



Glencore Technology *celebrates 30 years of the copper ISASMELT™ technology*

In 1987, the first demonstration-scale copper ISASMELT™ was constructed at Mount Isa Mines (MIM). Over the past 30 years its technology has evolved and is now regarded as the first choice for copper production around the world.

Our Mount Isa Mines Copper Smelter employees helped to develop the ISASMELT technology 30 years ago, which is still used to this day

Throughout the years, MIM and our employees have been at the forefront of developing processes and technology that improve efficiencies and keep mining operations viable.

For the past 30 years Glencore Technology has been dedicated to marketing our innovations, such as the ISASMELT™, around the world, along with continuing to develop technology used in the metals and mineral processing industries.

Development of the ISASMELT™ started in the late 1970s as a joint research project between MIM and the Australian Government's Commonwealth Scientific and Industrial Research Organisation (CSIRO). After laboratory testing of a potential lead smelting process at the CSIRO's Melbourne facility, MIM moved to a 120 kilogram per hour test rig in our Lead Smelter in 1980, then to a five tonne per hour pilot plant in 1983.

In the mid-1980s, the MIM copper smelter needed to reduce emissions to the environment and increase production so an alternative, sustainable processing route was investigated using the ISASMELT™ technology.

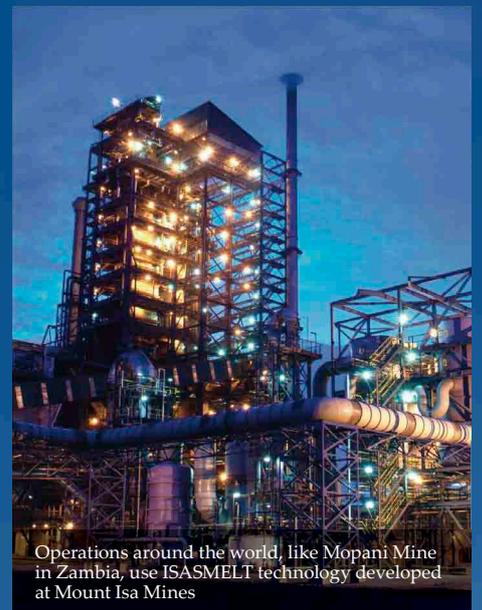
This led to the development of a copper smelting process and the construction of a 15 tonne per hour copper ISASMELT™ demonstration plant in the Copper Smelter in 1987. Our Plant Operators' involvement during development of the technology was one of the key contributors to the success of the ISASMELT™ process, as it ensured the technology was practical and robust, and therefore widely adopted by other operations.

Commercial scale ISASMELT™ plants for lead and copper were commissioned in Mount Isa in the early 1990's. Since proving the viability of these two processes, commercial plants are now located around the world.

The ISASMELT™ process is based on the top-submerged Strommelt lance, developed by CSIRO, and involves using a lance to inject air or oxygen-enriched air into a molten slag bath contained within a stationary, vertical furnace. The technology is used in smelters to perform primary smelting prior to converting, as part of the process to transform concentrate into anodes.

The key to ISASMELT™ process success has been its simplicity and its efficiency, along with the advantages of using a technology that improves smelting operations resulting in better environmental management, reduced operating costs, increased production capacity and stronger profits.

The ongoing development of the technology has seen continuous



Operations around the world, like Mopani Mine in Zambia, use ISASMELT technology developed at Mount Isa Mines

improvements to the ISASMELT™, ensuring the technology remains the gold standard for copper smelting that cannot be matched by our competitors.

One of the main reasons for ISASMELT's™ rapid success has been the high environmental standards the technology can achieve through containing and reducing the amount of emissions into the atmosphere.

The ISASMELT™ technology is used in regions where the tightest emission standards are enforced, such as Australia, Belgium, Germany and Peru, and it's a credit to the technology that these regional environmental standards can be met or even surpassed.

While lead and copper concentrate processing was the priority for the initial development of the ISASMELT™, the process has found use in other applications, such as the recycling of lead acid batteries.

An ISASMELT™ furnace was built at Britannia Refined Metals smelter in the United Kingdom in 1991, and when it was operating produced approximately 30,000 tonnes of recycled lead per year. The ISASMELT™ technology is also used by operations in Belgium and Germany for recycling copper and precious metals, a true indication of a robust and sustainable smelting technology.

The ISASMELT™ process has made a significant impact on the global metals industry allowing new operations to reach production quickly and cost-effectively, as well as making it possible for brownfield operations to improve profitability and meet stringent environmental standards.

From humble beginnings as pilot plants at our Mount Isa operations, today the ISASMELT™ process is well established as one of the leading technologies used for copper and lead smelting around the world. **M**