

EFFICIENT USE OF WATER IN TAILINGS MANAGEMENT

Reducing water consumption with
precise density measurement

QUALITY
MADE IN
GERMANY

BERTHOLD

PRECISE DENSITY MEASUREMENT IN TAILINGS LINES

Water is a critical resource in mining, supporting operations from ore processing and mineral separation to slurry transport, tailings management, and dust suppression. As water scarcity increases and regulatory requirements become more stringent, maximizing water efficiency and recovery has become a key priority for sustainable, cost-effective operations.

In tailings management, precise density measurement is essential to control the water-to-solids ratio. Optimizing water content in tailings lines ensures reliable slurry transport, protects infrastructure, and significantly reduces overall water consumption. Excess water increases tailings volumes, leading to higher disposal requirements, elevated operational costs, and greater demand on pipelines and storage facilities such as tailings dams. Conversely, insufficient water increases slurry viscosity, placing additional strain on pumps, elevating energy consumption, and increasing the risk of clogging and process interruptions.

Reliable density control is therefore essential for safe and stable tailings operations. Radiometric density measurement provides a robust, non-intrusive solution for continuous monitoring even under the most challenging conditions. Unaffected by abrasive slurries and changing material properties, it delivers highly accurate measurements with long-term stability, ensuring consistent performance, improved efficiency, and dependable operation.

Impact of density measurement precision on water consumption

Precise density measurement is critical, as even small deviations, such as detector drift, can lead to disproportionately high water consumption. In typical tailings applications, a deviation of just 1% in solids content can result in approximately 4% higher water usage.

Example:

- 40,000–60,000 t/day tailings throughput
- 4 % higher water content = 1,500–2,000 m³/day additional water
- 0.5–0.7 million m³ water lost per year

Berthold radiometric density measurement systems eliminate these risks through built-in drift compensation and exceptional detector sensitivity – up to 2.5 times higher than conventional systems. This ensures consistently accurate measurements over many years without frequent recalibration.

As a result, operators avoid systematic over-watering caused by measurement drift and maintain precise control of the water-to-solids ratio at all times. This leads to optimized water usage, stable tailings transport, and reliable, continuous operation.

At the same time, the high detector sensitivity enables extended source lifetimes, reducing lifecycle costs while ensuring long-term process stability and confidence in the measurement.

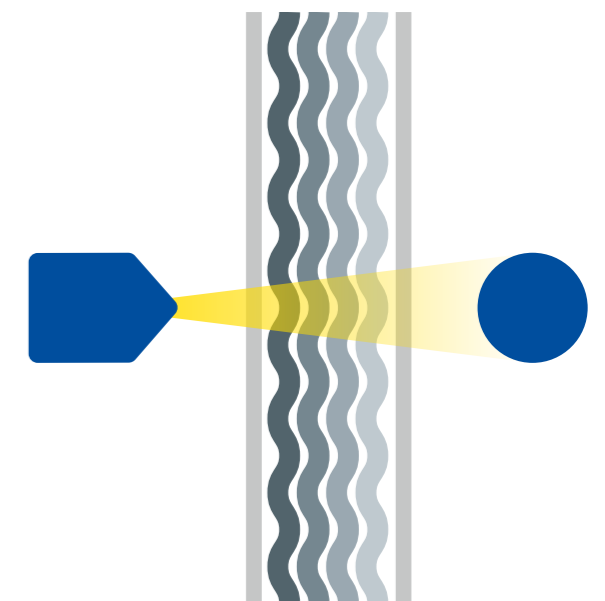


Customer Benefits

- Reduced freshwater consumption through precise density control
- Optimized water-to-solids ratio in tailings transport
- Improved operational stability and reduced risk of pipeline clogging
- Lower stress on pumps, pipelines, and tailings storage facilities
- Increased process reliability with minimal operating costs

Features

- Non-contact and non-intrusive installation on pipelines
- Continuous, real-time radiometric density measurement
- Long-term stability with built-in drift compensation
- No need for frequent recalibration
- Independent of slurry composition, particle size, and abrasive properties



Typical arrangement of a density measurement system on a pipeline



THE EXPERTS IN MEASUREMENT TECHNOLOGY

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