



AQUA FUSION

**Modular system for water
treatment and purification**

Water treatment plant
Wastewater treatment plant
Reuse





Water is a Strategic Commodity of the 21st Century

AQUA FUSION is a modular technological system for the treatment of raw water, accumulation, wastewater purification, and their reuse within a single integrated unit.

The system is designed as an alternative to conventional water management solutions, with a focus on minimizing construction requirements, rapid installation, and operational flexibility.

The solution can be deployed in both decentralized and centralized projects, depending on the quality of the water source, the required capacity, and the nature of the operation.

A wastewater treatment plant must have a constant supply of wastewater; otherwise, it stops functioning.

AQUA FUSION encompasses the complete water cycle in the following interconnected steps:

1. Water source
River, well, sea
2. Filtration
Water treatment
3. Storage
Of drinking water
4. Usage
City, Industry
5. Treatment
Of wastewater
6. Recycling
Of treated water



Technological and Operational Characteristics

- Automated operation using advanced water treatment and purification methods
- Rapid installation and commissioning without the need for extensive construction work
- Modular design allowing capacity expansion and relocation of the technology
- Delivered as a complete functional unit, including all connected processes
- Alternative to conventional water treatment plants without the need for complex infrastructure
- Reduced requirements for approval and certification processes compared to traditional waterworks
- Proven operation in challenging climatic conditions (high temperatures, dust, salinity)
- Compliance with European water quality standards
- Designed service life of at least 20 years
- Easy operation with low maintenance requirements

System Configurability

By selecting from modular capacities based on:

- Raw water quality
- Required capacity
- Local climatic and operational conditions

The output water quality is suitable for irrigation or discharge.

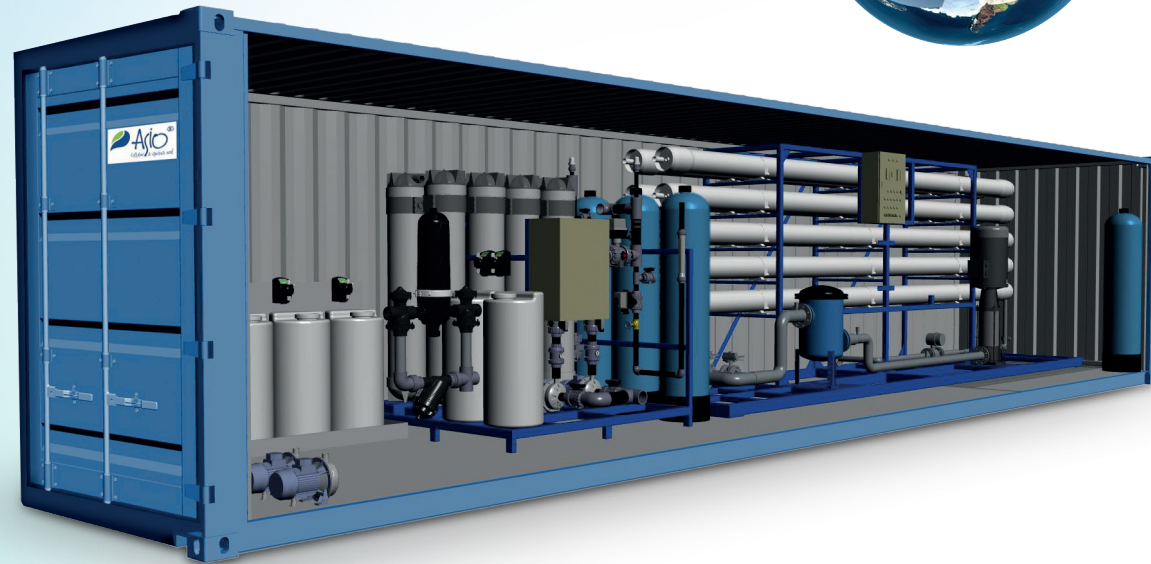
**The modular design allows
for gradual capacity expansion
and adaptation of the system
throughout its lifecycle.**



Water Treatment Plant

Modular Water Treatment Plant

- Capacities: 3,5 / 8,5 / 17 m³/h
- 3,5 m³/h version is housed in a single 20 ft module
- 8,5 m³/h version in a 40 ft module
- 17 m³/h version in two 40 ft modules



Water Intake and Inlet Control

Water is drawn from surface or groundwater sources through a hydrocyclone separator, which removes particles larger than 40 µm.

Captured impurities are periodically flushed via a membrane-operated solenoid valve. Conductivity and turbidity measurements are installed on the discharge pipe.

If preset limit values are exceeded, the system automatically switches to a safety mode, and the treatment process is stopped.



Mechanical and Chemical Pre-Treatment

Water is then passed through:

- An automatic disc filter with 130 µm porosity
- Activated carbon filtration with automatic regeneration

The process includes:

- Removal of organic and selected inorganic substances
- pH adjustment using NaOH solution
- Coagulant dosing into the reaction tank

Ultrafiltration and Storage

Ultrafiltration and Post-Treatment

Water is pumped under pressure to a fully automated ultrafiltration unit with hydrophilic membranes of the multi-channel hollow fiber type:

- Pore size: 20 nm
- Fiber diameter: 0.9 mm

The membrane process ensures the removal of:

- Undissolved and colloidal substances
- Bacteria and viruses

Smaller dissolved substances remain in the water, preserving its quality. The treated water is hygienically safe.

The process is controlled by a Siemens SIMATIC control system. Subsequently, the water is further treated with GAU filters and hygienically secured.



Drinking Water Storage

Capacities: 80 / 200 / 400 m³

Treated water is stored in above-ground circular tanks featuring:

- Sandwich insulating shell minimizing temperature fluctuations
- Ensured stability of water quality during storage
- Construction resistant to dusty environments and high salinity
- Suitable for operation in challenging climatic conditions

Tank installation is rapid and does not require complex construction work.



Wastewater Treatment Plant



Biological Treatment Line

The technology uses nested circular tanks:

- Outer section – sludge tank
- Middle ring – activation tank
- Inner ring – sedimentation tank

This concept optimizes hydraulic conditions and ensures a stable biological treatment process.

Modular Wastewater Treatment Plant

Capacities: 1,000 / 2,500 / 5,000 EO

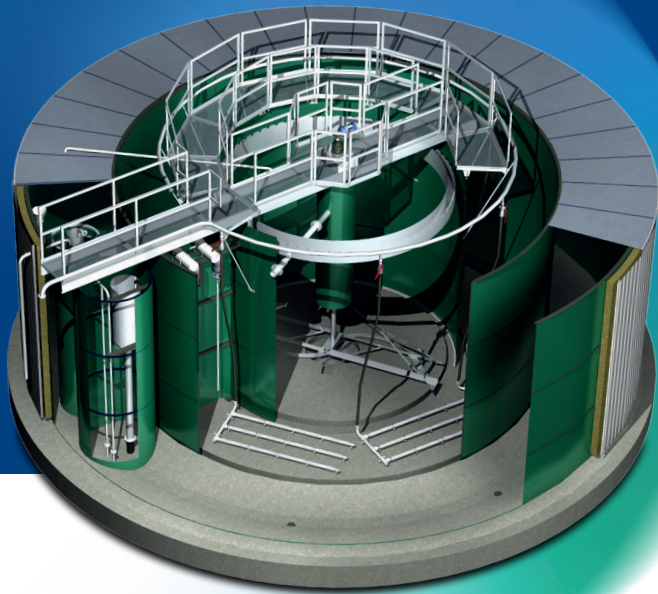
The 5,000 PE version is designed with a dual-line configuration to enhance operational safety.

Inlet Mechanical Pre-Treatment

The system includes integrated mechanical pre-treatment located within the technological module.

This unit removes coarse impurities (e.g., gravel, sand) before the water enters the biological treatment section, protecting downstream processes.

The modular design allows for rapid installation and minimizes construction work.



Technological Infrastructure

Blowers, electrical installations, and the control system are housed in a separate technological module.

Operation is fully automated using a measurement and control system (MCS), which enables:

- Continuous monitoring of operational parameters
- Optimization of energy consumption
- Remote supervision of the technology



Variability and Expansion

System Variability and Mobility

The AQUAFUSION technology is designed to be:

- Modular
- Demountable
- Relocatable
- Relocation and commissioning
- The tanks are sealed using special sealants – without re-sealing them, the tanks will not be fully functional after relocation



Supplementary Technological Units

The offering may include:

- Seawater desalination technology with equivalent capacity ranges
- Effluent polishing (ultrafiltration or microfiltration with UV)
- Water reuse for irrigation systems
- Modular sludge dewatering with the option for further processing

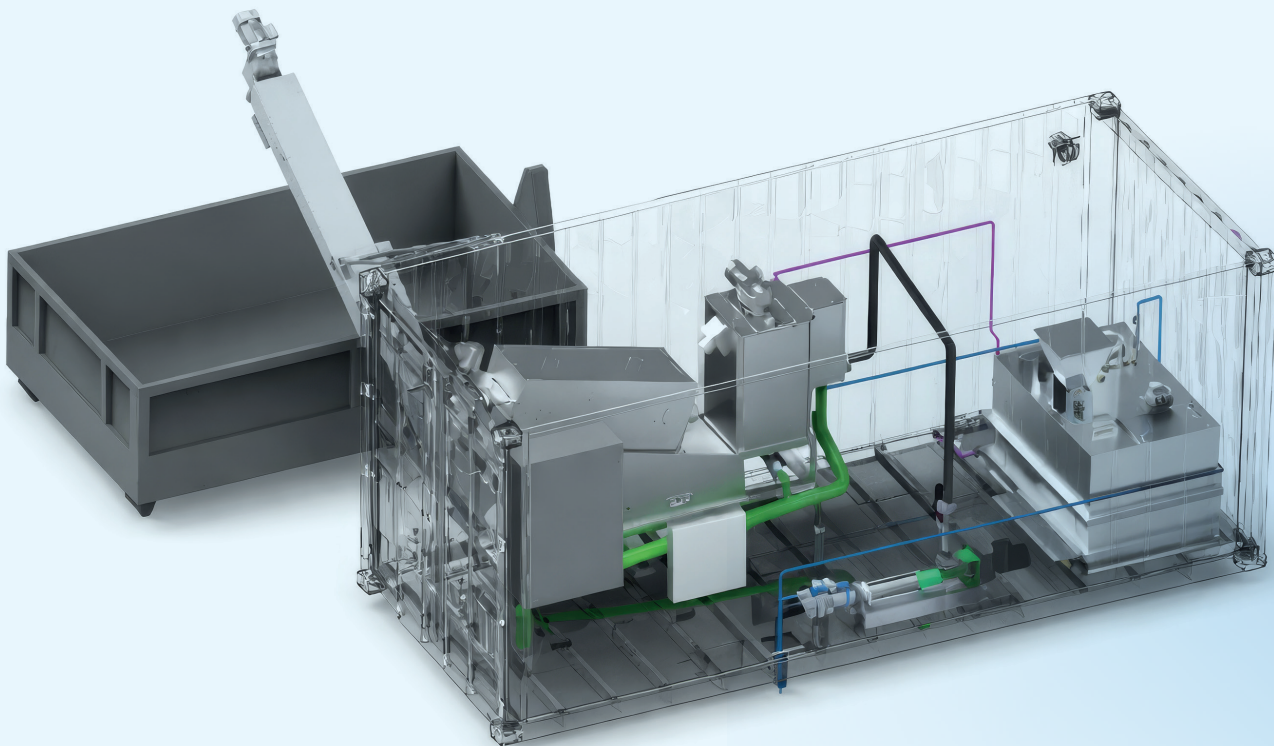
Design and Implementation

The system allows choosing a solution depending on:

- Project size and type (municipal / industrial)
- Raw water quality
- Operational and climatic conditions

The output water quality is suitable for irrigation or discharge.

The delivery includes support in selecting the system configuration and the option to utilize financial instruments for project implementation.





WITKOWITZ ENVI a.s.

Wastewater treatment technologies

- Technological units
- Water management projects
- Project implementation

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Modularity

Fast installation and easy capacity expansion according to project needs.



Mobility

Technological modules can be disassembled and relocated to another site.



Comprehensive Solution

A single system covers the entire water cycle — from drinking water treatment to purification and reuse.



Adaptability

System configurations are always designed according to local conditions, water source quality, and required capacity.



Implementation Support

Possibility to co-finance projects through Czech or European loans and development funds. Support in defining the specific project.