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# Lubricants and operating fluids

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## **LIEBHERR**

Earthmoving and material handling technology



# Lubricants and operating fluids

## Quality products for your Liebherr machine

You expect reliable performance from your Liebherr machine now and in the future.  
The Liebherr lubricants are precisely tailored to these requirements.





# Environmental protection

## Environmental protection

### Use of environmentally friendly hydraulic oils

Biodegradable hydraulic fluids are an environmentally friendly alternative to conventional hydraulic oils on mineral oil basis and are especially recommendable for use in environmentally sensitive areas such as water protection area.

Liebherr machines can either be filled with environmentally friendly hydraulic oil ex works or retrofitted at a later point in time. When selecting the right environmentally-friendly hydraulic oil, ecological aspects as well as technical aspects should be taken into account. Hydrolysis and oxidation stability, elastomer compatibility, temperature behavior and other properties of the oils used will influence the useful life of the filling and the service life of the components. This means: The total product life cycle from production through use up to disposal has to be taken into account when looking at environmental impact.

Liebherr offers you environmentally-friendly hydraulic oils based on polyalphaolefins (PAO). These have outstanding easy glide properties that can positively influence fuel consumption. If the oil is maintained and monitored properly, the oil change intervals can be significantly extended with these oils. The compatibility with elastomers and hoses as well as hydrolysis-stability are comparable with mineral hydraulic fluids.

## Developed and tested for your Liebherr machine

### Quality and reliability

To be able to meet the growing demands of lubricants in the future, Liebherr continuously invests in research and development of specifically tailored products for Liebherr machines. The lubricants correspond to Liebherr's high standards of quality. Liebherr lubricants thus enable trouble-free machine performance, short machine response times, good cold start behavior and a reduced warm-up phase. This also includes particularly precise and sensitive controllability of the machines.

Liebherr lubricants are distinguished by a long service life and offer the best possible protection from corrosion and wear for all components.

Take advantage of many years of experience, expertise and original parts from Liebherr. In this way, you can be certain that all components and lubricants are optimally matched and your machines return maximum performance.





# The Liebherr Lubricants Service

## Everything from one source

Profit from the many years of experience and the high quality lubricants and operating fluids from Liebherr. Take advantage of the comprehensive lubricants service from your Liebherr Service partner.

### **Expert advice and competent service**

With Liebherr lubricants, you are on the safe side. Your Liebherr service partner will assist you in all questions regarding the use of lubricants and operating fluids and, together with you, find the optimal product for your individual needs. In addition, he will be happy to provide you with information about the properties of the respective lubricant, about proper and safe use, storage and disposal. The Liebherr service partner will also gladly assist you in preparing your lubrication schedules.

Liebherr lubricants are available in the same high quality worldwide and can be delivered to the right location at any time as needed thanks to a perfectly coordinated logistics system. From Liebherr, you can obtain all of the lubricants and operating fluids for your Liebherr machine from a single source.

### **Oil care**

To preserve the quality and service life of an oil as long as possible and to ensure economic use, it all comes down to three factors: the selection of the right filter, a minimum degree of contamination of the oil by foreign substances and careful handling.

### **Original filters from Liebherr**

The quality of the oil has a decisive impact on the total life of the engine, transmission and complex hydraulic systems. Longstanding experience from the use of construction machines shows that a large part of all component failures as well as early wear are caused by contamination of the hydraulic system by solid particles. Poorly filtered oil or insufficient lubrication may cause serious and expensive engine damage.

Therefore, Liebherr uses only high-quality original filters in all of its machines. In this way, the risk of expensive component damage and machine downtimes is kept to a minimum. The difference between an original Liebherr filter and an imitation filter is often indiscernible from the outside. The Liebherr filters are subject to comprehensive tests. This ensures optimum processing and filtering performance. They are adapted optimally to the machine and the Liebherr lubricants and, as a result, they minimize the risk of poor filtration or leakages. Another contributory factor is the outstanding pressure stability of the Liebherr filters. Liebherr therefore recommends that only original filters from Liebherr are used and Liebherr servicing is relied upon.



# Oil analyses

## The cost effective alternative

Ever-increasing demands are being placed on modern hydraulics systems in terms of performance and precision, demands that the operating medium used in the system also has to fulfill. To safeguard the oil quality during consumption and thereby determine the oil change intervals optimally, Liebherr recommends that used oil analyses are carried out at regular intervals.



## Oil change at the right point in time

### The condition of the oil is decisive

During their use, hydraulic fluids are exposed in some cases to extreme conditions, environmental influences and risks. This can result in hazardous contamination and shortened effective lifespans of the oil.

### Oil changes in Liebherr machines according to the maintenance guideline

The necessity of an oil change depends essentially on the condition of the oil, which is influenced in no small way by the machine application. For normal use, change intervals for Liebherr oils are recommended in the operator's manual. Determining the condition of the oil is more precise by means of an oil analysis.

### Oil changes with lubricant analyses are a cost effective alternative

With the use of lubricant analyses in conjunction with respective care and maintenance, the oil change intervals during normal deployment can be significantly extended.



### Easy and efficient sample taking

With the prepared oil analysis sets, oil sampling can be carried out easily and efficiently. Clearly structured analysis reports provide information about the condition of the machine at a glance.

## Convenient diagnosis to protect your machine

### Protection and optimization

With oil analyses:

- Targeted oil change at the optimum point in time
- Find out about the condition of the lubricant inspected
- Discover potential damage at an early stage
- Reduce the burden on the environment with less used oil

### Ready-to-use analysis sets and online laboratory reports

With the practical analysis sets, samples can be taken quickly, cleanly and easily. The costs of a complete analysis are included in the price. For samples received in the laboratory by 12 noon with all of the requisite details, the lab reports will be returned by the next day at the latest and comprehensible comments.



### Advice from your Liebherr service partner

Your Liebherr service partner will assist you in all questions regarding the use of lubricants and operating fluids and, together with you, find the optimal product for your individual needs.

# Product range



## Motor oil

With Liebherr engine oil, you can maintain the properties of the engines fitted in Liebherr machines for as long as possible.

Product name	Viscosity / labeling	Ambient temperature
Liebherr Motoroil 10W-40	SAE 10W-40 ACEA E4	-25°C (cold start)
Liebherr Motoroil 10W-40 low ash	SAE 10W-40 ACEA E6	-25°C (cold start)
Liebherr Motoroil 5W-30	SAE 5W-30 ACEA E4	-30°C (cold start)
Liebherr Motoroil 5W-30 low ash	SAE 5W-30 ACEA E6	-30°C (cold start)



## Environmentally-friendly hydraulic oils

The high-performance oils Liebherr Hydraulic Plus, Liebherr Hydraulic Plus Arctic and Liebherr Hydraulic Plus 37 based on polyalphaolefins (PAO) are biodegradable (biodegradation (21 days, so-called primary degradation) according to CEC-L-103-12  $\geq 60\%$ ) and are suitable for applications in environmentally sensitive areas. The test method examines directly the disappearance of the oil up to the degradation level of water solubility.

Product name	Viscosity / labeling	Ambient temperature
Liebherr Hydraulic Plus	ISO VG 46	-30°C (cold start) to +45°C
Liebherr Hydraulic Plus Arctic	VG 25	-40°C (cold start) to +30°C
Liebherr Hydraulic Plus 37		-30°C (cold start) to 35°C



## Hydraulic fluid

Precise control and optimum efficiency, even under extreme operating conditions, are expected from hydraulic systems these days. Liebherr hydraulic oils were especially developed to meet these requirements and contribute significantly to the performance and efficiency of your machines. They are characterized by high thermal resistance and good elastomer compatibility, corrosion protection and minimization of wear. Furthermore, they allow long oil change intervals and reduce stick-slip.

Product name	Viscosity / labeling	Ambient temperature
Liebherr Hydraulic Basic 100	ISO VG 100	0°C (cold start) to +55°C
Liebherr Hydraulic HVI	ISO VG 46	-20°C (cold start) to +40°C

 Dump trucks  
 Crawler loaders

 Wheeled excavators  
 Crawler tractors

 Wheel loaders  
 Crawler excavators

 Telescopic handlers

## Use



## Properties and special features\*

- Long oil change intervals for diesel engines in Liebherr machines
- High wear and corrosion protection as well as aging stability



- Low-ash oil for diesel engine technology with exhaust gas treatment
- Long oil change intervals
- High wear and corrosion protection as well as aging stability



- Easy glide oil
- Long oil change intervals
- High wear and corrosion protection as well as aging stability



- Easy glide oil
- Low-ash oil for diesel engine technology with exhaust gas treatment
- Long oil change intervals

## Use



## Properties and special features\*

- Biodegradable
- Outstanding high and low temperature behavior with heavily reduced warm-up phase
- Significantly extended oil change intervals with respective oil care and monitoring through oil analyses
- Low air intake and good air separation properties
- Elastomer compatibility comparable with mineral oils
- Hydrolysis stability comparable with mineral oils



- Biodegradable
- Outstanding high and low temperature behavior with heavily reduced warm-up phase
- Significantly extended oil change intervals with respective oil care and monitoring through oil analyses
- Low air intake and good air separation properties
- Elastomer compatibility comparable with mineral oils
- Hydrolysis stability comparable to mineral oils



- Biodegradable
- Swedish Standard release
- Excellent low temperature performance
- Low air absorption and good air release properties
- Elastomer compatibility comparable to mineral oils

## Use



## Properties and special features\*

- Especially for hot climate zones
- Outstanding detergent and dispersant behavior
- Very good corrosion protection



- High-quality multi-grade hydraulic oil
- Optimized fine control with reduced warm-up phase
- Increased aging stability for long service intervals and low maintenance costs

\* Your Liebherr service partner will be happy to advise you if you have any further questions. Data changes due to further development and conversion of products are subject to change.

# Product range



## Axle and transmission oils

Axle and transmission oils from Liebherr were especially developed for components where high friction values and shearing forces occur. The use of high-grade basic oils and matched additives helps achieve optimum friction and wear behavior. This ensures a long service life of the components, even under demanding operating conditions.

Product name	Viscosity / labeling	Ambient temperature
Liebherr Gear Basic 90LS	SAE 85W-90	For Liebherr earthmoving machines: -30°C to +50°C in gearboxes, axles and splitter boxes without oil cooler -5°C to +50°C in splitter boxes with oil cooler
Liebherr Gear MF 80W	ISO VG 68	For Liebherr earthmoving machines: -30°C to +50°C in gearboxes, axles
Liebherr Hypoid 85W-140 EP	SAE 85W-140	For Liebherr earthmoving machines: -25°C to +50°C in gearboxes and splitter boxes without oil cooler +5°C to +50°C in splitter boxes with oil cooler
Liebherr Hydraulic-Gear ATF	SAE 5W-20	For Liebherr earthmoving machines: -25°C to +50°C in gearboxes and splitter boxes without oil cooler +5°C to +50°C in splitter boxes with oil cooler
Liebherr Syntogear Plus 75W-90	SAE 75W-90	For Liebherr earthmoving machines: -40°C to +50°C in gearboxes, axles and splitter boxes without oil cooler -20°C to +50°C in splitter boxes with oil cooler
Liebherr Gear ATF Plus 37	VG 37	-40°C to +40°C
Liebherr Gear Plus 20W-40	20W-40	-25°C to 50°C



## Coolants

Liquid-cooled engines need an effective coolant in order to sustain their performance on an ongoing basis. Liebherr antifreeze was tested to strict standards and, when used in Liebherr machines, meets the highest demands on function, quality, safety and environmental protection.

Product name	Viscosity / labeling	Ambient temperature
Liebherr Antifreeze OS Concentrate		
Liebherr Antifreeze OS Mix		> -37°C

 Dump trucks  
 Crawler loaders

 Wheeled excavators  
 Crawler tractors

 Wheel loaders  
 Crawler excavators

 Telescopic handlers

## Use



## Properties and special features\*

- Limited slip additives (LS additives)
- Good aging stability
- Developed for axle transmissions with limited slip differentials in
- Liebherr earthmoving machines and material handlers
- Optimized wear and corrosion protection



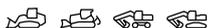
- Outstanding wear protection
- High shear stability
- Good response even at low temperatures
- Especially developed for new axle generation with LS additives
- Particularly suitable for very high thermal and mechanical loads with wet brake /limited slip differential systems



- Especially for final drives in Liebherr crawler tractors and crawler loaders
- High-pressure gearbox oil



- Excellent corrosion protection
- Special-alloy power transmission oil for automatic transmissions and special hydraulics in cranes
- Reduction of wear and friction



- Fully synthetic transmission oil with outstanding aging stability
- Reduction in fuel consumption
- Especially developed for low temperature use
- Long oil change intervals of up to 1000 Bh\*



- Designed for high-frequency shifting of the gear clutches
- Ideal for retarder use
- Excellent ageing stability and long oil change intervals



- Excellent wear protection
- High performance oil with special LS additive
- Good response at low temperatures
- Particularly applicable for very high thermal and mechanical loads in wet brake / limited slip differential systems
- Virtually no viscosity loss during operation

## Use



## Properties and special features\*

- Concentrate with extended change intervals for mixing with water
- Contains silicate
- Free of nitrate, phosphate and borate
- Effectively prevents corrosion and deposits in the cooling system
- Protection against cavitation and erosion damage
- Change interval of up to 6,000 Bh



- Ready-to-use mix with extended change intervals
- Contains silicate
- Free of nitrate, phosphate and borate
- Effectively prevents corrosion and deposits in the cooling system
- Protection against cavitation and erosion damage
- Change interval of up to 6,000 Bh

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# Product range



## Special lubricants

Liebherr offers special lubricants for special applications, such as the lubrication of screws or insert tools and wear sleeves in hydraulic and pneumatic hammers, which are designed to exactly meet these requirements.

Product name	Viscosity / labeling	Ambient temperature
Liebherr Fluid X-2	ISO VG 46	-40 to +50°C
Liebherr Coat Protect 900	solid	< 50°C (Storing)
Liebherr Cylinder Protect	viscous	-20°C to + 45°C



## Grease

Product name	Viscosity / labeling	Ambient temperature
Liebherr Universal Grease 9900	KPF 2 N-25	-25°C to +150°C
Liebherr Arctic Universal Grease	KPFHC 1 N-60	-60°C to +140°C
Liebherr Telescopic Grease 9613 Plus	KP 2 K-30	-30°C to +120°C
Liebherr Chisel Paste	MF 2-3 P-20	-20°C to +150°C

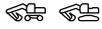
Dump trucks  
 Crawler loaders

Wheeled excavators  
 Crawler tractors

Wheel loaders  
 Crawler excavators

Telescopic handlers

## Use



## Properties and special features\*

- For application in the Liebherr energy storage cylinder
- Optimum wear protection
- Prevention of stick-slip
- Good elastomer compatibility
- Excellent high and low temperature behaviour



- Bonded coating with good surface wetting and adhesion
- Easy application
- Fast drying
- Temperature resistant up to 900°C



- Tested compatibility with the sealing systems used in Liebherr hydraulic cylinders
- Rapid water displacement
- Barium free
- No damage to the scraper as the product does not cure

## Use



## Properties and special features\*

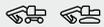
- VKA welding force > 6000 N
- Highly effective special corrosion protection
- Lubrication of swing ring, roller bearing, pins, gear rings, axles, bolts and much more.
- Pumpable and transportable in central lubrication systems at temperatures down to -20°C



- Pumpable and transportable in central lubrication systems at temperatures down to -55°C
- Lubrication of swing rings, roller bearing, pins, gear rings, axles, bolts and much more.
- Very strong adhesive properties, flex-stable, non-aging and water-resistant



- Special jib grease for telescopic applications in Liebherr machines
- Very low coefficient of friction
- Anti-stick-slip properties to prevent stick-slip motions, even under wet conditions
- High adhesive properties on plastic



- Special paste for lubricating insert tools and wear sleeves in hydraulic and pneumatic hammers
- Very resistant to flexure and oxidation as well as thermal loads
- Fill level can be checked easily through inspection window in cartridge

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# Oil sampling According to operating conditions

## No eco-friendly application (oil analysis optional)

Oil grade	Oil sampling in normal operation	Analysis set	
		Standard analysis	Advanced analysis
<b>Liebherr mineral oil</b>			
Liebherr Hydraulic HVI	every 1000 h	green set	yellow set
Liebherr Hydraulic Basic 68	every 1000 h	green set	yellow set
Liebherr Hydraulic Basic 100	every 1000 h	green set	yellow set
<b>Liebherr-PAO<sup>A1</sup></b>			
Liebherr Hydraulic Plus	every 1000 h	green set	yellow set
Liebherr Hydraulic Plus Arctic	every 1000 h	green set	yellow set
<b>Third-party product (ester)</b>	first at 1000 h, then every 500 h	green set	yellow set

## Eco-friendly application (oil analysis mandatory)

Oil grade	Oil sampling in normal operation	Analysis set
		Standard analysis
<b>Liebherr-PAO<sup>A1</sup></b>		
Liebherr Hydraulic Plus	every 1000 h	yellow set
Liebherr Hydraulic Plus Arctic	every 1000 h	yellow set
Liebherr Hydraulic Plus 37	every 1000 h	yellow set
<b>Third-party product (ester)</b>	every 500 h	yellow set

<sup>A1</sup> PAO = Polyalphaolefin





# The Liebherr Group



## Global and independent: more than 70 years of success

Liebherr was founded in 1949 when, with the development of the world's first mobile tower crane, Hans Liebherr laid the foundations for a family business now employing nearly 50,000 people and comprising over 140 companies across every continent.

The parent company is Liebherr-International AG in Bulle, Switzerland, whose associates are exclusively members of the Liebherr family.

## Leaders and pioneers

Liebherr is a pioneer and its forward-looking approach has seen it make important contributions to technology history over a wide variety of industries. Employees throughout the world continue to share the courage of the founder, sharing a passion to produce innovative products and a determination to provide world-leading equipment and machinery.

## Diversified portfolio

The company is one of the world's biggest construction equipment manufacturers and provides high-quality, user-oriented products and services to sectors including: earthmoving, material handling, deep foundations, mining, mobile and crawler cranes, tower cranes, concrete production and distribution, maritime cranes, aerospace and transportation, gear technology and automation, refrigeration and freezing, components and hotels.

## Customised care

Liebherr solutions are characterised by precision, implementation and longevity. The company is committed to technological excellence and to providing customers with solutions that match their needs exactly. That customer focus does not end with delivery of a product but continues through a comprehensive range of back-up and support services.

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

## Liebherr-Hydraulikbagger GmbH

Liebherrstraße 12 • D-88457 Kirchdorf/Iller • Phone: +49 7354 80-0 • Fax: +49 7354 80-72 94  
[www.liebherr.com](http://www.liebherr.com) • E-Mail: [info.lhb@liebherr.com](mailto:info.lhb@liebherr.com) • [www.facebook.com/LiebherrConstruction](https://www.facebook.com/LiebherrConstruction)