



Tailings management

Meet the tailings dewatering challenge with Alfa Laval's decanter centrifuges



Mainstream dewatering technologies require a lot of land, large investments and carry a risk of accidents. With Alfa Laval decanters, you can save time and money while minimizing the installation area and producing a large volume of water that is available for immediate reuse. When used for tailings treatment, Alfa Laval decanter centrifuges produce an easier to handle solid fraction and a liquid water phase.

Process overview

In the mining industry, tailings have been regarded as a waste product that is challenging to handle. Tailings – a mixture of water and finely ground rock – can vary widely in particle diameter and density, and contain slow-to-settle or non-settling particles.

Today, the separation of tailings has become a scientific field in itself, often based on experience and specific knowledge of tailings characteristics from a particular mining application.

Storage entails significant risks

Historically, tailings have been stored in dams or ponds, with the settling process left to gravity. This process could take months or years, depending on the nature of the particles. In remote areas with a plentiful supply of water, this was considered to be the cheapest way of handling the residue. Different run-off systems or evaporation would over time produce a solid fraction, which could be removed and used as back fill in disused mine shafts.



Samples showing the inlet slurry, added flocculant, solid fraction and liquid water phase from a typical mining tailings application.

A large number of tailings dams are still in use. However, in recent years there has been an increased focus on the associated risks and environmental issues. As the walls of tailings dams get higher, the risk of collapse increases, and the potential environmental impact increases dramatically. In recent years there have been several catastrophic events involving tailings dams collapses with severe impact on the environment and bio-diversity. Clean-up operations and re-balancing biodiversity in the wake of these disasters are extremely expensive and can take a long time.

The closure of tailings dams once a mining facility has reached the end of its service life, is another issue. This task, which is governed by extensive legislation, is a significant part of a facility's lifetime costs for mine operators.

In cases where tailing dams are still in service, but running at full capacity, a decanter centrifuge can also be ideal supplementary equipment to extend the lifetime of the dam.

Need for new solutions

The growing concern about storage risks, and the fact that not all tailing dams are in remote areas, means that new projects are sometimes not permitted to construct tailing dams. This has compelled mining companies to look for alternative solutions in recent years, solutions in which the dewatering of tailings can be achieved using a less risky method than bulk storage in dams. In addition, the liquid fraction from the dewatering process can be reused immediately – a clear benefit in areas where water is a scarce resource.

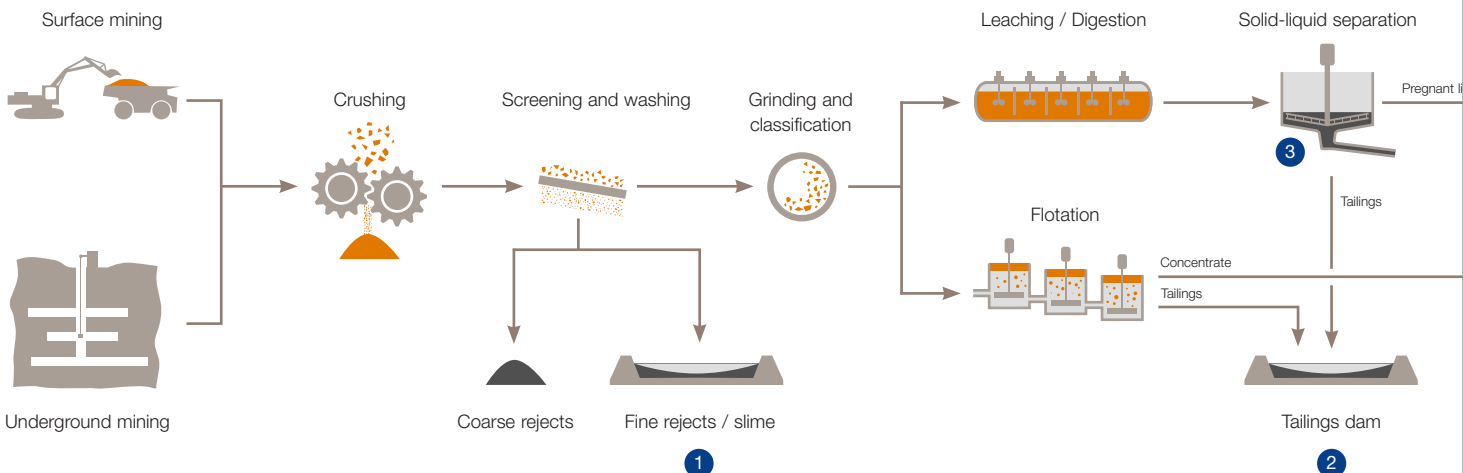
Meeting the challenge

With Alfa Laval's decanter centrifuges, you have an answer to these challenges. With 100 years of experience, we bring you cleaner, more efficient solid-liquid separation.

Alfa Laval decanters combine a design that can withstand the abrasive nature of tailings treatment, with technology that gives you high separation rates, dry solids and clean water for reuse. We use high-grade materials such as tungsten carbide, stainless steel and super duplex, and offer solutions for both high and low pH values. Due to their specially designed large gearboxes, our decanter centrifuges can handle high torque.

A decanter operates continuously in an enclosed environment – a fully automatic process that is monitored by online

Opportunities in mining rejects and tailings man



sensors. These sensors enable the decanter to respond rapidly and reliably to changes in the incoming slurry, making sure that you get a consistent result – regardless of whether the target is a dry solids cake ready for dry stacking, a pumpable paste or a large output volume of clean liquid centrate.

Key benefits:

- High capacity, high separation efficiency and dry cake – facilitated by our special deep-pond technology
- High-grade material designed to last in a harsh environment where withstanding erosion and corrosion is crucial
- High torque capacity specifically designed for high-density sludge
- Compact design and small installation area
- Fast access to service and spare parts through our worldwide service network
- Easy to scale-up capacities from test results.

An efficient solution for dewatering of tailings

Alfa Laval's decanter centrifuges are the perfect choice if you want to dewater your tailings in a fast, continuous process to secure an easy-to-handle solid- and liquid fraction. The liquid fraction can be reused in your plant.

Higher capacities

Our decanter centrifuges are designed based on decades of research and development in challenging industry



The output from an Alfa Laval decanter centrifuges is sufficiently dry to be stacked.

applications. By combining unique bowl geometries, exceptional solids handling rates and an innovative separation configuration, we are setting a new standard for decanter centrifuge capacities in tailing applications.

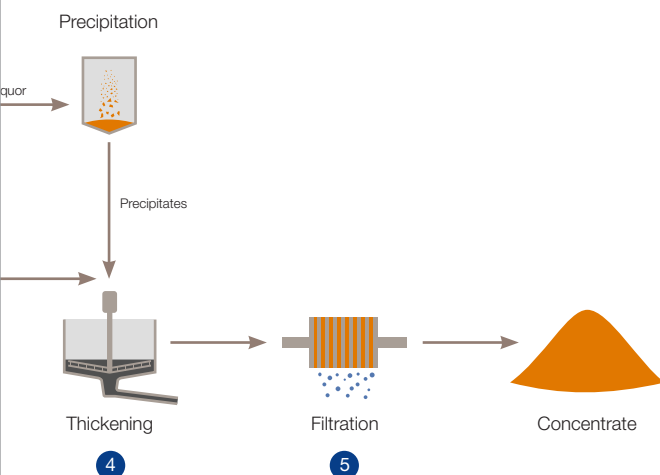
Application-specific materials

Tailings are known to cause erosion and abrasion, especially on rotating machines. We offer a wide range of stainless steel grades that ensure that a suitable material is selected for maximum protection of all exposed surfaces against erosion, to secure the longest possible lifetime of your equipment.

Let the G-force do the job

Dryness of the solid fraction is essential to be able to use dry stacking as a modern, safe alternative to traditional methods. Securing a dry solid fraction requires sufficient G-force and long retention time. Specially designed large gearboxes are installed to ensure dry solids are properly scrolled out in installations that require high torque. Accurate control is an essential part of this highly efficient dewatering process.

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Tailings management

- 1 Fine rejects / slime dewatering (water recovery, dry stacking)
- 2 Tailings dewatering (water recovery, chemical recovery, dry stacking)

Other decanter applications

- 3 Solid-liquid separation and washing (replacement of thickeners / washers)
- 4 Thickening of concentrate (thickener replacement)
- 5 Concentrate dewatering (filter replacement)



The Alfa Laval mining decanter (seen here in its largest configuration) is a proven, space-efficient solution that helps you efficiently manage your tailings.

Minimum space required

A decanter centrifuge offers you the largest capacity per installed area. Thousands of G can be applied if required and thanks to its compact design, the Alfa Laval decanter can be installed almost anywhere, as a sole treatment solution or as a back-up installation. The separation process is carried out in an enclosed environment with no open water surface or splashing inlet zones, creating a safer working environment.

Maintenance and service

Wherever you are, support from Alfa Laval is never far away. Our worldwide network of sales companies, service organisation and field service engineers are ready to provide assistance, rapid support and ongoing optimization. Our close cooperation with customers in nearly 100 countries is a source of valuable feedback for our research and development team, giving us an edge in the development of market-leading technology.

Design based on experience

Our decanters are designed based on experience, knowledge and testing in laboratory and field environments to optimize your specific processes, setting a framework for scaling up to meet your exact requirements and specifications.

Alfa Laval has a wide range of test equipment and resources available to suit the vast range of tailings applications in the mining and mineral industry.

Selected references

Alfa Laval has full-scale references worldwide for different applications and has also carried out extensive testing and laboratory analysis on numerous types of slurry.

Country	Decanter	Year	Application
South Africa	P2-305	2015	Gold
Australia	P3-8070	2013	Coal
Canada	Lynx 1000	2012	Mature fine tailings
Turkey	P2-800	2010	Borate

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.