



**WEIJI**  
CARBON-TECH 伟基炭科技



**WEIJI**

**CARBON  
TECH**

山东伟基炭科技有限公司  
ShanDong WeiJi Carbon Tech Co.,Ltd.

用我们的不懈创新和努力

以新型炭材料 · 贡献新能源 · 开创新生活



WITH OER PERSISTENT INNOVATION AND EFFORTS  
WITH NEW CARBON MATERIALS  
CONTRIBUTING NEW ENERGY AND CREATING A NEW LIFE



## COMPANY PROFILE

New carbon materials possess exceptional properties unmatched by traditional engineering materials. With continuous advancements in industrial technology, and the urgent needs for energy conservation, environmental protection, and low-carbon economic development, the role of new carbon materials in industrial progress has become increasingly significant.

Shandong Weiji Carbon-Tech Co., Ltd. specializes in new carbon materials and provides comprehensive solutions for high-temperature environments. After more than two decades of development, it has established long-term, extensive, and close cooperative relationships with leading carbon material companies domestic and abroad. It possesses capabilities in international trade, production processing, R&D design, and technical consulting. Its products and services have reached leading enterprises in related domestic sectors, becoming a significant force in China's new carbon materials industry.

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# + OPERATION SYSTEM



Material customization > Engineering design > Mechanical processing > Purification treatment > On-site installation > After-sales support

# + COMPANY QUALIFICATION

- + Quality Management System Certification: ISO9001
- + Occupational Health and Safety Management System Certification: ISO45001
- + Environmental Management System Certification: ISO14001
- + Shandong Province Green Factory Certification





## > OUR ABILITY

Weiji Company has multiple production and processing bases, a comprehensive sales service network, and a technical support system.

Providing customers with faster, more convenient, and higher-quality services.

- + Thermal field design and improvement of high-temperature vacuum furnaces;
- + Construction and modification of ultra-high-temperature furnaces;
- + Graphite Specialty: Includes cold isostatic press, extrusion molding, and mold pressing of graphite and its products;
- + Carbon Fiber Composites: Includes weaving, short cutting, layering, and anisotropic materials and their products;
- + Carbon Fiber Insulation Materials: Includes cured graphite felt, graphite soft felt, and their products;
- + Pyrolytic carbon, silicon carbide coatings, and high-temperature purification products and services.

## > OUR FIELD



New Carbon Materials: Widely used in semiconductors, solar energy, optical communications, powder metallurgy, vacuum heat treatment, ultra-high temperatures, and energy storage. Weiji tracks international cutting-edge technology trends and domestic market needs, focusing on new materials and new energy to develop and continuously improve ultra-high-temperature equipment and related production processes, providing comprehensive solutions for the ultra-high-temperature sector.

## > TECHNOLOGY AND SERVICES

### + Thermal field design and improvement of high-temperature vacuum furnaces

Primarily includes Czochralski monocrystal furnaces, multicrystalline ingot furnaces, silicon carbide, gallium arsenide, indium phosphide, cadmium telluride, aluminum nitride crystal growth furnaces, optical fiber drawing furnaces, optical rod sintering furnaces, high-purity quartz preparation crucible furnaces, dehydroxylation furnaces, and thermal field design and improvement of high-temperature vacuum furnaces for advanced functional ceramics, as well as collaborative research and development in high-temperature thermal fields.

# > PRODUCT CATALOG



+ Graphite Specialties

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+ Carbon/Carbon Composite

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+ Carbon Fiber Insulation

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+ Graphite Foils

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+ Purification And Coating

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# GRAPHITE SPECIALTIES

Graphite specialty materials are widely used in semiconductors, solar energy, powder metallurgy, vacuum heat treatment, and electronics. They are primarily used as heating elements, insulation parts, structural supports, and moving parts.

The advantages of specialty graphite include:

- Excellent thermal and electrical conductivity
- Outstanding thermal stability
- High resistance to thermal shock
- Good machinability
- Strong corrosion resistance
- High purity

## + Typical Physical Parameters of Specialty Graphite

Grade	Density (g/cm <sup>3</sup> )	Flexural Strength (MPa)	Resistivity (μΩ·m)	Compressive Strength (MPa)	Hardness (HSD)	Coefficient of Thermal Expansion (×10 <sup>-6</sup> °C)	Thermal Conductivity (W/m·K)	Average Particle Size (μm)
WJI-A00	1.79	39	13	78	56	4.8	104	13
WJI-B00	1.85	49	11	98	58	5.5	116	11
WJI-C00	1.82	63	17	/	72	4.9	81	4
WJI-C08	1.83	58	12	119	65	5.6	106	9
WJC-B25	1.80	52	12	104	65	5.0	104	13
WJC-B26	1.78	52	10	106	67	5.6	80	/
WJC-C43	1.85	62	11-13	135	68	5.9	120	7
WJC-C25	1.79	63	11	111	55	4.6	101	7
WJC-C48	1.88	60	10	100	52	4.5	130	5
WJC-B11	1.85	46	10	85	48	4.7	140	15
WJC-B15	1.82	48	11-13	115	65	5.8	120	9
WJI-E01*	1.74	27	7	/	43	4.4	170	230
WJI-G00**	1.72	17	8	32	/	2.8	120	800

- Note: The above values are typical and not guaranteed.
- In the table, "\*" indicates extrusion molding, "\*\*" indicates vibration molding, and the rest are cold isostatic pressing.

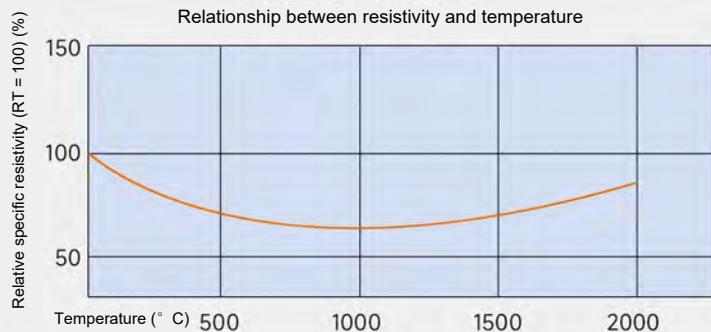
## + Typical Specialty Graphite Products



Notes: 1. Czochralski single crystal thermal field 2. Segmented heater  
3. Fiber optic heater 4. Chuck 5. Graphite disk 6. Graphite boat

## + Relationship Between Resistivity and Temperature

One characteristic of graphite is its ability to conduct electricity. When the temperature increases to 400 to 600° C, its resistivity significantly decreases, but it slightly increases beyond this temperature range. The resistivity of graphite can be controlled by adjusting raw materials and manufacturing processes to meet a wide range of requirements.

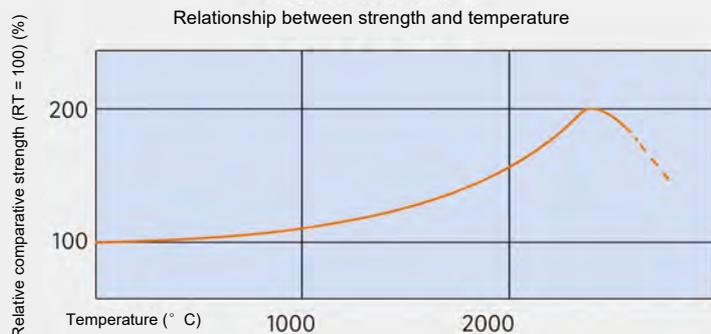


## + Relationship Between Strength and Temperature

The mechanical strength of graphite increases with temperature, when rising from room temperature to 2500° C, the strength approximately doubles. The correlation between flexural strength and compressive strength can be roughly expressed by the following formula:

Compressive strength  $\approx 2 \times$  Flexural strength

Tensile strength  $\approx 0.5 \times$  Flexural strength





# CARBON/CARBON COMPOSITE

Carbon/Carbon Composite (C/C) is a material composed of high-strength carbon fibers and a carbon matrix, enhanced through graphitization. It is extensively used in various structural components, heaters, and containers in high-temperature environments.

Compared to traditional engineering materials, Carbon/Carbon Composites offer the following advantages:

- High strength (five times that of steel at high temperatures)
- High-temperature resistance (retains excellent mechanical and electrical properties at 2000°C)
- Excellent thermal shock resistance
- Low heat capacity
- Low density
- Outstanding corrosion and radiation resistance
- Low coefficient of thermal expansion

## + Typical Physical Parameters of C/C Plates

Grade	Density (g/cm <sup>3</sup> )	Resistivity (μΩ·m)	Flexural Modulus (GPa)	Flexural Strength (MPa)	Tensile Strength (MPa)	Coefficient of Thermal Expansion (×10 <sup>-6</sup> /°C)	Thermal Conductivity (W/m·K)
CCP-130-12	1.35	34	23	72	42	X:0.5 Z:7	X:30 Z:6
CCP-140-12	1.45	35	38	97	80	X:0.5 Z:7	X:31 Z:6
CCP-145-12	1.45	35	40	108	86	X:0.5 Z:7	X:31 Z:6
CCP-147-12	1.47	34	40	124	81	X:0.5 Z:7	X:31 Z:6
CCP-149-12	1.48	33	43	143	93	X:0.5 Z:7	X:32 Z:7
CCP-152-12	1.57	31	60	149	108	X:0.5 Z:7	X:32 Z:7
CCP-160-HW	1.52	/	34	148	83	X:0.5 Z:7	X:31 Z:6
CF226	1.50	25	60	120	/	X:0.8 Z:7.3	X:40 Z:5
CF227	1.55	/	90	170	250	X:1.1 Z:7.3	X:40 Z:5
CF229/4Hybrid	1.52	22	65	110	200	X:1.0 Z:7.3	X:40 Z:5
CFC17*	1.65	20	45	200	140	X:1.3 Z:10	X:35 Z:12
28NF	1.48	26	47	140	100	X:0.8	Z:2.8

- Note: The above values are typical and not guaranteed.
- In the table, "\*" denotes short fiber C/C products, while the rest are long fiber C/C products.

## + Typical C/C Products



### ▶ C/C Trays, Boxes, and Racks

Deformation-free, lightweight, free of metal contamination, easy to operate, reusable, rapid heating and cooling rates, no lag in temperature changes, high production efficiency.



### ▶ C/C Bolts and Nuts

Excellent high-temperature mechanical properties, strength increases with temperature, withstands temperatures up to 2000° C, reusable without thermal damage.



### ▶ C/C Slots

Angle plates of various shapes meet different insulation material needs, protect the edges and corners of insulation materials, and enhance strength.



### ▶ PECVD Carrier Plates

High strength, lightweight, good machinability, ensures efficient production of N-type photovoltaic cells.

# CARBON FIBER INSULATION

Carbon fiber insulation materials provide excellent insulation effects at high temperatures, withstand temperatures up to 3000° C when used in vacuum or inert gases. Additionally, these products are lightweight, have low thermal expansion, low heat absorption, and low outgassing, increasingly used in high-end equipment applications. Carbon fiber insulation includes graphite rigid felt and graphite soft felt types.

## ● Graphite Rigid Felt

Graphite rigid felt products are available as standard plates or can be custom shaped upon request. Our specialized processing facility can machine standard plates to greatly reduce delivery times and lower costs for our clients. The company offers optimized designs based on customer requirements for thermal capacity and insulation performance. The products are easy to handle, simple to assemble, emit minimal dust, and cause minimal contamination, improving the working environment for employees.

### + Typical Physical Properties Table for Graphite Rigid Felt

Item/Grade		RTB/RTC Short Fiber	RL13 Long Fiber	RL16 Long Fiber	CSB/CSP Sandwich	
Material		Resin-based	Pitch-based	Pitch-based	Resin-based	
Density	g/cm <sup>3</sup>	0.17	0.13	0.16	0.16	
Carbon Content	wt%	>99.98	>99.98	>99.98	>99.95	
Ash Content	ppm	500	√	√	√	
		20	√	√	√	
		5	√	√	√	
Compressive Strength	Mpa	Face Direction	0.40	0.35	0.45	0.90
		Side Direction	0.25	0.10	0.12	0.10
Flexural Strength	Mpa	Face Direction	1.50	1.45	1.60	2.50
		Side Direction	1.1	0.7	1.0	0.5
Average Thermal Conductivity	W/mK (Vac.)	1500°	0.40	0.28	0.25	0.45
Coefficient of Thermal Expansion	×10 <sup>-6</sup> /K	1000°	2.5	2.2	2.2	2.5

• Note: The above values are typical and not guaranteed.

### + Typical Graphite Rigid Felt Products



Note: 1. Graphite rigid felt for silicon carbide epitaxy  
3. Graphite rigid felt for silicon carbide crystal growth  
5. Short fiber Graphite rigid felt

2. Bottom Graphite rigid felt for silicon semiconductor  
4. Graphite rigid felt for optical fiber preparation

## ● Graphite Soft Felt

Graphite soft felt, like cured graphite felt, possesses excellent insulation and high-temperature resistance after undergoing high-temperature graphitization. The product is soft and easy to cut, reducing the occurrence of dead spots in use, thus allowing it to be shaped into any form to achieve the final insulation goal. The product has a smooth surface, uniform thickness, even insulation effect, low impurity content, and does not affect the internal products being processed.



### + Typical Physical Properties Table for Graphite Soft Felt

Grade	Thickness	Density	Width	Ash Content	Fixed Carbon Content	Sulfur Content	Thermal Conductivity at 1550°C	Tensile strength
	mm	g/cm <sup>3</sup>	mm	ppm	%	ppm	W/ (m·K)	MPa
WJS-NG01	5/10	0.08-0.11	1200/1350	≤500	>99.95	≤200	0.20-0.22	0.10-0.14
WJS-NG02	5/10	0.08-0.11	1200/1350	≤200	>99.98	≤30	0.23-0.26	0.10-0.14
WJS-NG01S	5/10	0.08-0.11	1200/1350	≤20	>99.998	≤5	0.24-0.28	0.10-0.14
WJS-NG03S	10	0.10-0.13	1200/1350	≤20	>99.998	≤5	0.24-0.28	0.18-0.25

- Note: The above values are typical and not guaranteed.

# FLEX-SHIELD



A thermal reflection screen made by bonding graphite foil to a single-layer carbon/carbon composite. It provides an effective protective barrier between brittle insulation materials and the thermal field of high-temperature furnaces.

## ● Purpose

It is recommended to use flex-shield as a thermal reflection screen on the surface of high-temperature insulation systems. It can be directly installed on carbon/graphite felt or traditional cured insulation materials. Flex-shield is optimized for durability and flexibility, allowing it to be bent.

## ● Material Properties

### + Thermal Insulation Protection:

Prevent erosion of the insulation cured felt surface by high-velocity airflows and protects the thermal insulation system from damage due to falling parts. The use of flex-shield effectively reduces corrosion in insulation systems and extends their lifespan.

### + Machinability:

Flex-shield can be easily cut with a utility knife and straightedge. More complex shapes can be processed with a stamping press.

### + Easy Installation:

Flex-shield is applied to the surface of cured felt, aligning with both circular and square thermal fields. It can be directly fixed to the surface of cured insulation boards with graphite screws or secured in place using double-ended bolts on thermal field insulation covers or pressure ventilation systems.

### + Increase Efficiency:

Reduce thermal convection and radiation.

Standard Dimensions (mm)	Grade	Thickness (mm)	Minimum Bending Radius (mm)
1219.2*2438.4	CFS-100-6	0.66	101.6
1219.2*3048	CFS-100-12	1.02	304.8

# GRAPHITE FOILS

Graphite foils exhibit excellent thermal conductivity, electrical conductivity, and machinability. They can be used in high-temperature environments up to 3000° C in vacuum or inert gas conditions and are widely applied in industries such as photovoltaics, fiber optics, and semiconductors.

Our company offers a variety of graphite foil products in multiple specifications and purity grades, with a production capacity exceeding 5 tons per month.



Performance Specifications		Unit	Graphite Foil Grades		
			WJGF-01	WJGF-01M	WJGF-01S
Standard Thickness		mm	0.2/0.3/0.4/0.5/0.8 1.0/1.5/2.0	0.2/0.35/0.5/0.8/1.0	0.2/0.35/0.5/0.8/1.0
Bulk Density		g/cm <sup>3</sup>	0.9-1.5	0.9-1.5	0.9-1.5
Ash Content		ppm	≤2000	≤200	≤20
Fixed Carbon Content		%	≥99.8	≥99.98	≥99.998
Tensile strength		MPa	≥4	≥4	≥4
Sulfur Content		ppm	≤100	≤10	≤3
Chlorine Content		ppm	≤40	≤3	≤1
Compressibility		%		44	
Resilience		%		≥9	
Thermal Conductivity (at 25°C)	Parallel to Surface	W/ (m·K)		117	
	Perpendicular to Surface	W/ (m·K)		6	
Resistivity (at 25°C)	Parallel to Surface	uΩ·m		22	
	Perpendicular to Surface	uΩ·m		1100	
Dimensions		mm	Maximum width of 1000mm, with various lengths available		
Supply Form		/	Sheet or Roll		

- Note: The above values are typical and not guaranteed.

# PURIFICATION AND COATING

## ● Purification Technology

To meet the high purity demands of the semiconductor industry, Weiji can perform secondary purification of graphite, CC, insulation materials, and graphite foil in high-temperature purification furnaces, offering purified products with 50 ppm, 20 ppm, 5 ppm, and 5 ppm (specific element control) to satisfy the high purity requirements of silicon and silicon carbide semiconductors for thermal field materials.

## ● Coating Technology

We can apply pyrolytic carbon and silicon carbide coatings on the surface of graphite substrates, ensuring the coated graphite products have enhanced surface characteristics and improved performance.

Elements	Analysis Results (ppm)	
	S	SS
Al	0.05	<0.01
B	0.18	0.02
Ca	1.5	<0.05
Co	<0.01	<0.01
Cr	<0.1	<0.1
Cu	<0.05	<0.05
Fe	<0.01	<0.01
K	<0.05	<0.05
Mg	<0.05	<0.05
Mn	<0.01	<0.01
Na	<0.05	<0.05
Ni	0.14	<0.01
P	<0.1	<0.1
S	0.22	<0.05
Si	2	0.17
Ti	1.1	<0.01
V	0.35	<0.01

- In the table, "S" indicates ash content less than 20 ppm; "SS" indicates ash content less than 5 ppm.
- Analysis results are individual test values, not guaranteed.
- Purity control at the elemental level can be performed according to customer requirements for specific elements.



高温解决方案提供商  
High Temperature Solution Provider

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