

Carbon-Carbon Furnace Parts

Manufacturing engineering materials and parts relies heavily on high-temperature processes. In addition to heat resistance, key considerations include smooth processing, low energy consumption, and cost efficiency. C/C composites are specifically designed for high-temperature applications and are ideally suited for this purpose.



C/C Composite Fans

C/C fans are primarily utilized for gas circulation within heat treatment furnaces. These fans are crucial for maintaining a uniform temperature throughout the furnace, particularly around 800°C, where significant temperature variations can occur between the heater and other areas.

Constructed entirely from C/C composites, the fans exhibit minimal deformation even at very high temperatures. Additionally, their lighter weight compared to metal fans contributes to overall energy savings for the system.



C/C Composite Fans: Key Benefits

- **Lighter Weight, Higher Strength:** With a bulk density of 1.6 g/cm³, C/C fans weigh only one-fifth as much as metal. They also maintain consistent strength from room temperature up to 2000°C.
- **Maintenance-Free:** Proven by numerous customers, C/C fans require no maintenance for over a year, even under high temperatures, due to minimal deformation.
- **Reduced Motor Load:** The lightweight nature of C/C fans significantly reduces the load on motors.
- **Custom-Made:** Each fan is designed to meet specific customer requirements.

C/C Composite Rollers

C/C composite rollers offer a lightweight, high-strength, and heat-resistant alternative to traditional steel rollers. Their exceptionally low coefficient of thermal expansion ensures minimal deformation or strength deterioration, even at very high temperatures. Unlike high heat-resistant steel rollers, C/C composite rollers can operate continuously at temperatures up to 1200°C without the need for a water cooling system.

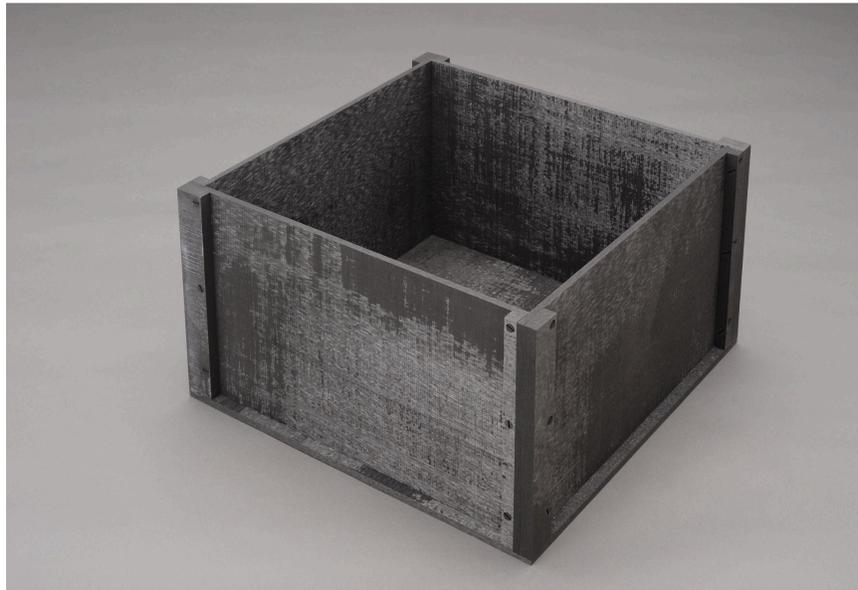


C/C Composite Rollers: Key Benefits

- **Versatile Applications:** Ideal as carrying rollers for solar cell production, metal powder sintering, various metal heat treatments, and ceramic baking, all requiring high-temperature processes.
- **Maintenance-Free:** Minimal deformation at high temperatures ensures no maintenance is needed for over a year.
- **Increased Productivity:** Extended maintenance-free periods and fewer replacements lead to higher production line output.
- **Energy Efficient:** Lighter weight, lower thermal storage, and no cooling system can reduce energy consumption by 20-50% compared to high heat-resistant steel rollers.

C/C Composite Cast Case

C/C composite is an ideal material for semiconductor furnace parts due to its carbon fiber reinforcement, which provides superior strength and modulus compared to graphite. Its robust nature makes it less prone to breakage, facilitating easier handling. When used for casting furnace crucible items in silicon ingot production, C/C composite allows for thinner, lighter, and larger designs than graphite, and also offers a longer service life.



C/C Composite Cast Case: Key Benefits

- **Lightweight with Superior Strength:** Despite a density of 1.6 g/cm^3 , similar to graphite, the carbon fiber reinforcement in carbon-carbon composites allows for the creation of larger, thinner, and lighter plates for casting furnaces. This enhanced strength is a key advantage.
- **Exceptional Dimensional Stability:** The coefficient of thermal expansion for carbon-carbon composites is significantly lower (one-fourth) than that of graphite, leading to much improved dimensional stability.
- **Simple Machining:** Precision machining processes can be applied to carbon-carbon composites with the same ease as graphite material.

C/C Composite Heaters

C/C composite, reinforced with carbon fiber, boasts superior tensile strength and modulus compared to graphite, making it more robust and easier to handle. This allows for the creation of C/C composite heaters that are significantly larger, thinner, and lighter than their graphite counterparts.



C/C Composite Heaters: Key Benefits

- **Lightweight with High Strength:** Despite having the same density as graphite (1.6 g/cm^3), carbon-carbon composite allows for larger and stronger heaters due to its carbon fiber reinforcement.
- **Low Coefficient of Thermal Expansion:** C/C composite exhibits a significantly lower coefficient of thermal expansion (one-quarter) compared to graphite. This property contributes to superior dimensional stability, which is crucial for larger heater designs.
- **Easy Processing:** C/C composite can be precisely machined using standard methods, similar to graphite.

C/C Composite Robot Arms

Industries such as industrial robotics are seeing a rapid increase in the size and speed of mechanical parts, which have traditionally been made from materials like ceramics, aluminum, and CFRP. This trend is driving a demand for lighter components with enhanced heat resistance, especially in high-tech sectors like liquid crystal and semiconductors. In response, CFC has engineered a lightweight, high-speed, and highly elastic material suitable for use from room temperature up to temperatures exceeding 200°C, which are beyond the capabilities of aluminum or resin-based materials.



C/C Composite Robot Arms: Key Benefits

- **100% Carbon Composition:** C/C composite is entirely carbon-based, consisting of a carbon matrix reinforced with carbon fibers.
- **Exceptional Heat Resistance and Low Thermal Expansion:** Unlike CFRP, C/C composites, being 100% carbon, are not limited by the heat resistance of resin. They can withstand temperatures up to 350°C in air and 2000°C in vacuum or inert gas. Their low thermal expansion ensures high dimensional stability across a wide temperature range.
- **Superior Thermal Shock Resistance:** Exhibiting greater thermal shock resistance than ceramics, C/C composites will not crack even when rapidly cooled from 600°C in water.
- **Lightweight, High Strength, and High Specific Rigidity:** These composites are lightweight and strong, possessing a specific rigidity that surpasses alumina, making them ideal for applications like robot arms.
- **Excellent Processability:** C/C composites can be easily machined using standard methods.

Custom Furnace Parts & Components Design

CFC Design specializes in customized carbon-carbon parts and design solutions, offering a wide range of products beyond standard parts. Our expertise allows us to provide cutting-edge technology and tailored solutions for your specific needs, including but not limited to:

- Vacuum and Heat Treatment Furnace parts
- Glass handling and production processing
- Sintering and Powder Metallurgy
- Magnetic Sintering applications
- Fans, Basket, Heat Insulation sheets, Furnace floors/rails, Custom Trays, Muffles, Hardware components
- Cast and Box Trays
- Roller Conveyor Systems
- Transport Trays and Plates and Carriers
- and many more custom solutions.

Have Questions or Ready to Order?

Our engineering team is ready to help you select the perfect furnace parts for your needs.

- **Visit our Website:** www.acrosscc.com
- **Call Us Today:** (310) 635 3555
- **Email for a Quote:** info@acrosscc.com