

### EFFICIENT WASTEWATER TREATMENT INDUSTRIAL - COMMUNAL - MARINE - BIOGAS POWER PLANTS - MEMBRANE PRE-TREATMENT



#### Industrial Wastewater Plants Discharge your wastewater directly

Epuramat's wastewater treatment plants are designed to function with a wide variety of industrial wastewater. Depending on the size of the solid/liquid separator ExSep, the system can treat up to 600 cubic meters of wastewater per hour. By using a wastewater treatment plant from Epuramat, the treated water can be put back into circulation, thus reducing the need for fresh water. The treated wastewater is usually so clean that it fulfills all laws and regulations for discharging it directly into bodies of water, thereby reducing or even completely eliminating wastewater fees.

Depending on the client's requirements for the quality of the treated wastewater, the cost to treat one cubic meter of wastewater ranges from about 5 to 20 cents, including energy and flocculation agents.

#### WATER CIRCULATION DIRECT DISCHARGE LESS SPACE REQUIREMENTS SHORT PAYBACK TIME

### The Epuramat wastewater treatment plant has a very short payback time

The Epuramat wastewater treatment plant has much lower investment costs and operational costs than conventional wastewater treatment plants. The consumption of energy and the use of chemical flocculation agents are also well below those of conventional plants. The reason for these significant reductions lies in the ExSep, which performs an efficient solid/liquid separation. Due to the efficient pre-treatment in the ExSep, the subsequent treatment steps with membrane filtration or biological treatment require relatively little energy. Depending on the kind of wastewater, the operating costs of treating 1 cubic meter of wastewater, making it so clear that it can be used in circulation or emptied directly into a natural body of water, are extremely low, from 5 to 20 cents. If discharged directly into a body of water, wastewater fees can be completely saved. If a water circulation system is in place, then substantial additional costs for fresh water can be avoided. The payback time depends strongly on regional wastewater fees. Epuramat wastewater treatment plants usually have a very short amount of time in which the plant pays for itself.

#### Example of an Epuramat wastewater plant for the treatment of 60 cubic meters of industrial wastewater per day:

Investment costs 270,000 € Yearly operating costs (electricity and flocculation agens) 2,000 € Yearly cost savings for wastewater fees and for fresh water 110,000 € Pay-back Time 2.5 years



### Communal Wastewater Treatment Plants Smaller is better

Epuramat provides communal wastewater treatment plants for population equivalents (PE) of 1,000 to 50,000 inhabitants. Epuramat's wastewater treatment plants are constructed and delivered turn-key in a compact building in less than 6 months. Sizes of the buildings vary from 10 m x 15 m (150 m<sup>2</sup>), 15 m x 20 m (300 m<sup>2</sup>), 20 m x 25 m (500 m<sup>2</sup>), up to 50 m x 50 m (2,500 m<sup>2</sup>).

Epuramat's wastewater treatment system is a closed process without open water surfaces, so odor and noise are considerably reduced. The investment costs are about half of comparable biological wastewater treatment plants. In addition, the reduced investment costs do not take into account the savings from the strongly reduced space requirements of an Epuramat wastewater treatment plant.

Epuramat can offer municipalities financial solutions tailored to their needs. Depending on the client's preferences, our wastewater plants can be purchased or leased. Epuramat also offers communities and municipalities the operating services of the specialized personal from Epuramat who take care of the complete wastewater treatment process. Payments can be based either on monthly rates or on the quantities of the wastewater treated.

Operating costs, including personnel costs, are significantly below these of conventional plants. For a plant suited for a population of 10,000 PE, the costs are about 12 Euros/year/PE. It costs about 20 cents to treat 1 cubic meter of wastewater. Epuramat wastewater treatment plants only require about 20% of the chemicals, organic flocculation agents on a polymer basis, when compared to conventional wastewater treatment plants. In certain cases and configurations chemicals may not even be required.

LESS SPACE REQUIREMENTS TURN-KEY DELIVERED IN COMPACT BUILDING NO SMELL OR NOISE INSTALLATION NEAR EXISTING BUILDINGS POSSIBLE LITTLE MAINTENANCE SHORTER CANALISATIONS ON-LINE MONITORING AND CONTROL SIGNIFICANT COST SAVINGS 
 Size / Population Equivalents (PE)
 1,000 PE
 5,000 PE
 10,000 PE

 Investment costs of an Epuramat wastewater plant (approx)
 625,000
 1,375,000
 1,840,000

 Space requirements (in m<sup>2</sup>)
 150
 300
 300

The table above gives an overview of the estimated investment costs for an Epuramat wastewater plant for different capacities, from 1,000 to 10,000 population equivalents (PE). Investment costs are up to 50% below those of conventional communal wastewater treatment plants.

### Residues from Biogas production plants Green energy and clean water

Biogas production plants have become an important source for renewable energy. However, the biggest disadvantage concerns what to do with the fermentation residues. Usually, the suspensions are used as fertilizer on fields. However, this is usually only allowed during crop-growing months. During the winter, the suspensions have to be stored, requiring large and costly containers. Also the fields have to be large enough to accommodate the volume of suspensions. Many biogas production plants could be built much bigger and produce more energy if the fields for the suspensions were also larger, thus avoiding over fertilization. The solution from Epuramat: By using the technology from Epuramat, fermentation residues from biogas production plants can be dewatered, dried, and pressed to pellets. The pellets take up much less space than the original suspension and can be stored without problem. During the crop-growing phase, the pellets are ground up and strewn as fertilizer on the fields. Because of their heating value, the surplus pellets can be burned, thus producing energy. They can be used to produce electricity to be fed into the local energy grid or to produce heat to dry the wet pellets or to be fed into the area heating grid. An additional advantage of the Epuramat technology is the production of water for mashing and the use of your own process water, for cleaning purposes for example, which conserves water resources and results in lower costs for fresh water and for wastewater fees. Due to the Epuramat technology, the biogas production plant can be operated even without being connected to the communal wastewater treatment plant.



### Membrane Pre-Treatment Make them work longer

Today's state-of the-art wastewater treatment plants use membrane technology to filter extremely small particles out of the water. But because of the solids in the water, such membranes can get clogged up and then have to be back-washed. Because Epuramat's ExSep removes almost all extractable solids, the membranes don't get clogged up so easily. Our technology extends the lifespan of membranes used in wastewater considerably, and so increases their efficiency, while simultaneously reducing costs. By placing Epuramat's ExSep in front of an existing or new membrane filtration unit, the filtration process will work much more efficiently.

### **Epuramat Circulation**



By using an Epuramat wastewater treatment system, treated water can be put back into circulation, and reused, thereby saving on both freshwater and wastewater fees. Because of rising fees for wastewater treatment, an Epuramat wastewater treatment plant usually pays for itself within 2-4 years. This not only saves your company substantial expenditures, but helps protect the environment, and adds to sustainable development. NO STORAGE FOR SUSPENSIONS NECESSARY DRYING OF SOLID MATERIALS TREATMENT OF PRESSED WATER TREATMENT OF WATER FOR MASHING OR OTHER USAGES ADHERENCE TO REGULATIONS FOR DIRECT DISCHARGE



LONGER LIFE SPAN OF MEMBRANES LESS BLOCKAGE AND WEAR OF MEMBRANES LESS ENERGY CONSUMPTION LESS BACKWASHING



#### Marine Protect the seas

Epuramat's "ExSep Offshore" model can be used with high quality, high performance sewage treatment systems for newly built or refurbished seagoing vessels of any size. The discharged water is in accordance with existing international and national regulations, as well as any future regulations, e.g., Zero Discharge Areas". Epuramat has constructed the "ExSep Offshore" for usage on ships and yachts. Together with a leading manufacturer of wastewater treatment plants for ships, the new system offers the maritime industry a technologically advanced wastewater treatment plant.

## The Epuramat wastewater plant

Epuramat's wastewater plant, which is based on the almost complete separation of solids and liquids in the ExSep, requires much less space and minimal maintenance when compared to conventional treatment plants. Because the ExSep increases the efficiency of pre-treatment significantly, the entire plant can be constructed much more compactly. Epuramat's wastewater treatment system is a closed process without open water surfaces, thus greatly reducing odor and noise. Epuramat's wastewater plants are constructed and delivered turn-key in a compact building in less than 6 months. Sizes of the buildings vary from 10 m x 15 m (150 m<sup>2</sup>), 15 m x 20 m (300 m<sup>2</sup>), and 20 m x 25 m (500 m<sup>2</sup>) up to 50 m x 50 m (2,500 m<sup>2</sup>). Epuramat wastewater treatment plants can also be delivered as mobile systems.



### Capacities

For industrial wastewater, the Epuramat system can treat up to 600 cubicmeters (0.6 million liters) per hour. For communal wastewater, Epuramat provides plants for use with population equivalents (PE) of 1,000 to 50,000.

### How it works

Pre-treatment ("mechanical cleaning") in Epuramat's treatment plant begins with a rake (1) that prevents large solid materials from entering the treatment facility. The ExSep solid/ liquid separator (2) is the core of the process and replaces the grit chamber and the primary sedimentation basin that are used in conventional plants. Due to the ExSep, largely only dissolved materials go on for subsequent cleaning (3). This is then either processed by compact bioreactors or by membrane filtration units. The solids that the ExSep removes from the wastewater in the form of sludge are processed in a sludge thickener (4).



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# Turn-key installation

Due to compact construction and standardized components, Epuramat can deliver its turn-key wastewater treatment plants in fewer than six months. To ensure optimal functioning of the complete installation, Epuramat delivers the whole plant as a one-stop shop. Therefore the client can be sure that the plant will always function dependably up to Epuramat standards.

# About Epuramat

Epuramat was founded in 2005 and offers technologically advanced turn-key wastewater treatment plants and systems for efficient wastewater treatment. Epuramat's innovative technology, based on its ExSep solid/liquid separator (patent pending), makes the treatment of wastewater more efficient, which results in much smaller, less expensive, and easier-to-use treatment plants and systems. Epuramat has taken over the wastewater treatment unit of Luxembourg based Chaux de Contern, which has constructed over 50 wastewater treatment plants.

The company has conducted a successful research project on the application of its ground breaking wastewater treatment system together with the Government of Luxembourg. Epuramat is privately held. The company is located in the industrial zone of Chaux de Contern, near the city of Luxembourg and the airport.