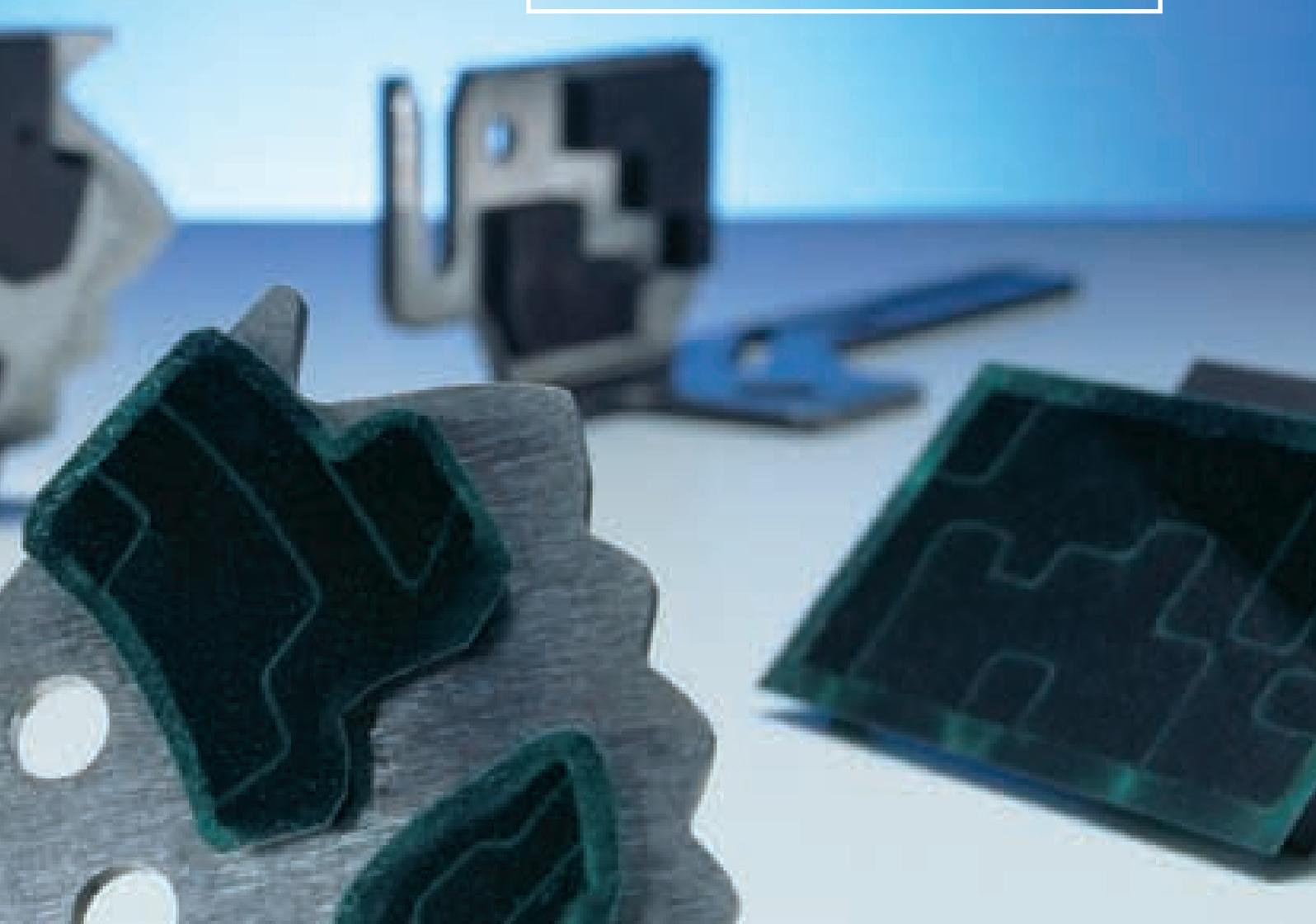


Magnetfabrik Bonn – innovative products
for a world on the move

magnetfabrik  bonn



Three generations – one goal:
The success of your company



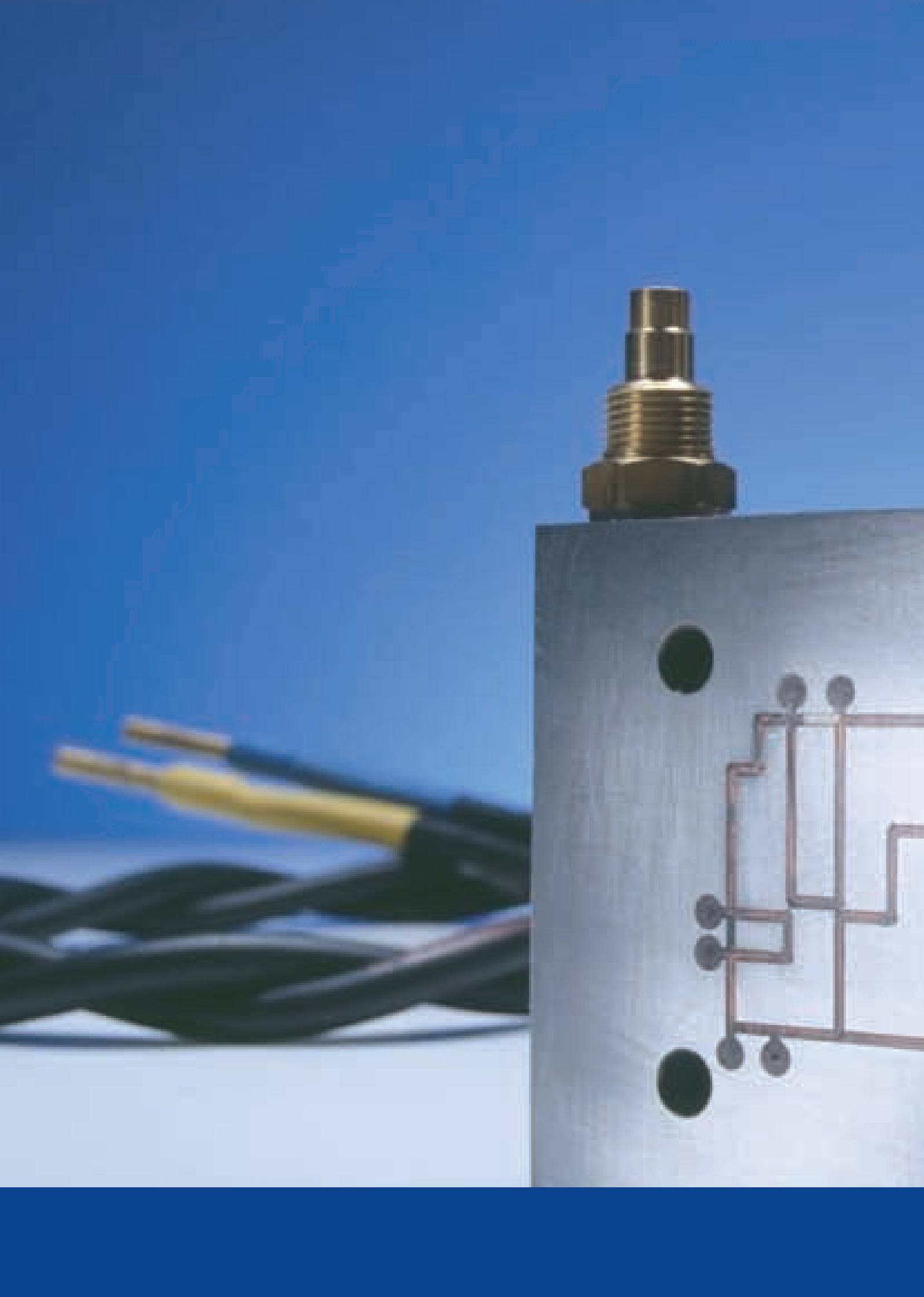
Magnetfabrik Bonn is an independent, medium-sized company that has been run by the owners for three generations. For more than 75 years, we have been successfully mastering challenges in the manufacturing and application of permanent magnets.

The experience in development and production that we have gained over the years, coupled with the practical skill gleaned from thousands of applications mean that we are in demand as experts in the field. In the realm of polymer-bonded permanent magnets in particular, we are now one of the leading suppliers on the international market.

Magnetfabrik Bonn takes on the responsibility for the entire magnet production process to ensure that we are able to offer our customers superior system solutions and engineering and knowledge services. From application consulting, through development and tool manufacture right up to production, our skilled specialists work alongside one another at the same premises.

By combining our strengths in this way and entering into intensive dialog with our customers, we ensure that the signals coming from the market are translated into impetus for our production. The result is reliable, tailored, economical solutions that give our customers a real competitive edge.





It's the mix that matters

The starting point for tackling any task in the world of magnets is the selection of the right material for the magnet. And such a material really doesn't exist, because magnets are always alloys of different elements with a wide range of properties and combinations of these properties.

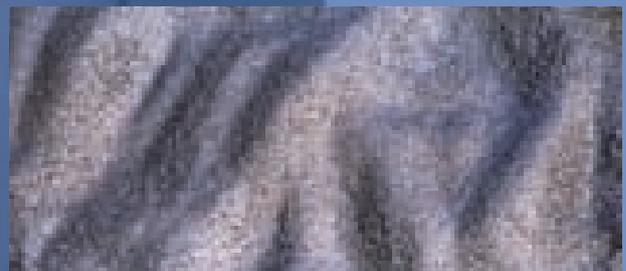
This means that extensive knowledge of materials is vital for us to be able to successfully realize our customers' specific requirements. More than 75 years of experience in processing and optimizing materials gives us a sound basis for quickly finding the right solution for your application.

The fact that we process all the materials used in our magnets ourselves using top quality raw materials and state-of-the-art technology is testimony to our expertise.

Our range covers all important groups of materials:

- Hard ferrite magnets
- AlNiCo magnets
on the basis of aluminum (Al), nickel (Ni), cobalt (Co), iron (Fe), copper (Cu) and titanium (Ti)
- Rare earth magnets
on the one hand on the basis of samarium (Sm) and cobalt (Co) or
on the basis of samarium (Sm), iron (Fe) and nitrogen (N)
as well as on the basis of neodymium (Ne), iron (Fe) and boron (B)

And, because we are experts on polymer-bonded permanent magnets, we naturally know the ideal compositions of the polymer bonding agents.



Expertise from A to Z

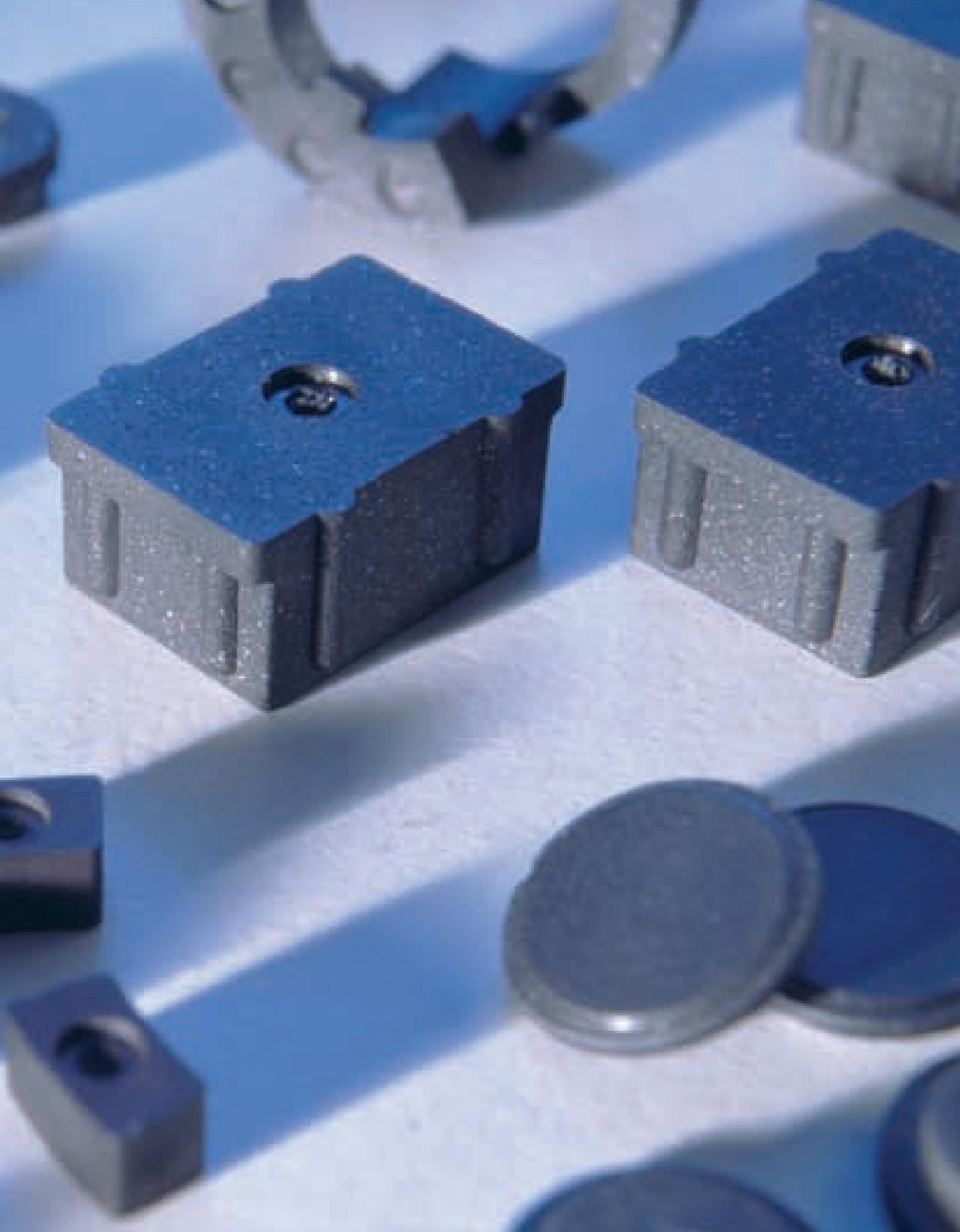
Advise and support rather than simply serve: That's Magnetfabrik's motto with respect to research and development. After all, specialists have to be involved from the very start in order to produce perfect magnet solutions.

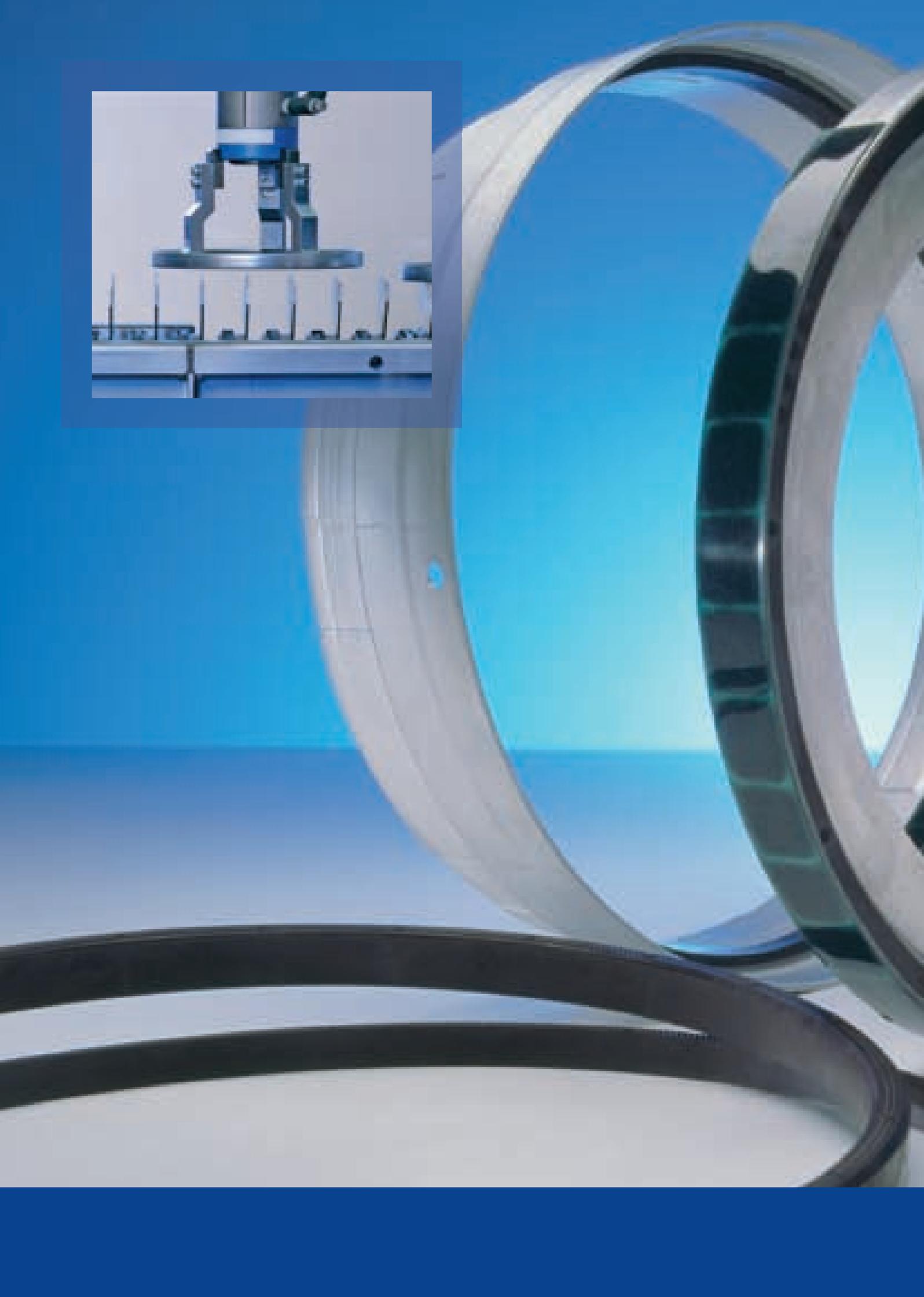
That is also why we consider ourselves as consultants rather than salespeople. To help us implement our product ideas, we can call on experienced specialists in the field of design, research and application engineering. Working together with you, they define and implement all the technical conditions right from the concept phase, through the engineering work and right up to the tailored solution to the problem.

Using modern techniques, some of which we developed in-house, we simulate and calculate the layout of magnetic circuits and the arrangement of the magnetic fields. The most important concerns here are the optimization of both the material used and the magnet's geometry.

Our toolmakers design and build injection molding dies or compression molds and magnetization equipment to ensure that we supply our customers with magnets of the very highest level of precision, functionality and quality. But it doesn't stop there: Our customers' needs are also catered for in other vital aspects such as assembly, handling and packaging that is suitable for automated processing.









The reliable way to an economical solution

Innovative technologies and production processes form the foundation for the manufacture of mechanically and magnetically sophisticated precision magnets. Over the decades, we have enhanced this foundation and perfected all our processes. After all, it is clear that with several thousand different items, none of our products are standard.

We use modern production and processing methods to ensure that the raw materials are transformed into top quality products with precisely defined properties. Depending on the materials used and the application in mind, the following methods can be used to produce magnets:

- Compression molding
- Sintering
- Casting
- Calendaring
- Injection molding

We see injection molding as being our particular area of expertise. Our high-performance machines and systems, some of which have been converted by our engineers and electricians to meet our own special needs, are the source of high-performance products which set new standards. And today we are in a position to mass produce even extremely small components with a diameter of just a few millimeters and a weight of only 0.4 grams.

Monitored workflows guarantee a high level of process reliability and provide support for our rigorous zero-fault policy. The high level of automation ensures cost-efficient production. And in this way, we boost the competitiveness of our customers.

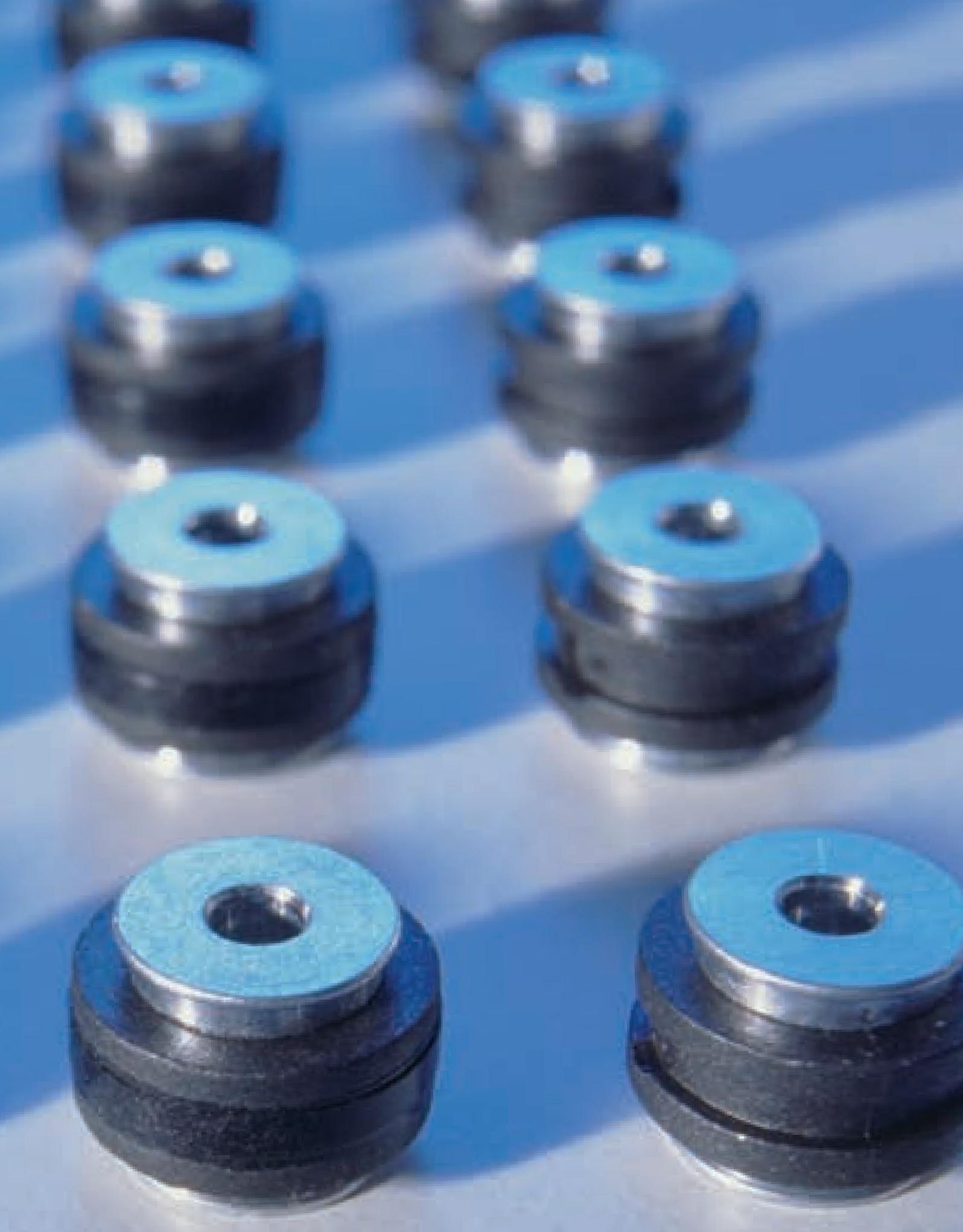
Quality first and foremost

For Magnetfabrik Bonn, the concept of quality is not just an empty promise but a commitment our customers can rely on. To us, quality means constant improvement.

Our objective is always to improve, whether it be in our consulting activities, in the development and production of competitive products, in the technical support we provide to our customers, in the quality of our products or in the protection of our environment. This philosophy is underpinned by a process-oriented quality management system compliant with DIN ISO 9001:2000 and ISO/TS 16949:2002. Ongoing development of our quality system ensures that we can continue to fulfill our customers' expectations far into the future.

However, for us quality is not just about realizing our customers' wishes or about our products; it is also about the way we treat our environment. Which is where our environment management system comes in: Compliant with ISO 14001:2004, it documents our commitment to ongoing improvement.







Traveling in comfort and safety

What many car owners don't know is that up to 170 magnets are fitted in modern cars. And leading car makers and their suppliers rely on our products.

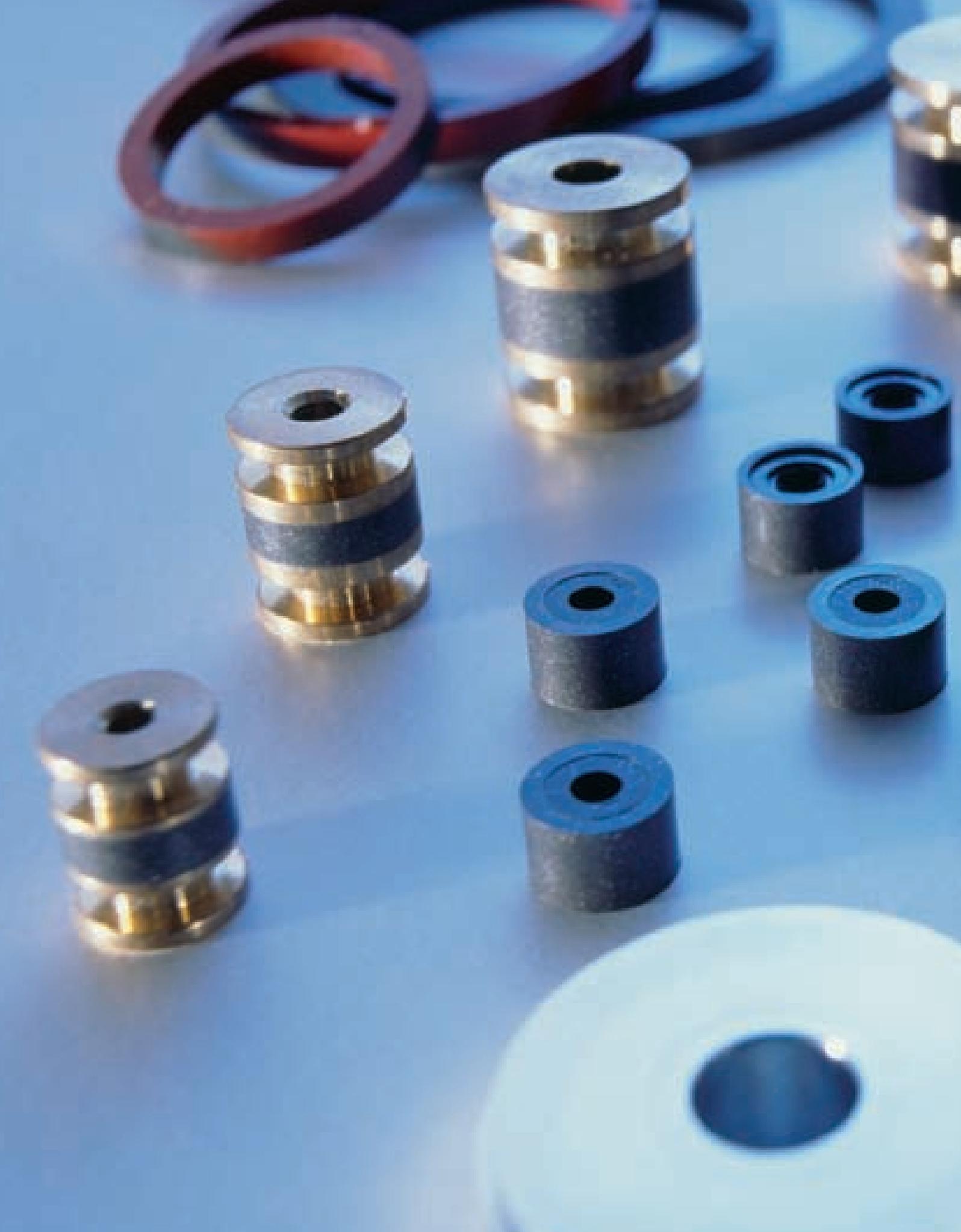
Thus, for example, magnets can be found in up to 70 electric motors used to drive a whole range of luxury and safety features. They open and close the side windows, the sunroof and the trunk lid. In their role as actuators in air conditioning units, they help to maintain a comfortable climate. And when they have adjusted the seat, steering wheel and rear view mirror, they allow an ideal, comfortable driving position so that any driver arrives at their destination perfectly relaxed.

But magnets contribute far more to improving the safety and performance of a vehicle in their role as integral parts of the electronic sensors that capture and transmit the data used to control a wealth of intelligent functions. They monitor the steering wheel angle, wheel speed, retardation and lateral acceleration and thus provide the basis on which the control electronics can decide whether a situation is dangerous and whether intervention is necessary. So, in an emergency, the anti-lock braking system or the electronic stability program is activated, the seatbelts are tightened or the airbag is triggered.

And under the hood, they monitor such things as the position of throttle valves, camshafts and crankshafts or injection systems, thus making sure that the engine is running as efficiently as possible.

Such applications where instructions are sent from a sensor via a controller and passed to an actuator by purely electrical means, with no mechanical connection are known as x-by-wire applications, and they will become ever more important in the automotive industry. Magnetfabrik will be actively involved in promoting development in this field.







Magnets in mechanical engineering – small parts with a great impact

Mechanical engineering is in the vanguard of German industry and products from this sector lead the world. And with our considerable expertise, we are playing our small part in ensuring that this will remain so in the future.

It is often tiny magnets the size of a match-head that ensure that large-scale plant equipment and production lines are able to perform their tasks flawlessly. All plant equipment contains controllers that receive numerous input signals giving the precise mechanical positions of all the moving components in the system. And to achieve this, magnetic sensors are used. These systems provide a number of crucial benefits in addition to precise signal processing. They are contactless and hence wear-free, they are resistant to soiling and are extremely robust. These benefits explain why new applications are constantly being developed in specific fields, for instance for rotating shafts, linear rails and actuators. The analog sensor technology used to capture the exact position is playing an ever more important role in this development. Our magnets are already even being fitted in pneumatic and hydraulic cylinders to allow sensor equipment to be retrofitted as required. In this way, our precision magnets are helping to guarantee reliable production in ever more industrial manufacturing processes.



Environmental protection and safety in drive engineering

All electric motors work on the basis of the forces generated by magnetic fields. In small, high-efficiency motors in particular, permanent magnets are indispensable. The magnetic properties of the material, in particular its energy density, have a direct impact on the power of the motor.

But it is not only high-performance magnets that are vital: Modern motors are inconceivable without sensor magnets. As microelectronics and power electronics continue to develop, intelligent motors are increasingly being used. In such intelligent motors, control of the permanent magnet is regulated. In the simplest scenario, electrical commutation, i.e. reversal of the current flow, which is traditionally achieved by carbon brushes, is replaced by electronic commutation. The position of the motor is captured without contact using magnetic sensors triggered by multipole magnets on the motor shaft. This allows the performance curve of the motor to be adapted flexibly depending on the requirements. It is thus possible to optimize the efficiency of an electrical drive unit and ultimately to convert electric power to movement with minimal loss. Even if just the circulation pumps in central heating systems in Europe were converted to modern drive technology, it would save the energy output of a modern power station.

Additional functions also cover safety aspects, for instance the motor can be protected against overloading or malfunctions can be detected. This means that small sensor magnets where the focus is on precision rather than performance are protecting the environment and improving safety in many motors.





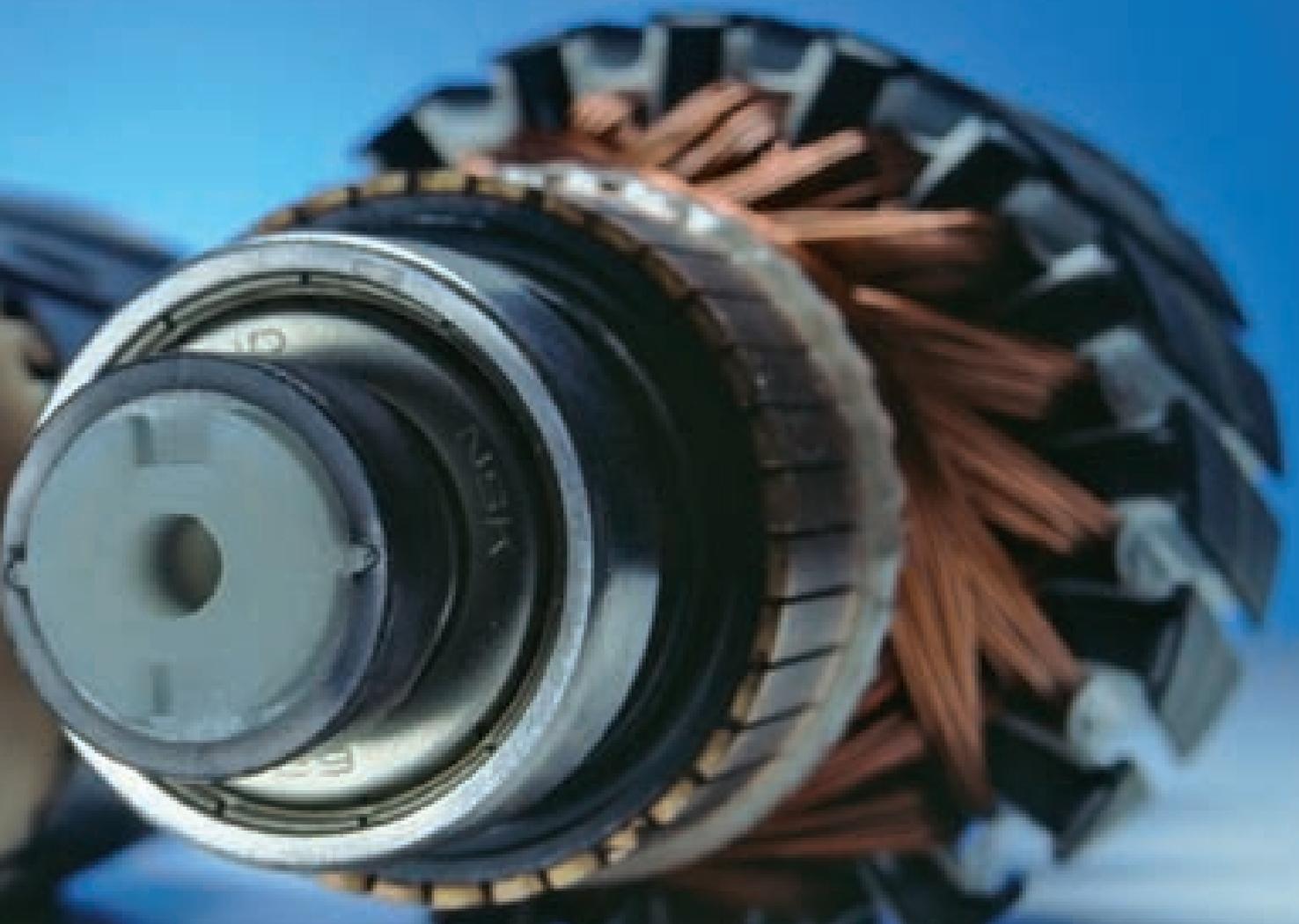
Indispensable at home as well

But magnets are not only found in industrial environments. Day in, day out and round the clock, our magnets are doing their job in private homes without the users even being aware of them.

No matter whether it is the washing machine, the dishwasher, the icebox or the domestic control units, the increasing demand for convenience, eco-friendliness and safety has resulted in increasing numbers of functions being integrated in household appliances. And wherever controllers are ensuring that these functions are available, magnets are to be found in combination with sensors generating the input signals the controllers need. In washing machines, the filling level is measured to sensibly control the quantity of water used and the heating cycle. While spin-drying, the speed and any imbalance are constantly monitored to save us from unpleasant surprises. Magnets also help to save water and detergent by detecting the position of the spray arm. In heating and domestic control technology, the positions of windows and ventilation flaps are detected magnetically.

When you consider that one third of primary energy is used in the home, it again becomes clear that our expertise is one component in achieving the goals set by environmental and energy policy.







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