



ROYTEC
Global Separation Solutions

Johannesburg | Perth | Toronto | Yantai | Santiago

ROYTEC GLOBAL and ION EXCHANGE

**MARKET LEADERS IN
LIQUID / SOLID SEPARATION**

ROYTEC GLOBAL and ION EXCHANGE

ROYTEC GLOBAL is an International Company specializing in Liquid / Solid and mineral Separation technologies for the Mining and Industrial sectors.

Roytec is privately owned by Directors and Managers. We are passionate about excellence in our services and we pride ourselves in delivery to our promises. Our equipment is fully supported by Roytec Specialists based in Johannesburg, South Africa; Perth, Australia; Toronto, Canada; Yantai, China and Santiago, Chile.

We have a close working relationship with IXT, an independent company specializing in Ion Exchange Technologies and founded by Mark Langton – a Director and Shareholder of Roytec.

ION EXCHANGE

Roytec have been active in the design, fabrication, installation and commissioning of Ion Exchange systems since 2005. We provide Fixed Bed, Continuous Counter-Current (CCIX) and Resin in Solution Ion Exchange systems.



Our experience ranges from Uranium, Zinc, Nickel, Copper and Cobalt Ion Exchange – from pilot level to large commercial scale operations. All our Fixed Bed installations are multi-column systems including process tanks, pumps, piping, actuated valves controlling the various process functions and fully automatic process control systems.

DESIGN FEATURES

Roytec work closely with IXT SA – a company specialising in Ion Exchange research and development, laboratory and pilot plant testing, flow sheet development and process design. Roytec take the overall project execution responsibility, for the design, fabrication, procurement, project management and site services.

The combined experience of Roytec & IXT covers;

- Metal recovery from waste streams, i.e. Cu recovery
- Purification of metals, i.e. removing Ni from Co electrolyte
- Precious metals recovery and purification
- Extraction of toxic materials from process streams
- Counter Current Ion Exchange:
- Metal recovery from process streams;
 - Cu/Co/Ni/Zn/U/V/Re/Mo/Au/Bi/Sb recovery.
 - Enhance product purity using scrub and pre- elution.
 - U, Re, Ni, Cu products employ these techniques,

- Purification of metals, i.e. removing Ni from Co electrolyte, V from U PLS;
 - Co/Ni; Ni/Fe; Cu/Fe separations.
- Precious metals recovery and purification.
- Extraction of toxic materials from process streams.
- Fe scrubbing from Ni & CU PLS feeds.
- Rare earths recovery and purification



EXPERIENCE & REFERENCES - ROYTEC & IXT

• Fixed bed ion exchange

Roytec has installed fixed bed ion exchange systems from small pilot size plants to large, multi-column systems such as at Langer Heinrich Uranium. The Langer Heinrich installation included all the process tanks, pumps, piping, as well as process control system. The plant is fully automatic, with actuated valves controlling the various process functions.

Roytec has installed a zinc removal fixed bed system on Cobalt electrolyte, as well as a Cu removal (polishing) fixed bed system for PMC.

• RIS (Resin in Solution) agitated tank systems

Roytec developed an agitated tank system for the elution

of the resin on Paladin's Kayelekera Uranium Mine in Malawi. This cascading tank elution system effectively and efficiently eluted the uranium from the resin that was received from the RIP columns. The plant included a caustic resin regeneration system.

• Continuous Counter-current ion exchange (CCIX)

Roytec can offer CCIX systems. CCIX is a highly efficient IX system, that can offer significant savings in resin inventory, reduces water usage and results in lower chemical consumption.

These systems are typically used where the species being loaded is at a high concentration, which requires high resin processing capabilities.

REFERENCES

End User	Client / Company	Engineering Duty
Chambishi Metals	Hatch	CCIX Nickel from Cobalt electrolyte
Palabora Mining Company	Metals Finance Africa	CCIX Nickel recovery IX
Palabora Mining Company	Metals Finance Africa	3 x 700mm dia Copper guard IX
Anglo Base Metals	Anglo Base Metals	1 x 1200mm dia Zinc IX
Langer Heinrich Uranium	Paladin Corp	15 off 3.1m dia x 3.0mH Uranium IX
Kayelekera Uranium	Paladin Corp	13 off 3.0m dia x 8mH Uranium IX elution
Sherrit Corporation	IXT	Copper IX lab testwork
Sherrit Corporation	IXT	CCIX Copper IX pilot plant
Horizon Mining	IXT	Cobalt IX lab testwork
Horizon Mining	IXT	Cobalt IX recovery study
Trailblazer Technologies	IXT	AMD CCIX elution plant
Coeur Mining	BQE Water	2 off 1.83m dia x 2.13mH Selenium removal from AMD
Iluka Rare Earths	Fluor / Eneabba	4 off 2.65m dia x 4.7mH Uranium IX
Iluka Rare Earths	Fluor / Eneabba	2 off 1.5m dia x 3.0mH Rare Earth Elements IX
Hastings Technology Metals	DRA / Yangibana	3 off 1.3m dia x 3.0mH Uranium IX



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Other ROYTEC equipment

- Vacuum Belt Filters & Vacuum Disc Filters
- Thickeners using RadFlow Feedwell Technology
- Dual Media Filters
- BGRIMM Flotation Cells, Magnetic Separators and Attritioning Mills
- Filter Presses & Tower Presses
- Ceramic Disc Filters
- Flocculant / Coagulant Preparation Dosing Plants
- Linear Screens
- Dynamic Bed & Pinned Bed Clarifiers
- Vibrating Screens



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