TOMORROW'S MATERIAL. **TODAY**

Applied Graphene Materials

Polymers & Composites

The benefits of Graphene enhanced composite materials

- ***G**enable*™ stable, process friendly dispersions
- Delivers significant increases in **fracture toughness, matrix modulus, laminate interlaminar shear strength** and **ultimate fatigue performance**
- Outstanding performance under hot/wet environmental conditioning
- Additional multi-functional benefits
- Exceptionally low % loading levels
- Extensive in-house product integration expertise

FOR MORE INFORMATION
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KEY PROPERTY	PERFORMANCE
Dispersion quality	***Genable***™ stable and process friendly dispersions that can be tailored to meet customer's process and end-use needs (see overleaf)
Mechanical Performance	Significant increase in: • Fracture toughness, typical increases of K_{IC} > +90% and G_{IC} > +400%. • Matrix compression modulus , typical increases of + 5-7% • Laminate Interlaminar Shear Strength (ILSS), typically increases +5-15% • Exceptional Fatigue Performance in highly loaded and cycled parts
Hot/Wet Conditioned Service	• A-GNPs can enhance laminate performance without negatively impacting on other key mechanical properties • Outstanding performance when tested under hot/wet environmental conditioning compared to other toughening agents
Electrical conductivity	Non-conductive to conductive material formats 10^{12} to 10^{3} ohm.m bulk resistivities are achievable at very low loading levels in epoxy resin (see overleaf)
Enhanced Heat Release	A-GNPs proven to deliver up to 25% reductions in matrix heat release capacity (J/g-K) and maximum specific heat release (W/g) values in epoxy resins
Thermal Conductivity	Thermal conductivity in excess of 5 W/mK achievable with AGM Thermal Paste ***Genable*** 4400
Other key benefits	• Very low weight % loading levels . • Particle size distribution optimisation • Potential to assist resin flow control • Adaptable formats for additive and digital printing

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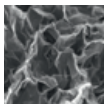
Standard **G***enable*™ range of dispersions

MATRIX	TYPE	MATRIX	TYPE	MATRIX	TYPE
Low Viscosity Epoxy Resin	Resin	Water	Solvent	Xylene	Solvent
Medium Viscosity Epoxy Resin	Resin	Ethyl Acetate	Solvent		
MEK	Solvent	Butyl Acetate	Solvent		

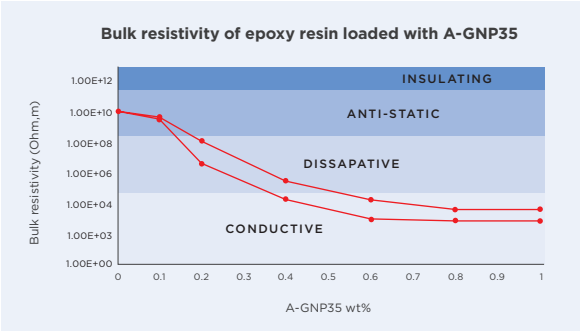
Typical customised dispersions under development

MATRIX	TYPE	MATRIX	TYPE	MATRIX	TYPE
Vinyl Ester Resin	Resin	Waterborne Paint	Solvent	DPGDA	Solvent
Benzoxazine Resin	Resin	PGME	Solvent	Mono Ethylene Glycol	Solvent
UV Curable Resin	Resin	Glycol ether	Solvent	DCM	Solvent
PTFE	Resin	Toluene	Solvent	Paraffin Wax	Wax
Polyurethane Resin	Resin	IPA	Solvent	Group I Base Oil	Lubricant
Polyester Resin	Resin	White Spirit	Solvent	Group II Base Oil	Lubricant
Alkyd Resin	Resin	Acetone	Solvent	Group III Base Oil	Lubricant
Acrylic Resin	Resin	TPGDA	Solvent	Group IV Base Oil	Lubricant
Polyol	Solvent	Ethanol	Solvent	Group V Base Oil	Lubricant
HDDA	Solvent	DMSO	Solvent	Greases	Lubricant
Methyl Methacrylate	Solvent	Cyclohexanone	Solvent	Solventborne Paint	Paint

Applied Graphene Nano Platelets (A-GNPs)

PROPERTY	 A-GNP10	 A-GNP35
Low Density	★★	★★★
Burn Onset	★	★★
Platelet Surface Area	★	★★★
Functional Groups Present as Manufactured	★★★	★★
Electrical Conductivity	-	★★★
Thermal Conductivity	-	-

N.B. Actual properties generated are dependent on parent matrix, loading levels and dispersion quality.



Applied Graphene Materials produces graphene nano platelets (A-GNPs) through a proprietary and scalable, bottom-up synthesis process, thus differing from nearly all other graphene suppliers in terms of material quality, consistency and properties. A guide to the A-GNP range and key performance characteristics is shown

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