

# Rosemount 5408 Provides Reliable Measurement in a High Temperature Blast Furnace

## RESULTS

- Stable reliable measurement achieved despite the high temperatures and fast level changes
- Downtime virtually eliminated
- Redundant measurement achieved
- Increased worker safety



## APPLICATION

Level measurement in two high temperature blast furnaces with temperatures up to 2200 °F (1200 °C)

## CUSTOMER

A metals and mining facility in Brazil

## CHALLENGE

The customer required reliable level measurement in their blast furnaces. The furnaces are fed from the top by a mixture of iron ore, coke and lime, and injected with heat from the bottom of the furnace. Due to the chemical reaction and heat, the product fractionates and useful metal falls to the bottom, slag floats on the top, creating an uneven and rough surface. The furnace is then emptied from the bottom.

This application is critical in order to keep the site working efficiently. Without reliable level measurement, the furnaces cannot operate and an unplanned shutdown could mean losses of up to \$300K per day. There are also additional safety issues due to the extremely high temperatures involved - approximately 2200 °F (1200 °C) inside and 570 °F (300 °C) outside.

Due to the obsolescence of previous level measurement technology used on the furnaces, the customer required a reliable alternative. Fast changes of the level inside the furnaces, extreme high temperatures, and continuous presence of carbon monoxide and soot during the furnace loading made this a particularly challenging application. Also, the furnace cannot operate without a redundant level measurement.

## SOLUTION

Two Rosemount™ 5408 Non-Contacting Radars with Frequency Modulated Continuous Wave (FMCW) technology were installed in each of the two blast furnaces. The second radar was installed to provide redundant measurement. Each transmitter was installed inside a cooling box with nitrogen purging to mitigate the effects of both the process and ambient temperatures on the radar.

*“We now have reliable, redundant measurement with increased safety using the Rosemount 5408”*



*Rosemount 5408 mounted inside a cooling box*

The FMCW technology’s reliability, agility, and ability to handle even the most demanding application challenges allowed the furnace to operate without error. As a result, operations were able to run the furnace with the required redundancy by using continuous measurement with the Rosemount 5408s, along with a point level switch (see graph to the right).

This solution eliminated the risks of furnace shutdown thanks to the reliability of the level transmitter, which provided high sensitivity and remote diagnostics. As a result, the customer was able to avoid potential shutdown costs of up to \$300K per day.

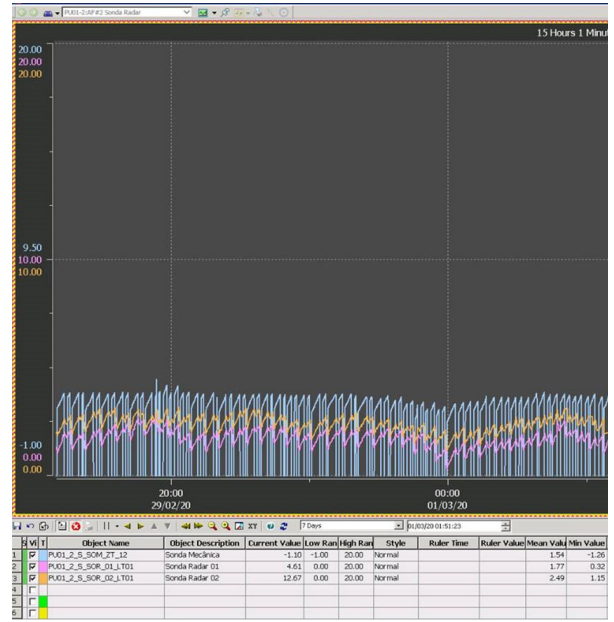
## RESOURCES

### Rosemount 5408 Non-Contacting Radar Level Transmitter

[Emerson.com/Rosemount5408](http://Emerson.com/Rosemount5408)

### Emerson Automation Solutions Industries

[Emerson.com/Mining-Minerals-Metals](http://Emerson.com/Mining-Minerals-Metals)



Loading graph from the DCS compares the measurement for the redundant technologies installed on the top of the blast furnace:  
 Light blue: mechanical level switch  
 Purple: Rosemount 5408 Non-Contacting Radar No. 1  
 Yellow: Rosemount 5408 Non-Contacting Radar No. 2

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