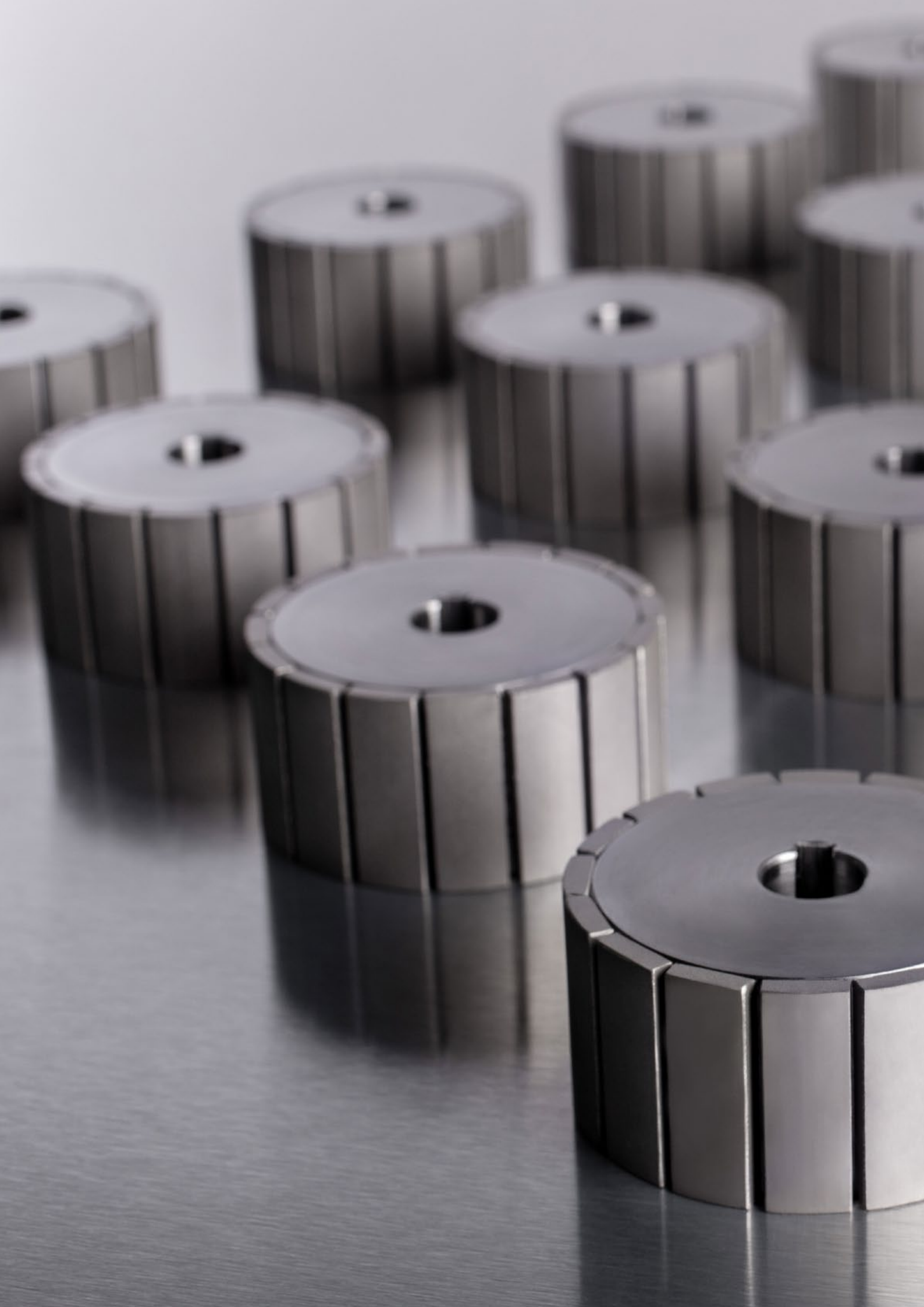


**no leak.
no wear.
full force.**



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no leak. no wear.

Contactless torque transmission with magnetic couplings

DST Dauermagnet-SystemTechnik GmbH is one of the world's leading manufacturer of high-performance permanent magnetic couplings and systems. Our success story is based on a simple, yet ingenious idea. By using permanent magnets in combination with a canister, we enable contactless torque transmission with hermetic separation between the input and output sides.

With over 30 years of experience in wear and maintenance-free transmission of torques, DST provides perfect solutions for various industrial applications in which hermetically sealed and reliable drives are crucial.



Powerful and customised

Magnetic couplings provide a reliable alternative to conventional dynamic seals. We develop high-performance standard magnetic couplings ranging from 1 to 1,200 Nm, as well as customised solutions from 0.1 to 25,000 Nm. Our core competence lies in the customised development and manufacturing of tailored solutions for complex applications.

Innovative and reliable partner

We support you from conception to final implementation. DST enjoys an excellent reputation worldwide as a reliable partner for the most demanding applications. Together with our customers, we develop innovative solutions for numerous application areas. With extensive product, application, and development expertise, we realise projects that meet the highest safety standards, performance, and cost-effectiveness.

Global presence

With six own branches and many other sales partners around the globe, our customers always have a qualified contact person available to provide fast and straightforward on-site application and product advice on site. Numerous well-known international customers appreciate our DST products developed and manufactured in Germany as well as our excellent service.

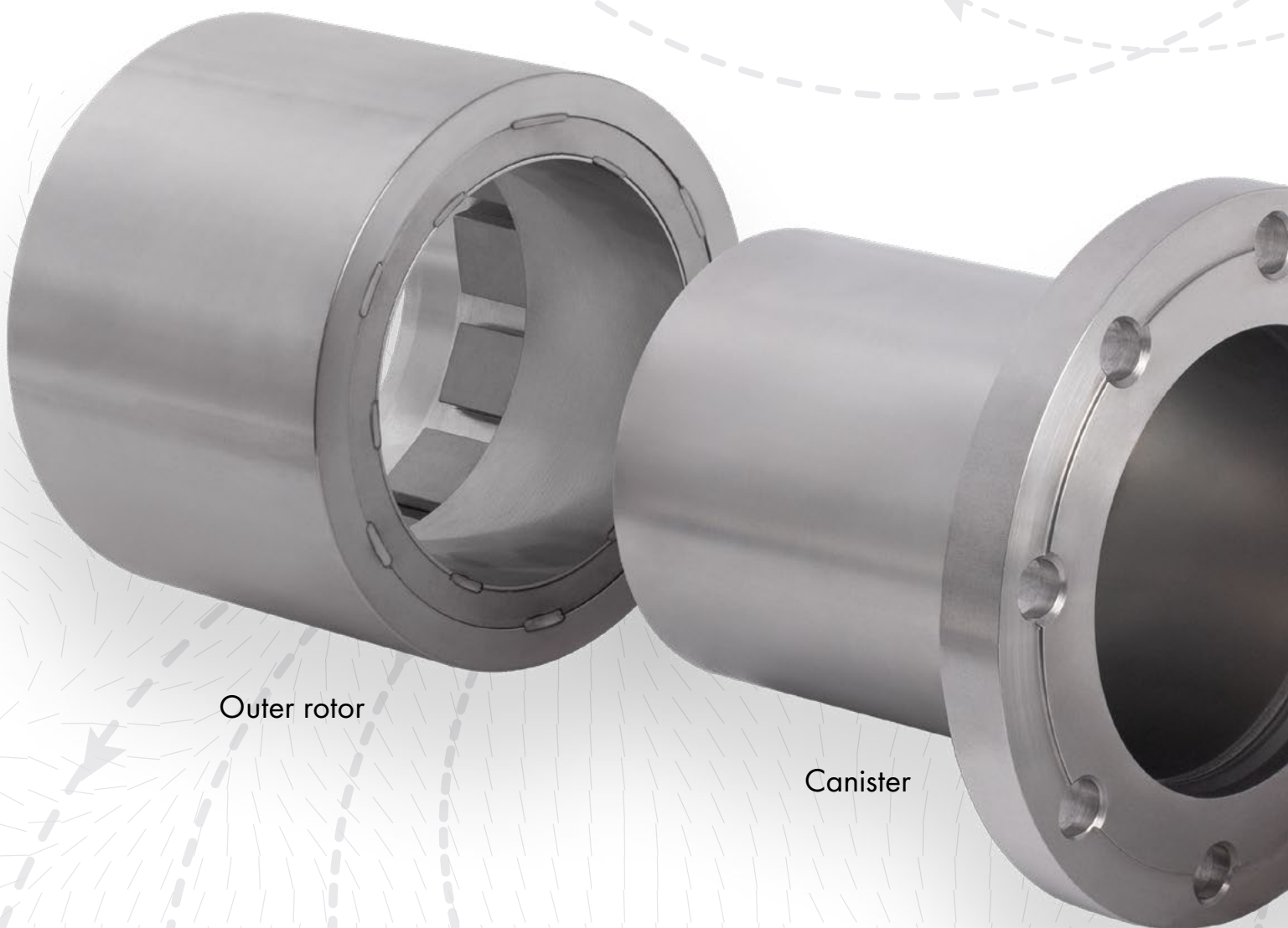
Operating principle and design

Design and function of a magnetic coupling

A magnetic coupling consists of an outer rotor, a canister and an inner rotor. By means of magnetic force, the torque of the drive unit (motor) is transmitted without contact to the output side (e.g. pump).

Torque transmission

The rotors are equipped with permanent magnets with alternating poles. The resulting magnetic fields transmit the torque in a force-fit and synchronised manner (drive speed is equal to the output speed).



Outer rotor

Canister

Sealing

The permanently mounted canister separates the inner and outer rotors. Sealing is static, e.g. with an O-ring, eliminating the need for dynamically loaded seals. This ensures hermetic separation of the operating medium and the atmosphere. Depending on the application, DST can offer a variety of non-metallic canisters in addition to the metallic canisters.

Explosion protection use

Depending on the design, our permanent magnetic couplings are suitable for contactless torque transmission in drives intended for use in potentially hazardous areas.

More than just standard – our custom designs

With our extensive expertise and comprehensive knowledge of materials and applications, we can thoroughly evaluate every request for technical feasibility and always design the optimal magnetic coupling. If the application parameters are not covered by the use of a standard magnetic coupling, DST offers maximum flexibility in design and material selection. With a deep understanding of the system and technical requirements, DST can successfully serve even the most demanding applications.

For over 85% of our projects, we already realise custom solutions, especially for small series and individual components. Using FEM simulation software and considering decisive parameters for designing a custom solution, including pressure, temperature, speed, and torque, we can identify optimal and safe material combinations for a suitable magnetic coupling.



Inner rotor

Video Operating principle



Our magnetic couplings – designed to impress

- Contactless and hermetically sealed torque transmission
- Leakage, wear, and maintenance-free
- Designed for high torques up to 25,000 Nm
- Designed for pressures up to 700 bar
- Construction, materials, and performance according to API 685
- ATEX certification according to Directive 2014/34/EU
- High-quality “Made in Germany”



Our strengths Your benefits

- ◉ We design the optimal magnetic coupling for every application.
- ◉ We conduct simulations and calculations with modern software for your inquiry.
- ◉ We offer customised and cost-efficient high-end products with sustainable functionality.
- ◉ We minimise the repair and downtime costs of your application.
- ◉ We can handle extremes:
 - Cryogenic and high temperature
 - Ultra high vacuum or high pressure
- ◉ We provide canisters in a variety of materials for optimal energy efficiency.



Automotive



Aerospace



Biotechnology



Chemical &
petrochemical



Food



Hydraulics



Marine



Oil and
gas



Pharmaceutical
industry



Process
technology



Renewable
energy



Test &
measurement

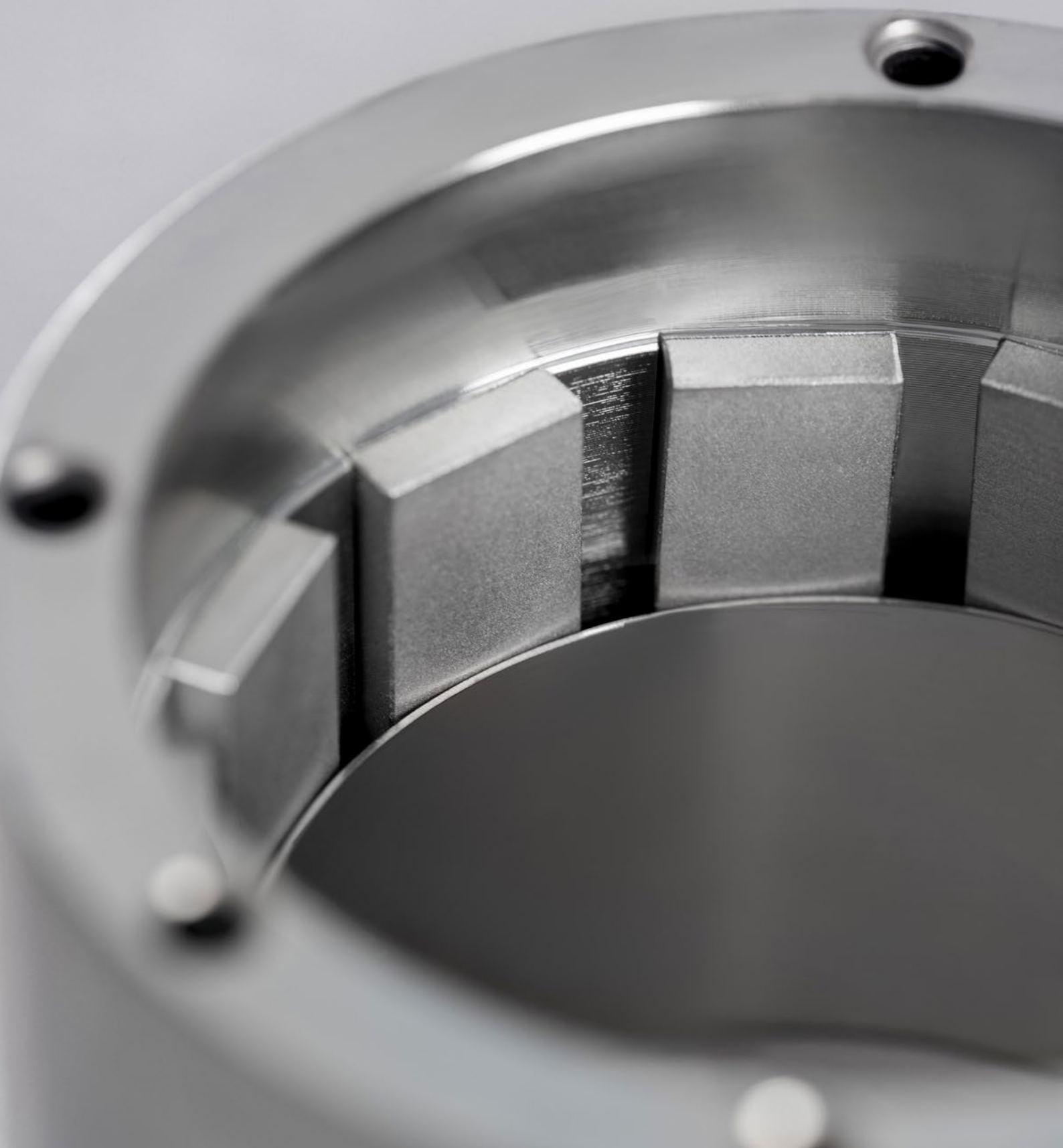
A close-up, black and white photograph of a magnetic coupling, showing the circular, metallic components with a central shaft. The image is positioned on the left side of the page, partially cut off by the edge.

Application expertise in various industries

Our permanent magnet couplings are very versatile and are applied in pumps, agitators, and other machinery where contactless torque transmission and leakage-free operation are essential.

DST provides customised solutions for industries including chemical, food, pharmaceutical, biotechnology, oil & gas, hydraulics, and many others. Magnetic couplings are also used in PU machinery, compressors, autoclaves, and cryogenics. Our innovative magnetic couplings are also applied in the renewable energy sector, such as in hydrogen generation and transportation systems, as well as in utilising waste heat for power generation.

**Contactless torque transmission
up to 25,000 Nm**



Magnetic couplings

The use of high-quality materials and high-performance magnets made from Neodymium-Iron-Boron (NdFeB) or Samarium-Cobalt (SmCo), along with the application of precise production techniques, distinguish our DST permanent magnetic couplings. They enable contactless, wear-free, and hermetically sealed torque transmission up to 25,000 Nm.



Torque

Standard:

1 up to 1,200 Nm

Customised:

0.1 up to 25,000 Nm

Pressure

Standard:

Vacuum up to 25 bar

Customised:

Ultra-high vacuum up to 700 bar

Temperature

-196°C up to +450°C

Materials

The wetted components are available in a variety of stainless steel, nickel and titanium alloys, which are optimally adapted to the respective application in terms of corrosion and chemical resistance.

Advantages

- ◉ Leakage-free
- ◉ Wear-free
- ◉ Powerful



**100%
hermetically sealed**

A suitable canister for every application

Our customers' applications are very different, as are the requirements for operating temperatures and pressures, extreme operating parameters or chemical resistance of the materials used. DST always provides an optimal canister solution.

Metallic canisters (standard version)

When using magnetic couplings in pumps, compressors, and agitators, DST magnetic couplings with metallic canisters are typically used to seal the process media from the atmosphere. Due to their high pressure and temperature resistance, metallic canisters cover a wide range of applications.

The eddy current losses resulting from the rotating magnetic field lead to heat generation, which can usually be dissipated through the pumped medium, especially in pump applications.



Metal

Material 1.4571 / 2.4610

Pressure Vacuum up to 25 bar
depending on size

Temperature -110°C up to +450°C

Advantages

- ◉ Wide range of applications
- ◉ High pressure and temperature resistance



**Safety for
critical processes**

Titanium canisters and double-walled canisters

Safety requirements in the chemical and pharmaceutical industries sometimes require solutions that are specially customised to the respective application. By using a titanium canister higher pressures can be realised. Titanium also significantly reduces eddy current losses due to its superior physical properties compared to standard materials.

DST also offers a double-walled version of the containment shell. Depending on the application, the system can be heated or cooled in the area of the magnetic coupling via the double-walled containment shell. The outer casing also acts as a secondary seal. For particularly critical processes, the design of the double-walled containment shell can be prepared for various system monitoring functions.



Titanium

Material 3.7165

Pressure Vacuum up to 320 bar
depending on size

Temperature -196°C to +350°C

Additional alloys available on request.



Double-walled

Material 1.4571 / 2.4610

Pressure Vacuum up to 25 bar
depending on size

Pressure for the heating/cooling system 8 bar

Temperature -110°C to +450°C

Advantages

- For critical processes
- Higher pressures can be realised
- Heating and cooling possible



**Energy efficiency without
eddy current losses**

PEEK and ceramic canisters

PEEK and ceramic canisters are an economical and energy-efficient alternative to metallic canisters. They do not generate any eddy current losses and are characterised by particularly good chemical resistance.

PEEK is suitable for applications in vacuum pumps, compressors, agitators, and PU foam systems with lower requirements for pressure and temperature resistance. Ceramic canisters are designed for higher pressures and temperatures compared to PEEK. Couplings with canisters made of PEEK and ceramics are suitable for use in potentially hazardous areas.

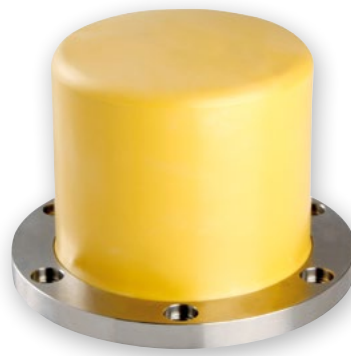


PEEK

Material PEEK, 30% carbon fibre reinforced

Pressure Vacuum up to 16 bar

Temperature -196°C to +120°C



Ceramic

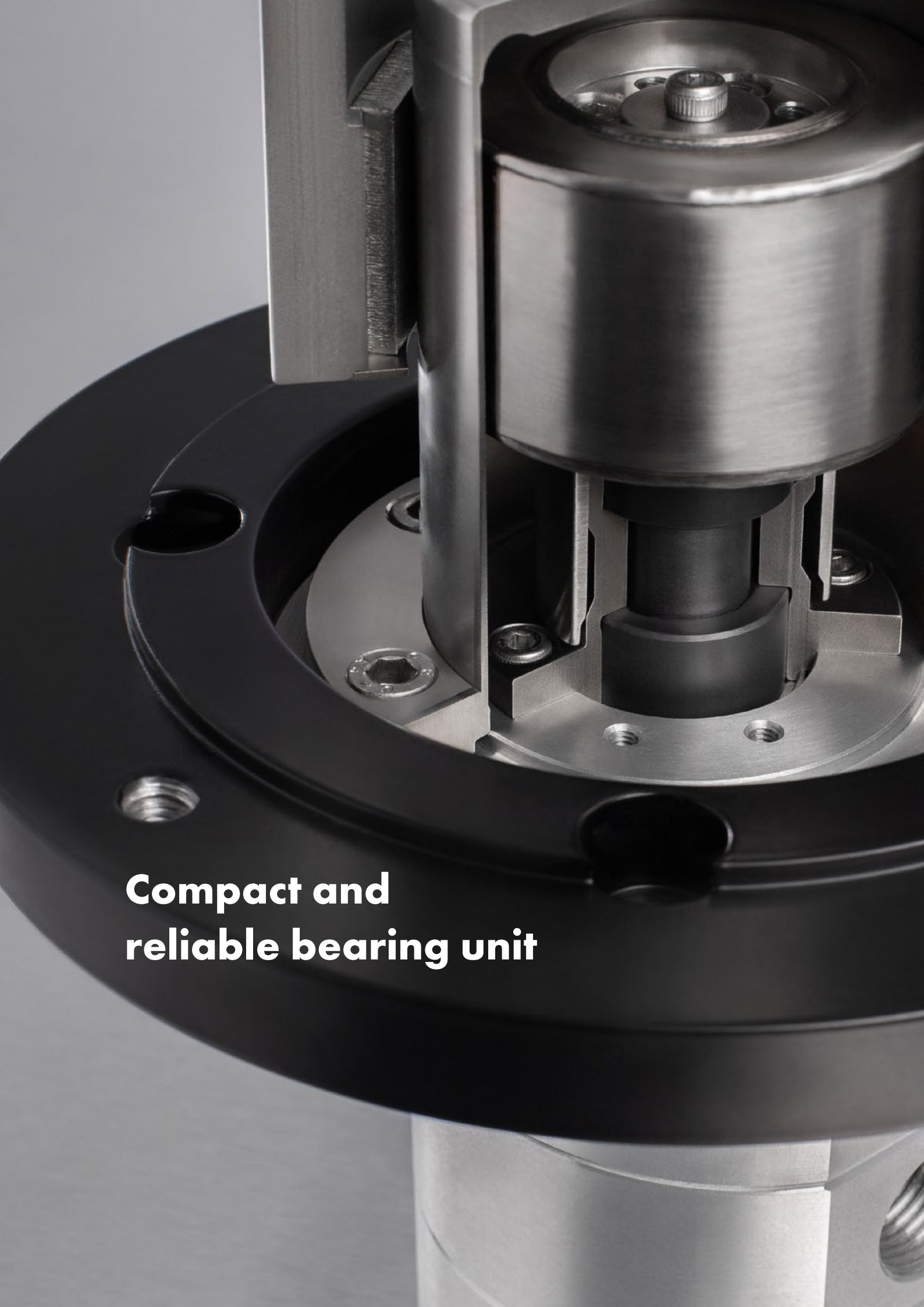
Material ZrO₂-MgO

Pressure Vacuum up to 60 bar
depending on size

Temperature -196°C to +450°C

Advantages

- Economical and energy-efficient
- No eddy current losses
- High chemical resistance

A detailed close-up photograph of a mechanical bearing assembly. The central component is a polished, cylindrical shaft with a small, knurled adjustment screw on its top surface. This shaft is supported by a complex, multi-layered housing. The housing features a large, dark, circular flange at the base, which has several mounting holes and a central recessed area. The overall design is compact and precision-engineered, typical of high-quality industrial machinery.

**Compact and
reliable bearing unit**

SSiC plain bearings

The DST SSiC plain bearing is particularly used for the application of a magnetic coupling in pumps. It absorbs axial and radial forces, minimises vibrations, and ensures efficient and reliable bearing support of the rotating pump shaft.

The reduced load thereby maximizes the service life of the system. If necessary, customer-specific special requirements and technical parameters such as the flow conditions can be considered and the bearing is tailored to the respective pump.



**Load capacity
depending on size**

Axial load

800 up to 15,500 N

Radial load

2,000 up to 19,600 N

Advantages

- Very good corrosion resistance
- High wear resistance
- Very good thermal shock resistance
- Limited dry-running properties can be realised



**Powerful and efficient
mixing processes**

Overhead agitator drives

Overhead agitator drives are applied in the chemical and pharmaceutical industries. They are used in reactors or process engineering machines and enable a powerful, safe and efficient mixing process.

The overhead agitators from DST are characterised by a compact design and connect the motor side with the process side. An agitator drive equipped with a DST magnetic coupling hermetically seals the agitator. This prevents the escape of hazardous liquids or gases and the ingress of foreign particles or substances during agitation. The use of a DST magnetic coupling thereby increases the safety and reliability of agitator drives.



Torque

0.1 to 25,000 Nm
up to 500 Nm complete unit
over 500 Nm as
special solution

Advantages

- Complete solutions incl. bearing, housing and shaft
- Compact design for laboratory technology
- High pressures and temperatures possible
- Integrated cooling circuit possible
- Design features for system monitoring possible



CIP/SIP-capable magnetic drives

Bottom-mounted agitator drives

Bottom-mounted agitator drives are primarily used in the food and pharmaceutical industries as well as in process engineering for suspending, homogenising, dispersing and emulsifying various substances.

With a bottom-mounted agitator, the inner rotor directly transmits the drive torque of the motor to the outer rotor, while which is immersed in the medium together with SSiC plain bearings. In this configuration, the agitator blades are installed by the customer by welding them to the outer rotor. In addition to the standard versions, preparation for speed monitoring is also possible.



Torque

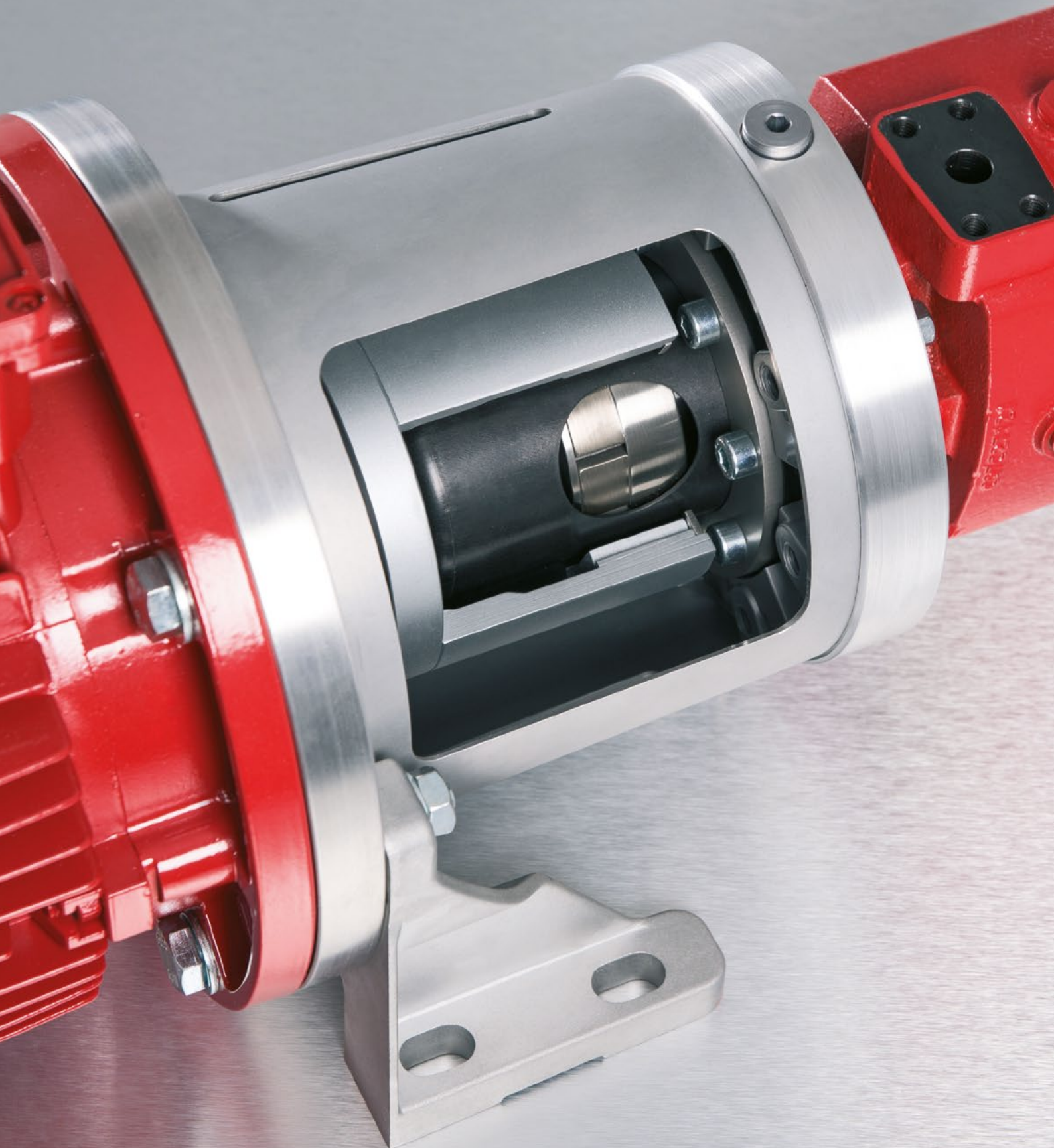
0.3 to 1,200 Nm

up to 150 Nm incl. SSiC bearing

Advantages

- ◉ Material certification for the pharmaceutical and food industries
- ◉ Very good surface quality up to Ra 0.4 μm
- ◉ CIP/SIP-capable
- ◉ Design features for system monitoring possible

Plug & Play Magnetic coupling system



Conversion kits

A conversion kit enables easy installation or retrofitting of all common pump and drive motor combinations. In existing systems, conventional couplings can be replaced with DST magnetic couplings to create a hermetically sealed and low-maintenance system.

DST offers conversion kits for various applications, including PU machines and compressors, as well as for the chemical industry and hydraulic applications. Our conversion kits are available in all coupling/canister combinations and as complete installation packages including bellhousings, flanges, seals and fittings.



Advantages

- Combination with all common pumps and drive motors
- Complete installation packages
- Also with foot flange and damping elements
- Conversion kits with SSiC bearings
- For high-temperature applications with bearing block design
- Compact design

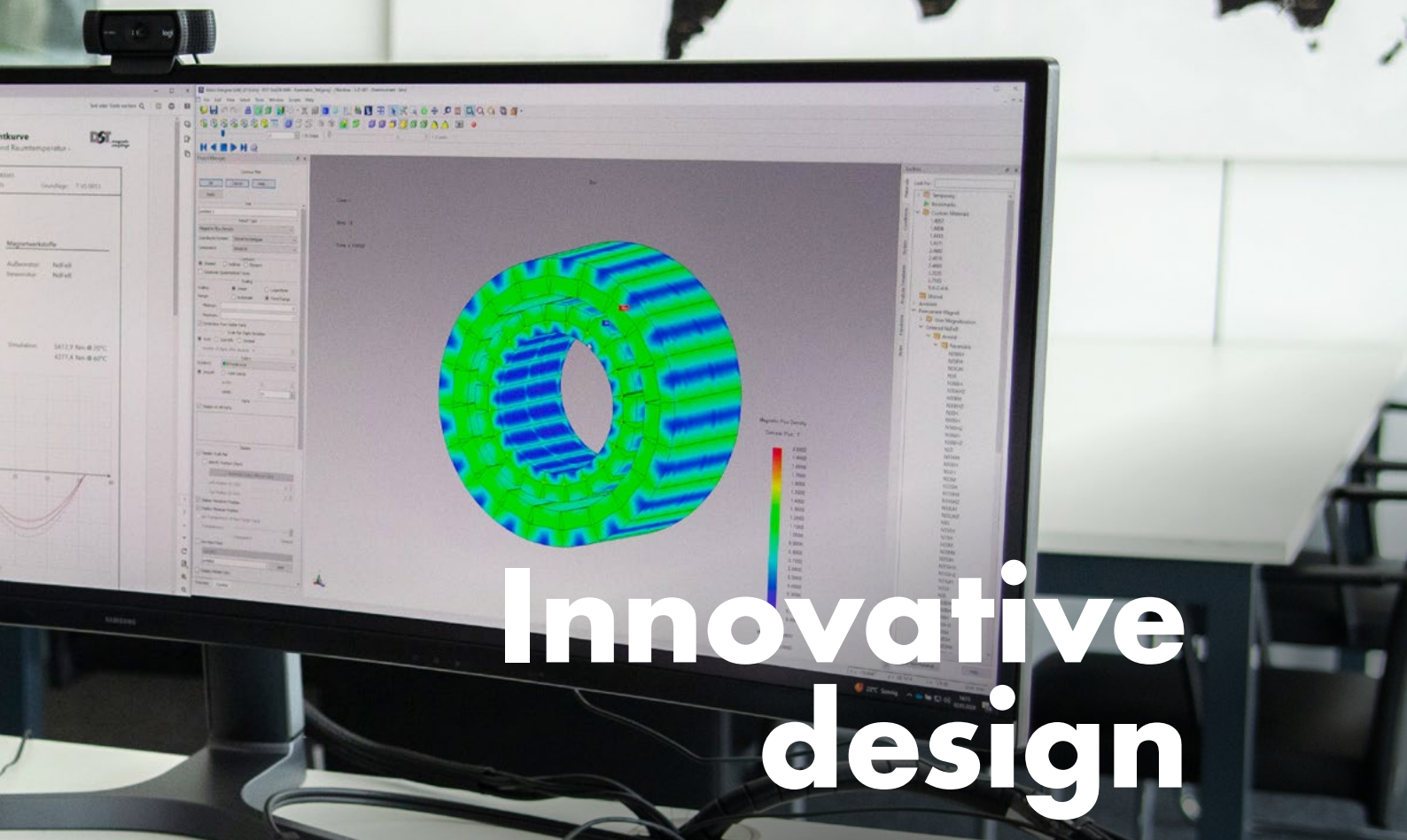


Technical expertise

Based on detailed analysis of application parameters such as pressure, temperature, and rotational speed, the appropriate coupling and canister combination is designed. In addition, calculations are conducted to determine torque, hydraulic friction losses, and eddy current losses, among other factors.

Calculations

- Calculations based on the AD-2000 and ASME-VIII, Div-1 guidelines
- Evaluation of product properties regarding relevant safety requirements
- Numerous calculations as a basis for the final material selection



DST conducts FEA simulations to develop the optimal magnetic coupling for your application. During the design phase, all technical parameters are taken into account to ensure a reliable operation in the final application.

Simulations

- Static torque
- Eddy current loss
- Pressure resistance of the canister
- Parametric simulation for different magnet geometries, materials, magnetisation and number of poles
- Easy replacement of individual values, such as geometry adjustments, material combinations, and rotational speed

Oleotec Pressure monitoring

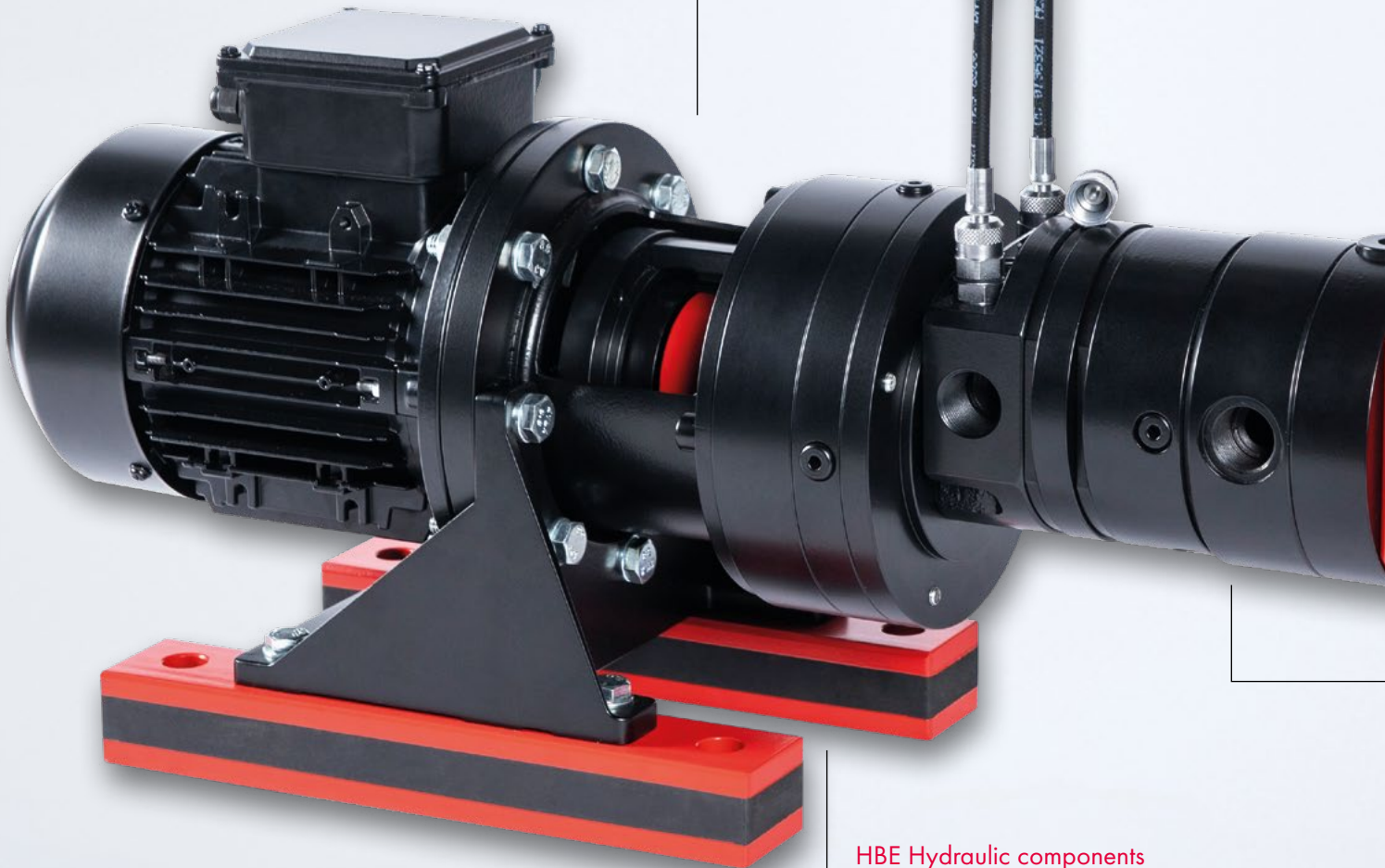
Oleotec offers a comprehensive range of test couplings, hydraulic hoses and pressure gauges for the safe and reliable measurement of pressure in hydraulic systems.

► oleotec.it

DST Permanent magnetic coupling

DST's high-performance permanent magnetic couplings, enable contactless power transmission from the motor to the pump. Leakage-free, wear-free and powerful.

► mag-couplings.com



HBE Hydraulic components

Bell-housings (whether rigid or damped), foot flanges and damping rods – HBE offers a wide range of hydraulic accessories.

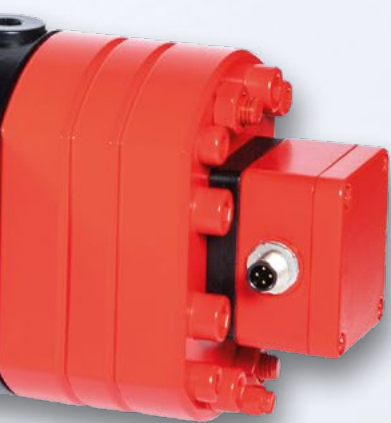
► hbe-hydraulics.com

Fluid Technology Solutions – everything from a single source

Since 1998, DST has been part of Echterhage Holding GmbH & Co. KG. With five production companies, Echterhage Holding is one of the leading specialists worldwide in fluid technology. Under one roof, Echterhage Holding combines technical expertise for numerous products and industries.

Through close cooperation within the group, customers benefit from comprehensive solutions that can be flexibly tailored to specific application requirements.

► e-holding.de



VSE Flow meter

The high-precision flow meters from VSE are optimised for customers and applications for precise volume and flow measurement of almost all pumpable media.

► vse-flow.com

Beinlich External gear pump

Beinlich's versatile external gear pumps are suitable for low-pulsation and exact dosing for applications with the highest precision requirements.

► beinlich-pumps.com

And ... Action!



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