

Patent filing strengthens pathway to reducing CO₂ emissions in cement production

HIGHLIGHTS

- **Patent filed in the UK to protect Company's intellectual property in the scale up of graphene-enhanced cement admixtures**
- **This strengthens Company's position in dealing with cement companies for the purpose of reducing industry carbon emission levels**
- **Patent specification to assist the Company and its development partners in the commercialisation of admixtures**

First Graphene Limited (ASX:FGR; "First Graphene" or "the Company") is pleased to advise it has filed a patent specification with the United Kingdom Intellectual Property Office that describes a novel method of scaling up the production of graphene suspensions for use in cement additives and concrete admixtures.

Cement mortar is widely used as a binding agent in concrete systems and several studies have shown that additions of less than 0.1 per cent of graphene nanoplatelets can significantly enhance the properties of the mortar.

Effective incorporation of graphene additives has been proven to enhance compressive and tensile strength of concrete by 34 and 27 per cent respectively. However, a challenge associated with graphene nanomaterials is their distribution within cement or concrete as they can tend to agglomerate, which leads to uneven distribution.

The solution is to use water-based admixtures containing pre-dispersed graphene nanoplatelets. Recent lab tests and field-trials have shown that First Graphene's PureGRAPH®, coupled with methods developed by the Company, provide a successful means to produce the admixtures in a robust and consistent manner.

This is a significant step forward in the journey to commercialise graphene-enhanced cement/concrete, and it allows improved access for First Graphene to a major global market-segment, with a solution that not only improves the base material's physical performance, but also significantly improves the industry's carbon footprint. The Company is in discussions with leading industry partners but there are no immediate commercial contracts in place or an assessment of economic impact to report.

The global cement and concrete market is predicted to be valued at US\$774 billion by 2027¹.

Concrete is the most widely used man-made material and the second-most commonly used resource on earth, behind water. It is a major contributor to global CO₂ emissions which are produced in the manufacture of the cement used in concrete products. The Global Cement and Concrete Association has committed to a 25 per cent reduction in carbon emissions by 2030.

¹ Source: 360 Research Reports

ASX ANNOUNCEMENT



Due to the mechanical property enhancements provided by graphene additives, and subsequent reduction in volume requirements for concrete, it is estimated that CO₂ emissions from cement manufacturing could be reduced by approximately 20 per cent through the successful incorporation of graphene.

First Graphene Managing Director and CEO Michael Bell said: *"Given the growth in interest for utilising graphene to enhance the mechanical properties and therefore improve sustainability credentials of cement and concrete products, the patent filing is designed to protect the intellectual property for PureGRAPH® formulations for the Company, its customers and development partners."*

Investors

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About First Graphene Ltd (ASX: FGR)

First Graphene Ltd is the leading supplier of high-performing, graphene products. The company has a robust manufacturing platform based upon captive supply of high-purity raw materials and an established 100 tonne/year graphene production capacity. Commercial applications are now being progressed in composites, elastomers, fire retardancy, construction and energy storage.

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.

PureGRAPH® Range of Products

PureGRAPH® graphene powders and **PureGRAPH® AQUA** pastes with lateral platelet sizes of 50µm, 20µm, 10µm and 5µm, as well as **PureGRAPH® MB-LDPE 20-30** and **PureGRAPH® MB-EVA** masterbatches for thermoplastics, and **PureGRAPH® MB-EVA Bitumen** masterbatch, are available in tonnage volumes. The products are high performing additives, characterised by their high quality and ease of use.

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Trading Symbols

Australia: FGR
Frankfurt: FSE:M11
USA OTCQB: FGPHF

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