Maximizing ore and grade recovery

RCS™ flotation solution
Metso Beneficiation Solutions for minerals processing aim for maximizing ore and water recovery while optimizing operations costs.

Proven solutions to address any mineral processing challenge.

Integrated packages for maximizing ore and water recovery

From plant modules to complete solutions, Metso offers world class technology for the beneficiation of a wide variety of ores such as copper, gold, iron, lead, zinc, platinum and industrial minerals.

Delivering a combined value with our Beneficiation Solutions

Maximizing Ore and Water Recovery is our ultimate goal and promise.

Classification
Metso’s advanced classification solutions help in achieving optimum size control, improved product quality, enhanced comminution efficiency and increased throughput.

Separation
Metso’s reliable beneficiation technology considerably improves the contained value of the ore by removing gangue minerals using flotation, gravity separation, magnetic separation and washing.

Dewatering
Metso’s energy efficient dewatering solutions enable concentrate separation achieving maximum recovery of valuable materials using filtration and slurry handling.

Beneficiation Solutions

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A versatile solution offering maximum recovery at the desired grade

Many challenges can be faced in your flotation process, and any recovery losses have an impact in the long run. Without proper flotation circuit analysis capabilities, chances for losses greatly increase. By installing the right flotation solution into your process, your plant will experience:

- Flexibility to capacity changes
- One-piece mechanism removal
- Optimized energy consumption
- Reduced operating costs
- Improved uptime
- Advanced automation and control systems

RCS™ flotation concept

Optimal mineral recovery in a flotation circuit depends on the capacity to adapt to metallurgical variability in the ore being processed. Recognizing the need for a solution that addresses these challenges, Metso has made several advances in flotation design and technology.

Combining the benefits of circular cells with the unique features of the patented DV™ mechanism, the RCS™ (Reactor Cell System) flotation technology has been developed to create ideal conditions to maximize flotation performance for all roughing, cleaning and scavenging duties. The cell can be modified to handle high density slurries.

DV™ flotation mechanism

The latest DV™ (Deep Vane) flotation mechanism design improves air dispersion and bubble size distribution. The patent protected DV™ mechanism impeller consists of a unique arrangement of vertical vanes with shaped lower edges and air dispersion shelf. The mechanism design produces powerful radial slurry pumping to the cell wall and gives strong return flows to the underside of the impeller to minimize sanding. Additionally, it is the only mechanism to provide maximum slurry recirculation to the upper part of the impeller. Vertical diffuser vanes promote these radial flow patterns and eliminate slurry rotation in the tank.

The fully suspended DV™ mechanism allows for the entire mechanism to be removed from the tank without the need to drain the tank of its valuable contents. The profile of the DV™ impeller, and the design and construction of the complete mechanism makes it possible to start the mechanism in a fully sanded situation.

Applications:
- Iron flotation
- Non-ferrous metals
- Industrial minerals
Why choose Metso RCS™ flotation solution?

Enhanced performance

- Maximum bubble-particle contact within the mechanism and the flotation tank
- Effective solids suspension & separation
- Effective air dispersion and distribution throughout the cell volume
- Smooth test setup & control

Innovative tank design

- Circular tank concept to maximize slurry short circuiting
- Modular design for quick construction, shipment & installation
- Simplified handling & installation
- Internal parts to minimize footprint requirements

Proven drive systems

- Standard belt drive up to 70 m³ cells
- Standard gearbox drive with extended design for extended cell diameter up to 100 m
- Availability of gearboxes for 50, 60, 40, 50, 50 and 50 m³ cells
- Availability of v-belts for 100 m³ and 130 m³ cells

VisioFroth™ technology

- Higher froth recovery with continuous monitoring and analysis of flotation cells

VisioFroth™ technology is an industry-leading image analysis system for live measurement of multiple flotation froth properties such as froth velocity, bubble size distribution, colour, stability, texture and other parameters. The camera can be used as a standalone instrument or combined with advanced process control (APC) methods to optimize set points throughout the concentrator.

Advanced process controls

- State-of-the-art platform for improving cell performance

OCS-4D© is among the most cost-and-time-effective proven tools for improving metallurgic plant performance, continuously maximizing plant throughput and recovery, while optimizing production cost. Since 1990, Metso has provided optimizing control systems for grinding and flotation circuits with successful applications in Europe, North & South America, Africa and Asia.

Efficient air & level control

- Positive air provided by separate air blowers
- Controlled air injection at each cell
- Effective pulp level control by pneumatically connected feed valves with abrasive resistant material and float

Reduced operating costs

- Extended useful life due to increased local high-velocity zones
- Impeller & diffuser constructed with abrasion-resistant elastomers
- Impeller profile designed to minimize absorbed power

Ease of maintenance

- Easily replaceable wear parts within the machine
- Extended maintenance due to full suspension of the DV™ mechanism from the cell superstructure
- Modular valve design provides flexibility in capacity changes

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### RCS™ Range and cell characteristics

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<th>Vol. (m³)</th>
<th>Diameter</th>
<th>Height</th>
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</table>

RCS™ flotation machines are available in sizes 0.8 m³ to 600 m³.

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### Unified regrind solutions

- **Rougher cells** extract majority of valuable mineral from the fresh ore.
- **Scavenger cells** capture remaining available valuable mineral.
- **Metso Vertimill®** handles fine grinding before grade improvement.
- **Cleaner cells** improve grade to final saleable product.
- **Metso NHC™** provides efficient size classification for regrid circuit.

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RTB Bor, Serbia

Together with Metso, the Serbian RTB Bor mine renewed the processing plant at its largest site, Velikkrivelj. The result was a higher throughput and better recoveries with less energy consumption per ton of processed copper.

Challenge
Outdated flotation cells due to obsolete automation, adding major bottlenecks to the production goals.

Solution
Complete RCS flotation plant was commissioned with advanced automation and process controls.

Result
RTB Bor improves recovery by more than 20% while reducing operating costs at the Velikkrivelj concentrator plant.

Hindustan Zinc Limited, India

HZL is a multi-metal mining conglomerate, engaged in the mining of lead, zinc and silver. Metso has been providing solutions for the mining company taking the collaboration to the next level.

Challenge
HZL was facing quality problem regarding lead-zinc grades & recovery.

Solution
Metso supplied 68 RCS flotation machines which have given better yield and improved results. Installed plant with 1.5 MT capacity, which is achieving close to 2 MT now.

Result
Flotation cells are designed to handle fluctuations in capacity. Even at higher capacities, recoveries of 89% lead and 91% zinc are achieved. At these recoveries, concentrate grades of 55% and 51% are achieved for lead and zinc, respectively. With Visiofroth, changes in the flotation cell are identified very quickly, making it possible to quantify the change in bubble size, colour and velocity.

Promising results

20% improved recovery

89% lead and 91% zinc recovery
Through our knowledge and experience, we work with our mining and aggregates customers to create solutions that enable them to attain their objectives. We call this **The Metso Way**, which focuses on creating value to our customers.

The Metso Way is built upon:

**Knowledge –**

We have deep knowledge about our customers’ business environment, processes and challenges

**People –**

Our committed and highly competent people make the difference to our customers

**Solutions –**

We create the technology and services required to meet our customer needs