

BENEFITS OF FLOTATION CONTACT CELLS

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The Flotation Contact Cell is a slurry aeration device with no moving parts. The SGS Minerals Services contact cell is compact, highly efficient, simple to operate, and has low energy and maintenance costs. The contact cell is mainly applied in rougher flotation circuits. There are a number of benefits and capital savings that can be obtained when installing contact cells in comparison with traditional mechanical cells.

MAJOR REDUCTION OF SURGING IN THE ROUGHER CIRCUIT VIA USE OF SURGE SUMPS

As opposed to the more traditional mechanical cells, contact cells produce a more consistent rougher grade and recovery. They also make it much easier to evaluate strategic changes as the circuit is always in a stable state, this in turn allows for higher optimization of reagents and thus a variety of strategies for responding to various ore types. Contact cells also eliminate most of the instability in the cleaner and regrind circuits, producing better regrind and cyclone performance than traditional methods. Overall, contact cells require fewer operational changes to control variables such as froth level and aeration rates while making it easier to control circulating loads, and improving cleaner circuit assessment.

IMPROVED CONTROL FROTH

In mechanical cells, froth tends to be very shallow in the back half of a bank of large rougher cells, making it difficult to achieve level control, thus compromising grade and efficiency. In contrast, contact cells maintain a constant froth level, producing a consistent increase in rougher concentrate grade.

REDUCED POWER CONSUMPTION IN REGRIND MILLS

When compared to mechanical cells, contact cells use lower air volumes, pull less gangue and produce higher concentrate grades. The higher concentrate grade results due to less gangue entrainment. The low air consumption in contact cells compared to mechanical cells also contributes to a lower level of power (Hp) required for compressed air production. The rejection of the gangue decreases the tonnage to the concentrate regrind which allows the operation of a fewer number of cyclones and a reduces of the size of the regrind mill and Hp.

CAPITAL AND OPERATING COST REDUCTION IN CLEANER CIRCUIT

Choosing contact cells over mechanical cells will result in savings in both capital and operating costs due to the lower tonnage put through the cleaner circuit. This reduces the size and the capacity of the circuit. The extension of the grade/recovery curve in the cleaner circuit creates more flexibility than would be obtainable by using mechanical cells in the roughing circuit.

LOWER MAINTENANCE

Since fewer rougher cells are needed when using contact cells, lower level of maintenance is needed. In large copper plants, the equivalent performance of a mechanical circuit could be reproduced by using approximately 75% less contact cells than mechanical cells. For lower tonnage gold plants, the number of rougher contact cells required is approximately half the quantity of the mechanical cells. The size of each contact cell is significantly smaller than the required mechanical cell. This means the smaller number needed and reduced surface area results in less maintenance and a lower spare parts inventory. Also, pump maintenance is independent of the SAG mill maintenance schedule. The pump can be taken off line simply by closing the automatic knife-gate valve on the intake of the pump. The contact cell circuit will remain fully functional on the other cells.

LESS ROUGHER PROCESS CONTROL INSTRUMENTATION

With fewer units and instrumentation than mechanical cells, contact cells also make the regular DCS/PC and advanced process control of the circuit less expensive and easier to configure and maintain. One camera per line can do the work due to the stable nature of the froth generated via contact cells. This also results in a lower demand for instrument technicians.



POTENTIAL POWER SAVINGS IN THE ROUGHER CIRCUIT

A significant savings in energy costs is gained by increasing the percent of solids in the feed, for example from 30% to 35%, which will then cause the pumps to slow down. This is not possible when using mechanical cells since the agitators need to maintain speed for bubble/particle collision.



REDUCTION IN SAMPLING AND ON-STREAM ANALYSIS

Sampling and On-Stream Analysis would be required for fewer lines if the conventional flowsheet calls for multiple lines.

REDUCED INSTALLED COSTS AND FOOTPRINT AREA

Due to the smaller area of space needed for contact cells and the ancillary equipment, the installation cost will be substantially lower than for the conventional mechanical cells. Tank installation costs are closely related to cell area. A large copper project with 40 mechanical cells of 160m³ each, would need a total area of 1,540 m². Meanwhile the 10 contact cells, two sumps and 8 to 10 pumps needed to do the same job would need an area of approximately 750 m², roughly half the space. The total area savings include shorter cable tray runs, much shorter span for the overhead crane, smaller MCC for electrical connections, and reduced infrastructure requirements in general such as foundations, walkways, lighting, and froth launder transport.

CONTACT INFORMATION

Email us at minerals@sgs.com
www.sgs.com/mining