APPLIED GRAPHENE MATERIALS

Paints and Coatings

WE ARE **GRAPHENE.**

INNOVATE. PERFORM. STAND OUT.

AGM's unique graphene additives dispersed in a range of resins and solvents offer outstanding performance benefits for industrial paints and coatings.

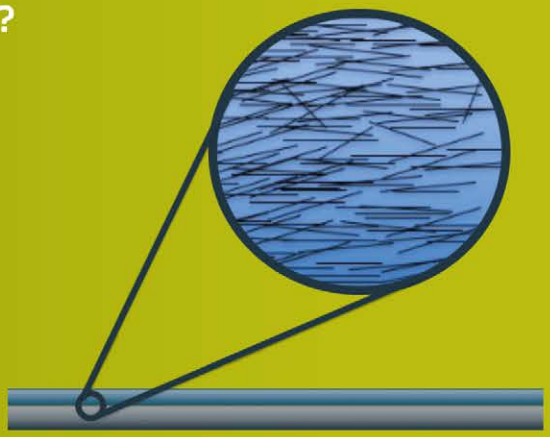
Graphene's two-dimensional structure in the nanoplatelet form results in very high aspect ratio, high surface area materials which are particularly suited for this industry, which currently accounts for 80% of AGM's business.

Many of members of our technical team have come from paint and coatings industry, helping AGM understand the challenges faced by formulators and end users. AGM is enabling formulators to easily innovate and realise the real benefits of graphene. The flexibility of our graphene dispersion systems allows for an optimised solution for every application.

How do GNPs work in protective coatings?

- Utilise **G***enable* dispersion as a new, standalone, highly effective barrier additive.
- Benefit from graphene's outstanding synergistic properties in combination with existing active and passive additives.
- Improve mechanical and physical properties to enhance the performance of new or existing industrial systems.

Acting as a passive barrier additive in standard industrial paints, for example, the addition of just 0.1% graphene nanoplatelets will increase the tortuous path length of a corrosive species, such as water particles, through the coating by 120 times.



Genable

GRAPHENE DISPERSIONS

STABLE, EASY TO FORMULATE and **SAFE TO INCORPORATE** for consistent, reliable performance enhancements in **REAL LIFE** applications.

Anti-corrosion and barrier

The **G***enable* range of graphene nanoplatelet dispersions offers a new innovative approach to combatting corrosion.

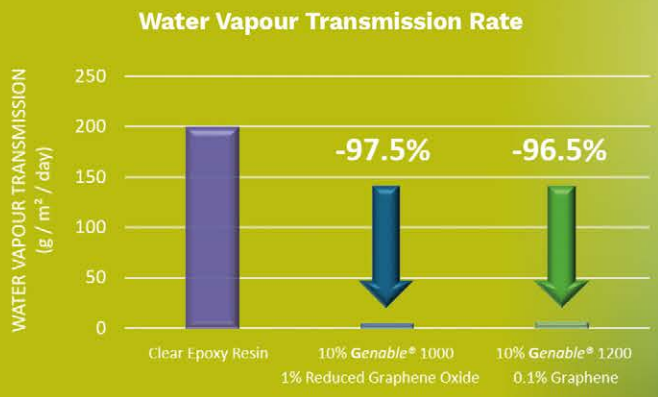
Why innovate with graphene?

- Maximise the potential of existing additives in synergy with graphene.
- Significantly extend the life of existing coatings, reducing the frequency and cost of asset maintenance.
- Offer customers an environmentally friendly, heavy metal free alternative to zinc based chemistries.

Standard Primer with no Graphene

168 hours | 336 hours | 432 hours | 696 hours | 1000 hours | 1750 hours

Graphene-based Anti-Corrosion Primer



Graphene-enhanced primers

AGM offers its own prototype primer formulation to demonstrate the ease of application and transformational performance benefits of graphene enhanced coatings.

Incorporating proven **G***enable* graphene nanoplatelet dispersion technology, the **G***enable* Epoxy Primer is available for testing in medium C3 environments and the **G***enable* CX Primer is suitable for extreme CX type environments.

"We look forward to working with AGM for trials in 2022 of this interesting and innovative product within a range of real world environments."

John Abraham, Project Manager and North East Innovation Lead, Environment Agency

Chemical resistance

Almost all industrial coatings will be exposed to some form of chemicals or acids, whether cleaning products, spills, or vapour.

Incorporating graphene into a high performance coating can increase its resistance to harsh chemicals to protect it from being damaged over time.

Epoxy Coating Comparison – *G*enable Products against 20% Glass Flake

Immersion Media (28 Days @ 23°C)	*G*enable 1200 Performance	*G*enable 1400 Performance
Xylene	▲▲	▲▲
Butyl Cellosolve	=	=
MEK	▲▲▲	▲▲▲
10% Lactic Acid	▲▲	▲▲
10% Sulphuric Acid	▲▲▲	▲▲▲
50% Sodium Hydroxide	▲	▲
10% Sodium Hypochlorite	▲▲	▲▲
Deionised Water	▲	▲

Performance relates to blistering, hardness and gloss retention.

▲ Good ▲▲ Very good ▲▲▲ Excellent = Equivalent

Sustainability

Graphene offers product life cycle advantages and reduces the environmental impact of paints and coatings, as an eco friendly alternative to traditional additives:

- Extended asset service life and reduced maintenance.
- Potential reduction of toxins like zinc, chromates etc.
- Fewer coats required and thinner coats can be applied due to improved performance.

Low VOC

Solvent free

Bio based

Low viscosity

SUSTAINABLE DEVELOPMENT GOALS

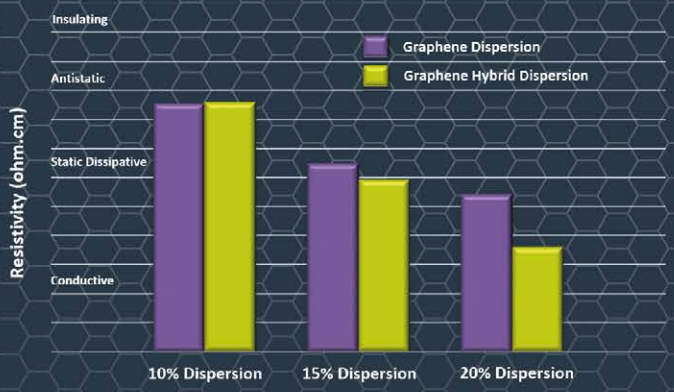
AGM's **G***enable* 1700 graphene dispersions are available in a selection of certified, award winning water and bio based solvents and resins.

Electrical conductivity and anti-static

Electrically conductive coatings can effectively disperse electrical charges, helping to stop the buildup of anti-static electricity on the surface.

As an electrically conductive additive, graphene nanoplatelets transmit electrical current through the paint, allowing the anti static coating to create a preferred pathway for the electricity flow.

Conductivity Assessment by Graphene Dispersion Loading Level



"We are indeed impressed with the performance of the AGM graphene dispersions and thank them for all their technical support and assistance in this development."

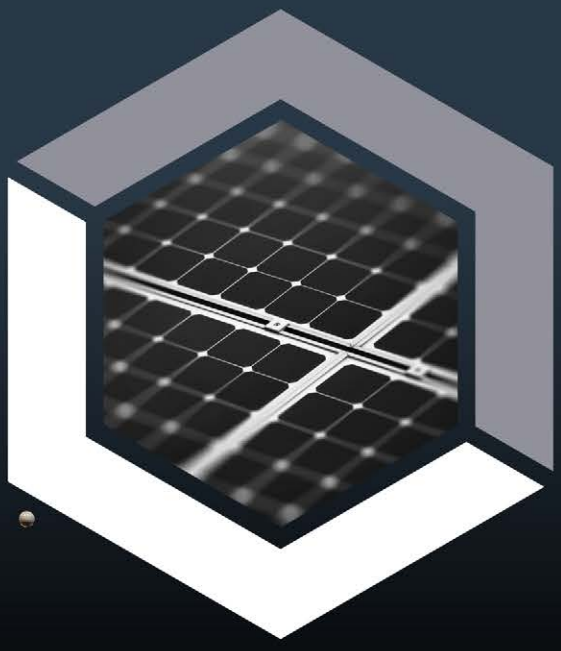
Sanjay Mehra, Managing Director,
Stanvac – Superon Group

Thermal conductivity

AGM's graphene nanoplatelets have a two dimensional form that can be employed to develop thermally conductive materials.

Thermal management materials help to dissipate heat buildup from components and facilitate rapid heat transfer.

AGM's nanoplatelet dispersion technology is enabling coating formulators to benefit from the intrinsic properties of graphene and enhance the thermal conductivity in their materials.



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The Graphene Council

American Coatings Association

North East England Chamber of Commerce

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The University of Manchester Graphene Engineering Innovation Centre

NIA Nanotechnology Industries Association

BCF British Coatings Federation

OCCA The Oil & Colour Chemists' Association

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

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