

Tailings Dewatering Challenge

TAILINGS DEWATERING

Challenge Statement

Innovative solutions to remove water from high-fines copper sulphide tailings to achieve $\leq 10\%$ moisture for safe, stable dry stacking and water recovery.



Removal of water from mill tailings to produce denser slurry, paste, or low moisture cake. Objective is to recover water for reuse, improve storage stability, shrink footprint, and reduce closure liabilities.

Purpose

- Reduce freshwater intake and pumping costs.
- Reduce risk through dense/filtered tailings enabling dry stacking or high density deposition, reducing reliance on large dams.
- Footprint & closure: Smaller storage volumes, better trafficability, faster capping/rehabilitation.
- Plant performance: Cleaner recycle water and predictable rheology for consistent deposition.

Common Dewatering Routes

- Thickening (high rate / high density / paste)
- Filtration (vacuum / pressure)
- Centrifuges
- Hydrocyclones / desliming
- Hybrid flowsheets

Key Performance Indicators

- Water recovery (90%) and return water turbidity/TSS.
- Cake moisture 10% and filter throughput.
- Availability & cycle time and specific energy.
- Reagent consumption and unit cost.
- Stack stability and environmental dust performance.

Common Challenges

- Feed variability (PSD, clays) causing moisture and throughput drift.
- Filter cloth blinding and cycle time creep.
- Scaling/fouling from hardness or organics.
- Balancing energy/reagents with water recovery and risk reduction.
- Dust management for dry stacks.

Emerging Approaches

- Large format, fast cycle pressure filters.
- Model predictive/AI control.
- Co disposal and filtered co stacking with waste rock.
- Additives/binders for dust control.
- Online filter cake moisture measurement.

Challenge Specifics

- Copper sulphide ore particles.
- Feed moisture content: 65%.
- Size range: <50 µm; 80% of particles between 8 µm and 20 µm.
- Clay content: 8%–10%.
- Operational throughput: 1,500 t/hr.
- Bench scale demonstration: up to 100 kg/hr.
- Pilot scale demonstration: 100 t/hr.
- Target moisture reduction: 10%.
- Prospective solution intended to be installed after a high rate thickener.

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Mine Operator Engagement

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