



Water Treatment Solutions

*for Pharmaceutical and
Personal Care Product Manufacturers*

WATER TECHNOLOGIES

Understanding Unique Water Challenges

Veolia Water Technologies is the world leader in providing technologies, services, and processes to help clients with their high purity water, utility water, and wastewater challenges.

Veolia understands the unique water challenges that pharmaceutical and personal care manufacturers face, such as:

- > Product Quality
- > Product Safety
- > Regulatory Compliance
- > Operational Efficiency
- > Variability in Wastewater
- > Sewer Surcharge Reduction
- > Increased Resource Recovery
- > Risk Mitigation
- > Corporate Sustainability Initiatives



A Creative and Trusted Solutions Provider

Leading pharmaceutical and personal care companies around the world have trusted Veolia with their high purity water, utility water, and wastewater treatment challenges. When it comes to high purity water, efficient & sustainable performance is critical. Additionally, having an operator-friendly, easy-to-use system that can plug-and-play into your existing process expedites the project timeline and minimizes engineering costs.

CASE STUDY



Life Science Company CONFIDENTIAL

TECHNOLOGY: ORION™ 500
APPLICATION: High Purity Water

The leading life science client needed to replace their existing aging water purification units. Veolia provided an ORION™ 500 high purity water system to treat water for use in the production, as well as sanitization. The ORION system is able to meet the water demands of the site by creating a very high quality permeate at flows up to 500 liters/hour (132 GPH).

The system also reduces their energy and water footprint. During periods of where the system is not in operation or in recycle mode, no RO reject water is discharged to the drain. A cooling heat exchanger also prevents high temperature water from being discharged to the drain during extended recycle periods.



Capabilities

Our technologies, services, and processes

Clean Utility Water / High Purity Water

Facilities producing pharmaceutical and personal care products rely on a consistent, high-quality supply of water that is free of contaminants. Veolia has a wide variety of filtration systems that meet the highest water quality standards.

- Raw water treatment
- Purified water
- Pyrogen-free water
- WFI (water for injection)

Utility Water Treatment

Producers of pharmaceutical & personal care products rely upon their utility operations to provide steam & cooling water for production. By integrating Veolia's equipment and Hydrex chemical technologies together, we can cost effectively produce the water quality that your plant requires for their specific production needs.

- Cooling circuit and boiler supply
- Hot water production
- Process water production
- Legionella prevention

Wastewater Treatment

A wide-range of products can create a high degree of variability in wastewater composition or flows. As a result, Veolia is experienced in designing systems or chemical service programs that can ensure consistent effluent characteristics.

- Biological wastewater treatment
- Flotation & clarification
- Tertiary treatment
- Sludge / Biosolids handling
- Chemical Coagulants & Flocculants

Water Footprint Reduction

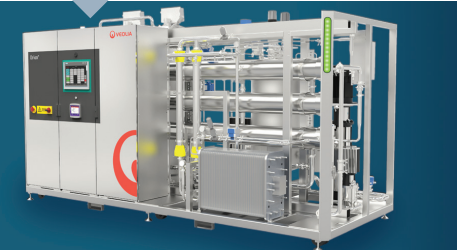
To reduce a facility's water footprint, Veolia offers a wide variety of water reuse technologies. Veolia helps companies optimize the use of water in their facility to reduce costs and total water use.

- Zero liquid discharge
- Point source segregation, treatment, and reuse
- Utility performance optimization

Expansive Technology Portfolio

Veolia's more than 350 patented technologies provide the Pharmaceutical and Personal Care Product Industry with a safe and reliable supply of water to support production and ensure wastewater meets regulatory compliance limits before discharge.

RELIABLE CLEAN WATER / UTILITY TECHNOLOGIES



ORION™
RO + CEDI + UF technology that provides superior high purity water for manufacturing applications, including WFI (Water for Injection)



IonPro™ LX
Advanced RO + EDI system that produces high purity water with low conductivity and bacteria levels in a very compact footprint



Nurion™ Reverse Osmosis (RO)
Reverse Osmosis unit that provides a consistent supply of high quality water for infant formula or other nutraceutical applications with a hygienic design



Sirion™ Reverse Osmosis (RO)
Advanced membrane based water filtration systems engineered to create a high-quality permeate for utility equipment, ingredient water, or water reuse applications



Sand, Multimedia, Carbon, and Cartridge Filters
Efficient equipment designed to remove particles, odors, and organics to improve intake water quality for use in utilities and manufacturing



Ion Exchange Systems
Flexible and automated water treatment systems used to soften, dealkalize, deionize, or demineralize water for utility or process applications

HIGH PURITY WATER CASE STUDY



BIOPHARMA CLIENT CONFIDENTIAL

APPLICATIONS: PURIFIED WATER
TECHNOLOGY: ORION™ 20000

CHALLENGE
A global biopharmaceutical company was expanding the production of its blood plasma products at one of its facilities. The manufacturer was in need of a reliable supply of high purity water to support the production.

SOLUTION
Veolia installed three ORION™ 20000 units at the client's facility. The skid-mounted water purification systems utilize reverse osmosis and continuous electrodeionization (CEDI) processes, which can also be hot water sanitized. Additionally, the system was pre-validated to ensure it met all performance requirements.

RESULTS
The new system can produce up to 60,000 LPH (15,850 GPH). As a result, the client's new clean water system is able to produce the required amount of high purity water for facility's production needs.

WASTEWATER CASE STUDY



ASTRAZENECA

APPLICATION: WASTEWATER TREATMENT
TECHNOLOGY: ANOXKALDNES™ MBBR (MOVING BED BIOFILM REACTOR)

CHALLENGE
Leading pharmaceutical company, AstraZeneca, was in need of a pharmaceutical wastewater treatment solution at one of its manufacturing sites. The facility discharged treated wastewater to a very sensitive body of water and needed a reliable and robust wastewater treatment system to remove toxic chemicals and organic content.

SOLUTION
Veolia installed a multi-stage AnoxKaldnes™ MBBR system to treat for the various pollutants in the wastewater stream. The different stages within the wastewater system utilize very specific microfungi and other bacterial communities in order to target, detoxify, and reduce residual organic compounds within the wastewater stream.

RESULTS
The wastewater facility was designed to treat up to 1,800 m³/d (0.48 MGD) with loading rates up to 440 kg/d of TOC (Total Organic Carbon). The system is able to remove 97% TOC, 80% Nitrogen, and 99% of Phosphorus. More importantly, environmental studies of the discharge point have shown that the receiving lake has not been subject to any negative effects.

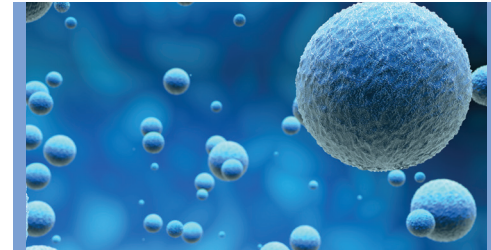
ROBUST WASTEWATER TECHNOLOGIES



Biothane® High-Rate Anaerobic Treatment System
Anaerobic granular wastewater treatment process designed to effectively remove COD/BOD, while simultaneously generating green energy as a by-product



AnoxKaldnes™ MBBR (Moving Bed Biofilm Reactor)
High-performance aerobic wastewater treatment technology engineered to effectively remove BOD/COD and nitrogen



eXeno™ Biological Micropollutant Removal
An effective biological wastewater treatment system that uses the AnoxKaldnes™ carrier technology to target and remove pollutants, including drug residues



IDRAFLOT® Dissolved Air Flotation (DAF)
An innovative and effective wastewater treatment technology based on a unique modular design to remove suspended solids and FOG (fats, oils, and grease)



Hydrotech Drumfilters & Discfilters
Filtration technology that uses woven media panels to remove suspended solids > than 10 microns



EVALED® Evaporators
Highly reliable and cost-effective evaporation technology designed to reduce wastewater volume and disposal costs, produce a high-quality and reusable distillate, and recover valuable by-products

Comprehensive Service & Solutions

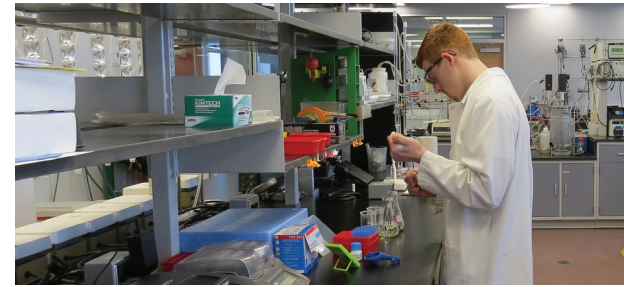
Beyond the innovative technologies and water treatment processes at Veolia are a vast selection of services and customer support products.

Our Services Include:

- > Laboratory Service / Testing
- > Bench-Scale Tests
- > Pilot Tests
- > Water Treatment Chemical Program Services
- > Water Audits, Studies & Evaluations
- > System Troubleshooting & Maintenance
- > Complete Process Design
- > System Integration
- > Start-Up & Commissioning
- > Training and Continuing Education
- > Spare Parts and Consumables
- > Full or Part-Time On-Site System Operations
- > Remote Monitoring / Automation
- > Service Deionization Programs



Veolia Water Technologies delivers creative, effective, and sustainable services and solutions that meet the operational and environmental goals of its clients



Lab Services & Pilot Testing

Laboratory and pilot testing is critical to characterizing water and wastewater streams for treatability. Veolia has in-house and onsite capabilities to ensure the feasibility and successful implementation of water and wastewater projects.



Mobile Water Services

Veolia's mobile fleet includes a wide range of technologies for temporary, emergency and long-term water treatment applications, including ultrafiltration (UF), reverse osmosis (RO), clarification/softening, discfiltration and more.



Aquaservice™ Operational & Environmental Compliance Services

Our on-site specialists can implement an objective, integrated, customer-specific plan to increase operational efficiency and ensure regulatory compliance.



Hydrex™ Chemical Solutions

Veolia's Hydrex™ chemical programs tackle our clients toughest water challenges by reducing their water footprint while improving both production and utility reliability and efficiency.

KEY SERVICES

SERVICES CASE STUDY



Bristol Myers Squibb

SERVICES: Hydrex™ Chemical Services & HUBGRADE

CHALLENGE

The client needed to replace a 6 cell cooling tower in three separate stages. The old cells and packing needed to be sanitized online before removal but the remaining cells needed to remain operational. Hyper chlorination of the cooling towers was deemed too aggressive for an online sanitization due to sensitive equipment onsite.

The existing tower packing also had some residual biofilm accumulation due to a design fault and the client wished to remove this before the project began to minimize Legionella risk to construction personnel.

SOLUTION

Veolia offered a solution using chlorine dioxide as the sanitizing agent and Hydrex 2874 as a supplemental dispersant. The service offering also included the installation of HUBGRADE to provide remote access to monitor the water quality and chemical dosage rates. Additionally, corrosion and microbiology monitoring was also put in place to reassure the client of our safe and effective program

RESULTS

Corrosion coupons confirmed that the entire process was not corrosive to existing pipe work and reaction vessels. Weekly analysis confirmed that organic activity was kept under control throughout the process. This dosing program proved very effective and the client has requested a permanent installation for the chlorine dioxide solution to replace the existing non-oxidizing installation. Tower replacement was completed on time with no lost construction time and no lost client production time.

Hubgrade Powered by VEOLIA



Smarter Water Management

To enhance water and wastewater treatment at your facility, Veolia Water Technologies has developed an all-in-one digital service called HUBGRADE.

The Power of Veolia by Your Side, 24/7

HUBGRADE combines artificial intelligence and water treatment to make your system smarter, safer, and more sustainable. Using HUBGRADE, Veolia can also perform a virtual site visit to provide troubleshooting and emergency support.

Resourcing the world

Veolia Water Technologies

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