



**APPLIED
GRAPHENE
MATERIALS**

Applied Graphene Materials



Introduction to AGM – August 2022

Adrian Potts - CEO

[appliedgraphenematerials.com](https://www.appliedgraphenematerials.com)

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



WE ARE **GRAPHENE.**

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Who are Applied Graphene Materials?

Decade + of Innovation

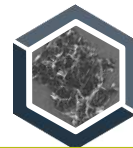


- Established in 2010 as a spin-out from Durham University.
- Listed on the FTSE AIM Stock Market 2013. OTC QX cross-trading
- Headquartered at the Wilton Centre, Redcar, UK
- Actively engaged with over 160 technology and product development partners
- Partnerships developed with global distributors
- Active staffing in USA

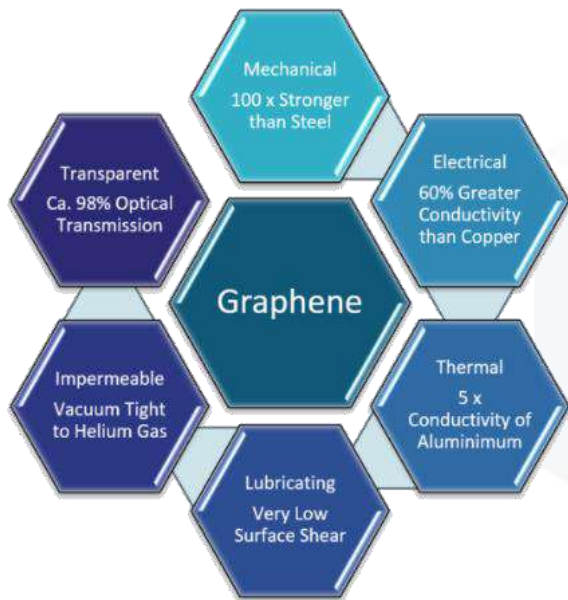


WE ARE GRAPHENE.

Graphene – What's it all about?



Graphene – U Manchester - 2004

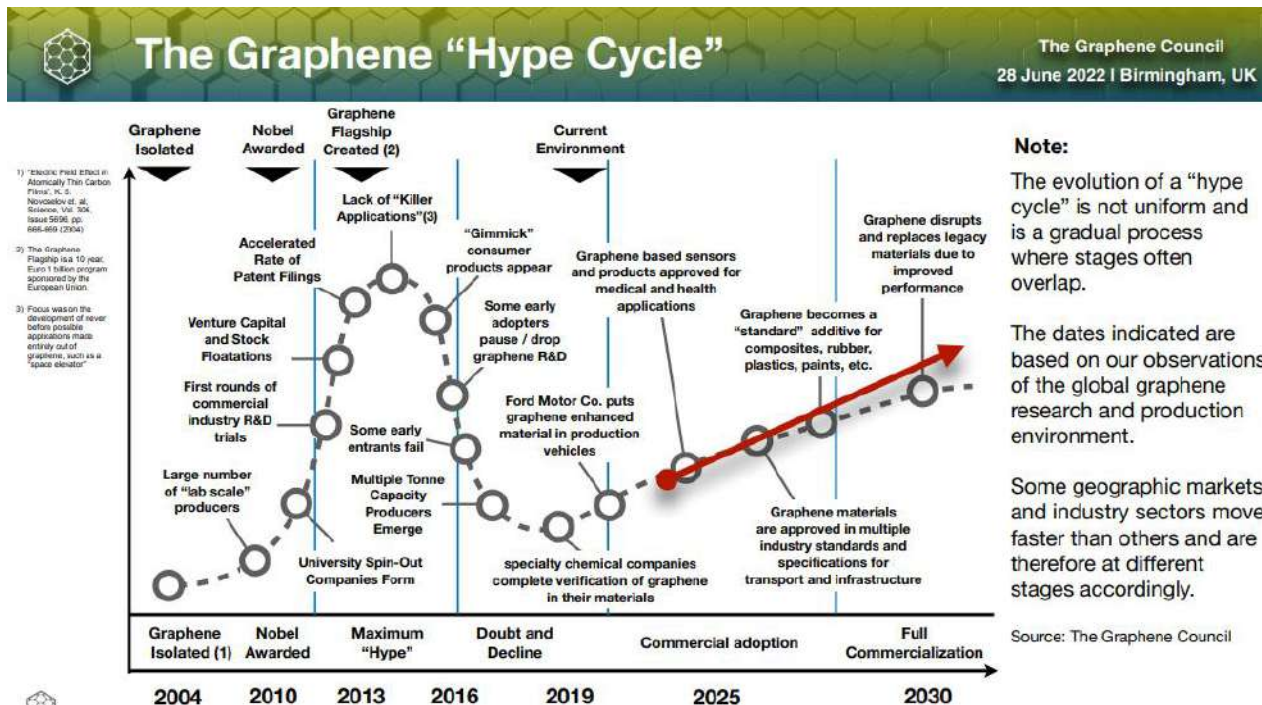
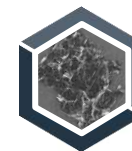


Amazing
material - BUT
Challenging to
use to make
other materials
better

Graphene Nanoplatelets (GNPs)

- ⬢ Practical version of graphene - powder format – High Technology Readiness Level (TRL) from unique process.
- ⬢ Over 300 companies globally that produce graphenes. Combined 2022 global capacity 15,000MT*. Set to increase substantially.
- ⬢ Why these materials matter?
- ⬢ Remarkable properties of graphene transferrable to make other materials perform even better
- ⬢ Key is how to use graphene. How to disperse them to create effectiveness in host materials
- ⬢ AGM dispersion technology provides these answers.

Graphene – Current stage of evolution



AGM has patent-protected technology to produce a range of Graphene Nanoplatelets (GNPs) plus IP covering dispersion and application of these highly functional materials.

USP – AGM unlocks 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** – *meeting what the industry needs.*

- Range of graphenes – best fit for application type
- Standard dispersions – High technology readiness
- Custom dispersions – meeting customer specific needs
- Range of applicable chemistries
- Application know-how
- Proven technical data
- Practical guidance and technical support group



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

Adoption of AGM dispersed graphenes

Making materials better – Protective Coatings, Composite Materials, Specialty Products



Commercial use of AGM dispersed graphenes

Customer product platform using  Genable technology from AGM



Anti-Corrosion industrial coatings

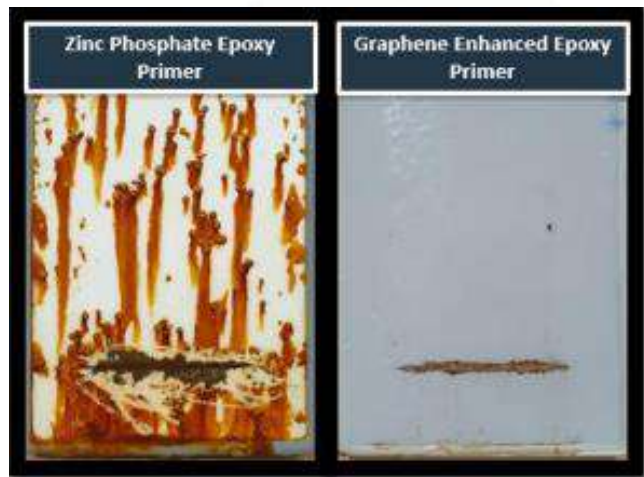
Chemical resistance industrial coatings

Car care protective coatings

Composite materials and adhesives

Sustainable opportunities

Conductives and printables



Corrosion performance after salt spray test



"Making material even better with graphene nanoplatelets"

Commercial use of graphene coatings

 **Genable** *dispersions from AGM enabling customers to use graphene effectively in industrial coatings*



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

ALLTIMES
COATINGS



Commercial use of graphene coatings

ALLTIMES
COATINGS



G enable *graphene dispersions from AGM in use in construction coatings*

Innovate. Perform. Stand out.



Detailed, collaborative advice provided to ensure old cut-edge corrosion treatment did not compromise new work or impinge the whole purpose of repair of the roof

Best practice and experience



Only one coat required with Advantage® Graphene for metal roofs

Money and time saved with product labour time



Product containing graphene

Enhanced corrosion resistance increasing longevity of repair



Dedicated training and site visits

Best practice and experience



30 year warranty



Barrier & Anti-Corrosion
Cost effective solution
Extended life
Roof surfaces, cut edges and gutters

ADVANTAGE GRAPHENE coating successfully used on projects for:



P&O



JDB



Severn Bridge Trading Estate



Royal Mail



Lidl



Bensons



Commercial use of graphene coatings



Genable *formulated paint products in use*



**Environment
Agency**



Commercial use in car care

 **G enable** *from AGM used in protective car care products*



DRIVING INNOVATION IN THE AUTOMOTIVE PROTECTIVES MARKET

- Customer products with AGM dispersions
- Waxes and detailers
- Anti-corrosion coatings
- Formats for aerosolised materials
- Retail to professional engagement
- More sizeable companies now evaluating – greater potential volume medium term



Barrier & Anti-Corrosion



Water Shedding



UV Protection

Specialty coating products



Innovate. Perform. Stand out.



Stanvac®

POWER TRANSMISSION COATINGS

- Indian infrastructure market
- Conductive coating for electrical connections
- Technical challenge solved to enable multiple materials attributes to be realized
- Awaiting customer integration on maintenance cycles



Permeability & Barrier



Conductivity

Chemical Resistance with graphene



G enable *dispersions from AGM for use in chemical resistant coatings sector*



CHEMICAL RESISTANT COATINGS

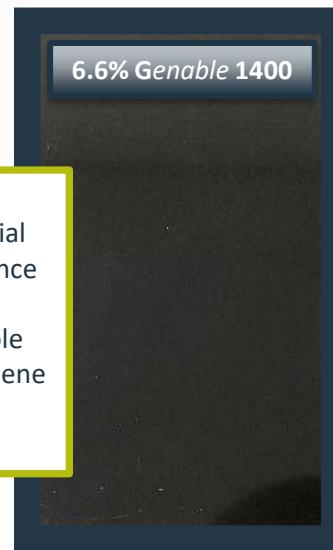
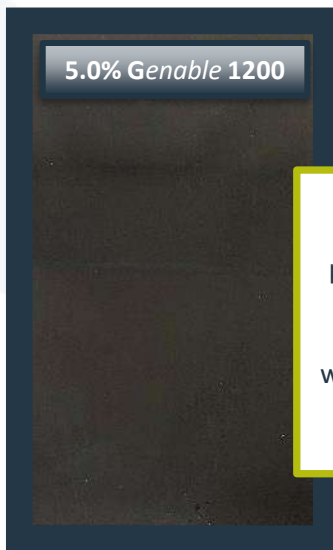
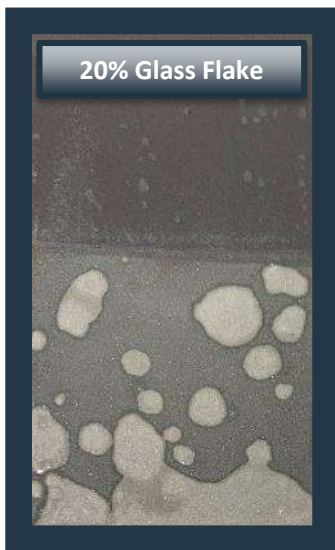
- **Factory floor coating application**
- **New data package demonstrates chemical resistant coatings solution with graphene**
- **Meeting the industry needs - standard and custom dispersions to suit application**
- **Opportunities in composites used for transport and storage applications**
- **Further development – anti-static, thermal**

Genable Dispersion vs. Sulphuric Acid

28 Day Immersion Testing



Immersion Media (28 Days @ 23°C)	Genable Dispersion in Epoxy Resin Vs. 20% Glass Flake			
	Genable 1200 Loading		Genable 1400 Loading	
	2.50%	5.00%	3.33%	6.67%
Visual Appearance	▲	▲	▲	▲
Blistering	—	—	—	—
Hardness Retention	▲	▲	▲	▲
Gloss Retention	▲	▲	▲	▲

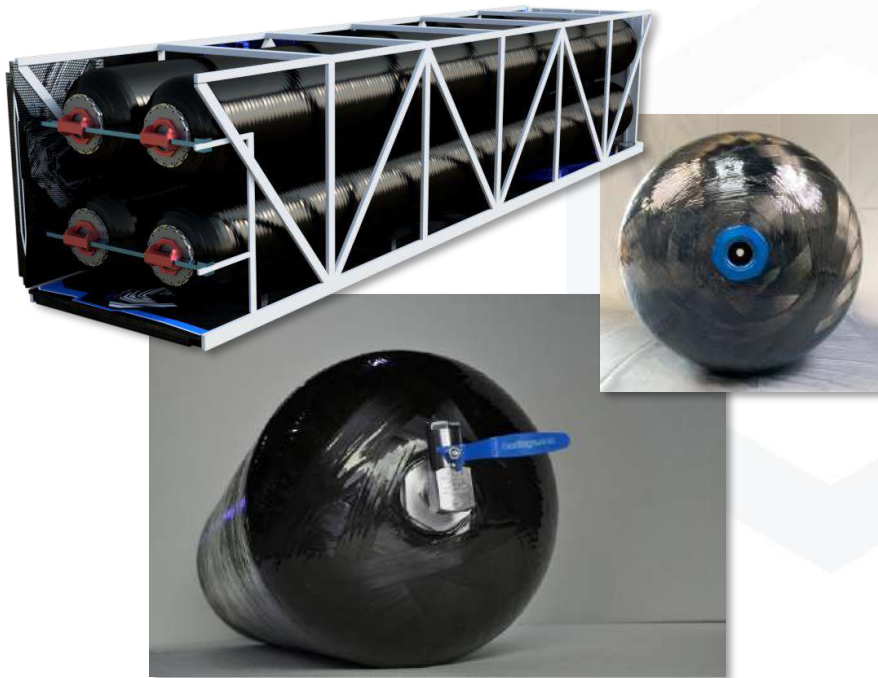


Substantial
performance
gain
achievable
with graphene
use

Graphene for composites for hydrogen



G enable *enabling 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

Positive sustainable innovation enabled with AGM graphene



Positive contribution to achieving **sustainability goals** as an alternative to traditional chemicals.

- ⬡ Customer coating life cycle advantages
- ⬡ Reducing deterioration of coatings
- ⬡ Extending coating life
- ⬡ Lower maintenance requirements
- ⬡ Potential reduction in microplastic release
- ⬡ Reduction of pollutants such as heavy metals, zinc phosphate, chromates etc
- ⬡ Product range with innovative chemistries to further advance the opportunity



AGM's Business model



Innovate. Perform. Stand out.

Demonstrating the technology works in our key platform sector.

Comprehensive product range

Continuing to invest in long range technology growth

Supplying and **serving** customers through mature global distribution network

Promoting innovative technology backed with compelling backup data

Establishing other niche technologies alongside a mature coatings platform

Creating capacity ahead of demand to service growth

Building long range revenue path through customer testing, integration, launch and sales of their products

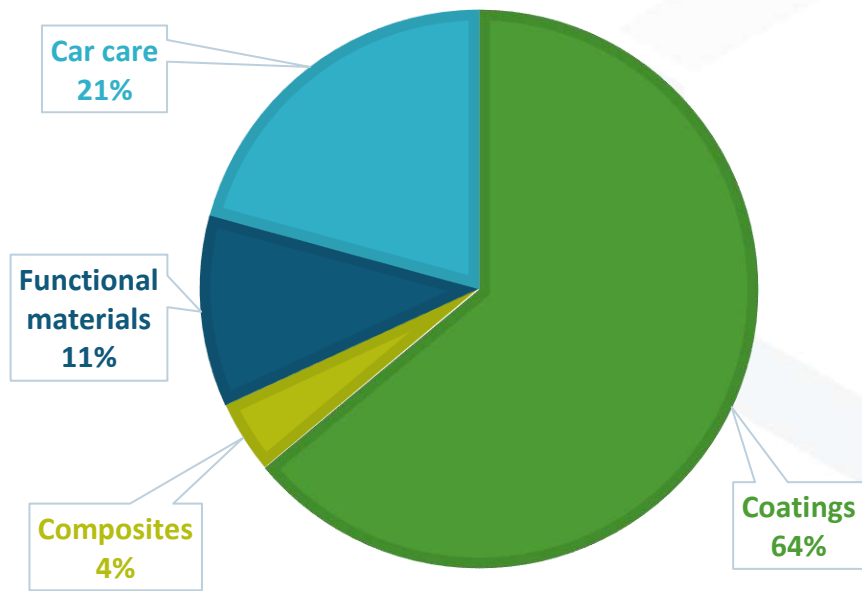
Opportunity pipeline

Sales opportunities at 31/1/22 (excluding completed projects)

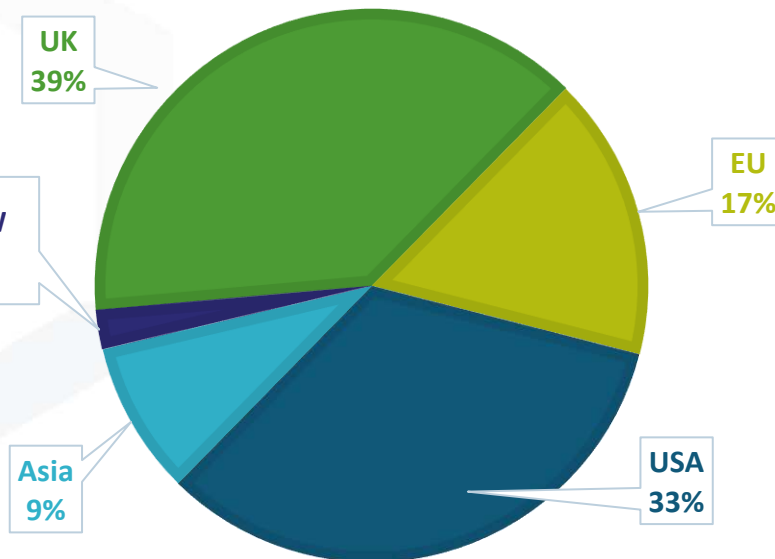
168
Ongoing
projects

£2.7m
Value*

VALUE OF OPPORTUNITIES BY SECTOR £'000



VALUE OF OPPORTUNITIES BY TERRITORY £'000



Current status – main points



Potential for long range growth

Previous fund raises – use of funds

- **2010 to 2017** Development of graphene manufacturing
- **2018 onwards** Start of dispersion know-how 2018 onwards
- **2021** Last fund raise – fully dedicated to dispersion platform technology
- **Cash** Beyond Jan 2023

AGM's dispersion technology now has high readiness

- The Right graphenes. The right dispersions The best support to meet customer need

Proven performance data to back up claims available for customers on our website

Conduit to market well developed

- Distribution model plus internal sale team

Exploitation phase developing commercialization

- Pipeline of engagements demonstrate commercial viability and bring in larger entities for greater momentum and read-across to other agencies
- Pathway to revenues – impact of supply chain issues and COVID has hit coatings sector hard

Distribution Sales Platform

Potential for long range global support and sales development



Conduit to market

- Distribution model for global reach
- **11** specialist distribution sales partners located directly in key markets
- **100** sales staff on the ground promoting AGM Graphene Products.



Current numbers



Potential for long range growth

Addressable market

- Global industrial coatings market is large and growing again post-COVID. Resins supply segment CAGR growth c. 4.7%

Realizing value through use of graphene in customer products

- Enabling strong product performance
- Allowing new product launches and range expansion with innovative offerings
- Potential to capture long range market share through successful product embedding
- Growing brand awareness as a technical solution provider
- Technology leadership in the space

Current financials

	6mo ended 31/1/22 £'000's	12mo ended 31/7/21 £'000's	12mo ended 31/7/20 £'000's
Revenue	46	123	83
EBITDA	(1,723)	(3,150)	(3,084)
Cash	4,214	6,308	3,685

Expected margins potential at volume

- Gross margin to average 30 – 40% with forecast mix

Why consider AGM now?

Solid platform for future growth potential

- ✓ Momentum with 30 customer product launches with embedded graphene products.
- ✓ Technology platform is well developed for focused verticals. Protective Coatings, Composites, Specialties
- ✓ Meeting customer need with reliable and reproducible easy-to-use products with enhanced EHS
- ✓ Outstanding Technical support for customer engagements
- ✓ Products are being launched to new adjacent markets
- ✓ Customer pipeline momentum is strong
- ✓ Sales network developing
- ✓ Larger entities starting to take notice



What's next?



Opportunity development – Where AGM is active in technology development

- ✓ Coatings space
 - ✓ Graphene-based conductive coatings
 - ✓ Topcoat development to complement primers
- ✓ Conductivity space
 - ✓ Graphene coatings in batteries
 - ✓ Dielectric materials technology
 - ✓ Graphene for thermal materials for heat management in batteries
- ✓ Hydrogen space
 - ✓ Further application to range of hydrogen pressure vessel technologies

Executive Team

Get in touch



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Appendix

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Progress update since interim results



- Launch of Chemical resistance package on time
 - IP filed
 - Marketing through distribution and direct sales
 - Applicability to wide range chemical resistance applications
- Progress with UK Environmental Agency – next asset applications identified
- Progress with Alltimes towards independent certification of Advantage Graphene product
- Stanvac – Awaiting maintenance access to electrical grid components
- Floor coatings customer – Approaching finalization of product spec
- Car care – Further customer products containing our dispersions coming to market
- Composites – Further revenue from ICT to support pressure vessel build
- Appointment of Indian distributor

Data resources for AGM's technology



Graphene dispersions <https://www.appliedgraphenematerials.com/products/genable-graphene-dispersions/>

Coatings

- **Corrosion**
 - [PowerPoint Presentation \(appliedgraphenematerials.com\)](#)
 - [Chemical resistance | Applied Graphene | \(appliedgraphenematerials.com\)](#)
- **Chemical Resistance**
 - [Chemical resistance | Applied Graphene | \(appliedgraphenematerials.com\)](#)
- **Automotive detailing products**
 - [Graphene additives for better performing Car Care products | Applied Graphene | \(appliedgraphenematerials.com\)](#)
- **Technical resources**
 - [Graphene dispersions that are stable, safe and easy to incorporate. | Applied Graphene | \(appliedgraphenematerials.com\)](#)

Composites

- [PowerPoint Presentation \(appliedgraphenematerials.com\)](#)

Adhesives

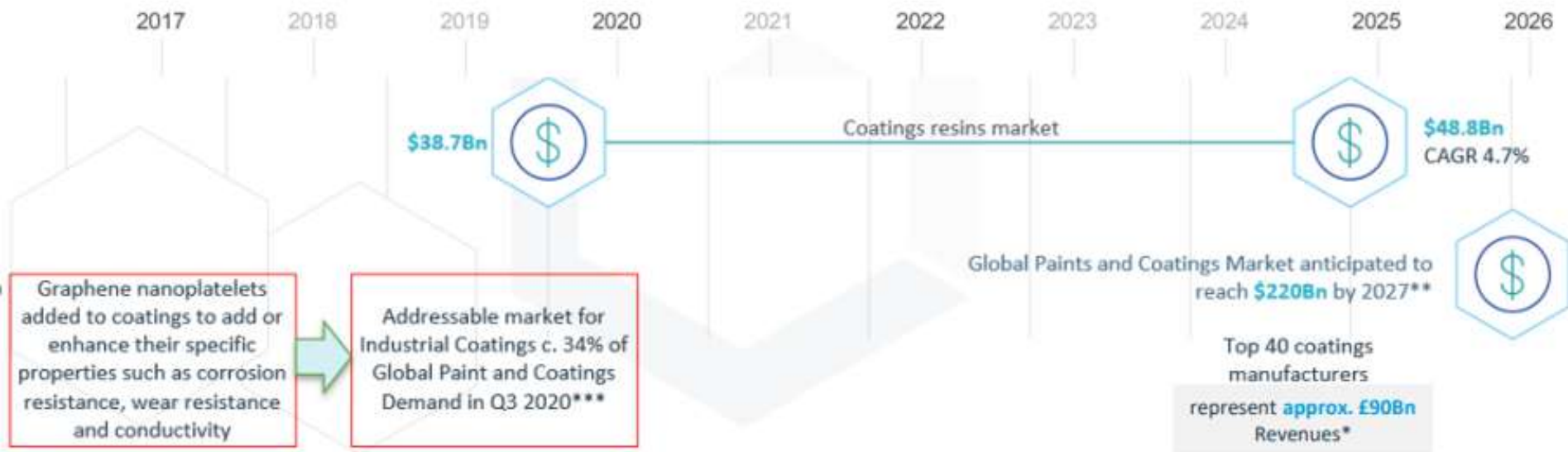
- [Light-weight and highly-thermal conductive materials. | Applied Graphene | \(appliedgraphenematerials.com\)](#)

Customer Case Studies

- [Customer Success Stories - Applied Graphene | Applied Graphene | \(appliedgraphenematerials.com\)](#)

Coatings Market info

Paints and Coatings Industry



Near term access with innovative coatings companies to demonstrate successful adoption of graphene nanoplatelets

* Source: Coatings World July 2020

** Source: https://www.coatingsworld.com/contents/view_market-research/2020-10-12/coherent-market-insights-paint-and-coatings-market-to-surpass-220-billion-by-2027/

*** Source: https://www.coatingsworld.com/contents/view_market-research/2020-11-09/growth-for-the-global-paints-and-coatings-market-in-q3-2020/

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.
- ⬡ Potential toxin reduction – zinc, chromates etc. in coatings.

Expanded product range

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



Graphene dispersion capacity developing:

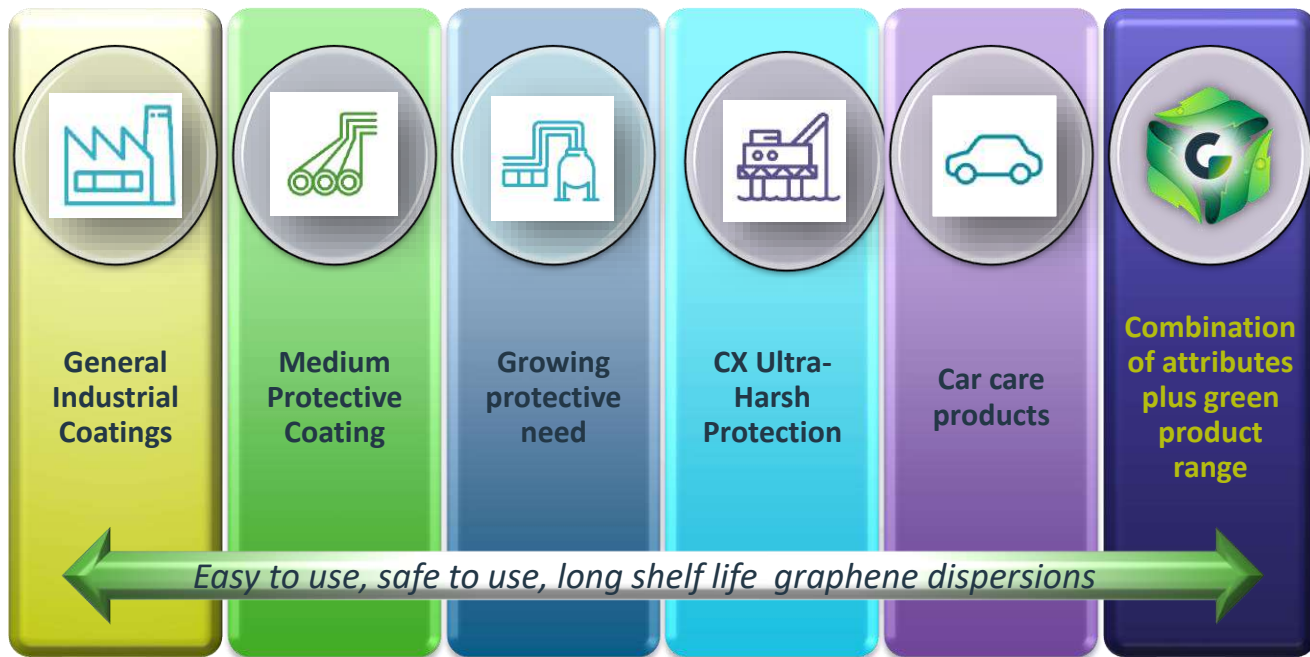
- ⬡ High speed dispersion.
- ⬡ Range of dispersion methods.
- ⬡ Suits both exfoliated and synthesized graphenes.
- ⬡ Space adjacent to current facility.
- ⬡ Spray booth commissioned.



Graphene innovation platform for industrial coatings

Meeting customer need - Exceptional package of materials technology for protective coatings and beyond

Innovate. Perform. Stand out.



- Choice of types of Graphene for best technical fit
- Dispersion selection for optimum formulation
- Practical application guidance
- Example coatings to help get started
- Test data to back up performance claims

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Future technology roadmap

Graphene in a "greener" world

Innovate. Perform. Stand out.



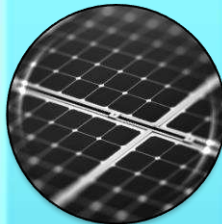
Wind Energy
– graphene
coatings



Hydrogen
Storage –
graphene in
composites



Batteries &
Fuel Cells –
graphene
coatings and
novel
materials
formats



Thermal
Interface
Materials –
developing
graphene
adhesives
further



IP growth

Green technologies with graphene

