CORE

YOUR RESOURCE DEVELOPMENT PARTNER

COPPER CAPABILITY STATEMENT

Core develops innovative and sustainable solutions to complex metallurgical problems allowing our partners to realise the value of their projects. With a strong focus on finding solutions that work, Core provides expertise across the entire Copper Project Cycle:

- Project Definition
- Testwork
- Process Engineering
- Detailed Design
- Project Implementation

PROJECT DEFINITION

Core has wide experience in the review of copper project geology and mine planning and their influence on the metallurgy of the ore. Understanding this ore geometallurgy is critical for the design of testwork and the circuit flowsheet. Core can provide expertise for the selection of composite samples for testwork and the mineralogical analysis of the ore.

TESTWORK

Beneficiation

Core can carry out a range of testwork for the beneficiation of copper ores including crushing, cycloning, primary grinding, ultrafine grinding, flotation, thickening and filtration.

For comminution, this includes Geopyörä rock breakage testing and IsaMill signature plot determination. For flotation this includes conventional lab and pilot scale tests, Jameson cell pilot tests and NovaCell™ coarse particle flotation.

Albion Process™

The Albion Process™ is a simple and cost-effective process for separating base metal concentrates. It uses a combination of ultrafine grinding and oxidative leaching at atmospheric pressure. The sulphides in the feed are oxidised and liberated, allowing the target metals to be recovered by conventional hydrometallurgical processes.

Toowong Process™

The Toowong Process™ is a patented hydrometallurgical treatment process designed to selectively remove arsenic, antimony and other penalty elements from base metal and precious metal concentrates. For copper, the process takes an ex-concentrator high arsenic concentrate and selectively removes the arsenic, making a premium clean copper concentrate that is suitable for conventional smelting. Core can conduct different stages of Toowong Process™ testwork including leach amenability and full circuit characterisation on a bench-scale and pilot-scale.

Column/Heap Leaching

Core has extensive experience in heap leach amenability testwork for ore characterisation, reagent consumption, agglomeration screening, intermittent agitation bottle roll leach tests and column leach tests. For copper heap leaching Core can process the emerging PLS via SX to generate raffinate solution and then leach the ore in a closed-circuit configuration.

Pressure Leaching

Core has extensive expertise in testwork relating to pressure oxidation and pressure leaching processes. Test programmes carried out to date have included use of pressure autoclaves for pressure oxidation of copper/arsenic leachates and pressure oxidation of copper/gold bearing flotation concentrates. For pressure oxidation in particular, Core offers unrivalled expertise in the area of chemical analyses for sulphur species (elemental sulphur, sulphide and sulphate).

Solvent Extraction

A broad range of solvent extraction test programmes can be carried out at Core. Core's experience and capabilities include simple bench-scale studies involving 'shake out tests' through to operation of SX pilot plants of various sizes and levels of complexity.

Ion Exchange

Core, in collaboration with IPEX, offers Ion Exchange solutions for copper recovery in mining operations. This process involves using a selective resin to efficiently recover copper from solution, even at low concentrations, producing a concentrated copper sulphate solution. With the ability to handle feed copper tenors as low as 25 mg/L, Ion Exchange is ideal for both tailings and process water applications.

Crystallisation

Core has extensive experience in crystallisation and chemical process development, honing expertise in refining the crystallisation process through meticulous control of variables including temperature, supersaturation, agitation speed, pH and residence time. Our laboratory has operated several crystallisation and precipitation pilot plants and conducted design testwork for numerous global companies.

PROCESS ENGINEERING AND DESIGN

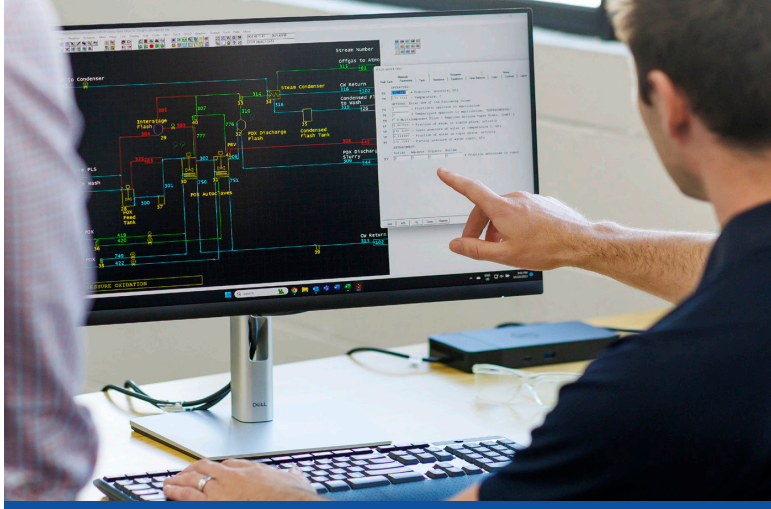
Core's team of Metallurgists and Process Engineers are experts in copper flowsheet development and capabilities include:

- Process modelling using METSIM, HSC and Excel based models
- Techno-economic evaluations
- Process options analyses
- Design, commissioning and execution of pilot and demonstration plants
- Conceptual or desktop studies, Scoping Studies, PFS to DFS
- Owners representative for Feasibility Studies
- Project Due Diligence

PROJECT IMPLEMENTATION

Core can offer the full range of Project Implementation services including:

- Process commissioning
- Process optimisation and plant surveys
- Plant availability analysis and optimisation
- Process debottlenecking
- Supply of Site operating staff from Process Manager to Operator



COPPER PROJECT EXPERIENCE

Project Location	Sample Type	Core Scope
Mexico	Cu / Pb / Zn ore	Testwork (Grind/Float)
Philippines	Enargite	Testwork (Grind/Float), Leach Pilot, Process Innovation and Process Engineering (As removal)
Australia	Refractory Copper Sulphide Scav. Tail	Testwork (bulk Grind/Float) for leach pilot plant
Australia	Copper Sulphide Tailings	Testwork (bulk Grind/Float) for leach pilot plant
Australia	Cu / Pb / Zn ore	Testwork (Grind/Float)
Australia	Copper Sulphide and Oxide	Testwork (Grind/Float/CPS)
Australia	Copper Sulphides & Phosphates	Testwork (Grind/Float)
Argentina	Copper Sulphides	Testwork (Grind/Float), Process Engineering, Commissioning
Australia	Copper Sulphides	Testwork (Grind/Float, Leach)
Botswana	"Copper Sulphide and Oxide"	Testwork (Grind/Float), Process Engineering, Commissioning
Philippines	Copper Sulphides	Testwork (Flotation Testing of Aged Samples)
Australia	Copper Sulphides	Testwork (Grind/Float), Cobalt and Magnetite Recovery, Process Engineering
PNG	Copper Sulphides	Testwork, Flotation Pilot, Leaching Pilot, Process Engineering
Australia	Copper Sulphides	Concentrator Plant Commissioning, Process Engineering, Copper Sulphate Plant
USA	Copper Sulphides	Testwork (Leach)
Australia	Copper Sulphides	Testwork (Grind/Float)

Interested to find out more?

Contact: info@coreresources.com.au

About Core Resources: Core Resources is an award-winning process engineering and metallurgical testing business based in Brisbane, Australia. Core Resources services a global customer base, enabling the world's mining projects with innovative metallurgical flowsheet solutions.

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