



Technologies & Services for the Treatment of Water, Liquor and Chemical Recovery Cycles

for the Pulp & Paper Industry

WATER TECHNOLOGIES

Understanding the Challenges Facing Pulp & Paper Companies

Water is vital to the production process at Pulp and Paper facilities. Veolia Water Technologies understands the issues related to water and wastewater management and has experience in helping manufacturers achieve their goals in:

- > Regulatory Compliance
- > Operational Efficiency
- > Increased Resource Recovery
- > Risk Mitigation
- > Corporate Sustainability Initiatives

A Creative and Trusted Solutions Provider

Veolia Water Technologies is trusted by leading Pulp and Paper companies since the 1960s, and has successfully completed hundreds of water, wastewater, liquor and chemical recovery projects.

Veolia provides its clients an integrated approach to water and resource management using innovative technologies, equipment, chemistry, and services. Our customer-focused culture combined with comprehensive capabilities make Veolia the preferred partner for all water, wastewater, evaporation, and crystallization projects.

Capabilities

Veolia is experienced in the design and implementation of standard and customized technologies and processes for the Pulp and Paper industry

Black Liquor Concentration

The thermal treatment of black liquor through evaporation achieves higher solids content and lower loads to the recovery boiler leading to the optimization of combined heat and power production. When integrated within the chemical recovery cycle, this technology promotes higher operational efficiencies while enabling the reuse of high-quality condensate.

Precipitator Ash Treatment

With the closing of process loops, chloride and potassium accumulate in the recovery cycle and result in scaling and corrosion in the boiler. Using highly-selective crystallization technologies, these non-process elements (NPEs) are removed while sodium is recovered to maximize soda chemical savings.

Influent (Raw) Water Treatment

Regardless of the source of the intake water, Veolia technologies ensure there is a consistent supply of water to the facility.

Utility Water

Pulp and paper manufacturers rely upon their utility operations to provide steam and cooling water to support production. Veolia's equipment and chemical technologies effectively produce the type of water your utilities need to ensure reliable steam quality, heat exchange efficiency and environmental compliance.

Wastewater

Veolia is experienced in helping clients reduce their financial exposure and comply with discharge requirements and stringent environmental regulations.

Water Footprint Reduction

To reduce a facility's water footprint, Veolia offers a wide-variety of water reuse technologies. From debarking wash water to wastewater reuse, Veolia helps companies optimize the use of water in their facility.

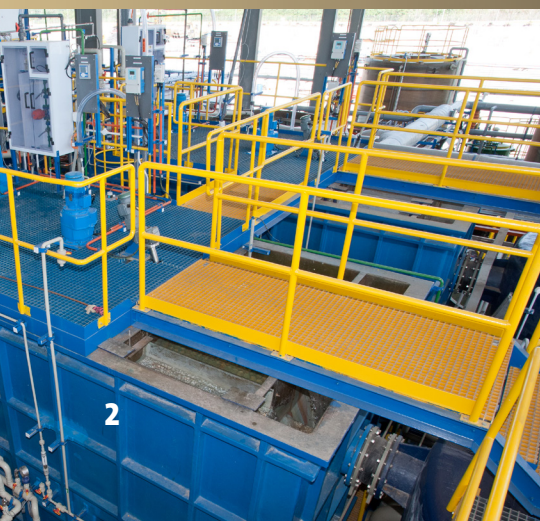
Mobile Water Treatment

Veolia Water Technologies provides mobile water and wastewater treatment solutions to cover emergency, temporary or long-term water treatment needs.

Applications

- > Absorption
- > Aerobic Treatment
- > Anaerobic Treatment
- > Biogas Cleaning/Handling
- > Chemicals
- > Clarification
- > Coagulation / Flocculation
- > Crystallization
- > Dealkalization
- > Demineralization
- > Dissolved Air Flotation
- > Equalization
- > Evaporation
- > Ion Exchange
- > Media filtration
- > Membrane Treatment (UF/RO)
- > Nutrient Removal
- > Oxidation
- > Screening
- > Softening
- > Sludge Handling / Dewatering

CASE STUDY



Irving Paper

TECHNOLOGY: Actiflo®
LOCATION: New Brunswick (Canada)

Irving Paper was looking to reduce water usage by 6,000 m³/day in summer and 8,000 m³/day in winter by cleaning and reusing certain process water streams. The mill's goals were to reduce raw water demand, improve process water quality, recover thermal energy and reduce wastewater flow.

Veolia installed two Actiflo® package plants to treat wastewater from the vacuum pump seal. Wastewater from the mill's vacuum pump seal flows to the Actiflo® units and is blended with raw river water. The technology is able to remove 99.9% turbidity for the two water streams. As an additional benefit, this process helped the mill decrease energy costs by allowing the warmer reuse water to increase the temperature of influent water from the river, prior to use in the mill.

CASE STUDY

Leading Recycle Paper Mill

TECHNOLOGY: Biothane® EGSB (Expanded Granular Sludge Bed)

A recycle paper mill was needing to upgrade their wastewater treatment facility to improve COD removal and Calcium removal as pretreatment before ZLD (Zero Liquid Discharge). Additionally, the facility needed to have reliable wastewater treatment to ensure regulatory compliance.

Veolia installed two (2) Biothane EGSB (450 m³ each) to replace their existing anaerobic system. The facility was designed to treat up to 1,320 m³/day with loading rates up to 12,700 kg COD/day. As a result, the system was able to remove 80% of the COD and with its calcium removal step, it was able to prevent scaling in the downstream ZLD process.





HPD® Black Liquor Evaporation & Recovery Systems

Highly efficient evaporation system designed to concentrate solids, optimize recovery boiler performance, and create a high quality distillate for water reuse



ECRP™ Enhanced Chloride Removal Process System

ECRP™ maximizes potassium recovery and repurposes a renewable by-product into high-purity potassium sulfate (SOP), a specialty fertilizer produced to feed high-value crops



CRP™ Chloride Removal Process System

Precipitator ash treatment process that removes chloride and potassium, recovers sodium, and protects utility equipment



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



AnoxKaldnes BAS™ Biological Activated Sludge Process

Specialized MBBR (Moving Bed Biofilm Reactor) process that removes easily biodegradable COD and protects the activated sludge system from peak loads and improved sludge settling



Anita™ Mox

Specialized biological process to treat wastewater streams that have high concentrations of ammonia

CASE STUDY



Leading Containerboard Manufacturer

Black Liquor Evaporation & Chloride Removal System

LOCATION: Virginia (USA)

An existing containerboard manufacturing facility needed to replace the existing three evaporator trains at the facility. The project scope included construction of a six-effect, HPD® falling film evaporator train that produces 74% product solids at an evaporation rate of 897k lbs/hr (407 t/h). Veolia also installed a CRP™ (Chloride Removal Process) System to successfully process precipitator slurry to protect downstream utility equipment from scaling.



Modular CRP™ System

CLIENT: Visy (Kraft Mill)

LOCATION: Tumut (Australia)

The modularized CRP™ (Chloride Removal Process) was installed to enhance the recovery cycle at the mill. It allows removal of non-process elements (NPEs) from precipitator ash while greatly reducing chemical makeup and ash disposal costs.

Standard & Modular Equipment Line

Pre-Engineered for Fast Implementation

Veolia offers standard, pre-engineered products and skid-mounted systems for several of its technologies. Our Standard Product Line offering is designed to provide cost-effective water and wastewater treatment solutions.

OUR STANDARD/MODULAR PRODUCT LINE INCLUDES:

- > Evaporators & Crystallizers
- > Media & Membrane Filtration
- > Reverse Osmosis
- > Clarification
- > Softening
- > Demineralization
- > Wastewater Equipment
- > UV Disinfection
- > Chemical Dosing Packages
- > Automated Control Systems



Actiflo® High-Rate Clarifier

Small-footprint technology in which water is flocculated with microsand and polymer to increase settling velocity for the removal of more than 99% of TSS



Hydrotech Drumfilters & Discfilters

Filtration technology that uses woven media panels to remove suspended solids > 10 microns



Multiflo® High-Rate Softener

Proprietary softening process that incorporates chemical precipitation with sludge thickening to produce an effluent with low concentrations of scale-formers and a highly concentrated sludge that can be easily dewatered



Ion Exchange Systems

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



IDRAFLOT® Dissolved Air Flotation (DAF)

An innovative and effective technology for pre-treatment or tertiary treatment that effectively separates fibers and suspended solids



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 other production areas



Reverse Osmosis (RO) Systems

Advanced membrane based water filtration systems engineered to create a high-quality permeate for water reuse applications

Comprehensive Service & Solutions

Veolia Water Technologies offers customer care at its best—not just during a capital project, but beyond.

Veolia does this by providing a wide variety of services to optimize the performance of water, wastewater, and utility infrastructure at pulp and paper mills. This is what makes Veolia a unique and comprehensive partner in water or other related projects.

Our Services Include:

- > Laboratory Service / Testing
- > Bench-Scale Tests
- > Pilot Tests
- > Chemical Service Programs
- > Water Audits, Studies & Evaluations
- > System Troubleshooting
- > System 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
- > Deionization Services



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

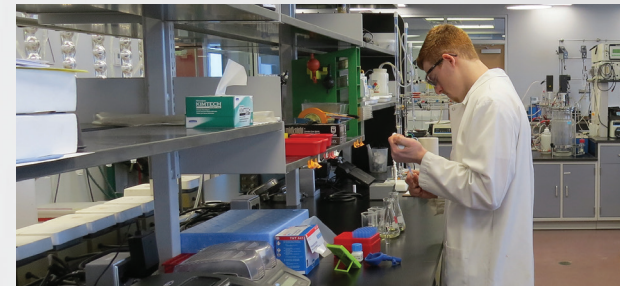


CASE STUDY

Large Coated Paper Products Mill

SERVICES: Hydrex™ Utility & Water Services
TECHNOLOGY: ProtectAll
LOCATION: Southern United States

A leading paper mill was experiencing increased iron levels and erratic chemical treatment. This created unstable boiler water quality. Boiler pH levels were low and unable to maintain the desired Magnetite iron oxide surfaces necessary to protect from corrosion. Only 2 weeks after the introduction of Veolia's ProtectAll technology into the boiler feedwater, tests showed significantly reduced Iron levels. In addition to protecting the boiler from corrosion, ProtectAll allowed the client to significantly increase boiler cycles, reduce chemical consumption costs, and improved steam quality.



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 reverse osmosis (RO), clarification/softening, 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



AQUAVISTA™ DIGITAL SERVICES

Smarter Water Management

To enhance the operation of key water, liquor and chemical recovery cycles at your facility, Veolia Water Technologies has developed an all-in-one digital service called AQUAVISTA™.

AQUAVISTA is accessible Anytime, Anywhere and on Any Device through a single private portal. This advanced service allows our customers to efficiently manage their equipment in real-time, 24/7. AQUAVISTA can be implemented for both individual technologies or comprehensive processes.

A Faster Response to Your Needs

Using AQUAVISTA, Veolia can also perform a virtual site visit to a facility to more efficiently provide troubleshooting and emergency support.

