

We pioneer motion

## Direct Drives

For more productivity and less energy loss



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*Our attitude towards the future has to be:  
We are responsible today  
for what happens tomorrow.*

Karl Raimund Popper

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# Schaeffler Industrial Drives AG & Co. KG

Schaeffler Industrial Drives AG & Co. KG, a Schaeffler Group company, is the specialist in direct drive technology.

Inspired by the will to positively change the future, we live and breathe innovation. We are passionate about developing and producing torque and linear motors in a wide range of sizes and performance levels, as well as direct-drive high-performance positioning systems for the demands of the present and the future. Direct drives impress through economy, reliability and efficiency.

As an innovation partner and manufacturer, we aim to find success-orientated solutions together with our customers. We focus on applications with an optimised cost-benefit ratio.

The result: together with our customers, we generate success based on sustainability.

## **Schaeffler Group – We pioneer motion**

As a leading global automotive and industrial supplier, the Schaeffler Group has been driving forward pioneering inventions and developments in the areas of motion and mobility for over 70 years.

With innovative technologies, products and services in the fields of CO<sub>2</sub>-efficient drives, electromobility, Industry 4.0, digitalisation and renewable energies, the company is a reliable partner for making movement and mobility more efficient, intelligent and sustainable. The technology company produces precision components and systems for power trains and chassis as well as rolling and plain bearing solutions for a wide range of industrial applications.

With approximately 83,900 employees, the Schaeffler Group is one of the world's largest family-owned companies.

### **Schaeffler Industrial Drives AG & Co. KG – Your partner for direct drives**



Contact us:  
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>> [More information about Schaeffler  
Industrial Drives AG & Co. KG](#)



# Pioneering: Direct drives

## Direct drives for a wide range of industrial sectors

Direct drive technology is fascinating not only because of its precision, dynamics and economy, but also because of its variety of possible applications. One thing is already certain: more and more industries will discover the advantages of direct drive in the future.

Schaeffler Industrial Drives has extensive industry expertise and years of experience in the machine tool, medical technology, automation and robotics, food and packaging machinery, printing and textile machinery, productronics and metrology sectors. This means the optimised and future-orientated drive for every application.



Machine tools



Medical technology



Automation and robotics



Food and packaging machines



Printing and textile machinery



Productronics

## Your advantages with direct drives



### Reduce operating and maintenance costs

- Wear-free precision over the entire life cycle
- No downtimes
- Simple integration
- High availability



### Improve productivity

- High accelerations and terminal velocities/speeds
- Shorter machining and indexing times
- More throughput



### Reduce energy consumption

- Few interfaces
- Weight reduction
- Compact design
- Better efficiency of the overall system



### Improve machining quality

- Positioning accuracies down to the nanometre range
- Excellent synchronisation
- No contamination, e.g. due to belt wear

### Innovation, quality and reliability – made by Schaeffler Industrial Drives

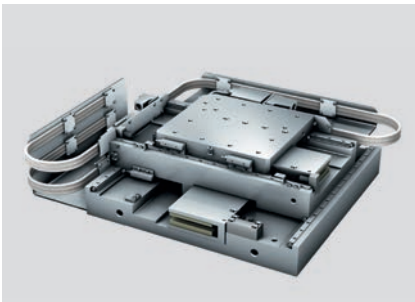
Passion, a spirit of research and the constant will to succeed in cooperation with our customers is what drives us. The result is in every detail of our motors and systems: quality and expertise of the highest standard. Our innovative products significantly increase the performance of the next generation of machines and equipment – coupled with higher availability and productivity as well as better machining quality.

Convince yourself of the benefits of direct drives.

We would be glad to support, advise and accompany you on your way to success.



- Torque motors: powerful and reliable.
- Linear motors: highly dynamic and efficient.



- Positioning systems: compact and customised.
- Short-stroke actuators: powerful and durable.

### Direct drives – briefly explained

The basic principle is that the force for movement is generated directly on the object to be moved without a mechanical conversion gear. The absence of transmission elements brings significant advantages over a conventional drive train, especially for dynamic and precise applications.

In short, productivity increases can be achieved that cannot be achieved with conventional drives.



# Torque motors – for almost every challenge

Are you looking for a torque motor with first-class benefits for your machine or equipment? We are the specialists in large torques. Our strength is acceleration, which leads to high dynamics. Schaeffler Industrial Drives offers maximum power density in the smallest installation space and knows the perfect twist to deliver the optimised torque motor for your applications. Depending on the application, different motor types with characteristic features in terms of torque, speed, synchronisation and design are recommended.



## Applications

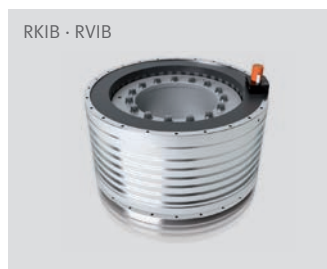
- Grinding machines
- Milling machines
- Machining centres
- HSC machines
- Tool changers
- Milling heads
- Swivel axles
- Rotary tables
- Pressing
- NC rotary indexing tables
- Indexing tables (cycle)
- Workpiece spindles
- Reflecting telescopes
- Printing presses
- Packaging machines
- Textile machinery
- Automation technology
- Medical technology
- High-precision positioning applications
- Cobots

## Torque motors for high torques, high dynamics and high precision



### The strong one.

- Power loss or torque optimised
- Cost savings through downsizing
- For extremely dynamic movements and precise positioning



### The fast one.

- Maximum torque in the installation space
- Advantageous combination of high power yield, very good synchronisation properties and low power loss



### The precise one.

- Maximum running smoothness
- For superlative surfaces without optical defects
- For extreme shape and dimensional accuracy of the workpieces



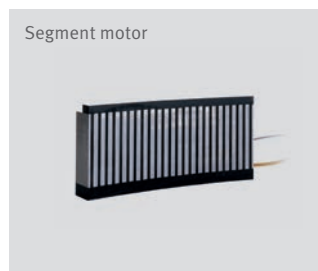
### The special one.

- Very high performance density
- Cogging and load pulsation practically non-existent
- Use as direct rotary table drive or in swivel axes



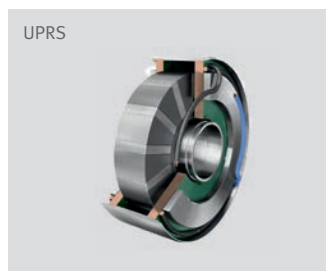


## Torque motors for special requirements



### The variable one.

- Cost-effective segmental construction
- Scaling of the torque by varying the number of segments
- Economic feasibility of large motors



### The lightweight one.

- Productivity increases due to up to 80 % higher speeds
- High energy efficiency
- Predestined for use in joints of collaborative robots



### The even one.

- Very uniform movement due to freedom from cogging
- High flexibility in design and diameter size
- Flat or coaxial design

## The perfectly tuned bearing to go with the motor?

Schaeffler's bearing solutions and services increase the functional reliability and performance of your machines and equipment.



» [High precision bearings for combined loads \(TPI 120\)](#)

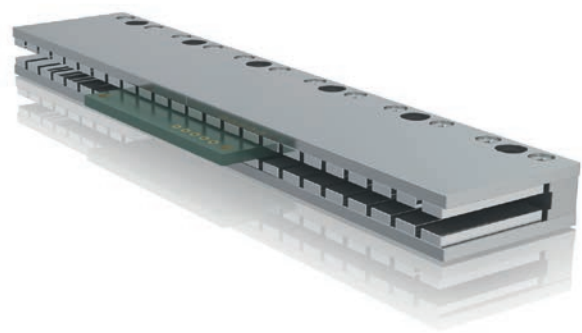
» [To the product website](#)



# Linear motors – expertise for linear movements

Straightforwardness in perfection: in a nutshell, linear motors from Schaeffler Industrial Drives stand for precision, dynamics and energy efficiency at the highest level. The linear motor portfolio impresses with reliability and optimises your application in terms of availability, higher productivity and better machining quality.

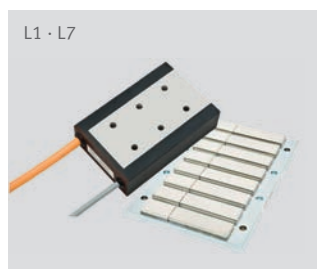
Each series has its own special characteristics that make it particularly suitable for certain applications. The range extends from the “sensitive” to the dynamic to the powerful engine. In short, the perfect drive for every application.



## Applications

- Handling systems
- Pick-and-place applications
- Machines for circuit manufacture
- AOI systems
- Measuring and testing machines
- Machines for optical inspections
- Medical equipment
- Wafer positioning and inspection systems
- Laser cutting
- Feeds
- Water jet cutting systems
- Milling and grinding machines
- Turning-milling centres
- Packaging machines
- Printing presses
- Electronics assembly
- Plotters with laser direct exposure
- Precision automation
- Semiconductor manufacturing
- Machine tools

## Linear motors for precise positioning, high terminal speeds and high efficiency



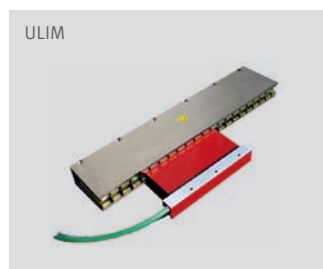
### The all-rounder.

- Compact design
- Excellent force-to-mass ratio
- Precise positioning without overshooting
- Active cooling options possible



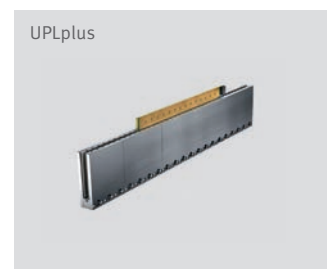
### The powerful one.

- Superb machining results in terms of dimensional tolerances and surface quality
- Double comb design
- Excellent controllability and noise immunity



### The dynamic one.

- Excellent dynamics due to an iron-free primary part
- Very high terminal speed
- High acceleration capacity



### The lightweight one.

- Higher productivity through innovative lightweight construction
- No attraction vis-à-vis the guidance system
- Very good synchronisation properties





### The right guidance for the motor?

The demands on guidances and motors have increased steadily in recent years. When precisely coordinated, they open up significant advantages in the time, process and machining chain.



» [Monorail guidance systems \(PF 1\)](#)



» [RUE-F \(TPI 272\)](#)



» [To the product website](#)

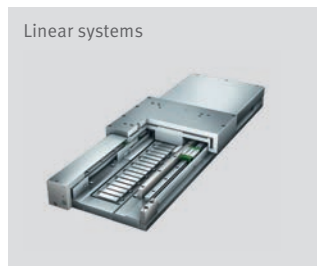
# Positioning systems – for shorter production cycles

Custom-made. Top performance. Application-optimised. Schaeffler Industrial Drives implements fast, precise positioning and handling systems based on direct drives, thus guaranteeing a better cost-benefit ratio. In terms of accuracy, standards are set – with values down to the sub-micro-metre range – even during movement against load thanks to excellent rigidity in the control loop. Accelerations of up to  $1000 \text{ m/s}^2$  and terminal speeds of up to  $6 \text{ m/s}$  ensure high dynamics and shorter production cycles.

## Applications

- Pick-and-place applications
- Short stroke applications
- Handling and transport systems
- Automation technology
- Mounting systems
- Wafer positioning
- Test and control applications
- Rotary indexing tables
- Positioning tables for point-to-point applications
- Robot kinematics
- Laser industry
- Productronics
- Printing industry
- Packaging industry
- Metrology
- Medical technology

## Positioning systems for the highest accuracy and dynamic requirements



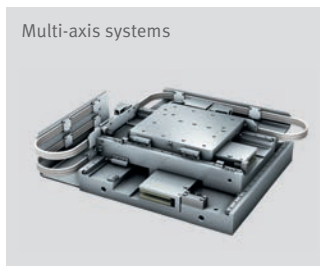
### The ready-to-install one.

- Low wear and low maintenance
- High guiding and positioning accuracies
- Design as short stroke axes, linear tables or push rod systems



### The round ones.

- Up to 70 % more torque in the installation space
- Optimised for minimum mass inertia
- Compact design
- Design as rotary tables or indexing tables



### The versatile ones.

- High performance
- Precise, controlled movement and positioning
- Compact design
- Design as X-Y tables, X-Y theta tables or multi-axis tables





### Customer-specific application examples

Machine and equipment manufacturers need to react to their customers ever faster and more individually. This also increases the demands on the supplier in terms of efficiency, dynamics and accuracy. Schaeffler Industrial Drives faces up to these and develops customer-specific solutions. So you get the perfect drive for your application.



**Robust linear actuator with bellows seal for precise handling**

- 145 mm stroke positionable in 0.1 s
- L x W x H: 443.8 x 104 x 96 mm



**Reliable direct drive system for high production throughput**

- Cycle number: 60,000 components/h
- Integrated air cooling
- Ø x H: 156 x 135 mm



**Electromagnetic brake with closed bearing unit for operating theatre ceiling mounts**

- Smooth-running, rotating and resilient
- Compact design
- Ø x H: approx. 200 x 77 mm

» [To the product website](#)





# Short stroke actuators – max. performance in a small installation space

Extreme dynamics and maximum precision are required in productronics and automation. Special drive solutions therefore need to be implemented for the production and testing machines. Schaeffler Industrial Drives is your partner for long-life products that meet the reliability requirements in particular of more than one billion cycles. Thanks to its comprehensive understanding of systems – coupled with industry and technological expertise – the company implements a variation of short stroke actuators based on variously optimised motors, bearings, encoders and equipment.

## Applications

- Pick-and-place applications
- Testing and sorting machines
- Samplers
- Optical inspections
- Testing machines
- Indexers, adjusters,  
e.g. in the semiconductor industry,  
in medical technology



## Positioning systems for the highest accuracy and dynamic requirements



### The compact one.

- Compensated attraction force for longer service life of the linear guidance
- No moving cables
- 300 m/s<sup>2</sup> acceleration at extreme force density



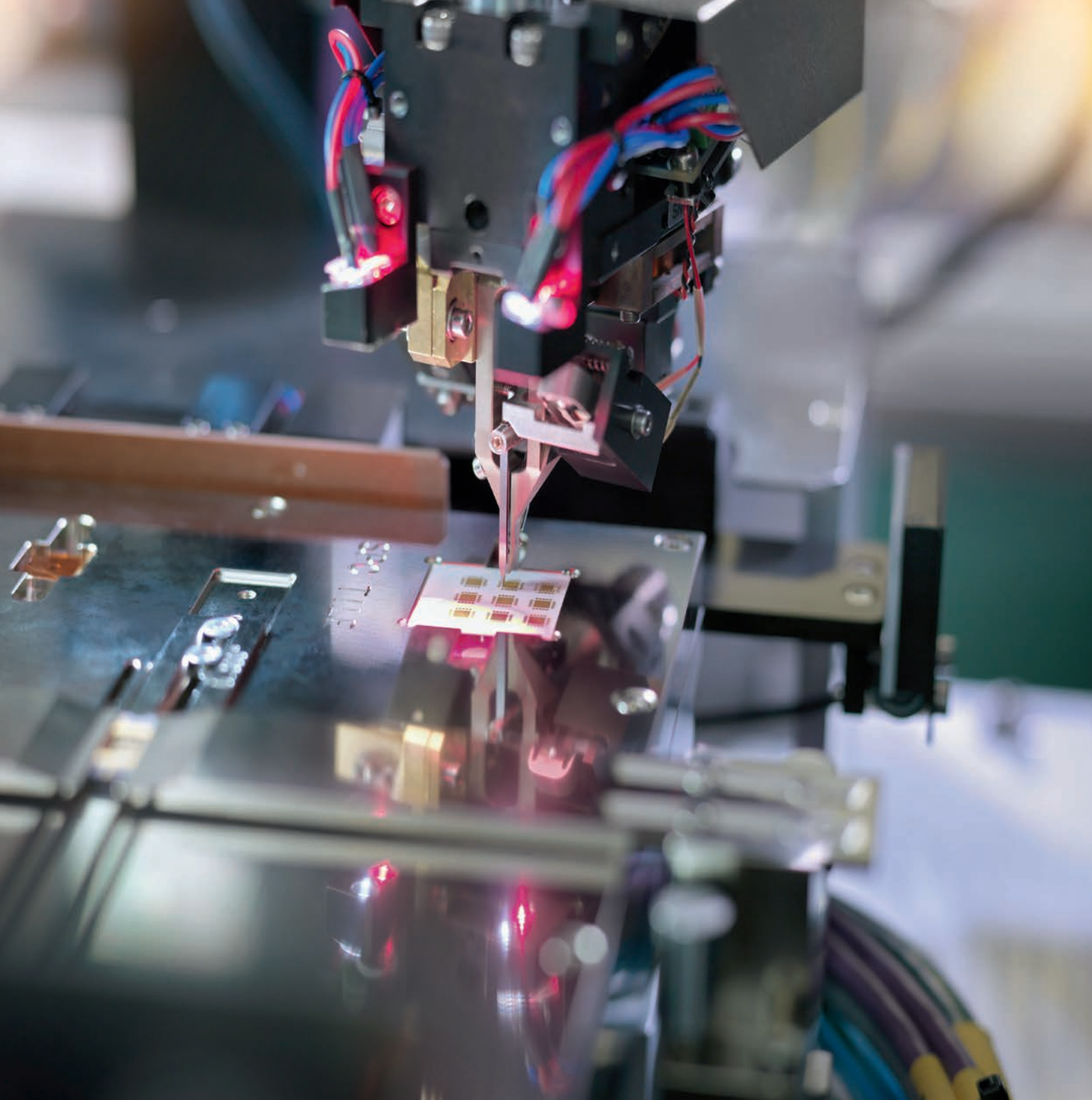
### The reliable one.

- High production throughput with maximum reliability of more than one billion cycles
- Up to 300 m/s<sup>2</sup> acceleration with only 5.5 W power dissipation



### The accelerating one.

- Up to 1000 m/s<sup>2</sup>
- Moving mass of only 10 g
- Wear and friction-free air bearing
- Maintenance-free



Further information can be found in the publication “High performance short stroke actuators”.

» [High performance short stroke actuators](#)



» [To the product website](#)

# Quality and the environment – responsible and sustainable

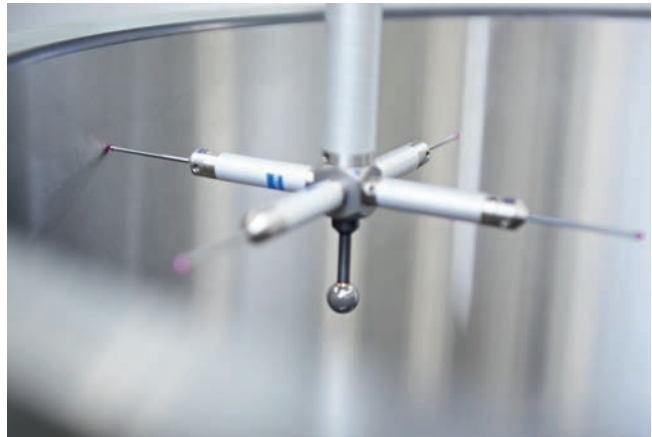


## Quality – not only good, but always excellent

Quality is of paramount importance for Schaeffler Industrial Drives. It has always been our goal to ensure the highest quality and product safety consistently and universally across all areas of application.

The link to Schaeffler-wide quality management guarantees compliance with high standards and ensures that our products meet the high demands of our customers.

Our work in all areas is geared towards continuous improvement with the goal of “zero defects” and is shaped by measures for error prevention and risk minimisation. Every employee is aware of his or her commitment to quality and aligns his or her thoughts and actions accordingly.



## Environment – a component of the corporate philosophy

Environmental protection, occupational health and safety (EHS) are anchored in Schaeffler's management principles. By creating and maintaining a safe working environment that promotes health and performance and by practising environmental protection, we contribute to the continued existence and success of our company. The Schaeffler location in Suhl is validated according to the demanding EMAS regulation and certified according to ISO 14001 as well as ISO 45001 in occupational health and safety.

The Schaeffler Group is increasing its commitment to effective climate protection. By 2040, the company will make the procurement of preliminary products and raw materials climate-neutral. The company's own production is to be climate-neutral from as early as 2030. To achieve this, Schaeffler primarily relies on reduction measures and the use of renewable energies. Because green makes the difference.







### Fully in focus

Schaeffler takes a holistic view of sustainability and concentrates on specific areas of action and clear focus topics.

#### Environment and energy

- CO<sub>2</sub>-neutral production
- Resource efficiency

#### Customers and products

- Sustainable solutions
- Circular economy

#### Suppliers and raw materials

- Sustainable raw materials
- Responsible supply chain

#### Employees and society

- Health and safety
- Diversity and development



Further information on quality and environmental management can be found on the website.

» [Outstanding quality and environmental management](#)

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