

Cement and concrete CO₂ solutions gain traction with new product releases and commercial trials



Highlights

- First Graphene and partners launch new range of mortars, admixtures and grinding aid products with focus on reducing CO₂ emissions and improving durability
- Launches are the culmination of extensive research, development, and trials with industry partners
- New industry partnership leads to additional commercial scale grinding aid trial
- Company enlists new industry commercial manager to spearhead growth
- Cement and Concrete segment forward orders strengthens to circa A\$175,000

First Graphene Limited (“ASX: FGR” or “the Company”) is pleased to announce the launch of a new range of products within its cement and concrete segment focused on reducing CO₂ emissions and improving concrete durability.

The Company also continues to advance commercial scale trials of graphene enhanced cement and concrete, including a second commercial scale grinding aid trial with a major European partner aimed at building upon recent positive laboratory results.

As the Company’s forward-looking order book continues to strengthen, First Graphene has also appointed a new industry commercial manager to spearhead the Company’s future growth.

New product introductions

1. The Company confirms the release of PureGRAPH CEM[®], a variation of the Company’s renowned PureGRAPH[®] graphene product range designed for use in cement grinding aids and admixtures. It is targeted at construction chemical manufacturers, providing an easy to incorporate graphene formulation that overcomes some of the known issues in evenly dispersing graphene into products.

2. The Company also confirms the release of an admixture developed in conjunction with South Africa based Nanoproof/Glade Chemicals. The admixture has shown excellent improvements in recent commercial trials, with significant improvements demonstrated in compressive and flexural strength if used in accordance with recommended loadings. The admixture is now being marketed by the Company as PureGRAPH® AM and is suitable for use by downstream concrete and construction material manufacturers to provide superior strength and durability properties.
3. The Company's distribution agreement with New Zealand based GtM Action, announced in July 2021, has come to fruition with the release of GtM's HexMortar™, a graphene enhanced dry mix mortar for shotcrete and pumping applications. HexMortar™ is formulated to quickly and permanently increase the flexural and compressive strength of dry mortars. Latest trials have shown significant improvement at 3, 7 and 28 days, including a 20% improvement in flexural strength and 27% improvement in compressive strength at the 28-day mark. Additionally, the benefits of graphene are delivering a product that is easy to work with while its minimal rebound reduces waste. The product is the first of a range of solutions being developed by GtM Action for the New Zealand and broader global cement and concrete markets that are in search of innovative products with reduced environmental impact.

Continued progress on commercial scale trials

The Company also continues to work with a consortium of partners including Breedon Cement Limited, Morgan Sindall Construction & Infrastructure Limited and the University of Manchester to develop a "green cement". The consortium received a grant from the UK Government in early 2022 to develop the green technology.

Under the agreement, the consortium is planning a trial utilising up to 1,500 tonnes of specially formulated cement, converting to circa 9,000 tonnes of concrete, with varying doses of PureGRAPH® being applied to determine optimum dosage rates and performance outcomes. This represents **one of the largest commercial trials of graphene enhanced cement and concrete globally**.

The Company is also progressing well in its collaboration with Fosroc International to develop cement additive systems. Under the five-year collaboration agreement, both organisations will contribute to the joint development of a range of PureGRAPH® enhanced cement additives that Fosroc aims to add to its portfolio of specialty products. These would provide the cement industry with a global solution to reducing carbon dioxide emissions and increasing the overall performance of cement.

Advanced grinding aid trials are currently being undertaken with Fosroc in their global competence centres. A procedure to add graphene into the mill has been established. First Graphene Materials Scientists are working closely with Fosroc's Group Technology and local operations teams to demonstrate synergistic performance of graphene and grinding aids

through optimisation of the graphene grinding aid formulation.

In addition, a **second commercial scale trial** has been scheduled with a major European specialty chemicals company. The trial builds on successful laboratory results and aims to replicate the demonstrated improvements in strength and carbon savings on an industrial scale. The trial will require 600kg of PureGRAPH[®] enhanced grinding aid and will produce over 160 tonnes of cement.

Further recruitment of industry specialists to spearhead growth

The Company continues to leverage industry specialists and experts to drive global growth. The most recent appointment is Singapore-based industry veteran Lester Lee as Commercial Manager – Cement & Concrete.

Mr Lee brings to the Company nearly 30 years' experience working in the cement and concrete industries. That includes senior leadership roles in Hong Kong and Singapore with global companies such as Fosroc Construction Chemicals, K. Wah Concrete Company and W.R. Grace.

Exploiting global opportunities

According to data analyst 360 Research Reports, the global cement and concrete market will grow to a market value of US\$774 billion by 2027.

First Graphene continues its pursuit of major commercial opportunities across the cement and concrete sectors, with a key focus on helping the industries achieve a targeted 25% reduction in CO₂ emissions by 2030.

As predicted, the Cement and Concrete segment is building momentum with a forward-looking firm order pipeline of circa A\$175,000 to be fulfilled within the coming months.

First Graphene Managing Director and CEO Michael Bell said:

"It is pleasing to see our efforts, and those of our collaboration partners, coming to fruition at a commercial scale. One of the primary drivers for the adoption of graphene solutions in this segment is the reduction of CO₂ emissions.

We're seeing considerable benefits both in the immediate reductions that can be achieved through the use of graphene enhanced grinding aids, as well as the potential reductions in concrete usage because of the enhanced physical properties these products provide.

Working with industry-focused partners such as Nanoproof/Glade Chemicals, GtM Action, Breedon Cement and Fosroc opens the way to an estimated addressable market of more than 12,000 tonnes of PureGRAPH[®] across the medium to long term."

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About First Graphene Ltd (ASX: FGR)

First Graphene Limited is focused on the development of advanced materials to help industry improve. The Company is a leading supplier of graphitic materials and product formulations with a specific commercial focus on large, high-growth global markets including cement and concrete; composites and plastics; coatings, adhesives, silicones and elastomers (CASE); and energy storage applications.

One of the key outcomes these advanced materials offer is the reduction of carbon dioxide emissions, whether directly through a reduction in output of these harmful greenhouse gases or lower energy usage requirements in manufacturing, or indirectly due to enhanced performance characteristics and extending the usable life of products.

First Graphene has a robust manufacturing platform based on captive and abundant supply of high-purity raw materials, and readily scalable technologies to meet growing market demand.

As well as being the world's leading supplier of its own high performance PureGRAPH[®] graphene product range, the Company works with multiple industry partners around the world as a supplier of graphitic materials and partner to research, develop, test and facilitate the commercial marketing of a wide range of sector-specific chemical solutions.

First Graphene Ltd is publicly listed in Australia (ASX:FGR) and has a primary manufacturing base in Henderson, near Perth, WA. The company is incorporated in the UK as First Graphene (UK) Ltd and is a Tier 1 partner at the Graphene Engineering and Innovation Centre (GEIC), Manchester, UK, where it has a strong marketing and R&D capability.

About GtM Action

GtM Action is focused on using new technologies in traditional industries enabling step change in productivity, growth in knowledge and wealth creation while minimising waste and harmful environmental impacts.

With authority of the board, this announcement has been authorised for release by Aditya Asthana, Chief Financial Officer and Company Secretary.

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