

Swirl Flow: Increase production and reduce tank maintenance costs

Swirl Flow enhances the agitation process in minerals processing by improving reliability. It has significantly lower capital and operating costs compared to traditional agitation systems, cutting installation costs by up to a third.

Business problem – Production loss due to tank downtime

Long-shaft cantilever agitator systems operating in slurry with air sparging, common in the gold industry today, can be costly to fix when unexpected stoppages or system failures take place.

Problems with tanks often arise from mechanical failure of an agitator, such as the breakage of blades, shaft and gearbox, wear of impeller blades, bogging of the agitator due to sediment and scale build-up in the tank.

Delays due to maintenance and repair can go on for weeks, causing significant losses in production.

The solution – Swirl Flow

Swirl Flow enhances the agitation process by mixing liquids and suspended solids to create a tornado-like vortex in a tank. The solution uses a motor, gearbox and a specially-designed radial impeller with a short shaft near the top of the tank. It is simple and inexpensive to retrofit to existing tanks.

The system improves agitator reliability, resulting in reduced maintenance and shutdowns. Due to higher and more uniform wall velocities, the scale formation rate is also reduced.

The benefits – Lower capital and improved performance

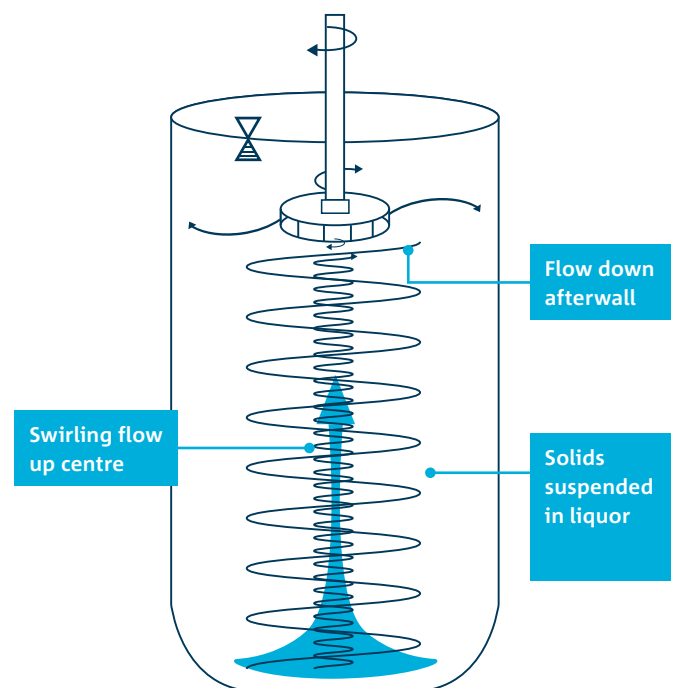
Swirl Flow can increase tank on-line time to lower maintenance and equipment replacement costs.

Swirl Flow has been designed for slurry tanks:

- as a short-shaft system to reduce the mechanical failure risks common in conventional agitator systems
- as a low-weight, lower cost replacement or new agitator system for gold carbon-in-pulp (CIP) leach and process tanks
- where downstream pumps are starved of feed due to sedimentation blockage of the pump inlet pipe
- to address build-up of inventory, scale or sediment that reduces tank on-line time, or results in a premature stoppage of the tanks.



The Swirl Flow system



Schematic flow patterns

In operation today

LKAB Iron Ore in Sweden retrofitted their iron ore slurry surge tanks with Swirl Flow leading to improved mixing of additives, achieving about a 50 per cent increase in surge capacity



[Our] surge tank has been running without baffles since 2012. Swirl Flow has improved mixing and surge capacity from about 60 or 70 per cent to 100 per cent. This has reduced dependency (stoppages) between our concentrating and pelletising plant.

DANIEL MARJAVAARA, TECHNOLOGY AND BUSINESS DEVELOPMENT, LKAB.

Energy Resources of Australia retrofitted a leach tank with Swirl Flow at their Ranger Uranium Mine operation. Removal of baffles improved tank structural integrity by reducing rubber lining damage risks and tank lining costs.



Leaching Tank 3 is running without baffles. As an indirect measure of the mixing efficiency, the extraction is good.

FRANK JIA, SUPERINTENDENT OPERATIONS TECHNICAL, ENERGY RESOURCES OF AUSTRALIA.

Queensland Alumina Limited (QAL) retrofitted their desilication holding tank with Swirl Flow, which reduced bogging and increased on-line time by three to four months over a 12 month period.



The application of Swirl Flow in QAL has increased the operating factor, increasing both plant yield and capacity.

TOM CONNOR, PRODUCTION ANALYST, QAL.

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