

Codelco Gabriela Mistral Enhances Dust Monitoring with Oizom's Dustroid Max



INTRODUCTION: Tackling the Hidden Threat of Dust in Copper Mining

Copper extraction at Codelco División Gabriela Mistral involves multiple dust-intensive processes, including primary, secondary, and tertiary crushing. As a leading Chilean mining company specializing in copper extraction through advanced leaching techniques, it operates in a harsh, arid environment where airborne particulate matter (PM1, PM2.5, PM10, and PM100) poses significant health and environmental risks.

Codelco sought an advanced, robust, and real-time dust monitoring solution that provides precise, continuous air quality data to enhance worker safety and environmental compliance. They needed a system that provides actionable insights to help mitigate dust exposure, optimize dust control measures, and maintain a cleaner, safer mining operation.



THE CHALLENGE: Managing Dust in a High-Impact Mining Environment

The mining industry inherently generates significant dust emissions, which pose several challenges:

- 1. Uncontrolled Dust Emissions Across Processes:** Operations such as primary, secondary, and tertiary crushing released large quantities of particulate matter, especially PM10 and PM2.5, contributing to poor visibility and health risks.
- 2. Worker Safety at Risk from Fine Particulates:** High concentrations of PM10 and PM2.5 can lead to respiratory issues among workers, necessitating stringent monitoring.
- 3. Dust Dispersion from Wind Patterns:** Strong and shifting wind conditions made it difficult to predict or contain dust spread without real-time wind speed and directional data.
- 4. Need for Location-Specific Data:** Dust behavior in mining sites is influenced by wind speed and direction, making localized monitoring crucial for effective mitigation strategies.
- 5. Need for a Weatherproof Device:** In harsh mining environments, exposure to extreme weather conditions interrupted data collection and impacted data accuracy.

Recognizing these challenges, DGM sought an advanced, reliable, and durable monitoring system that could provide real-time dust analysis in harsh industrial conditions.

THE SOLUTION: Oizom's Dustroid Max for Real-Time Dust Monitoring

To address these challenges, our partner Southblu deployed Oizom's Dustroid Max, an MCERTS-certified dust monitoring system, at the site. The device was strategically placed on the tertiary crushing building, enabling it to track dust dispersion from primary, secondary, and tertiary crushers while correlating it with real-time wind data.

Why Oizom's Dustroid Max?

- 1. High-Precision Particulate Monitoring:** Accurately measures PM₁, PM_{2.5}, PM₁₀, and PM₁₀₀ concentrations, ensuring comprehensive data collection.
- 2. Rugged & Weatherproof Design:** Engineered for extreme mining conditions with a robust, weatherproof aluminium enclosure.
- 3. Heated inlet for high accuracy:** Dustroid Max comes with a heated inlet, which dehumidifies the sample to eliminate humidity, ensuring highly accurate dust measurements.
- 4. Real-Time Data Insights:** Provides immediate access to dust levels, wind speed, and wind direction,



**INSTALLATION
DETAILS**

**1 UNIT of
DUSTROID
MAX**

enabling proactive mitigation.

- 5. Seamless Integration:** Supports multiple data transmission methods (GSM, Wi-Fi, LoRa) for effortless connectivity.
- 6. Low-Maintenance:** Ensures uninterrupted operation with minimal intervention, reducing downtime.

Oizom's Dustroid Max provided DGM with accurate, real-time dust monitoring, enabling proactive dust control in harsh mining conditions. Its robust design, seamless connectivity, and low maintenance ensure reliable environmental compliance and a safer work environment.

THE TRANSFORMATION: A Key Benefits of Oizom's Technology

Since the installation of the Dustroid Max, DGM has experienced significant operational improvements:

- 1. Enhanced Environmental & Worker Safety:** Real-time dust monitoring allows quick interventions, reducing airborne pollutants and protecting worker health.
- 2. Optimized Dust Mitigation Strategies:** By analyzing dust dispersion patterns and wind data, DGM has identified key dust sources and implemented targeted suppression measures.
- 3. Improved Operational Efficiency & Decision-Making:** Reliable data-driven insights have streamlined compliance reporting and environmental risk assessments.
- 4. Data analytics and prediction:** Envizom's advanced analytics, along with dust emissions reports, help predict and control dust generation trends, leading to better resource allocation.
- 5. Proactive mitigation:** Real-time data enables proactive mitigation, and adaptive dust control techniques have resulted in lower particulate emissions across operational zones.
- 6. Accurate data in every condition:** Dustroid Max delivers accurate real-time data in all conditions, ensuring reliable dust monitoring even in extreme weather and high humidity.

Since its deployment, Dustroid Max has helped DGM with effective dust management with real-time insights, data-driven decisions, and proactive mitigation.

BROADER IMPACT: Pioneering Sustainable Mining Practices

The success of this initiative underscores how real-time dust monitoring can revolutionize environmental management in the mining industry. By leveraging advanced monitoring technology, Codelco División Gabriela Mistral has set a new standard for sustainable mining operations:

- 1. Influencing Regulatory Policies:** Real-time dust data strengthens compliance with environmental regulations and encourages data-driven policy reforms in the mining sector.

- 2. Enhancing Community Relations:** Reduced dust emissions contribute to a healthier environment for nearby communities, fostering goodwill and social responsibility.
- 3. Scalability Across Mining Sites:** The success of Dustroid Max at DGM demonstrates its potential for broader implementation in other mining operations worldwide.

DGM's proactive approach serves as a benchmark for other mining companies aiming to minimize environmental impact. By enhancing worker safety, optimizing dust control, and streamlining operations, Oizom's technology ensures a cleaner and more efficient mining operation.

CONCLUSION: Advancing Sustainability in Mining with Smart Monitoring

By integrating Oizom's Dustroid Max, Codelco División Gabriela Mistral has taken a significant step toward sustainable mining operations. The real-time, high-accuracy dust monitoring system has enhanced environmental compliance, worker health protection, and operational efficiency.

This project exemplifies how data-driven environmental monitoring can transform industrial practices, ensuring long-term sustainability while maintaining productivity in demanding mining environments.

Oizom is a company specializing in environmental monitoring solutions. They offer products to monitor air quality, weather conditions, and other environmental factors. Utilizing advanced sensor technology and data analytics, Oizom aims to provide actionable insights for construction, industrial compliance, and community awareness. Their solutions can be applied in various sectors including government, industries, and community initiatives.