

AUSTRALIA'S

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## GIANT STEPS

Australian companies carving a niche

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# Still floating high

THIS year marks the 20th anniversary of the Jameson Cell, the Australian invention that removed the need for compressors or blowers in the flotation process.

University of Newcastle professor Graeme Jameson had a vision of simplifying the flotation machine. In the place of the compressors that had long been a part of the process he used naturally induced air while promoting a fast flotation reaction.

This development led to the Jameson Cell, which was first put into operation at the lead-zinc concentrator in Mt Isa, Queensland. Since then almost 300 cells have been installed worldwide in base and precious metals, coal, solvent extraction, oil sands, potash and other industrial mineral applications.

These days the Jameson Cell is the preserve of Xstrata Technology, which has continued to improve on Jameson's design.

The key to the cell is the simplicity of its operation. A feed pump delivers the slurry to downcomers, which contain slurry nozzles that create high pressure and induce air.

The high shear of the slurry passing the nozzle produces fine bubbles, which results in a high probability of bubbles coming into contact with hydrophobic particles and eventually allows flotation to occur.

The Jameson Cell's big advantage over other flotation systems is the large volume of fine air bubbles it produces. Another benefit is that the only moving part in the cell is the feed delivery pump. This removes the need for impellers, stators or spargers, meaning easy maintenance. The downcomers also can be easily inspected while the plant is in operation.

The cells have grown larger than those Jameson started with. The largest is up to 7m in diameter for use in solvent extraction. Coal and base metal extraction cells are up to 6.5m in diameter. These large cells can treat up to 2400 cubic metres of feed per hour in a relatively small footprint.

Another key development of the cell has been the invention of the external recycle mechanism. By using gravity and recycling

part of the tailing stream back to the feed pump box, a steady feed can be pumped to the cell. This allows fixed speed pumps to be used.

The latest Jameson Cell, the Mark IV, was released to the market last year. It features an upgraded slurry delivery system to the downcomer.

This eliminates rubber-coated steel pipes and makes it quicker and easier to check downcomers as well as retrofit on older models.

A wear-detection device has been designed in the delivery pipe. Each cell also can have a clear downcomer to help operators understand the impact of variables to the cell as well as assist with training.

Recent Jameson Cell installations in coal include Yarrabee and the Carborough Downs expansion in the Bowen Basin, and Moolarben in the Hunter Valley. Metals installations include the prefloat cleaning circuits at Red Dog Alaska and the cleaning circuit at OZ Minerals' Prominent Hill. **AMM**

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