

xGnP® Graphene Nanoplatelets

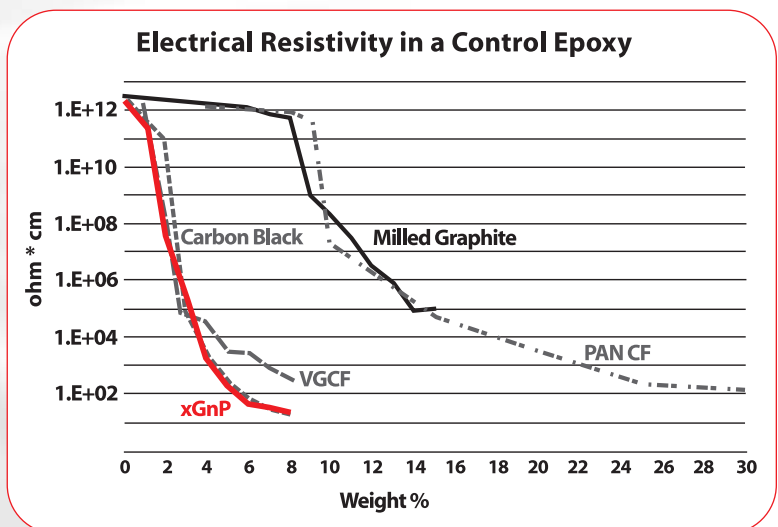
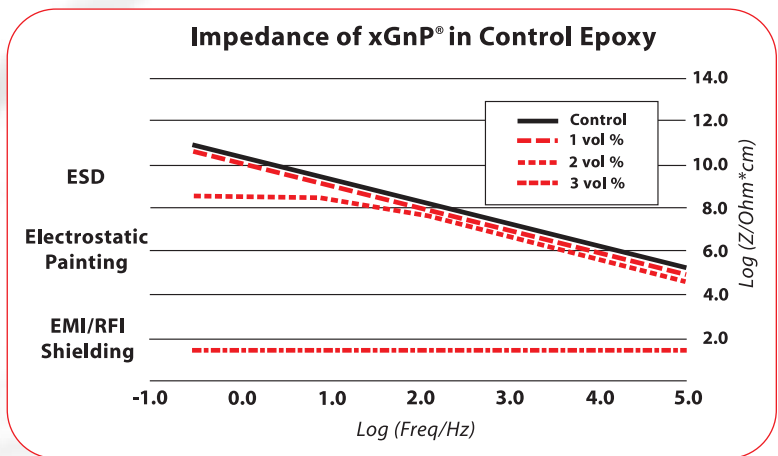
Carbon Nanoparticles with Multifunctional Capability

Enhancing Electrical Conductivity with xGnP® Nanoplatelets

xGnP® *graphene nanoplatelets* can be used to provide electrical conductivity in most polymeric materials. Like carbon nanotubes, the graphene sheets that form these nanoplatelets are highly conductive, and form an effective conducting network at *low percolation thresholds* – the concentration necessary to achieve electrical conductivity. Unlike many conductive additives, xGnP® *nanoplatelets* do not negatively affect the base resin’s mechanical and aesthetic properties, nor are they abrasive to tooling as metal flake and fiber can be.

ESD and EMI/RFI shielding capabilities are typically achieved at loading levels of 2 - 3 wt% in thermoset resins and 5 - 7 wt% in thermoplastics.

xGnP® *nanoplatelets* typically show percolation thresholds as good as, or better than, most other carbon materials. This fact, coupled with performance advantages in areas like stiffness and toughness makes the material an ideal additive in situations where cost-effective performance is important.



Comparison of Nano-Scale Conductive Fillers for Various Properties

	High-Structure Carbon Black	Vapor-Grown Carbon Fiber	Carbon Nanotubes	xGnP® Nanoplatelets
Effect on Resin Processability	Moderate	Fair	Moderate	Good
Electrical Conductivity	Good	High	Very High	High
Impact on Resin Toughness	Poor	Fair	Moderate	Good
Improvements to Resin Stiffness at Typical Loading Levels	Minimal	Fair	Good	Good
Improvements to Resin Barrier Properties at Typical Loading Levels	Moderate	Moderate	None	High
Relative Cost	Moderate	High	Very High	Moderate

Using xGnP® Nanoplatelets in Combination with Other Materials

xGnP® *nanoplatelets* can also be used in conjunction with other additives to provide multi-functional property improvements at lower costs. For example:

- ⊗ Adding xGnP® *nanoplatelets* to carbon-fiber composites improves cross-fiber electrical conductivity and significantly increases ESD and thermal conductivity
- ⊗ Combining xGnP® *nanoplatelets* with nanotubes allows conductive polymers to be produced at lower cost, while also improving barrier properties
- ⊗ Coating fiberglass with xGnP® *nanoplatelets* renders the fibers electrically conductive without requiring any changes in processing or fabrication procedures

Our Competitive Pricing Advantages

The unique price and performance properties of xGnP® *nanoplatelets* allow them to be cost-competitive with both far-more-expensive nanoparticles (e.g. single- or multiwall nanotubes) as well as additives with less functionality (e.g. carbon black and metal flake or fiber) in a broad range of applications.

To Learn More

For more information on xGnP® *nanoplatelets* and the products made with them, please contact us at:

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