Metso

Cu POX leaching process

Cu POX (pressure oxidation) leaching is a cutting-edge solution for copper sulfide concentrates, maximizing recovery while reducing environmental impact.

Why Cu POX

Cu POX is suitable for recovering copper from copper sulfide concentrates at lower capacities, including impure and lower grade Cu concentrates. As a standard process solution Cu POX is implemented with SX-EW facilities to produce high quality cathodes, but Cu POX can also be utilized to refine low grade copper concentrates to produce substitute PLS for existing SX-EW plants to compensate depleting heap leaching PLS production.

How Cu POX works

Copper sulfide minerals require specialized leaching conditions to achieve high recovery rates. Cu POX utilizes high pressure and temperature oxidation to convert sulfide sulfur into sulfate and sulfuric acid, ensuring efficient copper dissolution.

Benefits

- Tailored integration with SX/EW plant
- Reduce investment risk, one stop shop technology provider
- Full value chain knowhow from ore to copper metal
- Guaranteed process performance

Cu POX is a seamless part of Metso's complete process chain from ore to cathode. Cu POX - SX - EW is designed to maximize copper recovery and end product quality. The process chain comprises the following steps:

- Pulping & acid pretreatment – Initial concentrate preparation
- Pressure oxidation – High-temperature leaching
- Solid-liquid separation – Efficient phase separation
- Copper solvent extraction (SX) – Purification for electrowinning
- Electrowinning (EW) – High-purity copper cathode production
- End neutralization – Managing residues and recirculating process solutions, closed loop process reduces water usage.

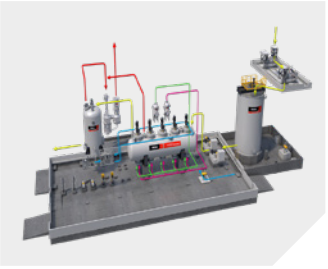
The flowsheet can be combined with Metso's Cyanide Leaching process to recover gold and silver from the Cu POX leach residue.

Cu POX Leaching Process

Copper sulfide leaching with high recovery - environmentally sound and cost-efficient process

High-temperature Copper POX process

The Copper POX process operates at high temperatures (200–220°C) and pressures (27–29 bar), ensuring efficient metal extraction. Oxygen has high solubility in the leach solution under these conditions, promoting rapid and effective leaching and high copper recovery.



OKTOP® Autoclave plant unit scope

The OKTOP Autoclave plant unit for Cu POX process includes proprietary and key equipment, components:

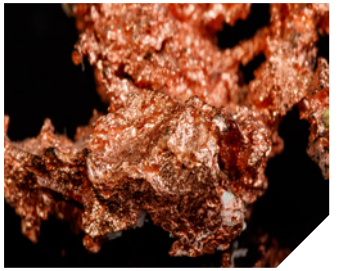
- OKTOP feed tank/reactor with agitator
- Autoclave feed pumps
- OKTOP Autoclave with agitators and seals supply system
- OKTOP Flash vessel and venturi scrubber
- Level control and pressure let-down valves
- OKTOP Blowback tanks
- Comprehensive instrumentation and Metso's PROSCON® process control system for optimal performance

Metso Cu POX plant offering - early stage

- Batch and pilot test work
- Study services
- Basic engineering services

Metso Technology Package offering

- Project management services
- Basic engineering services
- Detail engineering support
- OKTOP pressure equipment
- OKTOP reactors and vent gas scrubbers
- OKTOP cooling towers, thickeners
- Courier analyzers and sampling systems
- Metso field instrumentation and process automation
- Services and spare parts



Smarter copper processing

Metso's Cu POX leaching is a proven, sustainable, and high-performance solution for modern copper recovery. Whether you're looking to improve existing operations or implement a new processing plant, we provide end-to-end expertise to maximize your success.

Read more at metso.com/cu-pox-leaching-process/