# OreVia

## Froth

MOLYCOP
A tega company

**Measurement and Analytics**

Flotation



# Advanced precision with the OreVia suite

**Molycop's cutting-edge OreVia technology suite revolutionises mining operations by stabilising and optimising mineral processing. Using Artificial Intelligence (AI) and advanced machine learning, OreVia delivers real-time insights to:**

- increase efficiency
- reduce wear
- improve product consistency
- increase profitability.

OreVia technologies can be placed at the primary crusher discharge, secondary crusher discharge, above the mill feed, above flotation tanks or directly into slurry pipes, and use advanced AI capabilities to learn the context of each location. Using robust, high-resolution cameras, they detect and alert operators to process variations, providing high-resolution imagery and real-time data and analysis with remote monitoring and playback feature options.

## OreVia technologies

**The OreVia suite of advanced AI-based technologies includes:**

**Rock:** Detects and measures rock particles to ensure a consistent blend into the mill, stabilising throughput and reducing liner wear.

**Slurry:** Detects and measures fine particle size and fragmentation in pipes for robust, affordable and accurate particle-size insights.

**Froth:** Monitors froth pulp velocity and bubble size and reports anomalous flotation conditions in real time to maximise mineral extraction efficiency.

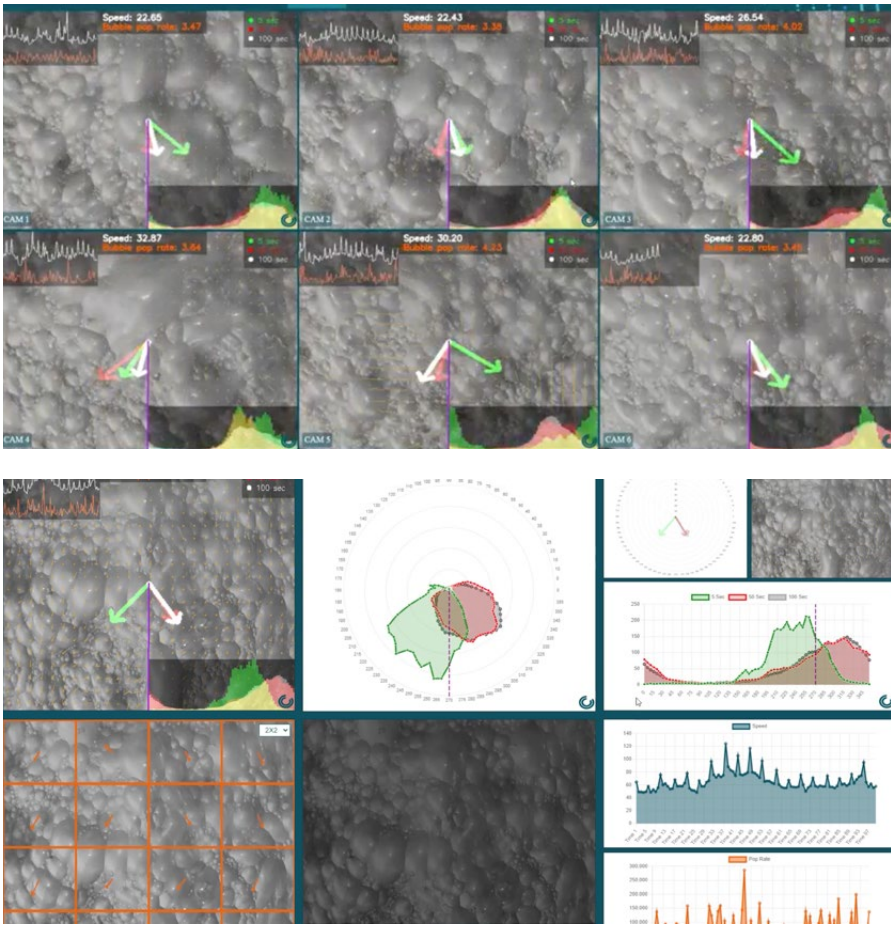
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# OreVia – Froth overview

Installed above flotation tanks, OreVia accurately detects froth pulp velocity, monitors bubble size and reports flotation anomaly conditions. OreVia enables real-time measurement of flotation froth velocities on individual flotation cells to maximise mineral extraction efficiency.

The system integrates seamlessly with existing control systems and offers remote monitoring features. OreVia can easily be evaluated off-site through quick video-based demonstrations provided by Molycop free of charge using video footage of flotation cells.

Images are captured by an Internet Protocol (IP) camera positioned above the froth flotation tank. Video is livestreamed to the control room, with AI technology enabling operators to diagnose and react quickly to operational problems such as no-flow or adverse pulping conditions.



Advanced cameras track froth pulp velocity, froth stability and bubble size in real time.

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# Features

- Accurately detects changes in froth velocity and bubble size
- Learns and improves over time, trained on flotation images
- Provides high-resolution analysis of froth stability and bubble dynamics and learns the context of bubbles providing real-time accurate bubble sizing to optimise air addition to the cells
- Provides real-time pull rate velocities to stabilise and optimise mass pull between flotation cells and banks
- Low-cost implementation, allowing installation on all flotation cell sections
- Live video stream provided to control room
- Integrates seamlessly with the OreVia suite, Molycop VIP Platform and existing flotation control systems
- Detect anomalies: Identify trends and anomalies in the froth to facilitate data-driven decision making

# Benefits

- **Improve recovery:** Accurate bubble sizing enables optimised air addition and use of flotation surface area to improve recovery and bank stability.
- **Measure pulp velocity:** Stabilise and optimise mass pull between flotation cells and banks.
- **Lower operational costs:** With improved process control optimising recovery rates, reducing reagent consumption and maintaining product specification, operational costs are reduced and profitability is enhanced.

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# Case for OreVia in Control

## How can OreVia be used to stabilise recovery?

- Figure 1 shows an example with four individual flotation cells. Groups of two cells form a bank. Each cell has an OreVia camera measuring pulp velocity.
- By controlling the air addition in each tank the total velocity flow between cells in a bank can be controlled.
- By manipulating the valves between banks, the total froth depth of a bank can be manipulated to ensure the total pulp flow between banks is balanced.
- By ensuring that pulp flow is balanced the system utilises the entire available pulping surface area of all flotation tanks and maintains the total flow stability.

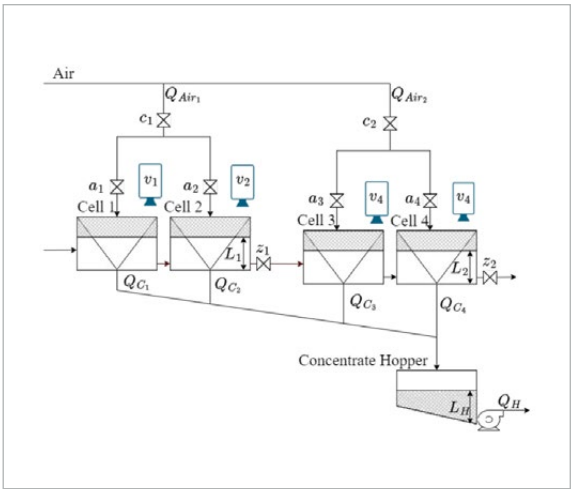



**Figure 1:** OreVia flotation circuit with two banks and four cells in total.

## Optimising flotation using particle size

- Using bubble size as an input to control provides an opportunity to optimise air addition grade and recovery.
- Coupling OreVia with advanced process control such as FloatStar's grade optimiser can significantly improve the air addition into flotation cells.

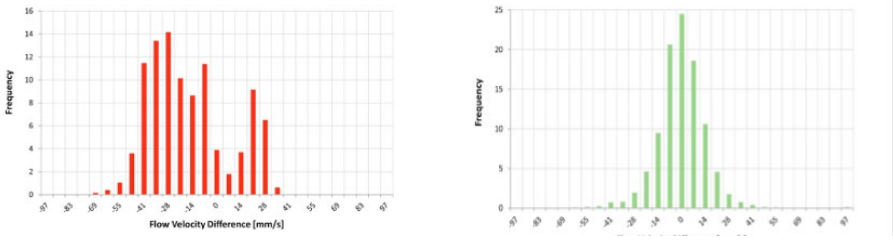



**Figure 2:** Left (red plot) shows the spread of flow difference between cells when not using OreVia. Right (green) shows the flow spread between cells when OreVia velocity is used in control.

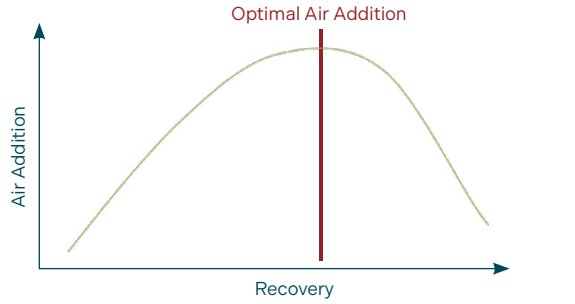



**Figure 3.** Optimal air addition.

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# Detailed interface view

Each camera comes with a local detailed interface view, as shown in Figure 4.

The detailed view shows all the additional complex outputs of OreVia. Visualisations assist operators make sense of the information provided.

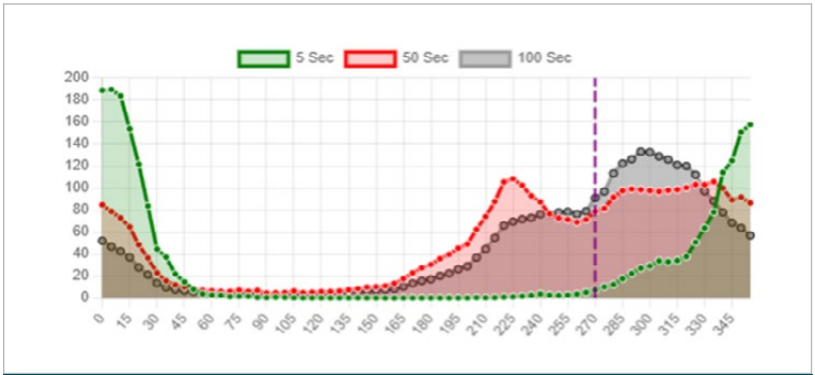



**Figure 4:** Anomaly histogram visual from the local detailed view page.

# Anomaly histogram measurements

## How OreVia can be used for anomaly detection

Based on the flow analysis, OreVia can generate histograms and other statistical representations of bubble behaviour. These visualisations aid in identifying trends and anomalies in the froth, facilitating data-driven decision-making.

Anomaly histograms can be provided through the Modbus or OPC output to control system or PLC network. This is a unique feature that is a core advantage of OreVia. When coupled with FloatStar this anomaly identification can provide significant improvements to the optimisation of flotation cells and prevent the control system being thrown out of stability by disturbances in flotation flow.

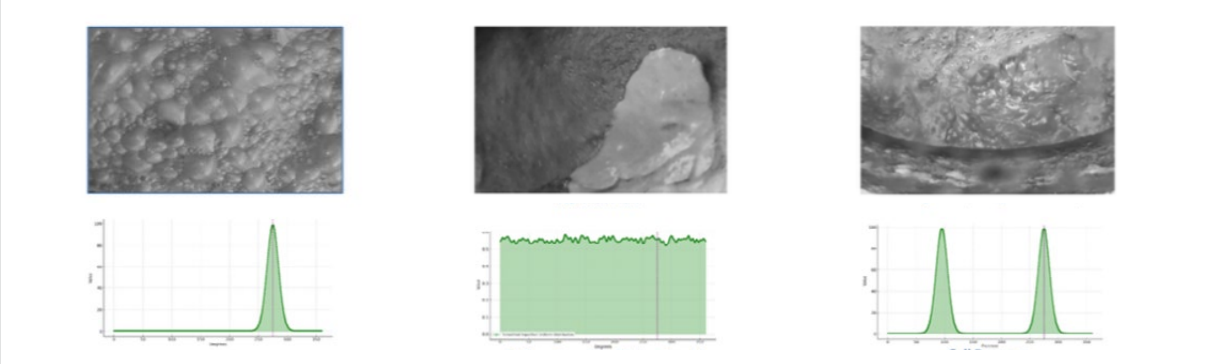


**Figure 5.** Anomaly histogram results example showing (from left to right) Normal flow, Boiling flow (insufficiant froth) and Cell dropout.

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# Typical uses

OreVia is used by mining operations to improve control over the flotation process for optimised performance and profitability. By continuously analysing froth behaviour, operators make immediate adjustments to improve recovery rates, reduce reagent consumption and stabilise plant operations.



Contact Molycop to find out more about how Molycop OreVia optimises mineral processing operations.

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