



**xGNP®**

## TECHNICAL DATA SHEET

### xGNP® Graphene Nanoplatelets

*A unique carbon nonomaterial with multifunctional properties*

**xGNP® Graphene Nanoplatelets** are ultrathin particles of graphite that can also be thought of as short stacks of graphene sheets made through a proprietary manufacturing process. We produce several grades and sizes with thickness ranging from 1 to 20 nanometers and width ranging from 1 to 50 microns.

The unique size and platelet morphology of **xGNP® Graphene Nanoplatelets** makes these particles especially effective at providing **barrier properties**, while their pure graphitic composition makes them excellent electrical and **thermal conductors**. Unlike many other additives, **xGNP® Graphene Nanoplatelets** can improve **mechanical properties** such as stiffness, strength, and surface hardness of the matrix material.

**xGNP® Graphene Nanoplatelets** are compatible with almost all polymers, and can be an active ingredient in inks or coatings as well as an excellent additive to plastics of all types. Our unique manufacturing processes are **non-oxidizing**, so our material has a pristine graphitic surface of sp<sup>2</sup> carbon molecules that makes it especially suitable for applications requiring high electrical or thermal conductivity.

#### **Available as bulk powder or in dispersions:**

##### **xGNP® bulk dry powder**

- Grade C
- Grade H
- Grade M

##### **xGNP® dispersions**

- Aqueous
- IPA
- Organic solvents
- Resins and custom

#### **Potential applications include:**

- Ultracapacitor electrodes
- Anode materials for lithium-ion batteries
- Conductive additive for battery electrodes
- Electrically conductive inks
- Thermally conductive films and coatings
- Additive for lightweight composites
- Films or coatings for EMI shielding
- Substrate for chemical and biochemical sensors
- Barrier material for packaging
- Additive for super-strong concrete
- Additive for metal-matrix composites

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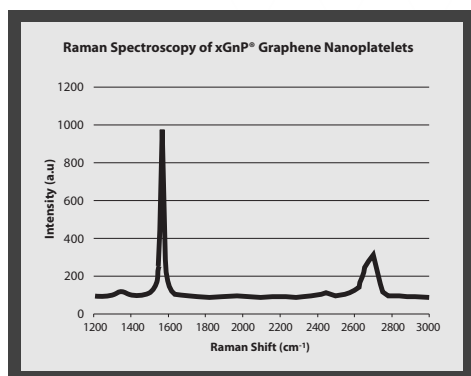
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## xGnP® Grade M Product Characteristics

**xGnP® Graphene Nanoplatelets** are unique nanoparticles consisting of short stacks of graphene sheets having a platelet shape. **Grade M** particles have an average thickness of approximately **6 to 8 nanometers** and a typical surface area of **120 to 150 m<sup>2</sup>/g**. **Grade M** is available with average particle diameters of **5, 15 or 25 microns**.



### Characteristics of Bulk Powder

Appearance	Black granules
Bulk Density	0.03-0.1 g/cc
Oxygen Content	<1%
Residual Acid Content	<0.5 wt%

	Parallel to Surface	Perpendicular to Surface
Density (g/c <sup>3</sup> )	2.2	
Carbon Content (%)	>99.5	
Thermal Conductivity (W/mK)	3,000	6
Thermal Expansion (CTE) (m/m/°K)	4 - 6 x 10 <sup>-6</sup>	0.5 - 1.0 x 10 <sup>-6</sup>
Tensile Modulus (GPa)	1,000	N/A
Tensile Strength (GPa)	5	N/A
Electrical Conductivity (S/m)	10 <sup>7</sup>	10 <sup>2</sup>

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Please contact XG Sciences or visit [www.xgsciences.com](http://www.xgsciences.com) for the most current technical information.

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 **XG sciences**  
THE MATERIAL DIFFERENCE

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