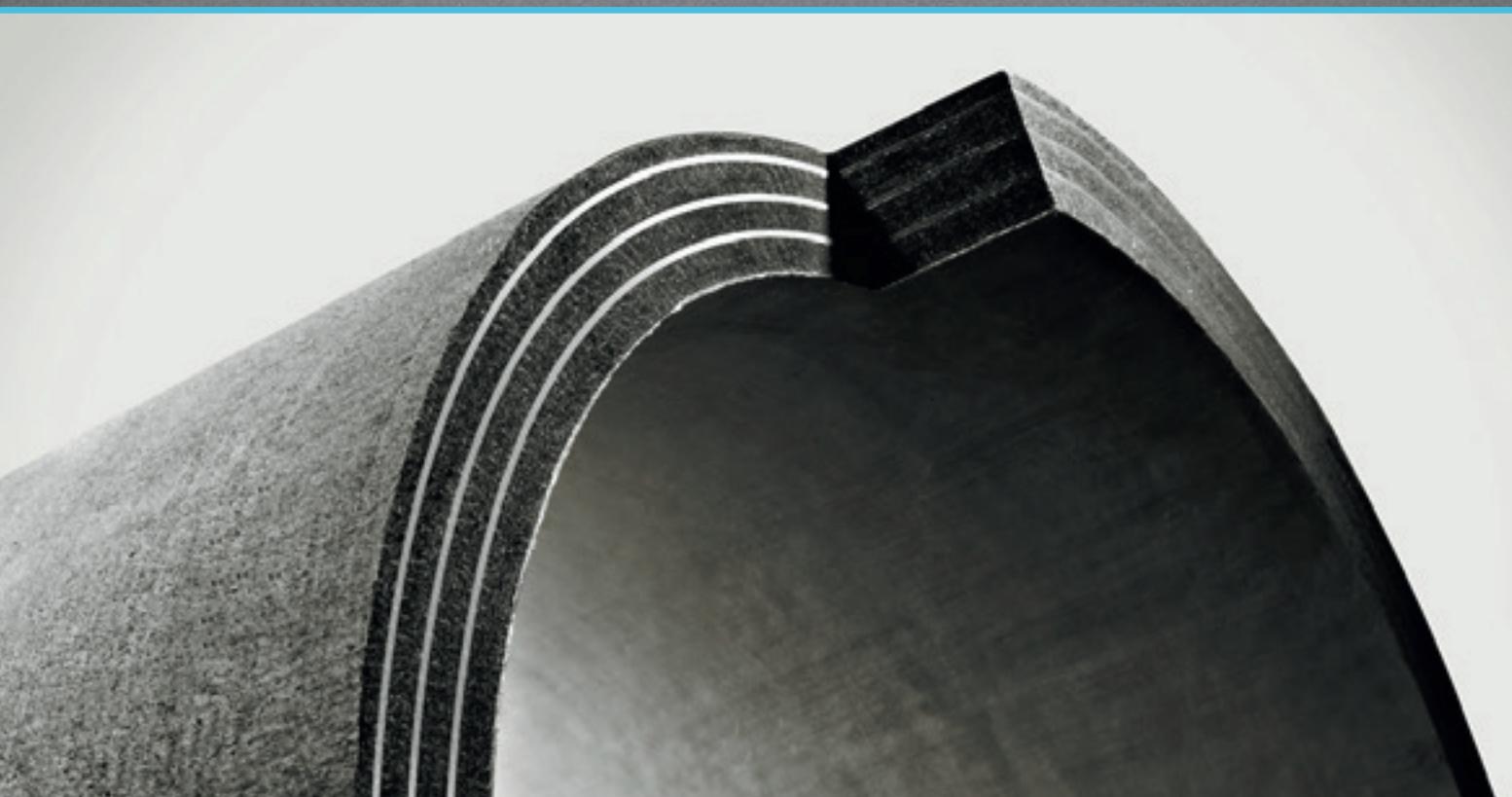


System Solutions

for high-temperature applications



| Insulation cylinders

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.

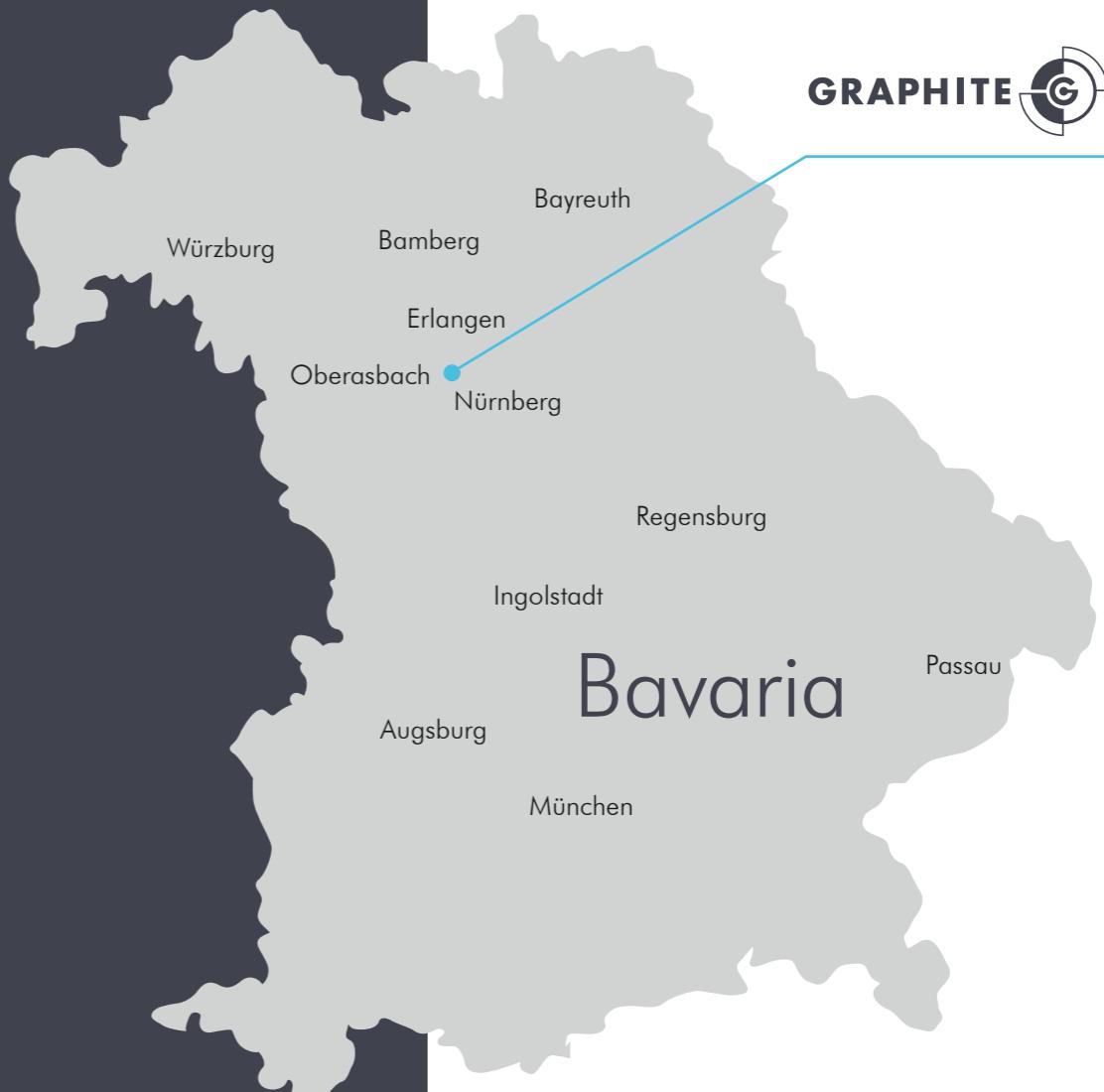
Kind regards, Dr.-Ing. Rolf Terjung

GRAPHITE **MATERIALS**



**Graphite Materials.
Your partner for the best that
carbon has to offer.**

GRAPHITE **MATERIALS**



Bavaria

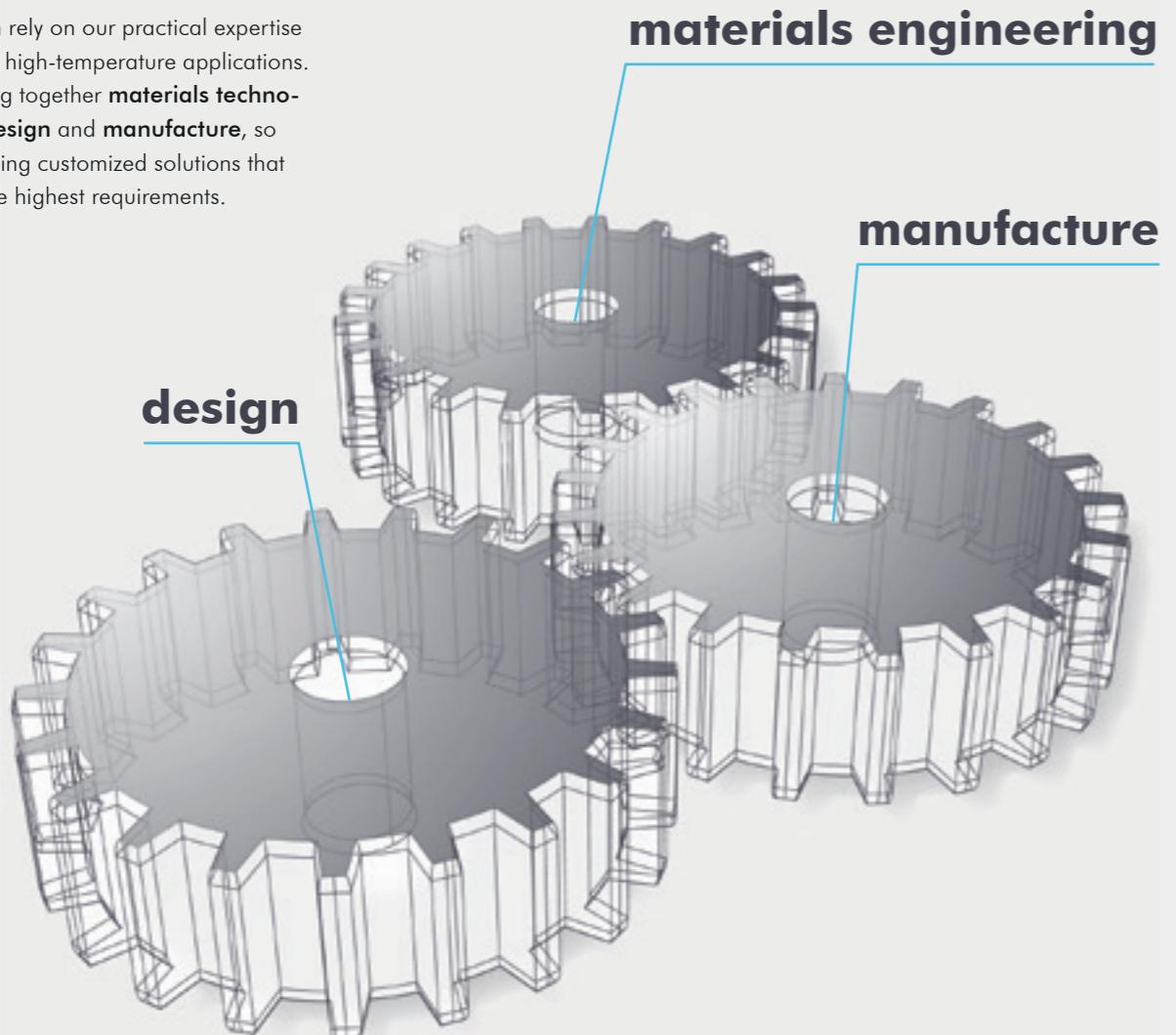
**In the heart of the metropolitan region of
Nuremberg:**

- 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

Divisions

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.



**Good ideas.
Optimum components.**

Creative partner for high-temperature applications

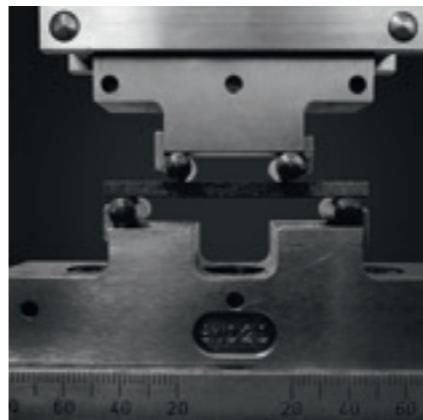
Graphite Materials is your equal partner for high-temperature applications in the range from 1000 degrees Celsius. We manufacture high-quality components from graphite and CFC, which are used in systems in a wide variety of different industries. From the robust special screw in series production to the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



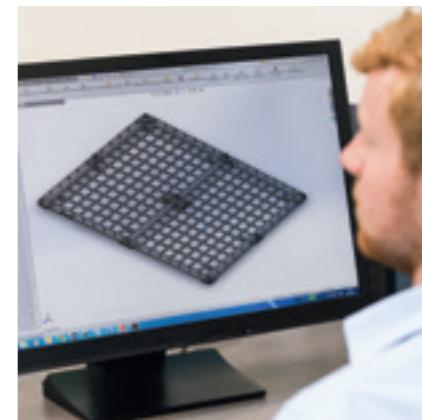
↑ Multi-layer CFC fixture in use

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.



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.**



**YOUR ORDER –
OUR SOLUTION**



Insulation cylinders

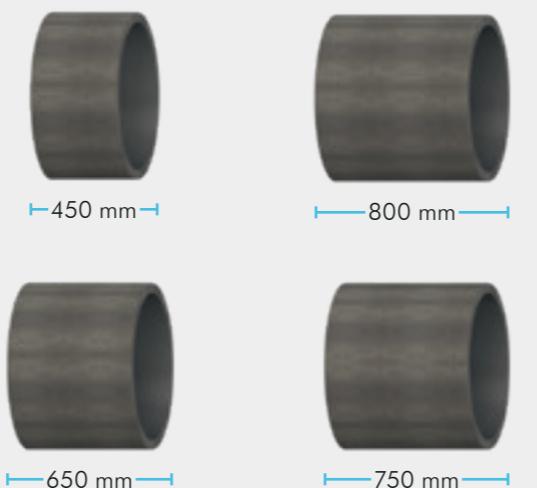
Modular. Precise. Variable in length. Insulation cylinders for greater efficiency.

Optimize your heat treatment and save energy and costs. Insulation cylinders from Graphite Materials are the ideal solution for effective heating chambers. We have more than 20 years' practical experience with insulation cylinders. We manufacture felt insulation for pressure-sintering plants, gas-quenching and vacuum furnaces. We cooperate with the innovative Japanese company KUREHA, which develops extremely high-quality and energy-saving felt.

Precise flexibility thanks to modular construction

Insulation cylinders from Graphite Materials have a modular design. The basic modules are available in four standard sizes and we machine them to meet your requirements. They are then assembled and/or bonded. This modular concept enables maximum flexibility and customized concepts. Any length is possible. Outer diameters range from dia 400 to 2000 millimeters.

Each individual module is manufactured with modern CNC-controlled machines. This enables the maximum reproducibility of the insulation properties.



There are lots of reasons for the extreme durability and effectiveness of our insulation cylinders:

As an option, the outside diameter of the ends of the insulation cylinders can be **laminated with graphite foil** to protect them against aggressive media (cleavage products).

CNC machining of the ends of the insulation cylinders results in **extremely tight tolerances** for impermeable and aligned transitions.

Special CFC fabric ensures **high rigidity and optimum surface protection** of both the inside and outside of the insulation cylinder.

The joints are bonded for the **impermeable and stable connection** of the individual insulation elements.

The front sides of the insulation cylinder are sealed against **element penetration (metals)**, and this protects the felt insulation against chemical attacks.

Insulation cylinders are heated for **maximum purity and optimum material properties** to more than 2000 °C.

Graphite foils between the layers of felt act as **convection barriers** to reflect the thermal radiation back inside the furnace and so maintain a uniform furnace temperature.

Simulation for maximum quality

Graphite Materials continues to work on improving its products. As part of a scientific research project, we have thus developed a method for evaluating the outgassing behavior of insulation cylinders.

In addition, Graphite Materials **simulates thermal application cases during manufacture**. This makes insulation cylinders calculable. The results are supplemented by actual energy consumption values from practical experience. This enables the continuous improvement of the materials used and provides the basis for the right insulation cylinders for your operation.

Quick assistance with defects

In the event of an unexpected operational malfunction, Graphite Materials provides quick and straightforward assistance. As we always hold the basic modules for our insulations in stock, we can **produce a replacement for a damaged insulation cylinder within a very short time**. Whether you need a complete cylinder or an individual segment: Graphite Materials delivers every part ready to assemble.

With its many years of experience and understanding of your processes, Graphite Materials is your expert for insulation cylinders. We operate throughout the euro-zone and score points with our expertise and efficient processes.

Advantages of our insulation cylinders for your manufacture:

- + **Reflective:** Uniform furnace temperature thanks to reflective graphite foils
- + **Impermeable:** Extremely tight tolerances for the impermeable and aligned transitions of the ends of the insulation cylinders
- + **Rigid:** Extremely rigid insulation thanks to special CFC fabric
- + **Protected:** Surfaces and ends of the insulation cylinders have optimum protection
- + **Stable:** Bonded joints for impermeable and robust connections between the elements of the insulation cylinders
- + **Sealed:** Protection against element penetration and thus break-up due to sealed front sides
- + **Pure:** Maximum purity and optimum material properties

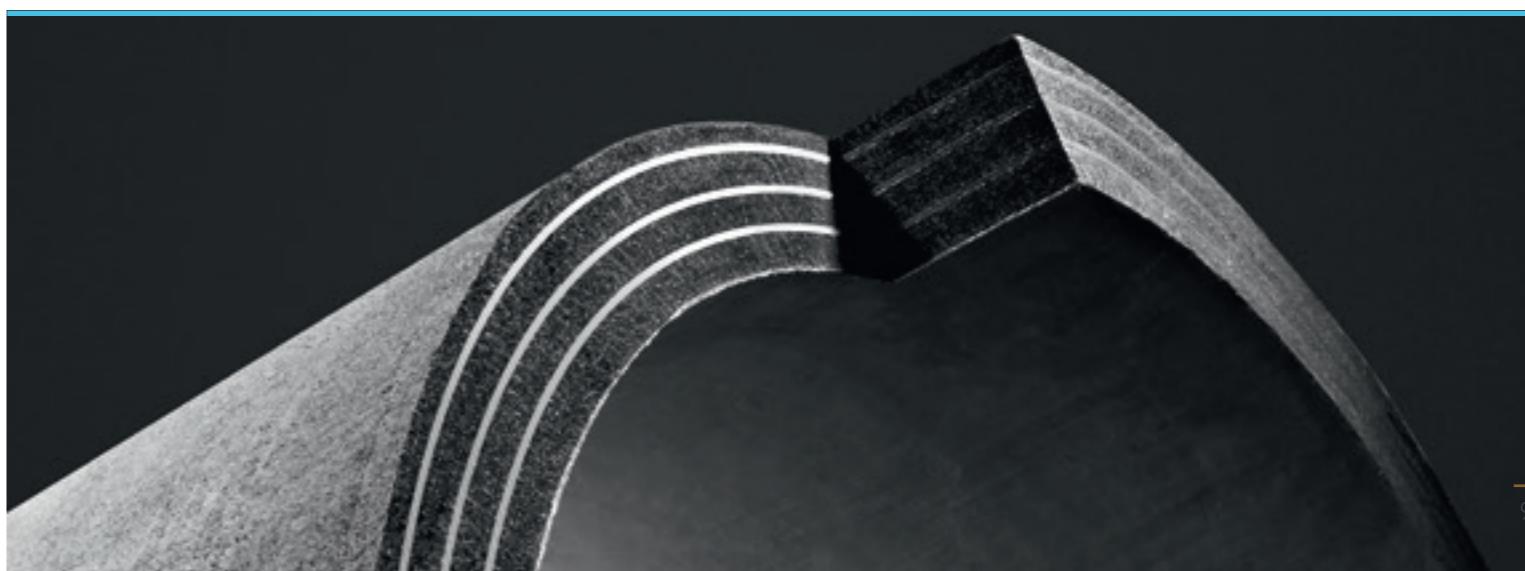
Your contact person:



Roland Weeske

Head of Business Unit Specialty Graphite
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↓ Cut edge of an insulation cylinder





**ONE RAW MATERIAL
– VARIOUS OPTIONS**

QUALITY MEANS MORE



from the
idea
to the finished
component

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.

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:

ENVIRON- MENTAL PROTECTION MEANS MORE

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.

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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Let's keep in touch:

