Outotec industrial water treatment provides tailored water treatment solutions to produce water that meets environmental discharge regulations. Our technologies maximize water recycling, reduce water and energy consumption, and enable recovery of valuable elements.

With a long tradition in designing and managing integrated water treatment processes for mines and metallurgical plants, Outotec offers proven technologies and efficient, sustainable solutions for the treatment of different type of industrial wastewaters.

**BENEFITS**

- Integration of water treatment into core process for optimal results and maximum productivity
- Minimized capital expenditure through optimized process design
- Reduced water consumption through optimized recycled water treatment
- Improved productivity and product quality through secured and clean process water
- Improved quality and reduced volume of generated solid residues
- Reduced chemical usage via efficient process control
- Comprehensive service portfolio
WATER TREATMENT EXPERTISE DEVELOPED THROUGH A LONG HISTORY OF METALS & MINERALS PROCESSING

Water is a crucial part of the minerals and metals production cycle from exploration to the closure of the mine site. Water is truly as important as the ore itself.

We provide industry leading water treatment solutions, which are built on our own technologies and proprietary equipment. At Outotec we continue to innovate to develop solutions for ever-challenging waters.

Outotec Industrial Water Treatment can offer complete solutions for:

- Raw water management
- Process water management
- Effluent / Discharge water management

Tightening environmental standards, together with reduced water availability leads to the need for efficient water treatment solutions.

Outotec has a long history in pyro- and hydrometallurgy and we use this knowhow in the field of industrial water treatment in order to provide customers with solution-driven & optimized water treatment processes. We know that every plant and process has its own process requirements and strive to provide tailored solutions to specific needs.
Building an industrial water treatment solution

Outotec’s process of finding the best solution for a mining and metallurgical site starts by analyzing the customer’s process requirements in order to identify water treatment and management issues and define targets. Our world class water experts then develop concepts and discuss their suitability together with the customer to tailor the best approach.

We then carry out process modeling using the Outotec HSC SIM process simulation program in order to test the concept solution’s impact on the entire process and identify areas for optimization. Once a suitable option has been found, laboratory testing is carried out in order to prove the suitability of the proposed processing option.

Once the suitability of the process has been proven, technical and economic feasibility of the proposed process concept will be evaluated. Our aim is to construct the most economically and technologically feasible solution with optimized performance. Once the optimal process is agreed upon, the process engineering can begin.

Outotec offers:

- Tailor-made solutions from technology package to turnkey
- Complete water management
- On-site audits and plant performance assessments
- Laboratory and pilot tests
- Concept and feasibility studies
- Basic and detailed engineering
- Proprietary and key equipment supply
- Commissioning and start-up services
- Comprehensive service portfolio
COMPREHENSIVE, INTEGRATED SITE WATER MANAGEMENT

**RAW WATER MANAGEMENT**
Treat influent water to be suitable for the application (process, utilities, etc.). We offer traditional raw water treatment (lake water, river water etc.), sea water desalination as well as treatment of alternative water sources such as mine water or even municipal waste water.

**PROCESS WATER MANAGEMENT**
Treat circulating water to be suitable for reuse. Our key expertise in metallurgical processing means that we know exactly what water quality levels are required, where and when in the process.

**EFFLUENT WATER MANAGEMENT**
Treat discharge water to meet environmental regulations and ensure the stability of the solid waste generated. We have several proven technologies for effluent treatment.
Waters and wastewater within the mining and metallurgical industries contain elements such as heavy metals (Cu, Fe, Mn, Zn, etc.), arsenic, selenium, sulfate, calcium, magnesium, nitrates, solids, salts and acidity, which require treatment prior to discharge to the environment and/or reuse within the processes.

Outotec offers a wide range of effluent treatment and water management solutions for industrial applications. Typical Outotec industrial water treatment solutions include:

- Metal removal and recovery
- Neutralization
- Ca & Mg removal
- Arsenic, Selenium, antimony removal
- Sulfate removal
- TDS [Total Dissolved Solids] control
- Halide removal
- Membrane technology
- Electrochemical water treatment
- Nitrogen and phosphorus treatment
- Water reuse and recycling process solutions
- Water Quantity & Quality Management (WQQM) Service

Outotec industrial water treatment solutions are tailor-made for:

- Non Ferrous metal concentrators
- Gold processing and concentrator plants
- Non Ferrous smelters and refineries
- Iron and Steel industry
- Acid Mine Drainage (AMD) in different mining sectors
- Ferrochrome industry
- Coal mines and washeries
OUTOTEC ARSENIC REMOVAL

Arsenic removal from effluent
Arsenic-rich liquids require treatment prior to discharge or reuse as process water. Outotec offers the following arsenic removal processes:

- Calcium arsenate precipitation
- Calcium arsenite precipitation
- Ferric arsenate precipitation
- Scorodite precipitation

Arsenic precipitation with lime has long been one of the most straightforward and cost-effective ways of removing arsenic from a solution. However, the stability of the generated calcium arsenite or arsenate solids are poor. An effective alternative to lime precipitation is provided by precipitation with iron sulfate, a chemical process that generates ferric arsenate solids.

With correct process design, significant benefits can be seen, such as:

- Lower chemical consumption
- Less scaling → less maintenance
- Stable pH profile, allowing precipitation reactions to take place in the reactors and providing stable effluent
- High quality sludge with uniform chemical composition → long-term safe storage of As residues
- High quality solid residue with minimum moisture → lower disposal costs and higher water retention
- Process effluent with low, residual As-concentrations and low solids carry over
OUTOTEC PROPRIETARY EQUIPMENT FOR YOUR WATER TREATMENT NEEDS

An Outotec technology package combined with our own proprietary equipment ensures smooth process operations by eliminating unnecessary bottlenecks and shutdowns.

Our equipment solutions are designed to optimize metallurgical results and ensure reliable operations. Outotec equipment is designed to be the most economical solutions for the entire lifetime of your plant. Furthermore, we can guarantee equipment performance. A complete technology transfer package with proprietary equipment from Outotec ensures that you get an optimized process with maximal financial return.

Industrial water treatment takes advantage of three separate Outotec proprietary equipment types, namely reactors, thickeners/clarifiers and filters.

Outotec OKTOP® Reactor – the best solution for your process
We know that every plant and process is unique, so each OKTOP Reactor is designed for a specific purpose. Outotec will provide you with a complete reactor package, with flexibility for you to choose the accessories you need. For us, the reactor is more than just a tank. It is the heart of a successful operation.

Outotec® Thickening & Clarification technologies
Outotec is a global leader in the design, fabrication and supply of thickening and clarifying solutions for the wastewater treatment industries. Our experience in testwork,

design, operation, installation and service of thickeners and clarifiers is renowned worldwide and is your guarantee of quality.

Outotec® Filtration solutions
Outotec is a leading innovator, developer and supplier of solid-liquid separation products, which are used as a part of the industrial water treatment solutions. The broad product range includes filters and solutions based on several different filtration principles, variety of sizes, capacities and related services, all performing in the toughest operating conditions.

An Outotec technology package combined with our own proprietary equipment ensures smooth process operations by eliminating unnecessary bottlenecks and shutdowns.
A HOLISTIC APPROACH TO IMPROVING PERFORMANCE AND PRODUCTIVITY

We combine the right services into a customized solution that meets your precise requirements and asset needs. By assessing, designing, delivering, and verifying, we ensure the solution has maximum impact on your performance and productivity.

Assess
The process begins with collaborative work and benchmarking to provide a clear picture of your business and operational challenges, using our comprehensive range of Advisory Services. Our services range from plant and equipment inspections and assessments to process audits and research and test services. These provide valuable information to help identify areas in which improvements would generate substantial increases in safety, reliability, availability, or productivity.

Design
Based on the assessment results, we design precisely the right service solution to suit your operational and plant needs. Whether you are aiming to improve efficiency through modernization, minimize production losses during shutdown projects, or optimize the availability and productivity of operations and maintenance, our service solution will help you achieve a step change in performance.

Deliver
Our experienced teams follow established processes that enable a holistic delivery approach to your service solution, ensuring safe, efficient, and reliable implementation with minimum disruption to your operations. Through close collaboration with you, we integrate all the necessary elements required for a successful solution delivery that will generate high-quality results in the shortest time possible.

Verify
Results are closely monitored and analyzed by our experts to verify that the desired new performance level has been achieved. We focus on continuous improvement and on maximizing the positive impact on your bottom line.