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Super sized flotation

As the mining boom grows, so too does cell size.

Low grade and complex mineralogy ores, the need to improve the recovery of fine and coarse particles and lowering energy, capital and operating costs are just some of the challenges faced by mineral processing operations today.

However improvements in flotation cell and circuit design, operation and optimisation – among other advances – have allowed mining companies to meet these challenges.

Among the main advances, the development of large flotation cells handling high tonnage, high pulp densities and coarse grinding to increase efficiencies is particularly interesting.

The minerals industry has realised the economic benefits of large flotation tank cells with volumes greater than 250 cubic metres to lower capital, operating and maintenance costs – fewer cells, better control, smaller footprint and lower installed power and consumption.

Complex mineralogy ore bodies, lower cut-off grades and stripping ratios, and high tonnage plants with larger grinding mills are driving this push towards large capacity flotation machines.

In addition, economies of scale, declining ore grades and near-term commodity pricing stability bode well for the integration of “super cells” into large concentrators.

In fact, single flotation cell vol-

ume has more than doubled over the past decade.

A recent new development is the launch of FLSmidth's SuperCell 600 series with active cell volumes from 600 cubic metres to 660 cubic metres with a multitude of mechanism offerings.

A feature of the SuperCell 600 series is the ability to interchange naturally aspirated or forced air mechanisms: Wemco, Dorr-Oliver and Xcell; the first one is self-aspirated; the latter two are forced air machines. Operation of the series does not differ from other cylindrical cells in the SuperCell range.

The SuperCell 600 series is twice the size of existing equipment permitting an easy reconfiguration of flow sheets currently in design. Its capacity can match the throughput of the largest SAG mills in a single train, thus minimising installation, operation and maintenance cost.

The SuperCell 600 series has been designed using leading technologies including in-house developed computational fluid dynamics (CFD) with first principle flotation models. And, it is expected that the SuperCell 600 series will be used mainly for rougher-scavenger duty in gold, copper and molybdenum flotation circuits in very large throughput plants.

Hydrodynamic and metallurgical testing of the SuperCell 600 series is slated for the first quarter of 2013.