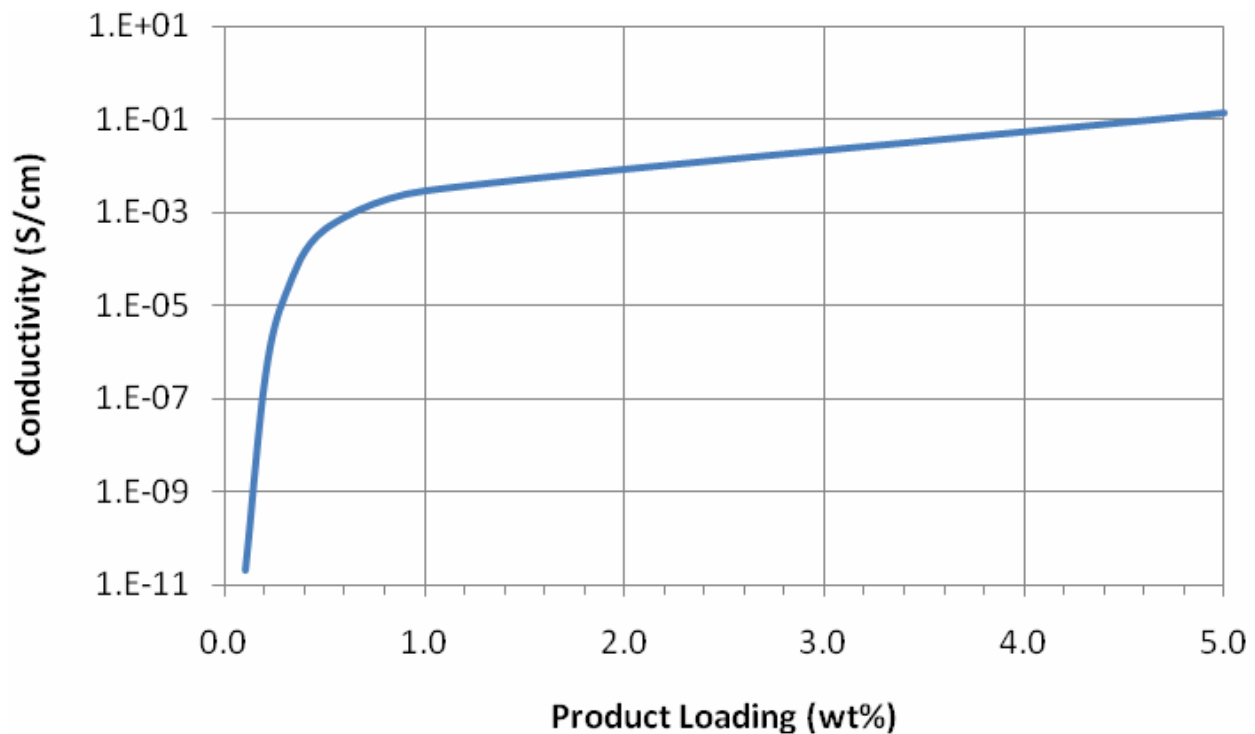**Continental Carbon**
Nanotechnologies, Inc.

CCNI Carbon Nanotubes XD Conductive Polymer Grade

Product Description

Fullerene nanotubes[i] are high aspect ratio polymers of pure carbon in which the atoms are bonded together in cylindrical form. XD Grades are designed to impart electrostatic discharge (ESD) levels of electrical conductivity to polymer compounds, using traditional melt processing equipment.

MSDS: CCNI Carbon Nanotubes

Representative Performance[i]

Continental Carbon Nanotechnologies, Inc. ● 16850 Park Row, Houston, TX 77084
Tel: 281-647-3778 ● Fax: 281-647-3758

Producer of Carbon Nanotubes and Nanomaterials

Benefits

- ESD levels of conductivity at 1% loading in polar polymers, ESD conductivity at higher loading levels in other systems
- Typically 5-10x lower loadings than other conductive additives (carbon black, carbon fibers, metal particles, etc.)
- Can be dispersed using standard melt blending equipment
- More uniform composite than other conductive additives
- Less sloughing than other conductive additives
- Low loading levels have minimal effect on matrix polymer properties or processability
- Recycled composites will not lose conductivity due to aspect ratio reduction normally observed during reprocessing of compounds loaded with other high aspect ratio conductive additives

Representative Properties

Color	Black
Morphology	Powder
Bulk Density	< 0.2 g/cm^3
TGA Residual	< 10 wt%
Moisture Content	< 5 wt%

General Processing

The goal of processing is to achieve an optimal dispersion of the carbon nanotube network in the compounded material and in the final part or product.
In general, dispersion is facilitated by:

- Interaction with chemically similar materials such as polar systems and systems containing aromatic groups and/or hetero atoms
- High shear and high energy input, including longer processing or residence times - base resin/matrix will likely degrade before carbon nanotubes
- Polymer melt processing - processing techniques such as solvent-based systems or powder blending/sintering may be suitable as well

Please consult CCNI for specific discussions about your system and performance requirements.

Pricing and Availability

XD grades are available in kg quantities for research applications and large scale product development. Please contact us for further information about pricing and availability.

---

i   CCNI XD grade carbon nanotubes are tubular fullerenes; polymers that are part of the fullerene family of carbon molecules discovered by Dr. Richard E. Smalley and colleagues in 1985. Fullerene nanotubes exhibit the degree of perfection associated with all molecules. They comprise single-wall carbon nanotubes (SWNTs), and endohedral or endotopic SWNTs, i.e., one, two or more tubular fullerenes nested inside another tubular fullerene. Van der Waals attractions cause fullerene nanotubes to self-assemble into networks of ropes or bundles.

i   Fullerene nanotubes were melt-blended into polycarbonate at loading levels as low as 0.2%. Bulk conductivity was measured using a 4-point probe

Producer of Carbon Nanotubes and Nanomaterials