IsaKidd™ Technology
WORLD BENCHMARK IN COPPER REFINING
IsaKidd™ Technology is the world benchmark in copper electro-winning and electro-refining. Providing world class plants, IsaKidd™ accounts for over 11 mtpa of copper production from over 100 licensees world wide, including Glencore’s own operations. We provide clients with a comprehensive range of technology, process support and core equipment to ensure long term operational and economic success.

Quality Technology and Continuous Development

IsaKidd™ Technology is focused on delivering quality products and services to its customers whilst continuously working on technical innovations and developments to address the ever changing needs of the market. We have successfully maintained ISO accreditation since 1993 ensuring the integration of quality management principals into all aspects of our business.

Since development and commercialisation in the early 1980s, both Isa and Kidd technologies have undergone continuous improvement and today are regarded as the benchmark technologies for high intensity copper electro-refining and electro-winning operations.

Significant advancements have been achieved with both the stainless steel cathode technology and the electrode handling equipment used in copper tankhouses.

Important to our success is our close co-operation with a number of smaller technology companies to enhance the overall package solution offered. IsaKidd™ Technology works together with these companies to continually develop all aspects of the technology ensuring our customers have the latest products on the market.

IsaKidd™ History

1978: First stainless steel permanent cathode plate technology, Isa Process™ developed by MIM in Townsville Australia
1980: Commercialisation Isa Process™
1985: Kidd Process developed at Kidd Creek Refinery Canada
1992: Commercialisation Kidd Process
2003: Xstrata purchases MIM
2013: Glencore purchases Xstrata

Above: Glencore Technology is at the forefront of continuous development in copper ER and EW plants including electrode handling equipment and permanent cathode designs to ensure high productivity and high quality copper production.
Cathode Plates

Glencore Technology developed the first stainless steel production cathode in the late 1970s and has over 30 years experience in cathode plate development, design and manufacture. We are committed to continually improving our offerings to address customer needs. More recently this has led to the development of different cathode types such as the HP, Isa Cathode BR™ and the Duplex Cathode.

HP Cathode Plate – High Corrosion Resistance

Kidd Process developed a cathode design for use in high corrosion environments, such as liberator cells in electro-refineries and high corrosion electro-winning plants.

The HP is the cathode of choice in high corrosion environment plants, as well as being favoured by many electro-refining plants seeking long reliable service life.

The plate features a stainless steel jacket that encapsulates the solid copper head bar, protecting it from corrosion. A corrosion resistant resin, specifically designed for copper service, protects the conductive interior weld between the head bar and the cathode blade throughout the interior of the jacket ensuring high quality sealing to prevent any ingress of electrolyte into the conductive interior weld.

Isa Cathode BR™ Plate – The Lowest Resistance Cathode Plate on the Market

The ISA Cathode BR™ is the lowest resistance cathode plate on the market. Development included extensive testing in a large electro-winning plant in Chile, South America, and in our own refinery in Townsville, Australia, clearly demonstrating the value and benefits of BR design.

Copper plating on the hanger bar and blade can be applied to the depth and thickness required by customers, with commensurate improvements in electrical conductivity of the plate.

The BR design can accommodate a wide range of electrode handling equipment and typically copper plating of 55mm down the blade can be achieved resulting in 10mV per cell power savings compared to standard designs.

Duplex Cathode

Since the introduction of Duplex stainless steel in 2006 into electro-winning operations, IsaKidd™ has experienced a rapid acceptance of the patented Duplex Cathode Plates. They have delivered excellent operational performance.

The superior mechanical properties of the Duplex steel compared to the 316L grade allows more flexibility and reliability in the cathode stripping operation, without permanent deformation to the blade, and has demonstrated improved corrosion resistance in operation compared to 316L.

The patented Duplex Stainless Steel cathode design has a unique surface finish to enhance stripping performance, with successful operation in EW and ER tankhouses, and designed in BR & HP style plates.
IsaKidd™ was first to use robotics for electrode handling in tankhouses, and has now taken this a step further by developing a fundamentally new stripping concept utilising robotics in the stripping function. The new stripping machine has been installed in plants in Australia and Norway and has demonstrated excellent performance and operational flexibility.

Robot technology is not new to Glencore Technology. IsaKidd™ introduced robotics in 2003 for handling copper sheets and cathodes. The machines deliver high reliability with minimal maintenance requirements and provide very good operational flexibility with extremely accurate and smooth positioning and movement.

The new patented Glencore Technology robot stripping machine extends the use of robotics from material handling to the core stripping function itself. Development was completed at CRL in Townsville delivering excellent results.

Glencore Technology engineers have successfully developed and programmed robots to accommodate the many and varied forms of copper cathode that can be used in tankhouse operations. As any operator knows, it isn’t the ‘average’ cathode that determines the stripping rate, it is the rare ‘problem’ that needs to be handled efficiently.
Machine Concept

The machine combines the successful functions of existing Glencore Technology machines with new features to improve stripping across a wider range of cathode types. Flexing rams are still used to release the copper deposits from the stainless steel cathode, but now a ‘pre opening’ device is used to ensure separation of the copper and the mother blank.

The robotic stripping function is performed by robots fitted with a proprietary wedge tool at the end of the robot arm. The wedge tool has been designed to slide between the copper deposit and the mother blank to prevent scratching of the stainless steel mother plate, and then ‘down ends’ the copper to produce individual copper sheets. This approach greatly improves splitting and separation with minimal deformation of copper sheets, even where lamination has occurred and with no impact on the stainless steel.

The robotic stripping function can successfully strip poorly grown cathode copper that cannot be handled by conventional machines. Glencore Technology’s robotic stripping technology is efficient, reliable and robust, and can be designed for low and high capacity automatic operation.

Robotic Cathode Stripping Machine

- Suitable for enveloped cathodes (taco) and split sheets
- Fully automated systems 150 to 700 plates/hr
- Less maintenance
- Less operator input when stripping poorly grown cathodes
IsaKIdd™ Technology teams provide complete engineering for a project from the initial concept study right through to commissioning and start up services. Highly experienced engineers and technologists provide the latest designs for clients, based on over 100 installations, over the last 30 years.

**Process Design**

Our services include:

### Engineering Design for Electro-Refining and Electro-Winning Tankhouses

- concept
- pre-feasibility
- feasibility
- bankable feasibility
- basic engineering

### Detailed Engineering Review

- layouts and material handling designs
- process and tonnage guarantees
- equipment warranties
- flowsheet development
- impurities treatment

### Plant Optimisation

- technical audits
- electrode handling optimisation
- process optimisation studies
- process troubleshooting
- metallurgical consulting

### Commissioning and Start-up Services

- technical and operational training
- oversight of core equipment installation
- start-up assistance covering operational and technical issues
- spare parts supply
- technical and engineering reference and backup
- exchange of know-how and experience with other IsaKIdd™ operators

**Process Design**

**Plant Optimisation**

**Commissioning and Startup Services**
Technology Partnership

IsaKidd™ technology is used extensively in some of the world’s biggest Electro-Refining and Electro-Winning operations. The technology was initially developed at Glencore operations, and further developed to address individual client site needs.

More than a machine

The IsaKidd™ technology package is more than just a cathode plate or stripping machine, but rather a technology solution encompassing all aspects of design and operation to ensure a highly efficient and functional copper refining operation.

Technology Partnership Concept

Our Technology Partnership concept is an approach that makes a wide body of knowledge and experience available, resulting in clients achieving the full benefits of IsaKidd™ Technology.

Glencore Technology prides itself with an ongoing technical relationship with users. We facilitate interchange and learning between clients. Glencore operations provide a core reference base for IsaKidd™ and clients.

The strong operational foundation of IsaKidd™ ensures rapid technology transfer to your operation.

Licensees are invited to participate in regular IsaKidd™ conferences where latest developments are presented and technical and operational issues discussed.

“We facilitate interchange and learning between clients.”
Glencore operates mines throughout the world. Tough testing grounds that make our process technologies the best on earth.