

Case study

Reducing CO₂ emissions in cement production

Cement Ożarów reduces CO₂ emissions in cement production with Qlar's Schenck Process technology

The energy-intensive cement industry is striving to improve its carbon footprint in response to climate change. A key component of this effort is the increased use of alternative fuels to fire the kilns and calciners in the clinker burning process. In order to continue weighing and dosing smaller quantities of fossil fuels accurately and reliably, plant technology needs to be adapted. The Polish cement plant Cement Ożarów, part of the CRH Group (CRH.plc), is using the expertise of the German manufacturer Qlar. The expert for weighing and dosing technology in the cement industry was known as Schenck Process before rebranding earlier this year.

Cement Ożarów, one of the Poland's major cement producers, operates a state-of-the-art facility that ranks among the largest and most advanced cement kilns in Europe. As part of the globally active CRH Group, which has been operating in Poland since 1995, Cement Ożarów plays a pioneering role in using alternative fuels in cement production. Two decades ago, the plants were fired exclusively with coal. Since then, the company has progressively increased the proportion of alternative fuels to reduce the need for fossil fuels. Today, the kiln and calciner primarily use difficult-to-recycle household waste as fuel. These alternative fuels have become the main energy source for the plant's cement production, significantly reducing coal use.

Driving **circular**
transformation

Precise dosing of small quantities of coal required

Cement Ożarów has been a regular customer of Qlar's Schenck Process technology for many years. As the requirements for cement production evolved, it became necessary to upgrade and adapt the existing plant to further increase the proportion of alternative fuels and save on fossil fuels. At present, it is often not technically feasible to completely eliminate coal. Fossil energy is essential to fire the kilns and maintain temperature stability in the kiln or calciner when the quality of alternative fuels varies.

Cement Ożarów's previous system for feeding coal dust was designed for larger quantities, so it

needed to be modernised to ensure accurate weighing and dosing with reduced feed rates. The new systems had to handle very small quantities of coal while being capable of high throughput rates during start-up processes. Reducing coal feed to smaller quantities is technically challenging as it requires pulsation-free kiln operation. Therefore, the requirements included continuous and accurate dosing of coal dust at low feed rates, while ensuring full utilisation of the feed rate range to maintain production during alternative fuel system maintenance. The high availability of Qlar's alternative fuel line allows it to operate with a lower throughput of coal.

Implementation of the MULTICELL MIN XR system

To overcome these challenges, Cement Ożarów selected the MULTICELL MIN XR system from Qlar. As a trusted supplier of weighing and feeding technology to the plant, Qlar was well placed to upgrade the proven coal dust feeders. The existing systems were designed to feed from approximately 2.5 t/h to a maximum of 20 t/h, whereas the new systems offer a feeding range from 0.55 t/h to 17 t/h. This wide control range, together with the ability to stabilise the coal dust feed and achieve high thermal substitution with alternative fuels, is a significant advantage of the MULTICELL MIN XR.

A key advantage of MULTICELL MIN XR technology is its compatibility with existing equipment, eliminating the need for a complete system overhaul. This seamless integration is particularly beneficial for cement plants such as Cement Ożarów, which can upgrade their existing infrastructure without the significant cost and operational interruption associated with a complete system replacement.

With the MULTICELL MIN XR system from Qlar, the Polish cement producer Cement Ożarów not only enhances its sustainability and efficiency but also secures a competitive edge in the cement industry.

Photo: Qlar



The MULTICELL MIN XR system is designed to retrofit and enhance existing feeding and dosing equipment, utilising the existing set-up while introducing advanced features and improved performance. This approach ensures that plants can efficiently modernise their operations, improve feeding accuracy, reduce coal consumption and increase the use of alternative fuels, while maintaining production continuity and minimising downtime. The redesigned Multicell Min XR continues the success story that began in the early 1990s, with more than 2,000 systems in operation worldwide.

Delivered in August 2023 and installed in the following weeks, the new systems were smoothly commissioned by Qlar service experts from Germany and Poland. Technicians were available around the clock, resulting in a short production stop of just a few days. The first system has been in operation since November 2023. The system features the newly designed horizontal star feeder MULTICELL MIN XR combined with the reliable and precise Coriolis mass flow meter MULTICOR K80, redesigned in 2020. The MULTICELL MIN XR is characterized by a star wheel

designed for pulsation-free feeding at low feed rates and high efficiency at high feed rates. This design incorporates a patented series of staggered pockets to ensure a smooth, pulsation-free material discharge at low feed rates. Independent material agitation, a proven feature of previous MULTICELL feeders, remains a key benefit of the new MULTICELL MIN XR.

The desired feed range of 1:30 was easily achieved, with a feed range of more than 1:50 demonstrated during commissioning. The MULTICELL MIN XR allows a wide feed range of 1:100. The reduction in coal usage not only facilitates compliance with emission targets but also contributes to cost savings. If the system allows for the usage of one tonne less coal, the savings on fuel costs can reach approximately € 900,000 per year, based on a coal price of € 110/t. This enables a quick return on investment.

By choosing MULTICELL MIN XR technology, Cement Ożarów demonstrates how incremental upgrades can deliver significant environmental and operational benefits, supporting sustainable practices without extensive and costly modifications.

Exceeding customer expectations

The results exceeded the customer's expectations, with even more stable and accurate dosing and a higher feed range than required. The coal feed rate can now be reduced to 0.3 t/h. All performance and production tests have been successfully passed. Cement Ożarów praised the flexibility and comprehensive technical support provided by Qlar during the commissioning of the equipment. By upgrading their plant with the MULTICELL MIN XR system, the plant not only enhances its sustainability and efficiency but also secures a competitive edge in the cement industry. The modernisation has made a significant contribution to the reduction of CO₂ emissions at Cement Ożarów – an important step on the way to environmentally friendly and even more sustainable cement production.

Cement Ożarów, one of the Poland's major cement producers, operates a state-of-the-art facility that ranks among the largest and most advanced cement kilns in Europe.

Photo: Cement Ożarów



Questions?

We're here to help!



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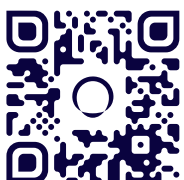
Qlar (formerly Schenck Process) is a global provider of sustainable products, integrated solutions, and services in mission-critical applications for bulk materials. Headquartered in Darmstadt, Germany, the group has more than 1,100 employees with a presence in over 13 countries focusing on markets alongside chemicals and performance materials, infrastructure and energy as well as alternative fuels. The production sites are located around the globe in India, China, Germany, UK and Czech Republic.

The product range includes solutions for industrial weighing, feeding, conveying, milling and grinding,

and related digital applications of the CONiQ product family. With its testing infrastructure of 4 global test centres and 6 centres of competence, Qlar knows more than 40,000 different bulk materials across its relevant verticals.

Under the motto "driving circular transformation" the long-established international company is taking on a leading role in climate-neutral material processing and will focus even more strongly on digitalised and sustainable solutions in future, helping their clients to achieve a carbon-neutral sector by 2050.

For more information, please visit www.qlar.com



For more information, please visit
www.qlar.com/green-cement

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