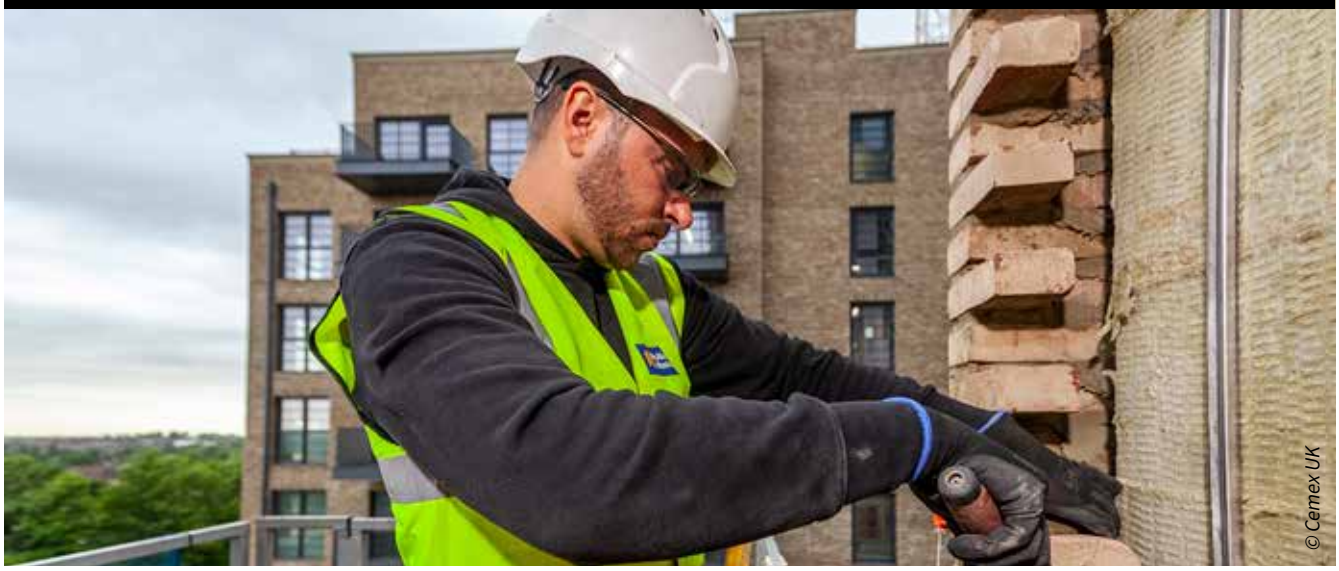
Lower-CO_2 clinker innovation

As part of Cemex's ongoing commitment to decarbonise its operations and products, the company has developed products with a reduced clinker content. Mike May, Cemex's European sales manager for dry and specialist mortar and executive committee chairman of MPA mortar looks at the development and impact of clinker reduction.

■ *by **Mike May**, Cemex, UK*

By developing products with a reduced clinker content, Cemex supports the decarbonisation of its construction materials



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As a global operation Cemex is committed to reducing emissions through a multi-faceted approach to decarbonisation. As one of the world's largest building materials solutions providers, climate action has been a top priority for Cemex for many years with its Future in Action climate action strategy now spearheading a global decarbonisation programme at speed. In line with the company's wider ambitions, the continued focus for Cemex's Urbanisation Solutions and specialist Mortar business is firmly fixed on achieving sustainable excellence through circularity, and natural resource management with the primary objective of becoming a net-zero CO_2 company.

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As an industry, there is no one-size fits all when it comes to meeting its stringent environmental targets. Every business has a unique set of demands, but the push towards net-zero emissions by 2050 presents quite a challenge for the mortar market at large.

Significant strides have been made to reduce the environmental impact of mortar through the adoption of lower-carbon cements and the use of alternative fuels. Recycling much of its returned product also reduces the need for new raw materials as well as minimising waste. Advances have been made here in the right direction, but there remains a need to increase the scale of adoption for more new energy-efficient technologies and processes to lower emissions from production and transportation. The industry is vibrant, strong, experienced and recognised for supplying quality products. Moving forward, many of these challenges will be overcome through increased investment and specialist training, to embrace new technologies and develop more sustainable practices.

New UK mortar plant

To help support significant growth with the demand for specialist mortar product solutions, Cemex UK's Mortar business has announced plans for a new plant in Swindon, Wiltshire, opening in the second half of 2025, dedicated to dry mortar and sprayed concrete production. As part of the Cemex Urbanisation Solutions offering, the new facility will enable Cemex UK's Mortar business to increase production capacity in the southeast and southwest to become a national supplier of both dry mortar and sprayed concrete. Building work for the new facility began in August

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2024, with development works progressing into the new year. The site is planned to be operational during the second half of 2025 and will supply a full range of lower-carbon high performance mortar solutions.

Lower-CO_2 clinker innovation

Innovation is a key lever for Cemex to significantly reduce its CO_2 footprint. The company is pursuing new R&D product development processes that favour lower-CO_2 clinker as well as projects on the carbon capture front. Through a number of high-profile projects in situ and in the pipeline, Cemex is actively pushing boundaries to find new ways to accelerate the decarbonisation process. Globally, it sees carbon capture at the final leg of the journey. The company recently received welcome news that a Cemex consortium has been selected to receive EUR157m (US$171.1m) in funding from the EU Innovation Fund for a pioneering CO_2 capture project at its Rüdersdorf cement plant in Germany. The project, Cemex's largest planned carbon capture, use and storage (CCUS) project to date, aims to capture 1.3Mta of CO_2 from Rüdersdorf's cement production, ultimately decarbonising the site by 2030.

Micronised clinker

Across all other mainstream elements of Cemex's business, the company is working hard to lower emissions using existing technology and more traditional processes to implement and scale its 'reduce before capture' strategies. When it comes to clinker reduction, Cemex has several key initiatives underway. Earlier this year the company developed an innovative approach designed to decrease CO_2 emissions in cement production by reducing the size of clinker particles. This process called micronisation, when combined with the use of proprietary admixtures, allows cement to significantly reduce its clinker factor per tonne of product, thereby lowering its carbon footprint.

Additionally, clinker micronisation has the added feature of maintaining the specified development strength required by the highest global cement standards. Pioneered by the Cemex Research and Development Centre in Switzerland, the company has created an alternative to traditional clinker grinding, enhancing efficiency and significantly boosting the strength of the final product. Industrial scale production trials have validated initial R&D findings to demonstrate that the adoption of clinker micronisation has the potential to reduce the clinker factor in cement products by up to 50 per cent. Concretes produced with Cemex's micronised clinker require less cement to reach the desired strength performance, further reducing the CO_2 footprint.

Clinker represents the most carbon-intensive part of the cement manufacturing process with the most direct CO_2 emissions being generated by the chemical reaction of clinker production in the kiln. Cemex's wider efforts across the company concentrate on substituting clinker with byproducts from other industries like blastfurnace slag and fly ash. Waste from other industries and alternative raw materials reduce the clinker factor while maintaining the same quality and durability of its products. This is a critical success factor for its specialist dry mortar and sprayed concrete offerings where decarbonisation challenges are equally matched by the need to ensure product performance is not compromised.

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New geopolymer clinker-free masonry mortar

The ongoing focus on innovative production techniques, has enabled Cemex to reduce the embodied carbon of its standard mortar range by up to 30 per cent including specialist sprayed concrete solutions, alongside a brand-new offering of Cemex geopolymer clinker-free masonry mortar. Due to be officially launched in the UK in 2025, the new development in mortar is an innovative collaboration between Cemex UK Mortars and Cemex's Global R&D. The clinker-free geopolymer masonry mortar is much anticipated with a customer pipeline awaiting trial. With lower-carbon solutions in high demand, particularly in the specification sector, the company looks forward to bringing the new solution to market and receiving customer feedback during the coming year.

The full lower-carbon mortar range is now included as part of Cemex's enhanced Vertua range, which is comprised of the company's most sustainable products. The Vertua brand covers five sustainability attributes: lower carbon emissions, increasing energy efficiency, saving water, incorporating recycled materials and optimising design. Any Cemex products that bear the Vertua brand must meet requirements for at least one of these sustainable attributes.

Future in action

At the forefront of the circular economy in the construction value chain, Cemex's Future in Action strategic climate action programme continues to pioneer new technologies to increase the use of waste and residues as alternative raw materials and fuels across its operations, with the primary objective of becoming a net-zero CO_2 company. Providing cement, ready-mix concrete, aggregates, mortar and urbanisation solutions in growing markets around the world, it is powered by a multinational workforce focussed on delivering a superior customer experience, enabled by digital technologies. ■

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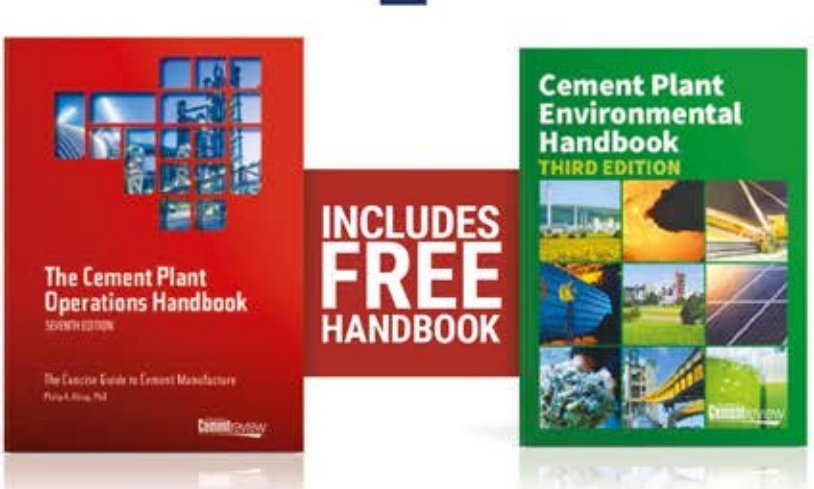

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