

Graphite Materials Catalog

2023



Welcome to

XURAN New Materials

Xuran New Materials Limited is a production-based trading company specializing in the production and sales of graphite materials and products. Located in Hebei Province, China, this company was established in 2010 and has been focused on the production and development of high quality graphite products to meet the needs of chemical, mechanical, semiconductor, new energy, metallurgy and other fields for inorganic nonmetallic materials.

Currently, our main products include special graphite, mechanical carbon graphite parts, carbon-carbon composites, graphite felts, graphite crucibles, graphite dies & molds, vacuum furnace graphite parts for heat treatment, photovoltaic thermal field graphite parts, etc. We are committed to providing our customers with effective, comprehensive

solutions as well as technical consulting and product customization services.

Professional service team, strict product factory inspection and timely tracking throughout the transportation process guarantee we can provide our customers with high quality, accurate, convenient and fast services. We aim to be the most trustworthy graphite solution provider for our customers and provide strong support for the development of our customers!



Chapter 1

Graphite Materials

Graphite is a substance composed of carbon elements. It has a distinct layered structure, with a single layer of carbon atoms bonded to three other carbon atoms through covalent bonds to form a covalent molecule. It is an allotrope of carbon.

Graphite materials have good electrical and thermal conductivity and are widely used in the field of electronics, batteries, coatings, friction materials, etc. Besides, they also have great high temperature stability and chemical stability. Therefore, they are widely used in high temperature fields, chemical industry, etc. Graphite materials have many unique physical and chemical properties. Various forms of graphite products can be obtained by processing different types of graphite to meet the needs of different fields.



Natural Graphite

Graphite is a crystalline form of carbon that is black to dark gray, soft and slippery. It has a distinct layered structure, with a single layer of carbon atoms bonded to three other carbon atoms through covalent bonds to form a covalent molecule. It was named by Abraham Gottlob Werner in 1789 and originated from the Greek word γράφειν. It is an allotrope of carbon.

Natural graphite is a carbonaceous crystalline mineral that is generally found in ores such as graphite schist, graphite gneiss, graphite-bearing schist, and metamorphic shale. It has two common forms: crystalline (flake graphite) and cryptocrystalline (amorphous graphite).



Features

The graphite structure is intermediate between atomic crystals, metallic crystals, and molecular crystals, and has a unique crystal structure, so it has some special properties.

High Temperature Resistance & Thermal Shock Resistance

The graphite melting point is 3850 ± 50 °C, and the boiling point is 425 °C. It has a small thermal expansion coefficient, in the case of sudden temperature change, the volume of graphite changes little, therefore it has good thermal shock resistance. The strength of graphite increases as the temperature rises, and at 2000 °C, the strength is doubled.

Electrical & Thermal Conductivity

As each plane of carbon atoms has residual atoms, together with residual atoms on the adjacent planes, functions as electron clouds and exists between the mesh planes, making graphite have good thermal and electrical conductivity. The thermal conductivity of graphite decreases as temperature rises, and at extremely high temperatures, graphite becomes a thermal insulator.

Lubricity

The van der Waals force between graphite layers is weak, making it lubricious. The lubricity of graphite depends on the size of the graphite flakes, the larger the flakes, the lower the friction coefficient, and the higher the lubricity.

Chemical Stability

Graphite has good chemical stability at room temperature and is resistant to corrosion from acids, alkalis, and organic solvents.

Plasticity

Graphite has good toughness and can be rolled into very thin sheets.

Coating Performance

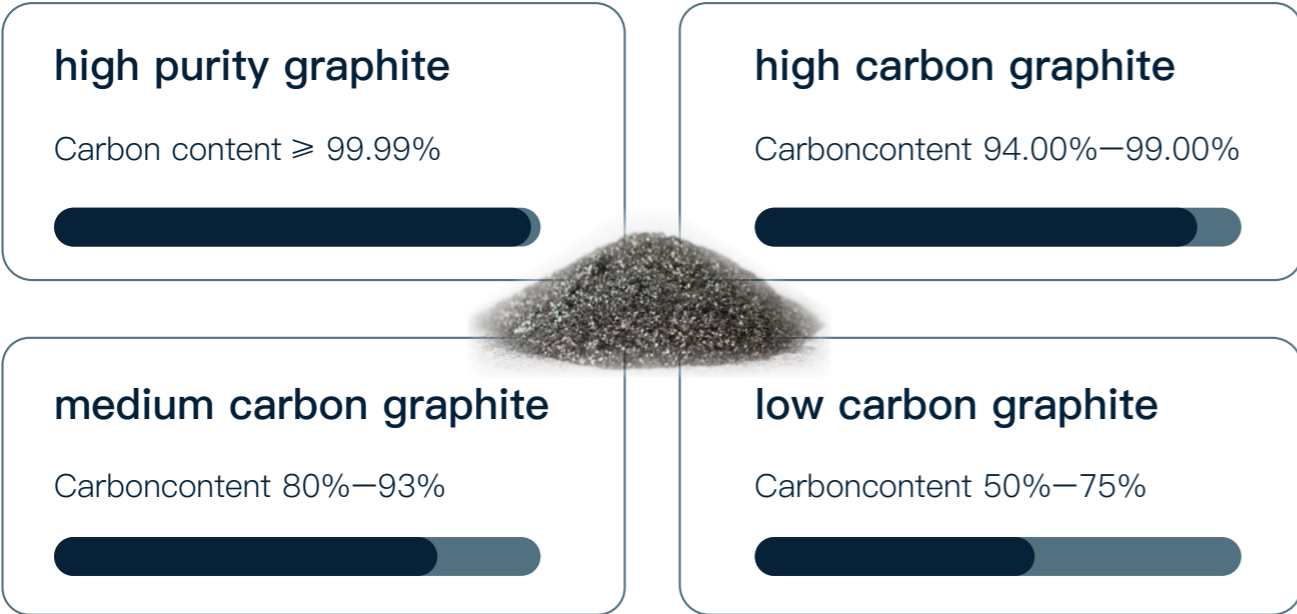
Graphite can be coated on the surface of solid materials to form a thin film, which adheres firmly and provides protection.

GRAPHITE

► Natural Flake Graphite

Natural flake graphite is a mineral that is formed through long-term geological metamorphism of carbonaceous rocks. It is a kind of natural crystalline graphite with a fish scale like appearance and presents a layered structure. Natural flake graphite has excellent high temperature resistance, corrosion resistance, thermal shock resistance, radiation resistance, high strength, good toughness, lubrication, plasticity, as well as electrical and thermal conductivity. It is commonly used to make refractory materials, electrode materials for lithium batteries, bipolar plates for fuel cells, brake pads, casting coatings, lubricants, etc.

According to the fixed carbon content by mass, natural flake graphite can be divided into four categories:



Key Indicators & Uses of High Purity Graphite

Model	Fixed Carbon Content	Moisture	Weight of Screen Residue	Main Uses
LC300-99.99	$\geq 99.99\%$	$\leq 0.20\%$	$\geq 80.0\%$	Flexible graphite sealing material
LC(-)150-99.99	$\geq 99.99\%$	$\leq 0.20\%$	$\leq 20.0\%$	Replace platinum crucible for chemical reagent melting
LC(-)75-99.99	$\geq 99.99\%$	$\leq 0.20\%$	$\leq 20.0\%$	
LC(-)45-99.99	$\geq 99.99\%$	$\leq 0.20\%$	$\leq 20.0\%$	
LC500-99.9	$\geq 99.90\%$	$\leq 0.20\%$	$\geq 80.0\%$	Flexible graphite sealing material
LC300-99.9	$\geq 99.90\%$	$\leq 0.20\%$	$\geq 80.0\%$	
LC180-99.9	$\geq 99.90\%$	$\leq 0.20\%$	$\geq 80.0\%$	
LC(-)150-99.9	$\geq 99.90\%$	$\leq 0.20\%$	$\leq 20.0\%$	Lubricant base
LC(-)75-99.9	$\geq 99.90\%$	$\leq 0.20\%$	$\leq 20.0\%$	
LC(-)45-99.9	$\geq 99.90\%$	$\leq 0.20\%$	$\leq 20.0\%$	

Notes :

Product model is composed of its classification code, fineness (μm) and fixed carbon content.

The symbol (-) indicates that the screen underflow is less than or equal to 20.0% after sieving on a test sieve with a sieve diameter of 150 μm.

1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 kcal/cm.h.° C

These properties are typical values and not guaranteed.

Key Indicators & Uses of High Carbon Graphite

Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
LG500-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	Filling material
LG300-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG180-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG150-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG125-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG100-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG(-)150-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	Lubricant base and coating material
LG(-)125-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)100-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)75-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)45-99	$\geq 99.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG500-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG300-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG180-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG150-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG125-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG100-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG(-)150-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)125-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)100-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)75-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)45-98	$\geq 98.00\%$	$\leq 1.00\%$	$\leq 0.50\%$	$\leq 20.0\%$	Lubricant base and electric brush raw materials
LG500-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG300-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG180-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG150-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG125-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG100-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG(-)150-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)125-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)100-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)75-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	Refractory materials, electric brush products, and raw materials for batteries and pencils
LG(-)45-97	$\geq 97.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG500-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG300-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG180-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG150-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG125-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG100-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\geq 75.0\%$	
LG(-)150-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)125-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)100-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)75-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	
LG(-)45-96	$\geq 96.00\%$	$\leq 1.20\%$	$\leq 0.50\%$	$\leq 20.0\%$	

Key Indicators & Uses of High Carbon Graphite

Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
LG500-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	Electric brush products
LG300-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG180-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG150-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG125-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG100-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG(-)150-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	Refractory materials, electric brush products, and raw materials for batteries and pencils
LG(-)125-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)100-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)75-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)45-95	≥ 95.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG500-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	Electric brush products
LG300-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG180-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG150-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG125-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG100-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≥ 75.0%	
LG(-)150-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)125-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)100-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)75-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	
LG(-)45-94	≥ 94.00%	≤ 1.20%	≤ 0.50%	≤ 20.0%	

Notes :

Product model is composed of its classification code, fineness (μm) and fixed carbon content.

The symbol (-) indicates that the screen underflow is less than or equal to 20.0% after sieving on a test sieve with a sieve diameter of 150 μm.

1 MPa = 10.2 kgf/cm2; 1 W/m.k = 0.86 kcal/cm.h.° C

These properties are typical values and not guaranteed.

Key Indicators & Uses of Medium Carbon Graphite

Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
LZ500-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	Crucibles, refractory materials and dyes
LZ300-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ180-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ150-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ125-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ100-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ(-)150-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)125-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)100-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)75-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)45-93	≥ 93.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ500-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ300-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ180-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ150-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ125-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ100-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	

Key Indicators & Uses of Medium Carbon Graphite

Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
LZ(-)150-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	Crucibles, refractory materials and dyes
LZ(-)125-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)100-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)75-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)45-92	≥ 92.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ500-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ300-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ180-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ150-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ125-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ100-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≥ 75.0%	
LZ(-)150-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)125-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	Crucibles and refractory materials
LZ(-)100-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)75-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ(-)45-91	≥ 91.00%	≤ 1.50%	≤ 0.50%	≤ 20.0%	
LZ500-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ300-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ180-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	Raw materials for batteries and pencils
LZ150-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ125-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ100-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ(-)150-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	Crucibles and refractory materials
LZ(-)125-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)100-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)75-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)45-90	≥ 90.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	Raw materials for batteries and pencils
LZ500-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ300-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ180-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ150-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ125-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	Crucibles and refractory materials
LZ100-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ(-)150-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)125-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)100-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)75-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	Crucibles and refractory materials
LZ(-)45-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)38-89	≥ 89.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ500-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ300-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	Crucibles and refractory materials
LZ180-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ150-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ125-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	
LZ100-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≥ 75.0%	

Key Indicators & Uses of Medium Carbon Graphite

Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
LZ(-)150-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	Raw materials for batteries and pencils
LZ(-)125-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)100-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)75-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)45-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ(-)38-88	≥ 88.00%	≤ 2.00%	≤ 0.50%	≤ 20.0%	
LZ500-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	Crucibles and refractory materials
LZ300-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ180-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ150-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ125-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ100-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ(-)150-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	Raw materials for batteries and pencils
LZ(-)125-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)100-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)75-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)45-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)38-87	≥ 87.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ300-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	Refractory materials
LZ180-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ150-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ125-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ100-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ(-)150-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	Casting materials
LZ(-)125-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)100-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)75-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)45-86	≥ 86.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ500-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	Crucibles and refractory materials
LZ300-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ180-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ150-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ125-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ100-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≥ 75.0%	
LZ(-)150-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	Casting materials
LZ(-)125-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)100-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)75-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ(-)45-85	≥ 85.00%	≤ 2.50%	≤ 0.50%	≤ 20.0%	
LZ500-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	Refractory materials
LZ300-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ180-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ150-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ125-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ100-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	

Key Indicators & Uses of Medium Carbon Graphite

Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
LZ(-)150-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	Casting materials
LZ(-)125-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ(-)100-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ(-)75-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ(-)45-83	≥ 83.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ500-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	Refractory materials
LZ300-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ180-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ150-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ125-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ100-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≥ 75.0%	
LZ(-)150-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	Casting materials
LZ(-)125-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ(-)100-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ(-)75-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	
LZ(-)45-80	≥ 80.00%	≤ 3.00%	≤ 1.00%	≤ 20.0%	

Notes :

Product model is composed of its classification code, fineness (μm) and fixed carbon content.

The symbol (-) indicates that the screen underflow is less than or equal to 20.0% after sieving on a test sieve with a sieve diameter of 150 μm.

1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 °cal/cm.h.° C

These properties are typical values and not guaranteed.

Key Indicators & Uses of Low Carbon Graphite

Model	Fixed Carbon Content	Moisture	Weight of Screen Residue	Main Uses
LD(-)150-75	≥ 75.0%	≤ 1.00%	≤ 20.0%	Casting materials
LD(-)75-75	≥ 75.0%	≤ 1.00%	≤ 20.0%	
LD(-)150-70	≥ 70.0%	≤ 1.00%	≤ 20.0%	
LD(-)75-70	≥ 70.0%	≤ 1.00%	≤ 20.0%	
LD(-)150-65	≥ 65.0%	≤ 1.00%	≤ 20.0%	
LD(-)75-65	≥ 65.0%	≤ 1.00%	≤ 20.0%	
LD(-)150-60	≥ 60.0%	≤ 1.00%	≤ 20.0%	
LD(-)75-60	≥ 60.0%	≤ 1.00%	≤ 20.0%	
LD(-)150-55	≥ 55.0%	≤ 1.00%	≤ 20.0%	
LD(-)75-55	≥ 55.0%	≤ 1.00%	≤ 20.0%	
LD(-)150-50	≥ 50.0%	≤ 1.00%	≤ 20.0%	
LD(-)75-50	≥ 50.0%	≤ 1.00%	≤ 20.0%	

Notes :

Product model is composed of its classification code, fineness (μm) and fixed carbon content.

The symbol (-) indicates that the screen underflow is less than or equal to 20.0% after sieving on a test sieve with a sieve diameter of 150 μm.

1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 °cal/cm.h.° C

These properties are typical values and not guaranteed.

Expandable Graphite

Expandable graphite, also known as graphite acid, acidized graphite or graphite oxide, is a graphite interlayer compound prepared by using chemical oxidation (chemical method), electrochemical method, microwave method, explosion method and gas phase volatilization method for natural flake graphite treatment. After special treatment, expandable graphite can be instantly expanded into worm-like shape under high temperature.

Different types of insert lead to different intercalation structures, giving it unique physical and chemical properties such as high electrical and thermal conductivity, superconductivity, magnetic permeability, battery performance, catalytic properties, and expansion performance. The application of expandable graphite covers the practical use in high-conductivity materials, battery materials, efficient catalysts, hydrogen storage materials, and improvements in expansible graphite sealing materials.

According to the sulphur content after expansion, expandable graphite is divided into sulfurous expandable graphite (≥ 0.120%) and low sulfur expandable graphite (< 0.120%).



Expandable Graphite Technical Indicators

Category	Before Expansion				After Expansion	
	Moisture	pH Value	Weight of Screen Residue (150 μm, 180 μm, 300 μm)	Expansion Volume (mL/g)	Sulfur Content	Fixed Carbon Content
Sulfurous expansible graphite	< 1.00%	3.00-9.00	≤ 20.00%	50-400	≥ 0.120%	90% - 99%
Low sulfur expandable graphite	< 1.00%	3.00-9.00	≤ 20.00%	50-400	< 0.120%	90% - 99%

Notes :
1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 °cal/cm.h.° C
These properties are typical values and not guaranteed.

Micro Powder Graphite

Micro powder graphite inherits the good properties of natural flake graphite and has special oxidation resistance, self-lubricity and plasticity under high temperatures. Besides, it also has good electrical conductivity, thermal conductivity and adhesion. It is widely used as a release lubricant in the production of catalyst for the fertilizer industry, a high-temperature lubricant base, a corrosion-resistant lubricant base, powder metallurgy release lubricant and metal alloy raw material, carbon film resistance making, conductive dry film and preparation of conductive liquid, plastic, rubber and various composite fillers or performance improvement agent to enhance the wear resistance, electrical resistance or conductivity of materials



Micro Powder Graphite Technical Indicators

Model	Fixed Carbon Content	Ash Content	Moisture	Particle Size	Testing Equipment
WFS-001	90% - 99.9%	0.1% - 10%	0.2%	1μm, ≥ 60%	Laser particle size distribution instrument
WFS-002	90% - 99.9%	0.1% - 10%	0.2%	2μm, ≥ 60%	
WFS-003	90% - 99.9%	0.1% - 10%	0.2%	3μm, ≥ 60%	
WS-006	90% - 99.9%	0.1% - 10%	0.2%	6μm, ≥ 60%	
WS-010	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	10μm, ≥ 60%	Laser particle size distribution instrument
WS-013	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	13μm, ≥ 80%	
WS-018	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	18μm, ≥ 80%	
WS-028	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	28μm, ≥ 80%	
WS-043a	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	43μm, ≥ 85%	Water sieve
WS-043b	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	43μm, ≥ 85%	
WS-043c	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	43μm, ≥ 85%	
WS-074	90% - 99.9%	0.1% - 10%	0.1% - 0.5%	74μm, ≥ 85%	

Notes :
Product model is composed of its classification code and oversize particle size after sieving.
1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 °cal/cm.h.° C
These properties are typical values and not guaranteed.

Graphite Emulsion

Graphite emulsion is a emulsion that is mainly composed of micro powder graphite. It features high temperature lubricity, adhesion, easy demolding, stable chemical properties, non–corrosive, non–toxic, enhanced molding quality, significantly extended the service life of the die, etc. Strictly speaking, it should be called as graphite colloid and is divided into forging graphite emulsion, solvent–based graphite emulsion, and water–based graphite emulsion.

Of which, forging graphite emulsion is made from high purity, ultra–fine, natural flake graphite powder obtained by taking high carbon graphite as the raw material and then going through ultra–fine grinding. It is a highly dispersed colloidal graphite emulsion made by taking water as a carrier and then adding appropriate amount of chemical additives such as suspension dispersant, emulsifier, stabilizer, and colloid protectants. This emulsion is an ideal ideal high–temperature release agent for ferrous and non–ferrous black hot working and is widely used in forging and metal forming industries.



Graphite Emulsion Technical Indicators

Model	Solid Content	Graphite Content	Subsidence after 3 Hours Due to 20 Times of Dilution	Application Examples
GE-2820	> 28%	> 20%	35%	Die forging, gear rough, finish forge and roll forging
GE-3025	> 30%	> 25%	Free of dilution	Steel casting spout slide lubrication
GE-3525	> 35%	> 25%	Free of dilution	Purified silicon smelting
GE-4025	> 40%	> 25%	40%	Light alloy extruding
GE-3023	> 30%	> 23%	35%	Die forging for heavy–duty press
GE-3526	> 35%	> 26%	Free of dilution	Hot extruding for warheads and shell cases
GE-3023	> 30%	> 23%	35%	Hammer forging

Notes :
Product model is composed of its classification code, solid content and graphite content.
1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 *cal/cm.h.° C
These properties are typical values and not guaranteed.

► Amorphous Graphite

Amorphous graphite (aphanitic or cryptocrystalline graphite) is a dense aggregate composed of tiny natural graphite crystals, and also known as microcrystalline graphite. It is gray–black or steel–gray with a metallic luster. It has soft texture, feels smooth, and dyes hands easily. Besides, it has stable chemical properties, good thermal and electrical conductivity, high temperature resistance, acid and alkali resistance, corrosion resistance, and oxidation resistance. It is widely used in casting, coating, batteries, carbon, and other industries because of its small crystal size (grain size < 1 μm), strong plasticity, and good adhesion.

Amorphous graphite is divided into into two categories based on whether it contains iron or not:



Physical and Chemical Indicators of Ferrous Amorphous Graphite & Main Uses

Model	Fixed Carbon Content	Volatile	Moisture	Acid–Soluble Iron	Weight of Screen Residue	Main Uses
WT99.99-45	≥ 99.99%	-	≤ 0.2%	≤ 0.005%	≤ 15%	Battery and special carbon raw materials
WT99.99-75	≥ 99.99%	-	≤ 0.2%	≤ 0.005%	≤ 15%	
WT99.9-45	≥ 99.99%	-	≤ 0.2%	≤ 0.005%	≤ 15%	
WT99.9-75	≥ 99.99%	-	≤ 0.2%	≤ 0.005%	≤ 15%	
WT99-45	≥ 99%	≤ 0.8%	≤ 1.0%	≤ 0.15%	≤ 15%	Pencil, battery, electrode, graphite emulsion and graphite bearing ingredients, battery carbon rod raw materials
WT99-75	≥ 99%	≤ 0.8%	≤ 1.0%	≤ 0.15%	≤ 15%	
WT98-45	≥ 98%	≤ 1.0%	≤ 1.0%	≤ 0.15%	≤ 15%	
WT98-75	≥ 98%	≤ 1.0%	≤ 1.0%	≤ 0.15%	≤ 15%	
WT97-45	≥ 97%	≤ 1.5%	≤ 1.5%	≤ 0.4%	≤ 15%	
WT97-75	≥ 97%	≤ 1.5%	≤ 1.5%	≤ 0.4%	≤ 15%	
WT96-45	≥ 96%	≤ 1.5%	≤ 1.5%	≤ 0.4%	≤ 15%	
WT96-75	≥ 96%	≤ 1.5%	≤ 1.5%	≤ 0.4%	≤ 15%	
WT95-45	≥ 95%	≤ 2.0%	≤ 1.5%	≤ 0.4%	≤ 15%	
WT95-75	≥ 95%	≤ 2.0%	≤ 1.5%	≤ 0.4%	≤ 15%	
WT94-45	≥ 94%	≤ 2.0%	≤ 1.5%	≤ 0.7%	≤ 15%	
WT94-75	≥ 94%	≤ 2.0%	≤ 1.5%	≤ 0.7%	≤ 15%	
WT92-45	≥ 92%	≤ 2.0%	≤ 2.0%	≤ 0.7%	≤ 10%	
WT92-75	≥ 92%	≤ 2.0%	≤ 2.0%	≤ 0.7%	≤ 10%	
WT90-45	≥ 90%	≤ 2.0%	≤ 2.0%	≤ 0.7%	≤ 10%	
WT90-75	≥ 90%	≤ 2.0%	≤ 2.0%	≤ 0.7%	≤ 10%	
WT88-45	≥ 88%	≤ 3.3%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT88-75	≥ 88%	≤ 3.3%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT85-45	≥ 85%	≤ 3.3%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT85-75	≥ 85%	≤ 3.3%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT83-45	≥ 83%	≤ 3.6%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT83-75	≥ 83%	≤ 3.6%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT80-45	≥ 80%	≤ 3.6%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT80-75	≥ 80%	≤ 3.6%	≤ 2.0%	≤ 0.8%	≤ 10%	
WT78-45	≥ 78%	≤ 3.8%	≤ 2.0%	≤ 1.0%	≤ 10%	
WT78-75	≥ 78%	≤ 3.8%	≤ 2.0%	≤ 1.0%	≤ 10%	
WT75-45	≥ 75%	≤ 3.8%	≤ 2.0%	≤ 1.0%	≤ 10%	
WT75-75	≥ 75%	≤ 3.8%	≤ 2.0%	≤ 1.0%	≤ 10%	

Notes :
Product model is composed of its classification code, fixed carbon content and fineness (μm).
1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 *cal/cm.h.° C
These properties are typical values and not guaranteed.

Physical and Chemical Indicators of Ferrous-Free Amorphous Graphite & Main Uses

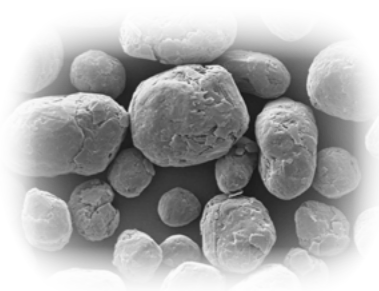
Model	Fixed Carbon Content	Volatile	Moisture	Weight of Screen Residue	Main Uses
W90-45	≥ 90%	≤ 3.0%	≤ 3.0%	≤ 10%	Raw materials for casting material, refractory materials, dyes, electrode paste, etc.
W90-75	≥ 90%	≤ 3.0%	≤ 3.0%	≤ 10%	
W88-45	≥ 88%	≤ 3.2%	≤ 3.0%	≤ 10%	
W88-75	≥ 88%	≤ 3.2%	≤ 3.0%	≤ 10%	
W85-45	≥ 85%	≤ 3.4%	≤ 3.0%	≤ 10%	
W85-75	≥ 85%	≤ 3.4%	≤ 3.0%	≤ 10%	
W83-45	≥ 83%	≤ 3.6%	≤ 3.0%	≤ 10%	
W83-75	≥ 83%	≤ 3.6%	≤ 3.0%	≤ 10%	
W80-45	≥ 80%	≤ 3.6%	≤ 3.0%	≤ 10%	
W80-75	≥ 80%	≤ 3.6%	≤ 3.0%	≤ 10%	
W80-150	≥ 80%	≤ 3.6%	≤ 3.0%	≤ 10%	
W78-45	≥ 78%	≤ 4.0%	≤ 3.0%	≤ 10%	
W78-75	≥ 78%	≤ 4.0%	≤ 3.0%	≤ 10%	
W78-150	≥ 78%	≤ 4.0%	≤ 3.0%	≤ 10%	
W75-45	≥ 75%	≤ 4.0%	≤ 3.0%	≤ 10%	
W75-75	≥ 75%	≤ 4.0%	≤ 3.0%	≤ 10%	
W75-150	≥ 75%	≤ 4.0%	≤ 3.0%	≤ 10%	
W70-45	≥ 70%	≤ 4.2%	≤ 3.0%	≤ 10%	
W70-75	≥ 70%	≤ 4.2%	≤ 3.0%	≤ 10%	
W70-150	≥ 70%	≤ 4.2%	≤ 3.0%	≤ 10%	
W65-45	≥ 65%	≤ 4.2,%	≤ 3.0%	≤ 10%	
W65-75	≥ 65%	≤ 4.2,%	≤ 3.0%	≤ 10%	
W65-150	≥ 65%	≤ 4.2,%	≤ 3.0%	≤ 10%	
W55-45	≥ 55%	≤ 4.5%	≤ 3.0%	≤ 10%	
W55-75	≥ 55%	≤ 4.5%	≤ 3.0%	≤ 10%	
W55-150	≥ 55%	≤ 4.5%	≤ 3.0%	≤ 10%	
W50-45	≥ 50%	≤ 4.5%	≤ 3.0%	≤ 10%	
W50-75	≥ 50%	≤ 4.5%	≤ 3.0%	≤ 10%	
W50-150	≥ 50%	≤ 4.5%	≤ 3.0%	≤ 10%	

Notes :
Product model is composed of its classification code, fixed carbon content and fineness (μm).
1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 °cal/cm.h.° C
These properties are typical values and not guaranteed.

Spherical Graphite

Spherical graphite is a kind of graphite products with various fineness and an oval spherical shape. It takes high quality amorphous graphite (aphanitic graphite) as raw materials, and then advanced processing technology is adopted to perform modified treatment on the graphite surface. It is a powder with metallic luster and gray-black or steel gray appearance.

Spherical graphite material features good electrical conductivity and chemical stability, high crystallinity, low cost, high theoretical lithium insertion capacity, high charge/discharge capacity, low charge/discharge potential, etc. It is an important part of the anode (cathode) material for lithium-ion batteries, and is an alternative to anode material for lithium-ion production at home and abroad.



Spherical Graphite Technical Indicators

Model	Sphericity	Fixed Carbon Content	Tap Density (g/cm³)	Magnetic Substance Content (mg/kg)	Ion Content (mg/kg)
SG- I -09	≥ 0.9	≥ 99.95%	≥ 0.90	≤ 0.1	≤ 30
SG- I -08	≥ 0.8	≥ 99.9%	≥ 0.90	≤ 0.3	≤ 50
SG- I -06	≥ 0.6	≥ 99.0%	≥ 0.75	≤ 0.5	≤ 70

Notes :
Product model is composed of its classification code, grade and sphericity.
1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 °cal/cm.h.° C
These properties are typical values and not guaranteed.



► Carbon Raiser

Carbon raiser, also known as carbon additive or recarburizer, is a material added to molten metal to increase its carbon content. When being used in steelmaking or casting, the fixed carbon of carbon raiser can reach more than 95%. It has been widely used in various industries such as metallurgy, chemical, and power.

There are many kinds of raw materials and production processes for carbon raisers, including wood-based carbon, coal-based carbon, coke-based carbon, graphite-based carbon, with many sub-categories under each category. High quality carbon raisers generally refer to graphitized carbon additives. As the carbon atoms are arranged in a graphite-like microstructure under high temperature conditions, so it is called as graphitization. Graphitization can reduce the content of impurities in the carbon additive, increase the carbon content, and lower the sulfur content. When being used in casting, carbon raisers can significantly increase the amount of scrap steel used, reduce the amount of pig iron used, or eliminate the need for pig iron.

Granularity

Graininess:

0 – 2 mm



Graininess:

2 – 5 mm



Graininess:

2 – 8 mm



Graininess:

8 – 25 mm



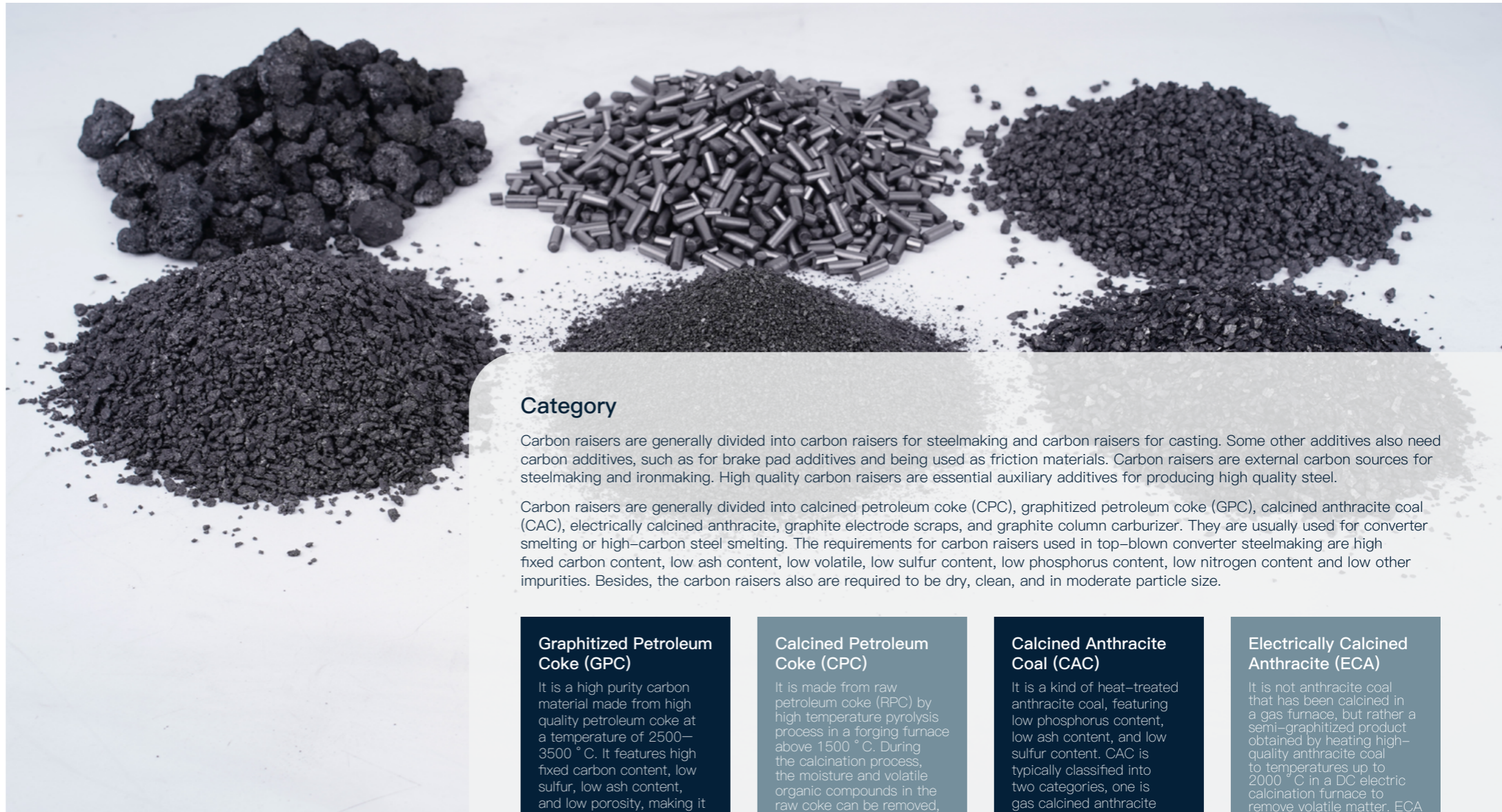
Specifications of Various Carbon Raisers

Item	GPC (Graphitized Petroleum Coke)	Semi-GPC	CPC (Calcined Petroleum Coke)	GCA (Gas Calcined Anthracite)	GCA (Gas Calcined Anthracite)	GCA (Gas Calcined Anthracite)	Graphite Electrode Scraps
Fixed Carbon	≥ 98.5%	≥ 98.5%	≥ 98.5%	≥ 90%	≥ 92%	≥ 95%	≥ 98.5%
Sulfur Content	≤ 0.05%	≤ 0.30%	≤ 0.50%	≤ 0.50%	≤ 0.40%	≤ 0.25%	≤ 0.05%
Volatile Matter	≤ 1.0%	≤ 1.0%	≤ 1.0%	≤ 1.5%	≤ 1.5%	≤ 1.2%	≤ 0.8%
Ash	≤ 1.0%	≤ 1.0%	≤ 1.0%	≤ 8.5%	≤ 7.5%	≤ 4.0%	≤ 0.7%
Moisture Content	≤ 0.5%	≤ 0.5%	≤ 0.5%	≤ 1.0%	≤ 1.0%	≤ 1.0%	≤ 0.5%
Particle Size/mm	0-1; 1-3; 1-5; etc.	0-1; 1-3; 1-5; etc.	0-1; 1-3; 1-5; etc.	0-1; 1-3; 1-5; etc.	0-1; 1-3; 1-5; etc.	0-1; 1-3; 1-5; etc.	0-1; 1-3; 1-5; etc.

Notes :

1 MPa = 10.2 kgf/cm²; 1 W/m.k = 0.86 kcal/cm.h.°C

These properties are typical values and not guaranteed.



Category

Carbon raisers are generally divided into carbon raisers for steelmaking and carbon raisers for casting. Some other additives also need carbon additives, such as for brake pad additives and being used as friction materials. Carbon raisers are external carbon sources for steelmaking and ironmaking. High quality carbon raisers are essential auxiliary additives for producing high quality steel.

Carbon raisers are generally divided into calcined petroleum coke (CPC), graphitized petroleum coke (GPC), calcined anthracite coal (CAC), electrically calcined anthracite, graphite electrode scraps, and graphite column carburizer. They are usually used for converter smelting or high-carbon steel smelting. The requirements for carbon raisers used in top-blown converter steelmaking are high fixed carbon content, low ash content, low volatile, low sulfur content, low phosphorus content, low nitrogen content and low other impurities. Besides, the carbon raisers also are required to be dry, clean, and in moderate particle size.

Graphitized Petroleum Coke (GPC)

It is a high purity carbon material made from high quality petroleum coke at a temperature of 2500—3500 °C. It features high fixed carbon content, low sulfur, low ash content, and low porosity, making it an ideal carbon raiser for producing high quality steel, cast iron, and alloys. It can also be used as an additive for plastics and rubber.

Calcined Petroleum Coke (CPC)

It is made from raw petroleum coke (RPC) by high temperature pyrolysis process in a forging furnace above 1500 °C. During the calcination process, the moisture and volatile organic compounds in the raw coke can be removed, thereby improving the purity and density of the coke. CPC has a high carbon content, low ash content, and high electrical and thermal conductivity, and is widely used in the aluminum industry for the melting of alumina. It is also used as a carbon raiser in foundries for producing high-carbon steel.

Calcined Anthracite Coal (CAC)

It is a kind of heat-treated anthracite coal, featuring low phosphorus content, low ash content, and low sulfur content. CAC is typically classified into two categories, one is gas calcined anthracite (GCA) that is widely used as a carbon raiser in the steelmaking and casting industries. The other is electrically calcined anthracite (ECA) that is used in the metallurgical industry for producing carbon blocks, cathode carbon blocks, carbon bricks, and carbon paste.

Electrically Calcined Anthracite (ECA)

It is not anthracite coal that has been calcined in a gas furnace, but rather a semi-graphitized product obtained by heating high-quality anthracite coal to temperatures up to 2000 °C in a DC electric calcination furnace to remove volatile matter. ECA has a higher carbon content and a relatively higher thermal and electrical conductivity than traditional anthracite, and has excellent performance in terms of mechanical/compressive strength and long-term stability. It is mainly used in the manufacture of electrode paste, as well as in the production of steel and aluminum.

Gas Calcined Anthracite (GCA)

It is produced by annealing anthracite in a horizontal gas furnace at about 1280 °C. It is made from anthracite and is known for its low ash content, low sulfur content and low volatile content. It is mainly used as a carbon raiser in the steel or foundry industry.

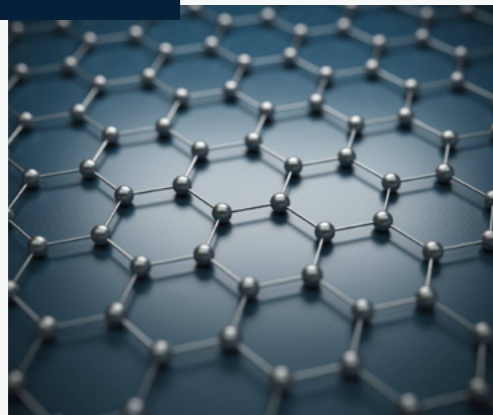
Graphite Electrode Scraps (GES)

It is also known as electrode scrap or graphite scrap, and is a collective term for the waste products produced by carbon products after graphitization and the materials generated by cutting and rushing graphitized products during processing. It is manually cleaned, rushed, and screened and features high carbon content, low sulfur content, low nitrogen content, low resistivity and low ash content, etc. It is the carbon raiser used in steel making and casting industries.

Graphite Column Carburizer (GCC)

Graphite column carburizer is a kind of column carbon raiser made of graphite powder and binder. It features high carbon content, low impurity content, high absorption rate and good use effect. It can improve the absorption rate of molten iron to the carbon raiser, shorten the absorption time, enhance the scrap steel output and reduce the production cost, thus realizing the reuse of scrap steel.

Graphene



The term graphene is derived from graphite and the naming suffix of alkenes (ene), indicating an atomic-scale network that the single atomic layer of carbon extended endlessly. That is, a single layer of graphite sheet, which is a two-dimensional carbon material and is a basic unit of various carbon allotropes such as graphene, charcoal, carbon nanotubes, fullerenes, etc. Besides, it is also a general term for single-layer graphene, double-layer graphene, and few-layer graphene. In fact, a single layer or a few layers of carbon atoms (graphene layer) can be called graphene. Graphene is currently the thinnest material artificially produced in the world, with a thickness of a single carbon atom only 0.335 nm.

Perfect graphene has an ideal two-dimensional crystal structure composed of hexagonal lattices. Each carbon atom is connected to three other carbon atoms through a strong σ covalent bond, forming a strong C-C bond. Moreover, each carbon atom contributes a non-bonding π electron, and these π electrons form a π orbital perpendicular to the plane. These π electrons can move freely in the crystal, endowing graphene with excellent mechanical strength and conductivity. Therefore, graphene is a two-dimensional carbon nanomaterial consisting of carbon atoms in a hexagonal honeycomb lattice with sp^2 hybrid orbitals.

Graphene materials refer to graphene-related two-dimensional carbon materials with no more than 10 carbon atom layers, including single-layer graphene, double-layer graphene, few-layer graphene, graphene, single-layer graphene oxide, graphene oxide, single-layer reduced graphene oxide, reduced graphene, and functionalized graphene.

Graphene and graphene-related materials are widely used in battery electrode materials, semiconductor devices, transparent displays, sensors, capacitors, transistors, etc. Given the excellent properties of graphene materials and their potential applications, a series of significant advances have been made in a wide range of disciplines, including chemistry, materials science, physics, biology, environmental science and energy.



It has a stable crystal structure with a C-C bond length of 0.142 nm.



The double bond on graphene can be used to join the required groups through addition reaction.



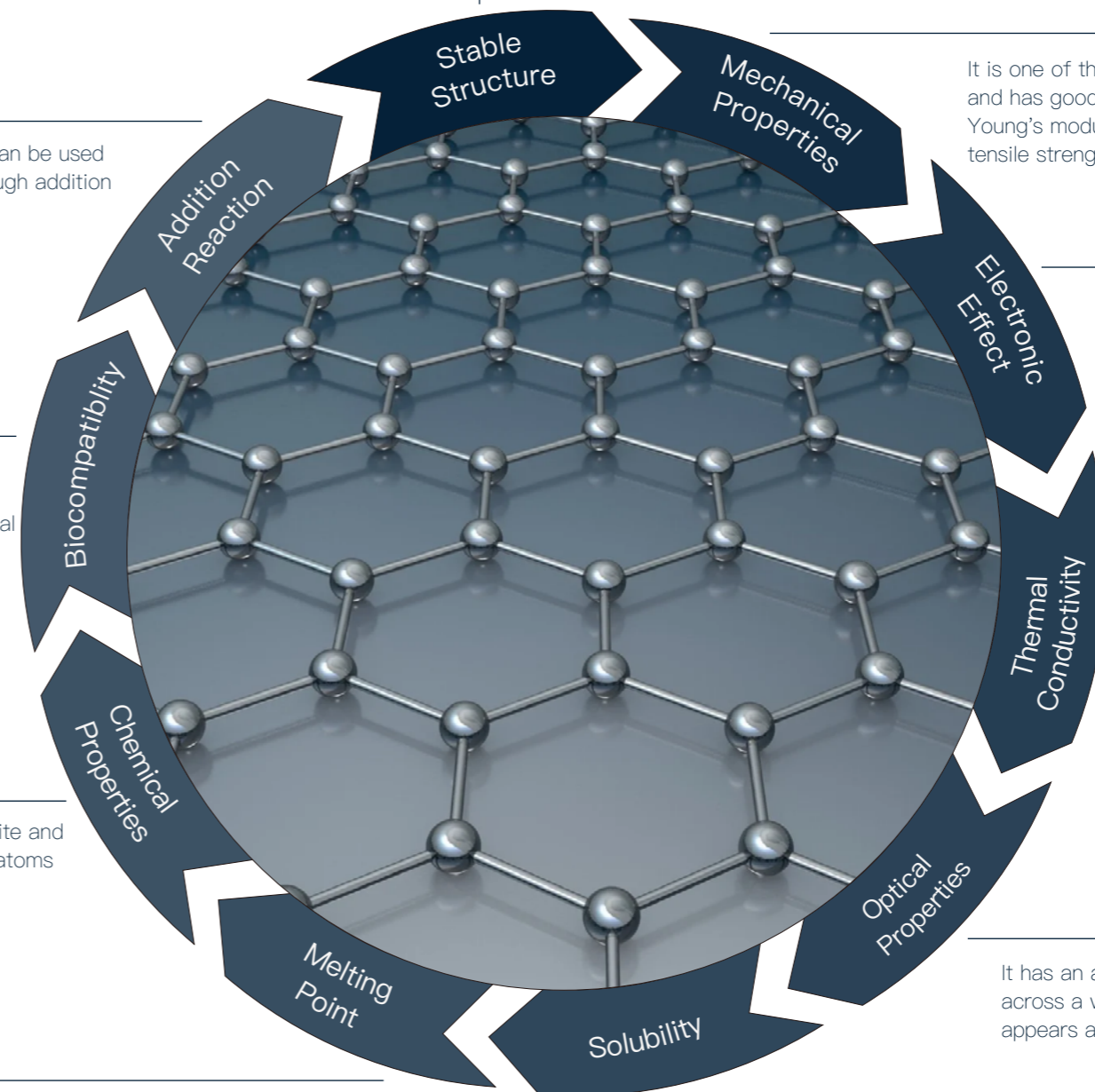
Implanting carboxylate ions can make the surface of graphene material possess active functional groups, thus significantly improving the material's cell and biological response activity.



Chemically, it is similar to graphite and can adsorb and desorb various atoms and molecules.



Its melting point was estimated to be around 4125 K in a 2015 study, although other research suggests it may be closer to 5000 K.



It is one of the strongest materials known and has good toughness. It has a theoretical Young's modulus of 1.0 TPa and an intrinsic tensile strength of 130 GPa.



It has a carrier mobility of about $15,000 \text{ cm}^2/(\text{V}\cdot\text{s})$ at room temperature, which is dozens of times higher than that of conventional semiconductor silicon materials.



Theoretically defect-free pure single-layer graphene has a thermal conductivity of up to 5300 W/mK. When used as a carrier, it has a thermal conductivity of up to 600 W/mK.



It has an absorption of about 2.3% across a wide range of wavelengths, and appears almost transparent.



It exhibits good solubility in non-polar solutions, and has superhydrophobic and superoleophilic properties.

Graphite Solutions for Tomorrow's Innovations

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