



# Conveyor Belt Monitoring

## Valparaiso, Chile

Codelco, the National Copper Corporation of Chile, is the largest copper-producing company in the world. AP Sensing is monitoring conveyor belts at one of Codelco's operations, a copper refinery and processing plant. The client wanted to be able to monitor these conveyor belts in real time with the purpose of implementing a preventative (and not simply reactive) system that is able to anticipate critical conditions and generate pre-alarms for abnormal temperature conditions. The project was successfully commissioned in the middle of 2019.

The project began when our partner, RMC Engineering Solutions, started conducting pilot trials and demonstrations to the maintenance team of the mine. The mine was then equipped with one N4387B device for Linear Heat Detection (LHD) with 4 channels and a 2 km range in a redundant setup. This monitoring unit is paired with our armored fiber optic sensor cable. The sensor cable is maintenance-free and highly resilient to tough industrial environments and extremely high temperatures (tested to withstand 750 °C flame temperature for up to 2 hours). An additional offering by AP Sensing is our SmartVision™ software. This project utilizes our asset visualization software to illustrate alarm zones, operational status and real-time temperatures at a glance.



*Project view of AP Sensing's SmartVision Asset Visualization Software*

A connection with SCADA via Modbus shows defined temperature zones as well as fiber optic cut signals. This is displayed on the operators' SCADA screens, generating a stop alarm for the conveyor belts in the event of a confirmed alarm due to an increase in temperature.



*Copper conveyor belt with sensor cable at Ventanas Operation*

Relays are connected to a central panel of fire alarms using monitoring modules in order to activate the fire suppression system. The project also implemented a wireless communication network that would allow information to be transmitted to a central unit within the client's company, in addition to integration into the FACP system and fire extinguishing system.

### **Testing**

The system was fully tested and activated. Once the temperature increases at any given point along the entire fiber optic cable by more than 15 °C in an adjustable timeframe, the corresponding relays are activated to indicate a pre-alarm. The relays triggered the monitoring modules present in the central fire panel and initiated the activation of an audible notification system. Lastly, the system was tested for correct alarm activation and relays with a temperature increase of 30 °C. The relays were used to activate the monitoring modules again and also activate the discharge systems (water mist) associated with the belt area. Conveyor belt stoppage is also performed by the relay signals connected to SCADA.

The aforementioned tests were fully accepted and approved by the customer, and the AP Sensing systems are now validated in Coldeco Group due to AP Sensing's unique technical approach and advantages over other fire detection systems.