

Optimal Technologies for Highly Efficient Wastewater



Wastewater Treatment Presentation



■ ■ ■ INTRODUCTION

- ❑ **The first "Epuramat" company was founded in Luxembourg in 2005.**
- ❑ **We developed solutions for:**
 - municipal and industrial wastewater treatment
 - oil-water separation
- ❑ **All our systems are:**
 - compact
 - low energy consumption
 - easy to maintain
 - do not require chemicals (flocculants) for sludge dewatering



The Higher the Costs – the Stricter the Requirements

Various trends are forcing municipalities and industrial companies to address the challenge of wastewater treatment

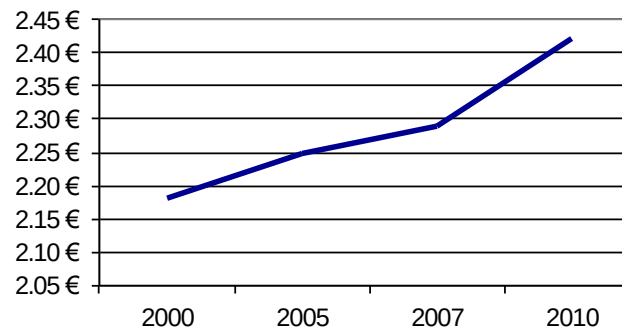
- Stricter global requirements – especially in developing countries
- Increasing global pressure on industry
- Increasing costs of drinking water and energy consumption
- Increasing fines for pollution through sewage systems
- Shortage of qualified personnel

Fresh water costs in 2014 (per m³)



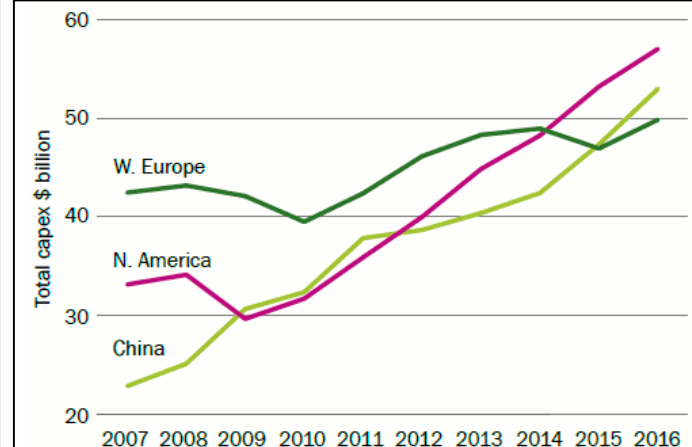
Source: Global Water Intelligence

Wastewater treatment costs per m³ in Germany



Source: Federal Statistical Office of Germany

Water and wastewater CAPEX forecast by region (USD billion)



Source: Global Water Intelligence

■ ■ ■ Municipal wastewater treatment

Box4Water

Epuramat systems are ideally suited for remote locations such as small communities, construction sites, mines and worker camps.



The Box4Water design depends on the client's requirements and local conditions.

Remote locations without access to a municipal sewer system benefit from this decentralized solution.

■ ■ ■ Municipal wastewater treatment

Box4Water

Key Features



Standard 20- and 40-foot containers for wastewater treatment, based on patented ExSep® technology, with no need for additional equipment or tanks.

- The world's most compact wastewater treatment equipment, integrated into a container.
- An equalization tank (up to 8 hours) with homogenization function is already installed in the container.
- Mobile and modular designs allow treatment of 12.5 to 60 m³/day in a 40-foot container (120 m³/day in two 40-foot containers).
- Effluent parameters meet future mandatory requirements through the use of ExSep bio-membrane technology.
- For operation from -45°C to +45°C, all components are installed in insulated containers.

Assembly and testing are carried out in Contern, Luxembourg (at Epuramat's premises).

■ ■ ■ Municipal wastewater treatment

Box4Water

Key Features



- Remote monitoring and control via GSM or satellite communication
- Closed systems, with no noise or odor nuisance
Thanks to the integrated sludge dewatering system,
- sludge (without chemicals or flocculants) reaches a minimum dry solids (TS) content of 15%
- During operation, personnel are required only once a week to clean the settling tank
- Low operating costs
(low energy consumption, low maintenance costs, no chemicals)
- Short delivery times (delivery within 3 months after ordering, ready for operation within a few days after commissioning)

View of **Box4Water** with ExSep® as the pre-treatment system

■ ■ ■ Municipal wastewater treatment

Epuramat's compact systems are ideally suited for upgrading existing overloaded wastewater treatment plants.

Installation example in Luxembourg: Motel wastewater treatment

Capacity increased from 1,000 to 2,000 population equivalents using only two ExSep® 500 units installed in a 20-foot container



Installation example in Austria: Municipal wastewater pre-treatment

Pre-treatment system at a municipal wastewater treatment plant consisting of:

- 2 x ExSep® 2000

Increase in the capacity of the existing plant by more than 30%

■ ■ ■ Industrial wastewater treatment

- ExSep® technology for industrial process water treatment
- Wastewater treatment in the food industry
- Wastewater treatment for waste collection vehicles and concrete mixers
- Wastewater treatment systems for drilling sites and mining operations
- Oil-water separation systems for process water in oil production, oil spills and sanitary operations



■ ■ ■ What Makes Epuramat Unique?

Patented separation and air-separation technologies with up to 99% treatment efficiency for separating solid particles from liquids



after



before

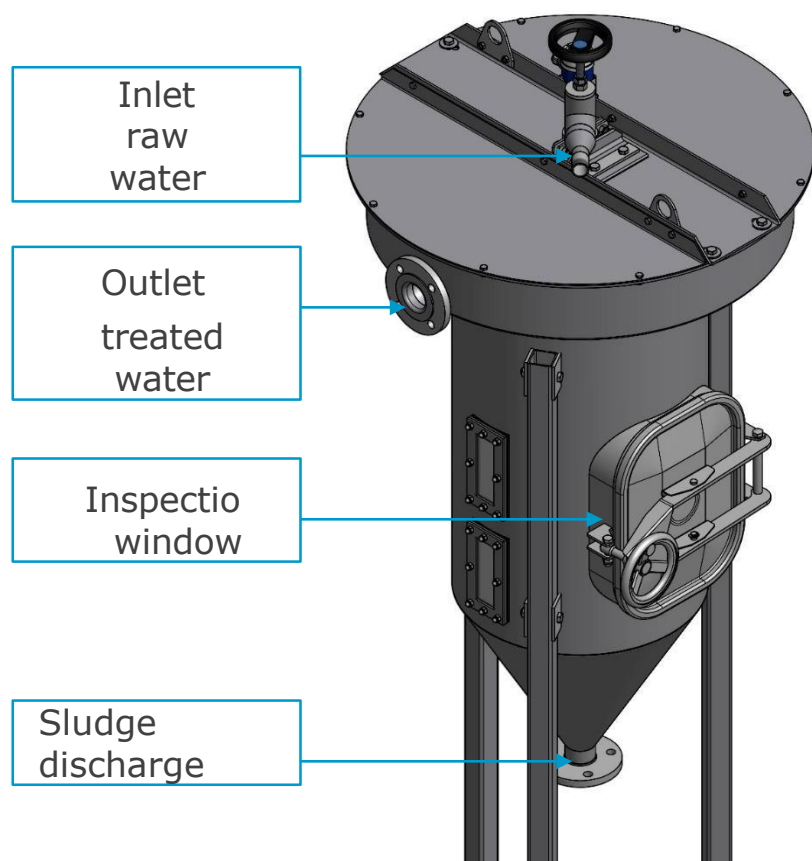
ExSep® replaces

- Large settling tanks
- Plate separators
- Hydrocyclones
- etc.



What Makes Epuramat Unique?

ExSep® Technology

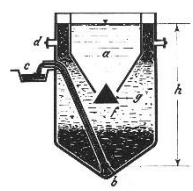
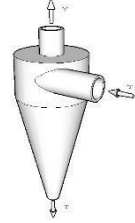
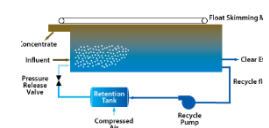


ExSep® separates suspended and filtered particles, grease and oil from water.

Separation range	6,000 μ - 15 μ
Separation efficiency	up to 99%
ExSep® capacity	0.5 – 200+ m³/h
ExSep® dimensions	500 – 7000 mm

- ❑ Very low energy consumption
- ❑ In most cases, no chemicals required

What Makes Epuramat Unique?

	ExSep®	Grit & grease traps / settling tanks	Dortmund well	Hydrocyclone	Flotation	Plate separator
						
Capital investment	medium	high	high	high	medium	medium
Separation efficiency organic and inorganic particles	up to 99 %	~ 80 %	up to 97 %	up to 90 % for inorganic only	up to 99 %	up to 97 %
Adaptation to changing water quality and quantity	yes	no	no	no	yes	no
	medium	yes	medium	no	medium	medium
Footprint	Very small	Very large	Medium	Small	Medium	Medium
Chemical use	Very low	no	low	Low – (inorganic) high – (organic)	high	high
Maintenance requirements	low	medium	medium	high	high	medium
Energy consumption	low	medium	medium	high	high	medium
Operating costs	Very low	medium	low	high	high	medium
Lead time	short	long	long	medium	medium	medium
Service life	long	medium	long	medium	medium	long



■ ■ ■ What Makes Epuramat Unique?

Compact high-tech separation and air-separation systems for wastewater treatment



- ❑ Reduce the load on downstream treatment stages,
- ❑ Treatment plants save significant space,
- ❑ No chemicals required,
- ❑ Lower capital and operating costs
- ❑ The plant can be expanded thanks to the modular system
- ❑ No noise or odor thanks to the fully enclosed design

In addition, all wastewater treatment systems can be manufactured, installed and commissioned within a very short time.

Containerized and mobile **Box4Water** system:

- ❑ Easy to transport and commission, and capable of operating under extreme climatic conditions
- ❑ Saves a great deal of space compared with conventional wastewater treatment plants



Wastewater treatment in

remote communities, worker camps ...

Box4Water for decentralized wastewater treatment at a worker camp in Canada

Mobile worker camps in remote locations have populations ranging from 100 to several thousand people – and all of them produce large quantities of wastewater every day that must be disposed of.

Box4Water solves this problem.



Drilling rigs (bottom right) and logging camps (top right) are spread throughout Canada



Extreme climatic conditions on site



■ ■ □ Upgrading existing wastewater

treatment plants

Epuramat systems in Luxembourg, Austria and Germany for upgrading existing wastewater treatment plants

Planned increases in the capacity of existing plants are often problematic due to limited space. With the Epuramat system, existing plants can be upgraded without requiring additional space.

Expansion of wastewater treatment plants using various ExSep® systems



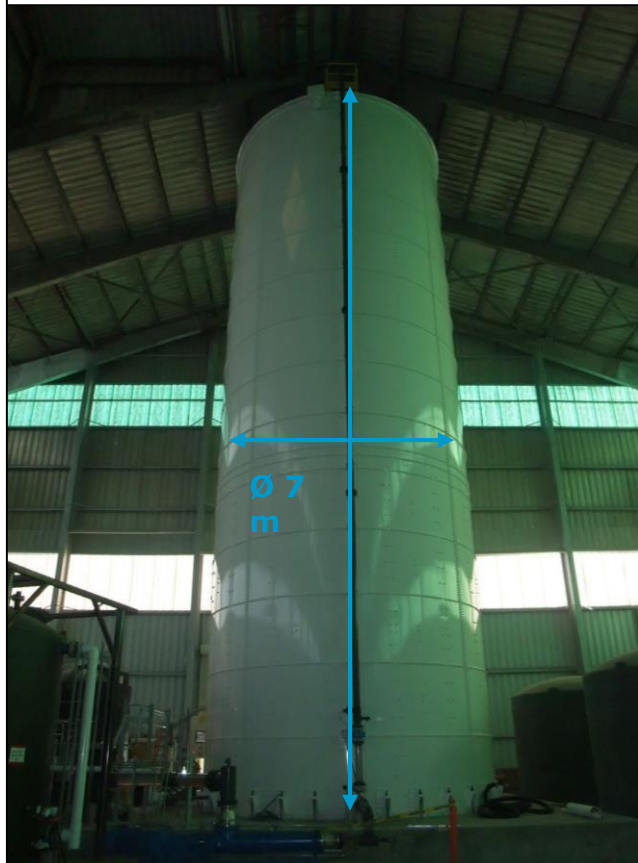
Upgrade in Luxembourg using a containerized system



Industrial wastewater treatment

at large scale

ExSep® installation in the USA for treating large quantities of industrial wastewater



Weight
480 t



Separation of fine particles $> 15 \mu$ for green cement production ExSep® 7000 processes $130 \text{ m}^3/\text{h}$



Sludge (left) and treated water (right)

■ ■ ■ Industrial wastewater treatment

at large scale

ExSep® equipment in Germany processes large quantities of industrial wastewater



Reuse of process water
at a plastics recycling plant in
Germany reduces disposal
costs



Industrial wastewater treatment

at large scale

Implementation of a wastewater treatment plant that highly efficiently removes iron, metal scale, oil and grease



ExSep® Inlet
approx. 35 ml/l
(left)

ExSep® Outlet
approx. 1 ml/l
(right)

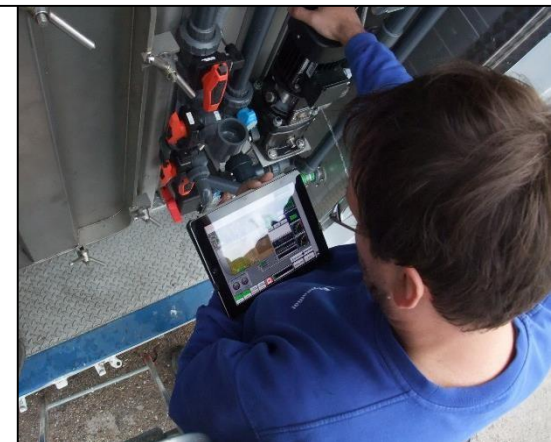
AWARDS

The International Technology Consortium «EPURAMAT» has received many awards:



 Made Around the World...

Today, the International Technology Consortium «EPURAMAT» develops and manufactures its water treatment systems in Slovakia, Serbia, Belarus, Russia and other countries around the world. In 2011, the Luxembourg Chamber of Commerce granted the «Made in Luxembourg» label for **ExSep®** and **Box4Water**



OUR VISION

"Most people still do not realize that in just 5–10 years, all competition and most wars in the world will be driven not by oil and gas, but by shortages of water for drinking and irrigation."

The teams of the companies participating in the International Technology Consortium «EPURAMAT» fully agree with this statement and work every day to address this challenge by applying modern water treatment technologies and creating equipment that is successfully operated at sites in various regions of the world.

We are happy to have partners – customers, investors and component suppliers – who share our values and priorities, developing our joint business and changing the world around us together.

- TOGETHER WE CAN ACHIEVE MORE! -



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