




IMAGINE.  
WITH  
CARBON.

A close-up photograph of a hand holding a large, billowing cloud of dark, fine-grained carbon powder. The powder is suspended in the air, creating a dense, dark mass that tapers towards the top. The hand is positioned at the bottom right, with fingers slightly curled as if holding the powder. The background is a soft, out-of-focus blue gradient.

Imagine, you have  
a material for an  
infinite number  
of **ideas...**

Uncompromising in quality, versatile in use – **Schunk Carbon Technology**  
develops solutions from carbon where your ideas are limitless.

# Schunk Carbon Technology: Always at your side.

Schunk Carbon Technology focuses on development, manufacture and application of carbon and ceramic solutions. It combines innovative spirit and technological expertise with exceptional customer service to provide a range of products and services unique to the market. In Schunk Carbon Technology, you have a partner who can offer all the technological possibilities of an international company and implement ideas custom-tailored to your needs, both for high-volume industrial markets and for highly specialized niche markets. After all, this is our commitment: **Ahead in Carbon Technology. Closer to your Business.**

## A Schunk Group division.

Enabling, idea-driven, cooperative - if you hope to apply technology to develop better products and capture new markets, we can help. The Schunk Group has been supporting customers with innovative technologies since 1913. As an idea-driven technology company, innovation is fundamental to our culture. We forge long-lasting, cooperative working relationships with our clients.

You will find our custom-tailored high-tech products and systems in markets such as carbon technology and ceramics, environmental simulation and air conditioning, sintered metals and ultrasonic welding. The Schunk Group is active in a large number of key industries, from automotive, rail, aviation and marine technologies to solar and wind energy, medical and electrical technology as well as the semiconductor industry. Our more than 8,500 employees in 29 countries are ready to serve you.



Imagine you had  
a material as  
**multifaceted**  
as life itself ...

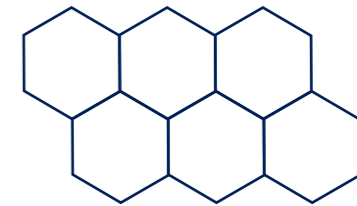
Leave compromise behind and discover the full potential of carbon's unlimited properties.



# We are Carbon Technology.

Carbon is our passion. Our actions and our entire knowledge focus on this fascinating element and its versatile industrial applications. Lean on our technological expertise in the development, production and application of carbon technologies to gain a head start in your own markets.

*Graphite specimen  
and hexagonal crystal system*



## **Transcending limitations: We work on it every day.**

Every part, every component and every system faces technical limitations that are often linked to the material chosen for the job. Our materials of carbon graphite, carbon composites, silicon carbide, aluminum oxide, and quartz allow the manufacture of innovative products which overcome many of the limits that conventional materials are subject to. Enhancing traits like electrical conductivity, surface hardness, abrasion resistance, self-lubricating properties and heat and media resistance is our profession. Overcoming obstacles requires sound material expertise, a deep understanding of customer applications and a desire to make something good even better. We are able to continually optimize the performance and process reliability of your systems and help you gain new perspectives for future markets and technologies.

## **If you can imagine it: We can make it happen.**

Our highly specialized technology portfolio covers **mechanical carbon, electrical carbon, high temperature applications** and **technical ceramics**. From automotive, rail, aviation and marine technologies to solar and wind energy to medical and electrical technology and the semiconductor industry, we've got you covered.

# Let us be your competitive advantage.

Carbon still harbors countless opportunities for opening new applications and levels of performance. We'll find them.

Filament winding for C/C and CFRP components



Schunk has been behind the carbon industry's past century of technological milestones. Together with you, we can celebrate new breakthroughs. Our innovative material and production technology developments already meet the future needs of customers in many areas:

- Consumption-reducing components for the automotive industry
- Extremely high-performance carbon brushes in wind power plants
- Innovative 3-D production processes in ceramics processing
- Future-oriented solutions for power transfer in personal and goods transport

We will identify market trends to proactively develop marketable solutions and secure you a valuable competitive advantage in your global markets.

Chemical vapor deposition (CVD) and infiltration (CVI) under clean room conditions



## Top quality, from raw material to finished product.

As we develop and manufacture our materials, we follow a consistent quality control strategy from raw material acquisition to material preparation through to shaping and processing.

At Schunk Carbon Technology, we achieve unsurpassed quality through a series of intricate production and refining processes, such as our chemical vapor infiltration (CVI) method. We work with our customers to develop efficient and cost-effective manufacturing solutions.



Imagine your  
**technology partner**  
is part of your  
company ...

Whenever you need us, we'll be here for you. From entrepreneurial-minded employees to a customer- and market-oriented structure, we're built to work seamlessly with our customers.



## Schunk Carbon Technology – We're ready. Worldwide.

Schunk Carbon Technology features a decentralized and flexible company structure that is oriented precisely toward our customers' market segments and areas of application. We're not only close to our customers, we are also able to initiate product development in a fast and uncomplicated way while operating within flat hierarchical structures. Consider us a partner who will use all available resources to support you. Working with us, you'll get where you're going faster, from development to the start of production.

### **Designing efficient and economical processes.**

As specialists in your markets and applications, we see the big picture when it comes to customer-specific material and component development. Trust us to understand how:

- Increases in quality affect the service, maintenance intervals and productivity of your systems.
- Investments in further development and new development can reduce follow-up and operating costs.
- Market trends are readied for serial production early on to ensure our customers a technological head start.

### **On the move in many markets. At home everywhere.**

Schunk Carbon Technology is active in more than 29 countries. It means we're never very far away. We know your specific market conditions and can respond to individual needs. We enable international cooperation in development and production with all the required infrastructure. This enables us to provide optimum support as you enter new markets.



*Autoclave for the production  
of 3-D components*



# Imagine nothing slowing you down on your path to greater **energy efficiency** ...

**Mechanical carbon** from Schunk Carbon Technology reduces friction and is energy-efficient. It's media resistant and extremely durable. It's everything you need to reach your objectives.



# Harder, longer-lived and more energy-efficient - mechanical carbon for tribological systems.

Schunk Carbon Technology combines comprehensive expertise in development, production and processing of carbon and silicon carbide materials and their tribological behaviors. Seals, bearings and pump components made of our sliding materials are characterized by low friction coefficients and high wear resistance. Materials for just about every chemical media and for use in a wide range of temperatures are available.

## A broad spectrum of industrial applications.

You will find materials we develop for tribological system components in nearly every industrial field: chemical, petrochemical, pharmaceutical, foodstuff, air conditioning, power plant technology, aircraft and ships. Our high-strength, low-wear and corrosion-resistant solutions form the basis for economical and faultless production processes.



Bearing out of a unique SiC-C-composite material



Gas seal ring out of high performance carbon graphite





## Dynamic solutions for the automotive industry.

The demands on automotive components in today's vehicles are increasingly complex. Schunk Carbon Technology uses its carbon know-how to develop solutions within tribological systems to reduce friction, wear and emissions.

As a development partner for international automobile suppliers, Schunk Carbon Technology offers innovative solutions for vehicle efficiency, increased safety and enhanced comfort of modern motor vehicles. From components for dry-running vacuum pumps to future-oriented, media-lubricated bearings in coolant pumps; and from heat-resistant dry-running sliding bearings for flap systems to durable fiber composite parts for energy storage devices - we have what you need. We work with customers to develop future-oriented solutions for brake systems, air conditioning and engine and exhaust gas management.



Rotor/vane system for dry running vacuum pump



Duromer mass production components - resin bonded carbon graphite in "Tribo-Quality"

Imagine everything  
flowing **faster**  
and **smoother**  
than ever before ...

**Electrical carbon** products from Schunk Carbon Technology put trains on the fast track, bring driving comfort to automobiles, bring eco-friendly energies to new levels of performance and put power in every household.



#### A development partner with foresight.

As a reliable development partner to the automotive industry, we accompany automotive-technological progress from the idea to serial production. We employ our engineering skill and wide variety of expertise in material development, component design, prototyping and production. Simultaneous engineering enables us to offer valuable expertise from the very beginning.

## More drive for riding comfort, safety and consumption reduction.

Electrical components in modern motor vehicles are the catalysts for forward-looking solutions in the areas of propulsion, driving safety and comfort. Our innovative carbon brushes provide reliable new technologies to the automotive industry. Carbon brushes must fulfill stringent requirements in areas of radio interference suppression, long service life and resistance to heat. As a development partner, Schunk fulfills precise specifications using custom-tailored materials.

#### Sustainable consumption reduction with carbon brushes from Schunk Carbon Technology.

Our carbon brushes support consumption reduction in conventional combustion engines. Innovative developments for the start-stop function of modern cars enable 350,000 reliable starts and contribute to energy-efficient engine management. Commutation solutions for maximum effectiveness with a broad range of fuel variants and fuel pump performance classes are continually being developed. With improved overvoltage protection and a higher current load, our innovative solutions support downsizing and the development of compact component assemblies.

#### Solutions for safety and driving comfort.

Our carbon brushes reliably perform their duties in countless electric motors, including windshield wipers, window lifters, seat adjusters and sunroofs. Anisotropic carbon brushes for stringent system requirements (e.g. in brake systems) ensure greater driving safety. They do it with maximum precision and especially quietly to make day-to-day driving a safe and comfortable experience.



Carbon brushes with anti-corrosive coating on shunt



Performance optimized bi-component carbon brushes for start-stop-motors

# Paving the way for innovative drive concepts.

In the rail sector, Schunk Carbon Technology is a global leader in power transmission and has set milestones as a recognized development partner to the rail industry since the electrification of rail traffic.

Today, we offer comprehensive solutions for power transmission and grounding in the rail, bus and high-speed system sectors. This means pantographs, including those for high-speed applications, current collectors for the third rail, charging current collectors, grounding systems, carbon sliding strips, carbon brushes and grounding brushes, together with the appropriate brush holders.



Current collector for electrical buses



Earthing system for HF-grounding

## Ideas for the personal and goods transport of tomorrow.

Schunk Smart Charging is the technological response to reduced-emission local public transport. We offer intelligent solutions for designing fast and efficient charging of electric buses during operation and at the depot. Thanks to Intelligent Carbon for Pantographs, carbon sliding strips can be monitored using remote diagnostic tools, optimizing maintenance intervals. Schunk Intelligent Grounding provides reliable solutions for grounding currents.

### An overview of our solutions:

- Pantographs for local public transport, long-distance rail traffic and special vehicles
- High-speed pantographs
- Charging current collectors for electric vehicles
- Third-rail current collectors
- Carbon and metal contact shoes
- Products for reliable power transmission in electric motors, such as carbon brushes and brush holders
- Conductor bands and contacts
- Solutions for wheel flange lubrication that increase the service life of wheels and rails
- Classic ground contacts and carbon-to-carbon ground contacts that are especially low-wearing and have a long service life
- Grounding systems for grounding HF currents



**Maximum performance for industrial applications.**

Our solutions are used in industrial applications where power must be transmitted faultlessly and reliably, including under the toughest conditions: engines and generators; in the steel, wire, paper, plastic and rubber industries; in medical technology; the automotive industry; wind power plants; port operations; power plants and mines.

In addition to materials for commutation applications, Schunk solves for linear power transmission with metallic materials and two-component materials and systems for shaft grounding.

**The driving force in the workshop, household and garden.**

Schunk offers carbon brushes and sliding contacts for household appliances, electric power tools, gardening equipment, toys and micro motors. Schunk is the ideal development partner for electric motors, which are becoming smaller and more powerful all the time. Our high-quality solutions are characterized by maximum operational safety, a long service life and low-noise operation, regardless of whether it is in extremely tough usage conditions in professional tools or for an extremely long service life as required by washing machines.



**Carbon brushes for electrical motors**



**Fiber reinforced sleeves**



**Carbon brushes with cut-off device and signaling device**

# Power transmission from very large to very small.

Our products for efficient power transmission can be found in many consumer goods and almost all industrial applications, whether carbon brushes, brush holders, slip rings, contacts, conductor bands or any of our many products. Our ability to develop materials and components that suit a variety of precise needs and areas of use makes us the ideal technology partner for power transmission.



# Imagine staying totally cool, even at **2,800°C...**

Schunk Carbon Technology provides reliable solutions for **high temperature applications** with even greater demands.





# High temperature applications: Material expertise for the most extreme conditions.

Our premium carbon solutions are used in nearly every high temperature application. Schunk Carbon Technology offers a broad spectrum of graphite, carbon fibre-reinforced carbon and ceramics, carbon and graphite felt materials and components for these applications. Together with solutions devised by our technical ceramics business unit, we have a spectrum of products and services for high temperature applications and heat engineering available nowhere else in the world.



## Made-to-order industrial solutions.

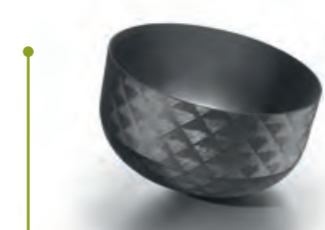
It's good to know what markets need. It's even better to provide the technological answers. As a global leading specialist for high temperature applications, Schunk Carbon Technology has solutions and ideas to benefit every market, including:

- Hollow glassware industry
- Components and systems for the photovoltaic industry
- Delicate, yet high-performance, graphite components for analysis and medical technology

*CVD-PyC coating  
under cleanroom conditions*



**Graphite tube for  
atomic absorption spectroscopy**



**C/C crucible for CZ-pulling**



**Carrier for  
PECVD-coating equipment**



Interlocked C/C grid  
for a design load of 10 t

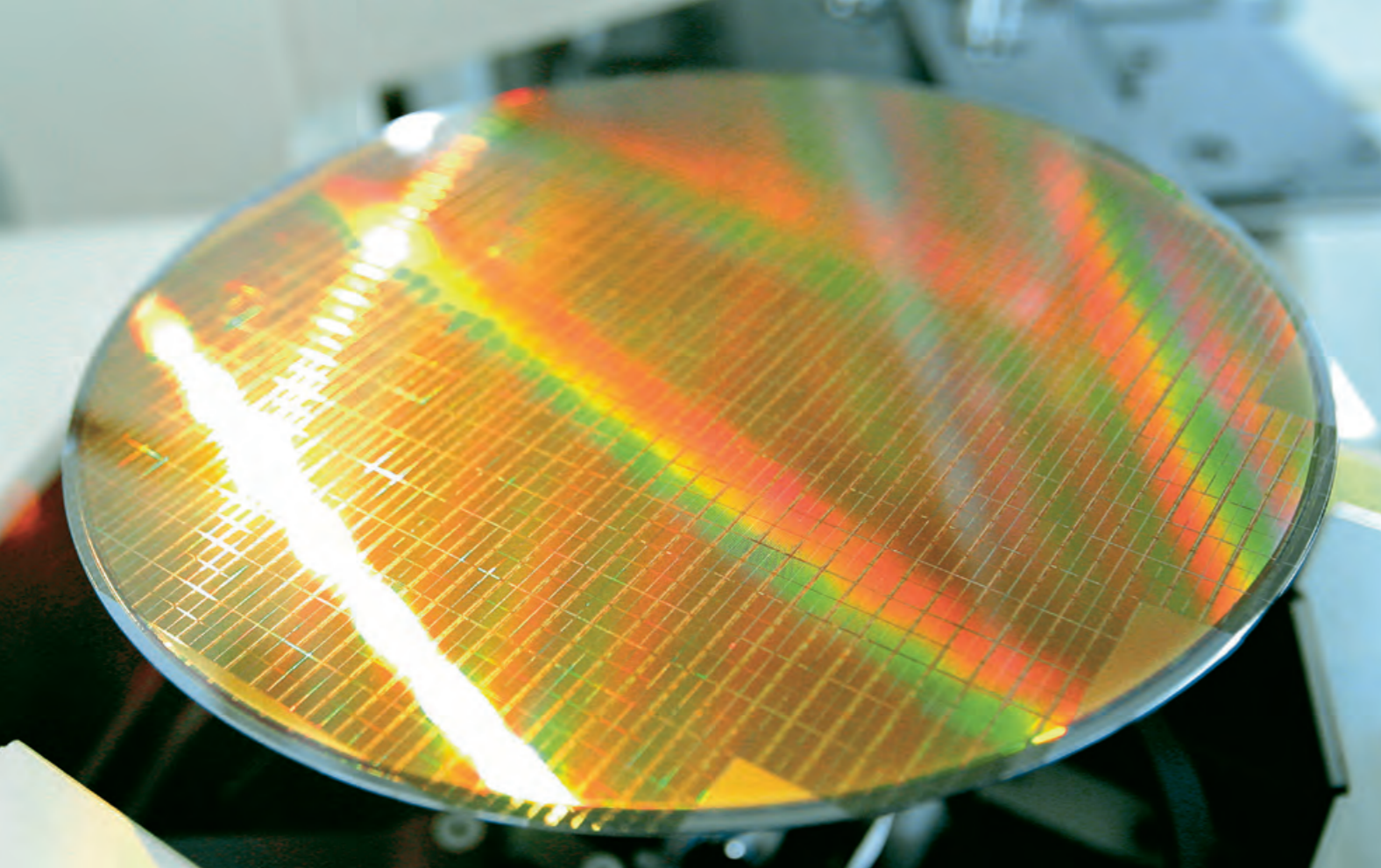
## Thermal processes firmly under control.

In the area of heat treatment and tempering, we have assembled a product portfolio that sets standards in technological development. This includes everything from furnace components, insulation materials and charge carrier systems to burning aids and solutions for temperature measurement.

We combine innovative solutions, such as new patented processes for relining Hot Zones, silicon material solutions and intelligent charge carrier designs, with our distinctive material and application expertise to create solutions that bring economy, energy efficiency and a long service life.



Expert Reline Service



# We provide pure excellence in everything we do.

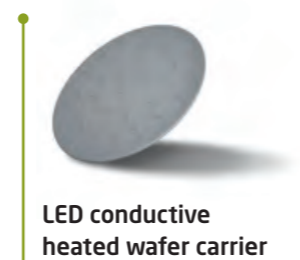
Schunk Xycarb Technology, a subsidiary of Schunk Carbon Technology, is a leading global supplier of quartz, graphite, and advanced technical ceramic products and services for the semiconductor, LED and solar wafer processing industries.



Quartz epi chamber topview with SiC graphite parts



LED planetary inductive heated wafer carrier



LED conductive heated wafer carrier

## Semiconductor solutions from Schunk Xycarb Technology set standards in both technology and processes.

Schunk Xycarb Technology provides customers innovative products and services using technology backed by application knowledge, allowing customers to maintain their competitive edge in the marketplace.

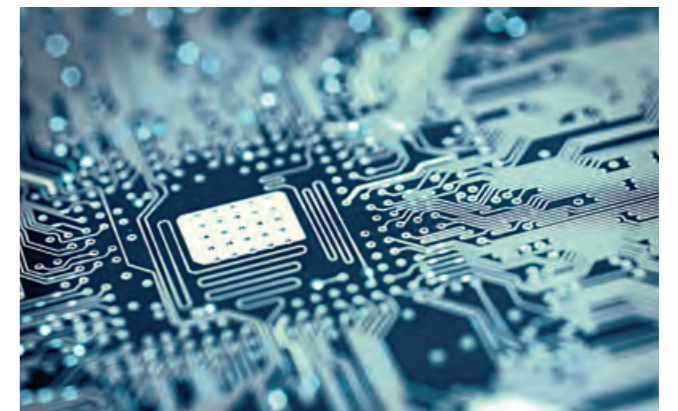
Schunk Xycarb Technology offers a complete range of critical consumable equipment products and services for the semiconductor wafer manufacturing and processing industry. Specialties encompass the entire range of ceramic products essential to the industry, including CVD SiC-coated graphite, quartz, graphite as well as high-performance silicon and ceramic products. Consumables help our customers reduce costs and improve productivity in some of the most demanding wafer and IC manufacturing sites in the world. Our expertise allows us to quickly adapt products to meet new process requirements.

## First choice for high-quality products.

Specified by major manufacturers of wafer-processing equipment worldwide, exceptional quality and innovation make us the preferred choice of wafer and chip manufacturers. Our products meet the semiconductor industry's toughest demands for dimensions, purity and particle level. At every production step, measures are taken to ensure high product purity and required specifications are met. Critical production steps, final inspection and packaging are done in ultra clean-room conditions. Systems enable full traceability from raw material to final product.

## Leading edge solutions for the LED industry.

Schunk Xycarb Technology is the market leader for equipment products for the critical Light Emitting Diode (LED) manufacturing processes and is setting standards in susceptors and silicon carbide (coated-graphite) products for the MOCVD market. Schunk Xycarb Technology MOCVD wafer carriers are known for their optimal process results. Through our state-of-the-art manufacturing methods, we achieve optimal uniformity and cost-effective product lifetimes. Schunk Xycarb Technology has the knowledge and engineering power to improve the products to specific needs, increasing throughput by optimizing on wave-length uniformity and brightness. The production methods of Schunk Xycarb Technology guarantee impurity-free products for an excellent process.



Imagine there  
are **no limits** to  
your ideas ...

Never accept limits again! **Technical Ceramics** from Schunk Carbon Technology keep going when other materials give up.



# Technical ceramics - Optimum design, tough as nails.

Temperature resistant, media resistant, non-wearing, extremely hard and bulletproof - no other material combines as many valuable features for industrial use as technical ceramics from Schunk Carbon Technology.

*SiSiC radiant tubes  
in continuous annealing line*



*Schunk oxide ceramics  
AluSiK-99 GB*

Our high-precision, state-of-the-art manufacturing processes provide high-end ceramic solutions for a broad range of applications. Nobody serves you better than we do. Innovative production processes, such as flexible 3-D printing with IntriSiC, make new and economical applications possible and enable the manufacture of large components, shape diversity, small batches and prototyping.

As a specialist for ceramic materials and components made of silicon carbide (SiC) and aluminum oxide (Al<sub>2</sub>O<sub>3</sub>), we provide materials and components for thermal processing technology, furnace and system construction and process engineering. Thanks to its outstanding features, our SiC is also used in ballistic protection.

## **Premium solutions for high temperature applications.**

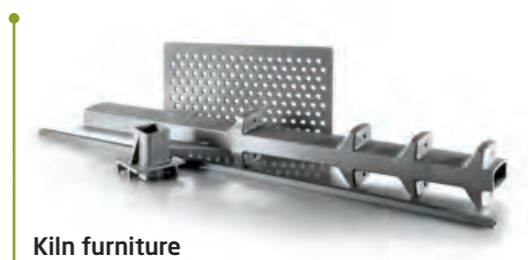
Technical ceramics from Schunk Carbon Technology set standards for the use of burner systems for direct and indirect heating, kiln furniture and furnace and system construction. Thanks to their exceptional oxidation and corrosion resistance, resilience through changes in temperature, and dimensional stability, our premium solutions guarantee economical, energy-efficient and reliable production processes.

## **Wear-free, even under the hardest usage conditions.**

Impressive friction-reducing properties in tribological systems ranging from pumps and compressors to medial and temperature-resistant laboratory ceramics enable our ceramic components to be used in a broad range of applications. They meet the high demands of the chemical industry and process engineering.



**Burner technology**



**Kiln furniture**

## Europe

---

Schunk Carbon Technology GmbH  
Austria/Bad Goisern  
Phone: +43 6135 400 - 0

Schunk Bahn- und Industrietechnik GmbH  
Austria/Bergheim bei Salzburg  
Phone: +43 662 45 92 00

Schunk Wien Gesellschaft m.b.H.  
Austria/Vienna  
Phone: +43 1 6 16- 68 07 - 0

Schunk Carbon Technology s.r.o.  
Czech Republic /Plzen  
Phone: +420 377 454 120

Schunk Carbon Technology S.A.S.  
France/Nanterre Cedex  
Phone: +33 141 19 52 - 52

Schunk Kohlenstofftechnik GmbH  
Germany/Heuchelheim  
Phone: +49 641 608 - 0

Schunk Carbon Processing GmbH  
Germany/Heuchelheim  
Phone: +49 0 641 608 - 0

Schunk Gerhard Carbon Technology GmbH  
Germany/Oberzenn  
Phone: +49 9844 97 11 0

Schunk Bahn- und Industrietechnik GmbH  
Germany/Wettenberg  
Phone: +49 641 803 - 0

Schunk Ingenieurkeramik GmbH  
Germany/Willich  
Phone: +49 2154 497 - 0

Schunk Carbon Technology Kft.  
Hungary/Csesztreg  
Phone: +36 92 500 900

Schunk Carbon Technology S.r.l.  
Italy/Magenta  
Phone: +39 02 97 21 90 - 1

Schunk Xycarb Technology B.V.  
Netherlands/Helmond  
Phone: +31 492 57 87 87

Schunk Carbon Technology B.V.  
Netherlands/Rotterdam  
Phone: +31 10 4 14 47 66

Schunk Portugal, Lda.  
Portugal/Marinha Grande  
Phone: +351 244 572 480

Schunk Carbon Technology SRL  
Romania/Magurele  
Phone: +40 21 3372859

000 Schunk Carbon Technology  
Russia/Moskau  
Phone: +7 499 372 51 57

Schunk Ibérica S.A.  
Spain/Pinto  
Phone: +34 91 691 25 11

Schunk Carbon Technology AB  
Sweden/Lenhovda  
Phone: +46 474 2 95 00

Schunk Tokai Scandinavia AB  
Sweden/Trollhättan  
Phone: +46 520 811 85

Schunk Carbon Technology AG  
Swiss/Adliswil  
Phone: +41 44 716 46 - 46

SIRMA Elektrik Kömürleri SAN. VE TIC. A.S.  
Turkey/Istanbul  
Phone: +90 212 278 99 70

Schunk Carbon Technology Limited  
UK/Pudsey  
Phone: +44 113 236 3496

## America

---

Schunk do Brasil Eletrografites Ltda.  
Brasil/São Paulo  
Phone: +55 11 4613 - 3202

Schunk Carbon Technology S. A. de C. V.  
Mexico/Ocoyoacac  
Phone: +52 728 282 - 78 90

Schunk Xycarb Technology Inc.  
USA/Georgetown  
Phone: +1 512 8 63 00 33

Schunk Carbon Technology, LLC  
USA/Menomonee Falls  
Phone: +1 262 2 53 87 20

## Asia

---

Schunk Carbon Technology Ltd.  
China/Hong Kong  
Phone: +852 2 408 6688

Schunk Xycarb (Shanghai) Precision  
Ceramics Technology Co., Ltd.  
China/Shanghai  
Phone: +86 21 503 15 123

Schunk Carbon Technology (Suzhou) Co., Ltd.  
China/Suzhou  
Phone: +86 512 6319 8098

Schunk Metal & Carbon (I) Pvt. Ltd.  
India/Bangalore  
Phone: + 91 80 6703 8501

Schunk Carbon Technology Japan KK  
Japan/Yokohama  
Phone: +81 45 470 2551

Schunk Xycarb Technology Pte. Ltd.  
Singapore/Singapore  
Phone: +65 636 0672

Schunk Carbon Technology Ltd.  
South Korea/Ansan-City  
Phone: +82 31 491 2722

Schunk Xycarb Technology Co., LTD.  
Taiwan/Hsinchu City  
Phone: +886 3 583 6019

Schunk Carbon Technology Co. Ltd.  
Thailand/Bangkok  
Phone: +66 2 73 60 32 34

## Australia

---

Schunk Carbon Technology Pty Ltd  
Australia/Rowville  
Phone: +61 3 97 53 - 35 88

IMAGINE,  
WITH  
CARBON.

**Schunk Carbon Technology**

Rodheimer Str. 59

35452 Heuchelheim, Germany

Phone +49 641 608-0

Fax +49 641 608-1223

E-Mail [division-carbontechnology@schunk-group.com](mailto:division-carbontechnology@schunk-group.com)

[schunk-carbontechnology.com](http://schunk-carbontechnology.com)