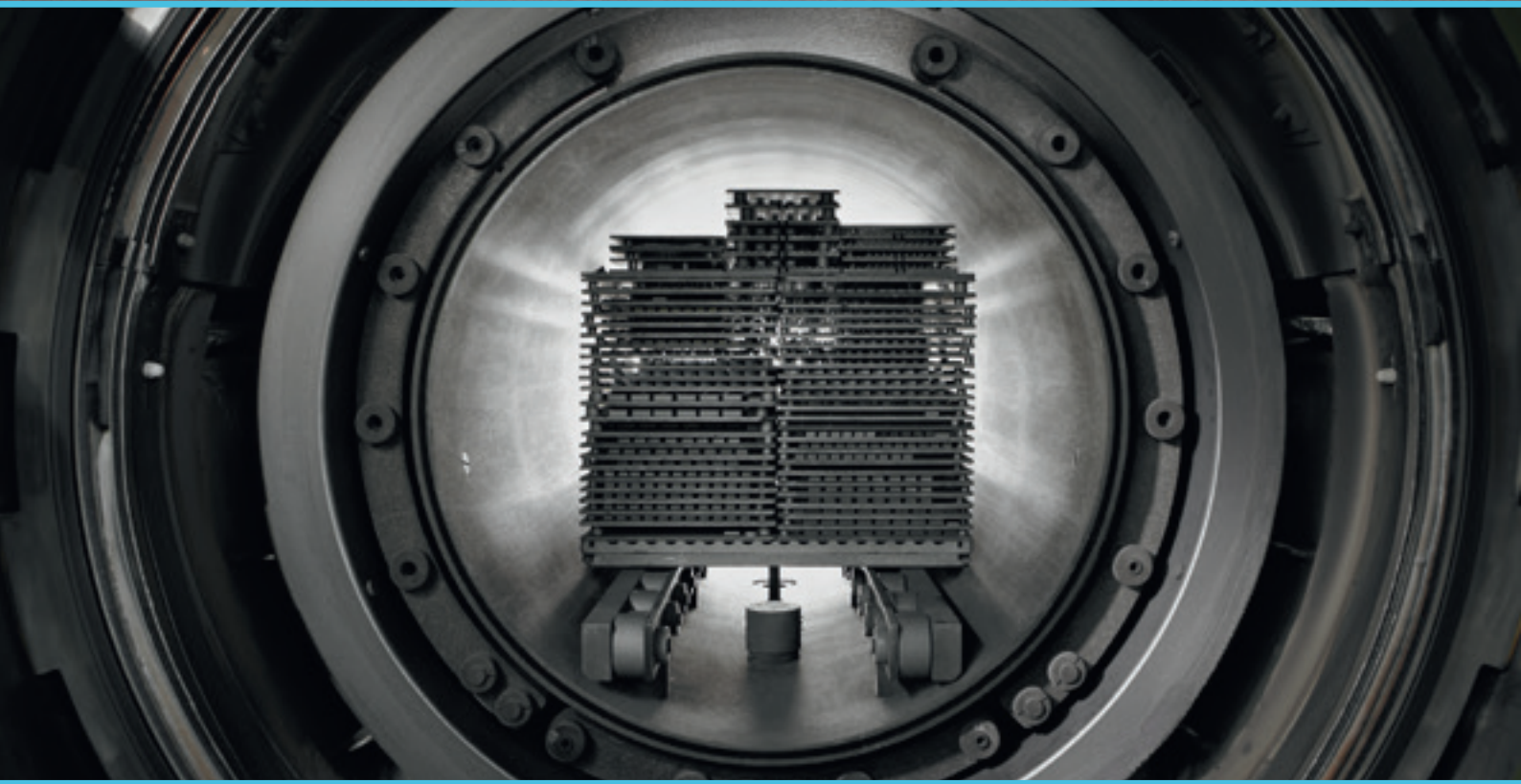


System Solutions

for high-temperature applications



Heating chamber &
Furnace components

From the idea to the finished component.



Lightweight. Stable. Temperature resistant.

Graphite Materials recognizes the tremendous potential of the element carbon. And enthusiastically gets it into shape.

It's up to you to decide what shape this will be. We are driven by your individual needs. These give us direction and point the way to the best solution for you with maximum benefit for your application.

Each of our employees is totally committed to this. From the initial idea to the finished component. From the dimensionally-stable CFC fixtures to the customized heating system. From piece production to large-scale manufacture. Quality in every fiber.

This begins with the use of materials that have undergone exhaustive testing, includes a precise design and culminates in effective manufacture according to the highest quality standards. Everything under one roof – everything from one stop. Always listening to you and taking your requirements into account. True to our guiding principle: we are only satisfied when you are.

This is the standard by which we are measured.

Kind regards, Dr.-Ing. Rolf Terjung

Graphite Materials.

Your partner for the best that carbon has to offer.

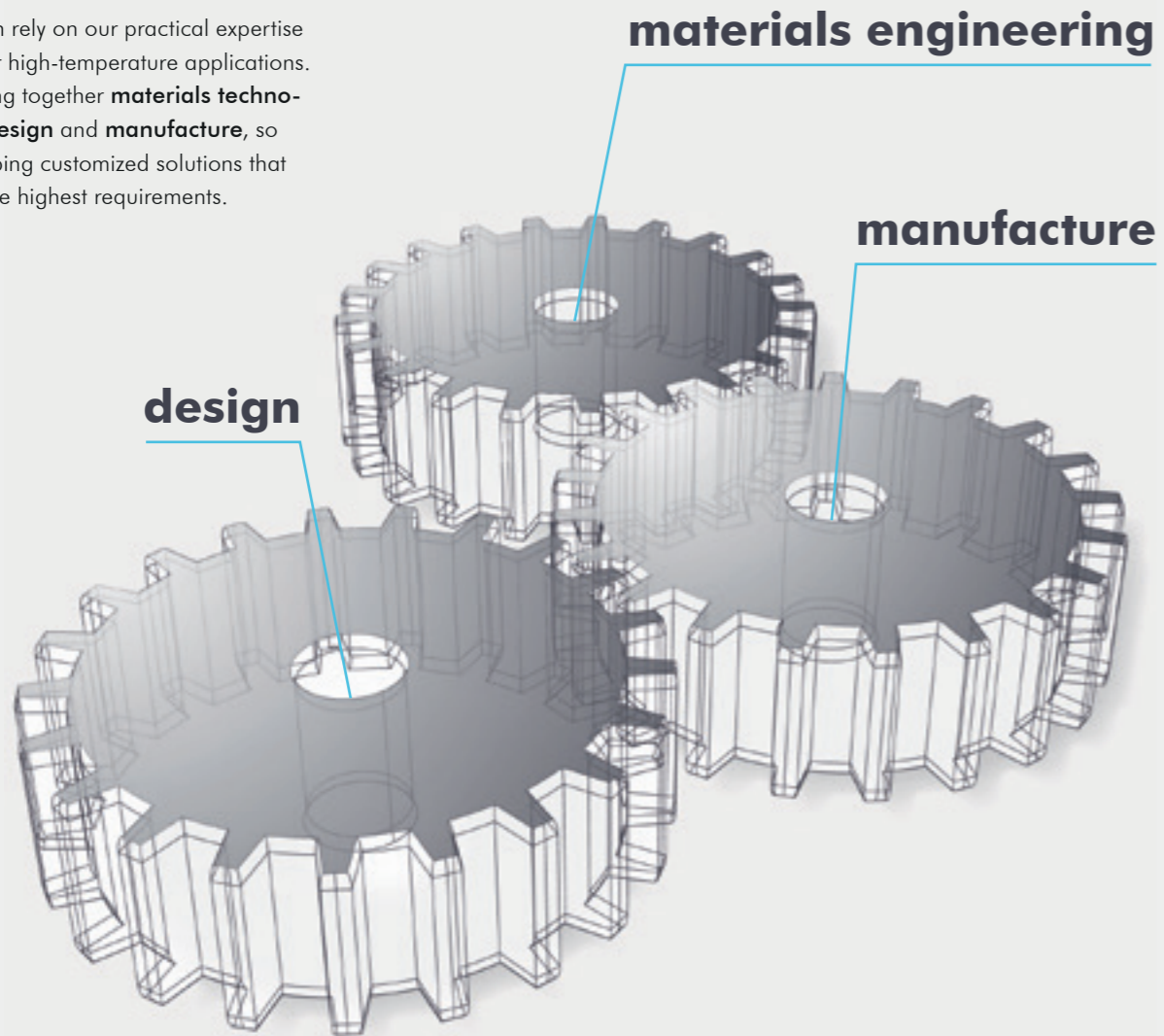


In the heart of the metropolitan region of Nuremberg:

- 3000 m² production area
- 30 employees
- Founded in 2000
- Owner-managed, independent company
- LEAN production management
- Sustainable environmental management ISO 14001:2015
- QM system 9001:2015
- Training is the future

Lots of questions, one solution: Graphite Materials.

You can rely on our practical expertise for your high-temperature applications. We bring together **materials technology, design** and **manufacture**, so developing customized solutions that meet the highest requirements.



Creative partner for high-temperature applications

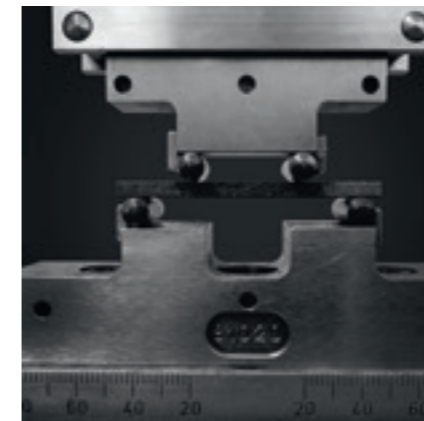
Graphite Materials is your equal partner for high-temperature applications in the range from 1000 degrees Celsius. We manufacture high-quality components from graphite and CFC, which are used in systems in a wide variety of different industries. From the robust special screw in series production to the complex CFC cylinder in piece production.

Our work is always centered on your individual requirements. Our employees include you in the planning and manufacturing process from the start and translate your wishes into tangible solutions. Creativity meets quality. In materials engineering, design and manufacture.



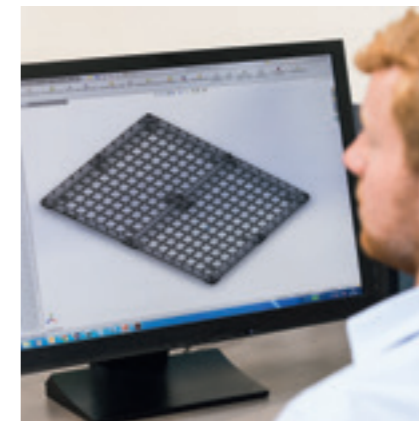
↑ Multi-layer CFC fixture in use

Materials engineering



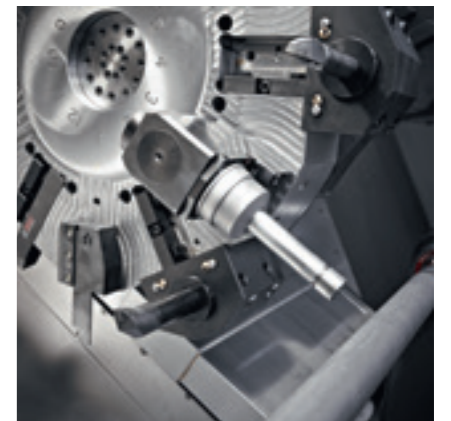
No compromises: We only use the best materials in our products. Our materials engineering specialists measure and analyze, simulate and experiment.

Manufacture



Spot-on solutions: Each of your wishes encourages our creative lateral thinkers to new heights. We offer you modern and effective solutions. Transparent and practical.

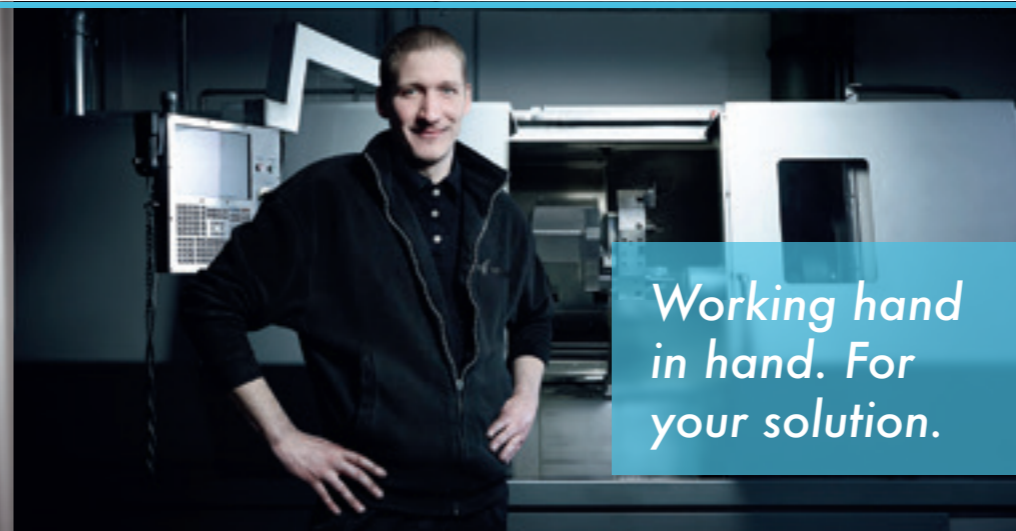
Design



Putting designs through their paces: Our manufacture is not just an extended workbench mindlessly producing one piece after another. It is the heart of Graphite Materials, kept in sync by skilled workers who use their initiative, always with a focus on customer benefit.



*Good ideas.
Optimum components.*



*Working hand
in hand. For
your solution.*





**YOUR ORDER –
OUR SOLUTION**

Heating chamber linings and repairs

Reliable. Durable. Efficient. Maximum performance for your vacuum, inert-gas and sintering furnaces.

Get the most out of your industrial furnaces with Graphite Materials. From **technical support** and the **development** of graphite and CFC heating systems to professional **heating chamber lining and repair**: Graphite Materials provides quick and straightforward support.

Professional servicing for reliable furnaces

Your industrial furnaces work with maximum efficiency, day after day. This takes its toll: Insulation wears out, heater elements break, steel cages become distorted. Often just when your customer is in urgent need of the product. Don't lose any time: **Graphite Materials provides quick and straightforward assistance and gets your vacuum, inert-gas and sintering furnace up and running again.** Generally within eight days.

As practical experts, we know what really matters to you: Reliable furnaces that work efficiently. So we only use **high-quality, tested materials** to line your heating chamber. For example, **insulation with high thermal insulation, moisture-repellent for short pumping times.** This increases the efficiency of your heating chamber, so ensuring a long service life.

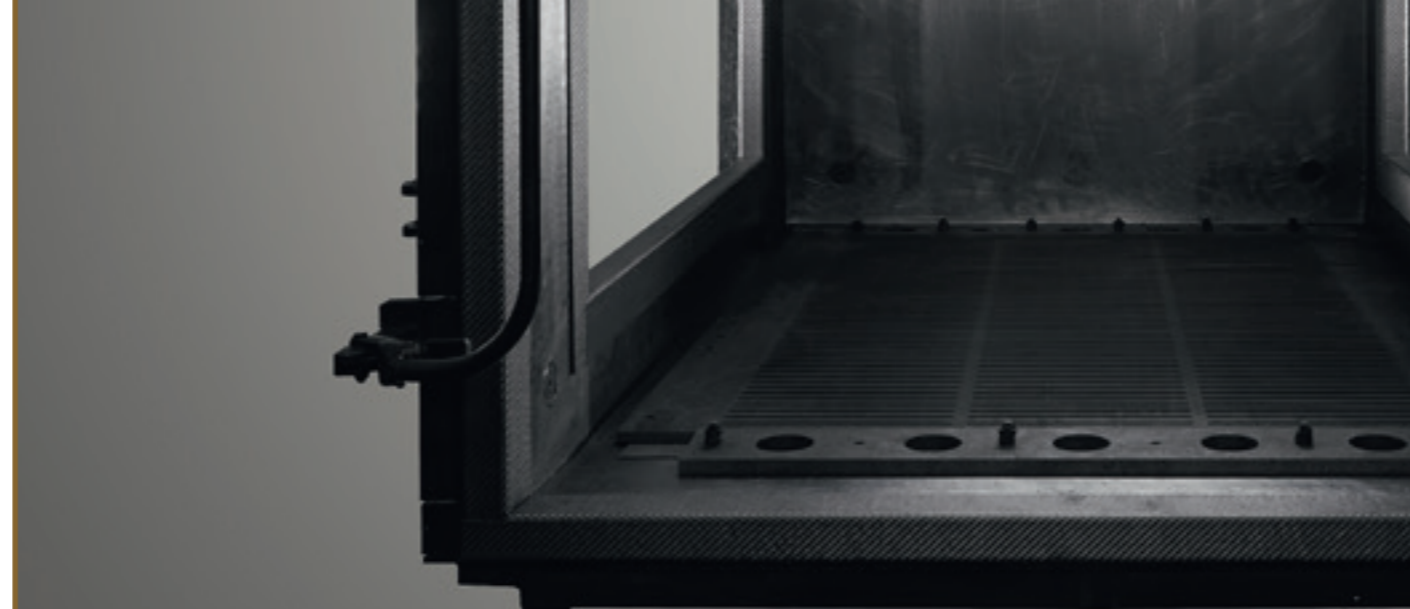
On request, our comprehensive service also includes **collecting your heating chamber and returning it to you** after servicing. Of course, we will also be happy to support you on site with commissioning.

Spare parts service: Maximum quality, quick delivery

Short waiting times, no delivery bottlenecks: **Graphite Materials replaces defective parts in your industrial furnace within 24 hours.** Our employees manufacture each spare part in top quality to meet your individual requirements. From the broken special screw to the worn muffle. All it takes is a phone call and we will find the optimum solution for you. Quickly and reliably.

Optimization and engineering for excellent manufacture

No adventures in manufacture: **Reduce the risk of production downtimes and optimize the performance of your industrial furnace.** Graphite Materials is your competent partner for increasing the service life and energy efficiency of your system and for finding customized solutions. Of course, this is all based on the very latest engineering expertise. A phone call that pays off.



Advantages of our heating-chamber services for your manufacture:

- + Fast:** Servicing within eight days, delivery of spare parts generally within 24 hours
- + Individual:** Repair and manufacture according to your needs
- + Durable:** High-quality, tested materials for a long service life
- + Effective:** Optimization and engineering for maximum performance
- + Safe:** Reduction of production downtimes
- + Personal:** The right contact person with just one phone call
- + Uncomplicated:** Service from the first phone call to commissioning

Our heating-chamber services at a glance:

- Servicing of vacuum, inert-gas and sintering furnaces, incl. cleaning and disposal of the old components
- Steel chamber construction or repair
- Partial disaster recovery
- Technical support for furnace insulation made of carbon fiber with a focus on durability, performance and energy efficiency
- Development and production of graphite and CFC heating systems in accordance with mechanical and thermal requirements
- FEM calculation for mechanical and thermal load cases
- Manufacture of high-quality, customized spare parts, generally within 24 hours

Your contact person:



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Furnace components

**Customized.
Tried and tested.
Always available.**
Graphite components
for your furnaces.

You can rely on furnace components from Graphite Materials for your high-temperature applications. We manufacture all components you need for the smooth and effective operation of your heat-treatment furnaces.

Our graphite components are used, for example, in furnaces for the manufacture of permanent magnets, hard metals and silicon ceramics. They withstand temperatures between 900 and 2400 °C. Our premium components are also used in heat-treatment systems, vacuum units, crystal-growing systems and soldering furnaces.

Our recipe for quality?
People, materials, machinery

The performance of your furnaces largely depends on the quality of the materials used in their components. Graphite Materials scores highly here with its experience and specialist knowledge. Our materials engineering department searches extensive databases containing reliable measurement values for the right material. The suitable material is then put through its paces by experienced employees in practical applications. We only use materials that have fully convinced our specialists.

During manufacture, Graphite Materials adapts to your individual requirements. You benefit from our many years of experience and our practical specialist knowledge. These success factors are supplemented by state-of-the-art machinery that is specially adapted for our product portfolio. You receive customized components for high-performance furnaces.

Flexible manufacture and rapid assistance

Graphite Materials manufactures furnace components in single part and series production. We also keep machine capacities in reserve to be able to provide rapid assistance and hold spare parts in stock. In this way, Graphite Materials helps you keep your production up and running.



Current bridges:

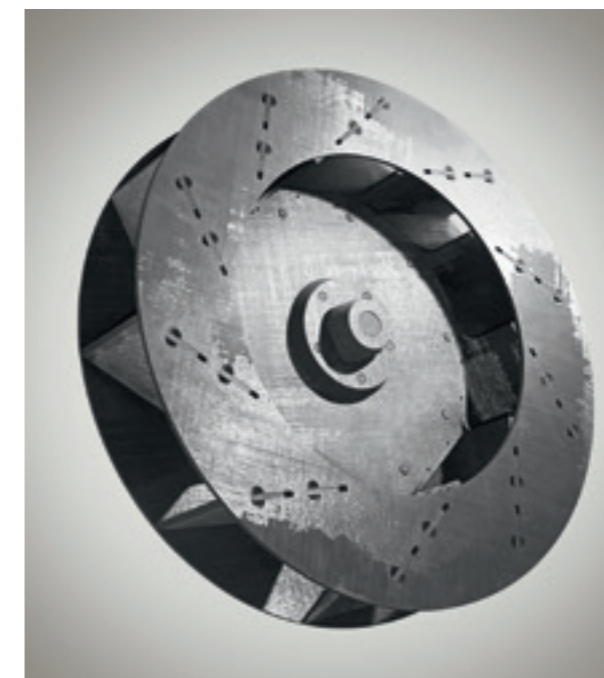
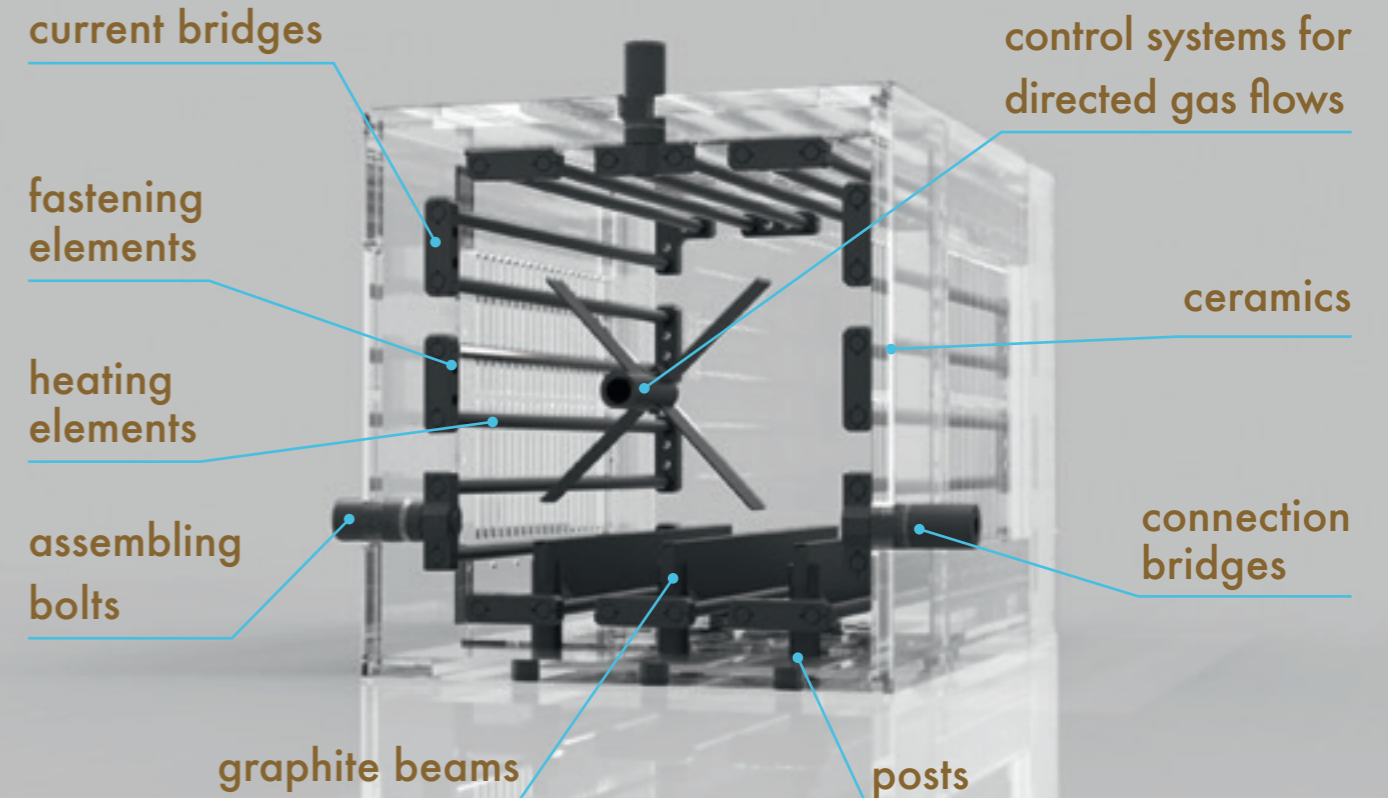
Current bridges position and connect the individual heater elements in the heating chamber and then conduct the current to them.



Assembling bolts:

Assembling bolts are the interface to the external system. They conduct electricity from the transformer to the heating chamber.

Graphite Materials manufactures the following components for your furnaces:



Graphite Materials manufactures furnace components in single part and series production.

Control systems for directed gas flows:

After heat treatment, the microstructures of metallic components are "frozen" by a process of rapid cooling. With gas quenching, flow-optimized control systems, such as CFC diffusers and CFC slotted panels, direct the cooling flow onto the batch. CFC fan wheels also circulate hot gases in the furnace chamber.



Graphite beams/ posts:

Like a bridge, graphite beams are supported by posts. This enables heating elements to also be installed below the product batch.



Heating elements:

Electricity flows through the heating elements. The resulting resistance causes them to glow and generate heat.



Fastening elements:

Fastening elements include molybdenum bolts to attach current bridges, as well as CFC threaded rods and CFC nuts in all conceivable shapes and sizes. The fastening elements are based on the positive-lock and friction-fit connection technology used in mechanical engineering. These include wedges and bolts, as well as snap couplings and clamp connections.



Susceptors and muffles:

Susceptors and muffles protect the batch against direct thermal radiation from the heating elements. They heat up themselves and emit their heat uniformly to the workpieces (homogeneous temperature distribution).

Advantages of our furnace components for your operation:

- + Fast:** Servicing within eight days, delivery of spare parts generally within 24 hours
- + Established:** High-quality components thanks to years of experience and practical knowledge
- + Measurable:** Database-supported material selection based on extensive measurement values
- + Simulated:** Tested material properties thanks to technical simulation
- + Tried and tested:** Material testing in practical applications by experienced and trained employees
- + Customized:** Individual processing with state-of-the-art machines
- + Flexible:** Manufacture of single parts and series
- + Fast:** Rapid assistance as we hold machine capacities in reserve and have spare parts in stock

Graphite Materials helps you keep your production up and running.



Roller conveyors:

The batch is pushed into the heating chamber on a roller conveyor.



Connection bridges:

Connection bridges are current bridges to which additional assembling bolts can be connected.



Ceramics:

Ceramics insulate current bridges from the steel cage of the furnace.



Furnace trackers:

Dismountable furnace tracker fixtures are essentially special measuring fixtures that determine the temperature distribution in the furnace. They can be used to position the thermal elements in the furnace's hot zone. For sensitive heat-treatment processes, they can be used to determine the precise temperature distribution in the furnace.

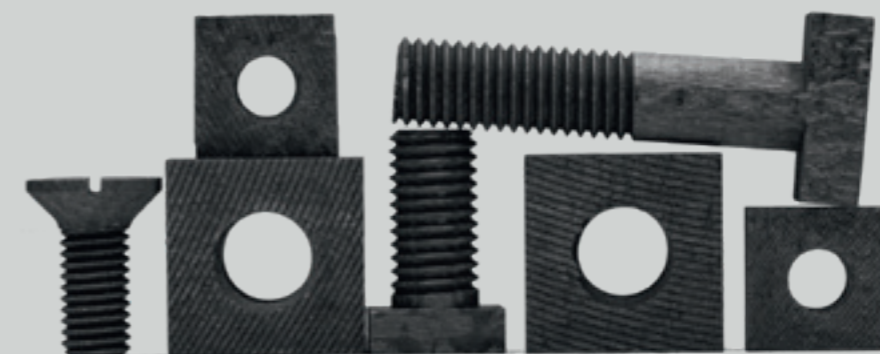
Your contact person:



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So much more than the sum of its parts.

You can also visit online at
www.graphite-materials.com





**ONE RAW MATERIAL
– VARIOUS OPTIONS**

QUALITY MEANS MORE



💡 →
from the idea
to the finished component
→ ⚙️

Graphite Materials thinks ahead. As a system supplier, we not only offer you inspiring ideas but also clear added value – at every stage of our collaboration:

1.

Consultation

Always at your service: Your personal contact at Graphite Materials will be pleased to hear from you. We take the time to give you comprehensive, individual and transparent advice. With our modern ERP system, we control all business processes to ensure they are perfectly aligned. In this way, we ensure that your orders are processed quickly and economically.

2.

Materials engineering

Experienced and inquiring: Which material is suitable for your application? What are the strengths and weaknesses of the different materials? We help you to choose the best material for your application. This results in tested material combinations, such as our DuComGrid® for high-temperature applications.

3.

Design

Resourceful: We have pragmatic ideas for designing products that function perfectly in everyday use. Visual models at the design stage give you an idea of how your finished product will actually look. We are passionate about finding the best solution and creating customized products for your application area. Cost-aware, with state-of-the-art technology and optimum benefit.

4.

Manufacture

Modern and motivated: Manufacture at Graphite Materials is characterized by state-of-the-art CNC machines, high-quality tools and a committed team. Thanks to flat hierarchies and little red tape, we respond quickly and flexibly to your requirements. Our employees continue to expand their knowledge. Graphite Materials brings together vertical integration and an extensive range of services with professional and effective lean production management.

5.

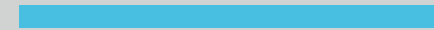
Logistics

Intelligent packaging: Our Logistics department no longer dispatches our products in cardboard boxes with polystyrene fillers but in robust wooden crates. These are easier to stack and store and protect against light, dirt and moisture. The lids of the crates are screwed down rather than nailed. This makes them easy to open and, if necessary, re-close. Damage caused by crowbars and similar implements is a thing of the past.

6.

After-sales service

Service-oriented: As part of our after-sales service, we continue to talk to you about a product's performance. Are you satisfied with it? Do you need support? Is there now an effective enhancement for your product? We'll also be happy to support you by visiting you on site, for example, for training, inspections and servicing. Thanks to online documentation, we respond quickly when you need a specific replacement part.



Sustainability is apparent in the materials used, efficient processes and manufactured or traded products. We set high standards and have developed our own environmental management system based on LEAN principles. In September 2017, we were certified in accordance with the requirements of the international standard ISO 14001:2015.

ENVIRONMENTAL PROTECTION MEANS MORE

Save energy,
reduce waste,
preserve reusable materials.

Sustainability is more than just a catchword.



There's no question about it: Like all industrial companies, Graphite Materials consumes resources such as electricity, water and packaging materials. To minimize their use as much as possible, we have implemented a comprehensive environmental management system. In this way, we achieve optimum results – in this case, for the benefit of our environment.

As part of our environmental management system, we continue to document the impact of our actions on the environment and take immediate action when problems occur. Our employees make it a personal concern to use resources consciously and economically, to reduce waste and to preserve reusable materials.

For example, Graphite Materials uses recyclable packaging materials to transport its products. These include corn packing chips, paper buffering material and filling made from recycled card. Polystyrene has been reduced to a minimum. Fragile parts are delivered to you in wooden crates. This not only spares the environment, but it also saves time and nerves when unpacking. It also provides optimum protection for the components transported.

Further measures currently include:

- Light sensors for our lighting system
- Energy-saving, ceiling-mounted radiant heaters as hall heating system
- Use of process heat and thus reduction in consumption of natural gas
- 100 percent use of green energy
- Advising customers on energy-saving measures with vacuum and inert-gas furnaces

Our current environmental policy is available to download in PDF format from www.graphite-materials.com/gm-umwelt-leitlinien.pdf.

Graphite products in a wooden box secured by paper and cardboards →





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