-date requirements and are analogue to equipment of leading world manufacturers that adapted to operational environments in Russia. Use of screw drying press allowed decreasing the amount of wastes taken away and improving their sanitary condition thanks to rinsing'.

Rake type bar screen

(Herzlia, Israel)

From comments of 'Gorteploenergo' ME

'...First of all, maintenance organization noted materials used for production of up-to-date rake type bar screens. Rake screens are made of stainless steel and polymer materials, that make your products look modern and aesthetically beautiful and also operation life time increases.

Such technical matters as easy adjustment of filtering screen, use of induction sensor of torque limiting, capability of rake screen operation in automatic mode as by time, so by level of water in supply channels are successfully implemented in rake type bar screen construction.

There was no emergency stop of rake screen for all period of operation within 10 months.'

Mounting of rake type bar screen at Dikanyovka wastewater treatment plants

(Kharkov, Ukraine)

From comments of 'Municipal treatment plants' CJSC

'...It should be noted steady, reliable and most importantly uninterrupted operation of all just installed equipment for all in-service time. Treatment of wastewater became significantly better, amount of wastes to be taken off increased and this in its turn significantly improved operation of equipment of all water treatment complex in whole. Energy consumption decreased in 5 times. As a result of partial dehydration and respectively decreasing of wastes volume, transport charges became lower, wastes discharge in winter became easier.'

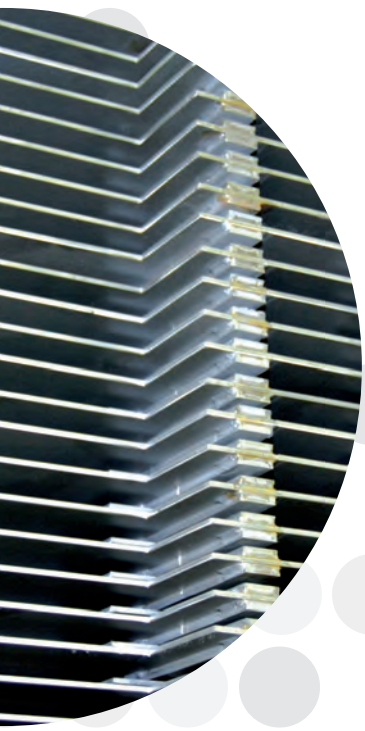
STEP TYPE SCREEN RSK

Step type screens are intended for extraction of large and medium waste solids from waste-water and recommended for fine treatment of domestic and industrial wastewater.

Step Type Screen Advantages:

- Screen is made of stainless steel that ensures long service time of equipment;
- Stepwise principle of operation provides forming of a wastes layer on the work surface of the screen, hence rataining fine contaminations on a filtration profile with 5 mm spacing between lamellas.
- Step screen is serviceable: main units are easy accessible in operation and demounting is not required to lift up the step type screen from the channel;
- Automation of screen operation allows saving energy and reduces influence of human factor.

Mechanical treatment complex based on step type screens



From comments of 'Vodokonal' MUE

'...Step type screen RSK 0509, serial number No 39, was put into operation at sludge dewatering facilities shop to remove trash and different contaminants from sediments and thickening of activated sludge. The screen was used in the shop from December, 2010 to August, 2011. In August, 2011 the step type screen RSK 0509 was installed in outhouse of pumping station in front of sludge consolidation tank. During the all-time the step screen operated as it should without any failures. We have no complaints against its operation. '

From comments of 'Vodokonal' JSC

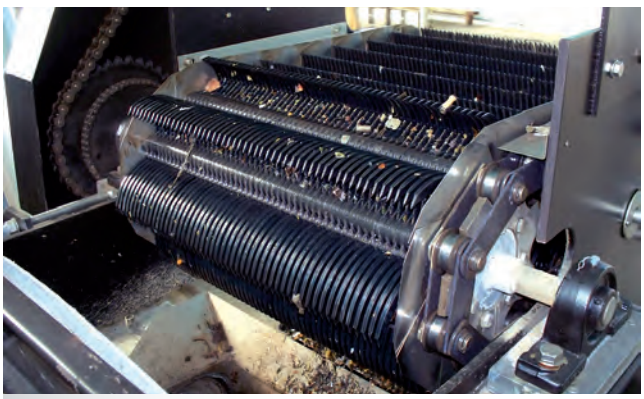
'...I want to note reliability of your equipment that operates fully in automatic mode for all period of service. Percentage of wastes caption increased, especially fibrous contaminants are very important for us. All mentioned improved the operation of equipment. Because of rinsing and partial dehydration frequency of wastes disposal decreased and hygienic and sanitary conditions at the mechanical treatment site improved.'

HOOK TYPE SCREEN RKKT

Hook type screens are intended for removal of fine and medium waste products from wastewater. Such screens are recommended for fine treatment of wastewater from municipal and industrial enterprises.

Hook Type Screen RKKT Advantages:

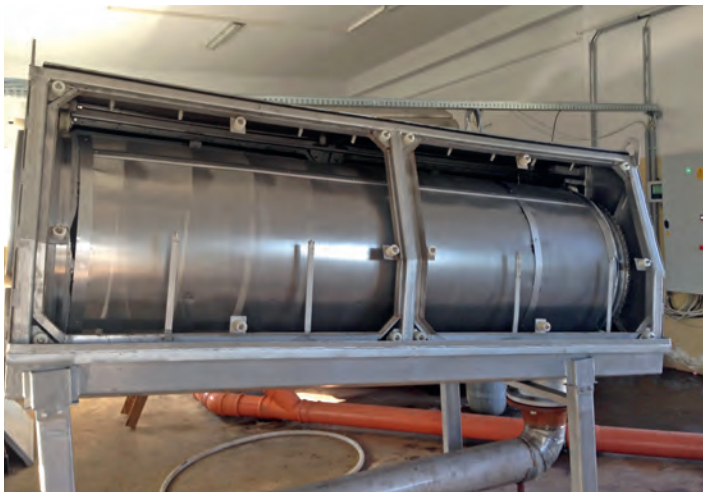
- The screen housing is made of stainless steel; the trash retaining mesh consists of hooks made of flexible impact-resistant plastic; the motion path of the chain is protected against abrasion by wear-resistant polymer. This guarantees the long service life of screens;
- The screen design allows retaining fine particles due to expense of creating a filtering layer of waste products;
- A possibility of replacement of both modules and individual hooks is provided in the screen mesh design. The screen can be repaired quickly and cheaply due to this;
- The self-cleaning trash retaining mesh is flushed with water from nozzles after the retained trash removal and is cleaned additionally by revolving brushes;
- The screen is maintenance friendly; the main units are in the operating condition and no demounting is required for the screen removal from a channel;
- The screen operation automation allows saving energy resources and reduces the human factor impact.

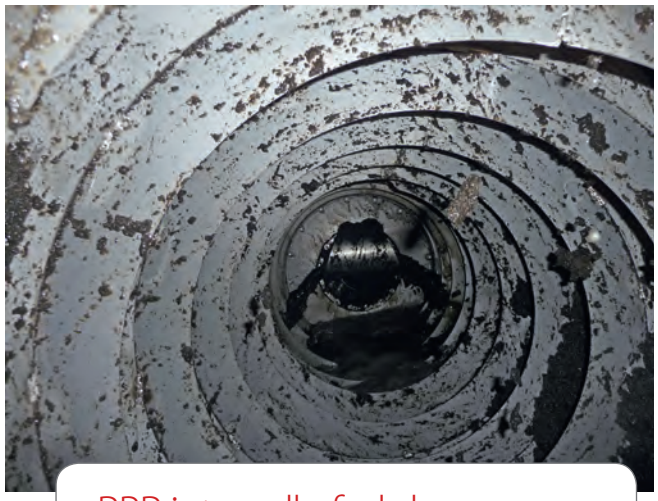


Hook Type Screen RKKT

ROTARY DRUM SCREENS RBR

RBR drum screens are used for fine mechanical treatment of municipal and industrial wastewater.





RBR internally-fed drum screen is noted for its high reliability when applied to specific wastewater containing large number of dry solids, fibrous and woven inclusions, large pieces of trash.

Advantages of RBR drum screens:

- 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 with 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.

BRUSH TYPE DRUM SCREEN RMB SH

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

Brush Type Drum Screen RMB SH Advantages:

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

DRUM TYPE SCREEN WITH MESH MADE OF TRIANGLE PROFILE RMB TP

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

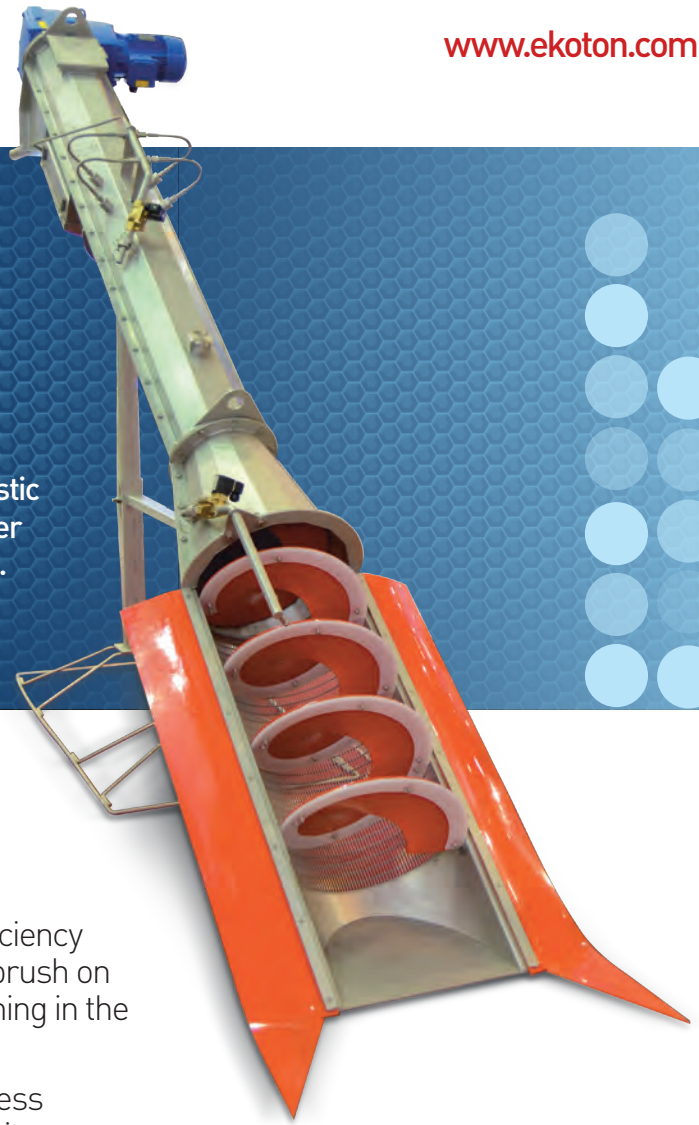
Drum Type Screen with Mesh Made of Triangle Profile RMB TP Advantages:

- 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 flushing with a flow of treated wastewater and hot water under pressure.

Local treatment facilities of 'Poultry Farm 'Kaluzhskaia' OJSC

SCREW SCREENS RVO

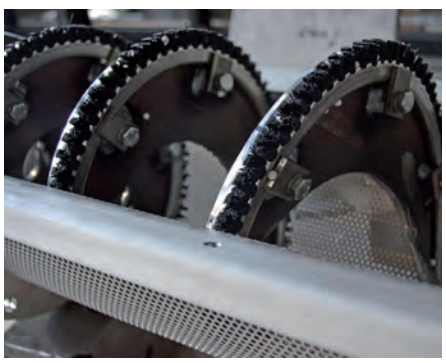
The screen is intended for removal, washing and pressing of solid particles with fine size from wastewater. It is recommended to use it in domestic wastewater, as well as effluents of pulp-and-paper and cardboard mills, textile and food productions.



Screw Screen RVO Advantages:

- The perforated mesh ensures the high efficiency of filtration. The screw is equipped with a brush on its edges to ensure the optimal mesh cleaning in the filtration zone.
- The trash retaining mesh is made of stainless steel in the form of a perforated mesh and it has an increased filtration area due to inclined arrangement in a channel;
- Waste products retained on the filtering mesh are removed by the revolving axial screw and this solves the problem of hair inclusions winding up.
- Debris washing from organic compounds occurs while it moves on a transporter. It is compacted due to screw pitch decrease.

Screw screen RVO combines the functions of debris retention, its flushing, compaction and transport. This means that in individual cases it can replace a mechanical treatment module.



GRINDING SCREEN RKD Grizzly

Grinding screens are intended for grinding coarse waste products in domestic wastewater.

Grinding Screen RKD Grizzly Advantages:

- The use of grinding screen RKD allows reducing the needs in maintenance personnel at pump stations and costs for wastes removal.
- The special design of drums, which does not allow waste products to accumulate inside the screen ensures high capacity and reliability of the screen operation;
- The grinding screen housing is made of stainless steel. Shafts and cutters are hardened tool steel. This guarantees the long service life of the screen;
- The screen is maintenance friendly. Auxiliary rigging fixtures allow lifting the screen from a channel, not empting the latter. The grinding mechanism and drum are made as separate modules, which allows removing them from the device separately, not removing the screen from the channel;
- Efficient grinding of coarse wastes due to grinder's shafts rotating at a different speed towards to each other;
- An automatic reverse gear is provided to eliminate possible jamming. This increases considerably the level of equipment independence.

The use of grinding screens allows not only pumps protection from waste removal to pumps, but also to solve completely the problem of collected debris removal and its recovery.

WASTES GRINDER DO

Waste grinders are used for grinding fine and medium waste products removed from mechanized meshes at pumping stations.

Waste Grinder DO Advantages:

- The waste grinder housing is made of stainless steel. Shafts and cutters are made of of hardened tool steel. This guarantees 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

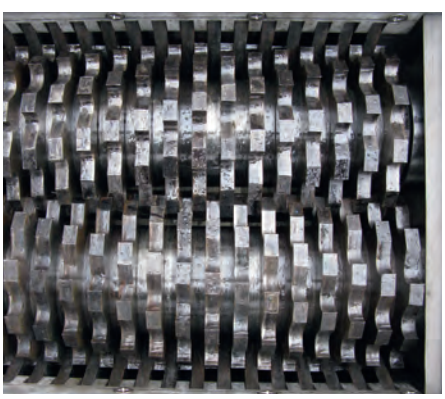
Pumping station equipping with wastes grinder EKOTON not only obviates the need to remove wastes, but also allows reducing the number of maintenance personnel or transferring treatment facilities completely to the automatic operation mode.

From the opinion of 'Mosvodokanal' JSC:

'...The grinders are installed at the sewage pump stations. The grinders installation did not caused any difficulties. The commissioning operations were carried out by the company's personnel.

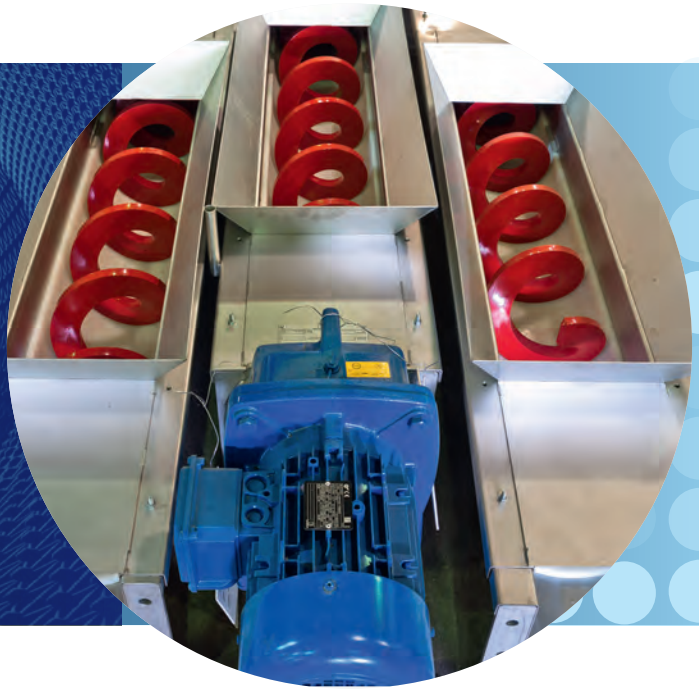
Waste is grinded quickly and qualitatively. A bucket of wastes is processed for 1.5 minutes.

The hammer grinders pre-installed at the stations, with the capacity of 0.5 t/h are equipped with 22 kW electric motors. The capacity of a grinder produced by EKOTON is 5.5 kW that leads to considerable saving'.



SCREW CONVEYOR KVE

**At wastewater treatment plants the screw conveyor is used for screening transportation or dewatered sludge transportation.
The transportation is performed in a horizontal or inclined plane to a distance up to 30 m.**



Screw Conveyor KVE Advantages:

- The conveyor screw is made of wear-resistant carbon steel. Other elements are made of corrosion-resistant steel AISI 304. This guarantees the long service life of the screen;
- The axis-free spiral of the transporter prevents from its clogging with transported waste products 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 maintenance personnel;
- The possibility of the conveyor operation synchronization with mechanized screens saves the energy resources consumption.

Mechanical treatment package based on screens RKE and screw conveyor KVE

(Kremenchug, Ukraine)

From the opinion of 'Vodokanal' SRUE

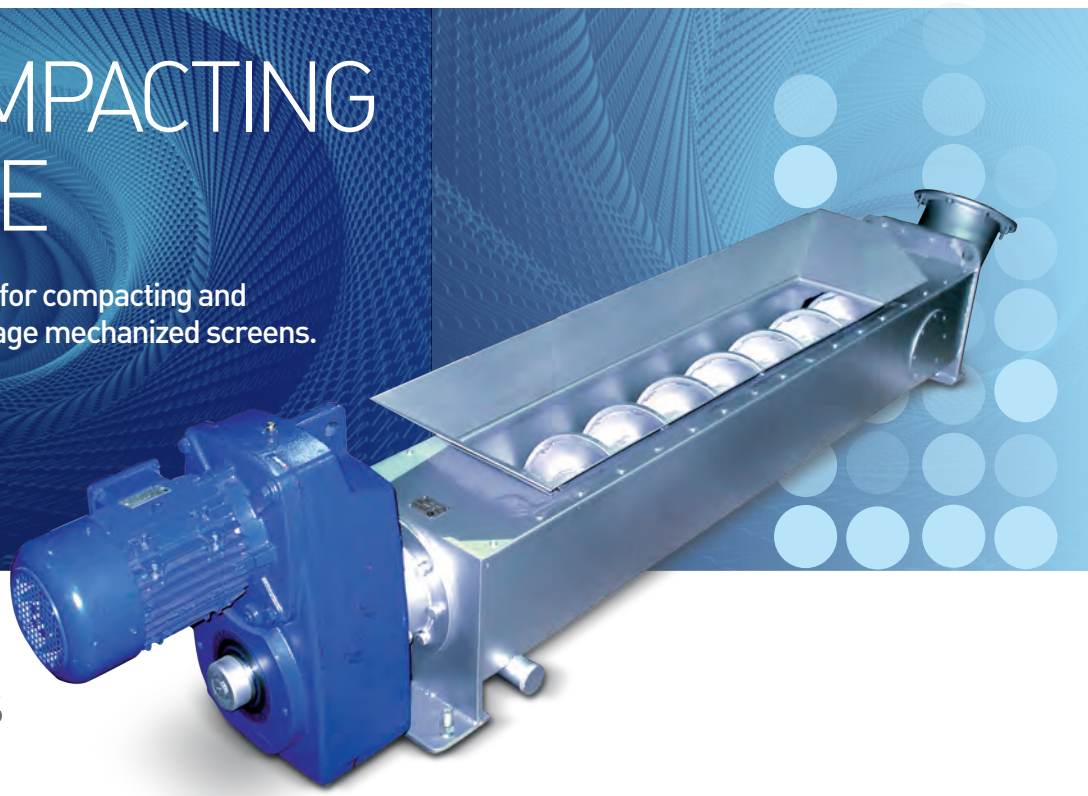
(Mogilev, Belarus):

'...The rake section of the Main Sewage Pump Station in Mogilev was reconstructed along with the installation of an automated mechanical treatment module: 3 mechanized sewage screens RKE, screw conveyor KVE-230, screw compacting press PVOE-2007.

The CSPS 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 pump station and thus improved the operation of the sewage treatment facilities in Mogilev.

SCREW COMPACTING PRESS PVOE

The compacting press is intended for compacting and flushing wastes entrained on sewage mechanized screens.



Screw Compacting Press PVOE Advantages:

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

Screw compacting press
(Kremenchug, Ukraine)

From the opinion of 'Kremenchugvodokanal' ME

(Kremenchug, 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 treatment facilities as a whole. The operation efficiency increase is as follows:

The use of the screw conveyor allowed collecting wastes in a concentrated manner and the use of the screw compacting press with waste flushing allowed reducing the release of smells from wastes and reducing their quantity 3-5 times.

TANGENTIAL GRIT CHAMBER

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

Tangential Grit Chamber Advantages:

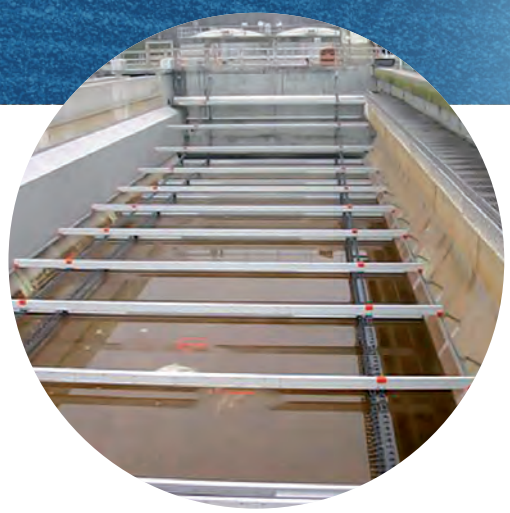
- Collected grit is washed additionally from organic compounds with water under pressure and grit mixing ensures more qualitative flushing;
- The housing of the inclined screw transporter is protected against abrasion by a wear-resistant polymer insert.

The circulating liquid flow is generated in the grit chamber of this type. This allows removing fine grit fraction more efficiently and preventing from organics sedimentation.

Tangential Grit Chamber

BELT SLUDGE SCRAPPER

The belt sludge scrapers are used to remove sediments and floating materials from the clarifiers and for grit removal from the grit chambers. It is mounted in horizontal rectangular clarifiers or in horizontal grit chambers. It can be produced in 2, as well as in 3 or 4-shaft performance.



The belt sludge scraper advantages:

- Using of high quality plastic in the belt sludge scraper production ensures high construction reliability while working in the absence of lubricant.
- Low investment and operating costs.
- The usage of plastic chains compared to analogues increases the product lifetime in 2-5 times.
- High wear resistance and the ability to work in conditions without lubricant due to the used polymeric materials.
- Low noise level during the operation of the equipment.
- Individual approach to the equipment with non-standard dimensions manufacturing by the customer's request.

COMPLEX FOR MECHANICAL WASTEWATER TREATMENT M-COMBI

(fine screen with aerated grit chamber)

The Complex for Mechanical Wastewater treatment M-Combi is used for mechanical treatment of domestic and industrial effluents.

Complex for Mechanical Wastewater treatment M-Combi Avantages:

- 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 complex M-Combi;
- Wastes and grit washing allows retaining organic compounds in wastewaters, which facilitates the process of their further biological treatment;
- Compact arrangement of equipment allows reducing considerably areas required for its location;
- The package operation automation allows reducing costs for maintenance personnel.

5 functions in one unit:

- fine mechanical treatment;
- wastes washing and dewatering;
- grit separation and washing;
- grit dewatering and discharge;
- grease separation and removal.

The Multi-Functional Package Operation allows Reducing Considerably Costs for Construction of Treatment Facilities!

SLIDE GATES

Slide gates are intended for complete or partial closing of channels. Gates can be completed with manual or electric drives.

Slide gates will serve for at least **25 years** at their correct operation and maintenance!

Slide Gates EKOTON Advantages:

- Slide gates 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 compactor is made of wear-resistant polymer which excludes 'adhesion' of wedges to each other when they stay on the gate in the closed position for a long time;
- The air-tight casing protects the jacking screw against contamination and oil drying when the gate is opened;

(Gryfino, Polska)

From the opinion of 'Astrovodokanal' MUE:

'The slide gate made of stainless steel with the size of 2,330*2,200 mm was installed on a distribution bowl of the primary clarifiers at the Northern Sewage Treatment Facilities in May 2009.

During the operation the maintenance personnel marked such characteristics as the convenient installation, easy manual control, resistance of the gate material to aggressive environment effect, sealing device ensuring air tight closing of the channel, simple maintenance, and reliable operation'.

02 EQUIPMENT FOR CLARIFIERS

- sludge suckers;
- sludge scrapers;
- bar mixer;
- trays for radial-flow settling tanks;
- overflow weirs;
- central cups.

Radial primary clarifiers are intended for suspended solids and floating particles removal. These are reinforced concrete tanks, where effluents are delivered to the central part; sediments are collected in the central pit by scrapers throughout the plane and the special float on the top removes all impurities that are lighter than water to the bunker.

There is also the second line of radial clarifiers downstream of the primary clarifiers and aerotanks in the biological treatment. Sludge suckers can be installed in the secondary clarifiers, the same us sludge scrapers - depending of technology was chosen. They are intended for activated sludge removal from the bottom of the secondary clarifiers of industrial and domestic

EKOTON Industrial Group delivered more than **300 sludge suckers and sludge scrapers.**

Cr.Ni.Al inside STAINLESS

Material – stainless steel and aluminium alloys

RADIAL SLUDGE SCRAPERS

Sludge scrapers are intended for sludge removal from the bottom of clarifiers.

Sludge Scraper EKOTON 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 central pit;
- 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 economic manner;
- The central support in the form of a rotating bearing unit facilitates considerably equipment installation and maintenance;
- The full 2 wheel drive (optional) of the trolley ensures protection against wheel slip in winter when the clarifier side wall is iced.

Sludge scrapers of ZGR type were awarded with Grand Prix at the XII International Exhibition Fair of Machines and Devices for Water Lines and Sewage Systems WOD-KAN 2004 (Poland).

Sludge scraper EKOTON IRPO instalation

Sludge scraper
(Gnev, Poland)

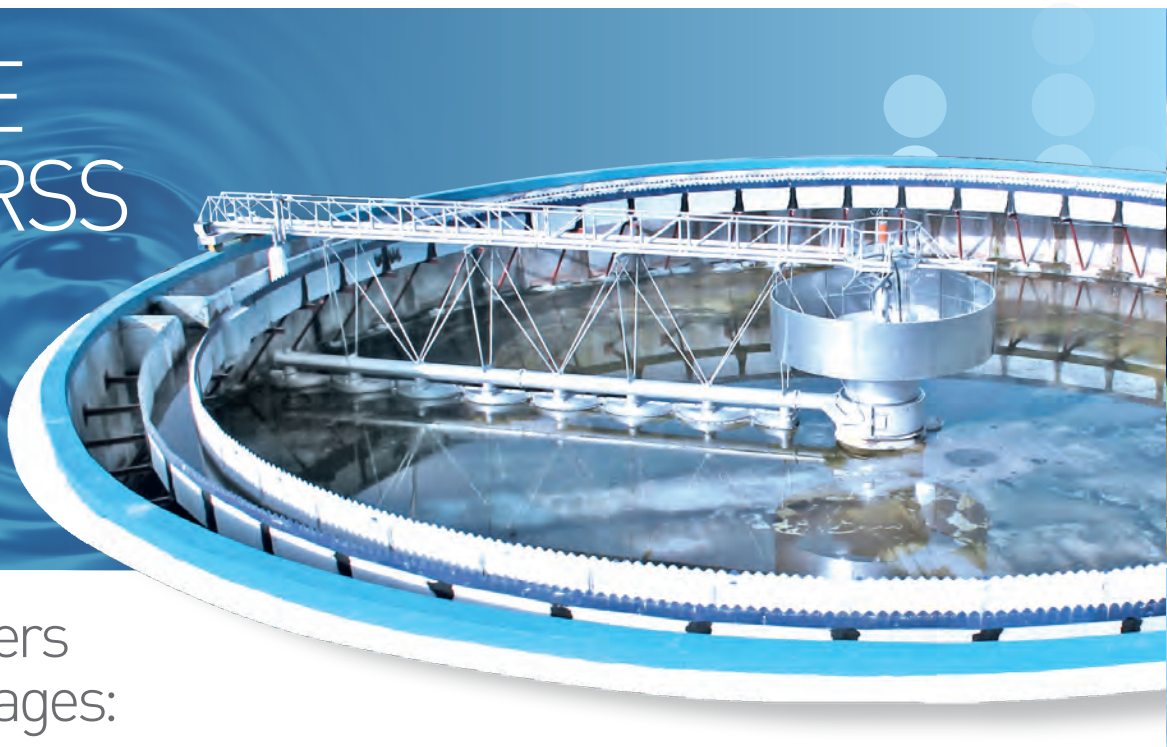
Sludge scraper
(Elk, Poland)

Cr.Ni.Al inside STAINLESS

Material – stainless steel and aluminium alloys

SLUDGE SUCKERSS

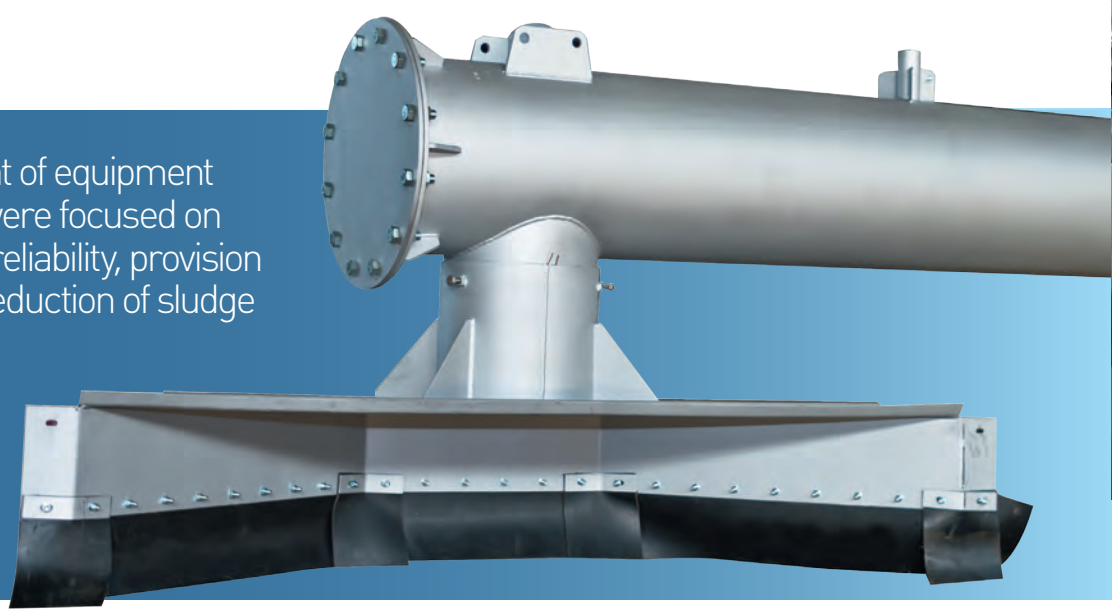
Sludge suckers are intended for activated sludge removal from the bottom of secondary clarifiers.



Sludge Suckers IRVO Advantages:

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

During the development of equipment the designers' efforts were focused on maximum increase of reliability, provision of easy maintenance, reduction of sludge intake module cost.



From the opinion of Lipetsk WWTP:Lipetsk

'One of the main advantages of this equipment type is its easy maintenance and reliability. Structurally, sludge suckers and sludge scrapers are rated for long-term fail-safe operation. No wear and tear of rotating parts is observed.

In particular, the ultimately simple, but efficient system of sludge intake, which is composed of one sludge suction pipe as against four-stream sludge collector, proved to be quite efficient. According to the reports of our enterprise's employees this design proved to be stable, rigid and reliable in operation. The suction pipes are designed in such a manner that no sludge 'stagnation' occurs on the bottom of the clarifier because they are equipped with original elastic rubber plates reproducing the bottom relief. In addition, the single-stream design allowed collecting the sludge with lower humidity.

The cleaners on the side walls and edges of both sludge suckers and sludge scrapers are designed efficiently and do not cause any blames. Geared trolleys have travel smoothly and uniformly and the electrical part of the drive operates uninterruptedly in different temperature modes'.

BAR MIXER WITH CENTRAL DRIVE FOR GRAVITATIONAL SLUDGE THICKENER

The bar mixer is intended for intensification and increase of the compaction process in sludge compactors.

Bar Mixer Advantages:

- The bar mixer is made of corrosion-resistant materials ensuring the long-term service life of equipment;
- The form of mixing bars and the distance between them are such that drainage channels are generated in the sludge when they move; void water and gases can be extracted from the sludge with the help of bars.
- 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 accident.

TRAYS FOR RADIAL-FLOW SETTLING TANKS

EKOTON produces trays with different configurations: both direct-flow and radial-flow. Trays for radial-flow settling tanks are made of parts coupled exactly in a circumferential direction, without any angles formation between the planes of adjacent elements' walls.

OVERFLOW WEIRS

Overflow 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 tray and saturation of clarified water with atmospheric oxygen. Overflow weirs are used for equipping of primary and secondary clarifiers at the site of sewage treatment facilities.

SEMI-SUBMERSIBLE BOARDS

Semi-submersible boards are intended for entrapping grease and oil inclusions from the wastewater surface in primary clarifiers. They are used for equipping of primary clarifiers at the site of sewage treatment facilities.

CENTRAL CUPS

Central cups are intended for prevention from jet distribution of liquid in radial-flow settling tanks. They are used for equipping of primary and secondary radial-flow settling tanks at the site of sewage treatment facilities.

FENCES AND BRIDGES

Bridges and safety fences are made of aluminium alloy noted for high strength and corrosion resistance characteristics, thanks to which no complex and expensive painting is required (this alloy is used in particular in ship-building, air, food and chemical industries).


03

03 PHYSICOCHEMICAL TREATMENT

- DAF Units FT
- Automatic station for preparation of "Smart Mix" flocculant solutions

Dissolved air flotation is one of the most efficient physicochemical methods of industrial wastewater treatment.

Suspended substances, greases, oils and oil products are removed from wastewater in the process of flotation; the biochemical and chemical oxygen demand is reduced.

This technology application allows reducing the load onto biological treatment facilities and reach the maximum permissible concentration in case of their absence for effluents discharge to the sewage.

DAF UNITS FT

The units are intended for removing fine particles from wastewaters, such as greases, suspended and surface-active agents at paper mills, food and oil refining enterprises, small sewage treatment facilities, as well as for thickening sludge mixture at enterprises dealing with domestic wastes treatment.

DAF Units EKOTON Advantages:

- Equipment is made of corrosion-resistant steel AISI 304, which ensures long-term operation of DAF units;
- The original form of the DAF unit chamber ensures the floatation process for a sufficient period of time (the period required for the flotation module reach of the liquid surface) without the unit size increase. Such form allows ensuring the most efficient route of liquid movement, at which no 'dead' zone occurs. It also provides for a possibility of convenient removal of precipitated sludge.
- The design features of DAF unit EKOTON allow saturating liquid with air directly in a circulation pump, that's why it is possible to refuse from any additional costs for a saturator purchase;
- High quality and reliability of the units are ensured by the use of components produced by the leading European companies: Grundfos (Germany), Rosa (Italy), Nord (Germany), Endrews&Hauser (Germany), etc.;
- The operation of the whole complex, including reagent facilities is completely automated.

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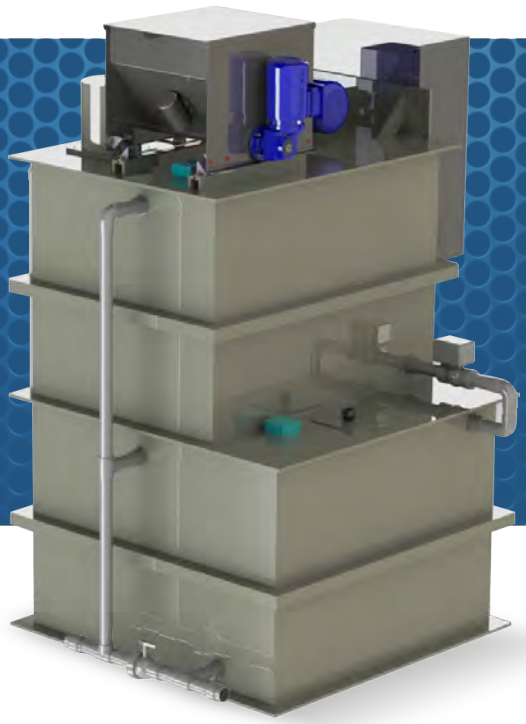
DAF unit FT EKOTON

From the opinion of 'Belgorodskiy Abrasive Works' OJSC:

'The removal efficiency of resin-oil admixtures, oil products and grease approaches 98.5 %; the reduction of COD and suspended substances as a result of treatment reaches 80%. The average monthly consumption rate of flocculants does not exceed 25 kg and that of coagulant does not exceed 3.5 m3 of 30%



AUTOMATIC STATIONS FOR PREPARATION OF "SMART MIX" FLOCCULANT SOLUTIONS

Automatic stations "SMART Mix" for preparation of flocculant solutions are used for cyclic preparation of polymer solutions on the basis of as dry, as liquid concentrates, when its preparation process requires certain preparation time.

- Stations are produced with one, two or three chambers.
- Station capacity: from 250 l/h to 6000 l/h.
- Solution concentration: from 0.05% to 0.5%.
- Solution retention time – depends on the capacity.

Areas of application of polymer preparation units:

- water treatment;
- wastewater treatment;
- industrial wastewater treatment;
- dewatering of municipal and industrial sludges;
- biogas production.

Advantages of polymer preparation stations "SMART Mix":

- **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 station can be operated both in periodic mode (single preparation of a dose of solution) and in cyclic mode of preparation without interference of operating personnel.
- **Simplicity and low cost of assembling.** The station is supplied as ready to use system (all components are mounted on a case of a station), to start operation it only has to be mounted on a foundation and connected to supply lines.
- **Tightness.** The station is supplied to a customer fully enclosed, but upon necessity of maintenance all protective parts can be easily removed.
- **Easy to operate.** The station is equipped with a control system based on PLC Siemens and Weintek (HMI) graphical panel, which allows operating the station in a fully automatic mode with minimum interference of an operator. Clear interface of control system allows operating the station without high qualified personnel.
- **High reliability.** Only high-quality reliable component kits are used for production of equipment. The station is also equipped with minimum number of movable parts, it reduces a list of wear components and spare parts to a minimum.
- **Ability to connect the station to SCADA system.** Control system gives a possibility to transmit data and remotely control the station from an operator's work seat by using SCADA data transmission system.


04

04 AERATION SYSTEMS

Based on Tubular Aerators AP

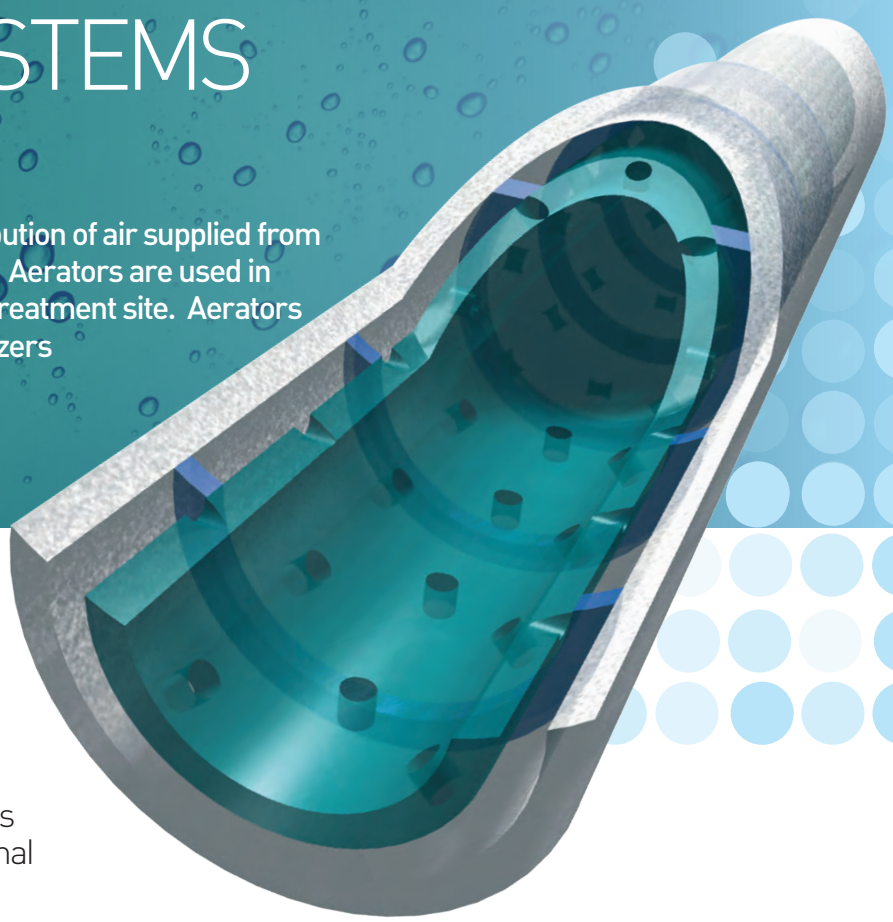
Aeration in wastewater treatment is intended for artificial saturation of sludge mixture in bioreactors with dissolved oxygen used by microorganisms for oxidizing organic and biogenous contaminants.

In the majority of cases the so called pneumatic aeration is used in aerobic bioreactors; its operating principle lies in compressed air delivery to the tank bottom with activated sludge and its advancing through aeration elements that facilitate bubbles generation.

EKOTON Industrial Group delivered **more than 600,000 m** of aerator units and continues increasing this value.

AERATION SYSTEMS EKOTON

Aerators are intended for equable distribution of air supplied from a compressor or air blower in the water. Aerators are used in aerotanks, at the biological wastewater treatment site. Aerators can be also used in aerobic sludge stabilizers and basins.



Aerators EKOTON Advantages:

- Aerators EKOTON generate bubbles 2-3 mm in diameter being the optimal size both in terms of mass transfer surface and sludge mixture mixing;
- Aerators EKOTON ensure uniform air distribution throughout the corridor at the expense of using an air gap in the aerator design;
- The special design of aerators ensures their resistance to hydraulic impacts and mechanical exposures and thus ensures high reliability of aerators;
- Aeration systems EKOTON are installed in an easy and convenient way;
- Low capital costs - cost of a structure purchase is **2.5 times** on average less than for other types of aerators.

EKOTON gives the multi-year guarantee for the aerator, though the practice proves that they continue operating successfully upon this term completion as well.

Aerator EKOTON Design

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

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

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

The disperser and frame are fixed with the help of male and female fittings having a completely modular construction which ensures easy installation and allows replacing separate elements during operation.

Installation of aeration system EKOTON

(Shang Yin, China)

Start of aeration system EKOTON

(Hertseliyya, Israel)

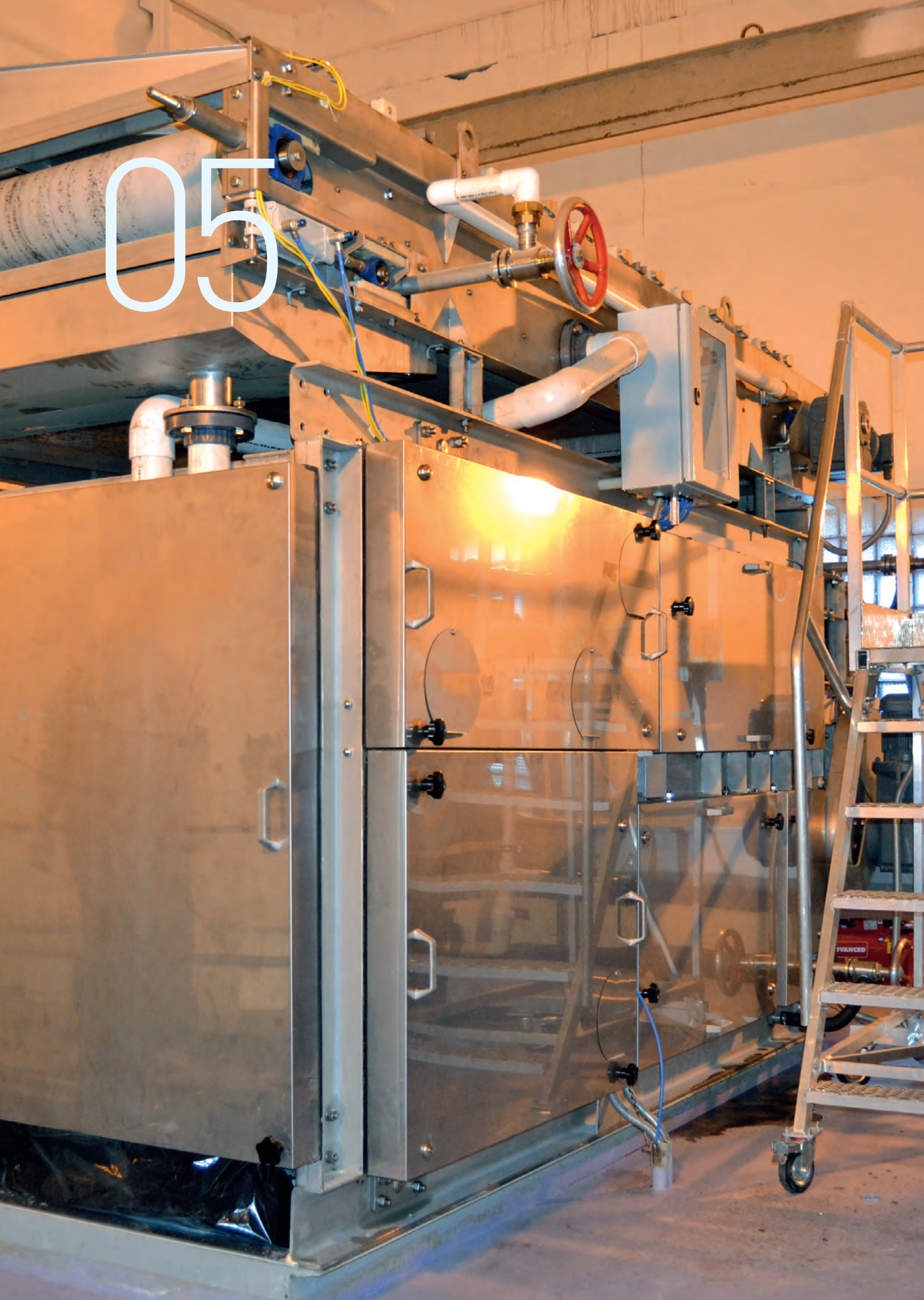
From the opinion of 'Municipal Treatment Facilities' CJSC

'The overhaul repair of the aeration system in the aerotanks was performed in 2009-2010. Aerators EKOTON were installed in the aerotanks. The total number of the aerator shoulders located in each aerotank is 10 (including in three rows in the first and second corridors and in two rows in the third and fourth corridors).

As a result the following results were achieved:

- the uniformity of air distribution excluded the formation of stagnant zones due to which the processes of activated sludge biodegradation terminated;
- the fine-bubble aeration allowed saturating the sludge mixture with air in a more complete manner. This increased the activity of activated sludge microorganisms;
- the electric power consumption for the aeration system operation decreased by 20 thousand kW/h/day;
- the effect of wastewater treatment by the nitrogen group increased.

Moreover, the advantages of aerators EKOTON may include simple and fast installation operations'.


05

05 MECHANICAL SLUDGE DEWATERING

- belt and chamber-membrane filter presses;
- sludge thickeners;
- screw and multidisk dehydrators;
- compact mechanical sludge dewatering units KK00.

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

When dewatered, sludge and pulp turn into substations with considerably higher concentrations of suspended substances and have the consistency of damp soil. Such consistency allows transporting dewatered sludge in a truck body.

EKOTON Industrial Group

delivered more than **130 belt filter press, thickeners and dehydrators**.

Cr.Ni inside STAINLESS

Material - stainless steel

BELT FILTER PRESS

Belt filter presses are intended for mechanical dewatering of wastewater sludge, as well as water treatment and industrial sludges.

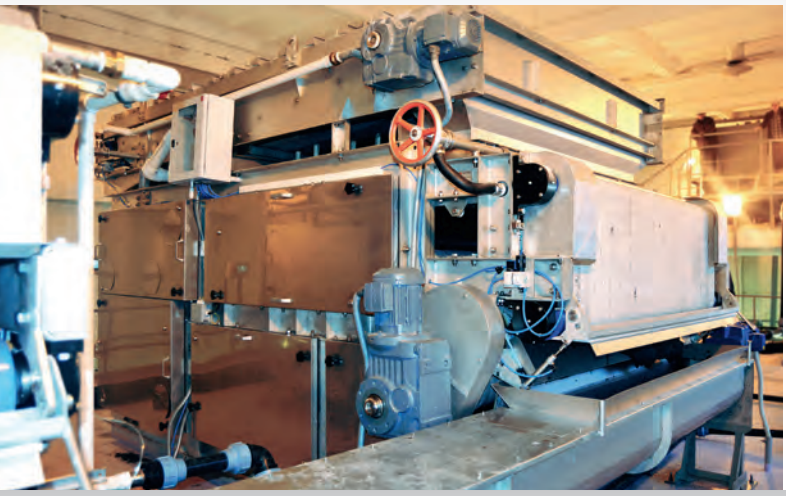
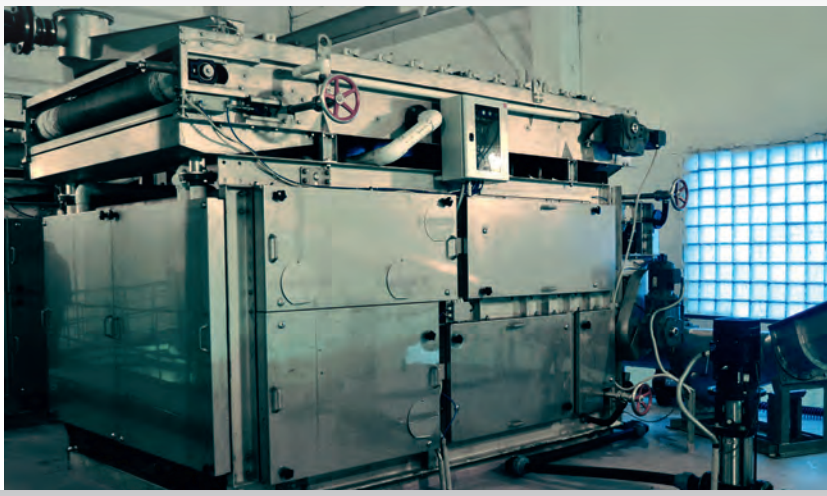
To increase the capacity of the dewatering unit it is recommended to deliver a COMBI version belt filter press completed with a thickener. Preliminary thickening of the sludge before its supply to the belt filter press depending on initial humidity allows reducing its volume 3-10 times.

Belt filter press PL EKOTON Advantages:

- High efficiency of dewatering due to the sequence and special geometry of arranging shafts with different diameters;
- High corrosion protection level: The housing is made of stainless steel AISI 303 and high-capacity shafts are made of carbon structural steel are protected by the polymer coating;
- Low energy consumption;
- Low flocculant consumption;
- Reliability of the filter press is also ensured by high quality components, which are produced by the leading European manufacturers;
- Automated belt control system and its protection against misalignment;
- Equipment compactness, in particular, of COMBI version.



Assembly of filter press PL

Mechanical sludge dewatering department (MUE 'Belvodokanal')

From the opinion of 'Mozyrskiy Oil Refinery' OJSC

'During a half a year of operation the equipment delivered by CJSC SPC 'EKOTON' showed the reliable, stable and efficient work, simple operation and maintenance, high corrosion resistance, low energy consumption (installed capacity of electric drives PL-12 C with the thickener is 3.3 kW), sufficient process efficiency (dewatered cake humidity is 81% to 84%). The actual capacity when using mineralized compacted excess activated sludge amounted to 15 m^3/h'.

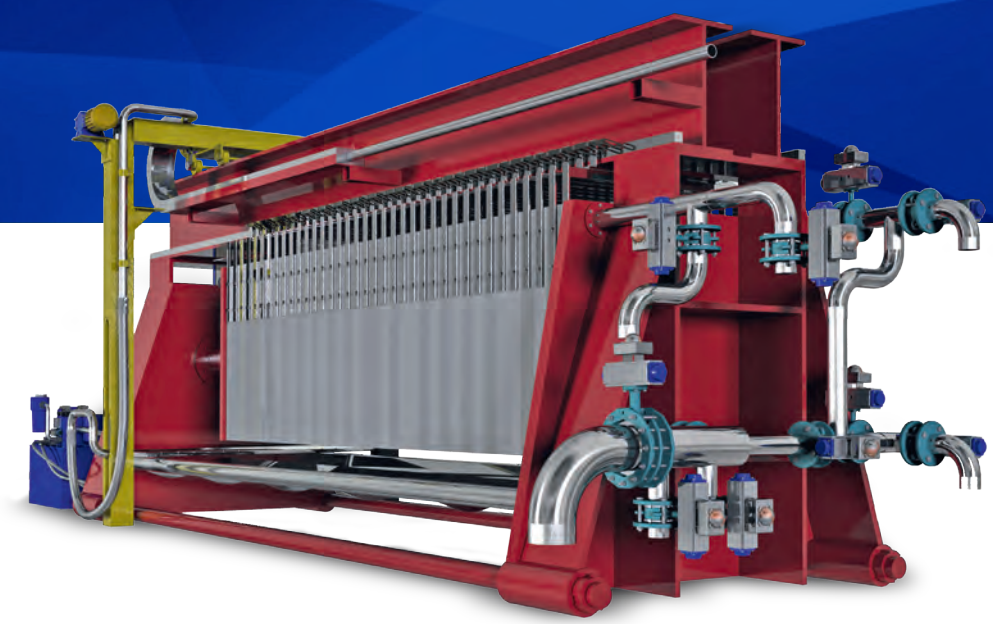
From the opinion of 'ME WSM SCK':

'As compared to the use of a centrifuge of OGSh 600 grade the energy consumption reduced from 90 kW/h to 10 kW/h.

- The noise level in the mechanical dewatering shop building has decreased considerably.
- The flocculant consumption reduced from 16 kg per day to 7 kg.
- Due to the reduction of suspended substances quantity in the sludge from 1,500 mg/l to 300 mg/l, the load onto the primary clarifiers decreased and this led to the improvement of the treatment facilities operation as a whole and quality of wastewater treatment, correspondingly'.

CHAMBER-MEMBRANE FILTER PRESS

Chamber-membrane filter press is used for dewatering of industrial suspensions and municipal wastewater. Its usage allows to reach a maximum level of phase separation by means of high pressure of sludge filtering, washing, pressing and drying.



Areas of application of chamber-membrane filter presses:

- metallurgy;
- food industry;
- chemical industry;
- coal mining industry;
- cement industry;
- kaolin, pottery and porcelain manufacture;
- dewatering of industrial suspensions;
- municipal wastewater treatment.

Advantages of a chamber-membrane filter press:

- Use of high-density filtering materials ensures high clarity of filtrate;
- Low sludge humidity is ensured by means of high pressure of sludge filtering, pressing and drying;
- Low remaining content of a primary filtrate is achieved by means of sludge washing and drying;
- Minimum filtrate dilution by a washing filtrate due to multi-stage washing;
- Low consumption of washing liquids and air during drying 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.

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 sludge in case of deterioration of filtration properties of a suspension;
- Additional decrease of humidity under the high pressure extraction;
- Reduction of consumption of washing fluids and air for drying comparing with a chamber version.

SLUDGE THICKENER SG

The thickener is intended for use as the first stage of sludge dewatering before its supply to a filter press, increase of its capacity, as well as an independent unit for sludge preparation for anaerobic fermentation in anaerobic digesters or reduction of load onto sludge fields.

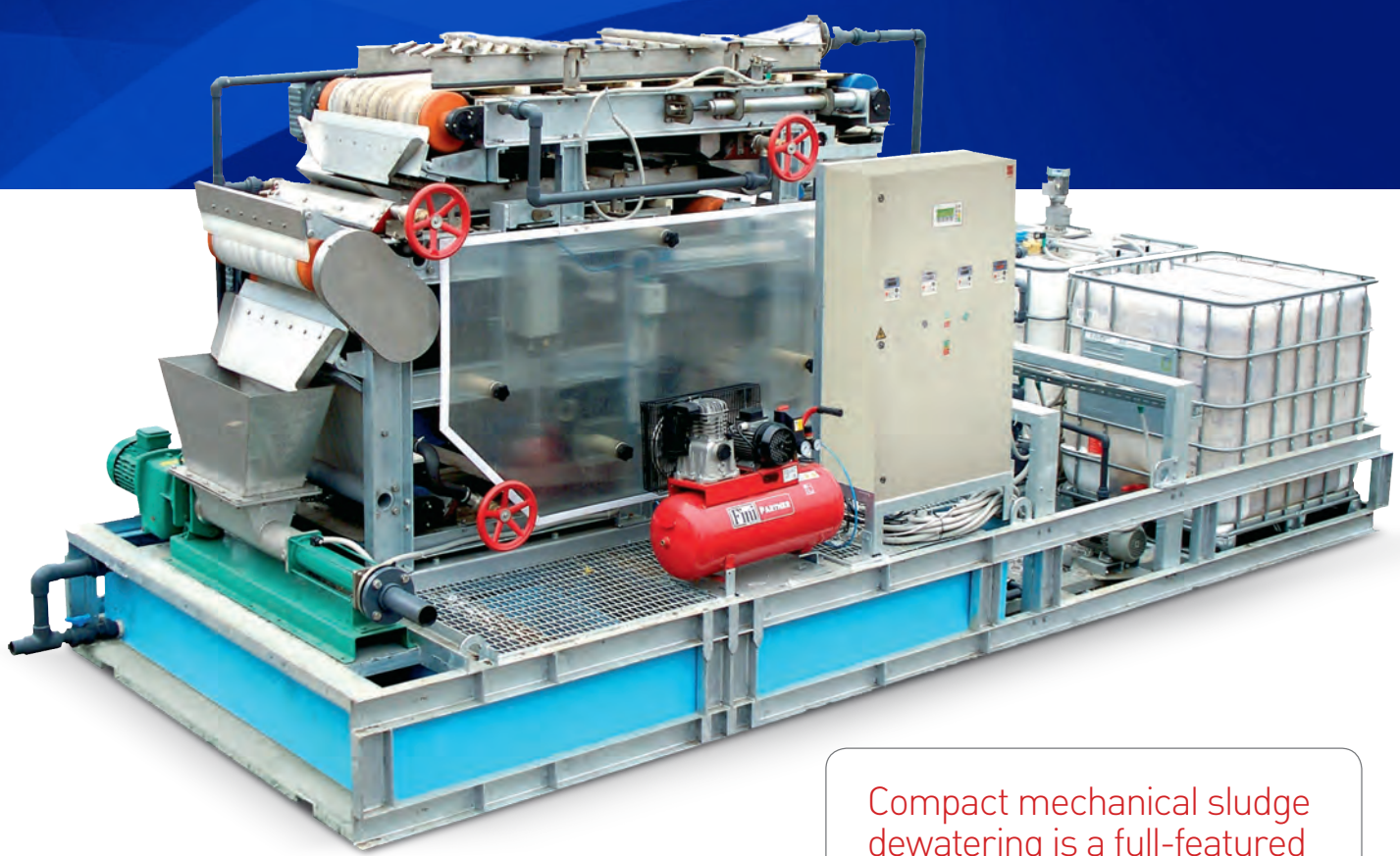
Sludge Thickeners SG Advantages:

- High corrosion protection level: The housing is made of stainless steel AISI 304 and high-capacity shafts are made of carbon structural steel are protected by the polymer coating;
- High efficiency of sludge thickening due to the special system of 'rippers';
- Automated belt control system and its protection against misalignment.

Sludge thickeners

COMPACT MECHANICAL SLUDGE DEWATERING UNITS

The compact unit is intended for mechanical dewatering of wastewater sludge, as well as water treatment sludge and industrial sludge at treatment facilities with the capacity up to 8 m3/h by initial sludge.



Compact mechanical sludge dewatering is a full-featured functional module. It can be used both as a mobile and

Compact Module KK00 can be used for:

Selection of optimal operation parameters of a digital microprocessor-based oscilloscope, for example, selection of flocculant type and dose for different actual samples of sludge;

- Carrying out of scientific researches and experiments with different sludges;
- Dewatering of sludge accumulations located at a distance from treatment facilities;
- Dewatering of bottom sludge in different basins;
- Dewatering of sludge at local treatment facilities.

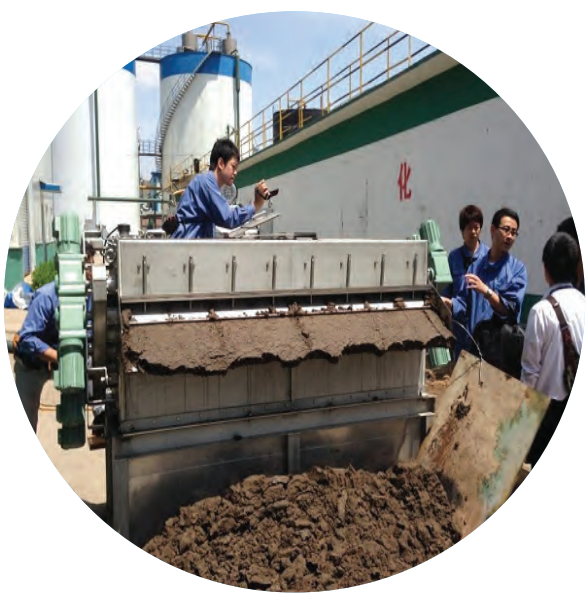
JD MULTI-DISC DEHYDRATOR

The JD series Dehydrator is used dewatering of organic sludge by means of a disc drum system and highly efficient collection of solids with lower energy consumption.

Production is licenced by Tsurumi-Pump (Japan)

Advantages of JD multi-disc dehydrator:

- **Compact and easy to install.** Major components such as dehydration unit with a set of rotating discs, flocculation tank, flushing water tank, control cabinet, and etc. are compactly housed in a unit. The space required is minimal, and it is easy to install.
- **Possible to treat oil-contained sludge.** Since the dehydration unit has a "hard to clog" structure, it can be used for treatment oily sludge or DAF froth. Acceptable range of the sludge concentration is between 0.5% and 5.0%.
- **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 flushed 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.



SCREW DEHYDRATOR MDQ

Production is licenced by
Tsurumi-Pump (Japan)

TSURUMI PUMP

Dehydrators are intended 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

Screw Dehydrators EKOTON - TSURUMI Advantages:

- compactness;
- low energy consumption;
- flocculant consumption is consistent with flocculant consumption for dewatering on a belt filter press;
- low consumption of flushing water;
- dewatering of fat 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.

Screw dehydrator MDQ EKOTON TSURUMI was awarded the Grand Prix at International Exhibition Fair of Machines and Devices for Water Lines and Sewage Systems WOD-KAN 2013 (Bydgoszcz, Poland)

From the opinion of 'Belgorodskiy Abrasive Works' OJSC

The economic and process effect of using this equipment surpassed all expectations, namely: the received cake humidity is 75-80% at the initial humidity of water sludge of 94-98%; this reduces the volumes of removed wastes by 8-10 times'.

ONE PRODUCER FOR **DIFFERENT STAGES**

Nowadays, equipment EKOTON is operated at treatment facilities in 13 countries: Belarus, Bulgaria, Hungary, Israel, Kazakhstan, China, Moldova, Netherlands, Poland, Russia, Turkmenistan, Uzbekistan, and Ukraine.

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TECHNOLOGIES AND EQUIPMENT

for wastewater treatment

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