Testo
Example application

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Monitoring and optimizing cement production with the emission measuring instrument testo 350.

Worldwide, no material is used more for building than cement – and the demand is increasing daily. Accordingly, supply is growing, and the competition on the market is becoming tougher. As a result, impeccable product quality as well as time- and cost-efficient production are of crucial importance. On top of this, numerous environmental protection regulations must be adhered to. The use of the most modern measurement technology, such as that of the testo 350, is thus indispensable.

The challenge.

In cement production, three main areas of use for the monitoring and analysis of occurring emissions can be defined.

Testing furnace atmosphere in brick production
In this area, average temperatures of 1,100 °C to 1,300 °C are reached. In addition to this, concentrations of 2 Vol. % O_2, max. 500 ppm CO and approx. 1,000 ppm NO are to be expected. A possible site for recording these values can be at the rotary furnace exit, for example. Here it is easy to establish whether incorrect air intake occurs between the pre-heating input and the pre-heating exit.

Testing furnace atmosphere in the pre-heater
In the core process of cement production, the raw material is passed down through a cyclone tower, where it is treated with hot process air from the opposite direction in order to drove out the CO_2. At the exit from the pre-heater, measurement values of 700 °C, 3 Vol. % O_2, 500 ppm CO and 400 ppm NO are to be expected. Daily measurement of these parameters is recommended.

Compliance with environmental stipulations
Cement production is a raw material- and energy-intensive process which produces an accordingly high level of emissions which are harmful to humans and nature. For example, the regular drying and heating cause exhaust gases which contribute to the extremely dusty exhaust air from the process as a whole. Among the emissions are carbon dioxide emissions which occur in combustion.
In order to ensure that all emissions remain within the environmental protection regulations, the emissions must ideally be measured and analyzed directly at the flue. This is the only way to allow the responsible people to react in time, optimizing the respective processes and plants if limit value violations occur.

Brick production (calcination process)

Firing the raw granulate in the pre-heating plant and the rotary kiln.

In order to keep up with the competition for the most-used building material in the world, not only does good product quality need to be guaranteed with as low a consumption of time and cost as possible, but also the relevant environmental protection regulations have to be adhered to. Testo has taken on this challenge and designed an optimum solution: the emission measuring instrument testo 350.

The solution.

The portable emission measuring instrument testo 350 is the ideal tool for professional flue gas analysis. It consists of the control unit and the analyzer box.
The control unit is the removable control and display unit of the testo 350. The measurement values are clearly presented in the colour graphic display of the control unit. The measurement technology is situated in the analyzer box. Thanks to the internal memory, measurement data can be transferred from the analyzer box to the control unit. If required, several analyzer boxes can be simultaneously operated and controlled with one control unit.
The robust housing of the measuring instrument has an integrated impact protection. Downtimes due to instrument contamination are almost completely eliminated by the robust design. Closed chambers also protect the interior of the instrument from contamination from the surroundings.
As an alternative to the control unit, operation can also be carried out in direct connection with a PC or notebook. After programming, the analyzer box can conduct measurements and store data independently. This increases the efficiency of your measurement routine.

Optimized for the cement industry
The control unit is recommended for the use of the testo 350. However, the analyzer box, with its various sensors, is indispensable. For example, only with the O_2 in the analyzer box can the trace oxygen concentration in the exhaust gas be measured; the CO sensor, on the other hand, serves to measure CO concentration at many different sites; and finally using the NO sensor and an optional NO_2 sensor, the compliance with the NOx limit value can be easily monitored.
In order that the exhaust gas values refer to dry gas, and thus comply with an official measurement (this is required for preparatory measurements before the official emission measurement), Peltier gas preparation incl. peristaltic pump is required (optionally available).
High CO concentrations due to stoichiometric conditions can be covered by the measuring range extension for the single slot (CO).

The one-meter industrial gas sampling probe with thermocouple for temperatures up to 1,200 °C belongs to the basic equipment for measurement in the cement industry. An additional connection line of 5 metres' length serves to transfer data from the control unit to the analyzer box. A special benefit is provided by the practical testo easyEmission software. It allows measurement values to be stored, documented and analyzed on a computer. In addition to this, the measurement results can be printed out on site.

testo 350: robust and convenient for use in tough surroundings.

testo 350 – the advantages at a glance:

- Guided operation with helpful instrument pre-settings – for even easier measurements
- Large colour graphic display – for increased convenience in bad light conditions
- Insensitive to impact and dirt – ideal for use in tough surroundings

More information.

More information on the testo 350, and answers to all your questions concerning emission measurement at www.testo.com.

The emission measuring instrument testo 350.

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