



Versarien Plc AGM 2023

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AIM: VRS
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Overview

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Chris Leigh - Future Direction and Funding

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Stephen Hodge - Construction, Textiles & Research Highlights

Future Direction





Introduction

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Cost base and options

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Introduction and working with David Stone



Cost base

- Historic burn rate has been ~ £400,000 per month
- Redundancies and other cost cutting measures have been made providing costs savings which are now coming into effect
- Future burn rate needs further reducing to match availability of funding



Options

- **Divest two mature businesses - Total Carbide and AAC Gyroma**
- **Review overseas operations in Spain and South Korea**
- **Concentrate on construction and textiles sectors – return to other sectors when profitable**
- **Retain core know-how and IP**
- **Minimise PLC overheads**



Historic funding

- Development contract £1.9m (2020-2022) – 5%
- Grants £1.6m (2014-2022) – 5%
- Innovate UK loan £5.0m (2020-2022) – 14%
- Strategic investment £1.9m (2021) – 5%
- Institutional/PrimaryBid equity £16.2m (2013-2018) – 47%
- Non-institutional equity £2.2m (2022-2023) – 6%
- Lanstead equity £6.2m (2020-2022) – 18%

Total £35m



Future funding

- Grants – significant grants applied for
- Debt – not available as security given to Innovate UK and Santander
- Asset disposals
- Equity – dependent on placing authority
 - Strategic investment
 - Too small or early stage for majority of institutional investors
 - Non-institutional equity – more likely to be traded
 - Retail platforms alongside placing required to set the price

Focus on Construction and Textiles

- Highest technology readiness level, significant market opportunities
- Already starting to see the emergence of commercial revenues
- Construction - total value graphene opportunity per annum estimated to be £888m by 2028
 - In-house testing taking place with large ready-mix manufacturers
- Textiles and footwear - total value graphene opportunity per annum estimated to be £363m by 2028
 - Working with Umbro, Bia Brazil and GoToGym





David Stone role

Phase One: Stabilisation

- Work up a 100 day plan that includes:
 - Focus of cost cutting
 - Pause all non-core activities that will not impact longer term development.
 - Review which areas of the Company (Group) can achieve breakeven, positive EBITDA quickly.
 - Continue with the sale of the two non-core businesses: Total Carbide Ltd & AAC Cyroma Ltd.



David Stone role

Phase Two: Strategic Plan

- Review and redefine the approach the Company (Group) takes with:
 - Commercial opportunities / Joint Ventures
 - How to transition from R & D to commercial
 - What resource is needed for R & D and pre-commercial development
 - How to exit elements of Company / Group that are defined as non-core going forward.
 - Plan Roadmap for delivery.



Conclusion

“We will continue to seek grant funding to support our operations but will also need the support of investors either strategic or in capital markets to fund the business until such time as the graphene market gains traction and material commercial revenues flow.”

2022 Annual Report

Construction, Textiles & Research Highlights

Construction





Cementene™

- Demonstrated improvements to a number of mix designs when utilising Cementene™ (water-based admixture containing graphene)
- A number of case studies have been generated
- Process underway with British Board of Agreement (BBA) to ensure compliance with the requirements of BS EN 934-2: 2009
 - Expected to be completed by October 2023
- Trials ongoing with 2 large ready-mix companies

3D Concrete Printing (3DCP)

3D concrete printing

We are currently working with a number of sectors including:

- Highways
- Water
- Marine
- Retail
- Education





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CAMBRIDGE



3DCP headwall

Headwalls are a type of retaining wall that is commonly found near streams, ponds, or similar waterways

Used to provide support for bridges and roadways by anchoring the piping to prevent movement due to hydraulic and soil pressures and prevent soil erosion

Conventional pre-cast headwall →





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3DCP headwall

Versarien have built and delivered a 3D printed headwall to a highway site for installation by Costain and National Highways

Although the design is not yet fully optimized, the 3d printed headwall has achieved:

- Significant reduction of steel rebar
 - Able to incorporate some rebar during printing
- Curved design
- Significant financial savings to the client

Textiles



GRAPHENE - WEAR™

TEXTILES



Graphene-Wear™

- Transfer of printing from GEIC to industrial rotary screen print presses, ~2 m wide, printing at >20 m/min
- We now work with global supply chain partners supplying them with Graphene-Wear™ **printed fabrics**, or in some cases the Graphene-Wear™ formulations
- Commercial traction with a number of UK and global companies incorporating the **Graphene-Wear™** brand
- Versarien has secured the OEKO-TEX^(R) Eco Passport certification for its Graphene-Wear formulation



GRAPHENE - WEAR™



ECO
PASSPORT

EP 60720
Shirley





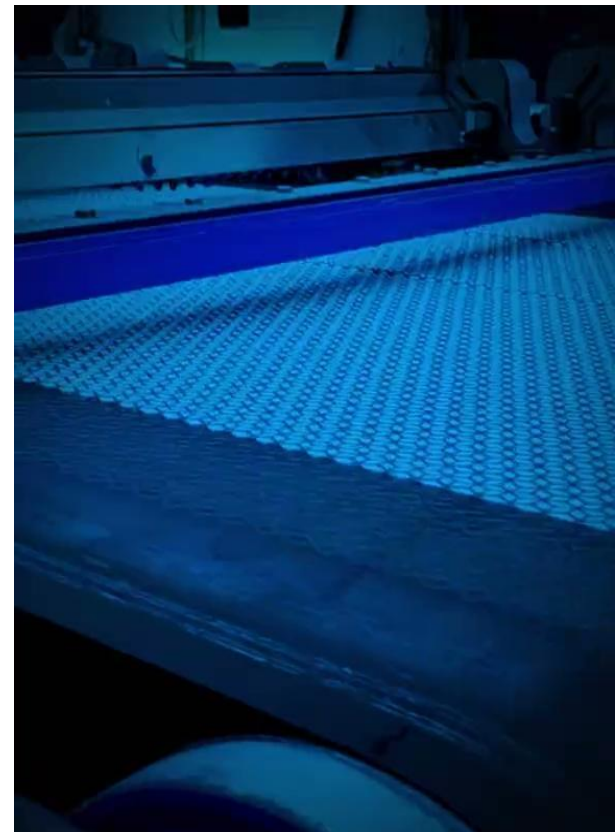
GO TO GYM



GRAPHENE-WEAR™



Spring/Summer 2023





Tensile strength +50%
Modulus +30%
Elongation +20%
Tear Strength +23%

Compared to non-graphene
reference compound



- US stocks have almost sold out
- More shoes currently in manufacture
- Royalty agreement in place for US sales
- Additional ranges to be explored in 2023

Research



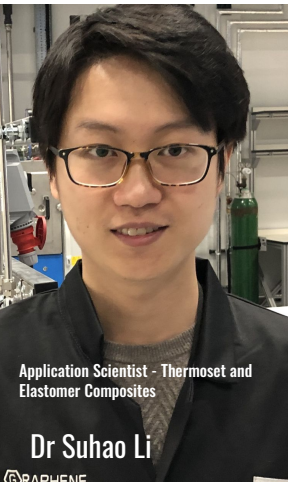
UK R&D team

6 PhD level scientists
across GEIC (Manchester),
NIBEC (Ulster) & CGC
(Cambridge)



Senior Application Scientist - Textiles, Composites & Coatings

Dr Mayank Gautam



Application Scientist - Thermoset and Elastomer Composites

Dr Suhao Li



Application Scientist - Composites

Dr Pei Yang



Process Development Scientist & DC

Dr John Benson



Senior Application Scientist - Construction

Dr Daniele Annicchiarico



Application Scientist - Thermoplastics

David-Reinoso Arenas



Graphene Engineering Innovation Centre



Nanotechnology and Integrated Bioengineering Centre



Cambridge Graphene Centre



CAMBRIDGE GRAPHENE

Research projects

Graphene Flagship (G-ICE Project): Developing aircraft ice protection systems (IPS) incorporating a graphene heater mat (GHM)



Horizon Europe (iCARE Project): Neuro nanotoxicity - Versarien will supply graphene in two key case studies:



1. Graphene in cementitious composites
2. Graphene in elastomer composites (tyres)

PhD project at WMG: Graphene Enhanced Elastomers - student started in Jan 2023

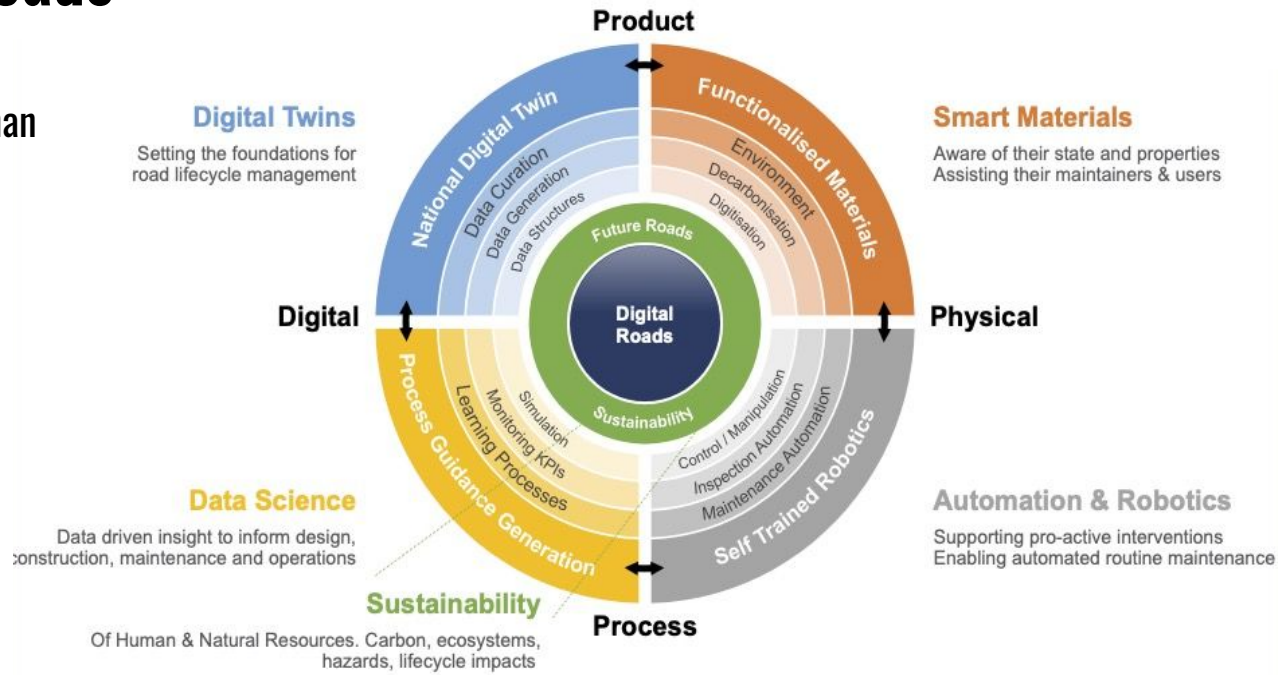


PhD project at University of Plymouth: CVD Graphene Biosensors - student started in Jan 2022



Digital Future Roads

The initiative involves more than 50 researchers at Cambridge, working collaboratively with industry across 5 themes:



Roads Research Alliance

A new research alliance has been launched to lead a £14.5 million programme which will help shape the development of innovation in the highways industry over the next five years

National Highways and some 20 companies from its supply chain have joined forces in the Roads Research Alliance to define and develop a portfolio of innovative projects for the roads sector



...more to join

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Middle East Opportunities



جامعة خليفة
Khalifa University

شارع سلطان بن زايد الأول
Sultan Bin Zayed The First St

RIC-2D @ Khalifa University

The Research & Innovation Center for Graphene and 2D Materials (RIC-2D) hosted by Khalifa University of Science and Technology is part of a strategic investment by the Government of Abu Dhabi, UAE to advance the scientific development and commercial deployment of technologies derived from graphene and other 2D materials

RIC-2D will serve as an integral part of an advanced materials innovation ecosystem being developed in Abu Dhabi

The RIC-2D Research and Innovation Fund (~\$20 m funding) is designed to foster research, development, demonstration and deployment of novel technologies derived from graphene and other 2D materials, particularly targeting key topics of importance to Abu Dhabi and the UAE

Summary



Summary

- + Pioneer in the supply of graphene in the UK with embedded connections with Universities of Manchester and Cambridge
- + IP secured with over 130 patents globally

128 granted patents and a licence agreement for 6 patents for the manufacture, processing and application of nanomaterials with a wide portfolio of high-quality verified products

- + 16 InnovateUK projects completed
- + Largest ever UK Innovate loan £5m to scale up (GSCALE)
- + Focus on commercialising in Construction and Textiles
- + First company to be certified and then re-certified by the Graphene Council as a “Verified Graphene Producer”
- + EU REACH registered with a director leading the Technical Working Group
- + Member of the EC’s €1bn Graphene Flagship project



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