

For cool heads

Radiometric detection of deposits in cyclones



Holcim Schweiz AG is Switzerland's largest domestic producer of cement and a subsidiary of global company LafargeHolcim Ltd. Holcim's core business includes the production of concrete, gravel and cement and the associated services. The company, with a workforce of 1,200 at 55 locations, operates three cement, 16 gravel and 36 concrete plants.

"The new Gammapiilot FMG50 operates at ambient temperatures of up to 80° C without additional water cooling. That eliminates the complicated installation and operating costs associated with an auxiliary water cooling system. The Gammapiilot FMG50 is thus the ideal instrument for detecting blockages in cement plant cyclones."

Markus Berndt
Process engineer
Holcim, Switzerland



Commissioning was easier and safer with the new Gammapiilot FMG50 Bluetooth functionality.

Cement manufacturing is complex and demands a high level of system availability. Holcim Schweiz AG employs the new Gammapiilot FMG50 at its cement plant cyclone. The instrument reliably monitors product blockages during the process and detects the build-up of deposits in the cyclone. With the FMG50, Holcim can save 240 liters of water per hour and 800 euros in wiring costs.

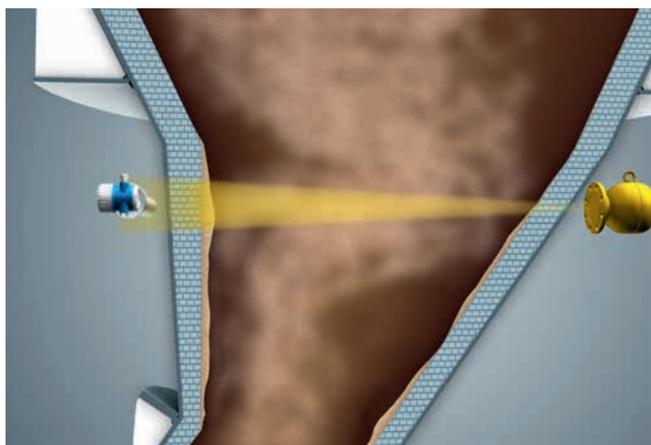
Customer challenge Cement manufacturing begins in the stone quarry where limestone and marl are excavated. The rock is broken up with so-called crushers, transported via conveyers and then homogenized. After quartz sand and clay are added, the limestone is ground to create the so-called raw meal or raw mix. This material is then preheated in a cyclone prior to manufacture of the so-called cement clinker. This step of the process employs a radiometric measurement instrument. "The greatest challenge with the process is that we produce 24

by 7. We have to continually monitor the material and gas flows," says Markus Berndt, process engineer at Holcim Schweiz.

The preheating in the cyclone is a demanding process. Depending on the amount of alkali that evaporates from the rotary kiln, considerable deposits can form on the brickwork. Even the slightest interruptions to the material flow have to be detected since they can lead to blockage of the cyclone. "Worst case, it could cause a system outage," adds Markus Berndt. The radiometric measurements, which are not integrated into the process, are carried out externally instead. Invasive systems such as radar, guided radar or capacitive sensors cover a maximum temperature range of 450° C. "The material is exposed to temperatures as high as 800 to 900 degrees Celsius.

The radiometric measurement from Endress+Hauser helps us continually monitor the fill level of the cyclone," says the process engineer. The earlier

the level status of the cyclone is detected, the more continuous and cost-saving the process becomes.



The radiometric measurement technology consists of a radiation source container with an integrated emitter on one side and a scintillation detector on the opposite side.

Our solution The new Gammapilot FMG50 has been installed here since 2019. The instrument offers a crucial advantage for the application since it does not require an elaborate, costly water cooling system. That means Holcim saves considerable amounts of water. This resource efficiency is tied to the expanded temperature range of the FMG50. By using an especially high-quality material and sensor electronics that generate minimal heat, the external cooling can be omitted. Despite the low-power design, the new sensor boasts the same sensitivity as conventional probes. Since the cooling jacket and cooling medium are eliminated, there is less material in the path of the beam so that less radiation is absorbed. The transmitters can be operated with lower activity, which extends their life cycle. The radiometric measurement technology consists of a radiation source container with an integrated emitter on one side and a scintillation detector on the opposite side.

Customer advantages “By eliminating the need for additional water cooling, we save up to 800 euros per instrument in planning, installation and on-going operations costs,” says Markus Berndt. Without the auxiliary cooling, up to 240 liters of water per hour can be saved with high-temperature applications. In addition, with this solution significantly less cabling work is involved. Thanks to the new operations features via Bluetooth, commissioning and maintenance can be carried out from a safe distance even with measurement points that are difficult to access. Integrated LEDs furthermore indicate the status of the instrument from a distance as well. A green LED indicates the instrument is functioning properly. Red points either to a malfunction or a radiation dosage that is too high or too low.



Thanks to a special type of material and two-wire sensor electronics, the FMG50 requires no complicated and costly cooling.

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