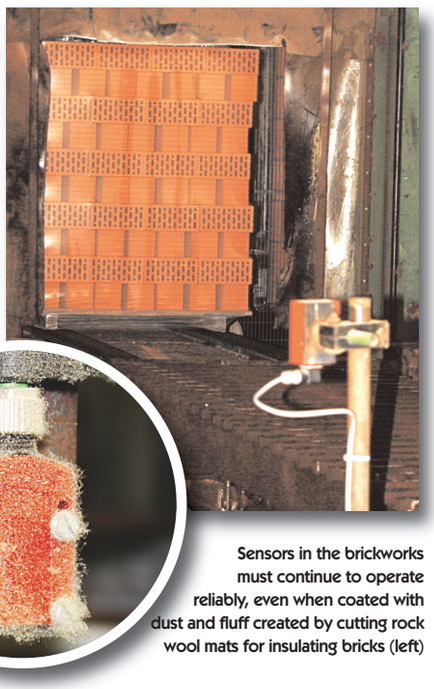
Brickworks places tough demands on sensing systems

THE GERMAN brickmaker Zeller Poroton can trace its history back more than two centuries to 1808 when it began to extract clay from sites near Alzenau, in northern Bavaria. The family business has witnessed incredible developments in brick manufacturing techniques over the past 200 years.

Today, the entire production sequence is controlled electronically. From the blank to the final product, the individual bricks can be tracked, observed, and recorded in a central computer with all necessary batch data.

"We developed and constructed many of the automatic processes ourselves," explains factory manager, Heinz Kunzmann. "We know best what requirements arise from the, in some cases, extreme process conditions. Furthermore, we want to put our know-how to work for us!"



Sensors in the brickworks must continue to operate reliably, even when coated with dust and fluff created by cutting rock wool mats for insulating bricks (left)

Zeller's processes rely on a variety of sensors from diffuse reflection light scanners to through-beam photoelectric sensors and optical distance measurement devices.

Take, for example, a line that produces a building brick that combines clay bricks with rock wool to deliver a product with good thermal insulation, soundproofing, stability and moisture characteristics, and attractive fire protection properties.

To produce these bricks, Kunzmann developed an automation system which feeds, cuts, and pushes a roll of rock wool into chambers in sleeves of pure brick ceramic. During this process, Leuze LSR 25B throughbeam sensors detect the start and end of the rock wool mats and monitor the stack heights. The sensors' performance reserve ensures reliable detection of objects in an environment laden with rock wool dust.

Diffuse reflection light scanners on the gantry crane monitor the transfer station from above to locate unoccupied storage spaces.

Another area where sensors plays a key role is in the shipping transfer station where a gantry crane lifts pallets of bricks that arrive from the production area on a conveyor belt, and moves them to storage spaces, from where, forklifts load the stacks onto trucks. Depending on the time of year, this loading area can be bitterly cold, placing extra demands on the sensors which look down onto the stretch-wrapped stacks of bricks over large detection distances.

The gantry crane is positioned using two Leuze AMS200 optical distance measurement devices which monitor its speed. These devices can detect positions with millimetre precision over a range of up to 200m.

The system knows which stacks are stored in which spaces, but not which pallets have already been retrieved by a forklift. For this reason, Kunzmann mounted a Leuze HRT 96M/P-5000 diffuse reflection light scanner with background suppression on either side of the gantry crane. These scanners, with a range of 5m, monitor the transfer station from above. If six sensors arranged in a row do not detect a stack of bricks, the system determines that the storage space is unoccupied. Reflections from the stretch-wrap material do not affect the sensors, enabling the system to unload up to 800 pallets per day.