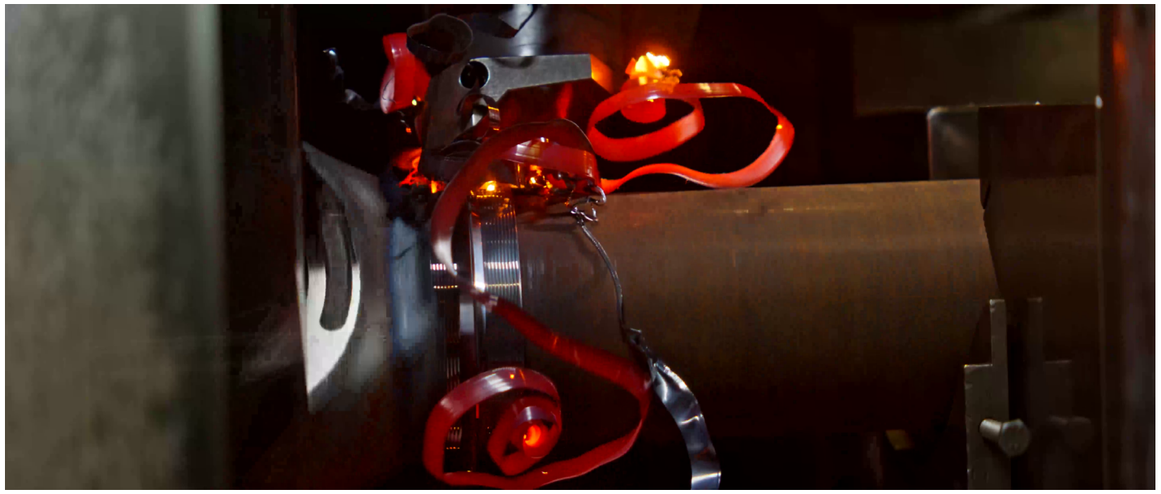
Setting big things in motion

LIEBHERR

Components
Hydraulic cylinders













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Hydraulic cylinders from Liebherr

“We are passionate about thinking ahead, creating real added value and pushing boundaries to build strong and enjoyable partnerships. Together, we move big things with our hydraulic cylinders.”

Management of Liebherr-Components Kirchdorf GmbH



Ulrich Hammerle



Thomas Sonntag



From Oberopfingen to the whole world



Performance, durability and innovation

For over six decades, the plant in Oberopfingen, Kirchdorf an der Iller has been synonymous with exceptional engineering expertise in the development and manufacture of hydraulic cylinders. As an industry pioneer, Liebherr sets the standard for performance, durability and innovation.

The portfolio includes series cylinders, large cylinders, piston accumulators, suspensions, as well as lightweight and special cylinders – all developed and manufactured for maximum load capacity and a long service life.
Liebherr hydraulic cylinders are used all over the world by Liebherr and its external customers – wherever reliability and peak performance are required.

Hydraulic cylinders belong to the Liebherr components segment. This includes high-quality industrial components for mechanical, hydraulic, electrical and control technology. As part of the Liebherr Group, we **leverage synergies across various product areas** to develop high-performance, innovative and long-lasting solutions in close collaboration with our customers.

Find out more about **Liebherr's hydraulic cylinders** and other products and services.

Where we move big things

The industries that rely on us

Our expertise is used in a wide range of applications, from harsh mining conditions to the highest levels of precision in maritime technology.

We are committed to supplying robust and reliable cylinders. At the same time, we keep up to date with technological trends and invest in predevelopment projects to help shape future innovations.
The result is technologies that fulfil current market requirements and support long-term goals such as reducing emissions and digital transformation.

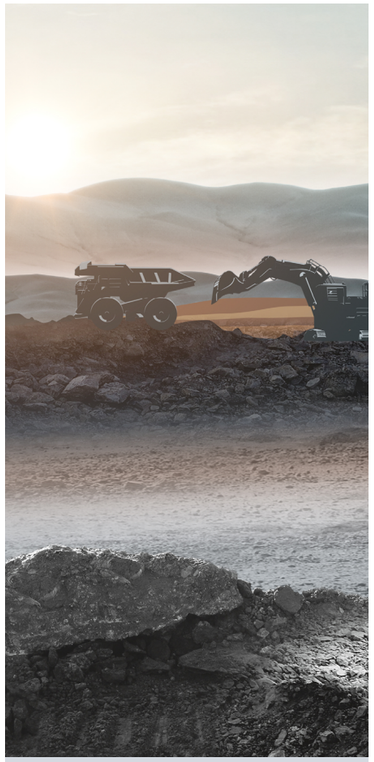
Scan or click the QR code to find out more about our **markets, applications and products**.



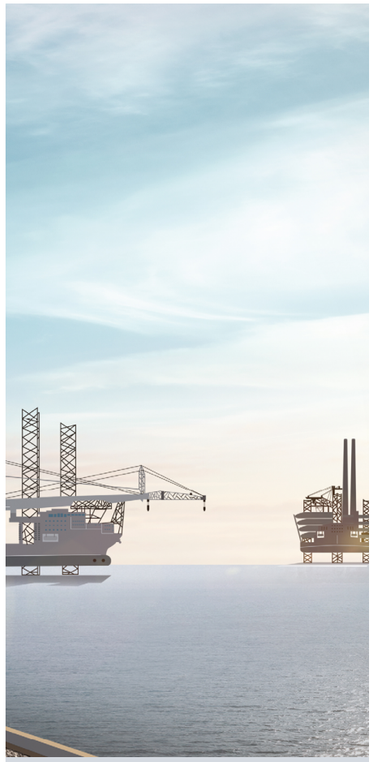
Earth moving and material handling



Mobile and crawler cranes



Mining



Maritime applications

Where we move big things

Earthmoving

A variety of mobile construction machines with different attachments are used on construction sites around the world. Robust and reliable components are required to withstand dust, dirt, water and cold.

Liebherr offers a comprehensive range of application-specific hydraulic cylinders designed for continuous use.

The **380 bar series-production range** is ideally suited for use in mobile and highly dynamic applications. Scan or click the QR code to find out more about these robust hydraulic cylinders.



A particular challenge with **hydraulic cylinders for wheeled and crawler excavators** is the frequent load changes to which these construction machines are subjected. However, the sophisticated Liebherr components can easily withstand these loads, thus increasing efficiency and work safety.

1 Bucket cylinder

- Crucial for movement and precise control of the bucket
- Generates the excavator's digging force
- Hardened piston rod ensures extremely high impact protection

2 Stick cylinder

- Essential for reach, diggin depth and working radius
- Designed for high mecanical loads

3 Boom cylinder

- Lifting and lowering the boom
- Significantly influences the loading height, load capacity and stability of the entire arm system

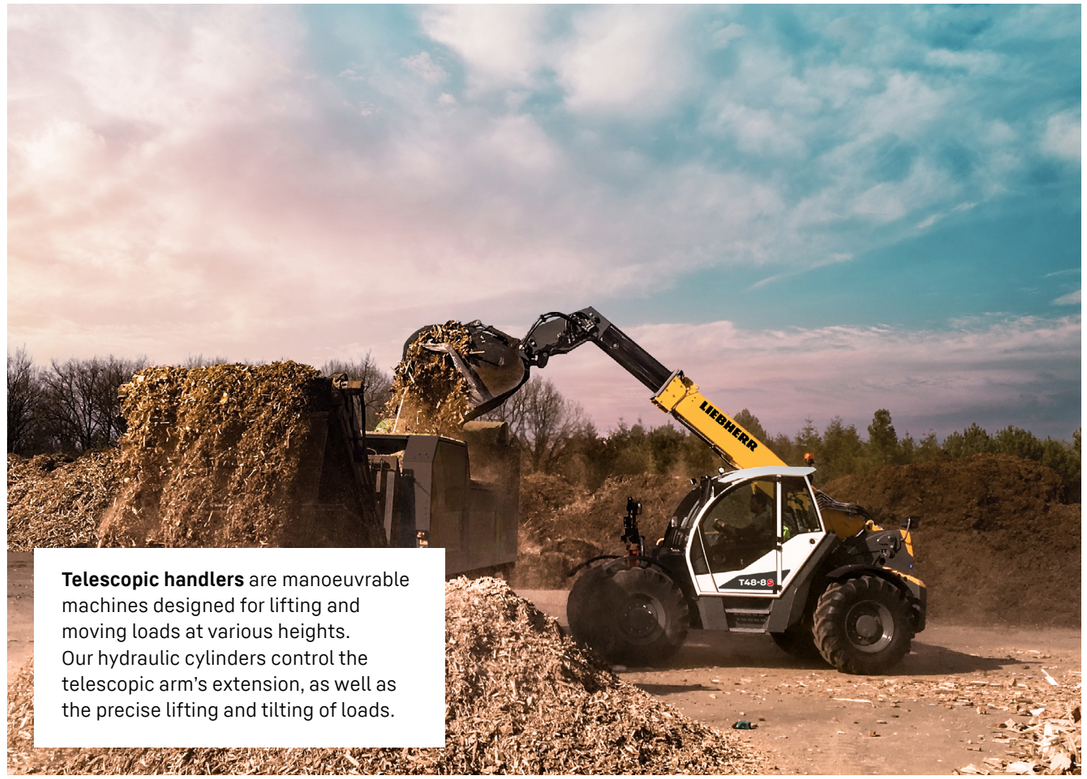
4 Support cylinder

- Stability, tilt protection and flexible switching between transport and operation
- Stabilisation and load distribution of the excavator

The versatile A 918 **mobile excavator** from Liebherr is particularly suitable for use on urban construction sites and in landscaping. Its powerful hydraulic cylinders enable precise movements during continuous operation.

Wheel loaders are powerful material handling machines. Our hydraulic cylinders convert hydraulic pressure into movement, controlling the shovel's lifting, lowering and tilting.





Telescopic handlers are manoeuvrable machines designed for lifting and moving loads at various heights. Our hydraulic cylinders control the telescopic arm's extension, as well as the precise lifting and tilting of loads.

Dump trucks are robust transport vehicles designed for use in mining and on large construction sites. Our hydraulic cylinders powerfully raise and lower the dump body to safely and efficiently empty the load.



Earthmoving

Hydraulic cylinders for piling and drilling rigs

Hydraulic cylinders in piling and drilling rigs generate the force required for driving piles or for precise drilling in hard ground.

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

1 Clamping cylinder

Ensures that the clamping tong securely fixes the drill rod and releases it again if necessary.

2 Height adjusting cylinder

Responsible for the precise vertical movement and positioning of the working unit.

3 Leader inclination cylinder

Designed to adjust the masts tilt and deliver perfect positioning.

4 Base arm adjusting cylinder

Moves the boom of the piling and drilling rig, handling mast raising, lowering, and rough positioning.

Where we move big things

Material handling

Hydraulic cylinders play a central role in material handling equipment. They are responsible for lifting, lowering, swivelling and positioning heavy loads. Therefore, reliable sealing technology, regular maintenance and robust materials are crucial for ensuring the durability and safety of these systems.



Our cylinders enable precise and powerful movement. They are ideally built to withstand challenges such as continuous operation under high loads, exposure to extreme environmental conditions (such as dirt, moisture and temperature fluctuations) and wear and tear.

1 Support cylinder

- Offers stability, tilt protection and flexible switching between transport and use
- Stabilisation and load distribution of the application

2 Boom cylinder

- Raising and lowering the boom
- Significantly affects the loading height, load capacity and stability of the entire arm system

3 Stick cylinder

- Fundamental to digging force, reach and working radius
- Designed to withstand high mechanical loads

Our hydraulic cylinders ensure the safe and reliable handling of heavy goods in the scrap and timber sectors, as well as in port operations.

Earth moving and material handling

Hydraulic cylinders for attachment tools

Hydraulic cylinders are a key component of attachments, enabling powerful and precise movements for a wide range of applications. The performance of an attachment can significantly impact the success of a project.

Hydraulic cylinders ensure that buckets, grapples, shears and other attachments operate reliably. Thanks to their robust design, they can withstand high loads and changing operating conditions.



Attachment tools

Hydraulic cylinders for scrap shears

Scrap shears use hydraulic cylinders to generate enormous cutting forces, enabling them to shred metals efficiently.

They facilitate precise and powerful movements, effortlessly cutting through even the thickest and hardest materials.
Their robust construction guarantees reliable performance and a long service life, even with intensive continuous use.

Depending on the application, we can equip our products with the latest technologies.
These include carbon fibre reinforced plastics (CFRP), which are used to optimise lightweight hydraulic cylinders, and customised sensor solutions within the cylinder.

Scan the QR code to find out more.



We manufacture hydraulic cylinders that are ideal for use with Genesis GmbH's scrap and demolition shears, which are produced by one of the industry's leading manufacturers. Twelve of our cylinder types are used in every model of the GXT series. We also deliver our cylinders to the US state of Wisconsin for Genesis Attachments LLC, the parent company.



Attachment tools

Hydraulic cylinders for concrete crushers

The XMB concrete crusher series from Gebrüder Egli Maschinen AG in Switzerland consists of various sizes of concrete crusher, all of which are equipped with our hydraulic cylinders.

For this project in the **demolition industry**, we were able to draw on our existing expertise in the manufacture of scrap shears cylinders.



Where we move big things

Mobile and crawler cranes

Precise and powerful movements are essential in crane technology. Our **hydraulic cylinders for mobile cranes** provide stable and controlled movement, even when lifting heavy loads, thereby contributing to the safety and efficiency of crane operation. Their robust design guarantees a long service life, even in extreme conditions.

Our lightweight cylinders combine the advantages of high-strength materials with optimised weight design.

1 **Support cylinder**

They ensure the mobile crane remains stable and secure by transferring its load to the ground via the supports during lifting operations.

2 **Luffing cylinder**

During operation, they raise and tilt the boom of a mobile crane to control the height and reach of load movement.

3 **Counterweight cylinder**

They enable the automatic picking up, positioning and setting down of counterweights.

Advantages of our integrated valve technology – located directly in the support cylinder

- Less pressure loss and increased energy efficiency
- Compact design
- Reduced piping
- Effective reduction of potential sources of error

Hydraulic cylinders are at the heart of the motion control system in mobile cranes, lifting, lowering and positioning loads with precision. They also ensure reliable operation under dynamic load conditions.

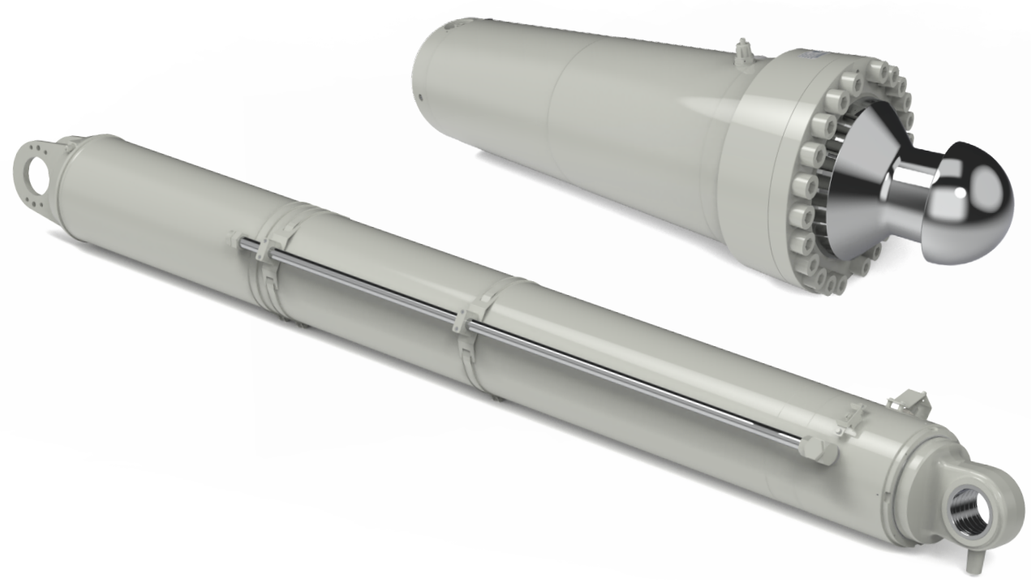
Mobile cranes

Support and luffing cylinders

Support cylinders stabilise mobile cranes and distribute their load evenly across the ground. Their design must ensure high load-bearing capacity, rigidity and compressive strength in order to safely absorb axial and lateral forces. The sealing systems and materials must be designed so that they remain functionally reliable under changing loads, temperature fluctuations and environmental influences.

Luffing cylinders are used to position the crane boom precisely. To ensure the smoothest and most controlled load handling possible, special attention is paid to the design of the friction-optimised cylinders during construction.

In addition, the cylinders are designed for **lightweight construction**, enabling heavy loads to be moved efficiently. High-strength tubular materials are used for this purpose, among other things.



Crawler cranes

Draw and extension cylinders

Crawler cranes impress with their high load capacity and flexibility on construction sites. They are equipped with infinitely telescopic hydraulic guidance systems that increase the crane‘s load capacity.

Our range includes **lightweight cylinders** specially designed for cranes. Despite their low weight, they meet the highest safety standards. They are available in various sizes.

They enable precise and powerful movements and provide stability for challenging construction projects. Their robust design guarantees reliable performance under extreme loads. They are available in a variety of sizes and configurations to meet your specific needs.

1 **Draw cylinder**

Pulls the boom sections into position, performing the functions of ‚erection‘ and, if necessary, static bracing of the system.

2 **Extension cylinder**

Used for the flexible extension and retraction of boom sections.

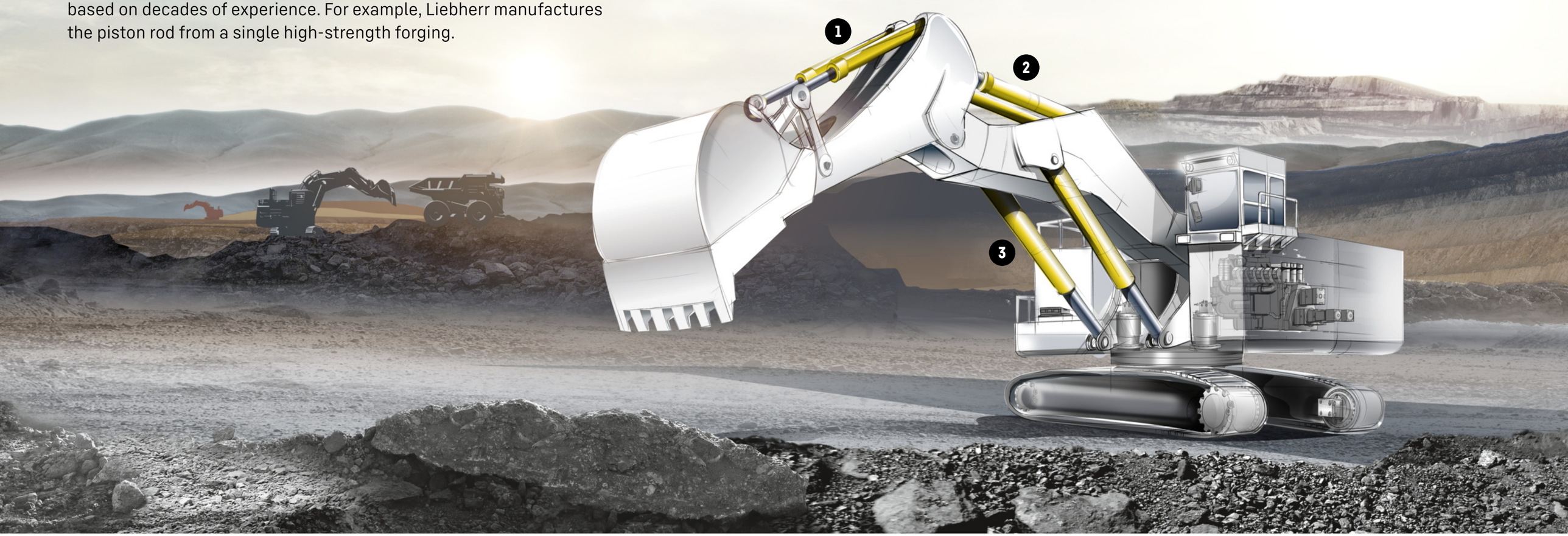


Hydraulic cylinders are essential for the effective operation of a crawler crane, as they facilitate precise control and safe lifting of heavy loads.

Where we move big things

Mining

Continuous use under the toughest conditions – **Hydraulic cylinders for mining excavators** must withstand extreme static and dynamic forces. These requirements are met through robust designs geared towards durability, and through the use of specially selected materials based on decades of experience. For example, Liebherr manufactures the piston rod from a single high-strength forging.



Reducing the weight of a mining excavator‘s bucket and boom cylinders can significantly increase efficiency. Depending on customer requirements, Liebherr offers various weight-saving concepts, even for highly dynamic applications. One example is the use of **carbon fibre reinforced plastic (CFRP)**.

1 Bucket cylinder

- Crucial for moving and controlling the bucket precisely
- Generates the excavator‘s digging force
- Hardened piston rod provides very high impact protection

2 Stick cylinder

- Essential for reach, digging depth and working radius
- Designed to withstand high mechanical loads

3 Boom cylinder

- Lifting and lowering the boom
- Significantly impacts the loading height, load capacity and stability of the entire arm system

Suspensions in **dump trucks** cushion the impact of loading and unloading bulk materials, as well as absorbing shocks during travel.





Our design prevents vibrations from being transmitted uncontrollably to the frame, axles or loading unit. This improves driving stability and traction on uneven ground while reducing material fatigue and minimising downtime.

Remanufacturing
Both the hydraulic cylinders and the suspensions used in mining applications are designed to be remanufactured up to three times. This gives the cylinders a service life of up to 48,000 operating hours. Suspensions can be used for up to 80,000 hours.

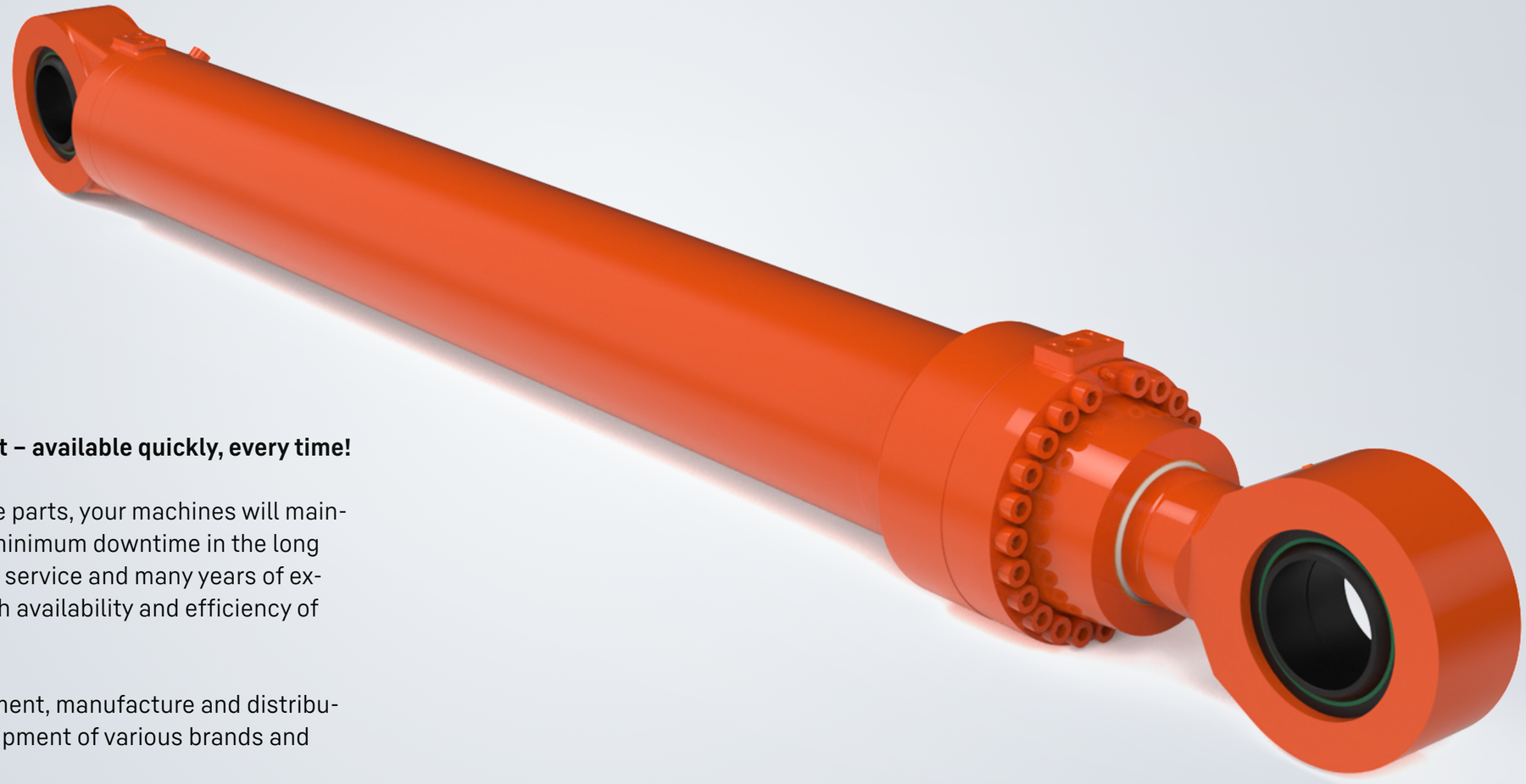


The conditions in mines are extreme: dirt, heat and continuous loads put a great deal of strain on every component. Therefore, to prevent failures, hydraulic cylinders must be particularly robust and durable.

Where we move big things

Mining Aftermarket

Scan the QR code to find out more about the spare parts we offer for the **Mining Aftermarket**.



Spare parts for mining equipment – available quickly, every time!

With Liebherr‘s OEM-quality spare parts, your machines will maintain maximum performance and minimum downtime in the long term. Thanks to our reliable repair service and many years of expertise, we can guarantee the high availability and efficiency of your equipment.

Our services include the development, manufacture and distribution of spare parts for mining equipment of various brands and models, including Hitachi.

Our high-quality aftermarket cylinders provide an economical solution that guarantees optimal performance, durability and machine availability, even in challenging conditions.

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

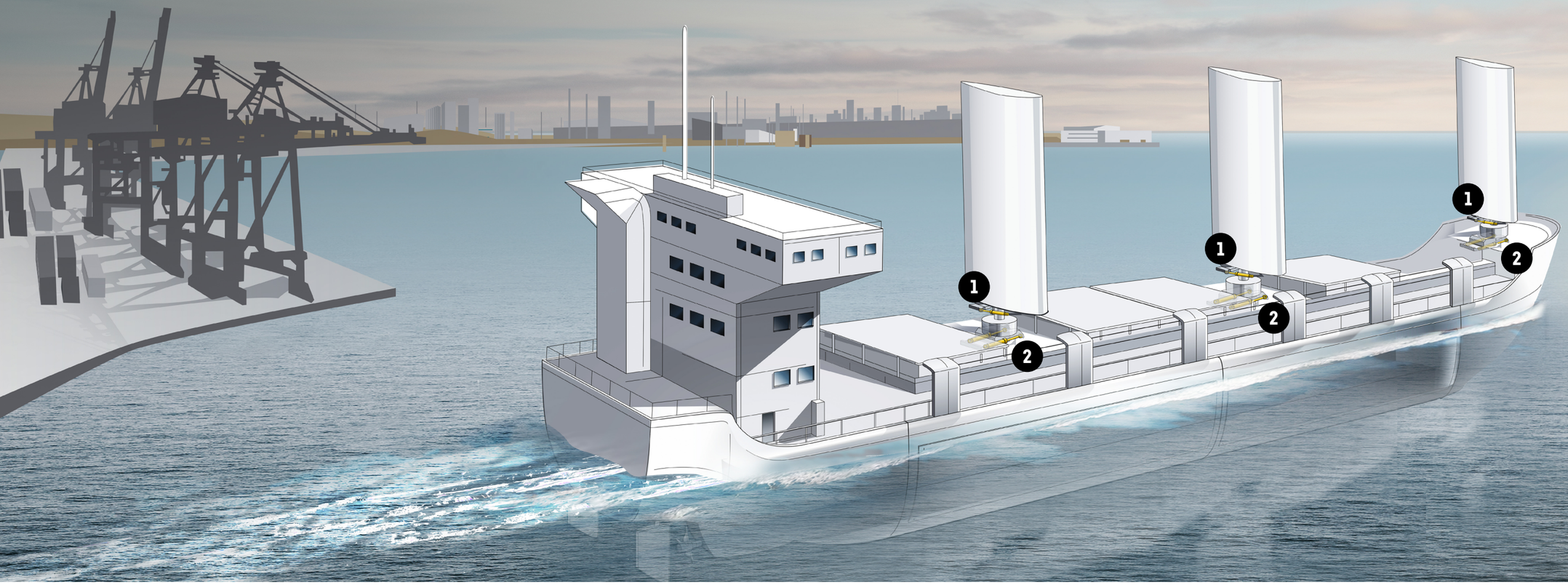
- Hitachi EX2500/2600
- Hitachi EX3500/3600
- Hitachi EX5500/5600

Where we move big things

Maritime applications

Liebherr manufactures offshore-certified and corrosion-resistant **hydraulic cylinders for transport vessels**. These cylinders are used to raise and lower the sail mast and to unfold and fold the two-part wing sails.

Scan the QR code to find out more about **Liebherr's all-in-one wind-assisted propulsion solution**.



Advantages of our hydraulic cylinders:
- DNV design
- Two-layer, high-density coating for excellent corrosion resistance, optimal sealing properties, and a maximum seal service life
- Flexible position measuring system
- Pressure transducers and load-holding valves
- Emergency release valve on the cylinder
- Leak-free compensation valve
- Reliable shut-off and pipe rupture protection

1 Folding cylinder

- Used to open and close the sails
- The folding of the sail surfaces is supported by the wind through appropriate alignment of the sail

2 Tilting cylinder

- Used to raise and lower the sail surfaces
- The wind also assists in lowering the sail surfaces



Our extremely robust **tilting cylinders** are used to raise and lower the sails. When fully extended, the cylinders are over 9 metres long.

Scan the QR code to find out more about the benefits of our **hydraulic cylinders** as key components in wind-assisted propulsion systems.

Who we are

Milestones in the manufacturing of Liebherr hydraulic cylinders

Proud of the past – ready for the future

Manufacturing hydraulic cylinders at Liebherr's first site in Kirchdorf an der Iller laid the foundation for Liebherr-Components Kirchdorf GmbH, established in 2014. A key milestone in this success story was the construction of the Oberopfingen plant in the Kirchdorf district in 2018, where the assembly, testing and painting of hydraulic cylinders reached a new level.

The next significant step followed in 2024/25 when the entire mechanical production moved from Kirchdorf to the newly built halls in Oberopfingen. This expansion more than doubled the size of the site, paving the way for further growth in Liebherr's hydraulic cylinder product segment. Thus, the Liebherr hydraulic cylinders consolidated their expertise at one location. This will enable improvements to be made to manufacturing processes, efficiency, flexibility and quality.

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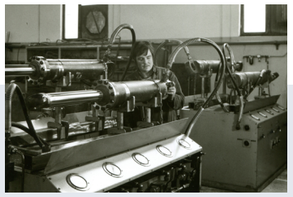


Start of the development and manufacturing of hydraulic cylinders in Kirchdorf as part of the excavator production

2014



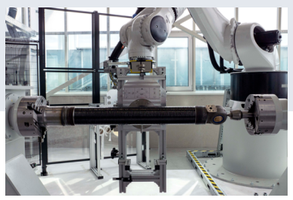
Foundation of Liebherr-Components Kirchdorf GmbH

2018



Relocation of the administration, assembly and logistics departments to the newly built site in Oberopfingen

2020



Production of lightweight hydraulic cylinders wrapped in carbon fibre reinforced plastic (CFRP), as well as other fibre composite components

2021



Opening of hydraulic cylinder assembly in Dalian (China)

2025



Today, all fields involved in the construction and manufacturing of Liebherr hydraulic cylinders are located in Oberopfingen.

One of the smallest products
Bucket cylinder of A 914 excavator



One of the largest products
Draw cylinders in LR 12500 crawler crane



Who we are

Facts and figures

Founded

2014

as an independent company
from Liebherr-Hydraulikbagger GmbH

Our **PV system** generates enough **electricity** to supply

4,000 households

We manufacture

hydraulic cylinders

on an area the size of

10 soccer fields

Each year we need around

8,000 tons of steel

for the manufacture of hydraulic cylinders

600 employees

We supply around

90,000

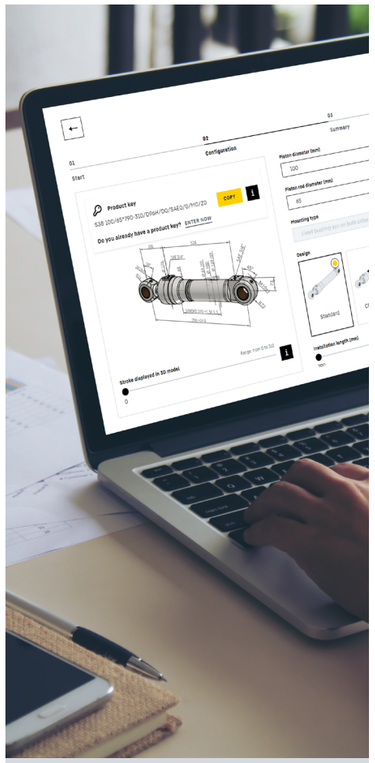
products every year

What makes us strong

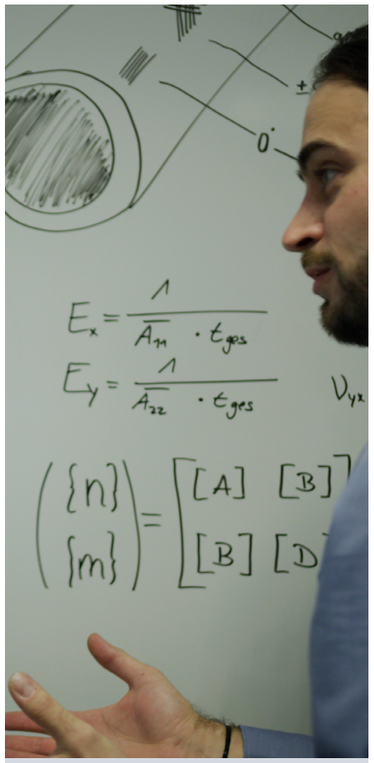
Expertise all in one place

At Liebherr‘s hydraulic cylinder factory, all core competencies are brought together under one roof, from consulting and development to quality assurance, manufacturing and customer service.
For you, this means short communication channels, quick decision- making and flexible solutions from a single source.

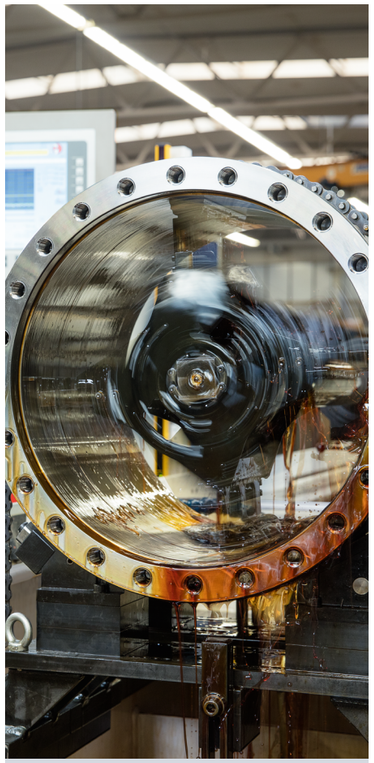
We support you throughout the process, from the initial idea to the ready-to-install hydraulic cylinder and beyond.
Our goal is not only to supply top-quality cylinders, but also to provide a service that will impress you.
Experience the advantages of a partner who will set everything in motion for you, for today‘s and tomorrow‘s hydraulic solutions!



Consultancy



Development



Manufacturing



Services

Quality

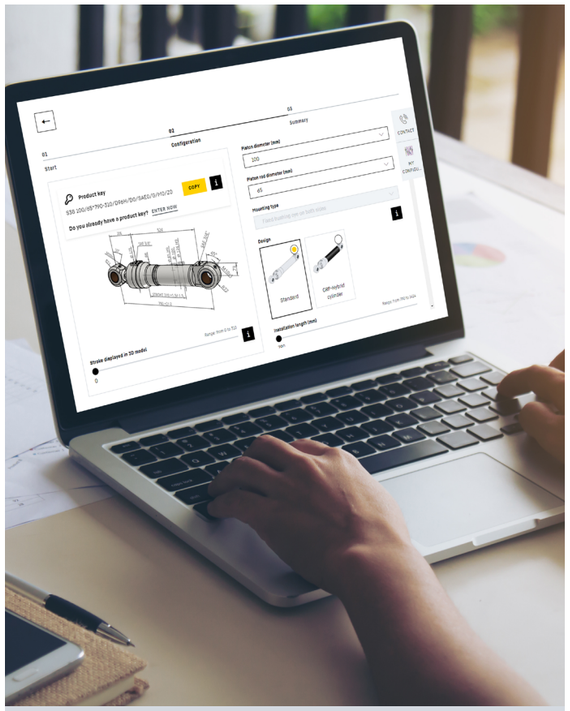
At Liebherr, quality lies at the heart of everything we do. We are committed to this goal at every stage of the value creation process.

What makes us strong

Tailored solutions for powerful products

Standards and certifications

- DIN EN ISO 9001:2015
- EN 13000 ff, EN 1090-1:2009+ A1:2011, EXC4 nach 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
- Maritime Register of Shipping (RMRS)



Consultancy

From the application-oriented design of a hydraulic cylinder to maximise service life, to the purposeful use of new technologies, we are here to support you with our many years of experience.

Our experts support customers worldwide in the development of hydraulic cylinders.

We also provide expert advice on the effective use of cutting-edge technologies, which we extensively promote and test in our factory. From the initial consultation stage, we plan ahead to ensure our products perform at their best and provide long-term added value for our customers.

What sets us apart

- Technical advice based on many years of experience
- Holistic approach: Reliable cooperation throughout the component's entire life cycle
- Complete solutions for hydraulic cylinders
- One-stop shop for lightweight solutions made of carbon fibre reinforced plastic (CFRP): We carry out all process steps under one roof, from design to manufacturing with our own winding machine and tempering oven for curing the material, to quality testing in accordance with Liebherr standards and assembly of the hybrid hydraulic cylinder.

Hydraulic cylinder series-production range – economical products with short delivery times

- 380 bar: Mobile and highly dynamic applications
- 260 bar: Mobile and stationary applications
- ISO 6022: Intelligent in stationary applications
- Online configurator for our hydraulic cylinder series-production ranges: Generate customised solutions simply and flexibly, 24/7

We develop solutions for individual requirements together with our customers. Our team enables us to manufacture high-quality, reliable products that are calculated down to the last detail.

What we offer

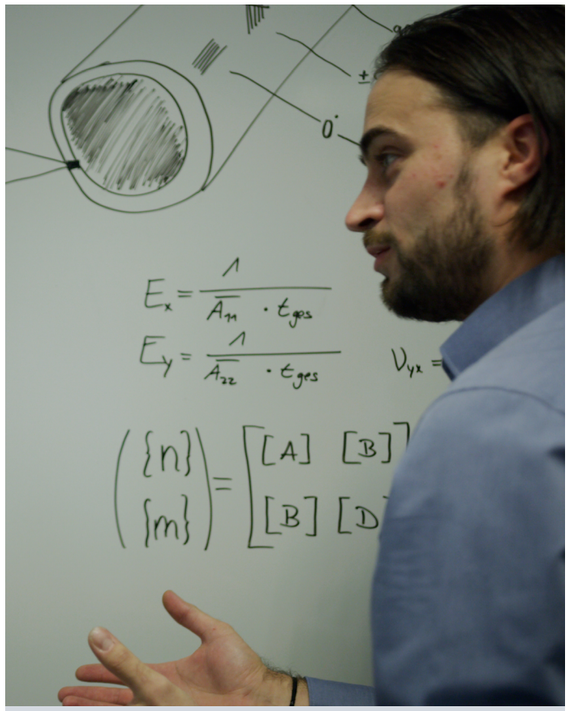
- Design: Detailed expertise in materials and manufacturing precision
- Powerful software:
  - 3D CAD systems
  - Use of simulation methods, such as the finite element method (FEM)
  - Testing and comparison of simulation results (pulse tests, endurance tests, etc.)
- Reversed Engineering: The cylinder is designed with sustainability and reparability in mind to extend its service life over several cycles
- Reliable 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 VI in the future

Development partner specialising in the use of sensors in hydraulic cylinders

- Monitoring the condition of the component
- Predictive maintenance: recognising component faults at an early stage



Development

We develop robust hydraulic cylinders featuring precise, application-specific designs. We utilise the latest methods and technologies.

What makes us strong

Entire production process takes place under one roof

Procurement | Mechanical production | Assembly | Painting | Logistics

Liebherr has the capability to manufacture hydraulic cylinders with a stroke of up to 8,000 mm. This includes the complete processing of the piston rods on specialised machining centres, highly efficient deep-hole drilling, and precise honing of the tubes, as well as cylinder assembly. The entire production process, including in-house testing and robot-assisted painting, takes place in-house.

Innovative strength
- Continuous improvement of processes
- Focus on creating reproducible and reliable processes

Modern welding technologies
- Robot-assisted welding systems
- Automatic clamping, centring and welding
- Friction welding process: High-strength, homogeneous material connection with the quality of a forged part, without the use of additives

Complete processing
- Piston rods and cylinder tubes are machined on state-of-the-art CNC turning and milling centres
- Automatic tool change for short throughput times

Honing, skiving and roller burnishing
- Final machining of the cylinder running surfaces takes place on site
- Processing to the correct dimensions, shape and surface finish
- Machining is possible up to an internal diameter of 500 mm

Standardised assembly processes
- Large cylinder assembly system
- Test benches for series and large cylinders
- High-pressure cleaning of components

Robot painting system and large cylinder painting
incl. sandblasting system

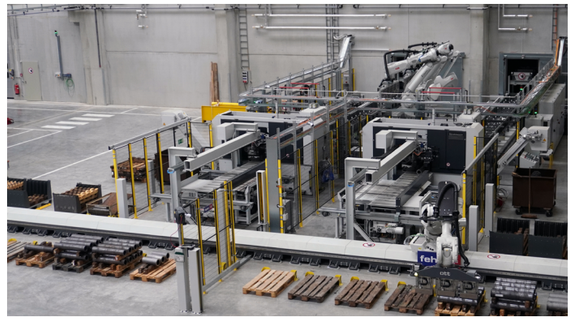
Logistics
- Packaging is ready for dispatch, according to the customer's requirements
- Organising customs clearance and transport with forwarding agents



Manufacturing

The basis for our high-performance cylinders is our flexible machinery and state-of-the-art production technologies. Our primary goal is to achieve economical, efficient and flexible production with short lead times.





Robot-controlled sawing centre
The transfer cassette store has a maximum storage length of 9,000 mm and comprises 765 cassettes. It is equipped with two band saws for diameters ranging from 40 to 300 mm, with a maximum saw length of 3,000 mm.



We use ultra-modern, **high-performance turning/milling centres** for the complete machining of large components. These centres are used to machine piston rods within the standard range, as well as cylinder tubes, shock absorbers, and piston rods within the large cylinder range.



Double welding systems accelerate the production of large and special cylinders. The cylinders are alternately loaded and welded by welding robots at two stations in order to minimise downtimes.

What makes us strong

Services for hydraulic cylinders



Services

The Liebherr service network is available worldwide, ensuring customers are never far from help. The high availability of original spare parts and the Liebherr-Reman programme significantly improve product lifecycles.

Our experienced service team is always on hand to help. We develop customised solutions that are tailored to your needs and offer long-term added value.

Our services

- Fast supply of spare parts
- Reliable repair and reconditioning (Reman programme)
- Support for the assembly and smooth commissioning of hydraulic systems
- Liebherr assembly bench with a customised design to maximise efficiency during repairs, including trainings for workshop personnel
- Practical training and certification for workshops carrying out repairs according to Liebherr quality standards
- Documentation: repair instructions and comprehensive information

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

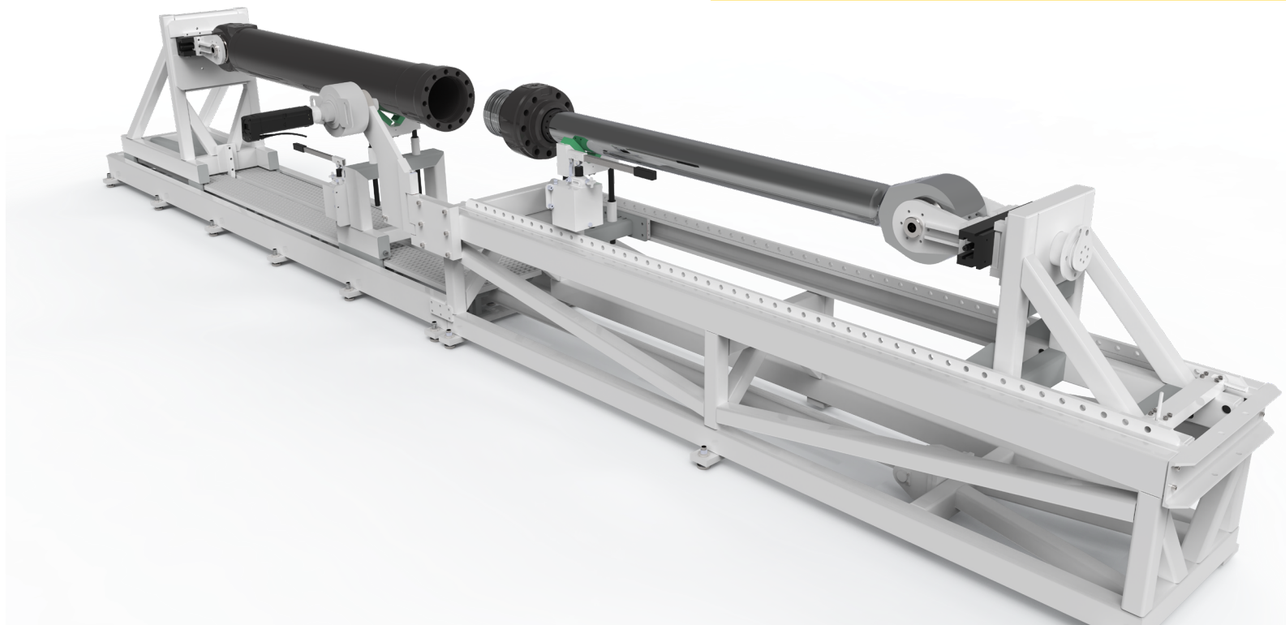
Would you like to find out more about our **service for hydraulic cylinders**? Scan or click on the QR code.

Do you run a hydraulic cylinder workshop and don't yet have a Liebherr assembly bench?

LiCYB stationary – Liebherr assembly benches

- Focus on sustainability: Our assembly bench was designed to maximise the service life of our products. By enabling efficient **repair and maintenance work using original spare parts**, we guarantee the long-term use of our hydraulic cylinders in a way that saves resources.
- Design highlights of the LiCYB stationary:
  - Height and width adjustment with drive
  - Ergonomic one-person operation
  - The piston is released quickly and with little effort
  - Electric torque spanner up to 17,000 Nm
  - Excavator cylinders up to 100 tonne class can be repaired
- Our assembly benches are available worldwide and are already in use in many workshops across Europe and North America.
- Our experienced service team carries out commissioning and training on client sites.

Discover how our assembly bench is **commissioned** to make repairs more efficient.



What makes us strong

Quality is the foundation of our hydraulic cylinders, which set the standard

We lay the foundations for a high-quality product from the outset of the development phase. From technical consultation to supplier selection and support, and throughout production, we ensure that the highest standards are met. A permanent operational quality assurance system accompanies us throughout production, immediately recognising and rectifying any issues.

All these measures are integrated into our **quality management system**, which encompasses everything from intensive supplier support and seamless process control to the continuous improvement of all company processes. Each individual step therefore contributes to sustainable overall quality.

Supplier management

Our tested processes guarantee quality and short delivery times that far exceed the industry standard.

Centralised quality & process management

All operational processes are continuously monitored and improved. The products undergo comprehensive testing before delivery.

Operational quality assurance

Initial and random sample testing, as well as state-of-the-art methods such as 3D measurement technology and ultrasonic testing, guarantee high component quality.

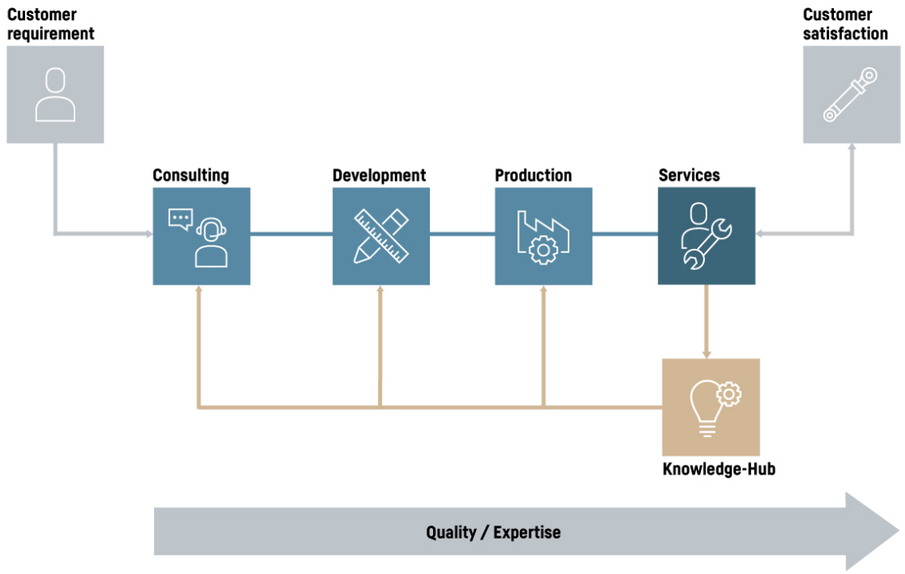
Test benches

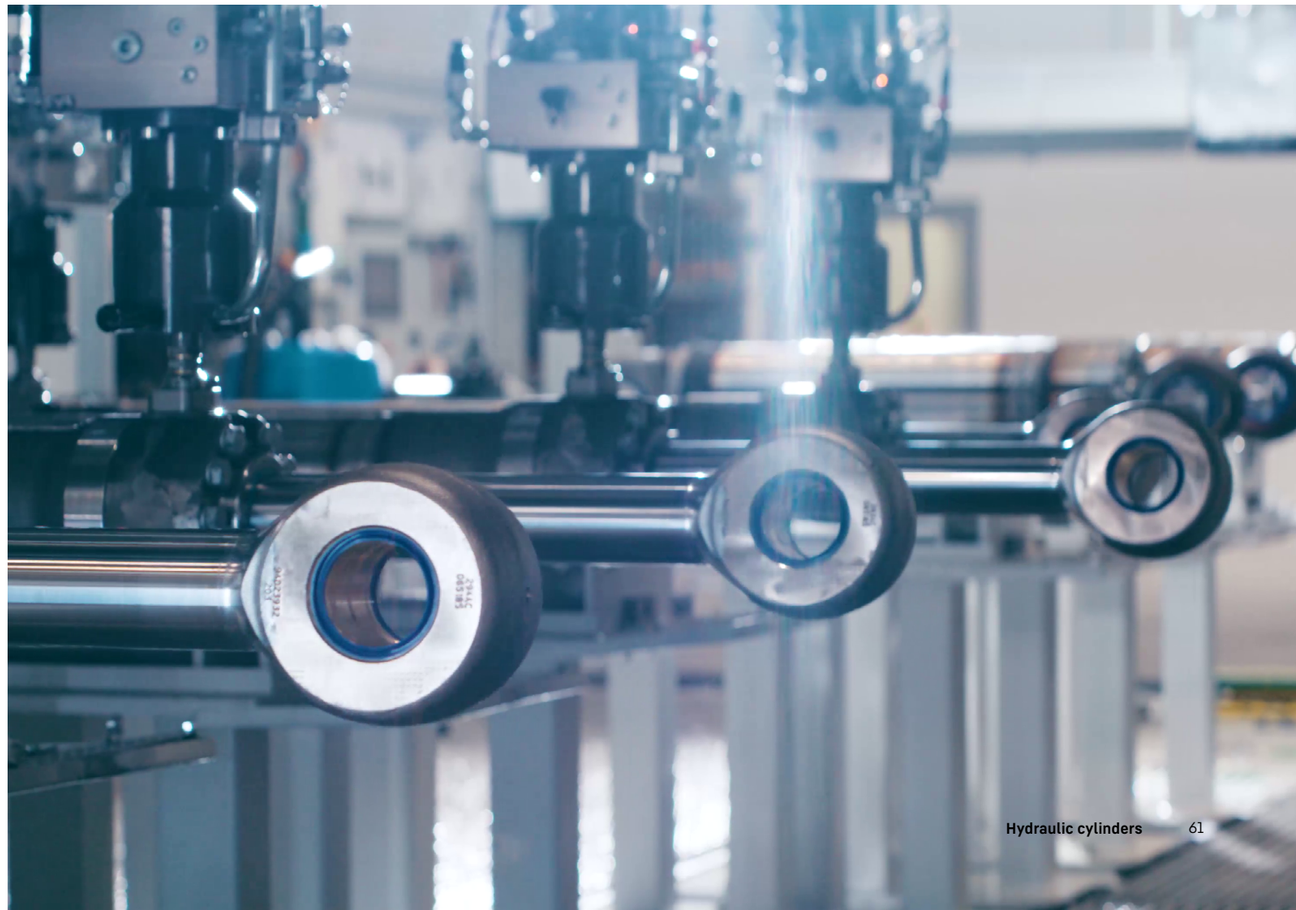
The reliability of the hydraulic cylinders is ensured by thorough functional and leak testing. The results are automatically recorded to ensure comprehensive documentation.

Our commitment to quality does not end with delivery

Maintaining hydraulic cylinders gives us valuable experience that we use to constantly improve our processes. This creates a closed quality cycle where each stage affects the next.

Center of competence for hydraulic cylinders





Where we shine

Projects that inspire

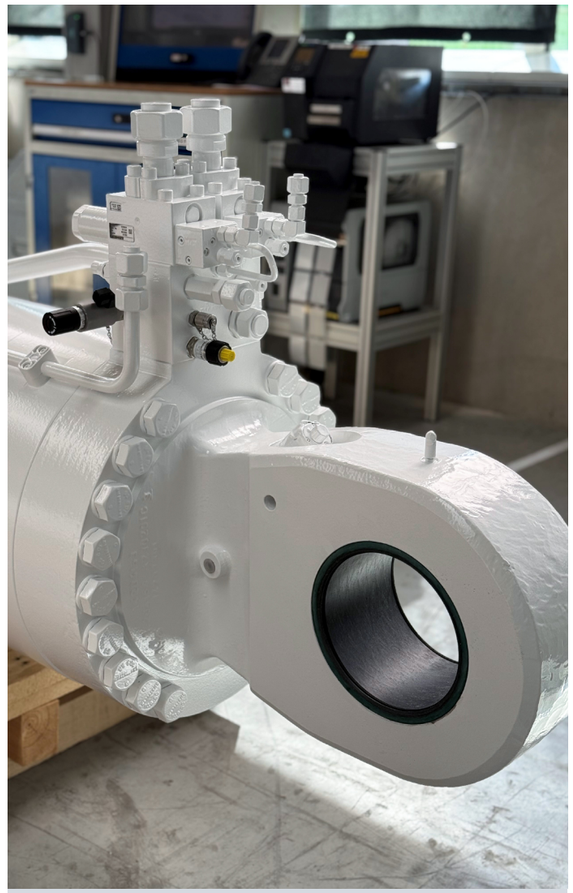
Largest order in the company‘s history
A total of 415 Liebherr machines, equipped with hydraulic cylinders and suspensions, are being delivered to the Australian mining group Fortescue – supplied by Liebherr-Components Kirchdorf GmbH.

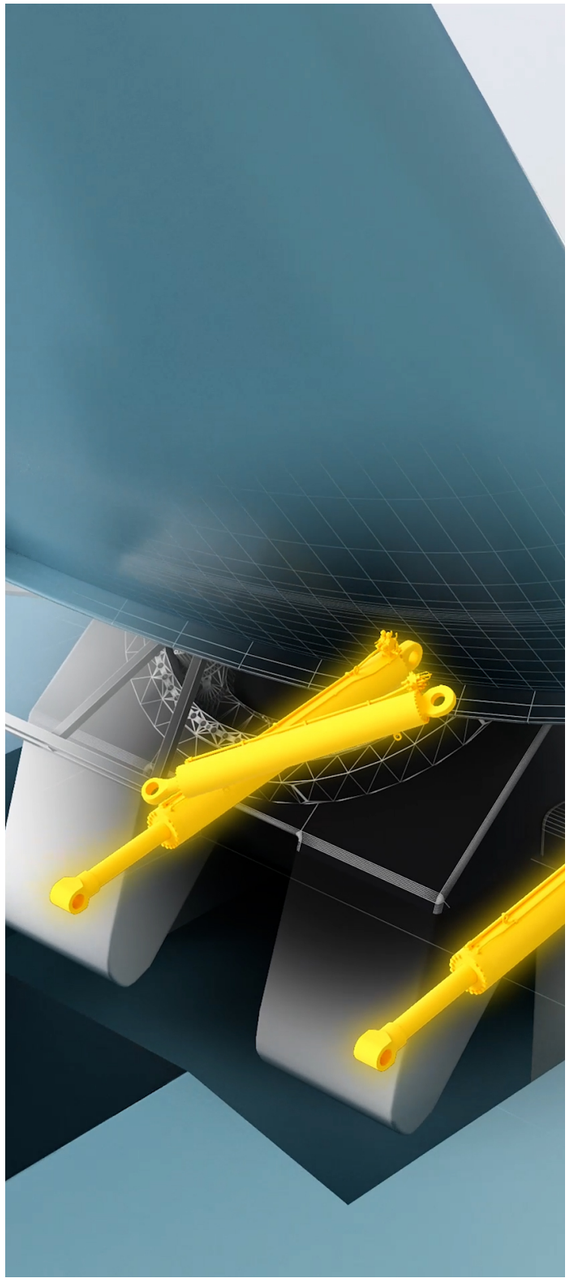




Advancing sustainable visions in mining

In collaboration with the technology group Fortescue, Liebherr is developing innovative, eco-friendly mining technologies and will supply 360 autonomous mining trucks and 55 electric excavators. The aim is to reduce Fortescue's CO_2 emissions significantly by 2030.





Wind-assisted propulsion systems

Liebherr supplies components for wind-assisted propulsion systems used in green energy shipping. Its offshore-certified, corrosion-resistant hydraulic cylinders are used to raise and lower the sail mast and to unfold and fold the two-part wing sails.





Lightweight construction in material handling

The handling machine is equipped with two carbon fibre reinforced plastic (CFRP) hybrid cylinders on the boom. The reduced weight of the hydraulic cylinders cuts energy costs and increases the load capacity for material handling.



CFRP hybrid cylinders in mining excavators

Two bucket cylinders made of carbon fibre reinforced plastic (CFRP) are already in successful use in their second life cycle in an Indonesian mine. They enhance the performance of the mining excavator. Thanks to the significant weight reduction, digging performance is increased, efficiency is improved, and emissions are reduced.



What drives us forward

Research into the hydraulic cylinder of tomorrow

We are shaping the future of hydraulic cylinders together with our customers and partners, taking an open approach to technology and focusing on innovation.

In our research and development work, we focus on high-quality, sustainable materials and coatings, precision manufacturing technologies, and intelligent hydraulic solutions. Our goal is to achieve maximum performance and reliability with a long service life and minimum energy and resource consumption.

For decades, our engineers have played a decisive role in shaping the industry. We want to continue setting the standard as a leading manufacturer of modern hydraulic cylinders.

What makes our hydraulic cylinders stand out?

Durable & robust

The cylinders are characterised by their robust design, ease of repair and sustainable construction, which maximises their service life and cost-effectiveness.

Intelligent

Integrated sensor technology enables the real-time monitoring of hydraulic cylinders, paving the way for predictive maintenance and the automation of construction machinery.

Sustainable

Our hydraulic cylinders are a forward-looking solution for industries that want to achieve both performance and sustainability goals, offering maximum efficiency while reducing environmental impact.

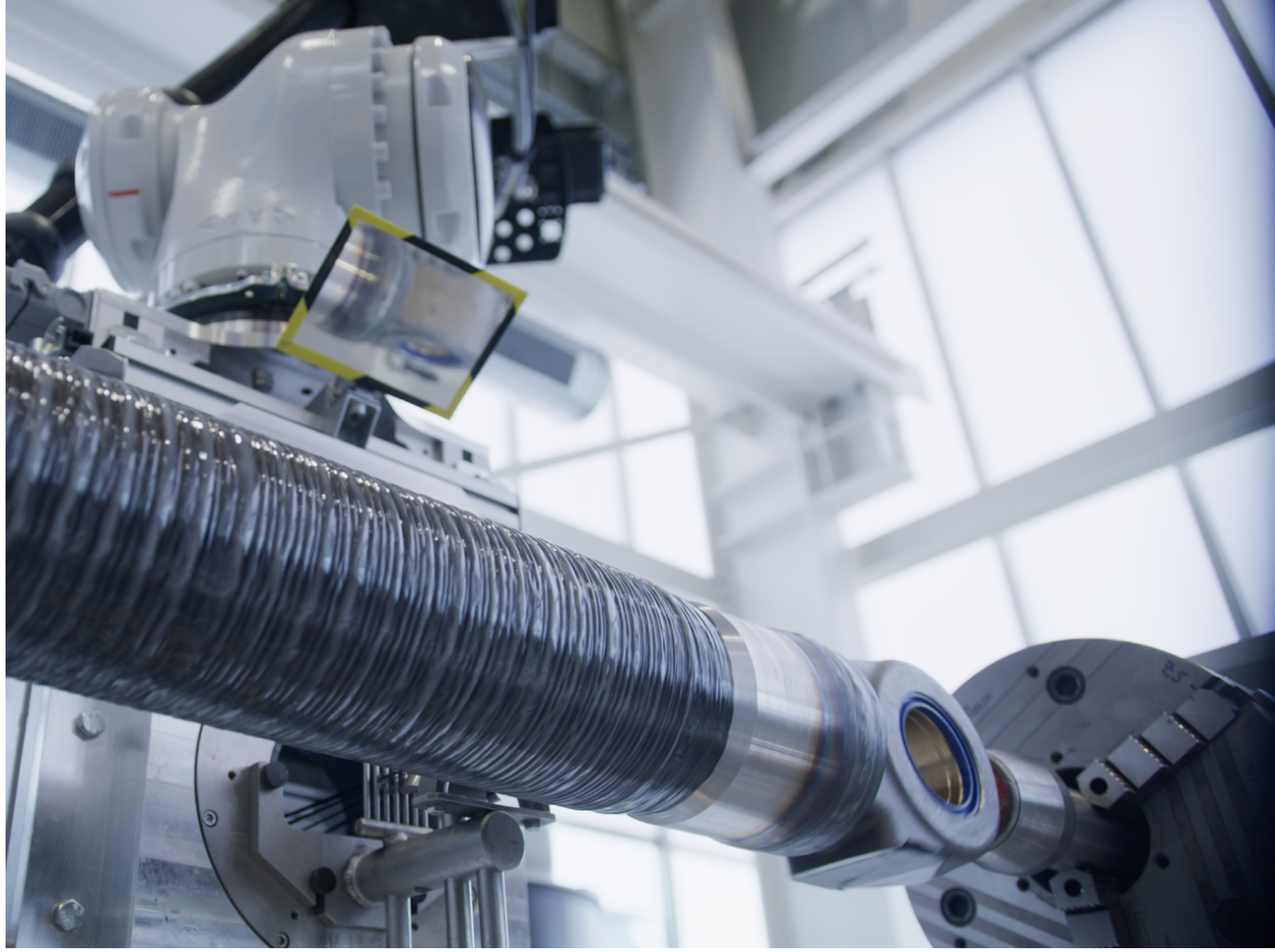


What drives us forward

Fibre composites and their unique properties

Imagine a material that is extremely light yet incredibly strong, and that can be precisely adapted to the end product‘s requirements. **Carbon fibre reinforced plastic (CFRP)** offers exactly this: carbon fibres are fused into a plastic matrix to form a composite material whose mechanical properties can be specifically controlled, ranging from high stability to exceptional flexibility.

The result is materials that can compete with steel in terms of strength, and surpass it in other properties. At the same time, they are significantly lighter, which is particularly advantageous in lightweight construction. Fibre composites therefore enable the production of more powerful, efficient and sustainable products, offering customers and developers maximum design freedom.



Advantages of fibre composites/CFRP

- Low weight
- High strength and rigidity
- Low density
- Positive corrosion and fatigue behaviour
- Good damping behaviour
- X-ray transparency
- Non-magnetic
- Customisable properties
- Adjustable thermal expansion



Lightweight design

Using carbon fibre reinforced plastic (CFRP) allows us to significantly reduce the weight of our hydraulic cylinders, thereby improving machine performance and reducing CO_2 emissions.

Why use CFRP hybrid cylinders?

- Increased efficiency through improved digging and handling performance
- Optimised attachment dimensions
- Lower CO_2 emissions during operation
- Compliance with permissible axle loads
- Realisation of longer booms
- Interchangeability with consistent installation situation
- Retention of tribological properties
- Reduction of cylinder tube expansion during pressure peaks

One-Stop-Shop for CFRP hybrid cylinders – we have all the expertise in-house. Scan/click the QR code now to find out more!

What drives us forward

Alternative, future-proof coatings for our piston rods

Were you aware that piston rod coatings are important for manufacturing hydraulic cylinders?

They protect the piston rod from corrosion and wear, thereby extending the component‘s service life. We have been testing and developing in this area for several years. This is in anticipation of stricter regulations in the future. It will enable us to offer alternatives to hard chrome plating well in advance of any changes.

What motivates us

Maximum service life for hydraulic cylinders

We develop coatings that are future-proof and make your hydraulic cylinders even more durable and resistant.

More options to suit your individual needs

We are working passionately on developing alternatives so that we can continue to offer you the best possible solution for your specific requirements in the future, while complying with strict environmental regulations.

Economic efficiency without compromise

Quality and cost must go hand in hand.
We ensure that you receive solutions that are both cost-effective and highly efficient.

Shaping the future proactively

We don‘t wait for change; we drive it forward. Our commitment to alternative coatings is setting new standards for sustainability, innovation and customer satisfaction.

Would you like to future-proof your product at an early stage by developing the right coating for your application in partnership with us?



What drives us forward

Customised sensor solutions for hydraulic cylinders

As a **development partner for our customers**, Liebherr-Components Kirchdorf GmbH is driving forward predictive component maintenance.

Pressure and temperature sensors can be integrated into hydraulic cylinders. These sensors monitor the condition and performance of the cylinders in real time. This technology enables wear to be detected at an early stage, failures to be avoided, maintenance schedules to be optimised, and unplanned downtime to be minimised.

Using sensor technology increases the safety and efficiency of machines and extends the service life of components.

This sensor-based approach is groundbreaking for the future of **autonomous construction machinery**.

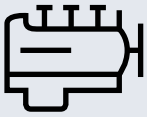
Would you like to find out more about **sensor solutions for hydraulic cylinders** that are suitable for your particular application and needs?

Components

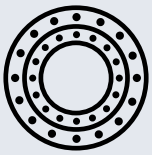
From A for drive units to Z for gear rims, the Components division of the Liebherr Group offers a wide range of mechanical, hydraulic, electrical and electronic drive and control technology solutions. These high-performance components and systems are manufactured to the highest quality standards at ten production sites worldwide. Liebherr-Components AG and the regional sales offices provide central points of contact for all product lines.

Liebherr is your partner for mutual success, supporting you from product conception and development to production, commissioning and customer service solutions such as component remanufacturing.

components.liebherr.com

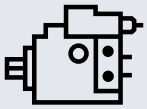

Combustion engines


Injection systems

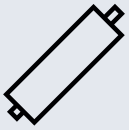

Slewing bearings


Gearboxes

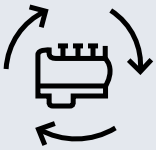

Rope winches

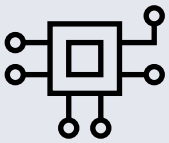

Hydraulic pumps and motors

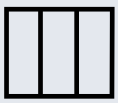

Hydraulic cylinders

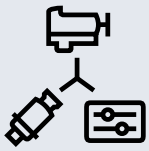

Piston accumulators


Electronic machines


Remanufacturing


IOT Solutions


Electric drive and control technology


Drive systems


Eletronic Aerospace


Fibre composites

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Find out more about hydraulic cylinders here