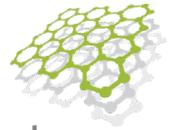


## ASX Announcement

25 October 2018



**first graphene**

The world's leading graphene company

# PureGRAPH™ Graphene Demonstrated In Real-World Application In The Mining Industry

## Highlights

- PureGRAPH™ graphene has been successfully incorporated into a high volume application in the mining sector.
- A full scale mining reclaimer bucket was cast for an on-site trial with a multi-national mining company
- Test work has confirmed PureGRAPH™ readily disperses into the polymer resin used
- Further bucket linings will be cast and sold for use in northern Australia with a multi-national mining group
- PureGRAPH™ enhanced polymer liners for a range of associated applications will also be trialled
- This success with a graphene-enhanced bucket lining will open an important growth curve for graphene enhanced rubbers and composites

Advanced materials company, First Graphene Limited ("**FGR**" or "**the Company**") (ASX: FGR) is pleased to provide an update on the development of its PureGRAPH™ products in mining services products.

### Background

FGR is working closely with a number of companies to demonstrate performance enhancement of their products through the addition of its PureGRAPH™ graphene products. In this case, the wear-life of mining equipment can be extended with the inclusion of PureGRAPH™ graphene into protective polymer linings. The rapid progress made with these polymer linings was enabled by the high consistency of PureGRAPH™ products and the ease of dispersion into the polymer resin. The know-how being acquired is readily transferable to a vast range of other polymer products, in many industries. The suitability of the PureGRAPH™ is particularly pleasing as it confirms this is a commercially superior product.

It is expected that, as manufacturing companies start to witness the improvements that graphene can offer, there will be an acceleration of demand for supplies of PureGRAPH™. First Graphene is well-positioned to satisfy the demand as it enters an exciting growth phase.

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FGR  
FGROC

## newGen

As announced in June 2018 FGR is working with newGen Group on equipment used in the mining industry to improve polyurethane liners to protect them from excessive abrasion and increase their useful life.

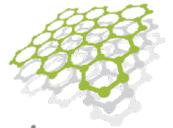
Since then FGR and newGen have conducted various tests using PureGRAPH™ in polyurethane to determine the best suited PureGRAPH™ product and the optimum quantity to be added.

These tests have demonstrated that the PureGRAPH™ product provides significantly increased flexural strength to the base polyurethane product.

newGen have now cast a liner for a Sandvik reclaimer bucket using PureGRAPH™ 20.



Ben Walker (left) MD of newGen and FGR's Craig McGuckin



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The reclaimer bucket liner has 200kg of polyurethane and is strengthened by PureGRAPH™ 20

There are 12 buckets on the wheel for the machine these buckets are destined for, each with a capacity is 2.2 m<sup>3</sup>. The reclaimer has a nominal machine capacity is 12,000 tph and maximum capacity is 14,500 tph in bauxite.



Typical Sandvik 12,000 tph bucket-wheel reclaimer

newGen are now working with FGR on the use of a PureGRAPH™ enhance polyurethane in other high volume mining applications in the iron ore industry where newGen are preferred supplier.

Managing Director, Craig McGuckin, stated: *"Achieving the creation of this bucket liner for a multinational end user is a credit to Ben's foresight and the team at FGR."*

newGen's Ben Walker stated: *"We are pleased to be at the forefront of graphene use in mining materials. It has been excellent to work with the calibre of people at First Graphene in this march towards supplying our valued clients with ground breaking, high performance materials."*

### **About First Graphene Ltd (ASX: FGR)**

First Graphene has established a commercial graphene production facility for the bulk scale manufacture of graphene at competitive prices. The Company continues to develop graphene related intellectual property from which it intends to generate licence and royalty payments.

The Company has collaboration arrangements with four universities and is at the cutting edge of graphene and 2D related material developments. Most recently First Graphene has become a Tier 1 participant in the Graphene Engineering and Innovation Centre (GEIC) of the University of Manchester. First Graphene is working with numerous industry partners for the commercialisation of graphene and is building a sales book with these industry partners.

### **PureGRAPH™ Range of Products**

The PureGRAPH™ range of products were released by FGR in September 2018, in conjunction with a detailed Product Information Sheet.

PureGRAPH™ graphene powders are available with lateral platelet sizes of 20µm, 10µm and 5µm. The products are characterised by their low defect level and high aspect ratio.

### **About Graphene**

Graphene, the well-publicised and now famous two-dimensional carbon allotrope, is as versatile a material as any discovered on Earth. Its amazing properties as the lightest and strongest material, compared with its ability to conduct heat and electricity better than anything else, means it can be integrated into a huge number of applications. Initially this will mean graphene is used to help improve the performance and efficiency of current materials and substances, but in the future, it will also be developed in conjunction with other two-dimensional (2D) crystals to create some even more amazing compounds to suit an even wider range of applications.

One area of research which is being very highly studied is energy storage. Currently, scientists are working on enhancing the capabilities of lithium ion batteries (by incorporating graphene as an anode) to offer much higher storage capacities with much better longevity and charge rate. Also, graphene is being studied and developed to be used in the manufacture of supercapacitors which can be charged very quickly, yet also be able to store a large amount of electricity.

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