



**APPLIED
GRAPHENE
MATERIALS**

Applied Graphene Materials



North East Future Resources Conference

30 June 2022

appliedgraphenematerials.com

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*Proud to be a leading innovator in graphene
dispersion and application technology*



WE ARE GRAPHENE.

Who are Applied Graphene Materials?

Over a Decade of Innovation



- Established in 2010 as a spin-out from Durham University.
- Listed on the FTSE AIM Stock Market.
- Headquartered at the Wilton Centre, Redcar, UK
- Actively engaged with approximately 170 technology and product development partners.
- Partnerships developed with global distributors.



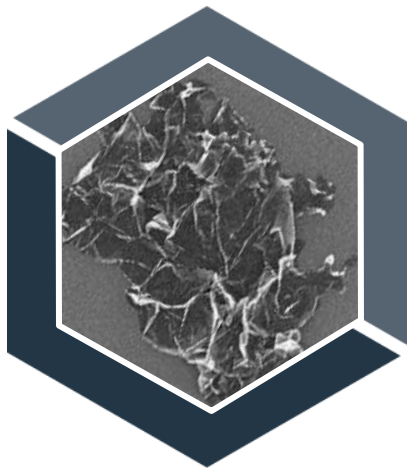
WE ARE **GRAPHENE.**

What does Applied Graphene Materials do?

Production and Characterisation of Graphene Nanoplatelets



- ⬡ Patent-Protected technology to produce a range of Graphene Nanoplatelets (GNPs)



Graphene Nanoplatelets

- ⬡ **Practical** version of graphene - black powder
- ⬡ **Thin** - with high aspect ratio
- ⬡ Increase in **Mechanical** performance
- ⬡ Electrical & Thermal **Conductivity**
- ⬡ **Impermeability** - Barrier attributes

BUT the industry recognises that the **dispersibility** of graphene nanoplatelets is essential to achieving success in an application...

Unlocking the potential of graphene nanomaterials

Creating long-range value - AGM's dispersion and application expertise



Consistent supply of high quality, repeatable graphene dispersions that are **stable**, **easy to formulate** and **safe to incorporate** is where AGM's expertise lies.



- Range of graphenes – best fit for application type
- Standard dispersions – High technology readiness
- Custom dispersions – meeting customer need
- Range of applicable chemistries
- Application know-how
- Proven tech data
- Technical support end-to-end



Graphene dispersions + know-how + proven application data = Essential for customer success

Customer use of AGM dispersed graphenes

Remarkable materials effectiveness



Commercial use of AGM dispersed graphene

Customer product platform which demonstrates our  Genable technology

Anti-Corrosion industrial coatings

- Transformational differences in range of applications
- Products in consumer and professional market
- Longer life coatings products

Chemical resistance industrial coatings

- Improved barrier performance for industrial flooring chemical storage, pipelines, transportation use

Car care protective coatings

- Graphene-enhanced products for this fast-to-market sector

Composite materials

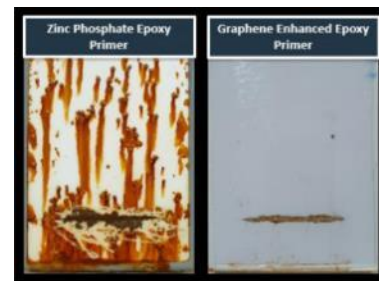
- Use of graphene dispersions in tougher, lighter composites
- Being used in the emerging hydrogen space for pressure vessels

Sustainable opportunities

- Water based and low/no VOC industrial solutions to meet industry push for green solutions

Conductives and printables

- Niche technology to service use of graphene with custom formulations
- Thermal conductivity products for adhesives to batteries



Corrosion performance after salt spray test



Graphene: a game changer in coatings technology



3000 Hour Salt Spray Corrosion Testing



***Complete Failure of
Standard Coating***



Graphene-enhanced

Chemical Resistance Immersion Testing



***Complete Coating
Failure of Glass
Flake Control***



Graphene-enhanced

Commercial use of graphene coatings

Genable *helping customers to use graphene effectively, easily, safely for industrial coatings*

Product
in use

- Reduced corrosion repair requirements.
- Increased service life of the coating.
- Reduced potential lifetime coating costs.
- Customer products in use at a growing scale.



Graphene for Chemical Resistance market



Chemical Barrier



CHEMICAL RESISTANT COATINGS

- ⬡ Positive demonstration already for floors with customer in final review.
- ⬡ AGM test data to support marketing into broad chemical resistant coatings products sector and use of graphene as an innovative solution.
- ⬡ Offering standard and custom dispersions to suit application opportunities.
- ⬡ Potential for further attributes to suit specific applications – anti-static, thermal.
- ⬡ Potential for read-across into composites used for transport and storage applications.



Graphene for composites



Genable *equipping customers to use graphenes in emerging gas storage sector*



COMPOSITES PRESSURE VESSELS

- Essential technology for hydrogen storage.
- Technology application for the broader hydrogen agenda.
- Longer life solutions, higher pressure rating, lower weight.
- Engagements with a number of composites manufacturers in the hydrogen space.



Fracture Behaviour



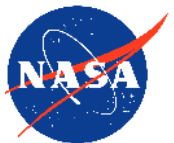
Permeability & Barrier



Mechanical Performance



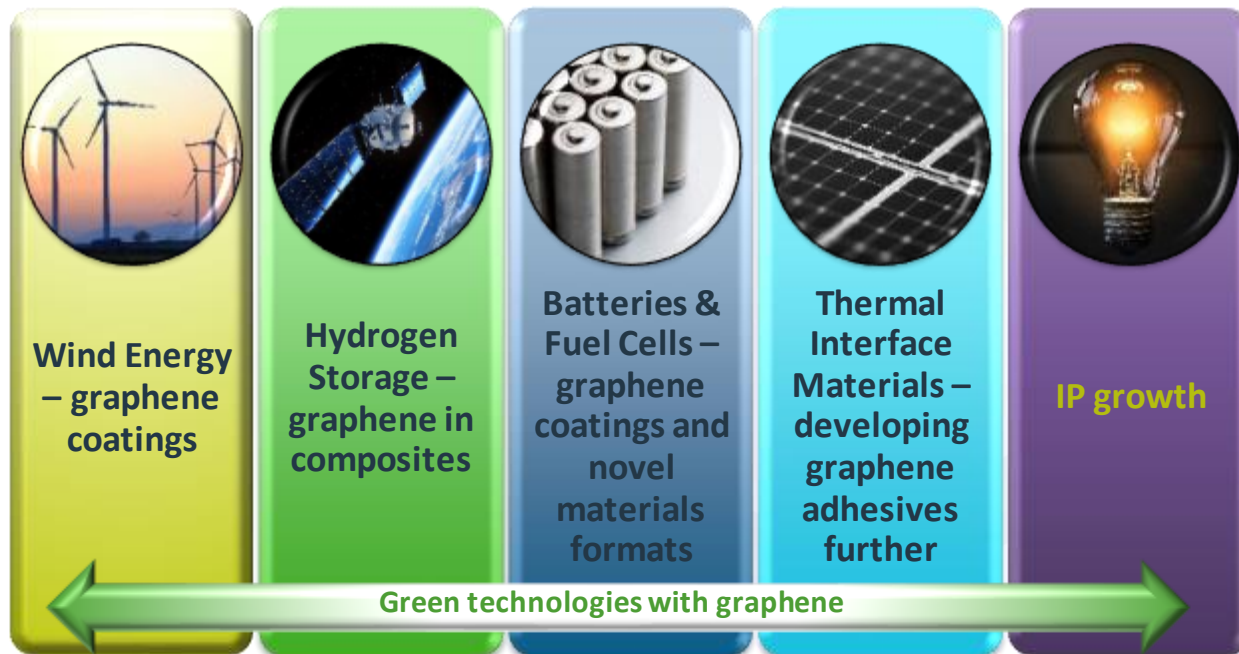
Conductivity



Future technology roadmap

Graphene in a "greener" world

Innovate. Perform. Stand out.



Sustainability and capacity for growth

Enabling more sustainable solutions



Graphene contributes to **sustainability goals** as an alternative to traditional chemicals.

- ⬡ Product life cycle advantages.
- ⬡ Extended life and improved performance, resulting in lower maintenance requirements .
- ⬡ Potential toxin reduction such as zinc and chromates in coatings, as well as reduced release of microplastics into the environment.

Expanded product range

- ⬡ Water based dispersions incl. UK patent.
- ⬡ Bio-based materials launched.



Why AGM?

Solid future of potential growth

- ✓ As we will see today, the North East is emerging strongly in many areas and significant opportunities lie ahead
- ✓ We believe graphene, an advanced material, has an important role to play alongside many of the new technologies that are developing in the North East
- ✓ AGM has world leading know-how in the usage of graphene in many applications with data backed performance improvements
- ✓ AGM's graphene is an easy and safe to use dispersion product, quality is reliable and reproducible
- ✓ AGM is ready and able to work with our fellow companies in the North East to facilitate improved performance in a range of applications from light weight hydrogen storage tanks to batteries and many other applications
- ✓ We are ready to work with you and look forward to meeting many new partners today and in the future.



Present today at the NEFR Conference

Get in touch



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