Using good sense

Sensors demonstrate reliability under the most demanding conditions in a brick factory

The production of bricks for house construction is hard work – For millennia the process of making moist clay into fired bricks, has placed considerable strain on men and their tools. Fire, air, earth and water have always needed to be mastered in this process, but as manufacturing technology has developed so has the strain placed on automation sensors. For more than 20 years, Zeller Poroton has relied upon the robust design and high quality of the sensors from Leuze electronic, to resist these extreme mechanical loads, plus soiling and thermal effects.

Zeller Poroton's company history begins with the extraction of clay from sites near Alzenau, in the north of Bavaria in Germany. A family business founded in 1808, it has seen incredible development in manufacturing methods in 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 the central computer with all necessary batch data. "We developed and constructed many of the automatic processes ourselves," explained 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!"

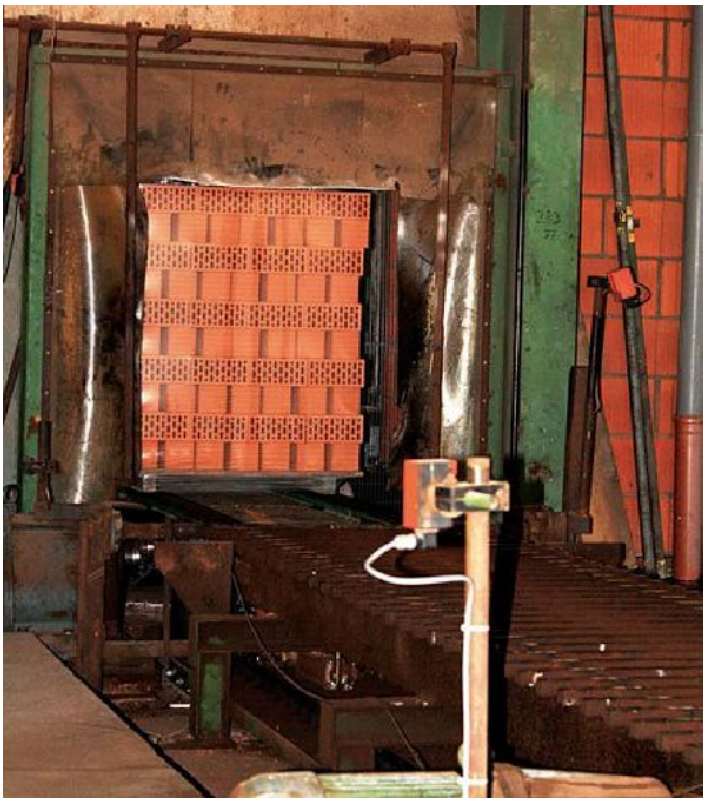
For more than 20 years now he has relied on numerous, varied sensor systems from Leuze electronic, from diffuse reflection light scanners to through-beam photoelectric sensors and optical data transceivers as well as optical distance measurement devices.

"The products function reliably, even under the hard environmental conditions encountered in brick production," confirmed Kunzmann. An example is the optical data transceivers that he mounted in 1990 in front of the ovens.

Process reliability with performance reserve

Leuze electronic's through-beam photoelectric LSR 25B sensors are used throughout an automation system for the production of ThermoPlan MZ8, which is a building brick that combines the clay brick with rock wool.

A specially developed, stable sleeve of pure brick ceramic is filled with high-quality rock wool elements and both securely bonded to one another, to produce a product giving maximum thermal



ABOVE: The entire production sequence at Zeller is controlled electronically. The signals necessary for this purpose are supplied by sensors from Leuze electronic

ABOVE: The dust that is created when cutting the rock wool mats for the ThermoPlan MZ8 does not affect sensor function

insulation, good soundproofing, very good stability, outstanding moisture characteristics and good fire protection properties.

Kunzmann developed automation systems where a roll of rock wool is fed in, cut, and then pushed into the chambers within the brick ceramics. During this process, the through-beam photoelectric sensors detect the start and end of the mats and monitor the stack heights. What Kunzmann particularly values in the devices is their robust construction with an extremely stable and tight housing. Also important for him is the performance reserve, which ensures reliable object detection in the environment that is laden with rock wool dust.

The automatic cutting and filling system for the MZ8 is safeguarded with Leuze electronic's ROBUST multiple light-beam safety devices. Transmitters and receivers of the three-beam system are functional units with separate transmitter and receiver profiles. With their integrated optics heating and protection class IP 67, the active optoelectronic protective devices are designed for operation in rough environmental conditions.

Hard conditions

Kunzmann shows another automation solution in the transfer station near the shipping area, which is dependent on the reliability of Leuze electronic's sensors. High demands are made of the sensors, which look down onto stretch-wrapped stacks of bricks over large detection distances. Additional challenges are the temperature influences of working in an outdoor area where, depending on the time of year, it can be bitterly cold.

In this transfer station, a gantry crane lifts the pallets of bricks that arrive on a conveying belt from the production area, across to free storage spaces, from where, forklifts load the stacks onto trucks.

"By means of the control, the system knows which stacks are stored on which spaces, but not which of these pallets have already been retrieved by a forklift," explains Kunzmann. For this reason, he mounted an HRT 96M/P-5000 diffuse reflection light scanner with background suppression on each side of the gantry crane's traverse. With a maximum scanning range of 5 meters, they monitor the transfer station from above. If six sensors arranged in a row do not detect a stack of bricks, the respective storage space is not occupied. Reflections off the stretch-wrap material do not affect the sensors, enabling the system to unload up to 800 pallets per day.

The gantry crane itself is positioned by means of two AMS200 optical distance measurement devices, which thereby ensure uniform speed. With these devices, positions can be detected at a range of up to 200 metres with millimetre precision. The distance data received in the distance measurement device is available as speed information, on the basis of which, speed monitoring can also be performed. [Photo 4 - AMS200 Distance measurement devices monitor the positioning of the gantry crane and the uniform drive of its axles.]

"While dust and heat are the primary factors contributing to hard working conditions during operation, in the loading area, it is the low temperatures during the cold parts of the year" says Kunzmann, as he outlines the extreme strain placed on man and machine in the brick factory.

For more information contact Leuze on tel: 01480 408 500 or visit: www.leuze.co.uk