



Outotec solutions for tailings dewatering

Optimized offering with large portfolio for different demands of tailings treatment.

Currently Tailings are a composite of all processing plants wastes and represent varieties of mineralogy with a wide range of particle sizes rheology, process water, excess reagents and spillage. Parts of these streams are relatively easy to dewater while others may be extremely difficult to handle. As a composite they tend to behave more like the worst component.

Outotec offers a wide range of equipment and process knowhow for tailings thickening, filtration and water recycling, with decades of databased knowledge of process solutions, operation support products and life cycle solutions.

Benefits

- **Decreased costs**
- **Reduced risk**
- **Savings in energy**
- **Savings in fresh water**
- **Lifecycle solutions**

Outotec

**Complete solution -
Aiming for superior performance**

Tailings treatment

Outotec offers comprehensive tailings treatment solutions to the mining industry worldwide, for both landfill and backfill solutions. Outotec services range from scoping studies through to full detailed plant and system design. Thickening and filtration equipment, backfill solutions, EPC deliveries, commissioning, operation and maintenance services.

Landfill and backfill technology

Outotec paste technology is a modern way to handle and store tailings from mine operations in a more environmentally sustainable way. Outotec solutions in this area consider both paste disposal for landfill and stabilized backfill to mine. Outotec backfill technology also handles traditional dry backfill solutions.

Landfill benefits:

- Minimized dam failure risk and overall dam costs
- Direct water recovery
- Minimized dusting
- Less footprint in nature
- No or very little seepage
- Applicable on all tailings
- More efficient handling of fines
- Simplifies future mine closure

Outotec thickening solutions

As the global leader in the design, fabrication, and supply of thickening and clarifying solutions for the minerals industry, the Outotec® High Rate Thickener has pioneered thickening and clarifying methods around the world. Outotec Vane Feedwell™ incorporates a cutting-edge design and is the major innovation in the thickening industry. One of many design features is the interconnected upper and lower zones.

Technology employed in Outotec® Thickeners enables higher underflow densities to be produced, leading to water savings and a reduction in space requirements for tailings dams.

Dry stacking of tailings is water recycling

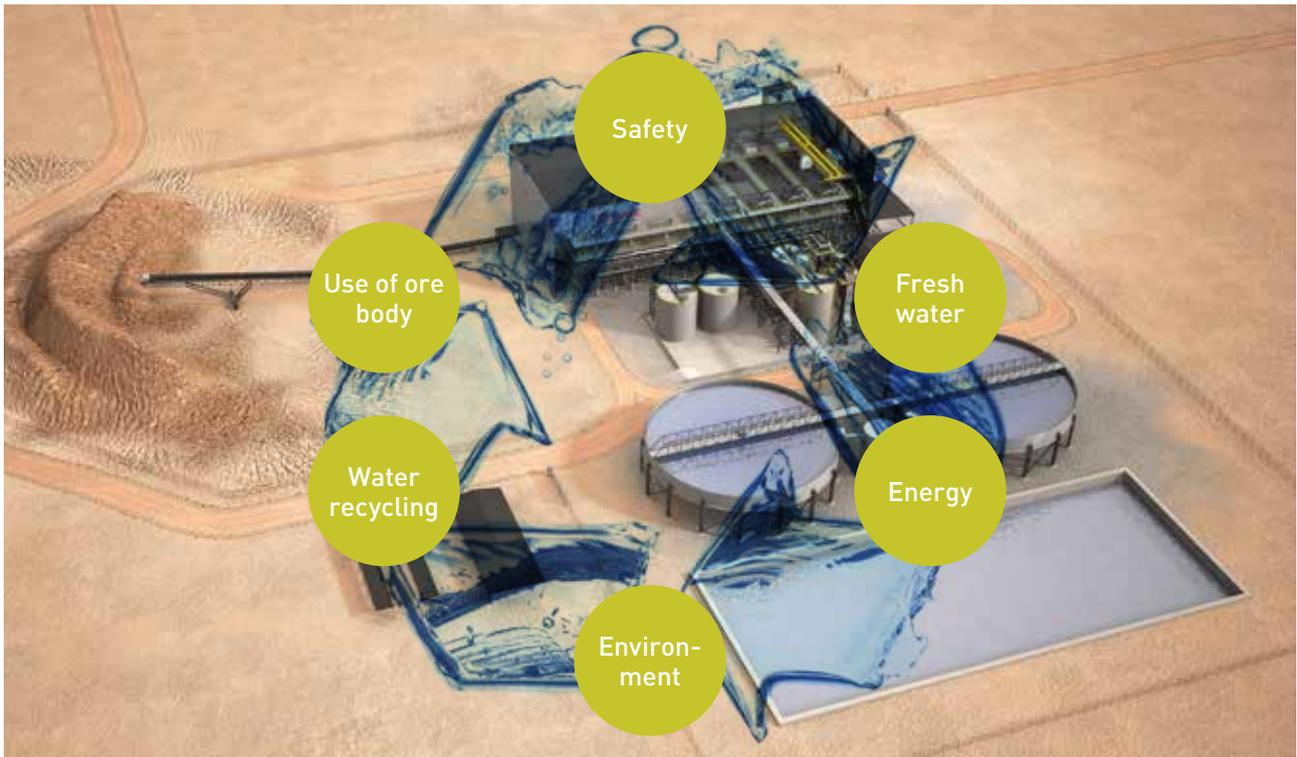
Traditionally paste and tailings handling have concentrated between the option of filtration combining all of the wastes to a single stream, or simple tailings dam operation. Improvements to current practice may



be achieved by splitting of process tailings streams to better suit the strengths of the differing separation technologies.

Where tailings streams contain significant amounts of fines, paste thickening technologies will continue to be the most attractive option. In cases where dry stacking of difficult slurries is required, increasing the underflow density will enhance the performance of filtration.

By changing the material flows and altering the duty points of filters and paste thickeners, superior performance can be achieved compared to either technology operating in isolation. Outotec offers solutions for efficient dewatering with largest paste thickeners, pressure and fast opening filters in the market.



Water recycling can solve water shortage problems

Dry stacking for tailings solves both dry disposal and water recovery. Water recovery is usually accomplished through sedimentation or filtration processes.

Outotec Dewatering solutions

While water recovery may be important and in some cases can limit production generally the selection of filtration for tailings dewatering is based on the decision to apply dry stacking of the tailings.

Dewatering tailings produce a filtered wet cake that can no longer be transported by pipeline. These filtered tailings are normally transported by overland conveyor or truck, deposited, spread and compacted to form an unsaturated tailings deposit. The solids fraction varies depending upon the particles size, shape, distribution and method of filtration, a typical moisture content of less than 20% can be achieved by using Outotec high efficient filtration systems. At a typical cake with more than 80% w/w solids almost 90% of the process water can be recovered.

The decades of knowhow in process and dewatering technologies enable Outotec to create the optimum process plant design. Outotec creates sustainable concepts to optimize slurry and disposal handling in

early stages of the project. There are multiple options available based on selection of dewatering systems.

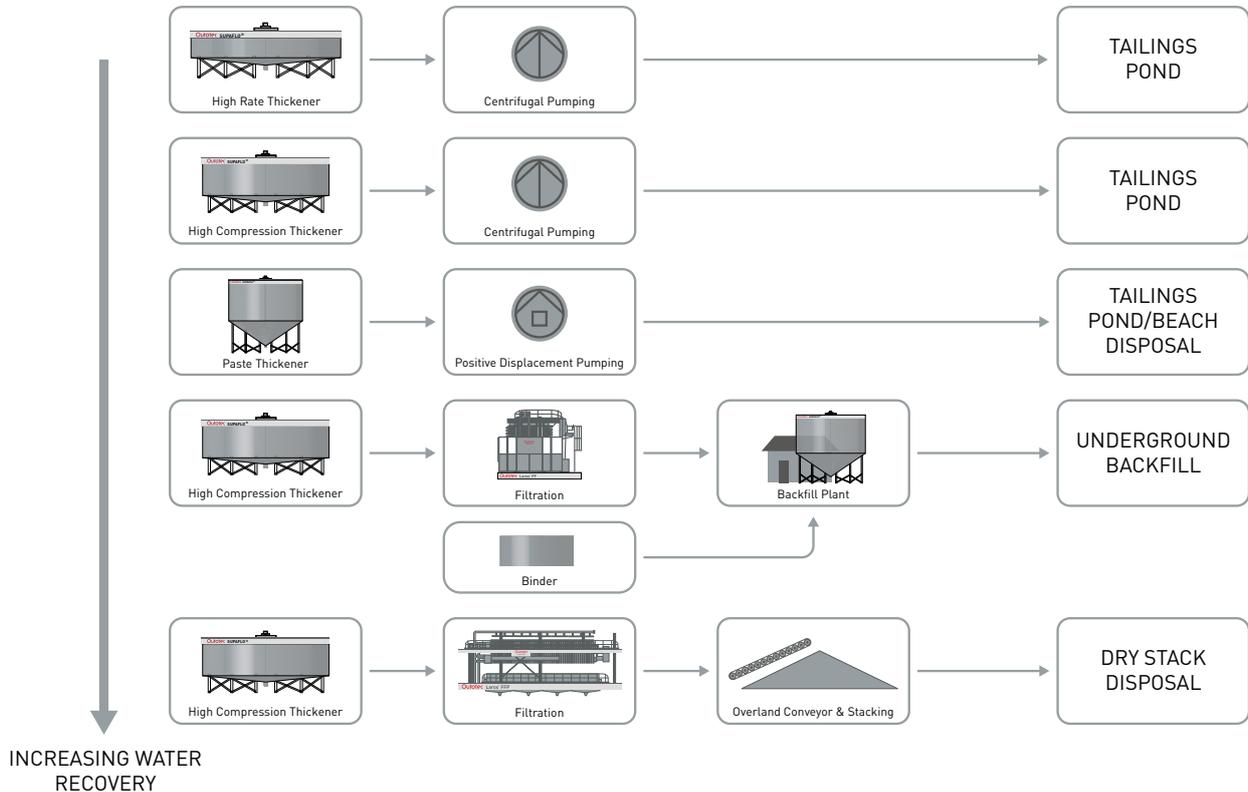
Proven performance

The Outotec Dewatering Plant is based on Outotec thickener and filtration technologies, which have a long track record and proven performance in the targeted applications with maximized energy efficiency. With optimized equipment and a process layout based on testing, sizing and a vast knowledge base, the dewatering plant is the ideal solution for fast-track execution and an efficient process.

Automation of Tailings plant

Outotec's automation offering ranges from concentrator-wide solutions all the way to single process equipment's control systems, and on-line analyzers.

Outotec has developed and delivered standardized and tested local control solutions for thickeners capturing Outotec's vast thickening knowledge into a pre-programmed control screens providing consistent and improved operation for thickening process. Operators' dewatering process know-how can also be further developed with Outotec's Virtual Training Simulator which combines theoretical insight together with practical hands-on simulator exercises. Outotec's



Advanced Process Control platform ACT offers a great platform for dewatering process control utilizing information from multiple sources and turning them into transparent reliable control actions.

In every case the Outotec tailingsplant set up is based on:

- Outotec Thickening
- Outotec Larox filtration
- Outotec paste and backfill solutions
- Outotec automation solutions
- Outotec services: technical services
- Best process layout practices
- Compact footprint and minimized elevation
- Ease of operation and maintenance
- Optimal sizing, pumping distances, retention times and energy consumption
- Health, safety and environmental quality



Outotec provides leading technologies and services for the sustainable use of Earth's natural resources. As the global leader in minerals and metals processing technology, Outotec has developed over decades many breakthrough technologies. The company also provides innovative solutions for industrial water treatment, the utilization of alternative energy sources and the chemical industry.

Outotec shares are listed on NASDAQ OMX Helsinki.

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