

Schaeffler Global Technology Solutions

Steel and non-ferrous metals

ArcelorMittal, France

Reliable condition monitoring of continuous furnace deflection rolls

The ArcelorMittal plant in Mouzon (Ardennes, France) is part of the Group's Flat Products division. From here, the steel company supplies not only all major automobile manufacturers but also customers in the construction and household appliances industries. In Mouzon, an aluminum-based coating is applied to the coils supplied by the Group. Two coating units are in operation making the finished products.

Challenge for Schaeffler

Continuous furnace LM1 has 7 deflection rolls supporting the running of the steel belt and its tensioning. Factors such as imbalance, excessive clearance or the fracture of a feather key can cause these rolls to fail. Damaged bearings or housings can lead to an immediate standstill of the continuous furnace and result in a significant loss of production. In order to avoid such undesirable events, ArcelorMittal's maintenance department was therefore looking for a suitable solution to switch over from corrective maintenance to predictive condition monitoring.

Schaeffler Solution

Schaeffler developed an innovative service concept for the condition monitoring of all critical components of the continuous furnace. The solution comprises 14 SmartCheck systems for the permanent monitoring of roll oscillation. A SmartController acts as a bidirectional gateway between the customer's control system and the sensors of the SmartCheck. The use of Power over Ethernet (PoE), which ensures both the power supply of the system and communication with the ArcelorMittal monitoring station, has minimized the amount of cabling.



ArcelorMittal

Technical Information about the Plant

Location:

Mouzon, Ardennes, France

Capacity:

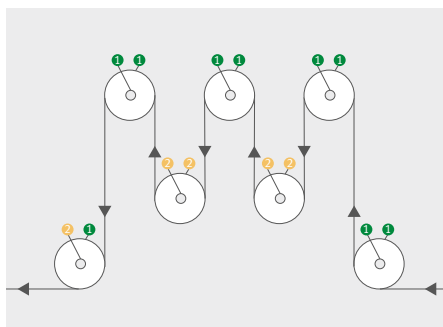
348 000 tons of coated steel

Application:

Continuous furnace

Monitored assemblies:

7 deflection rolls of continuous furnace LM1



Visualization of alarm system
1 = Value OK / 2 = Early warning



Control cabinet with SmartController



Schaeffler SmartCheck

Customer Benefit

This condition monitoring solution enables the customer to avoid unscheduled shutdowns and to better plan maintenance measures. Any incipient damage to bearings or adjacent mechanical components can be detected at a very early stage and corresponding countermeasures initiated. Condition monitoring helps to effectively prevent cost-intensive loss of production and the bearing status is continuously tracked without having to stop the machine.

Estimated annual savings		
Measure	Approx. costs	Savings (shutdown vs. maintenance)
Scheduled maintenance work 8 hrs.	€ 1 000	
Unscheduled shutdowns (without continuous furnace standstill)	€ 35 000	€ 34 000
Unscheduled shutdowns (with continuous furnace standstill)	€ 200 000	€ 199 000
One-off expenses for condition monitoring system	€ 20 000	
Effective savings: (without furnace standstill)		approx. € 14 000
(with furnace standstill)		approx. € 179 000

What's special

By using the condition monitoring system, the customer receives information about possible failures at an early stage and can thus carry out suitable maintenance measures in good time. This solution is also suitable for other machines at the plant.

Technical Information about the Solution

Monitoring system:

- 14 SmartCheck
- 1 SmartController

Power supply:

(PoE) Power over Ethernet

Input provided by the customer:

- Speed
- Load

Monitored assemblies:

7 deflection rolls with special bearing supports

Monitored components:

Bearing housing, bearing, alignment and imbalance of rolls

Monitored parameters:

- Bearing vibration
- Bearing temperature
- Rolling bearing components
- Lubrication
- Imbalance and misalignment
- Condition of roll surface

Measurement methods:

- Speed
- Acceleration
- Envelope curve