

# System Solutions

for high-temperature applications



Powder metal & ceramic

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.

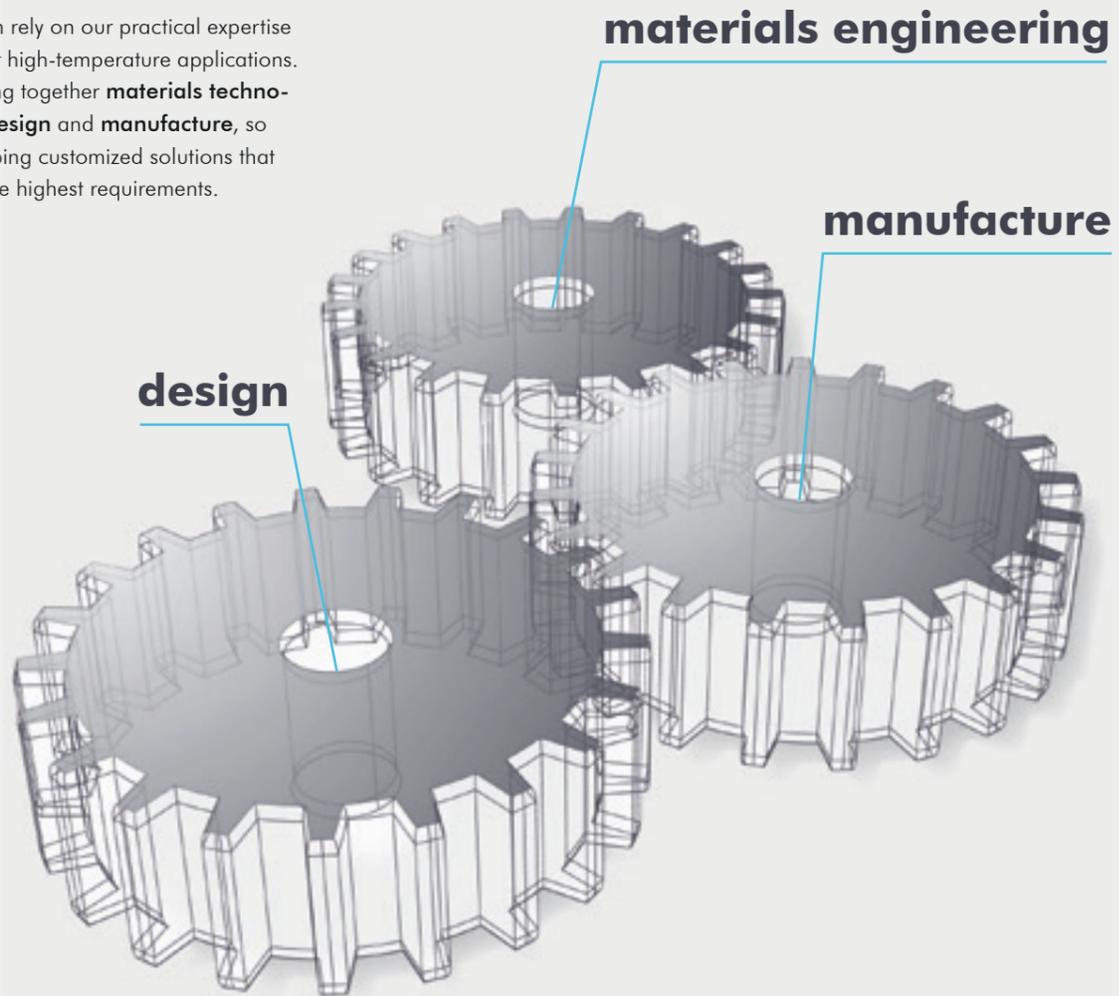


### In the heart of the metropolitan region of Nuremberg:

- 3000 m<sup>2</sup> 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

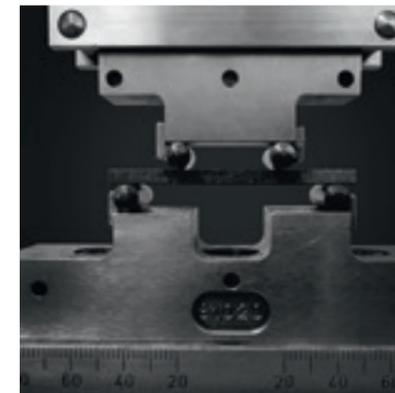
Graphite Materials is your equal partner for high-temperature applications in the range from 1000 degrees Celsius. We manufacture high-quality components from graphite and CFC, which are used in systems in a wide variety of different industries. From the robust special screw in series production to the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



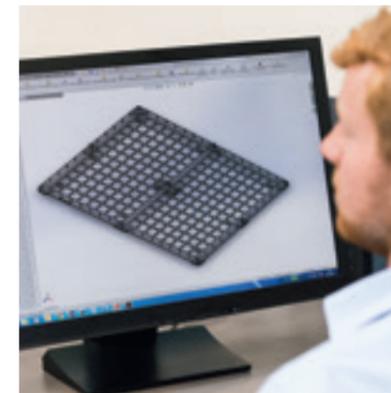
↑ Multi-layer CFC fixture in use

### 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.

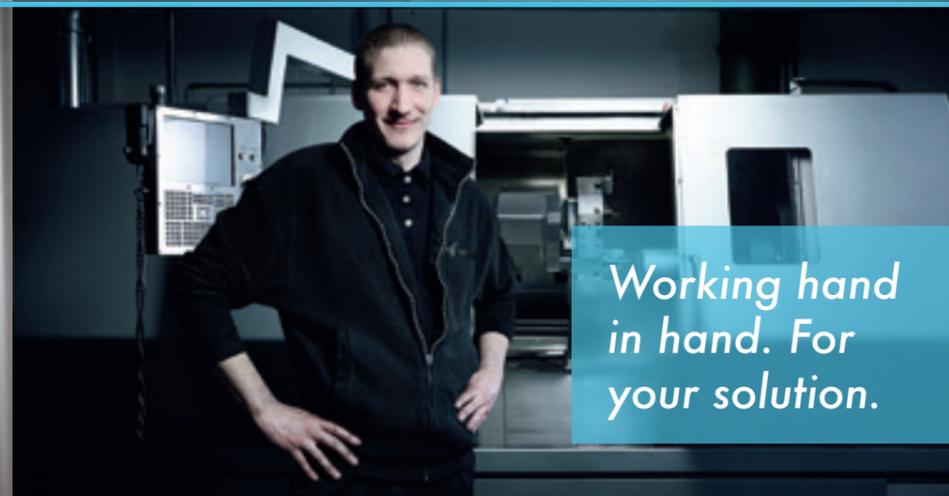
### Design



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**

## Powder metal and ceramic

**Safe. Precise. Energy-saving.**

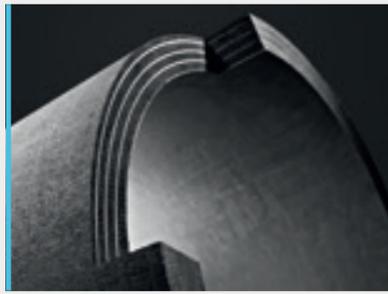
**Ideal systems for your sintering process.**

You control the process – we supply the system. True to this motto, Graphite Materials has been manufacturing high-quality products for powder metallurgy shaping for many years. With our system solutions, you benefit from all the advantages of the sintering process for semi-finished and finished parts.

**Graphite Materials manufactures the following components as single parts or system solutions for your sintering process:**

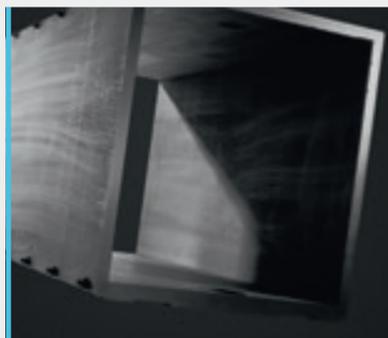
### Insulation cylinders and insulation panels (rectangular chamber):

Insulation cylinders and insulation panels from Graphite Materials ensure a uniform furnace temperature, which is ideal for your sintering process. In addition, integrated foils prevent convective heat transfer during pressure-sintering. CFC surfaces on the internal and external diameter of the cylinder offer additional protection and stability.



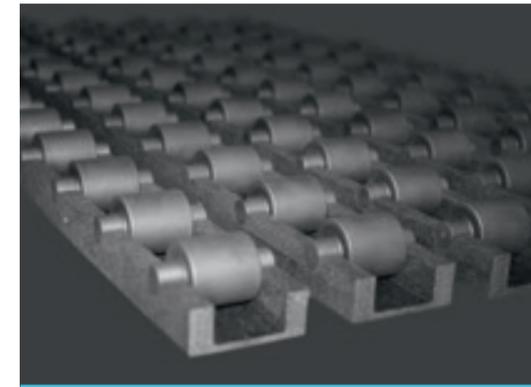
### Heating systems (heating elements and tubes; current bridges):

Efficient heating systems made of graphite and CFC operate reliably and uniformly, delivering the necessary heat for successful sintering. Graphite Materials calculates the individual heating elements in accordance with your requirements, so ensuring a low-loss energy flow.



### Susceptors and muffles:

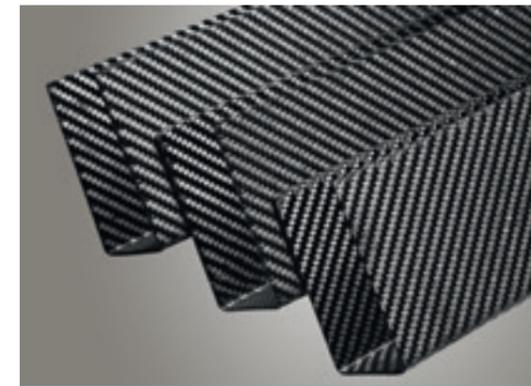
Susceptors and muffles from Graphite Materials protect the sinter from external influences, such as direct thermal radiation from the heating elements. They heat up themselves and emit their heat uniformly to the workpieces. Local overheating (so-called hot spots) is avoided.



### Roller conveyors and track systems:

Load-bearing roller conveyors and track systems safely load and unload your sintering facility. Graphite Materials only selects the very best materials for your components. We then manufacture our extremely stable and functional roller conveyors and track systems based on exact calculations.

*You control the process – we supply the system.*



### Edge and surface protection (CFC elements and coating):

Sintering processes release chemical compounds that vaporize at different temperatures and condense again. Contact reactions with the insulation and the graphite and CFC components in your system are unavoidable. For this reason, we recommend you rely on effective edge and surface solutions from Graphite Materials for the long-term protection of your components.

### Advantages of the sintering process with components from Graphite Materials:

- + Accurate:** High dimensional accuracy with large piece numbers
- + Lightweight:** Ten to 15 percent lower weight than solid material
- + Flexible:** Wide variety of different material combinations thanks to freely selectable powder mixes
- + Efficient:** No processing waste



### Charging plates and spacers:

Unsintered components are very fragile. So Graphite Materials recommends you use precisely manufactured support plates with near-net-shape profiles and the finest tolerances.

### Your contact person:



**Roland Weeske**

Head of Business Unit Specialty Graphite  
Phone: +49 911 999 01 03-43  
roland.weeske@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](http://www.graphite-materials.com/gm-umwelt-leitlinien.pdf).

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





**GRAPHITE**  **MATERIALS**

Represented by:  
**Prolific Heating International Co., Ltd**  
11/11 Moo 11, Soi Kingkaew 37,  
Rachatheva, Bangplee, Samutprakarn, Thailand -  
10540  
Phone : +66 2170 8171  
E-mail : [prolific@phiheating.com](mailto:prolific@phiheating.com)  
supportsales@phiheating.com  
Website : [www.phiheating.com](http://www.phiheating.com)



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