"PURE WATER" HI-TECH







CONFIDENTIAL

WATER DESALINATION AND PURIFICATION TECHNOLOGIES

To solve the problem of obtaining fresh water from sea water is economically feasible to use nanomembrane reagentless desalting technology and selective filtration (using a resonance method under the influence of selective separation of perpendicular electric and magnetic fields).





TECHNOLOGICAL ADVANTAGES

- Simple design of basic equipment.
- Fully automated control and inspection, using telemetry.

• No correction of the salt composition is required during water desalination, and the desalinated water is always in compliance with the World Health Organization (WHO) requirement in terms of organic, physical, chemical and microbiological indicators.

The technology has a number of considerable advantages as compared with world – known processes and installations:

- No chemical are used during the process altogether.
- The concentrate (salt solution) does not contain any toxic impurities.
- The membrane service life is 3 to 5 years.
- The fresh water volume at the output is 90 % of the original salty water volume.
- Low Complex operation costs, and, therefore, a fresh water self-coast that is adequate to the coast spent
- Reliability and considerable operational life of equipment, ease of access to equipment for servicing and maintenance.
- Rapid turn-key erection of equipment, rapid construction, rapid installation operations (due to the container-type and metal/ foam/ polymeric structures of work floors) and plant capacities can be thus increased easily.



WHAT WE DO

- >>> Sea water desalination plants for the purpose of drinking water in coastal areas.
- Mobile sea water desalination units.
- Water recirculation cooling systems, for process water purification at cogeneration plants and regional heat supply networks.
- Electro-membrane installations intended for the purification and separation of electrolyte mixtures, as well as for the production of ultrapure water with a specific electrical resistivity of 1 to 18 M Ohm*cm from tap water.
 - Domestic and commercial use small water purifying systems.

Ttechnical specifications:

Utilization ratio of initial water - at least 80% (theoretically - 87.5%);

Derived products: pure water, brine (possibility of further processing in the alkali and acid) Power consumption $= 0.5 \cdot 1 \text{ kWh} / 1$ cubic meter

Power consumption – 0,5-1 kWh / 1 cubic meter





EMO-PROCESS SPECIFIC ENERGY CONSUMPTION



The cost of electricity taken - \$ 0.05 kw-hr

EMO-SEPARATOR UNIT (DRIVING DEVICE)



Separator, a key element of the system, provides a block with controllable power sources application of nonequilibrium thermodynamics processes (e-vaccination) in the processes of desalination EMO and selective filtering EMR.

The process of continuous hydraulic mass transfer of electrolytes in the EMO, EMR devices made polymer separator such as "Archimedean spiral" that prevents the formation of dead zones of hydraulic flow.

EMO PROCESS SCHEME



SCHEMATIC DIAGRAM OF NONCHEMICAL WATER DESALINATION TECHNOLOGY





ELECTROMAGNETIC OSMOTIC APPARATUS EMO



Electromagnetic osmotic apparatus EMO is used for desalination of saline water using electromagnetic energy in the form of a voltage or a certain fixed range of frequencies applied to the electrodes of the separator, which increases efficiency process compared to the membrane device type electrodialysis (ED) and reverse osmosis (RO), operating at a constant electric current or a constant water pressure. Unlike conventional membrane devices EMO device synthesizes three commercial products: pure water + acid + alkali, which increases the technical efficiency and lower operating costs due to no use of chemicals.



WATER DESALINATION PLANT





WATER DESALINATION PLANT









AREAS OF APPLICATION

- Vast areas of application installations for water desalination:
- Microelectronics obtaining deionized water and the creation of closed water circulation systems;
- Small-scale energy storage and management;
- Fine chemicals;
- Medicine and Pharmaceutics, water for dialysis in medical clinics, deep cleaning of medical and biological products;
- Food production, obtaining desalinated water for the production of high-quality liquor - vodka products and beverages;
- Analytical, biochemical and research laboratories;
- Jewelry manufacture;
- Manufacture of cosmetic







CONCLUSION

- Physical methods allow high quality and cheap to meet the demand for clean water. No need to use filters and chemicals for purification * water flow in such plants, can significantly reduce the operating costs.
- Depending on the task, taking into account the source characteristics of the water, dissolved salts it can be derived in the form of environmentally friendly solid insoluble sludge, either selectively (to solve the problem of resonant selective separation of ions polyelectrolyte by weight, valence, release ions from the group of ions of the same sign).
- Compared with traditional systems technology filtration and evaporation, physical methods allow to keep a given percentage level of the composition and the salt content, which is essential in the preparation of drinking water.



NECESSARY INPUT DATA

composition of the original water analysis

requirements for the resulting water

the required capacity (including the use of modes)

At your request the installation of small capacity (a few liters per hour) can be set.

Depending on the tasks described above membrane purification methods can be used in combination with the technology plazm disinfection and purification of water flows. The combination of technologies makes it possible to solve the problem of cleaning almost any source of water.

Best regards, Victor Gusev

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