



PROCESS INSTRUMENTATION

The highest level of safety and efficiency in bulk material level

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What safety precautions do you take each day?

Using smoke detectors, fastening seat belts while in the car, wearing safety glasses during home improvements. All of these are crucial to ensuring your safety at home and on the road.

Now, imagine being responsible for the safety of workers producing one million tons of gritstone and asphalt each year. What safety measures would you take?

Lafarge Tarmac in Bayston Hill, UK, ensures the health and well-being of its employees while keeping production efficiencies high.

Throughout the plant's operations, Siemens process instrumentation gives Lafarge Tarmac the information it needs to operate safely and efficiently.

Driving the country's construction

As the UK's leading sustainable building materials group, Lafarge Tarmac produces a range of products for the construction industry including ready-mixed concrete, asphalt, cement, and lime.

From its quarries across the UK, Lafarge Tarmac extracts sand, hard rock, and gravel to be used in infrastructure projects like roads, schools, hospitals, homes, and offices. As well, these products play a part in industries such as steel, pharmaceutical, food, clean water, and sewage treatment.



SITRANS LR560



SITRANS RD200



SITRANS RD200 remote display, connected to this custom-built panel, shows level percentages in the fibre pellet storage vessel.



Delivery truck drivers can easily read the display panel while filling limestone dust into the two storage vessels.

For the past century, the Bayston Hill site near Shrewsbury has produced high-quality materials used locally and across the country on major road projects.

The company has shipped this location's particular gritstone even further abroad to Bahrain for its Formula 1 racetrack surfacing and construction project. The quality of stone found at Bayston Hill is ideal for this application as it provides excellent traction and has a long lifespan.

Safely adding additives

The system allows Lafarge Tarmac to control and standardise the management of material deliveries, storage, usage, and reordering of materials. Importantly this system also provides plant safety.

Ingredients for asphalt production include filler dust and fibre pellets: the former helps reduce moisture in the mix, while fibres increase the stability of the asphalt, increasing its lifespan.

Tankers regularly deliver these Filler & Fibre materials to the Lafarge Tarmac

plant. On arrival, the drivers check the relevant panel displays for the amount of Filler or Fibre to be filled. Once authorisation is granted from the control room, the driver connects the hose from the silo to the delivery tanker and use air to blow the light fibres into the storage silo.

The process is similar for filler, and both require close monitoring to ensure safe filling practices are met. This procedure is aligned with the Mineral Products Association (MPA) guidance: "...to prevent over-pressurisation of storage silos during the delivery of (non explosive) powders in the cement, concrete and quarrying industries".

Tanker drivers and operators need to know exactly how much of each material enters the storage silo. On one hand, they want to make sure that the production facility has enough of each additive so that asphalt production isn't slowed down or halted. However, drivers must control the pneumatic filling process so that the silos are not overfilled – a potentially dangerous situation.

To keep materials at an optimal level, operators keep a close eye on the display panel mounted at the base of each silo. This reading is also retransmitted and simultaneously shown in the control room for the purpose of monitoring and the reordering of material.

Each panel is comprised of a SITRANS RD200 display, warning LED's, sounder with flashing beacon, and a Siemens LOGO PLC, and is connected to a SITRANS LR560 Radar level transmitter at the top of the concrete vessel. The radar device continuously tracks the level in the silo, and has two alarm points: High & High-High. A third level, called the Ultimate High Level, is monitored by a Pointek CLS300 capacitance level switch. The panel sequence control is carried out by Siemens LOGO PLC.

All of these devices and processes are closely monitored by a dedicated Siemens service Engineer who takes care of routine maintenance and the onsite calibration.



The 78 GHz SITRANS LR560 radar transmitter (right) provides continuous level readings of fibre, while SITRANS CLS300 (left) gives high-level alarming.



Trucks arrive daily to pick up hot asphalt from Lafarge Tarmac's finished asphalt storage silo. The SITRANS LR560 radar transmitter is installed at the top of the 10m narrow silo that houses the fibre.

Automation throughout production

Elsewhere in the Lafarge Tarmac facility, the SIMATIC S7 PLC and SCADA control system operates the plant's Primary and Tertiary Crushers, and level process instrumentation plays an important role in keeping operations running smoothly. A few examples:

- SITRANS LR300 radar device measuring levels of hot bitumen reaching temperatures of 170 °C (338 °F)
- SITRANS LC300 capacitance level transmitter tracks levels of hot stone bins
- SITRANS LR200 radar transmitter continuously measures finished asphalt levels in the storage silo

Truck drivers arrive at the facility early each morning to load hot asphalt into delivery trucks for local road construction projects. At each step of the production process, Lafarge Tarmac keeps precise measurements of materials.

"Siemens level and remote display instruments help us keep track of our production and make our processes safe for workers and equipment," says Paul Bishop, Electrical Engineer at the Lafarge Tarmac Bayston Hill Quarry.

From this efficient manufacturing facility to the road beneath your car tires, Lafarge Tarmac and Siemens work together to keep you safe.

But don't forget to fasten your seat belt!

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