



STEEL MANUFACTURER IMPROVES BLAST FURNACE EFFICIENCY WITH INTEGRAL ORIFICE FLOW METER

Customer

Steel Manufacturer in Australia

Application

Blast Furnace Efficiency

Challenge

The production of steel requires a lot of energy in order to transform the raw material into final product. Due to rising costs in energy production, there are numerous steel mills in the world wanting to improve efficiency throughout the plant. One of the main areas for improvement is in the blast furnace area. Operators combine iron ore, limestone and coke in a blast furnace to produce molten iron. The iron is then refined with scrap and other additives in a basic oxygen furnace to produce liquid steel. Such facilities are capital-intensive and are capable of producing two to four million tons of steel annually.

A major international steel manufacturer realized that they could obtain a nine-month payback by improving blast furnace efficiency. Blast furnace efficiency is greatly influenced by the airflow supplied for combustion. The company determined that furnace operation could be optimized by changing the process of providing airflow by injecting oxygen into the tuyeres of the furnace.

In order to meet the rigors of this new process, the application required a number of criteria to be met. First, the metering of the oxygen process was critical and had to be very accurate in order to ensure correct levels of oxygen injection. Second, due to the combustibility of oxygen, the flow measurement flow meter had to be clean, safe and reliable. Lastly, the blast furnace could not be shut down, so installation required minimal downtime.

Results

- Reduced installation time
- Minimized downtime
- Improved blast furnace efficiency



Rosemount™ 3051SFP Integral Orifice Flow Meter

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Solution

The installation of the Rosemount™ 3051SFP Integral Orifice Flow Meter solved the customer's challenge of safe installation, accuracy and maintenance. In addition, Rosemount orifice plates adhere to AGA3 and ISO 5167 standards. This flow meter was shipped cleaned for oxygen service to ensure safe operation. The ready-to-install configuration also helped to reduce installation downtime.

The 3051SFP provided a "drop in" solution for the mechanical contractor who was building the injection system offsite. The required straight pipe lengths are integral to the flow meter. This fully integrated flow meter eliminates the need for fittings, tubing, adapters, manifolds, and mounting brackets, thereby reducing welding and installation.

The 3051SFP combines the Rosemount 1195 Integral Orifice with the Rosemount 3051S Scalable Transmitter in an integrated DP flow meter. The 3051SFP was able to achieve tighter control because the flow meter's design addresses many of the errors associated with measurement in small line sizes. The pipe section is honed to 32 inches, significantly reducing pipe ID uncertainty. A self-centering design ensures proper installation of the orifice plate in the pipe. Finally, the 3051S with 0.025% accuracy ensures accurate and repeatable performance.

The 3051SFP met all of the criteria required in making the oxygen injection measurement improve the plant's blast furnace efficiency. By providing a complete solution optimized to the measurement requirement, start-up, and operation have been worry-free. The customer estimated a nine-month payback was achieved due to the flow meter's accurate measurement of oxygen injection and reduced installation time with the "drop-in" solution.

"There is enough to worry about on this project already. With the Rosemount solution, I don't have to recheck all the standards, worry about straight pipe lengths, or the oxygen environment. This flow meter is perfect for our application."

-Project Manager



Rosemount 3051SFP Integral Orifice Flow Meter pipe rack skid with the "drop-in" solution

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