

SUPERIOR  GRAPHITE  
INNOVATING SINCE 1917

*Formula* **BT**<sup>TM</sup>  
Alkaline Batteries





## Electrically Conductive Additives in Various Battery Systems

(Primary Alkaline, Lead Acid, Zn-Air, Li-ion batteries and others)

**FormulaBT™** (Battery Technology) are carbon and graphite powders, developed and manufactured by Superior Graphite, primarily for use in the energy marketplace. **FormulaBT™** takes advantage of our proprietary Electro-Thermal Treatment/Purification Technology. This continuous high temperature process exposes the raw materials, e.g. natural flake or vein graphite, synthetic graphite and other carbonaceous products to temperatures approaching 3000° C, so that impurities including inorganic contaminants are vaporized. Combined with a variety of milling and classification techniques and processes, **FormulaBT™** provides the market with superior performance and high purity products.

### FormulaBT™ Benefits:

**Excellent Electrical Conductivity** - Provides outstanding electrical and thermal conductivity at lowest possible concentration of graphite in electrode systems

**High Lubricity** - Substantially reduces tool wear in the manufacturing process of the cathode rings

**Compressibility for High Mechanical Strength** - Provides the compressed electrodes with outstanding mechanical stability and integrity

**Chemical Stability** - No chemical interference with active materials in the electrode mix, or with electrolytes

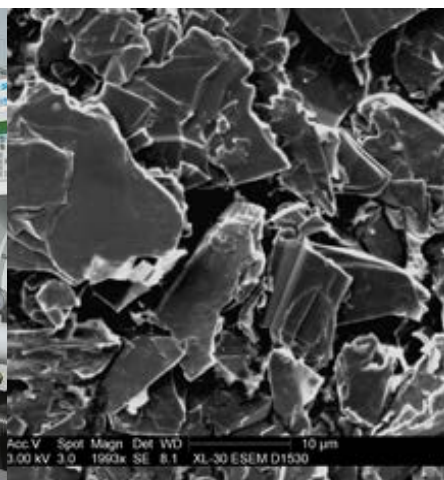
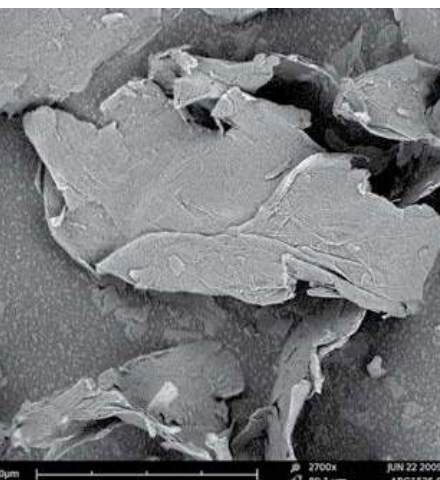
### FormulaBT™ Characteristics:

**High Purity** - High, consistent carbon content (>99.9%) with low moisture content, and extremely low impurities

**High Crystallinity** - Near 100% crystallinity leads to excellent electrical conductivity, thermal conductivity and lubrication performance

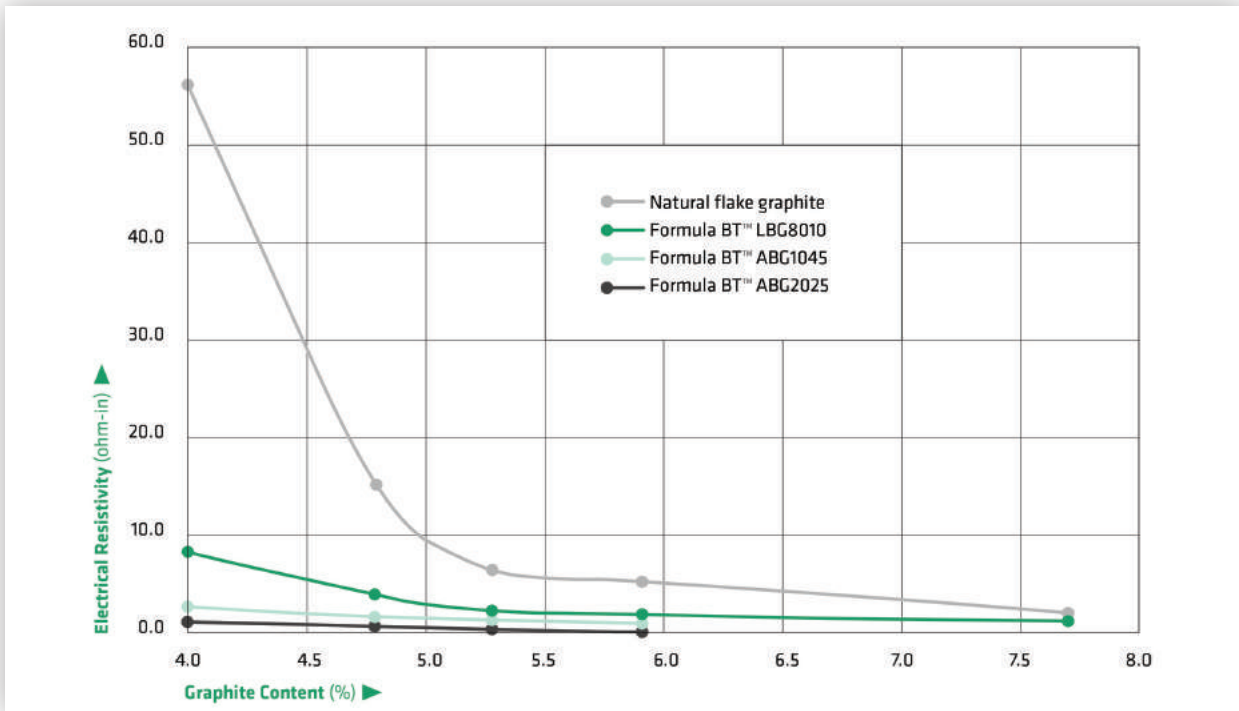
**Defined Texture** - Advanced milling and processing technologies produce defined particle shape, surface area, and bulk density to maximize the electrical conductivity of electrodes

**Defined Particle Size Distribution** - Predictability in performance and processability



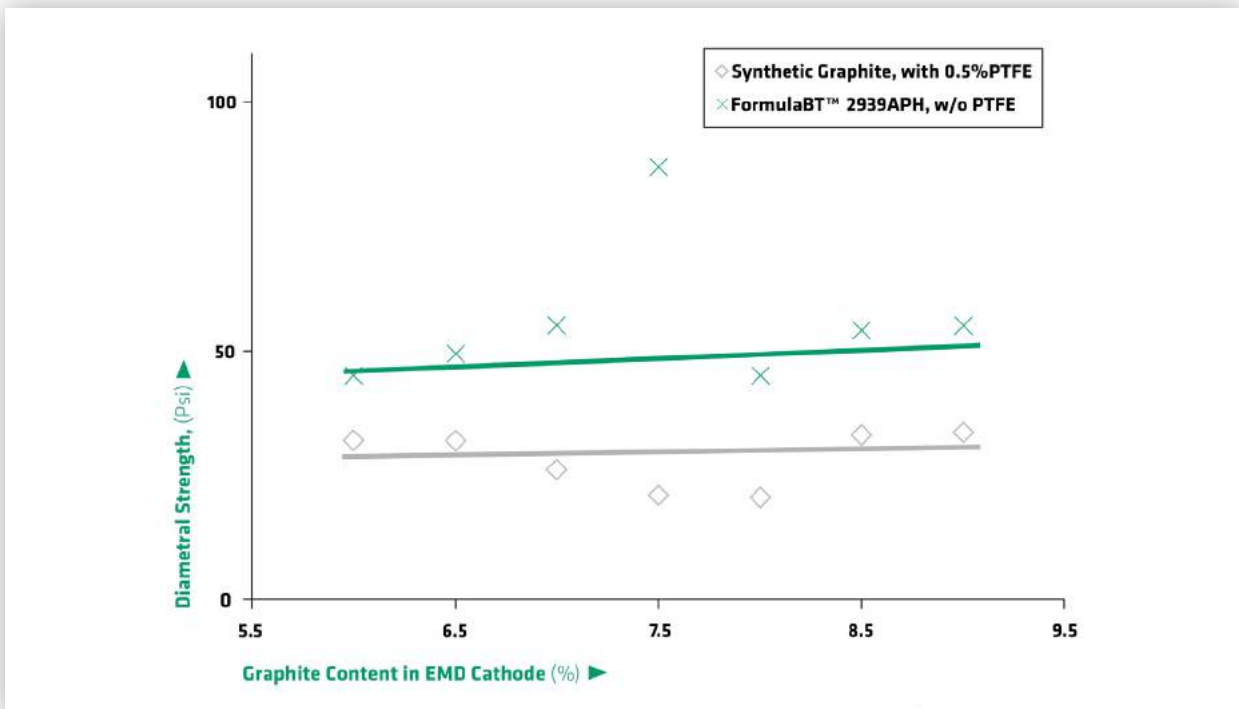
## FormulaBT™ offers excellent electrical conductivity in electrode systems

### Electrical Resistivity of MnO<sub>2</sub>/Graphite Mix as a Function of the Graphite Content



## FormulaBT™ 2939APH significantly improves the strength of MnO<sub>2</sub> cathodes and eliminates binders

### Mechanical Strength of MnO<sub>2</sub>/Graphite Tablets



## FormulaBT™ Products

Electrically Conductive Additives in Various Battery Systems  
 (Primary Alkaline, Lead Acid, Zn-Air, Li-ion batteries and others)

**FormulaBT™ ABG series** - High purity expanded flake graphite powders, large surface area, various particle sizes. Outstanding electrical and thermal conductivity enhancer for various battery systems.

**FormulaBT™ LBG series** - High purity natural flake graphite powders. Excellent electrical and thermal conductivity enhancer, various particle sizes down to 4 micron, well-defined particle size distribution specially developed for battery and fuel cell applications. Very high compressibility and lubricating properties.

**FormulaBT™ 29xx series** - Electro-thermally purified, natural flake graphite powders from 10 micron up to 800 micron. Conductivity additives, easy to compress, low tool wear.

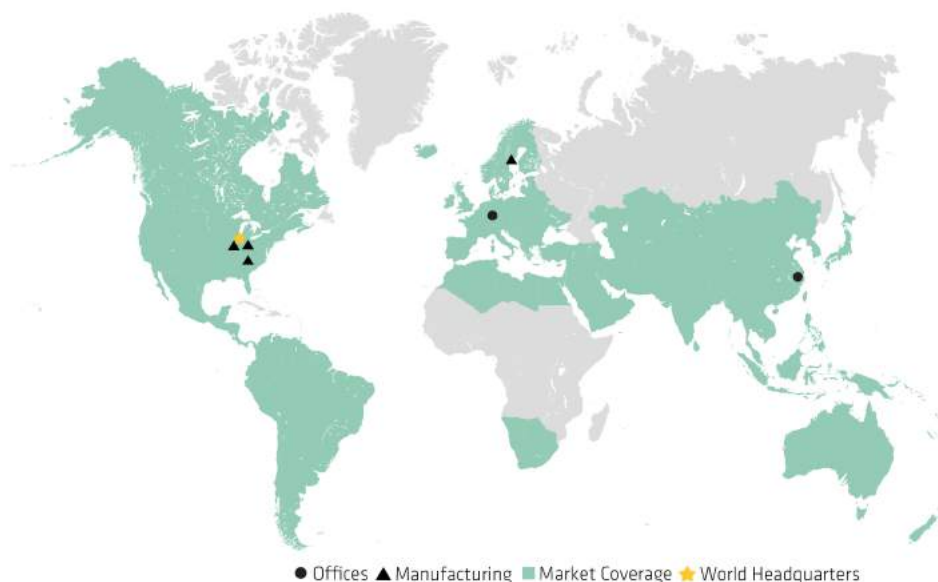
## FormulaBT™ is more than just a high performance energy material. It's a philosophy:

- Our innovative research and development team provides Superior Solutions with customized products
- Our dedicated production staff, combined with ISO 9001:2015 certified quality management systems ensure high quality products which meet agreed-upon specifications
- Our extensive worldwide distribution network ensures supply chain efficiency
- Our materials management experts secure the supply of high quality raw materials, and continuously evaluate new sources globally



### Our Mission:

We create value for our customers by providing SUPERIOR SOLUTIONS - utilizing our unique technologies, processes and talents - while contributing to the company's long-term success.



● Offices ▲ Manufacturing ■ Market Coverage ★ World Headquarters

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