



Schunk Carbon Technology

Driven by imagination

Leading carbon technology for electrical,
mechanical and thermal systems in cars

Schunk Carbon Technology

A worldwide success. Always by your side.

Schunk Carbon Technology is a worldwide leader in the development, production and application of carbon and ceramic solutions. Like no other company, Schunk Carbon Technology combines innovation and technological expertise with exceptional service orientation into a service portfolio that is unique on the market.

Schunk Carbon Technology is a partner who offers you all the technological possibilities of a globally operating company and pragmatically puts your ideas into practice. And always precisely tailored to meet your requirements—for industrial volume markets as well as for highly specialized niche markets. Our technology portfolio, including mechanical carbon, electrical carbon, high temperature applications and technical ceramics, offers you perfect solutions for a diversity of industrial applications.

A division of the Schunk Group

Pioneering, full of ideas, based on partnership—this is how the Schunk Group has made a name for itself as a global technology group since 1913. Pioneering, because we build bridges for our customers to enable them to use innovative technologies to develop better products and conquer new markets. Full of ideas, because innovations are an essential part of our corporate culture. And based on partnership, because customer orientation is practiced on a daily basis by each and every Schunk Group employee.

With over 8,000 employees in 29 countries, the Schunk Group develops customized high-tech products and systems in a wide variety of areas on this basis: We are active in carbon technology, ceramics, environmental simulation, air conditioning technology as well as sintered metal and ultrasonic welding. And this is the case for many key industries: from automotive, train, aircraft and ship technology to solar and wind energy through to medical and electrical engineering as well as in the semiconductor industry. Our customers benefit from this extensive expertise.

Facts Schunk Group

Turnover 2017	EUR 1,192 m
Employees	8.262
Locations	60
Investments Plan 2017	EUR 74.0 m
Equity Ratio	65.7 %





Get on the fast track with us.

As a reliable development partner for the automotive industry, we not only provide sophisticated components, but above all new ideas and perfectly coordinated processes. Benefit from our innovational strength and use it as your driving force in a constantly changing market environment.

When it comes to your requirements relating to mobility, the work of our experts starts with a key question: How can our solutions help you progress as quickly as possible? In order to come up with the right answer, we leverage all of our experience for you. From customized materials development to component design and prototyping through to serial production and logistics you benefit from the early integration of our considerable expertise in the electrical, mechanical and thermal application of graphite materials or graphite composites material. Even in the areas of process safety and quality management systems, we offer you solutions that are precisely tailored to meet the needs of the automotive industry. Take advantage of the strengths of a global player who meets the highest standards of product and process quality right down to the smallest details.

Electrical carbon—We give new technologies a head start

Electrical components in modern motor vehicles are the driving force behind forward-looking drive, driving safety and convenience solutions. Always on board: innovative carbon products from Schunk Carbon Technology. They meet the highest requirements for functional performance, service life and temperature resistance.

Our carbon brushes help you with fuel consumption reduction and engine management in conventional internal

combustion engines with start-stop systems, fuel pumps and assembly downsizing. Our carbon brushes also provide reliable service in countless electric motors. Sophisticated anisotropic carbon brushes for high system requirements such as in braking systems also ensure greater driving safety. And they do all that in a highly precise and particularly low-noise manner to ensure that driving is a comfortable and safe experience day after day.

Mechanical carbon—Special solutions for smooth processes

To increase efficiency and service life, the demands on tribologically affected parts in automotive components are constantly increasing. Our materials, which are custom-tailored to meet your requirements, are the ideal solution for this. In compressors, vacuum pumps, fluid transfer pumps, high-performance electric motors and energy storage systems through to high-temperature exhaust gas valves, our materials pave the way for the highest possible performance. With our wealth of experience in tribologically optimized, temperature and media-resistant carbon, graphite and thermoset materials as well as fiber composite materials, we work with you to give pioneering automotive solutions a head start.

Leverage our strengths to generate your success.

It is not possible to become one of the world's leading partners in the automotive supply sector overnight or by merely making promises. Experience and results count. And we have plenty of both to offer.

Anyone who works with us can rely on our full commitment. Uncompromising in terms of quality, reliable thanks to our considerable experience and global presence as well as extremely flexible in meeting your individual requirements—benefit from the strengths of a globally operating technology leader.



Development partner

We see ourselves as imaginative and solution-oriented partner for the further development of your products. Simultaneous engineering—early involvement in development—allows us to play an important part in this. Possible sources of error can be detected and eliminated as early as your product's design development phase. Harmonizing your requirements with technical feasibility is what drives us.

Quality standards

Quality forms the basis of establishing and maintaining a trusting relationship with our customers. We will therefore make every effort to continuously reaffirm the trust they place in us. For this purpose, we have for example established a firmly institutionalized quality management department and certified our individual companies according to current ISO standards. All the common quality and approval processes are run through within a defined new part project management procedure. We even meet the demand for an error target of 0 ppm through the self-inspection of every employee at their respective workstation.

Innovational strength

Just like the entire Schunk Group, our working area is also characterized by its wealth of ideas, profound expert know-how and the courage to forge ahead. The results of our ideas and actions give your products more performance, comfort, safety and efficiency. Take advantage of our innovative strength in the areas of materials recommendation, optimum component design, prototyping, innovative production processes, component testing and application-oriented trials as well as custom logistics solutions.

Wealth of experience

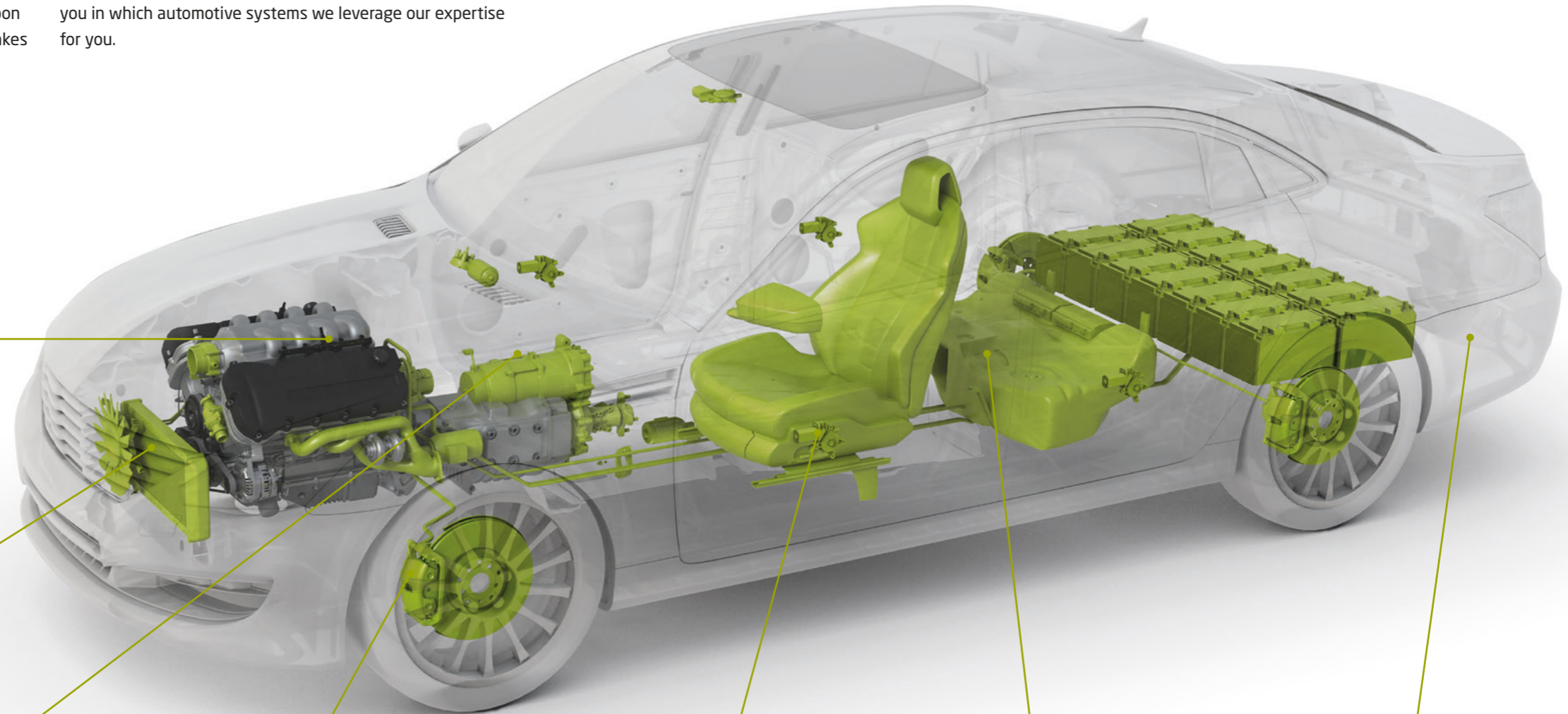
We have already been supporting and shaping the technological progress of the car for a very long time and in many different ways. Our ongoing collaboration with our partners in the automotive industry makes us very familiar with the special needs of your business sector. This allows us to seamlessly integrate our development and manufacturing processes into your processes, thus helping you shorten development phases and reduce life cycle costs.

Back to the future with Schunk.

From the first idea to series production we support you in all stages of development, production and logistics. The outcome are technical solutions that enable progress and innovation in many areas of automobiles.

Most automobiles around the globe would probably not function without our components. At least not as fuel efficiently, reliably and safely as with components from Schunk Carbon Technology. After all, our unique materials expertise makes

many things possible in the first place or perfects already existing technology. This schematic representation shows you in which automotive systems we leverage our expertise for you.



Internal combustion engine

Our carbon brushes for starters, alternators and radiators as well as the components for safe thermal management work reliably and efficiently.

Pumping systems

With our experience in the field of bearings and mechanical seals, we deliver components like coolant pumps - to divert fluids where they are needed.

Electric traction motor

Whether effective power transmission, safe discharge of interference currents or reliable thermal management—we customize our modules to meet your requirements.

Safety systems

Rotors and vanes for dry lubricated vacuum pumps and compressors allow efficient auxiliary systems in confined spaces, and will not let you down even in case of emergency.

Comfort systems

We manufacture high-quality components for servo motors, HVAC blowers, power windows, side mirrors, sunroofs and seat adjusters.

Fuel systems

Rely on technologically advanced materials for carbon brushes and carbon disks for the fuel delivery module and the throttle valve positioner.

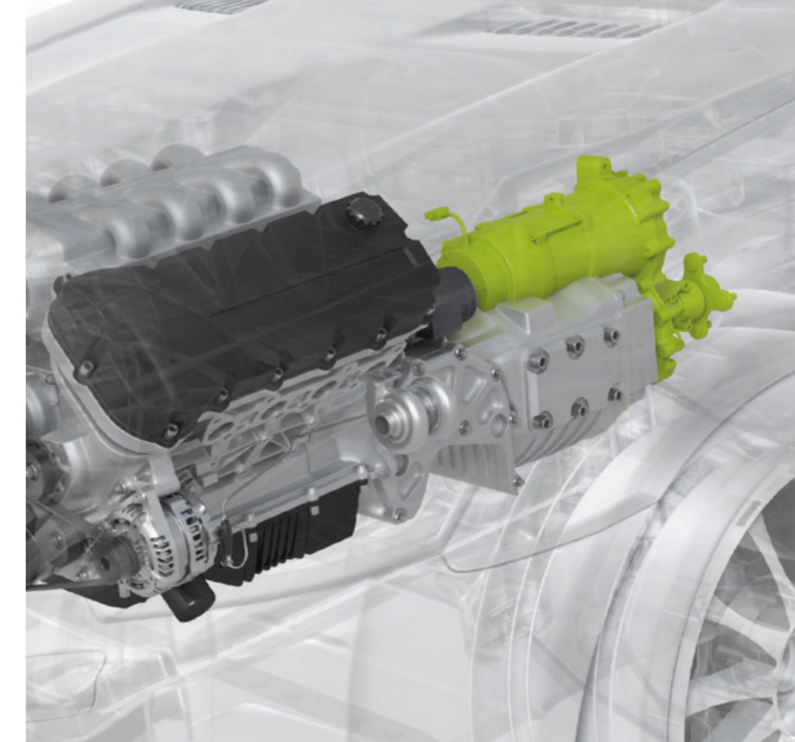
Exhaust gas systems

Our graphite bearings offer you the lowest actuating forces along with high temperature resistance for your exhaust line and exhaust gas turbocharger solutions.

Engine systems—Schunk quality in the heart of every car.

Internal combustion engine

No matter what fuel drives your combustion engine, our carbon brushes and components decisively contribute to enhancing efficiency, reliability and safety.



Electric traction motor

Electric drives represent the mobility of the future. We supply customizable materials and components today to keep you ahead of the pack tomorrow.



Carbon brush for starters

Strong performance and a long service life are the priorities when it comes to development. Used in the start-stop system, our carbon brushes reliably allow over 350,000 starts and thus contribute to reducing fuel consumption.



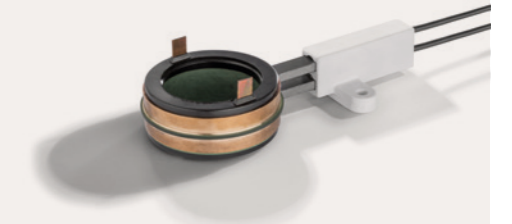
Carbon brush for alternators

The alternator and battery combination have to keep ever more power consumers supplied in today's automobile. Our carbon brushes successfully deal with this increased energy demand while meeting the highest requirements in terms of performance and efficiency.



Shaft grounding assembly

Capacitive interference current on the rotor shaft of electric drives can damage bearings and gears. Our ground contacts safely discharge these currents, thus protecting critical components. The ground contacts can be used either in combination with slip ring systems or as a stand-alone solution.



Carbon brush assembly for traction motors

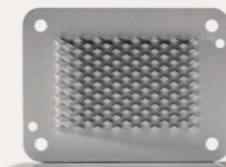
These components are offered in modular construction and for all typical loading conditions. Early integration into the work process—simultaneous engineering—allows us to develop the carbon brushes according to your individual requirements. Rotational speeds of up to 40 m/s are feasible.



Carbon brushes for radiators

Our specially developed materials with innovative binder technologies are extremely fuel-efficient, enable quiet operation and can even be used for higher temperature and humidity requirements.

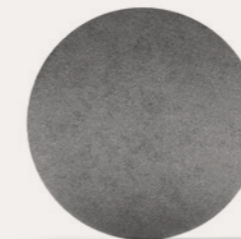
Pin Fin Cooler



Thermal management

Our thermal management components combine many positive characteristics. Customized graphite composite material provides low dead weight, high reliability even under the most difficult conditions, high thermal conductivity, improved power density and low thermal expansion.

Disc for Thyristor Modules



Base plate

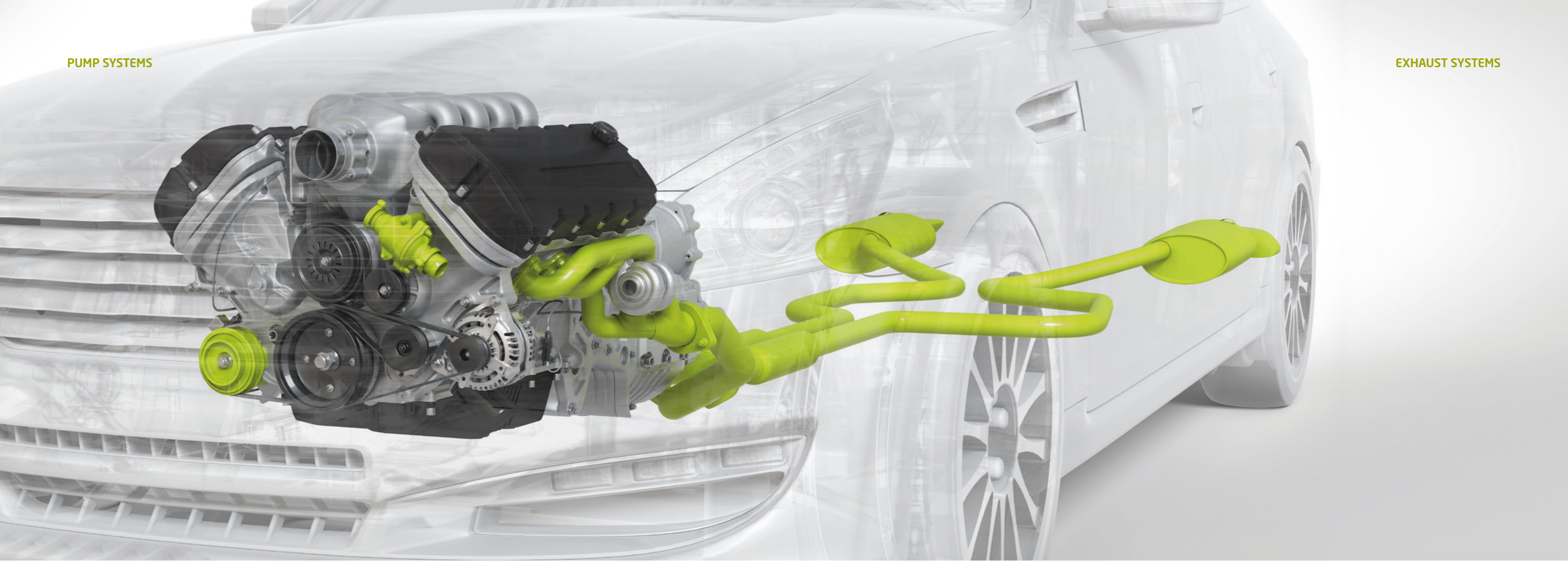


Heat Sink 1



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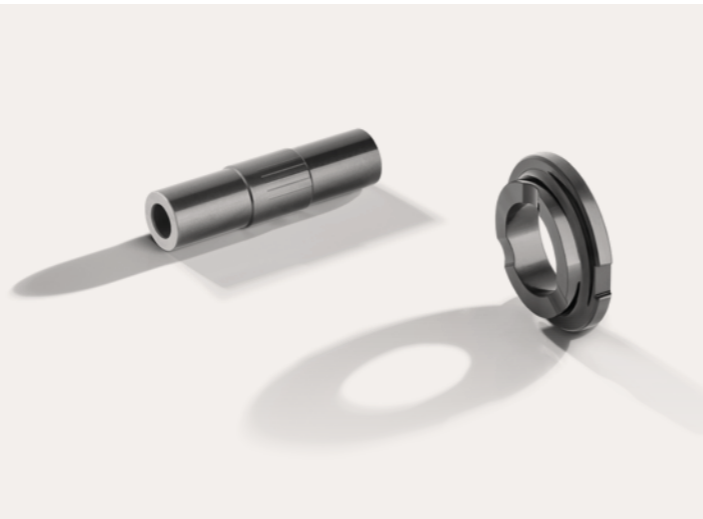


Pump systems—We make sure it runs smoothly.

Whether coolant or fuel, automobiles contain circulating fluids that must be reliably pumped to their destination. The quality of pump components should therefore be up to par in every sense of the word. You would do well to rely on our expertise.

Injection molding components

We produce bearings and other tribologically loadable parts that are used in coolant and fuel pumps and are custom-tailored to meet your requirements. In this area, we produce individually tailored bearings and other tribologically loaded parts—used in coolant and fuel pumps—to meet your requirements. These components convince through their good tribological properties, they are applicable in most fluids used within the automobile and they can be reliably produced in large numbers. Additionally, the materials can be used as insert components within a coating process.

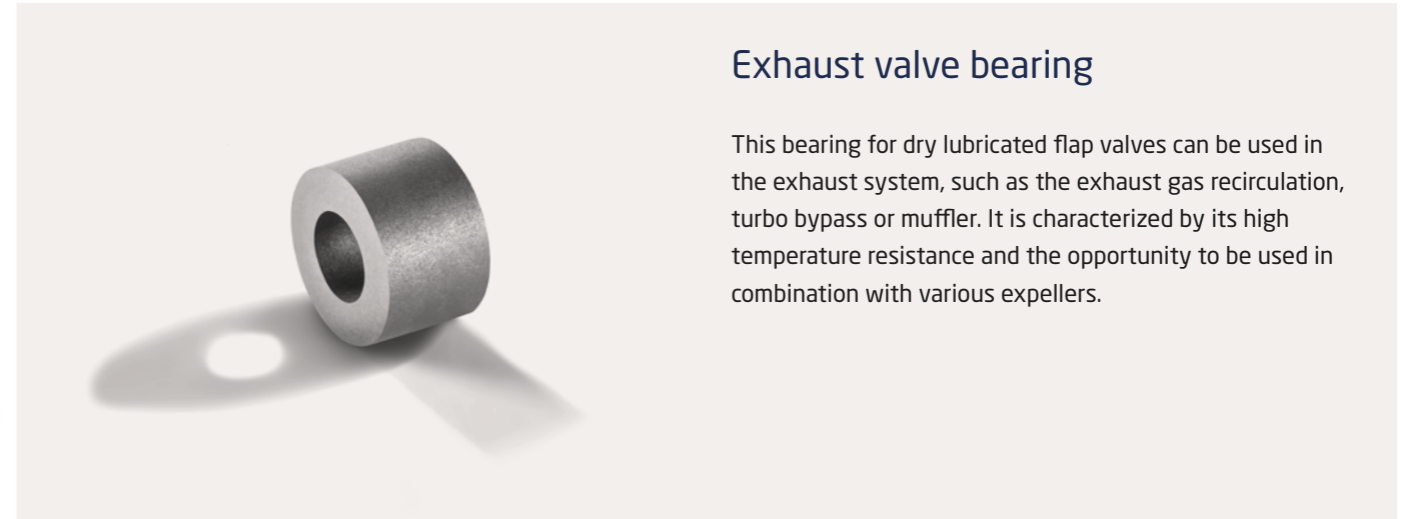


Exhaust systems—Keeping smoke and noise under control.

Cars cause noise and contamination? That used to be the case. Modern exhaust systems control not only noise, but also emissions and performance. And one component plays a key role here: the exhaust valve bearing.

Exhaust valve bearing

This bearing for dry lubricated flap valves can be used in the exhaust system, such as the exhaust gas recirculation, turbo bypass or muffler. It is characterized by its high temperature resistance and the opportunity to be used in combination with various expellers.



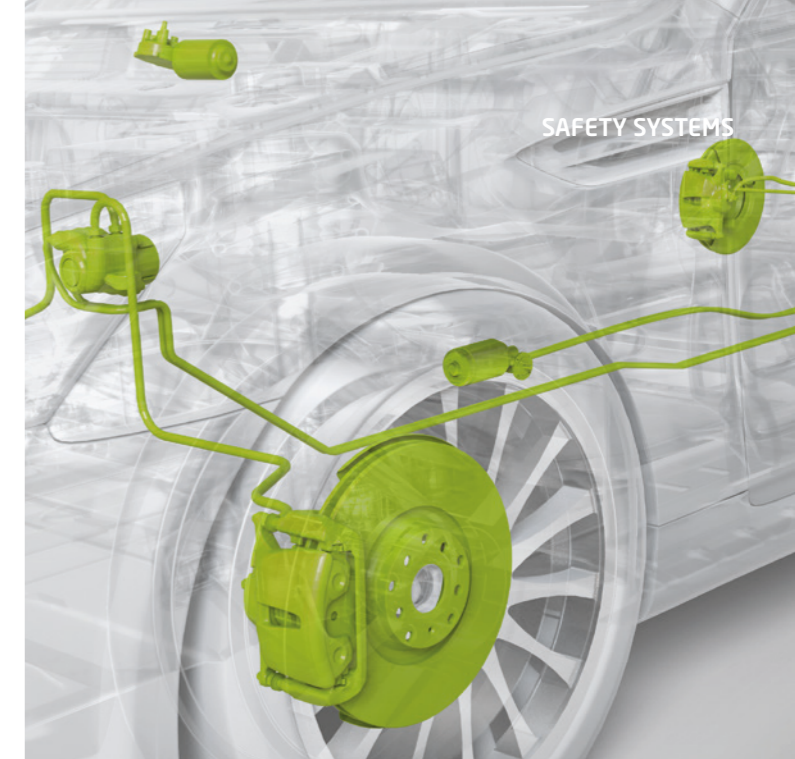
Comfort systems— Innovative solutions at the press of a button.

Up, down, on, off—modern comfort systems make driving more pleasant. Cooperating with our experts is equally pleasant. They take care of everything for you—not at the press of a button, but by making a call.



Safety systems— In the best of hands with us.

Safety is a big issue in the automotive industry and demands are constantly rising. You should only rely on the highest of quality, years of experience and proven innovation in this highly sensitive area. It's safe to say that Schunk provides all the above.



Carbon brushes
for electric motor power windows and sunroof



Carbon brushes with leaf spring
for electric motor power windows and side mirrors



Carbon brush
for HVAC blowers



Advantages of our components for convenience systems

Thanks to their minimal size and extremely low dead weight, all of the products shown here require minimal installation space while allowing smaller assemblies. Specially developed materials with minimum error tolerances and precision manufacturing on high-speed milling machines enable absolutely noise-free operation.

Carbon brush for wiper motors



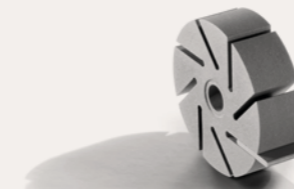
Both traditional wiper motors and new direct drive wipers function very reliably and precisely with our carbon brushes. The best radio disturbance characteristics and high-accurate position detection minimize malfunctions.

Carbon brush for electrical braking systems



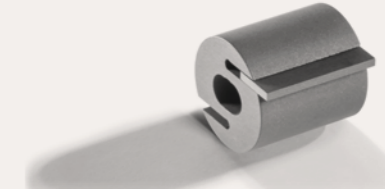
Modern engine design puts extremely high demands on commutation. You can deal with this challenge by using our newly developed, anisotropic carbon brushes. These are highly layered, direction-independent, stable and virtually wear-free.

Graphite vanes



Developed for use in the vane pump of diesel, hybrid and electric vehicles—boosting break performance thanks to vacuum generation in the “booster” chambers. Our graphite vanes are very reliable even under high mechanical loads, maintenance-free, self-lubricating and increase efficiency.

Carbon graphite rotor



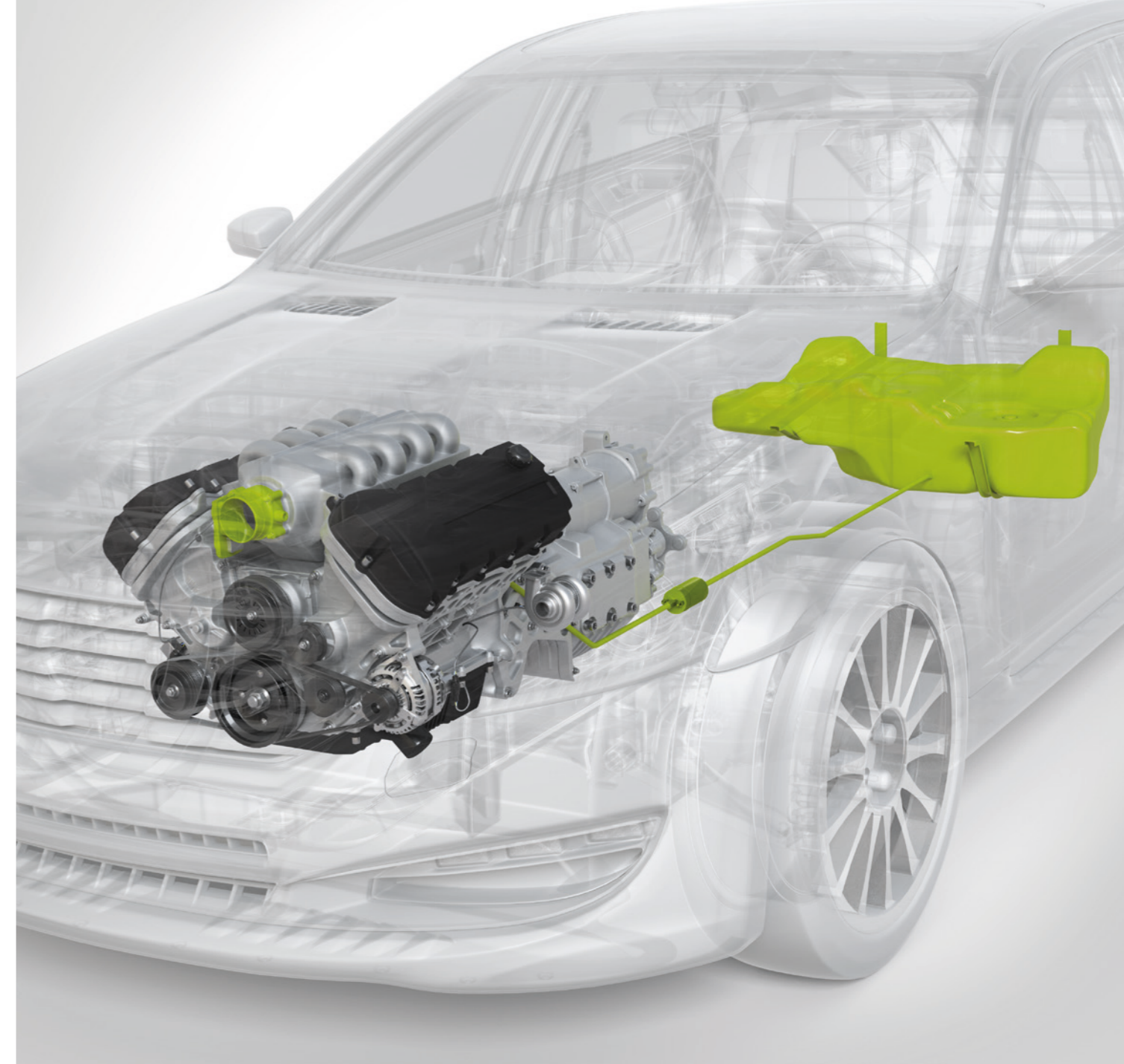
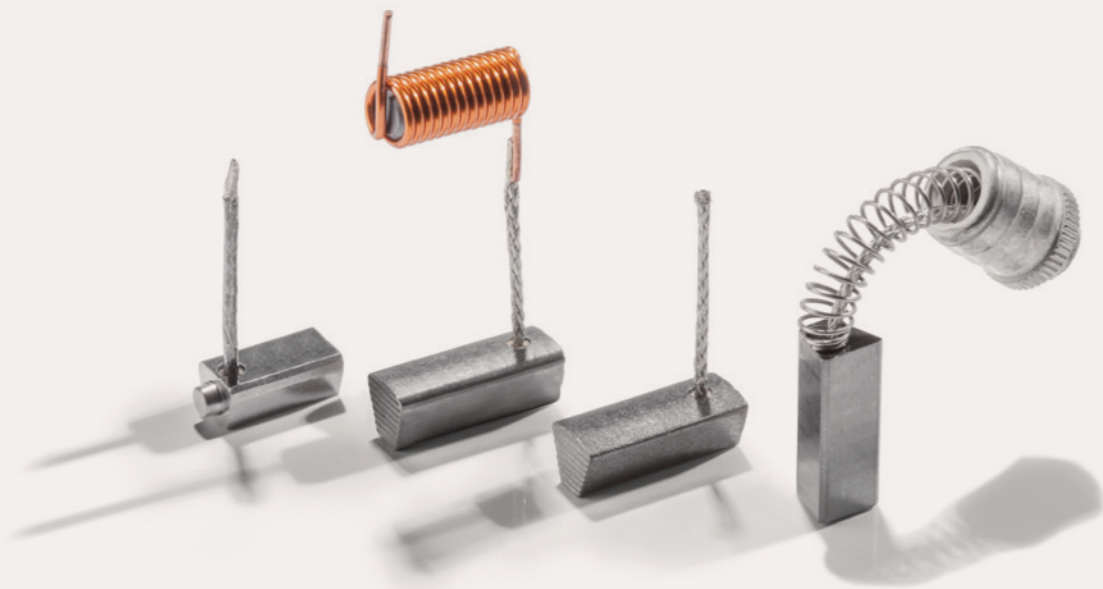
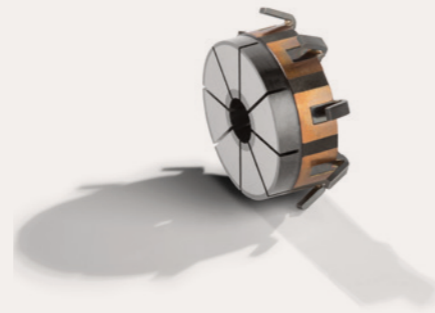
Just like our graphite vanes, this rotor is installed in the vane pump of diesel, hybrid and electric vehicles. It works maintenance-free and owns good emergency running properties, without needing additional lubricants. Its high-precision manufacturing ensures maximum pumping values.

Fuel systems— Refueled with the latest technology.

Modern engines put ever-greater demands on the fuel system. There are also safety-related requirements that must be met. That's fine if you rely on us as a technology partner – we'll find the right solution for you.

Carbon products for fuel delivery modules

Our carbon brushes as well as carbon discs for commutators and assemblies are used in the tank and impress with durability and efficiency thanks to monitoring of electrically corrosive properties. We offer commutator solutions to ensure maximum efficiency for diverse fuel variants and performance classes.



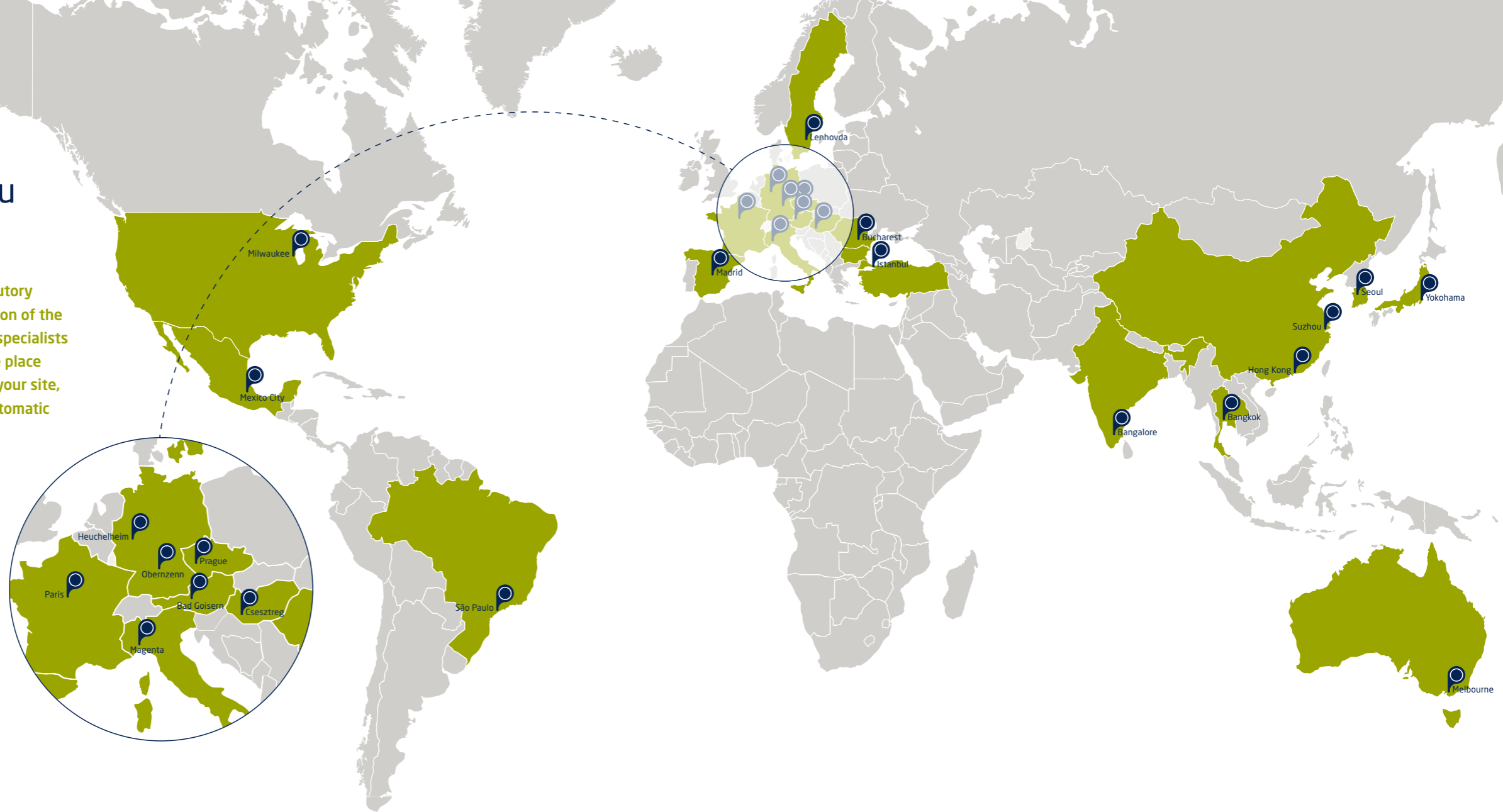
Carbon brush for electronic throttle control motors

Our custom-developed materials allow safe operation with constant characteristics over their entire service lifetime. Accurate positioning of the throttle valve at all times regulates the amount of air and fuel. These carbon brushes work extremely reliably, are economically viable and pay off for you in every respect.



Our commitment to you has no limits.

We meet the ever-increasing demands and statutory requirements on modern mobility—in every region of the world. At 22 automotive sites, you support our specialists with the pooled expertise of a global player. We place production and logistics as close as possible to your site, using manual, semiautomatic as well as fully automatic manufacturing systems.



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