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# Moving big things together

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## LIEBHERR

**Hydraulic cylinders**  
Liebherr-Components Kirchdorf GmbH



What drives us

# Welcome to Liebherr in Oberopfingen

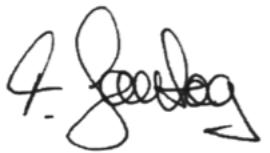
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*'We are passionate about thinking outside the box, creating real value, and pushing the boundaries – for strong and visionary partnerships. With our hydraulic cylinders, we move big things together.'*

Management Liebherr-Components Kirchdorf GmbH



Ulrich Hammerle



Thomas Sonntag



# Hydraulic cylinders made in Oberopfingen



## Liebherr hydraulic cylinders – robustness, innovation and outstanding performance and quality

For more than six decades, the factory at Liebherr's founding site in Kirchdorf has been known for its outstanding engineering expertise in the development and production of hydraulic cylinders. As an industry pioneer, Liebherr sets standards in performance, durability and innovation.

An important milestone in this success story was the construction of the modern plant in Oberopfingen in 2018, where the assembly, testing and painting of hydraulic cylinders was taken to a new level – with the latest production technology and the highest quality standards. The next big step followed in 2024: The entire production was moved from Kirchdorf to the new, highly automated halls in Oberopfingen. In doing so, Liebherr-Components GmbH concentrated its expertise at one location and optimised efficiency, flexibility and quality – for even more powerful products.

Our portfolio includes a wide range of hydraulic cylinders for the most diverse requirements: from highly dynamic series cylinders to powerful large cylinders, piston accumulators and dampers to lightweight and special cylinders. Every component is designed and manufactured with the utmost care for maximum load capacity, superior performance and exceptional durability.

Whether in mechanical engineering, maritime applications, heavy-duty industry or mining – Liebherr hydraulic cylinders are used throughout the world wherever absolute reliability and technical excellence are required. You can rely on decades of experience, innovative technologies and uncompromising quality – made by Liebherr in Oberopfingen.

About us

# Facts and figures

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Established in  
**2014**

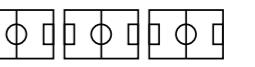
as a separate company from the  
Liebherr-Hydraulikbagger LLC

Our **PV system** generates  
enough **electricity** to power up to

**4,000**  homes

We manufacture  
**hydraulic cylinders**

in an area the size of

**10**  football pitches

Every year, we use about  
**8,000**  tons of  
steel

to manufacture hydraulic cylinders

**600**  employees

Each year  
**80,000**  
**products** leave our factory

Our strength

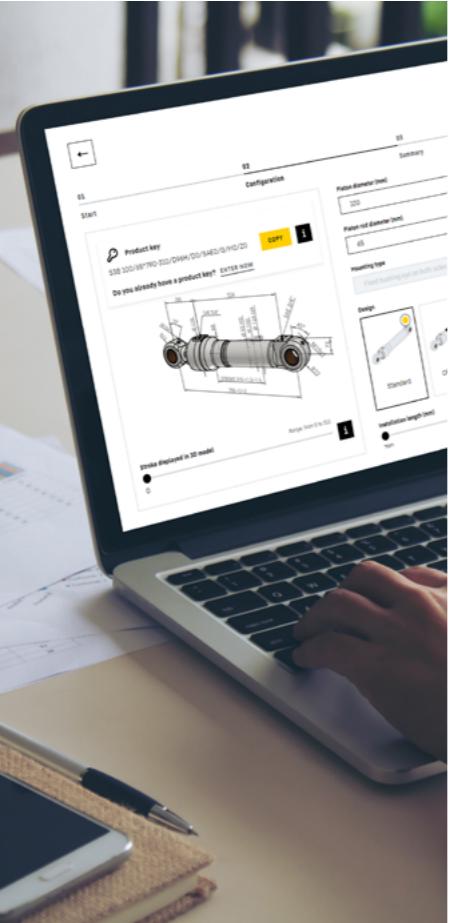
# All the expertise in one place

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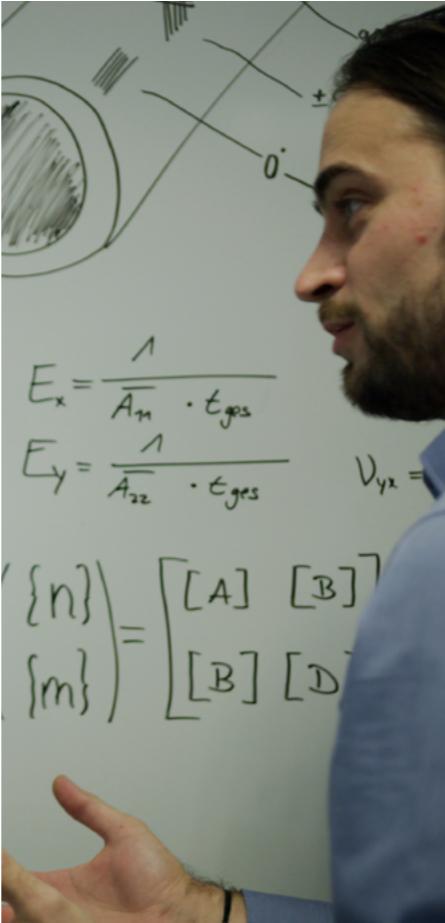
We combine all our core competencies under one roof – from consultancy, development, quality assurance and production to service. This means short lines of communication, fast decisions and customised solutions from a single source.

We support you from the initial idea to the ready-to-install hydraulic cylinder and beyond. With passion and precision, we develop durable and reliable products that exceed your requirements.

Our aim is not only to supply world class cylinders, but also to provide service that will impress you. Experience the benefits of a partner who makes things happen for you – for today's and tomorrow's hydraulic solutions!



**Consulting services**



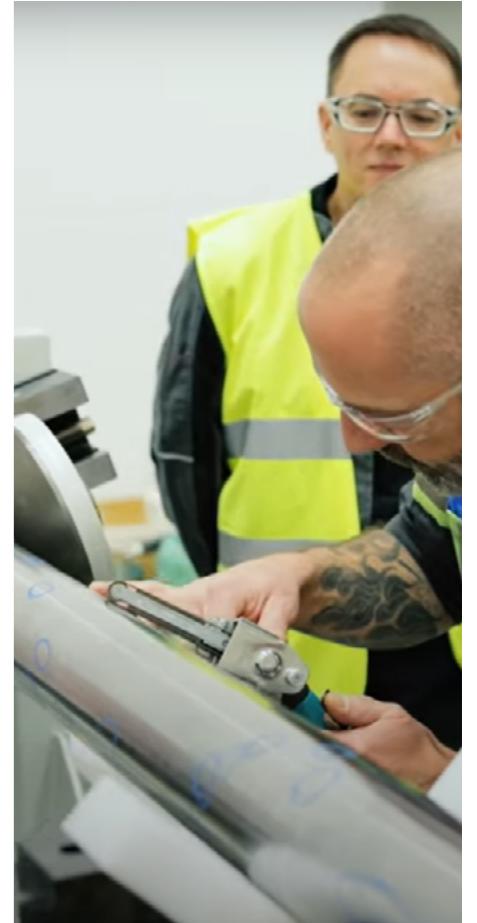
**Development & construction**



**Quality**



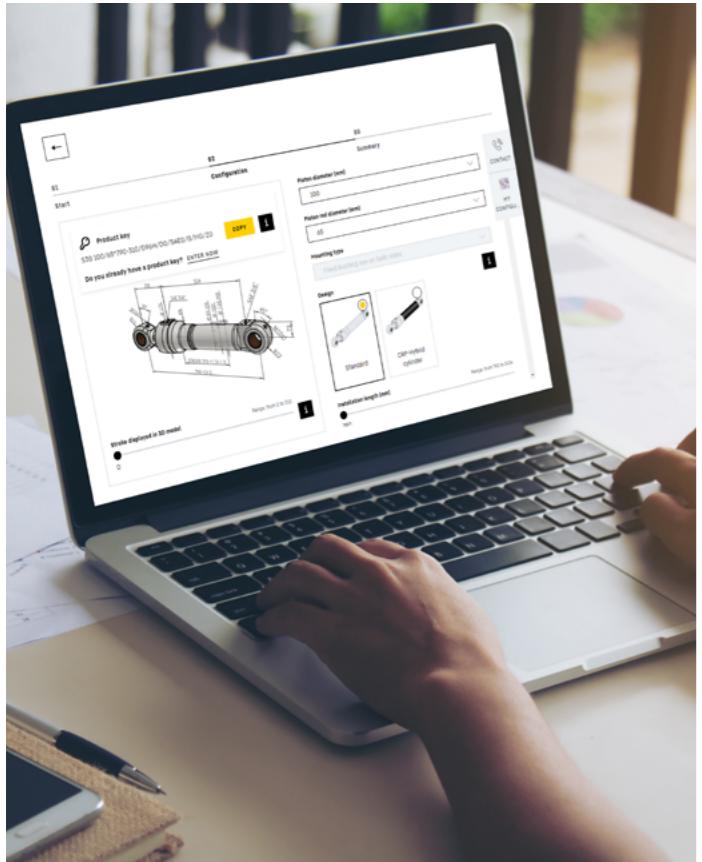
**Production**



**Service**

Our strength

# From consultancy to development & construction



## Consulting services

From the application-oriented design of a hydraulic cylinder for maximum service life to the purposeful use of new technologies – we are at your side with our many years of experience.



Our experts in Oberopfingen, Germany, support customers worldwide in the development of shock absorbers, piston accumulators, and hydraulic cylinders.

We also offer expert advice on the use of the latest technologies, which are developed and tested in-house. By looking to the future from the outset, we guarantee the best possible performance of our products to ensure long-term added value for our customers.

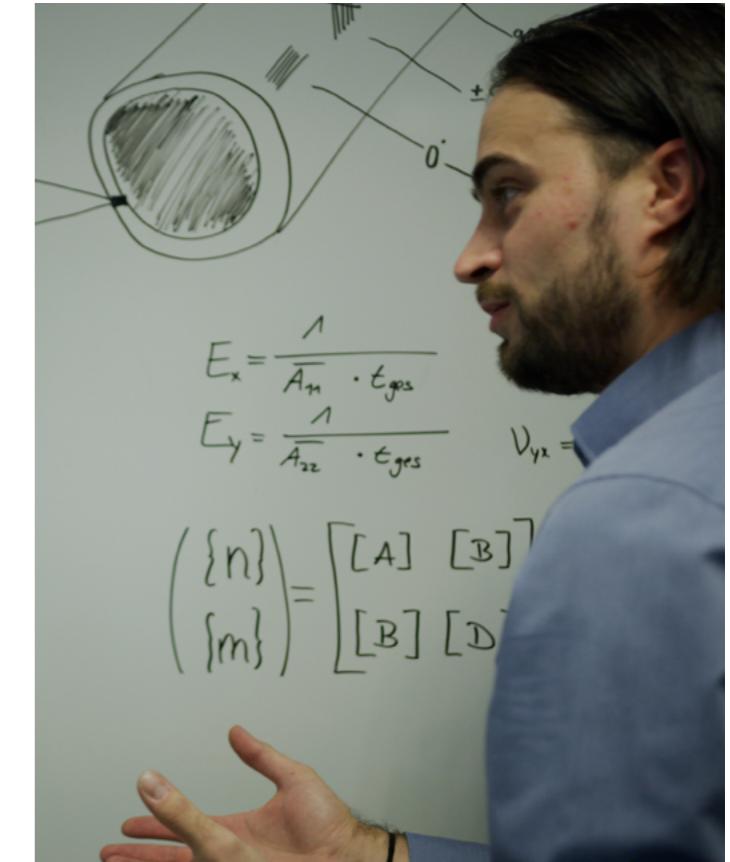
### What makes us unique

- Customer-oriented consulting based on many years of experience
- Holistic approach: reliable cooperation throughout the entire life cycle of the component
- Complete solutions for hydraulic cylinders
- Hydraulic cylinder series – customers benefit from cost-effective products and short delivery times:
  - ISO 6022 series-production range
  - 260 bar series-production range
  - Series-production range according to ISO 6022
- Online configurator for hydraulic cylinders from the series-production range series: Simple and flexible generation of flexible generation of customized solutions around the clock
- Lightweight solutions made of carbon fibre-reinforced plastic (CFRP)

We work with our customers to develop solutions for individual requirements. With our team we are able to produce high quality and reliable products, calculated down to the last detail.

### What we offer

- Powerful software: Modern 3D CAD systems, use of simulation (FEM), testing and comparison of simulation results (impulse tests, endurance tests, etc.)
- In-depth knowledge of materials and precision in the manufacturing process
- Sustainability and repairability are considered in the design of the cylinder to extend the life of the component over multiple cycles
- Reliable Liebherr sealing systems for every application
- Surface quality:
  - Proactive development approach for alternative piston rod coatings
  - Advanced protection against wear and corrosion to extend the service life of hydraulic cylinders
  - Compliance with strict environmental regulations, such as the REACH regulation on the restriction of Chromium 6 in the future
- Development partner for the use of sensors in hydraulic cylinders:
  - Monitoring the condition of the component
  - Early detection of component failures (predictive maintenance)



## Development & construction

We develop state-of-the-art hydraulic cylinders with precise and application-specific designs.



Our strength

# Quality assurance and cylinder manufacturing



## Quality

Liebherr stands for quality that inspires!

Every step of the value chain is designed to achieve this.



The foundation for a high-quality product is laid in the development phase. And that's not all: The quality management system includes intensive supplier support, permanent operational quality assurance and continuous improvement of all company processes.

### What makes us different

- Supplier management:  
Proven processes ensure quality and short lead times well above industry standards.
- Centralised quality and process management:  
All processes are continuously monitored and improved. Products are thoroughly tested before being shipped.
- Operational quality assurance:  
High component quality is ensured through initial sample and random sample testing, as well as state-of-the-art testing methods such as 3D metrology and ultrasonic testing.
- Test benches:  
The reliability of the hydraulic cylinders is ensured by a complete functional and leak test. Test results are automatically recorded for full documentation.
- Standards and certifications:
  - DIN EN ISO 9001:2015
  - EN 13000 ff, EN 1090-1:2009+A1:2011, EXC4 according to EN 10190-2
  - DGRL 97 / 23 /EG-AD 2000
  - DIN EN ISO 3834-2:2006
  - American Society of Mechanical Engineers (ASME)
  - DNV-ST-0194 for hydraulic cylinders in maritime environments

Liebherr can manufacture hydraulic cylinders with strokes up to 8,000 mm. From complete machining of the piston rods on special machining centres, highly efficient deep-hole drilling and precise honing of the tubes, to cylinder assembly, testing and robot-assisted painting, production takes place in-house.

### A high level of innovation

- Continuous development of products and processes to meet the highest quality requirements
- Focus on reproducible and stable processes

### Modern welding technologies

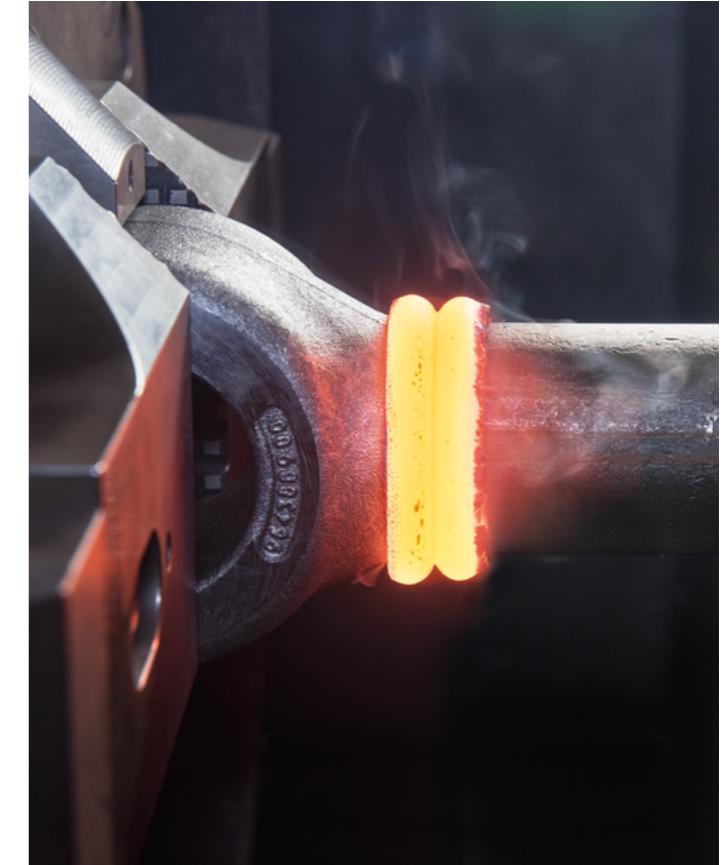
- Robotic welding systems for high quality and efficiency
- Automatic clamping, centring and joining of components
- Friction welding process: High-strength, homogeneous material joint with forge-like quality without additives

### Full processing

- Processing of piston rods and cylinder tubes on state-of-the-art turning and milling centers
- Several processing steps in one clamping operation
- Automatic tool change for short throughput time

### Honing, peeling and roller-burnishing

- In-house cylinder surface finishing
- Machining to dimensional, shape and surface accuracy and up to 600mm internal diameter



## Production

Our flexible machinery with state-of-the-art production technologies is the basis for customised products. Our top priority is to achieve economical, efficient and flexible production with short lead times.



Our strength

# To the service for our hydraulic cylinders



Our experienced hydraulic cylinder service team is here to help. We offer you individual solutions that go beyond overcoming challenges.

## Our services

- Fast spare parts supply
- Reliable repair and remanufacturing of your Liebherr hydraulic cylinders (Reman programme)
- Support during assembly and smooth commissioning of your hydraulic systems
- Liebherr assembly bench with optimised design for maximum efficiency during repairs
- Hands-on training and certification of work shops to repair to Liebherr quality standards
- Documentation: Repair instructions and comprehensive documentation

We ensure that your applications and systems run reliably and efficiently.

## Services

The worldwide Liebherr service network ensures customer proximity around the clock. The high availability of original spare parts and the Liebherr-Reman programme ensure very long product life cycles.



Want to learn more about our hydraulic cylinder services?

Scan the QR code now:



## LiCYB stationary - Liebherr assembly bench for hydraulic cylinders

- Focus on sustainability: Our assembly bench has been designed with the sustainability of our products in mind, to ensure a long and resource-efficient service life.
- Optimised design:
  - Convenient adjustment via drive
  - Ergonomic one-man operation
  - Height and width adjustment
  - Quick and modern disassembly
- Fast and effortless piston release
- Electric torque wrench up to 17,000 Nm
- Excavator cylinders up to 100 tonne class
- Base area: 1,000 mm x 9,500 mm
- The prototype successfully passed the test and has been in use at Liebherr-Canada Ltd. since February 2024.
- Full commissioning support and on-site training from our experienced service team.



**Maximum efficiency:** The assembly bench has significantly increased the number of repairs



Hydraulic cylinders

# Industries that rely on us

Our expertise covers a wide range of applications, from the harshest mining environments to the most precise marine applications. Our hydraulic cylinders deliver top performance wherever they are used. Our commitment to providing robust and reliable components is the key to our work. Through continuous development, we ensure that every cylinder is perfectly matched to your requirements.

At the same time, we keep our finger on the pulse of technology trends and invest in pre-development projects to help shape the innovations of the future. The result is technologies that not only meet today's market demands, but also support your long-term goals, such as lightweighting, zero-emissions applications or digital transformation.



**Construction  
machinery**



**Cranes**



**Mining and  
Aftermarket**

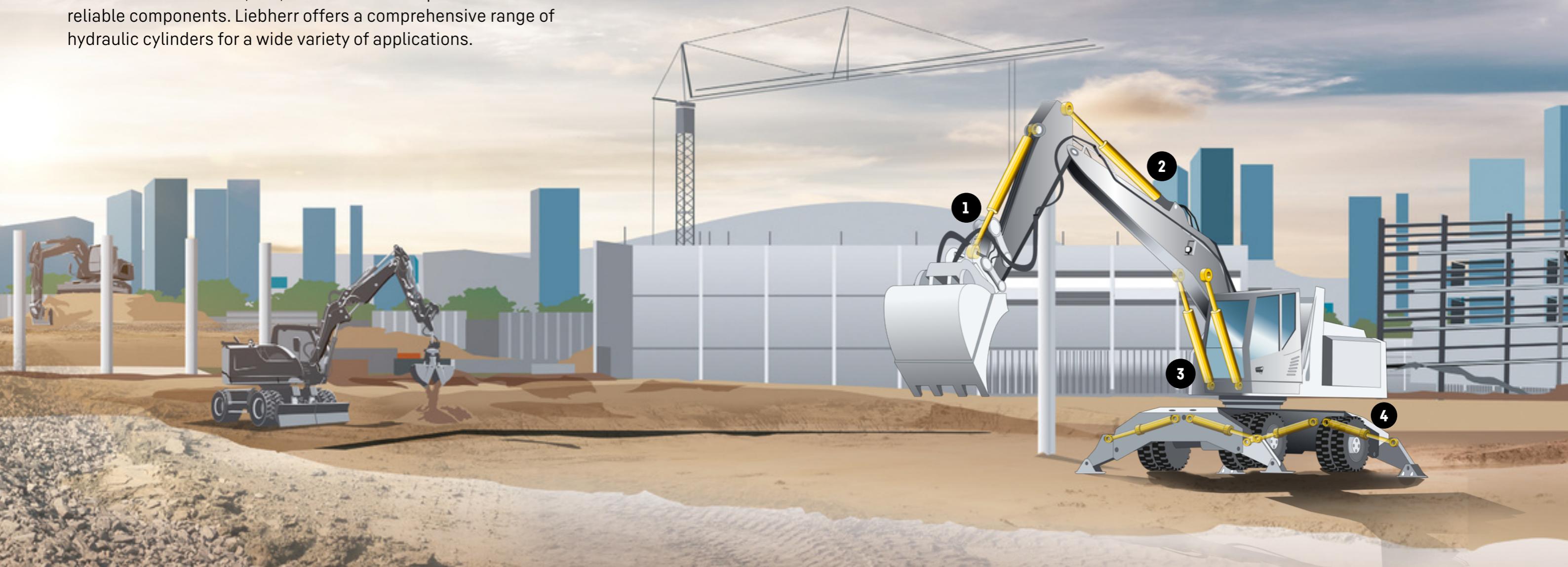


**Maritime  
applications**

Hydraulic cylinders

# Construction machinery

Many mobile machines such as excavators, bulldozers, piling and drilling equipment and construction machines with various attachments are in use on construction sites and handling centres all over the world. Dust, dirt, water and cold require robust and reliable components. Liebherr offers a comprehensive range of hydraulic cylinders for a wide variety of applications.



Frequent load changes are a particular challenge in the construction industry. Liebherr's sophisticated components easily withstand these impacts and increase work safety.

## 1 Bucket cylinder

- Crucial for excavator digging forces
- Hardened piston rod for high impact resistance

## 2 Stick cylinder

- Moves the boom and is exposed to the highest loads
- Designed for these loads to match service life to the application

## 3 Boom cylinder

- Co-responsible for the movement of the boom
- Highly corrosion resistant

## 4 Support cylinder

- Extremely robust to safely absorb high loads
- Stabilisation of the excavator

Construction machinery

# Hydraulic cylinders for piling and drilling equipment

Hydraulic cylinders in piling and drilling equipment generate the power needed to drive piles or drill precisely into hard ground.

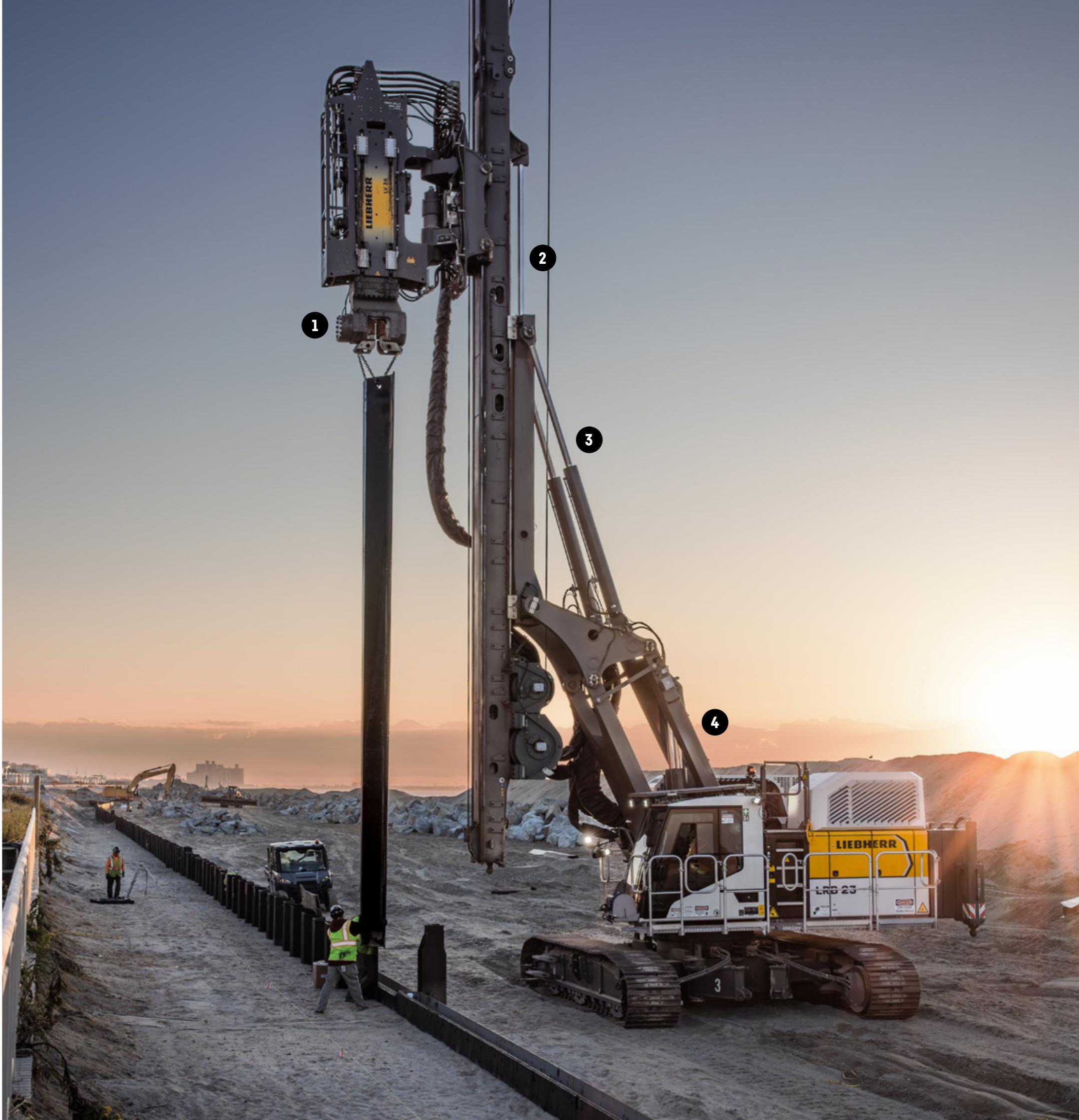
They provide controlled, powerful movements, ensuring high efficiency and stability in demanding construction projects. Their robust design ensures reliable performance under extreme loads.

**1** Clamping forceps cylinder

**2** Vertical adjusting cylinder

**3** Stick cylinder

**4** Boom cylinder





Material handling

# Hydraulic cylinders for scrap shears

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Hydraulic cylinders in scrap shears generate enormous cutting forces to shred metal efficiently.

They provide precise and powerful movements that cut through thick and hard material with ease. Their robust design ensures long life and reliable performance in intensive, continuous use.



Depending on the application, we can equip our products with the latest technologies, such as carbon fibre-reinforced plastics to optimise lightweight hydraulic cylinders and sensor solutions.

Interested?  
Scan the QR code to find out more!



## Hydraulic cylinders

# Cranes

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Hydraulic cylinders in cranes control the lifting, lowering and extension of loads with high precision and power.

They ensure stable and controlled movement of even heavy loads, contributing to the safety and efficiency of crane operation. Their robust design ensures long service life in extreme conditions.

- 1 Support cylinder**
- 2 Luffing cylinder**
- 3 Ballasting cylinder**

**Pull cylinder**

## Hydraulic cylinders

# Mining

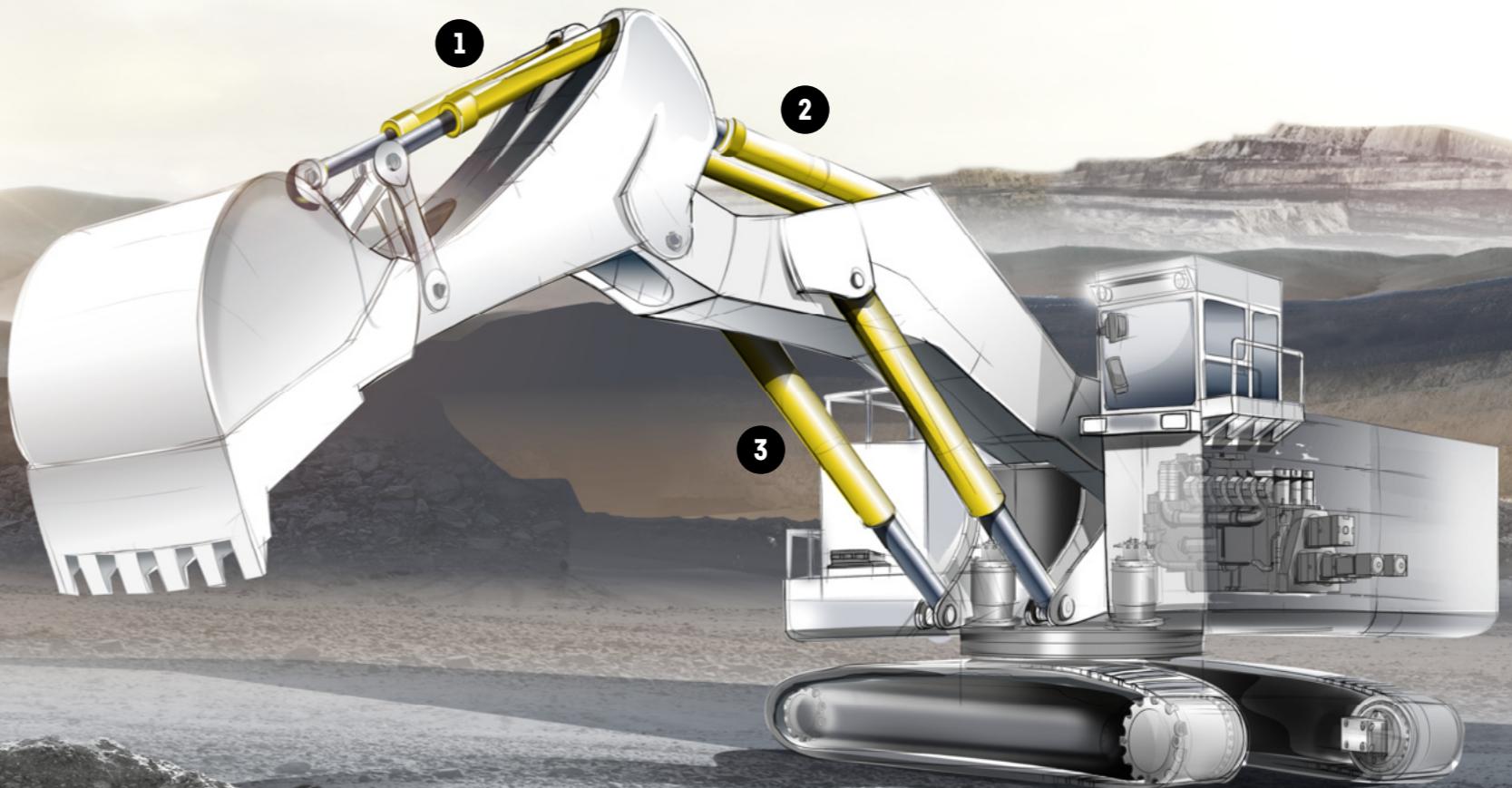
Hydraulic cylinders in mining equipment must withstand the highest static and dynamic forces.

These requirements are met by a robust design optimised for durability and a special selection of materials based on decades of experience. For example, Liebherr manufactures the piston rod from a single high-strength forging.



By reducing the weight of individual components, larger attachments can be used to increase digging performance. The result is reduced emissions and more efficient operation.

**Interested?**  
Use the QR code to learn more about our lightweight solutions!



The productivity of a mining excavator can be significantly increased by reducing the weight, especially of the bucket and stick cylinders. Depending on customer requirements, Liebherr therefore offers various concepts for weight reduction, even in highly dynamic applications, e.g. through the use of **carbon fibre-reinforced plastic (CFRP)**.

### 1 Bucket cylinder

- Determines the digging force of the excavator
- Hardened piston rod for high impact resistance

### 2 Stick cylinder

- Moves the boom and is exposed to the most impact
- Designed for this load to match the service life to the application

### 3 Boom cylinder

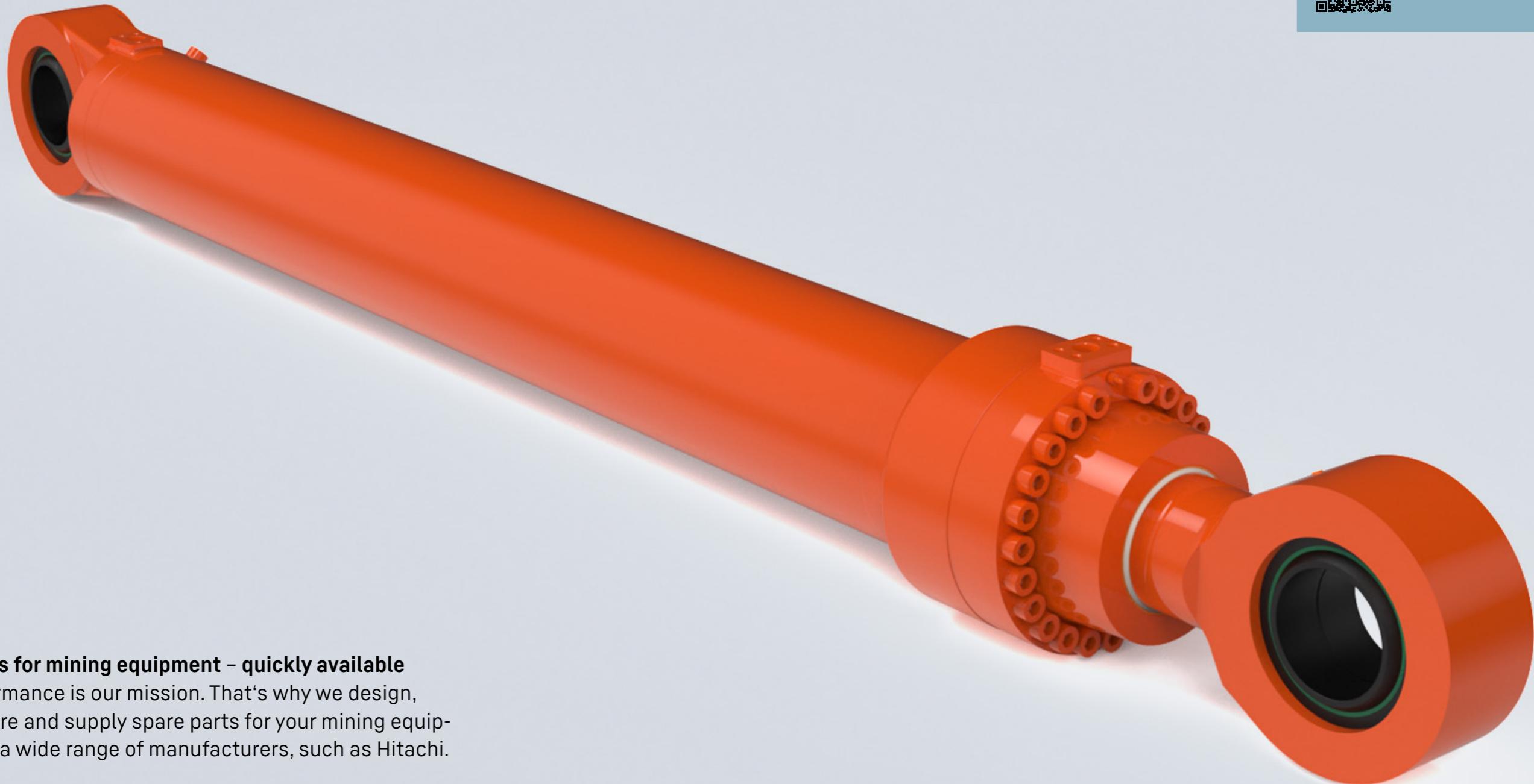
- Partly responsible for moving the boom
- Highly corrosion resistant

Mining

# Mining-Aftermarket



Use the QR code to find out  
more about our spare parts  
for the **mining aftermarket**



## Spare parts for mining equipment – quickly available

Your performance is our mission. That's why we design, manufacture and supply spare parts for your mining equipment from a wide range of manufacturers, such as Hitachi.

Our high-quality aftermarket cylinders provide a cost-effective alternative, ensuring maximum performance, durability and machine uptime in challenging mining environments.

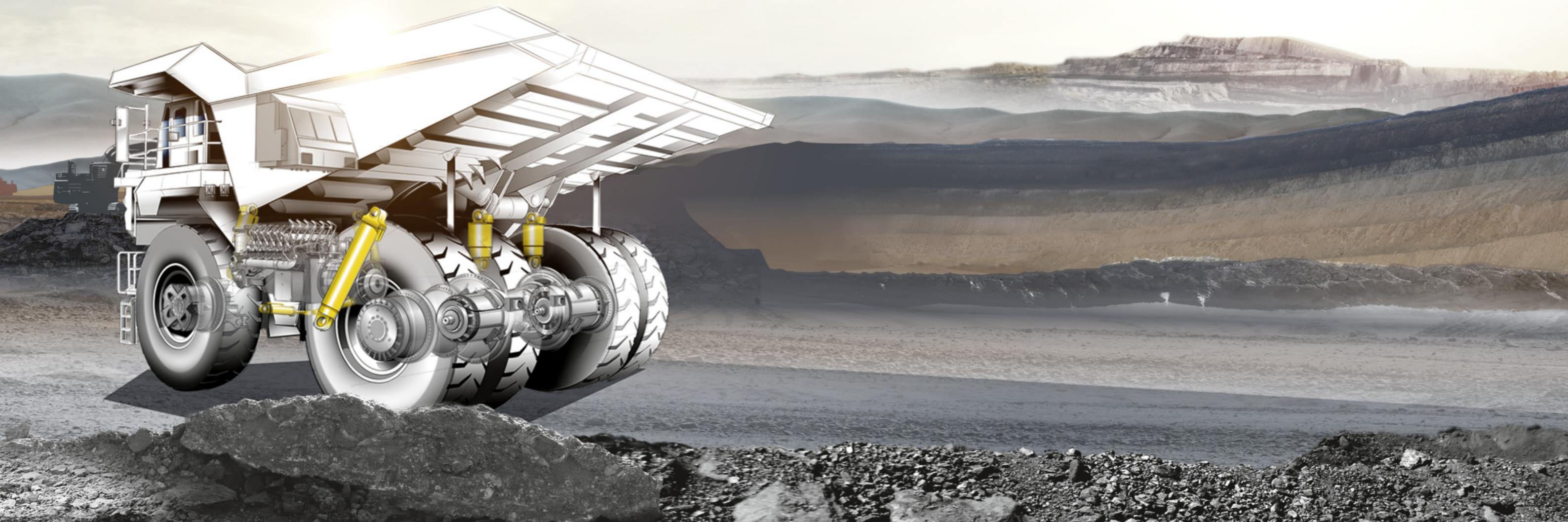
**Our hydraulic cylinders are compatible with the following Hitachi mining excavators:**

- Hitachi EX2500/2600
- Hitachi EX3500/3600

Mining

# Shock absorbers in mining truck

The compact design and use of an oil-gas mixture eliminates the need for an additional piston accumulator system.



## Life-Cycle-Management

Both hydraulic cylinders and shock absorbers for mining applications are designed to be remanufactured up to three times as part of lifecycle management. This gives a service life of up to 80,000 hours.

## From hydraulic cylinders for mining excavators to dampers for mining trucks

Liebherr designs, develops and manufactures sophisticated mining cylinders and dampers. In order to meet the requirements for maximum service life under the toughest conditions, only high-quality and durable materials are used.

Mining

# Hydraulic cylinders in bulldozer

Full performance every time – even in changing weather conditions and material qualities. From heavy-duty pushing to precise levelling, our hydraulic cylinders control the lifting, lowering and tilting of the bucket plate to move earth and debris with precision.



The hydraulic cylinders provide powerful and controlled movements even in the most difficult conditions and ensure efficient levelling. Their robust design guarantees durability and reliability in tough working conditions.

1 Tilt cylinder

2 Boom cylinder

3 Rear ripper cylinder

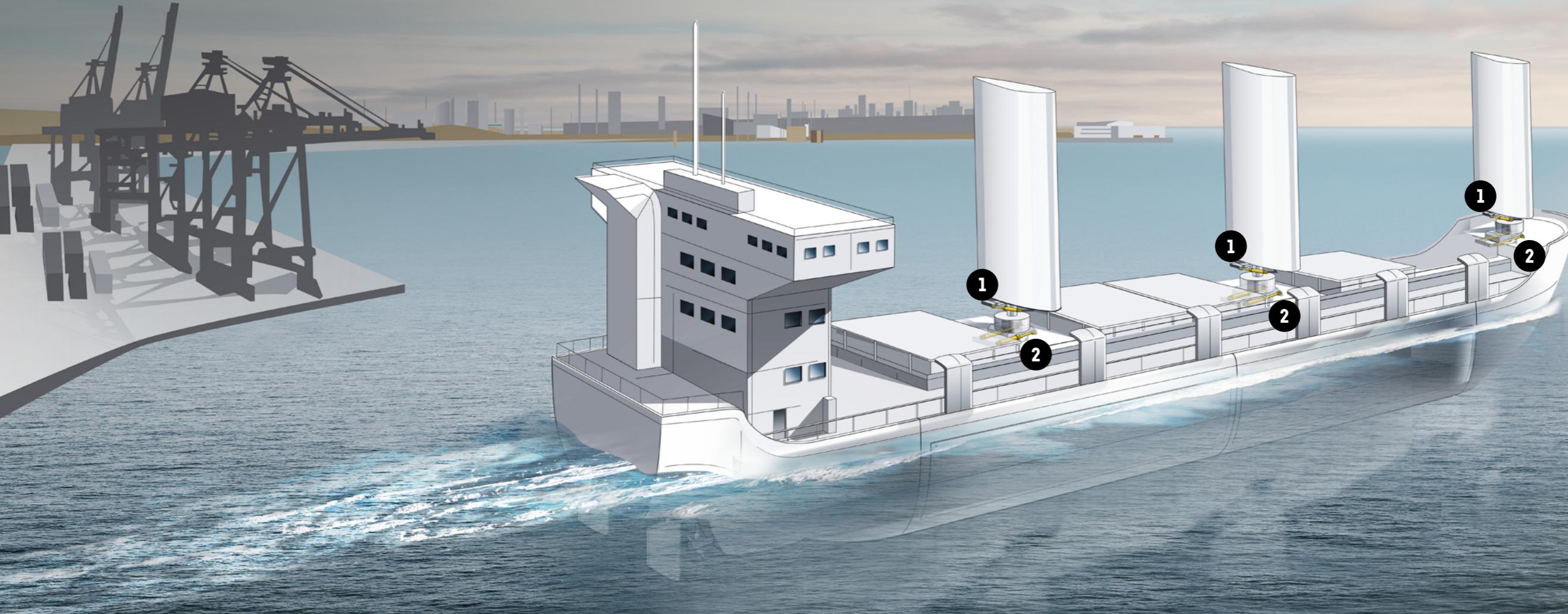
Hydraulic cylinders

# Maritime applications



Use the QR code to find out more about our complete solution for **wind-assisted propulsion**

Liebherr manufactures offshore-certified, corrosion-resistant and durable hydraulic cylinders that raise and lower the sail mast and unfold and fold the two-piece wing sails.



## Advantages of our hydraulic cylinders:

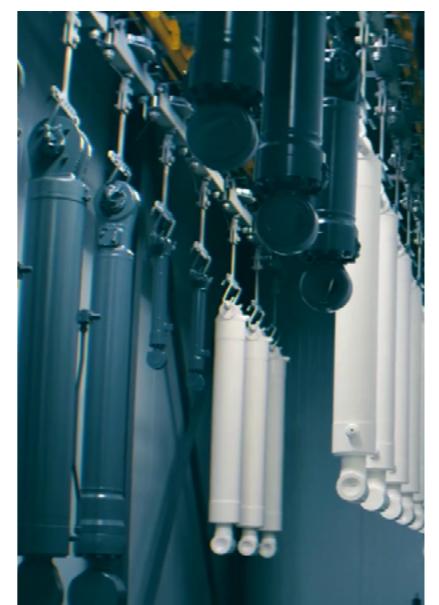
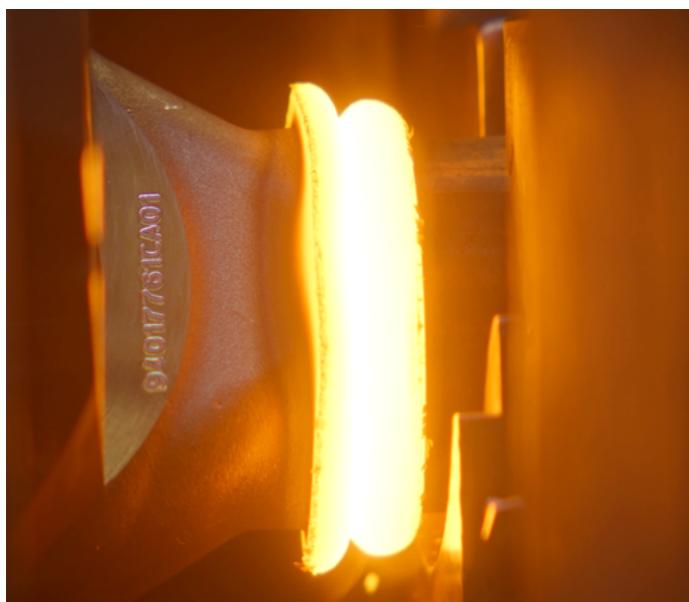
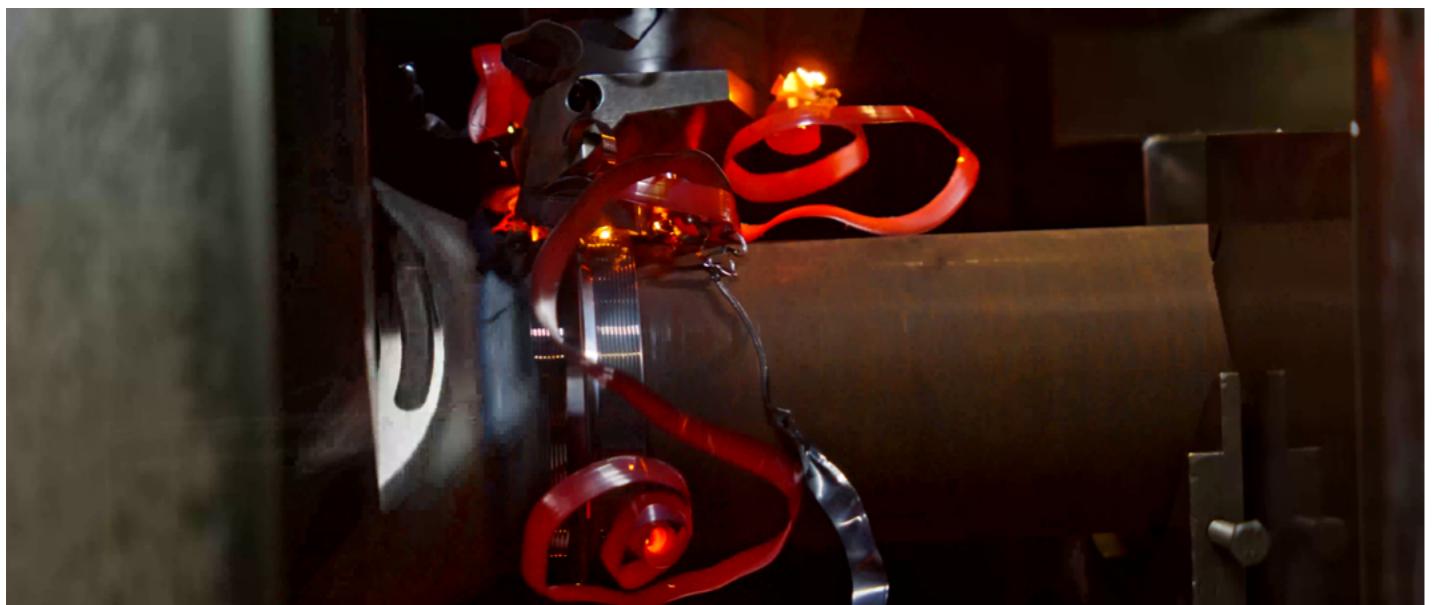
- DNV GL classification
- Two-layer, high-density coating for excellent corrosion resistance, optimum sealing properties and maximum seal life
- Flexible position measurement system
- Pressure sensors and load holding valves
- Cylinder emergency release valve
- Leakage-free counterbalance valve
- Reliable shut-off and pipe break protection

## 1 Folding cylinder

- Folding cylinders are used to unfold and fold the sail surface
- The folding of the sail surfaces is assisted by the wind by aligning the sail surfaces

## 2 Tilting cylinder

- Tilting cylinders are used to raise and lower the sails.
- The wind assists in lowering the sails



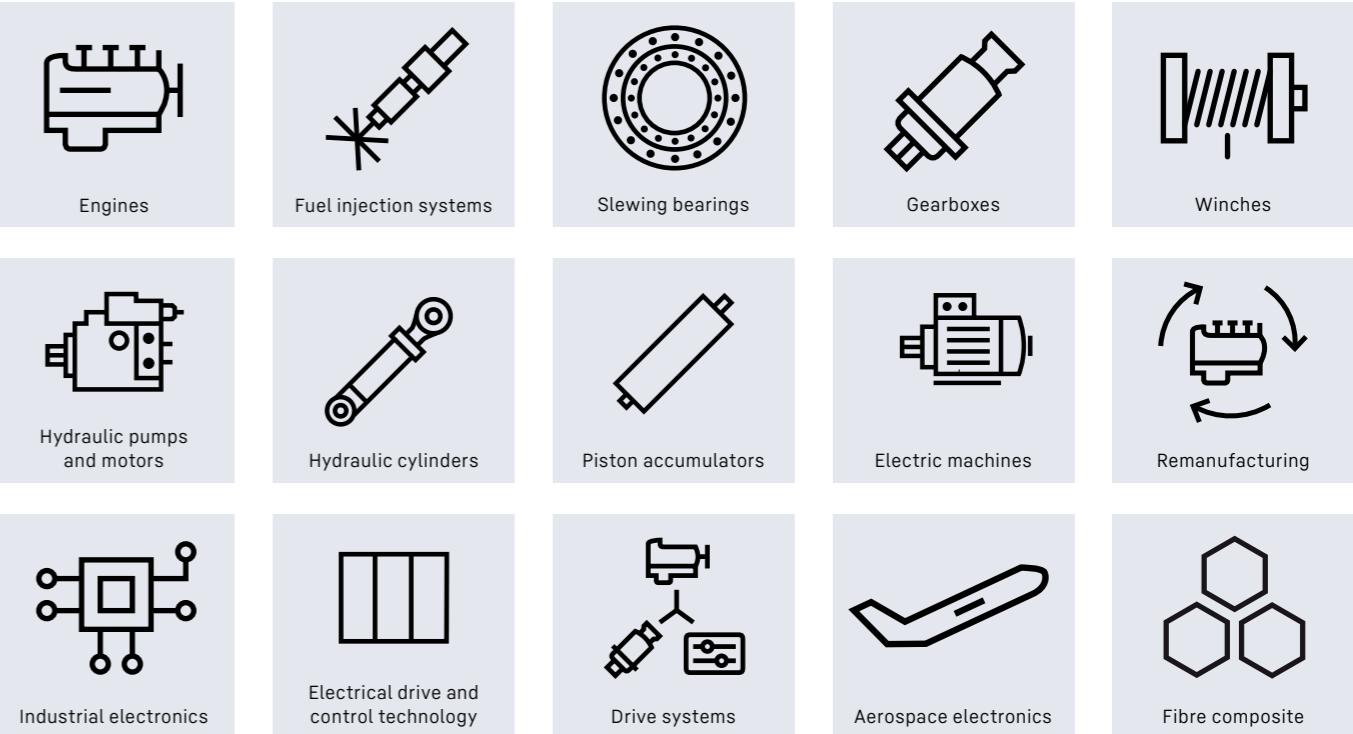
# Components

From A to Z – the components division of the Liebherr Group offers a broad range of solutions in the area of mechanical, hydraulic, electric and electronic drive system and control technology. The efficient components and systems are produced at a total of ten production sites around the world to the highest standards of quality. Central contact persons for all product lines are available to our customers at

Liebherr-Components AG and the regional sales and distribution branches.

Liebherr is your partner for joint success: from the product idea to development, manufacture and commissioning right through to customer service solutions like remanufacturing.

[components.liebherr.com](http://components.liebherr.com)



# LIEBHERR

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