INCREASING THE EFFICIENCY OF MECHANICAL WASTEWATER TREATMENT OF PRODUCTION ENTERPRISES

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Annotation:

This method plays an important role in the treatment of industrial wastewater and the separation of mineral and organic compounds in wastewater. The importance of using a mechanical method is that the wastewater from production is prepared for the next treatment steps. That is, it completely takes the process of decontamination of water using methods other than harmful factors to the final stage. Today, the treatment and recycling of wastewater from industrial enterprises by the above method increases the efficiency of water use.

Klyuchevыe slova: mechanical type, stochnye water, organic substances, xladagent, chlorinated azonom, gidrolift, predaerator.

Аннотация:

Этот метод важен при очистке промышленных сточных вод и важен для разделения минеральных и органических соединений в сточных водах. Важность использования механического метода заключается в том, что производственные сточные воды подготавливаются для следующих этапов очистки. То есть полностью доводит до завершающей стадии процесс обеззараживания воды методами, отличными от вредных факторов. Сегодня очистка и повторное использование сточных вод промышленных предприятий указанным способом повышает эффективность использования воды.

Ключевые слова: механический тип, сточные воды, органические вещества, хладагент, хлорирование азоном, гидролифт, предаэратор.

This method separates undissolved mineral and organic compounds in wastewater. The importance of using the mechanical method lies in the preparation of wastewater for further stages of treatment. That is, completely disinfect water from harmful factors using other methods and bring the process to the last stage. Including the transfer of wastewater through wire mesh, sand storage facilities, treatment and filtration at the next stage, if necessary, chlorination, ozonation, etc. Mechanical cleaning methods make it possible to separate large objects, suspensions, sand, etc. from water. Using this method, 90-95% of fatty substances and 20-25% of organic harmful factors are separated from water. Substances in a colloidal state are retained during the filtration process. If the amount of fatty substances corresponds to 50 mg per 1 liter of water, then coagulation and dilution methods can be used. Through the development of mechanical methods and the introduction of innovations in technological processes, including: multi-shelf settling tanks, various filters, hydrocyclones, synthetic filters, the introduction of new technological processes will lead to efficient operation of facilities and

will help to quickly reuse wastewater in a closed system and reduce costs to develop expensive methods.

Wire Mesh Wire mesh is installed in large pipes and sewers through which wastewater flows. In most cases, cleaning wire mesh types RMU and MG are installed. Coarse waste collected in the hopper is dumped into containers, which, when full, are sent to the crushing plant. The distance between the wires is 16 mm.

Sand holders. These structures are designed to capture mineral particles 0.2-0.25 mm in size in wastewater. Sand traps consist of two sections and must be constantly in use. Sand traps are designed for pumping all wastewater from industrial enterprises. Horizontal sand traps are usually designed to capture sand from industrial wastewater whose effluent is neutral or slightly alkaline.

The wastewater, after passing through wire meshes, is directed into sand traps and then through rods into settling tanks. Deposits in sand traps are removed using hydraulic lifts. If sand mixes with oil products and forms a sediment, the sediment is washed using high-pressure hydrocyclones.

Sand traps vary in size and can handle 100-280,000 m3 of water, some can handle even more.

Some sand traps are ventilated, hydraulically designed for sand particles with a diameter of 13-18 mm and a water flow rate of 0.08-0.12 m/s. Such sand traps are capable of passing 240-280 thousand m3 of water in 1 day. Aerotor devices are installed at the base of the sand traps. Depending on the volume of water pumped, it can reach from 200 to 920 m3 in 1 hour for wastewater aeration. If a sand container is 4.5 meters wide, 2.8 meters deep and 18 meters long and flows 280,000 m3 of water per day, then the air flow will be 920 m3 per hour. Aeration of water promotes the oxidation of certain organic substances, i.e. decomposition.

Primary silencers. Depending on the amount and composition of wastewater from industrial enterprises, the composition of clarifiers is different. Their number is from 2 to 4. Their size is determined based on the following evidence:

1 sec. amount of running water - Q $м^3/с$.

Concentration of fatty substances - C 1 mg/l, heavy and light mechanical mixtures (oil, petroleum products).

The amount of permitted fatty substances in the content of clarified water is S mg/l, the amount corresponding to the sanitary standard or the amount provided for by the technological process, that is, 150 mg/l.

Stiffening ribs can be vertical, horizontal, radial type.

In settling tanks, water containing coarse mixtures is settled, which is usually close in composition to household wastewater or similar to household wastewater. Such softeners soften 196-200 m3 of wastewater per hour, the result of water softening is 50-70%. The sludge settling at the bottom of the settling tank is directed under hydrostatic pressure to the sludge discharge zone using a sludge drainage pipe.

Horizontal coolers. The width of such tanks is 9 meters, length 24-30 meters, depth 3-4 meters, they have 4, 6 and 8 sections, a total volume of 3200 m3, filling time 1.5 hours. Water enters horizontal settling tanks through wire sand traps. Water is drawn into the filter collection tube by a tube and then diffuses into the filter. The sludge is thrown into the tank using a shovel device that collects the sludge, from where it is removed by plunger pumps. The sludge is then processed for neutralization.

Radial mufflers. They have a diameter of 30 m and a depth of 2.5-4 m. The sediment falls to the bottom of the settling tank, and with the help of plunger pumps the sediment is removed to a specially designated place. Settling time is from 1.5 to 2.1 hours, tank volume is from 2360 m3 to 8760 m3. Wastewater enters the clarifier through a central pipe, and impurities floating on the surface of the water are discharged into a hopper. Softened water is fed into the central pipe using rotating rods and remains in the softener for about 1 hour.

In addition to the above methods, other additional means are used for wastewater treatment at industrial enterprises. Including: pre-aerial containers, biocoagulators, and devices for purifying water from turbidity are also used. The goal is to extract heavy metal ions and other colloidal substances from purified waters. Pre-aerotars are built into most primary settling tanks, biocoagulators are built into vertical settling tanks. Pre-aerial containers are built together with aeration tanks, biofilters with biocoagulators. Aeration-ventilation of water with active sedimentation takes 10-20 minutes. Activated sludge is directed to the pre-aerotank using generators through aeration tank treatment facilities. For every 1 m2 of water there is 0.5 m3 of air.

Oil holders. Installed to capture more than 100 mg of oil and petroleum products in 1 liter of water. These structures are long tanks with right angles. Due to the difference in density of oil products and water in these containers, they are separated. Oil and its products float to the surface of the water, and minerals sink to the bottom of the water. Oil products that float to the surface are lowered into a special cracker pipe, and at the end of the oil products collection pipe, the oil is heated using a roller. heated and diluted oil is collected in tanks. After capturing the oil, the content of residual oil and its products will not exceed 100 mg in 1 liter of distilled water.

Oil tanks can be multi-layered; in such oil tanks, the residues of petroleum products in wastewater can be reduced to 70-100 mg/l. Good results are obtained by passing wastewater from ceramic, glass, metal foundries, and manufacturing enterprises through accumulator hydrocyclones. With hydrocyclone diameters of 150 and 75 mm, the result is good; the amount of suspended solids in the treated wastewater is 5 mg/l. It's good that purified water is reused. For example, if 45,000 m^3 of water is purified per day, 40,000 m^3 of water is returned to the enterprise.

In conclusion, it should be said that at present, wastewater treatment by various methods with its subsequent reuse at the enterprise is an important factor in solving pressing problems of our time.

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