



TEGO™ COMPOSITES

High-performance polymers containing carbon nanotubes

Entegris, Inc. has been a key supplier to the microelectronics industry for 40 years and has been developing unique polymers to meet the high performance standards of that industry. Several years ago, Entegris began an investment in fundamental research around the manufacturing and molding of high performance polymers containing carbon nanotubes. Today, the results of that research are embodied in our TEGO™ polymers and available for commercial use.

Carbon nanotubes are pieces of pure carbon in a tubular shape that may be 1000 nm long and 1–20 nm in diameter. That is 150,000 times smaller than the diameter of a human hair! These wonders of science, when properly dispersed in a polymer, can offer some amazing properties.

Carbon nanotubes have many advantages over other fillers or additives. Abrasion resistance in polymers is improved with carbon nanotubes and is found to be better than carbon powder or carbon fiber. Because of the excellent dispersion that Entegris achieves using its proprietary technology, you will see consistent electrical and thermal conductivity in our polymers. Hot and cold spots are eliminated in your final part. With the smaller

size and high aspect ratio of carbon nanotubes, lower loadings can be used to achieve better performance than conventional carbon powder or fiber options. Due to the lower loadings required, the surface appearance of a part loaded with carbon nanotubes is more aesthetically pleasing. Carbon nanotubes in plastics do not cause differential shrink or add stress to plastic parts.

TEGO compounds containing carbon nanotubes are now available for your applications. Our portfolio is constantly growing.

Consider using TEGO compounds for your applications in semiconductor and electronics, aeronautics, auto, oil and gas, medical and fluid handling. Applications may include tubing, films, stock shapes, gaskets and seals, bushings and gears, valves and product carriers.

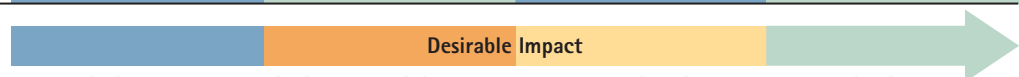
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TEGO CNT Polymers Product Offering

Relative polymer performance for key attributes.

| | Chemical Compatibility | Conductivity | Thermal Stability | Polymer Cost |
|--------|------------------------|--------------|-------------------|--------------|
| PEKEKK | Green | Green | Green | Blue |
| PEK | Green | Green | Green | Orange |
| PI | Orange | Green | Green | Orange |
| PEEK | Yellow | Green | Yellow | Yellow |
| PEI | Orange | Green | Orange | Green |
| PC | Blue | Green | Blue | Green |



Note: Polycarbonate [PC], poly (ether imide) [PEI], polyimide [PI], poly (ether ether ketone) [PEEK], poly (ether ketone) [PEK], poly (ether ketone ether ketone ketone) [PEKEKK]

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SPECIALTY MATERIALS DIVISION**

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