

# AJMM

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ADVERTORIAL

# IsaMill on target for 50MW installed power

**I**SAMILLS are highly efficient horizontal stirred mills that have been on the mineral processing scene for only 13 years.

However in that time frame, they have evolved from niche ultra-fine grinding applications, to now challenge ball mills and tower mills in more conventional coarser product sizes. By the end of 2007, there will be 50MW of installed power in IsaMill technology in concentrators around the world.

Currently there are seven sites utilising the technology, but this will grow to 14 sites during 2007 as the current orders for mills are installed and commissioned. This represents an increase in mills from 19 to 31 by 2007, and a doubling of installed power from 24.4MW to 50MW.

The mills are in a wide range of applications including lead/zinc, PGM, copper and gold.

IsaMill circuits involve concentrate regrinding for further flotation or leaching, as in the case of some copper and gold circuits, and more mainstream tertiary grinding applications such as PGM's.

The early installations of the IsaMill were predominantly fine grinding applications, with some applications producing sizes down to P80s of 7um to enable complex deposits to be treated. However, some of the IsaMills that are currently being designed will be treating coarser feeds.

One such application is Anglo Platinum PPL C circuit, which has been designed for a feed

sizing of 75 to 100um's, to produce discharge product of 50 to 60 um (D80). Larger feed particle sizes are also being targeted in recent pilot plant testing at the McArthur River concentrator, where a small M20 pilot rig was treating SAG mill discharge cyclone underflow, with feed particle sizes of the order of 250 to 300um (P80). Further work is planned to investigate the use of a M3000 in this application to determine what is the upper limit of the feed size the mill can treat.

## Advances in IsaMill Technology

There have been a number of advances in IsaMill technology in recent years, that have allowed all the advantages in ultra-fine grinding to be used in coarser feed applications.

The biggest advance was the development of the M10,000 IsaMill in 2002 for the Anglo Platinum WLTRP concentrator. This mill permitted high flowrates to be treated, and was powered by a 2.6MW motor, (M10,000 IsaMills now come with a 2.6MW or 3.0MW motor).

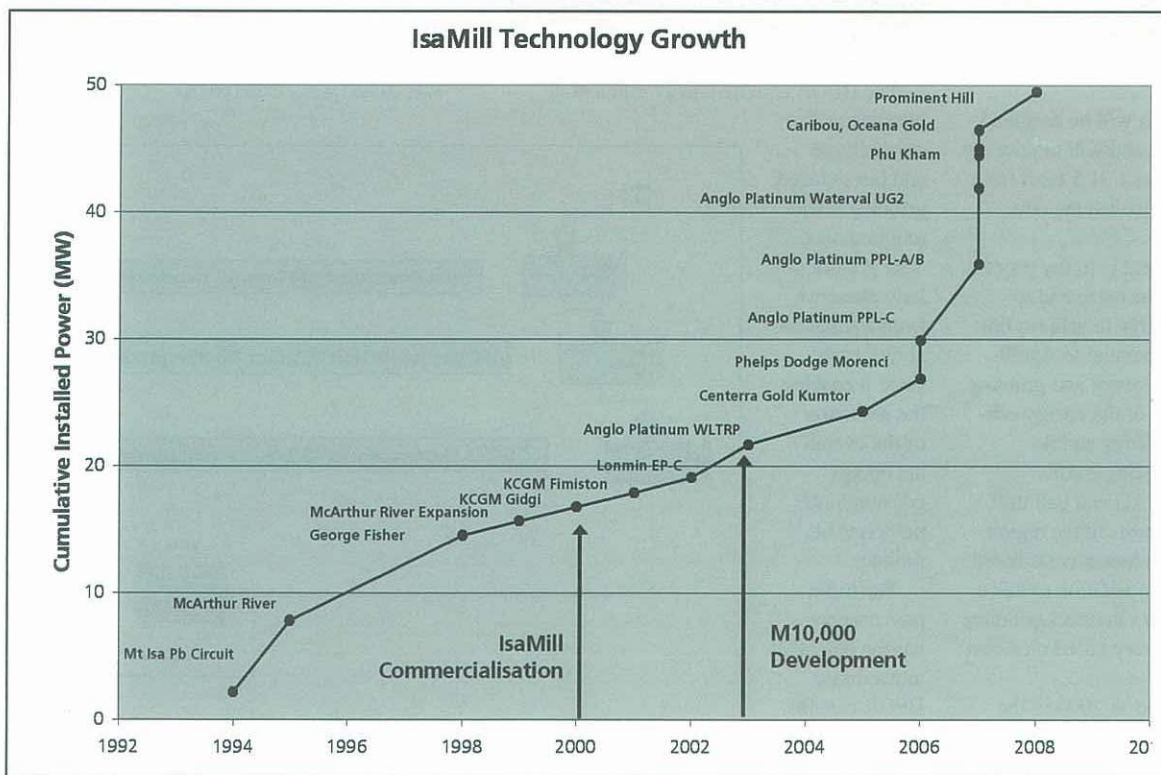
This was followed by the introduction of MT1 ceramic media being used in the mill. The MT1 ceramic media, was developed specifically for IsaMill operations by Magotteaux, and is very hard (~1350 HV), having a high specific density of 3.7, and is very smooth and round. This meant that more efficient grinding could be conducted by the mill as more energy was being used to impart on the material being ground, instead of being wasted on reducing the media, as often was the case with low quality sands and slags. The MT1 media also comes up to 3.5mm in size, which allows it to be used to grind coarse particles.

The net result of high quality media available at coarse sizes and larger mills, has resulted in the IsaMill being able to treat coarser size fractions, at high energy efficiency. Also, the use of ceramic media allows grinding to take place in an inert environment, which can permit better metallurgical response and more efficient use of reagents in down stream processes.

As there has been a greater implementation of IsaMill technology, Xstrata Technology,



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(ABOVE) ISAMILL DISC AND SPACERS SLIDE OFF CENTRAL SHAFT FOR MAINTENANCE

(LEFT) ISAMILL INSTALLATIONS VS CUMULATIVE INSTALLED POWER

ADVERTORIAL

## Innovative lining solutions

**LOSUGEN AUSTRALIA PTY LTD** is a manufacturer of engineered impact and wear lining systems for the mining and materials handling industries.

Losugen can undertake the design for all systems including custom moulding or cutting of off-the-shelf stock using an ultra high water jet cutter. Thicknesses range from 20mm to 80mm liners. The company can also carry out all installations using its field ready equipment and skilled installation team.

Losugen lining systems have been designed to eliminate rubber lining, ceramic and steel lining as the primary source of protection for working assets. The problem with rubber and ceramic lining is that once the asset has been put into service it becomes

subject to high wear and in most cases the lining cannot be easily replaced. Steel linings are also heavy, sharp and can be dangerous to replace.

Further issues arise when repairing rubber and ceramic linings as it is a timely process and optimum environment conditions are required to apply the repairs which can be costly and may fail within a short period of time.

Losugen's chute lining systems can be easily replaced, cannot fall out and are quick to repair and replace. The company offers tailored solutions for high-wear areas incorporating different products such as "Aggression" rubber panels, "DMAC" ceramic & rubber, "2605" & "2065" iron & rubber, "Let It Loose" lining systems and more. □

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the company that markets the technology, has increased the range of services it can supply with the mill. More installations are being provided with designing, engineering and construction of the surrounding circuit around the IsaMill. The experience that Xstrata Technology has gained from many installations ensures that all new developments are included in the IsaMill installation design. This not only includes feed and discharge pump and pumpbox design, but media feed systems and spillage handling systems, to ensure media is returned to the mill easily after shutdowns.

### Ease of Maintenance

The IsaMill has been developed to assist maintenance operations. The grinding chamber is rail mounted, and slides easily with hydraulic rams away from the central shaft and grinding disc for maintenance. Once the shell is off, the grinding disc can be inspected, and if required, replaced by sliding off the disc and spacers off a central shaft. The disc is attached to the shaft by a double key-way. Another advantage of the mill is that it is not a confined space when the shell is off, eliminating some of the training issues and dangers of conventional grinding mills. Mill availability tends to be of the order of 97 per cent to 98 per cent for well maintained mills.

A major change to the IsaMill design over the last 12 months has been the reversal of the internals of the mill. It has been observed, that the key wear areas in the mill were at the front of the mill, where

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As well as saving wear and tear on equipment our liners can be easily repaired or quickly replaced saving you downtime. Best of all, we manufacture both in Australia and overseas so wherever you have a project we can service your lining needs.

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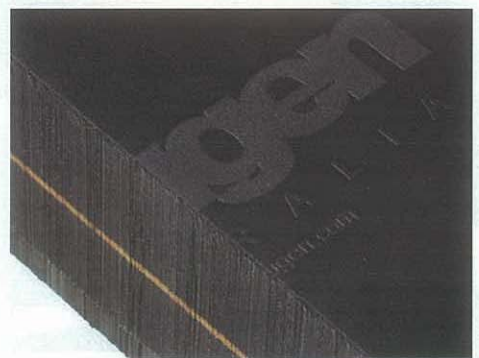
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A U S T R A L I A  
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# Focus changes for mineral processor

**W**A-BASED mineral processing company Nagrom is expanding its service base in response to the buoyant mining sector.

"The company is broadening its activity base in response to the significant number of new mining projects in developmental stages," said general manager Tony Wilkinson.

"We will be placing ourselves in the niche of offering met services with a slant to large-scale pilot programs and the flexibility of being able to operate 24/7. Coupled with our experienced staff this means swift service delivery of the highest quality".

Nagrom has been operating for 29 years in the custom processing

sector and has been steadily expanding the met testing services side of the business over the past two years.

"The benefit we have with our existing plant is that the testwork programs can be extended to include production level trials and with some mineral beneficiation tests the true behaviour at production levels is not necessarily reflected at bench scale testing", he added.

"I think all this means that we will probably develop project associations that move from the conceptual and testing phases right through to the commissioning and operational phases".

The relationship value is typified by Nagrom's 29 year association with the tantalite mine at Wodgina in the Pilbara region of Western Australia which began in 1978 when Goldrim started mining the alluvials.

"Obviously our main focus is the mining industry but the front end of our 200-ton per week plant, in the drying crushing and screening circuits, does have applications within the industrial sphere and hence 2007 is really going to be about re-focusing our activities". □

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the feed enters the mill. However, this required all the discs to be stripped from the mill to allow any worn discs to be changed. Now the internals of the mill have been rotated, and the feed of the mill enters the drive end of the mill, allowing any worn

discs to be easily accessed without the need of stripping the whole shaft. The operation of the mill is still the same as normal, with the product separator still being used to provide the sharp classification of the discharge product.

Wear in the mill depends on application, although the key wear items such as the disc and

shell lining generally last six months and 12 months respectively. This means a large shutdown is required every six months to replace these items. A trained crew can undertake this replacement in eight to 12 hours. □

FOR MORE INFORMATION VISIT [WWW.ISAMILL.COM](http://WWW.ISAMILL.COM)

## Your resource discovery and exploration is part of our business

Nagrom offers a comprehensive range of services in the mineral processing and metallurgical testing arena.

24 hours a day, 365 days a year you can use our expertise as a partner in your success.

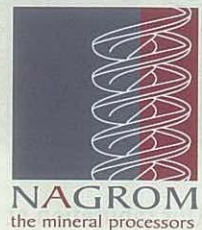
Discover the range of service from 10 kilo bench testing to 10 ton pilot plant operation and you will appreciate the reliability and affordability.

Explore the quality association from project planning through commissioning to on site operations.

### Our metallurgical expertise covers:

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- Zircon
- Mineral Sands
- Garnet
- Tantalite
- Columbite
- Spodumene
- Tin
- Chromite
- Iron Ore
- Magnetite
- Gold
- Vermiculite
- Sulphides

Explore the possibilities. Discover how Nagrom can work for you.



Our metallurgical testing services include: Ore Characterisation & Circuit Specification for Crushing • Drying • Screening • Gravity • Flotation • Magnetics • Electrostatics.

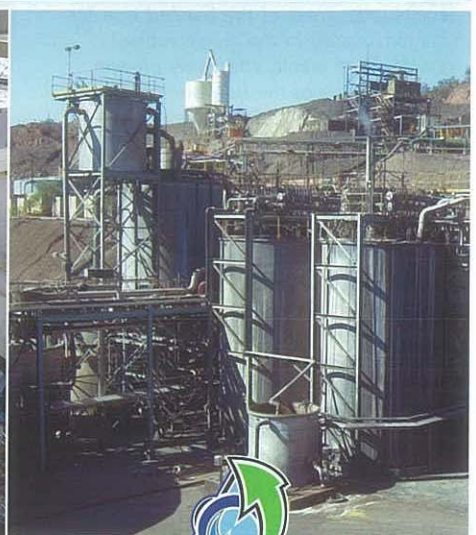
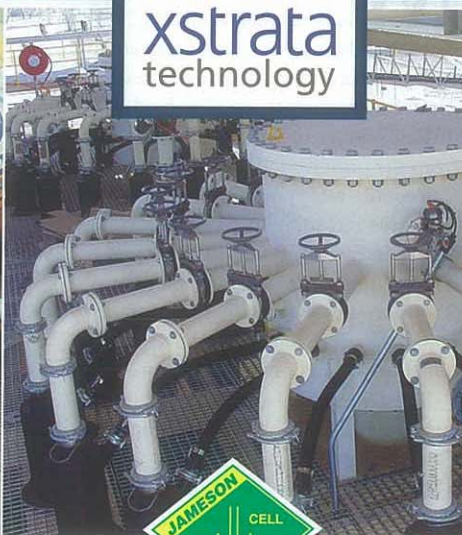
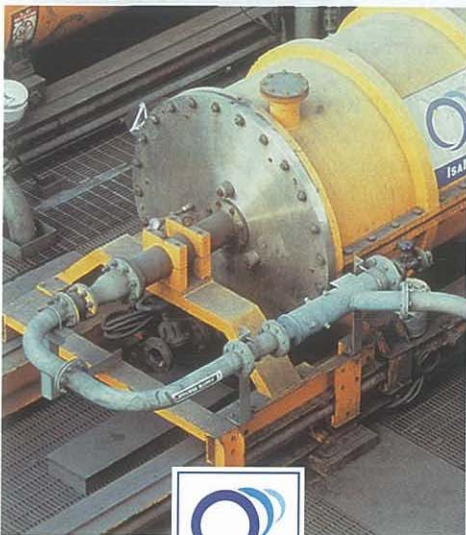
Custom Processing is part of our business.

**Tony Wilkinson (61) 08 9399 3934**

**Rick Murphy (61) 08 9525 5589**

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# Efficient technologies... Process expertise



## IsaMill

*High Intensity,  
High Efficiency Grinding*

- High Energy Efficiency
- Inert Media Improves Process Chemistry
- Accurate Scale-up
- Low Cost Installation
- Simple Maintenance
- Internal Centrifugal Classifier – Retains Media Without Screens
- Large Scale Mills (3.3MW)
- Multiple Grinding Stages – Sharp Size Distribution Without Need for Classification

## Jameson Cell

*Low Cost, High Grade, High Capacity Flotation*

- No Moving Parts
- Compact, Low Capital and Operating Costs
- Self-aspirating
- Accurate Scale-up
- Small Bubble Size – Fast Fines Flotation
- Frothwashing
- Small footprint, low cost additions to existing circuits

## Albion Process

*Simplicity in Leaching*

- Lower Capital Costs
- Simple Processing
- Lower Environmental Impact
- Atmospheric Pressure
- Easy to Automate
- High Availability



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