

Project Development Update - FireStop™

HIGHLIGHTS

- Firestop™ product offers a new approach to fire retardant coatings which facilitates fire protection using thinner coatings – reducing both coating material consumption and labour costs during application
- Test work continues to demonstrate that First Graphene FireStop™ outperforms existing fire-retardant coatings.
- Superior performance is enabled by the excellent gas barrier and thermal conductivity properties of First Graphene graphene additives
- In standardised testing according to UL94¹; the highest level of UL94-V0 is achieved on timber products coated with FireStop™.

Advanced materials company, First Graphene Limited (“FGR” or “the Company”) (ASX: FGR) is pleased to provide an update on its work with University of Adelaide (UoA) on FireStop™ fire retardant coatings.

Background

Development of the FireStop™ product is being conducted in collaboration with the University of Adelaide as part of the Company’s participation as a Tier-1 member of the ARC Research Hub for Graphene Enabled Industry Transformation.

The Flame Retardancy market is worth \$8 billion in 2016. The most valuable segment is in plastics \$5.7 billion; followed by textiles \$1.1 billion and wood/paper \$0.33 billion and coatings/paints \$0.31 billion.

Test Work Conducted

Following the successful development of a fire-retardant coating formulation the product was tested according to the UL94 standard test method with simultaneous testing of a commercially available competitor product.

Performance in the UL94 test was evaluated in relation to the thickness of coating required for effective fire protection.

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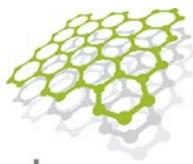
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ASX Code

FGR

FGROC

¹ UL94 refers to Underwriters Laboratories a USA Test House which develops and performs internationally respected test methods for product safety and quality. UL94 is the recognised test method for flammability and evaluates both the burning and afterglow times and dripping of the burning test specimen.



Sample Preparation for UL94 Testing

Coating formulations were applied to untreated balsa wood test pieces with a paint brush. The coating thicknesses were controlled by using a fixed number of coats. The coating thicknesses were then measured after deposition. Balsa wood is used in the test specimens because of its high flammability.

Test specimens were prepared with the following dry thicknesses:

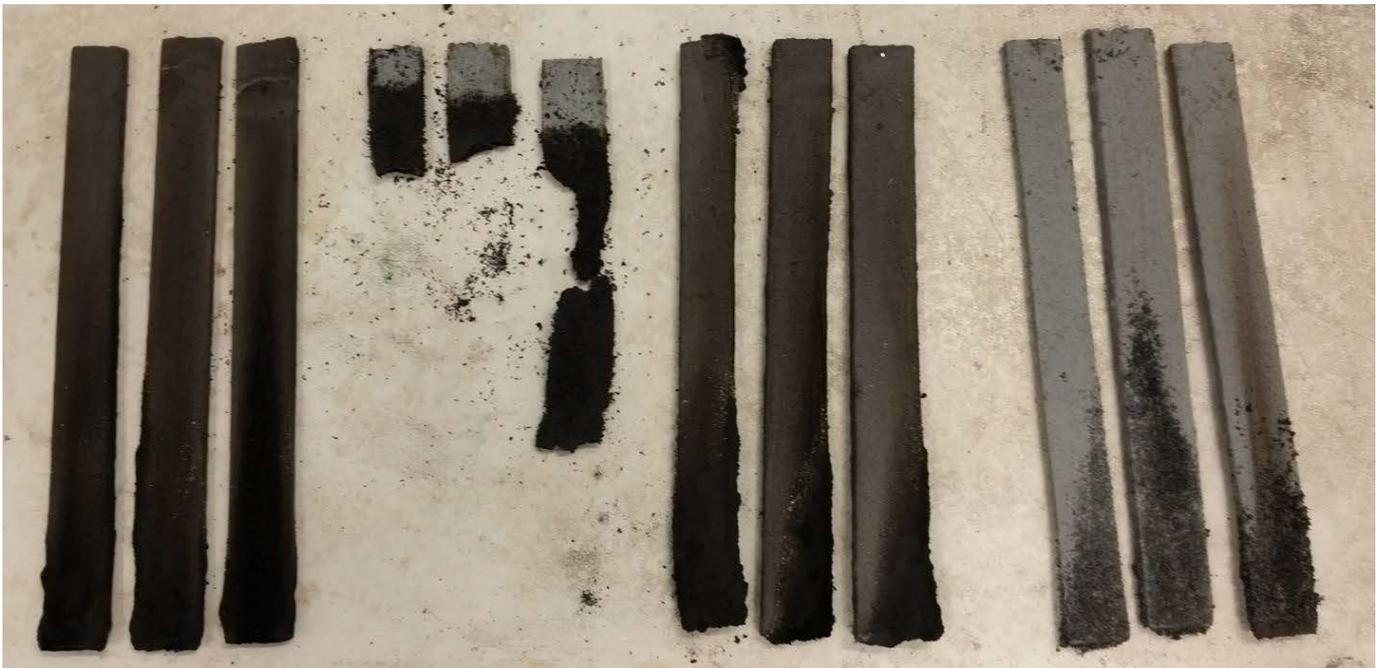
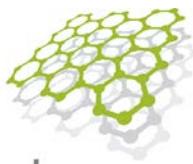
1. Untreated balsa wood.
2. First Graphene FireStop™ at 450 microns.
3. Competitor coating at 700 microns.
4. First Graphene FireStop™ at 700 microns
5. Competitor coating at 1020 microns.

The appearance of coated products is shown in Fig. 1 and the test specimens after exposure to UL94 test conditions are shown in Fig. 2.



Untreated balsa wood	First Graphene FireStop™ 450 μm	Competitor Product 700 μm	First Graphene FireStop™ 700 μm	Competitor Product 1020 μm
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Fig.1 Appearance of coated test specimens



First Graphene FireStop™ 450 μm	Competitor Product 700 μm	First Graphene FireStop™ 700 μm	Competitor Product 1020 μm
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Fig.2 Appearance of coated test specimens after exposure to UL94 test conditions

Results of UL94 testing:

First Graphene FireStop™ performs well at both 450 microns and 700 microns; meeting the UL94-V0 requirements at both thicknesses.

The competitor product does not meet the UL-94-V0 standard at a coating thickness of 700 microns and requires a much thicker coating, in this case, measured at just over 1000 micron (or 1mm) to reach the UL94-V0 standard.

Summary:

The graphene based Firestop™ product offers a new approach to fire retardant coatings which facilitates fire protection using thinner coatings – reducing both coating material consumption and labour costs during application. This performance is enabled by the excellent gas barrier and thermal conductivity properties of First Graphene graphene additives.

Future work

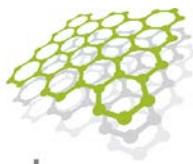
While these initial tests are very encouraging, the University of Adelaide continues to carry out performance testing using recognised test procedures, including LOI (Limiting Oxygen Index) to confirm these findings. This will be followed by independent verification by an external test house such as CSIRO.

Commenting on these results, FGR's Managing Director Craig McGuckin said

"Once again FGR's involvement in the ARC Hub's is providing valuable intellectual property to the Company. We anticipate further improvements with future tests and look forward to keeping shareholders updated as we progress."

Joint Company Secretary

The Company advises Ms Nerida Schmidt has been appointed as joint Company Secretary. Ms Schmidt holds a Bachelor of Commerce from the University of Western Australia, is a Certified Practising Accountant and a Fellow of FINSIA. She is also a Chartered Secretary and holds a Graduate Diploma in Company Secretarial Practice.



About First Graphene Ltd (ASX: FGR)

First Graphene produces high quality graphene from high grade Sri Lankan vein graphite.

First Graphene seeks to develop graphene production methods and acquire graphene related intellectual property which can provide further revenue related opportunities.

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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