

QUEENSLAND

RESOURCES

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XSTRATA TECHNOLOGY AND THE ISAMILL SUCCESS STORY

IN conjunction with the 10 year anniversary of the launch of Brisbane-based Xstrata Technology's IsaMill™, this overview analyses key reasons for the success of the technology, and how it has transformed grinding circuits.

Responding to climate change policy is a significant business challenge for resource companies. Companies are rising to this challenge by seeking ways to reduce their carbon emissions by improving energy and resource efficiency and by deploying low emission fuels and technologies.

Comminution of ore is often the most energy intensive step in metal production, with comminution consuming 14 per cent of all electricity generated in Australia and up to four per cent world-wide (Fuerstenau, Berkeley University, 2003).

The IsaMill is a new generation grinding mill that significantly improves the energy efficiency of mineral processing.

The technology offers resource companies a means to reduce their carbon

footprint and opens opportunities to the global carbon trading market.

The IsaMill is a radical departure from conventional tumbling mills. It was originally designed for ultra-fine grinding, producing particles less than seven microns (80 per cent passing), and following the success in these applications, has been further developed for use in coarser grinding, treating particles up to 250 microns (80 per cent passing) and grinding to a wide range of site specific target grind sizes.

The IsaMill has multiple grinding discs arranged along a horizontal shaft; an internal centrifugal classifier and uses fine inert grinding media between two and six mm depending on the application, housed in a grinding chamber.

The largest IsaMill, the M10,000, has a grinding chamber of only 10 cubic metres, and is less than one eighth the volume of equivalent powered traditional grinding technologies, such as the ball mill or tower mill.

The IsaMill is available in three sizes, the M1000, M3000 and M10,000, which are powered by 500 kW (670 hp), 1500 kW

(2010 hp) and 3000 kW (4025 hp) motors respectively.

GHG POLICIES TO AFFECT GRINDING

Many governments and policy makers are driving a global regulatory effort to reduce greenhouse gas (GHG) emissions under the guidelines of the 1997 Kyoto Protocol.

Increasingly, businesses throughout the world will be required to manage and reduce their carbon footprint by using low emission fuels and technologies and by adopting energy efficient processes.

Xstrata Technology has worked with its carbon partner, Sigma Global, on the potential benefits of IsaMill technology on a projects carbon footprint through improved energy efficiency in the grinding circuit, as well as improvements in processing efficiency.

Plant owners who adopt the IsaMill technology may be in a position to generate carbon credits which can be used to meet their current or future emission reduction obligations or, alternatively, can be sold on global carbon markets.

KEY BENEFITS

Xstrata Technology believes that the IsaMill holds key benefits over conventional grinding technologies, including greater energy efficiency, smaller footprint, simpler grinding circuit design and improved downstream metallurgical performance.

"The high energy efficiency of the IsaMill is due to its ability to use very fine media," said Xstrata Technology's IsaMill Global marketing manager, Steve Smith.

"The mill is stirred at high speed to create many grinding events in a small space. As a result, an IsaMill installation is much more compact and is 30 to 50 per cent more energy efficient than conventional grinding technology.

"The use of fine media is able to be used in the mill, as the patented internal centrifugal classifier at the end of the



The M3000 IsaMills are powered by 1500 kW (2010 hp) motors.



The M3000 IsaMill.

grinding chamber retains the fine media and coarse particles in the mill, while allowing the ground slurry to pass

“As a result, the IsaMill produces a sharp product size distribution in open circuit which, in turn, leads to a simpler grinding circuit without the extra footprint and energy consumption associated with hydrocyclones and high recirculating loads as is found in traditional grinding circuits.

“The IsaMill’s inert grinding media has a big advantage over conventional steel media as it greatly reduces the generation of ferric ions which inhibit the performance of downstream flotation and leaching circuits.

“When improved energy efficiency is coupled with the improved metallurgy and lower reagent consumption associated with inert grinding, the IsaMill can increase the mineral recovery per unit of power consumed by over 50 per cent in some cases.

“The combination of energy efficiency, small installation size, inert grinding and simple circuit configuration give the IsaMill an extremely favourable ‘life cycle analysis’ when compared with conventional grinding,” Mr Smith added.

There are currently more than 60 IsaMills™ operating or ordered worldwide, with more being planned, designed, and serviced by Xstrata Technology’s personnel based in Australia, Canada, South Africa and Chile.

The parts support for these mills is undertaken by the IsaMill service team,

who provide spares for operating mills as well as new mills being produced.

Part of the regular system of continuous improvement at Xstrata Technology involves working with the company’s partners, and tertiary academic institutions and universities to improve products and services, from bench scale R&D to full plant trials, as well as working with IsaMill clients with on site inspections and condition monitoring.

Xstrata Technology works closely with its partners, mill manufacturer Netzch of Germany and international rubber wear

component supplier Linatex, to ensure high quality workmanship and parts supply in the shortest possible time.

Xstrata Technology also works closely with international grinding media supply company, Magotteaux of Belgium, to develop a high efficiency, low wearing ceramic media specially for the IsaMill.

The company has also improved logistics support for their clients, by choosing Kuehne & Nagel as the third party logistics provider.

The Xstrata Technology spare parts stock holdings have been consolidated in Brisbane and Johannesburg.

Warehousing support is being examined, to minimise the transport to client’s sites, and a North American warehouse location is being negotiated to support IsaMills in the Americas.

AUSTRALIAN AWARDS

Xstrata Technology was recently awarded the Large Advanced Manufacturer Award in The Premier of Queensland’s Export Awards, which lead to the company becoming a National Finalist in the Australian Export Awards.

Then, in December 2008, the company took off the 2008 Australian Export Award in the Large Services category.



Xstrata Technology’s M10,000 IsaMill.