

13th December 2023

Multiple world-leading trials continue to validate performance benefits of PureGRAPH[®] in cement

Highlights

- **Further encouraging results from world-leading graphene enhanced cement trials with Breedon Group and Morgan Sindall Infrastructure**
- **Pioneering graphene-enhanced sand trials continue in New Zealand**
- **Ongoing collaboration confirmed with UK's largest precast concrete supplier**

First Graphene Limited (ASX: FGR; "First Graphene" or "the Company") has been working through a qualification period with graphene in cement for approximately two years and has come through with flying colours on all parameters. As the Company enters 2024, the focus will be on converting this success into commercial agreements for the supply of bulk quantities of graphene to an industry that is heavily focused on reducing its carbon emissions. To that end, the Company is pleased to provide an update on multiple trials of graphene materials in the cement and concrete segment.

New results from world-leading cement trials in UK

First Graphene has received further results from the world-leading graphene enhanced cement trials with Breedon Group ("Breedon") and Morgan Sindall Infrastructure ("Morgan Sindall").

Conducted in the United Kingdom, the trials determined the performance of graphene enhanced concrete slabs in a temporary wheel washing facility, used to support construction work on a highways project.

After four months of use, the graphene enhanced slab continues to perform well and has withstood exposure to constant heavy vehicle traffic loading, along with water and tyre abrasion from construction site traffic.

As previously reported by the Company, the graphene enhanced cement also had an immediate 15% reduction in CO₂ emissions as a result of its lower clinker factor.

Early-stage strength gain was reported, and the slab met the specifications for the concrete pad (37 MPa after 28 days) using a lower clinker factor variant.

Graphene enhanced CEM II A-L cement (Portland Lime Cement) was used in the concrete and longer term (90 day) strength testing indicated it approached the compressive strength of an equivalent slab made with a higher-performing CEM I variant.

First Graphene can announce the results provide a sound basis for Morgan Sindall to continue working with the Company and Breedon to identify further opportunities to collaborate on infrastructure projects.

World-first practical trial of graphene-enhanced sand

The first stage of world-first practical trials of graphene sand for a customer requiring fire retardant concrete panels has been completed, in collaboration with partner GtM Action (“GtM”) in New Zealand.

Two tonnes of a mixed blend of sand and graphene was used to validate the strength benefits of graphene sand and determine if graphene is easier to disperse in concrete when mixed with sand.

Results from this first stage of trials found the cement poured and handled well and showcased similar increases in cement strength to tests conducted in a laboratory setting.

Multiple graphene sand-enhanced panels were provided to the customer, who will apply them in the ceramics industry and provide feedback on panel performance.

The second stage of testing for graphene sand will involve investigating additional benefits, including comparison strength testing and reduction of carbon emissions.

If successful, graphene sand production could be up scaled to a commercial level for the cement and concrete sector as well as alternative industries.

Sand is a familiar product in concrete production and mixing graphene into this well-known material would allow companies to keep their techniques and processes the same.

Proof of concept study complete with FP McCann

The UK’s largest precast concrete manufacturer and supplier, FP McCann Ltd (“FP McCann”) has completed an initial proof of concept study using First Graphene’s PureGRAPH®.

The trial looked at the mechanical performance and sustainability benefits of graphene enhanced cement to potentially optimise FP McCann’s precast concrete production process.

Preliminary lab-based work used a variety of blends, with initial results showing early strength gain in the precast materials.

Additional testing will be conducted by FP McCann to further validate these encouraging results, where full-scale precast elements will be manufactured and structurally tested.

First Graphene Managing Director and CEO Michael Bell said:

“These updates are exciting developments for both First Graphene and our leading PureGRAPH® product, as we continue to develop market-making, graphene-enhanced materials for the cement and concrete industry.”

“It’s an exciting time for the cement industry, and for First Graphene as we advance our commercialisation strategy through a variety of different agreements and collaborations.”

Morgan Sindall Infrastructure, Highways Team Managing Director Sarah Reid said:

“It is very encouraging to see this graphene-enhanced cement full-scale production and site trial achieving the anticipated levels of site performance over the last few months.

“We look forward to our continued collaboration with First Graphene Ltd and Breedon Cement Ltd to support cement carbon reduction.”

-Ends-

This release has been approved for release by the board.

For further information please contact:

Investors

Michael Bell
Managing Director and CEO
First Graphene Limited
michael.bell@firstgraphene.net
+61 1300 660 448

Media

Josh Nyman
General Manager
SPOKE.
josh@hellospoke.com.au
+61 413 243 440

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 benefits of these advanced materials 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.