Increased productivity and reduced energy consumption in cement mills

SITRANS FC mass flowmeters

Case Study - July 2005

cement

After modernizing its cement mills at Peggau near Graz in Austria, Wietersdorfer & Peggauer Zementwerke is taking care of the environment, saving energy and further improving the quality of its range of high-grade cements. Two Coriolis mass flowmeters play a key role. Offering a high degree of automation, precision and reliability, the flowmeters are used to measure grinding additives, and have a decisive influence on the production process.

SIEMENS

The company
A major goal of Wietersdorfer & Peggauer Zementwerke (W&P) is the continuous improvement of product quality, productivity and safety. The privately-owned company is therefore continuously investing in the expansion and modernization of its two production facilities in Peggau and Wietersdorf.

In addition to purely economic aspects, the company attaches great importance to taking ecological aspects into consideration, such as reducing energy consumption, minimizing emissions and optimizing the use of raw materials.

A prime example of process optimization at W&P are the two cement mills in Peggau. Over a year ago, the company modernized the installation and implemented the Siemens Simatic S7 process control system to control the cement manufacturing process.

However, even a highly advanced control system is reliant upon correct and dependable information from the field. For this reason, the company decided to automate traditionally difficult areas, such as the metering of additives for the grinding process , using the latest generation of field devices.

The process
Cement mills grind the base material clinker together with additives such as gypsum, slag and lime to make the finished product. Grinding additives ensure smoothness of grinding and accelerated processes. The addition of metered quantities of these substances gives the cement a finer granulation and better flow properties, which in turn means lower handling costs. Grinding additives thus improve the quality of the cement.

These substances also make it possible for the clinker to be partially replaced by inexpensive substitutes such as slag, light ashes, or fillers such as limestone. W&P utilizes Glucose - increasing the grinding output of the mill and improving productivity, lowering energy consumption and reducing grinding costs overall.

The challenge
Ensuring adequate dispensing of the grinding additives is, however, a difficult task. Using too little of the grinding additive means that the mill does not run at optimum performance. Dosing too much, however, means that the material runs through the mill without being sufficiently ground.

The previous volumetric dosage system employed by W&P has now been replaced by a sophisticated metering system ensuring correct and dependable determination of additive quantities.

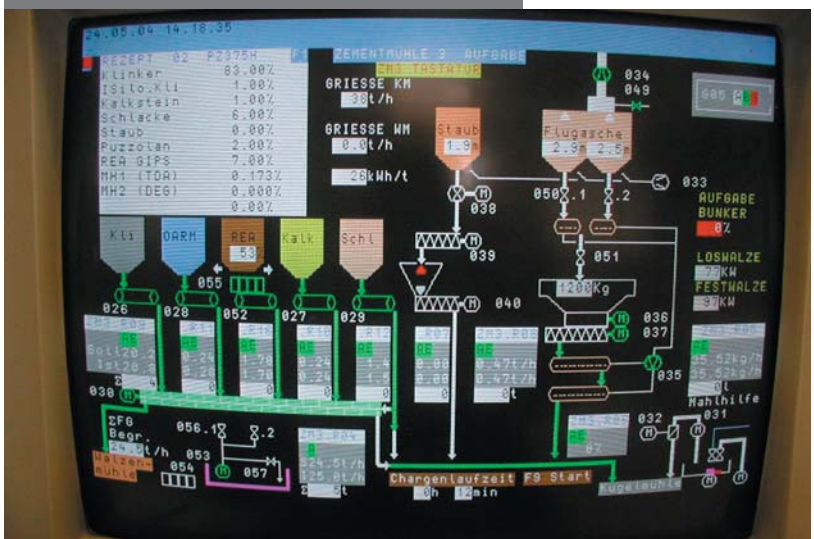
A dosing pump dispenses grinding additives in different quantities dependent upon the cement type currently being produced. Flowmeters installed in the loop deliver the key information to the dosing pumps about the exact quantity of grinding agent to be dispensed.

This application poses high demands on the instrumentation installed. The diversity of cement blends produced by W&P means that the flowmeter must be able to cover a very wide measurement range – in this case, 20:1.

The grinding agents are also non-conducting, rendering traditional magnetic-inductive flowmeters ineffective. In addition, very small quantities of the grinding agents have to be accurately dosed.

The 80 m length of the pipe means that pressure drops are also an issue, and the aggressive medium makes stainless steel piping necessary.

The photo to the left shows an overview of the application on the control system. The photo to the right shows the containers with the additives. The level of the containers is measured with Siemens ultrasonic level measurement devices in order to monitor and control the dosing of additives.



The solution
All of these requirements ultimately led the company to select SITRANS FC flowmeters with MASS 6000 transmitters and MASS 2100 DI3 and DI6 sensors.

Each flowmeter is permanently assigned to one milling unit and the dispensing system is connected to both units. This allows W&P to dose both mills simultaneously, something that was not possible in the past. This increases flexibility in production for the customer.

"The Siemens SITRANS FC flowmeters have been installed for more than a year now and have consistently delivered accurate data. This is something we expect of our equipment suppliers," said Hubert Thaller, in charge of maintenance at Wietersdorfer & Peggauer.

The product
Siemens' SITRANS FC Coriolis mass flowmeters are known for their high measurement accuracy of 0.1% over a wide measurement range.

They are suitable for both liquids and gases in applications with both high or very low flow rates and measurements are virtually unaffected by changes in the process parameters.

As a genuine multiparameter instrument, the Coriolis flowmeter supplies additional information about material density, material fraction, and temperature. This presents a real benefit, as the quality of the measurement can be optimized by having data about the density of the additive being dosed.

Additional diagnostic functions ensure optimum availability and a high product quality. Since the flowmeters have no moving parts they are virtually maintenance-free. An intelligent sensor design with a focus on safety, reliability and quality guarantees a high level of performance.

The SITRANS FC devices are the only flowmeters on the market for which both the hardware and software can be completely configured by the user.

The smart Universal Signal Module (USM II) supports tailoring to the functions required by the customer and the USM II platform is compatible with all current communication protocols such as HART, Profibus, CANopen and so on.

Inconspicuous but effective: The mass flowmeters of the SITRANS FC series meet all of the customer requirements posed by a company such as Wietersdorfer & Peggauer. Through modernizing the plant, the company has been able to improve its process monitoring and safeguard the quality of its high grade cements, which it has been producing for over a century.

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