

Microcel™

# Flotation columns



For higher  
concentrate  
grades





## A unique sparger technology

Metso columns cells have established a new standard in flotation technology. For the last four decades, columns have proven their ability to produce higher concentrate grades compared with conventional mechanical flotation cells.

Microcel™ columns increase product recovery and improve plant profitability. The sparger is derived from the patented Microcel™ technology and enhances metallurgical performance by allowing an unprecedented flexibility on the grade-recovery curve.

Metso offers industrial expertise and numerous references in full-scale flotation column design, manufacturing, installation, commissioning and training.

Metso also supplies testing and consulting services as well as laboratory and pilot units.

### **At the bottom of the column the Metso Microcel™ sparger system maximizes mineral recovery through:**

- Increased carrying capacity due to finer bubble surface area flux which is a standard parameter in evaluating flotation device performance.
- Maximum particle-bubble contacts within the static mixers.
- Effective reagent activation from the mechanical operation of the pump.

The general design includes wash water distribution system, internal launders and other features to produce high-grade concentrates.

### **Functional description**

The Microcel™ sparger consists of in-line static mixers and a centrifugal pump.

Tailings slurry is pumped from the base of the column through the static mixers, where air and slurry are mixed under high-shear conditions to create the bubble dispersion.

As the air-slurry mixture passes through the stationary blades located inside the mixer, the air is sheared into very small bubbles by the intense agitation.

Fine uniform bubble dispersions, with bubble size typically ranging from 400 to 1200 microns, are generated by the sparger system.

The bubble suspension is introduced near the column base, and bubbles rise through the column collection zone.

The Metso static mixers are wear resistant. The system is designed for easy operation and low maintenance and is not subject to plugging.



# Main advantages

- Improved recovery
- Optimized grade
- Increased throughput
- Enhanced bubble particle contact
- Maximized bubble surface area flux
- No plugging
- On-line replacement
- Reduced wear and maintenance

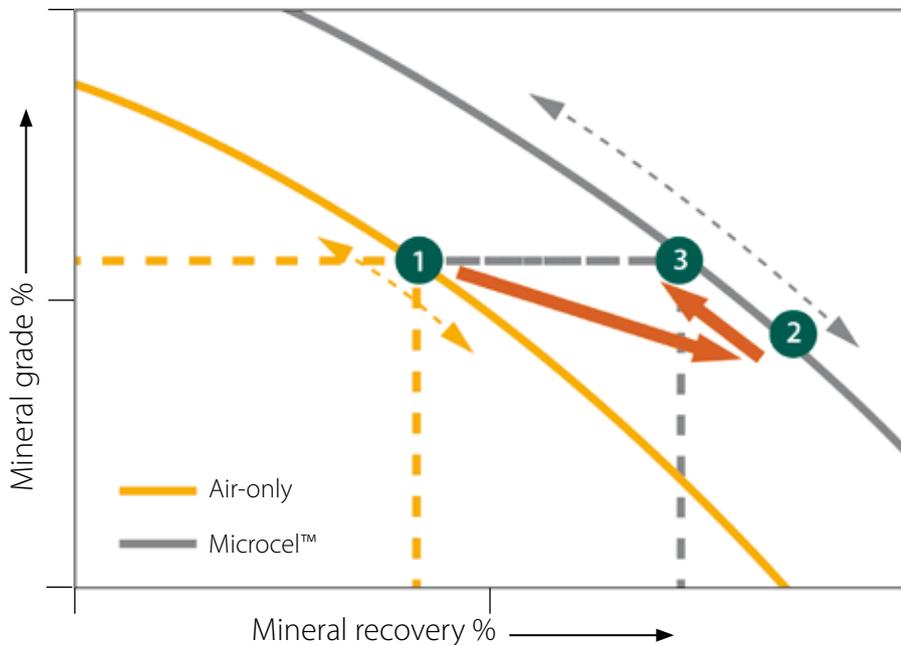




# Sparger retrofit

## Improved metallurgical performance

For plant metallurgists who need to increase recovery, Metso offers to retrofit its sparger technology on existing columns.



Metso sparger's ability to improve column metallurgical performance, and recovery in particular, has been demonstrated in every case when industrially tested in parallel with other sparging technologies. Increase in recovery of 30% or more were reported.

The figure illustrates the performance changes on column operation (represented by the grade-recovery curve) when a Microcel™ sparger is retrofitted.

### Increased recovery

**1** The initial sparger (air-water or air only type) allows the column to operate on a given grade-recovery curve with a limited flexibility to move along this curve. The operator has only access to a small operating range for the manipulated variables such as air rate, wash water addition or froth height. Typically the concentrate grade meets full requirements but the column recovery is poor which translates into high circulating loads.

**2** The Metso sparger operates on a different grade-recovery curve. This is partly due to the recycling of the tailings slurry which acts as a built-in scavenger cell. Under the same operating conditions, there is a large increase in column recovery when the Metso sparger is put into operation. At first the concentrate grade tends to be slightly lower which is compensated for in step 3. Due to both the smaller bubble size produced and the reagent activation provided by the mechanical action of the recycling pump, the froth stability is greatly enhanced.

**3** Thanks to improved froth stability, the operator has much more flexibility to adjust the operating parameters (wash water, froth height and air rate). As a result, the column retrofitted with the Metso Microcel™ sparger generates a significant increase in recovery with at least the same concentrate grade.



Robust control systems are essential to ensure product quality consistency and to minimize maintenance requirements.

Metso supplies the flotation column control system and associated instrumentation best suited to your plant. This may range from one single control loop to an advanced control system.

## Applications

The Metso column technology has proven its superior metallurgical performances in such applications as copper, lead, zinc, iron, graphite, phosphate, coal and fluorspar.

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