AxoPur®

Axolot AxoPur® Broad-Spectrum Purification

Compact electrocoagulation system for wastewater purification

AXOLOT
a MELLIFIQ brand

AxoPur®

Elektravägen 53
SE-126 30 Hägersten, Sweden
++ 46 10 252 30 00
www.mellifiq.com

Introducing AxoPur®

Broad-spectrum purification

Axolot's AxoPur® segment proudly delivers a compact, turn-key solution for transforming contaminated wastewater into clean, reusable water. Utilizing advanced electrocoagulation technology, it efficiently treats industrial effluents, municipal sewage, landfill leachate, and stormwater—removing suspended solids, emulsified oils, metals, phosphorus, and microorganisms with outstanding performance and minimal chemical use.

The AxoPur® system offers efficient process control and fine-tuning options, such as inline measurement of feed-forward conductivity and feed-back turbidity.

Purification occurs instantly, and the system is designed for continuous operation. It can also handle variable or intermittent flows using a buffer volume and/or level control in a tank, enabling automatic start and stop as needed.

The system delivers a high yield of purified water and water recycling rate, often replacing or supplementing fresh water. This reduces both effluent and freshwater consumption, significantly lowering the risk of supply shortages.

TREATMENT OF

- Wastewater
- Process water
- Leachate, storm, and bilge water

BENEFITS

- Efficient broad-spectrum purification
- Fully automated, easily controlled process
- Facilitates recirculation of purified water
- Instantaneous process requiring a small footprint

COMMON INDUSTRIES

- Pulp and Paper
- Vehicle washing
- Waste management
- Food processing
- Manufacturing
- Aquaculture

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Design specifications

To meet the diverse needs of our clients, AxoPur® offers flexible, containerized and skid-mounted systems tailored to a range of performance requirements, energy efficiency goals, and space constraints. These modular solutions are designed for easy integration into existing facilities, providing a compact and scalable option for efficient water purification.

The containerized systems offer mobility and versatility, making them ideal for projects requiring relocation or operation in limited spaces, while the skid-mounted systems are designed for simple installation and streamlined operation in fixed locations. Built with durable, corrosion-resistant materials, AxoPur® systems are perfect for harsh environments, ensuring long-term reliability and minimal maintenance.

Solutions for varying flow capacities

The AxoPur® system handles flows ranging from 1 to 40 m³/h, providing an effective solution for a wide variety of applications.

For larger flows, we offer AxoPlus®–our large-scale, customized wastewater purification system designed for high-capacity needs. The AxoPlus® can efficiently manage flows beyond 40 m³/h while maintaining optimal water quality and performance.

The AxoPur® reactor

The reactor is the centerpiece of the Axolot electrocoagulation system. The reactor is subject to regular exchange as it contains the sacrificing electrodes releasing the coagulants when direct current passes through them, available for hydraulic flows of 2, 5, or 10 m³/h, ensuring flexibility to meet diverse treatment needs.

An Axolot system normally includes at least two AxoPur® reactors – one installed and operational, and the other designated for potential up-scaling or stored as a ready replacement for the active unit once consumed. For enhanced redundancy, additional reactors can also be leased. These extra reactors can be stored on-site as a contingency measure, particularly in remote areas or locations with less reliable access, such as islands or regions at risk of being cut off during crises.

AxoPur® A-Series: Containerized system with complete integration of vital components.

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Technical data AxoPur®

AxoPur®	A-series			B-series				
Model	A1	A2	A3	B1	B2	B3	B4	B5
Nominal flow rate (m^3/h)	3	6	9	5	10	15	20	25
Number of reactors	1	2	3	1	2	3	4	5
Pipe connections	4 x DN 32 flanges			4 x DN 50 flange				
Power connection	3-phase 400 V							
Reactor material	Polypropylene							
Piping material	PVC-U PN10							
Electrode	Iron or Aluminum							
Automation	7" control panel with reactor current controls and MODBUS TCP							
Input power (kW)	1.5	3	4.5	2.5	5	7.5	10	12.5
Dosing station for polymer	Included			Included				
Footprint (containerized)	2,990 x 2,590 x 2,438			6,058 x 2,591 x 2,438				
Footprint (skid-mounted)	2,800 x 2,600 x 2,600 incl. service			5,800 x 2,600 x 2,400 incl. service space				

**Nominal water conditions conductivity 1.5 mS/cm, pH 5 - 9.5, at design temperature 5-40 deg C, pH 7.2, COD 250 mg/l, phosphorus 4 mg/l, heavy metals <50 mg/l, oil index 10 mg/l and TSS 100 mg/L. All performance data is subject to 15% performance tolerances and the end user is fully responsible for its*

Accessories	Scope
pH dosing station	Optional including automatic pH control PLC
CIP station	Optional
Rinse connections	Included
Heating	Optional with containerization
Sensors	ORP, conductivity and additional pH sensors optional
Feed water buffer tank	150 and 300 L tank optional
Floc flotation unit	Included in OptiFloc™ polishing system
Polymer dosing station	Included in OptiFloc™ polishing system
Sludge collection unit	Included in OptiFloc™ polishing system
Sludge dewatering unit	Included in OptiFloc™ polishing system

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AxoPur® containerized A-series

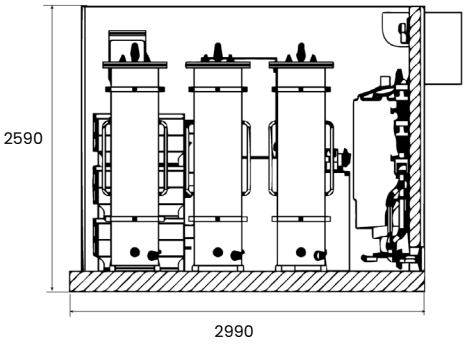
The AxoPur® A-series is available as a containerized solution in a 10′ container, equipped with 1–3 AxoPur® reactors. For the separation of the contaminants, a separate 20′ container including a flotation unit is available.

AxoPur® containerized B-series

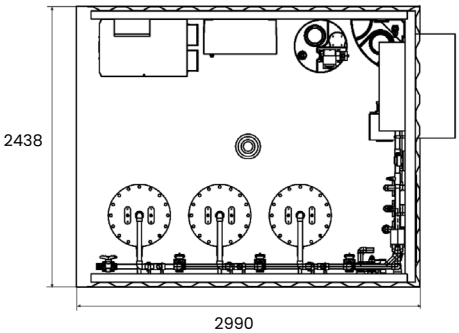
The AxoPur® B-series is available as a containerized solution in a 20′ container making use of 1–5 AxoPur® reactors. For the separation of the contaminants, a separate 20′ container including a flotation unit is available.

A-series

side view

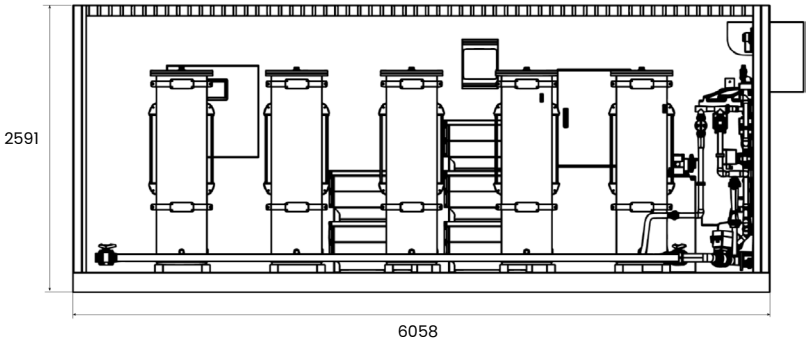


top view

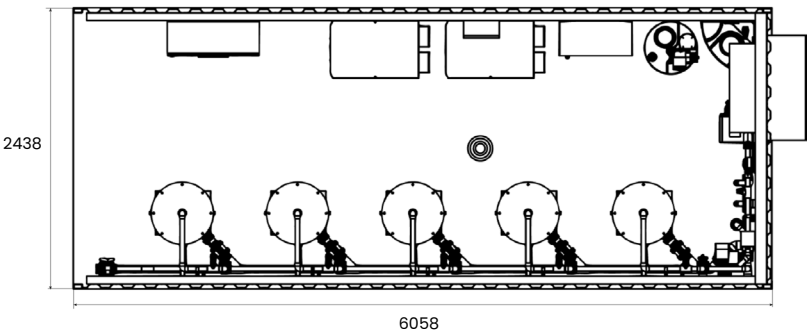


B-series

side view



top view



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Electrocoagulation – a proven and established technology

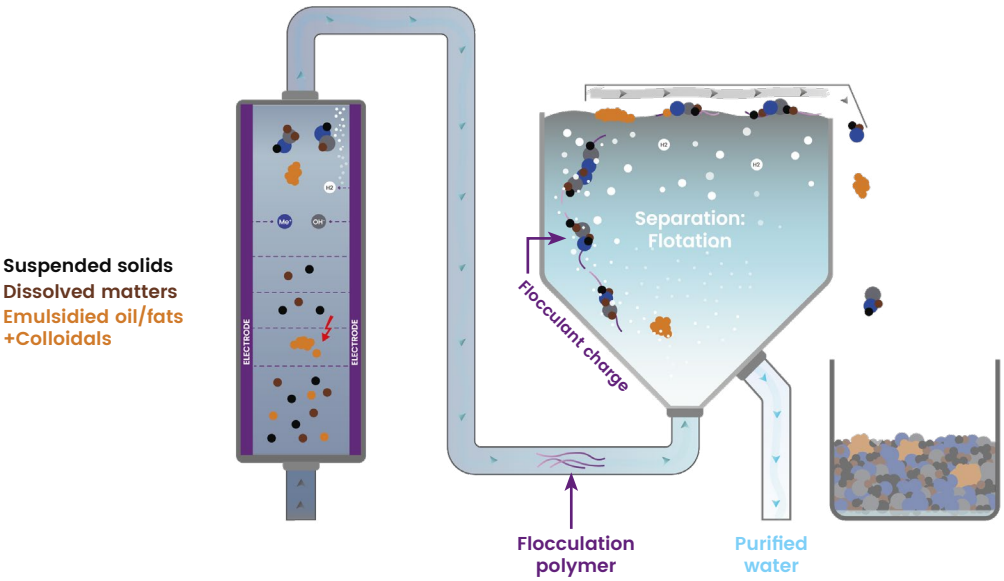
Electrocoagulation (EC) is a proven technology for wastewater treatment that enables recirculation of process water across various industries. It has numerous advantages compared to traditional treatment technologies, making it essential in a world facing growing water challenges and demands.

Following continuous innovation and technological advancement, EC is now a well-established technology and has become increasingly popular with its usage rapidly growing worldwide. The growing popularity of EC technology is due to its ease of operation, high reliability, cost effectiveness and ability to remove a wide range of contaminants that are typically difficult to eliminate using traditional methods. It effectively removes substances such as suspended solids, phosphorus, toxic organic compounds, heavy metals, and various other contaminants.

AxoPur® EC uses Mellifiq's patented closed reactor design, offering superior efficiency compared to other EC systems.

Furthermore, a key advantage of EC is its ability to generate significantly less sludge, which is also easier to dewater compared to traditional chemical coagulation methods. Pollutants in water, such as heavy metal ions and organic or inorganic colloids, remain dissolved in solution by repulsive electrical charges.

Coagulation occurs when oppositely charged ions are introduced, destabilizing these colloids and allowing them to aggregate. This process applies to both chemical coagulation and EC technology. Coagulation involves multivalent charged metal ions forming hydroxocomplexes that attract dissolved contaminants. These complexes then bind to an added flocculation polymer forming larger, easily separated, agglomerates.



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Electrocoagulation vs chemical coagulation

Electrocoagulation is based on principles similar to those of the widely used chemical coagulation, making the two technologies easily comparable. Chemical coagulation itself is a highly versatile process, removing a major part of the commonly occurring contaminants in wastewater.

In chemical coagulation, the coagulation is achieved by means of the addition of a strongly acidic and corrosive aqueous solution of e.g. ferric or aluminum chloride followed by a neutralization using sodium hydroxide. The process is usually carried out in large basins.

In electrocoagulation, the coagulation is achieved by means of letting a direct current dissolve a sacrificing electrode made of metal over time. In this process, hydroxide ions are formed as a counter-ion, thus omitting the need for neutralization and not adding any chloride ion to the solution as is usually the case in chemical coagulation. A small amount of hydrogen gas is also formed in the electrochemical process, improving the flotation mechanism with no compromise regarding safety.

By avoiding harsh chemicals and producing fewer byproducts, electrocoagulation technology aligns with the growing demand for sustainable wastewater treatment methods. It is an ideal choice for industries seeking efficient, environmentally friendly solutions to meet strict environmental regulations while maintaining cost-effectiveness.

BENEFITS OF ELECTROCOAGULATION

compared to chemical coagulation

- Handling of the corrosive aqueous solution for chemical coagulation is omitted together with the need for large storage tanks.
- Replacement electrodes or reactors are easy to store and require minimal space, which is particularly important for preparedness and in remote locations such as islands.
- The contaminants are formed into flocs with high solids content that are easily dewatered, leading to lower costs for subsequent sludge handling
- The cleaned water yield is higher which, as well as the absence of chloride addition, facilitates recirculation.
- 5-10 times lower sludge volumes and 50% lower operational costs.

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Full-scale implementation

Mellifiq provide on-site support and start-up services globally for projects of all sizes. For large flows, a new building is typically required to house the process equipment. The AxoPlus® system is generally supplied as part of an EPC contract, with Mellifiq delivering end-to-end services, including civil works, frontend engineering design, commissioning, process building construction, and installation of all process equipment.

Pilot project

Pilot projects can be conducted by Mellifiq's experienced engineers, which allows for high resolution scaling from pilot levels to full scale installation. We offer both on-site pilot projects as well as in-house small scale pilots depending on project size.

The AxoPur® system was tailored and installed in a plastic recycling facility in Sweden to meet the challenges of removing suspended solids, phosphorus, and emulsified oil from wastewater.

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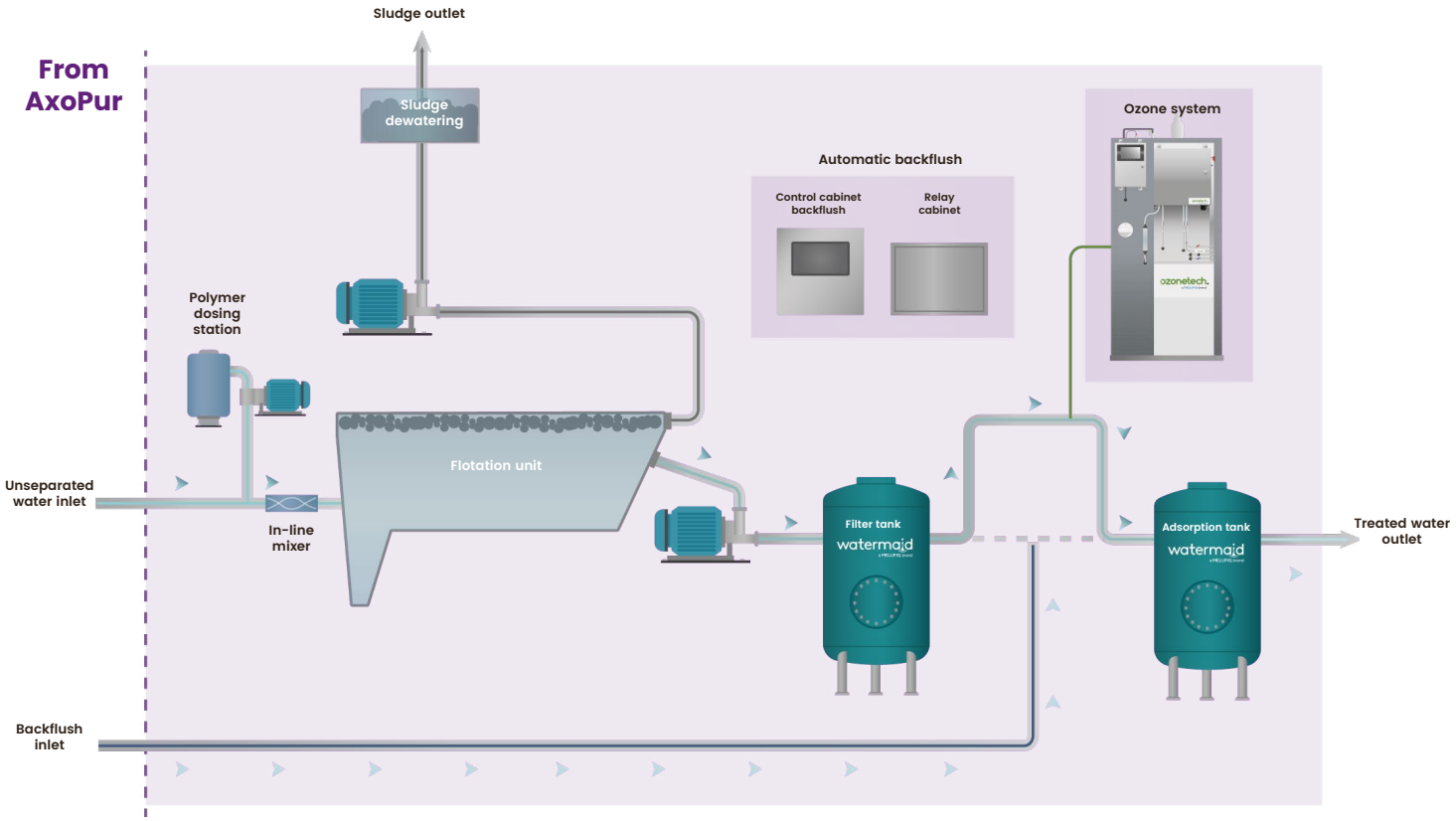
Seamless system integration

The AxoPur® system is designed for seamless integration with a wide range of products and systems from our other brands. It is effectively combined with Water Maid™ filtration and adsorption systems, as well as with the Water Maid™ dosing stations and OptiFloc™ flotation units, ensuring optimal removal of contaminants.

Furthermore, AxoPur® is compatible with Ozonetech's RENA Vivo ozone systems, enabling advanced oxidation processes for enhancing water quality and disinfection. By combining these technologies, we offer flexible, high-performance solutions tailored to meet the complex demands of various industries.



The wastewater is initially treated using the AxoPur® system. This is followed by seamless integration with our other systems to achieve a superior wastewater treatment result, tailored to the specific requirements and demands of each case.

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About Mellifiq

Mellifiq is a multi-awarded environmental service company group, that has since the early nineties evolved into a world leading system and solution provider with multiple groundbreaking applications for industrial, municipal, and real estate clients. We supply cutting-edge technologies to manage the most sophisticated air, water, and energy challenges.

Mellifiq offers a complete range of air and water treatment technologies and solutions across multiple industries such as processing industry, energy sector, food and beverage, pharmaceutical, wastewater treatment and commercial real estate.

Mellifiq offers strong and renowned brands, such as Ozonetech, Nodora Water Maid, Saniray, Axolot and world-class engineering services combined an excellent track record of more than 40 years of innovation. We help our clients achieve the most efficient and sustainable solutions while creating the maximum value for their businesses.

With several business units across Europe, Mellifiq is headquartered in Stockholm where research and development, production, QA and certification all take place. Our unique technology and our extensive expertise have made us the Center of Excellence for the world's most complex projects, and a global player with installations on all six continents.

Everyday millions of people rely on our solutions for ventilation, disinfection, sanitation, and odor control. We are committed to raising the bar for the concept of clean and the industry standard for engineering, technical services and general contracting.

For additional information, visit our website at www.mellifiq.com

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