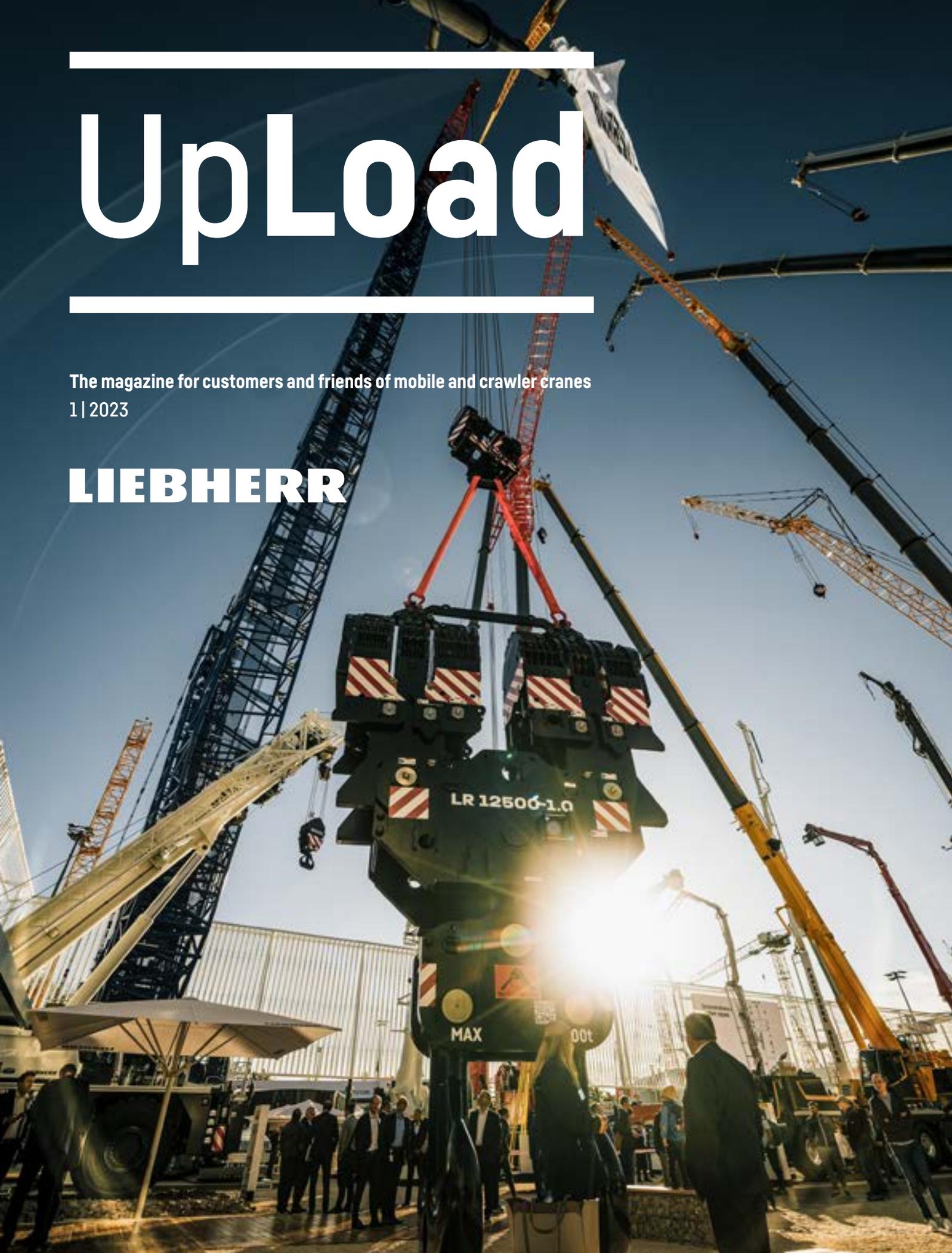

UpLoad

The magazine for customers and friends of mobile and crawler cranes
1 | 2023

LIEBHERR



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We use male pronouns simply to make our articles easier to read.
However, the content of the articles applies to all genders.

Dear Readers,

First of all, I would like to take you into the past. We are coming from the end of a year, which once again has been far from a normal one. It started as the third year of the coronavirus pandemic, saw the start of a war in Europe and included a mega event in October, Bauma. We are facing high inflation and the energy crisis and yet, despite all this, the mood throughout the industry is one of confidence. Many of you told me exactly this during 2022. And I am delighted that together, and including our 4,200-strong workforce in Ehingen and our global sales and service teams, we managed to react to many of these events and adjust well to them.

Good adjustment is also a feature of our new cranes – we launched four new models in 2022. In April we launched the LR 12500-1.0, a mega-crane and game changer – and not just in terms of design. A crane that is urgently required for the impending energy revolution – see page 52 for more. Then there was the electric version of our 50 tonne compact crane, which enables crane operations to be performed using electric power and therefore with zero emissions. This was a reaction to the subject of CO₂ emissions and therefore climate change. We exhibited this crane at Bauma with a mobile energy storage system – see page 124. We also unveiled the “master of all roads” in Munich. A 100 tonne crane of the latest generation, with LICCON3 crane control and a vehicle width of just 2.55 metres. But its real highlight is its many different driving modes with reduced axle loads which are very easy to adjust. This was our reaction to the difficult situation created by dilapidated bridges and the difficult subject of road permits, as you can see on page 34. And on top of all that, a new rough terrain crane with a lifting capacity of 130 tonnes, which rounds off our rough terrain crane portfolio at the top end, setting new transport and safety standards at the same time. It makes it well worth a look at page 24 – and a visit to the Conexpo in Las Vegas!

Alternative power units are another subject relating to adjustment. We as a group presented a truly unique range of alternatives in this respect at Bauma. From electric drive, be it battery or plug-in, HVO fuel and hydrogen engines to fuel cells – we have already developed lots of different technologies at our own competence centres and working with external development partners. You can find out more in “The world with Liebherr” starting on page 108. But it is not just future power unit technologies but also adjustments to how we use machines that can help to save CO₂ – find out more on page 94. And on page 40 we even show how our machines can help to protect nature in a spectacular job in Bilbao, Spain.



So we are always adjusting our cranes to suit future requirements. But we also go well beyond this into the area around the crane. For example, we are countering the increasing scarcity of trained personnel with digital solutions. We presented MyLiebherr at Bauma with a new look and lots of new functions. You can gain an insight into this on page 70 – and also at the Conexpo.

Lastly, I want to tell you about the wide range of investments which we are currently making. We have recently opened our new repair and service centre in Berg near Ehingen so that we can react even better to the rising number of Liebherr cranes in the field – you can read more about this on page 98. A large number of jobs around the world, some of which we report on in this edition, need cranes which are reliably, economically and properly maintained to make them suitable for their work. And we are working on this every day with everything we have.

Finally, I would like to wish you all a successful 2023 and hope for all of us that it will be a year that brings a little more positive normality to our lives.

A handwritten signature in black ink that reads "Ulrich Hamme".

Dr Ulrich Hamme,
Managing Director Design and Development,
Liebherr-Werk Ehingen GmbH

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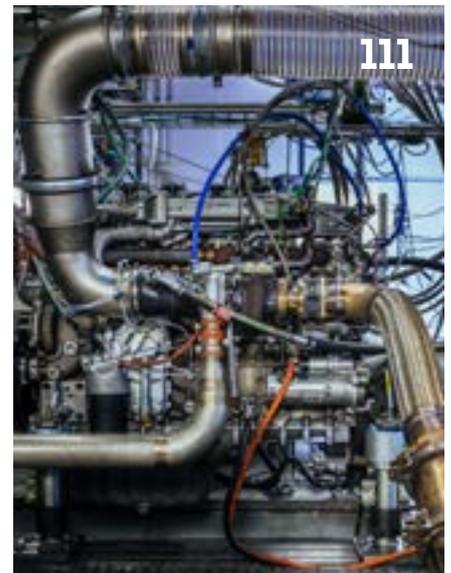
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Moments

Danish delicatessen...

...is not (yet) available at this site in Copenhagen. However, that could all change after the new building complex in the Danish capital has been completed. An LTM 1450-8.1 from crane rental contractor BMS was set up in full at the site to erect the first tower cranes as the only possible set-up area for the mobile crane was at the edge of the site.





Photo: Vandi Photography

Aotearoa – land of the long white cloud

That is the name for New Zealand in the language of the Maori. And New Zealand has also had a really big crane since 2022 – Smith Crane & Construction has taken delivery of a used LTR 11200. To carry out its first job in Kopaki, the crane was moved from Auckland southwards on around 20 heavy haulage vehicles and then erected to hoist bridge elements for the new State Highway 30.





Lock gate with panoramic Alpine views

Swiss building contractor and crane rental company Frutiger placed its trust in a time-tested power house to replace components of a lock gate on the River Aare in Thun, Switzerland. The LTM 1250-5.1 impressed with its unique lifting capacities in the 5-axle class.





500,000 visitors in Munich

In fantastic weather, Bauma 2022 was held for the first time in October due to the coronavirus pandemic and was visited by around 500,000 guests in Munich. A magnet for everybody – the 14,000 square metre Liebherr booth with over 70 exhibits from the world of construction machinery. Thank you for your visit!





A living meeting place

The rebuilt Berlin Palace on Spreeinsel in the historic centre of Berlin is home to the Humboldt Forum. The concept is designed to bring together collections from all over the world in memory of the spiritual legacy of Alexander and Wilhelm von Humboldt, provide areas for science and culture and deliver information about the history of the palace. After seven years of construction, a Liebherr mobile crane crowned the Palace in May 2020 with the magnificent, almost fully historically restored cupola.







Art in Copenhagen

The Royal Danish Opera House in Copenhagen is one of the most modern stages in the world. The building is a gift from the “A. P. Møller and Chastine McKinney Møller Foundation” to the Danish city. Arnold Peter Møller was the co-founder of Mærsk, one of the largest shipping companies in the world.

Designed by Henning Larsen, work on the building started in June 2001. The opera house was opened on 15 January 2005 with a special concert – after Liebherr cranes had already earned their own standing ovation.





A home for the yellow ball

The Arthur Ashe Stadium in New York is the largest tennis stadium in the world and the venue for the US Open. Built in 1997 and named after American tennis star Arthur Ashe (1943-1993), the court can hold around 24,000 spectators.

Plans for a roof structure were started in 2013 and the modification work was completed in 2016 - with hard-working Liebherr cranes lending a helping hand. Today, the roof can be closed in 5 minutes 42 seconds.





Made with Liebherr

Magnificent buildings steeped in history, famous cultural attractions or stadia with thousands of people watch matches and concerts. In short – venues that are exciting for all of us and leave their mark. And venues about which we can proudly say: Made with Liebherr.



LTM 1500-8.1 places the crown on city palace

In autumn 2020, an LTM 1500-8.1 owned by Mobi-Hub completed a job in the centre of Berlin in front of a large crowd – the 8 axle crane placed the magnificent cupola on the new Humboldt Forum. The historically reconstructed cupola is decorated with eight angel figures and palm leaves. The reconstruction of Berlin Palace, which was destroyed several years ago, has been undertaken to restore Berlin's historic cityscape.

The reconstruction of the former Berlin Palace was started in 2013. Since 2021 it has been home to non-European collections and other exhibitions. It also provides a new venue for lots of public events. The LTM 1500-8.1 crowned the Palace with its magnificent, almost completely historically reconstructed cupola. The public watched the cupola being hoisted by the 8-axle crane with great interest. It had been set up with a 42 metre luffing lattice jib and 90 tonnes of ballast to enable it to hoist the filigree load to a height of 70 metres.

Liebherr cranes place the roof on the largest tennis stadium in the world

The Arthur Ashe Stadium in New York is the largest tennis stadium in the world. The stadium was modified between 2013 and 2016 and fitted with a retractable roof to avoid all too frequent match postponements at the US Open caused by rain. A Liebherr LR 11000 crawler crane and two LR 1600/2 machines operated by American crane contractor Buckner HeavyLift Cranes put the steel structure for the roof in place over a period of ten months.

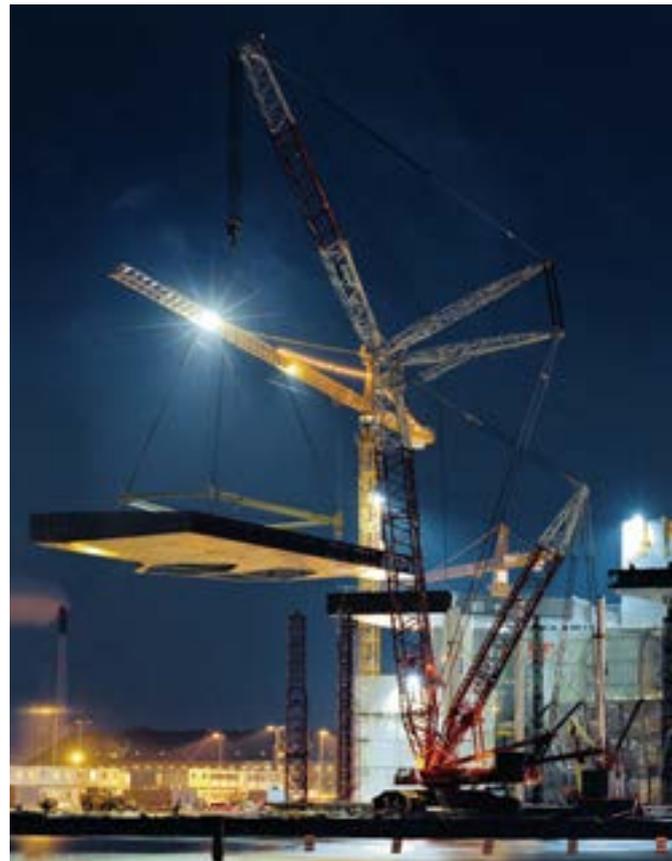
The three heavy duty cranes were at the site from autumn 2014 to July 2015 to complete the roof structure. The route to the installation of a roof on the stadium had been difficult as the American Tennis Association USTA had been looking for ten years for a solution, which was both feasible in terms of costs and logistics, and would also fit in with the architecture of the stadium as a whole. The stability of the foundation soil also caused problems. "The site was a major challenge logistically and a great deal of planning was required just to erect and dismantle the cranes. Liebherr crawler cranes feature an efficient erection process and short set-up times. That helps to keep costs down", says Kevin C. Long, Project Manager at Buckner.



Steel giant positions steel segments

A sophisticated material transport process was the start of a spectacular crane job for a Liebherr LR 1750 crawler crane in Copenhagen, which lasted almost two months. The heavy duty crane was required to hoist five roof segments for the construction of the new opera house. In 2003, over 50 low loaders set off to transport the flagship of crane contractor Riga Mainz (then known as Riga & Eisele) to the Danish capital over 800 kilometres away.

The team from Mainz had to maintain a minimum distance of six metres from the temporary quay wall for positioning and moving the LR 1750 heavy duty crane. The crawler crane was not allowed to get closer to the bank as during its hoisting processes with full ballast and a gigantic load on the hook, a total weight of around 1,300 tonnes was pressed into the ground. "During the lifts, some of which were carried out at night due to bad weather, we had a net weight of 235 tonnes. With hook block and slings, such a load case added up to about 265 tonnes," recalls Uwe Langer, owner of Riga Mainz and at the helm of the crane at the time. The roof structure was towed from the Danish mainland to the Copenhagen port basin on a floating bridge and then hoisted into place by the LR 1750. After hoisting the load, the crane had to move around 25 metres to the site. The heavy components remained on the hook for up to 24 hours after being positioned before they were welded accurately into the structure. "This LR 1750 was clearly the start of a new generation of crawler cranes, which is now fully established. With a wide range of features which Liebherr implemented for the very first time in this crane model and which today seem to be a matter of course", says Langer.



Mobile and crawler cranes

The first in Turkey

An LR 1700-1.0 has also been calling Turkey home since 2022. The first job for the 700 tonne crane owned by crane rental company Sistem saw it successfully hoist a 350 tonne reactor system into position in a fertiliser factory near Busa. And it did so in extremely constricted conditions.





The family keeps on growing



The toughest in the roughest

Munich was the place to be during the last week of October – at least if you are in the cranes or construction business. During the Bauma show, many new machines could be discovered at the world largest trade fair. And large is quite the right word to describe our new rough terrain crane. Why? Simply because this one is now the largest in our LRT product line. But what makes this crane special beside being the biggest one?

“When we launched our first two rough terrain cranes in 2017, we started with a 90 tonne machine, the LRT 1090-2.1 and a 100 tonne crane, the LRT 1100-2.1”, reports Julian Rapp, Product Manager at Liebherr in Ehingen. “These were the right machines to start with. Built with a clear concept that we called KISS – keep it simple and safe.

Our goal was and is to offer the safest rough terrain cranes. But not only safe, also highly efficient, economical as well as easy to transport and operate. The feedback on these two cranes has been very good to date – and the question for a larger unit has come up again and again in recent months.”



For lots of markets and every site

At this point, it was the right time to start raising questions in the biggest market for rough terrain cranes – North America. Beau Pocock, product manager for RT cranes at Liebherr USA, Co. was eager to get together with customers and came up with a load of interesting requests. “The market for larger RT cranes is growing at a fast pace in the USA. The need for a machine in the 120–140 tonne range was voiced loudly by our customers. This also solidifies the fact that we at Liebherr intend to offer a full line of RTs to our customers. That’s why the main market for this new machine is the US and Canada, but we also see big chances for such a crane in Latin America and the Middle East.” The engineers back in Ehingen asked the product

management for application areas of a larger RT crane, to understand the customers needs and to develop the right crane concept. Pocock explained that “for the US, there is a wide variety of applications. The strongest markets would be petrochemical and industrial jobs, the crane will be used as a bare rental machine there. Another strong market would be wind power, this crane will be great as a tail crane for rotor blades, the assembling of larger cranes such as crawler cranes like the LR 1800-1.0 or the LR 11000, and larger LTMs like the LTM 1750-9.1. The mobility of the new crane and its 60 m (197’) boom will open the door to many markets such as tilt wall construction setting trusses, cell tower work and so on.” Georg Reinbold, Head of Sales Latin America & Middle East at Liebherr in Ehingen,

1.

The telescope sections are extended and pinned fully automatically by our Telematik fast cycle telescoping system.

2.

Fully monitored:
The crane monitors the outriggers, the ballast installation and the installation of the optional double folding jib with angle adjustment.

3.

Worldwide safety standard:
Global uniform safety standard which complies with all current regulations – ASME B30.5, EN 13000, Australian Standards (AS) and GOST standard.

4.

Economical transport:
The crane’s dimensions are designed to ensure global economical transport on low loaders.

5.

Safe and variable support:
VarioBase® support technology delivers higher lifting capacities and also ensures maximum operational safety.



Beau Pocock presented the LRT 1130-2.1 to lots of customers from North America at Bauma.



Georg Reinbold and Julian Rapp discussing the new 130 tonne crane.

adds: "Beside these applications in North America, we also see a huge market in South America and Mexico, especially in the mining segment, where such crane acts just like a Swiss pocketknife for many different jobs. And we also have requests from customers for port handling applications, where such crane will fit in just perfectly. Also, in the markets in Middle East, we are convinced that this crane will be a helpful multitool for the oil and gas industry."

Having these huge markets and many applications in mind, the engineering departments in Ehingen went straight to work. It was clear that our customers will expect superior lifting capacities than that of other machines in this class. And for sure the machine must follow the successful principle of the two other rough terrain cranes in our product line – KISS. Regarding transport, "we've been asked for a machine in this class to transport easily in two loads, which the LRT 1130-2.1 does very well now. Just under 9.4 m (30 feet) in length and a transport weight of 44.8 tonnes (106,000 lbs). The North American market for rough terrain cranes is mostly a bare rental market, and so it was important for us that the new LRT 1130-2.1 is in a similar price level as other 120–130 tonne machines to keep the rental rates profitable for our customers", says Pocock.

The new standard in the 130 tonne class

The toughest in the roughest. That's the slogan we at Liebherr have chosen for this new enlargement of our rough terrain crane product range. Talking about the key arguments of this crane, Pocock goes on: "The LRT 1130-2.1 offers many advantages to any customer and defines a new standard in the 130 tonne (140 US-ton) class. Offering the largest capacity in its class on two axles, with a footprint comparable to smaller models is a key point. The global safety standards make it the safest crane in the rough terrain crane market. The larger cab is more comfortable than any cab of a rough terrain crane. On top the LRT 1130-2.1 offers more standard features than any crane of its type in the market." And also Reinbold is convinced that "all these great features make the LRT 1130-2.1 the best choice for customers, and that's not just North and Latin America as well as the Middle East, no, it's clearly all over the world."



A tricky job completed perfectly – the LRT 1130-2.1 can be transported economically in two units.

Easy transport and maximum safety

Like the other rough terrain cranes in the family, the LRT 1090-2.1 and the LRT 1100-2.1 cranes, the LRT 1130-2.1 also complies with a global, uniform safety standard and thus with globally valid regulations such as the US ASME B30.5 standard, the European EN 13000 standard, the Australian Standards (AS) and the Russian GOST standard. This is another key argument, coming from the KISS principle.

Julian Rapp sums up: „Our goal was to develop the strongest 2-axle-rough terrain crane on the market with the longest telescopic boom and an acceptable transport weight. These three pillars, capacity, reach, and transport were developed based on our customers feedback and the demand in that market class. It was great to hear the feedback from many customers in Munich during the show – and not only from North and Latin America, but also from many other countries around the globe where we did not expect such great feedback coming from. We are looking forward now getting the first units delivered into the different markets and we are also interested to hear more feedback at the presentation during the Conexpo in Las Vegas.”

Technical data



130 t / 140 USt



60 m / 197 ft



66 m / 217 ft



85 m / 279 ft



To find out more, go to:
<https://go.liebherr.com/1e7n9x>

World record at the start





The first ever LTM 1300-6.3 has been delivered



There has never been anything like it – a mobile crane that can carry a 90 metre telescopic boom with an axle load of just twelve tonnes. Unthinkable in the past. But our brand new LTM 1300-6.3 can do it. And it can do a whole lot more. We have packed our new model with just about everything that makes a crane operator's heart beat faster.

At last, we were ready by the end of November – the first of our new Liebherr LTM 1300-6.3 mobile cranes passed through the gates at the Liebherr plant in Ehingen and set off on the trip to its buyer in Switzerland. Its precise destination was Feldmann Pneukran + Transport AG based in Bilten east of Lake Zürich. The company, a long term Liebherr business partner, did not shilly-shally and immediately carried out a trial using its new purchase. Right at the top of the immaculate 300 tonne mobile crane's to-do list were two dismantling jobs for construction cranes. The new crane completed both jobs swiftly and to everybody's satisfaction – or actually, to everybody's delight.

"I've sat in a few cranes in my time, but this one is the absolute tops", said a very enthusiastic Patrick Geyer. The crane operator was in control of the LTM 1300-6.3 on both sites. The combination of man and machine made its debut in Regensdorf near Zürich. An enormous top-slewing crane with components with a gross weight of up to 12.6 tonnes and a radius of almost forty metres had to be dismantled. But there was no set-up area for the mobile crane anywhere close to the construction crane on the massive site. As far as Patrick Geyer is concerned, this demonstrated how well his new machine is designed for this work and how stable the chassis is. "When it was hoisting really heavy components, my crane on its outriggers didn't move a millimetre. Even though the machine is getting towards the limits of its lifting capacity, you don't feel a thing. It's rock solid." This dismantling job used 70 metres out of the total of 90 metres of telescope length. The LICCON control calculated the perfect configuration of the individual telescope sections for the load. This can be seen very clearly on the double-page spread on the previous page.



Masterpiece for the fleet

Christina Lenz, CEO and Member of the Board of Directors at Feldmann Pneukran + Transport AG, symbolically accepts the key to the first ever LTM 1300-6.3 from Marc Bollinger (Liebherr). To the left of her is Patrick Bösch, Crane Department Manager at Feldmann, Crane Operator Patrick Geyer and Gregor Blickenstorfer (Liebherr).

Feldmann is based in Bilten and has two more outlets in Dietlikon near Zürich and in Schmerikon on the western tip of Lake Zürich for its activities focusing on crane work, heavy haulage and installation equipment. The modern company has two dozen mobile and mobile construction cranes in operation on a daily basis.

High above Lake Zürich

our service engineers are shown here dismantling a Liebherr 132 EC-HM construction crane. This second job for the new LTM 1300-6.3 in Wädenswil on the south bank of the lake was also completed in very quick time.

90 metre boom length impressive

Whilst Geyer was busy dismantling the construction crane, we also came across Konrad Schönenberger at the enormous site. He is an experienced workshop manager at Feldmann and was previously a crane operator for many years. He travelled from his repair centre at Schmerikon for the new 300 tonne crane because he was curious to see the first ever LTM 1300-6.3. 24 years ago, he was actually the first person to sit in the cab of the then prototype of the LTM 1300-6.1, the predecessor of the new crane. "That was in 1999 when I worked for a company called Bollhalder. At the time we had to place a wooden bridge over a river", recalls Schönenberger. "My crane had a 60 metre boom. And now it's a massive 30 metres more – that's really incredible. And the new crane actually looks quite a bit more filigree."

On our latest product, however, we did not just work on the length of the boom of course. The clever overall design of this machine, which only requires two additional transport vehicles for the ballast, makes the LTM 1300-6.3 a genuine fast-erecting crane. The 90 metre boom it carries is ideal for erecting construction cranes and working on high buildings or plants. And if the mega-boom turns out to be too short for a job, hoist heights and radii can be drastically increased using hydraulically adjustable lattice jibs, which are up to 43 metres in length.

Simply sensational

"It can also hoist loads of up to 80 tonnes using the set of sheaves it carries. And this also enables it to move



smaller loads very quickly", explains Florian Brunner from our Product Management team. "That is made possible by the high line pull of 12.2 tonnes, which we managed to achieve with the crane. With the LTM 1300-6.3, we also ensured that the width of the basic ballast at three metres does not project over the chassis. This is often a major benefit if the crane has to be moved on site", adds Brunner. And another benefit at constricted sites: "The manually adjustable VarioBallast® delivers a radius of less than five metres in its minimum configuration. If space is at a premium, this is an immense benefit for slewing and unique on cranes in this lifting capacity class." The trapezoidal VarioBase® Plus support system and the WindSpeed load charts with the load charts adjusted to high wind speeds are a couple of additional major features which we have also packed into the new mobile crane.

In any event, Feldmann's innovative, compact power pack completed the two jobs on the banks of Lake Zürich with consummate ease. Patrick Geyer summed it up perfectly afterwards: "It is sensational to drive on the road and can be ballasted very quickly at the site. I find the crane control extremely good as the load can be moved with great precision, even when using a long boom. I am also positively surprised by the crane's handling and speed."





LTM 1100-5.3

MERCEDES



LTM1100-5.3



**The master
of all roads**



LTM 1100-5.3 – powerful lightweight with a narrow gauge

Describing a mobile crane as a “lightweight” is actually a contradiction in terms. But we are doing it anyway because our new LTM 1100-5.3 is the lightest 5-axle mobile crane in history, giving it maximum mobility through consistent lightweight construction. The LTM 1100-5.3 can get to places that no other 5-axle crane can access.

You may have seen the LTM 1100-5.3 live already – we unveiled it at our Bauma stand in Munich on a 2.55 metre “road”. Not only is it the lightest, but it is also the narrowest mobile crane on five axles. The LTM 1100-5.3 combines mobility, performance and economy on a whole new level – it features a powerful 62 metre telescopic boom and can

carry up to 16.9 tonnes of ballast on public roads with an axle load of just 12 tonnes. Our new 100 tonne crane also delivers global economical mobility as it can travel with an axle load of just 9 tonnes. That is a unique new feature for 5-axle mobile cranes. That is also the reason that we created its slogan, “The master of all roads”.

Narrow gauge

The LTM 1100-5.3 is the only 5-axle mobile crane with a width of just 2.55 metres.



“It is becoming more and more difficult to obtain road permits and the rapidly rising number of restrictions are a massive problem.”

Laura Rothmund

Shipment Liebherr-Werk Ehingen GmbH

No more diversions

In their everyday crane business, our customers not only want maximum performance and boom length, but are also ever more frequently faced with the topics of mobility and road permits.

Laura Rothmund from our Shipment Department, one of whose jobs is to apply for road permits for cranes ready for shipment, knows all about this: “A whole series of bridges which are now ageing or are already showing signs of damage now have reduced weight limits which means that they are no longer suitable for all cranes. For example, for trips to the German North Sea ports, we have to undertake long diversions to bypass these bridges. In this respect, the new LTM 1100-5.3 is worth its weight in gold because its nine tonne axle load and gross weight of less than 44 tonnes mean that not only can it reduce journeys by many kilometres, both our customers and we are benefiting from shorter processing times and longer validity periods for road permits and from fewer road and driving time restrictions.”

There are ramshackle roads and bridges in many countries which is why demand for cranes with lower axle loads and gross weights is growing in many parts of the world. Julian Rapp from our Product Management team worked on the design of the new LTM 1100-5.3: “We achieved an axle load of nine tonnes on this crane simply by removing the counterweight plates. It could not be simpler. On other cranes, components such as outriggers have to be removed to achieve the same result. But of course that is much more complicated.”



Designed for the comfort of crane operators

New multifunction steering wheel, improved instruments and keypads as well as new displays.

Flexible axle loads

Our Design, Structural Engineering and Product Management teams are working closely together to find the best possible weight distribution for the individual counterweight plates to demonstrate a range of practical axle load versions. For the LTM 1100-5.3, we designed the counterweight plates so that it can carry 4.4 tonnes of ballast with an axle load of ten tonnes and a gross weight of 48 tonnes.

“Our customers take as much ballast with them as they are allowed so that they use the maximum performance”, says Julian Rapp. “With an axle load of 12 tonnes, the innovative 100 tonne crane can carry up to 16.9 tonnes of counterweight. That is 75 percent of the maximum ballast of 22.5 tonnes. It is a real highlight and a new record for mobile cranes worldwide. It means it can complete almost all its jobs without additional ballast transport. It is a genuine taxi crane.” Laura Rothmund continues: “This crane provides our customers with maximum flexibility in terms of axle load versions and gross weights.”

Successful launch

The large number of orders received at Bauma demonstrates that the LTM 1100-5.3 is proving popular with our customers. The new crane features all the innovations from recent years, including VarioBallast® - and it is the second crane model with the new LICCON3 control. And of course its boom length and performance are not lacking either. At 62 metres, the telescopic boom is actually two metres longer than the next larger crane, the LTM 1110-5.2. As a result of its lightweight boom, the 12 tonne axle load version, in particular, delivers lifting capacity values for large radii that no other crane can match.

Julian Rapp regards the vehicle width of just 2.55 metres as another highlight of the new 5-axle crane. “It makes the crane extremely flexible, both on the road and on constricted sites. The dimensions of the LTM 1100-5.3 also make it ideal to enter the “Truck cranes” market, which is particularly popular in the USA.”



A shiny option
LTM 1100-5.3 with aluminium rims travelling in the Swabian Jura.



To find out more, go to:
<https://go.liebherr.com/36d1b8>

“When we designed the LTM 1100-5.3, our particular focus was on lightweight construction.”

Julian Rapp
Product Management Liebherr-Werk Ehingen GmbH

Technical data



100 t



62 m



64 m



76 m



2.55 m

Cranes protecting the environment





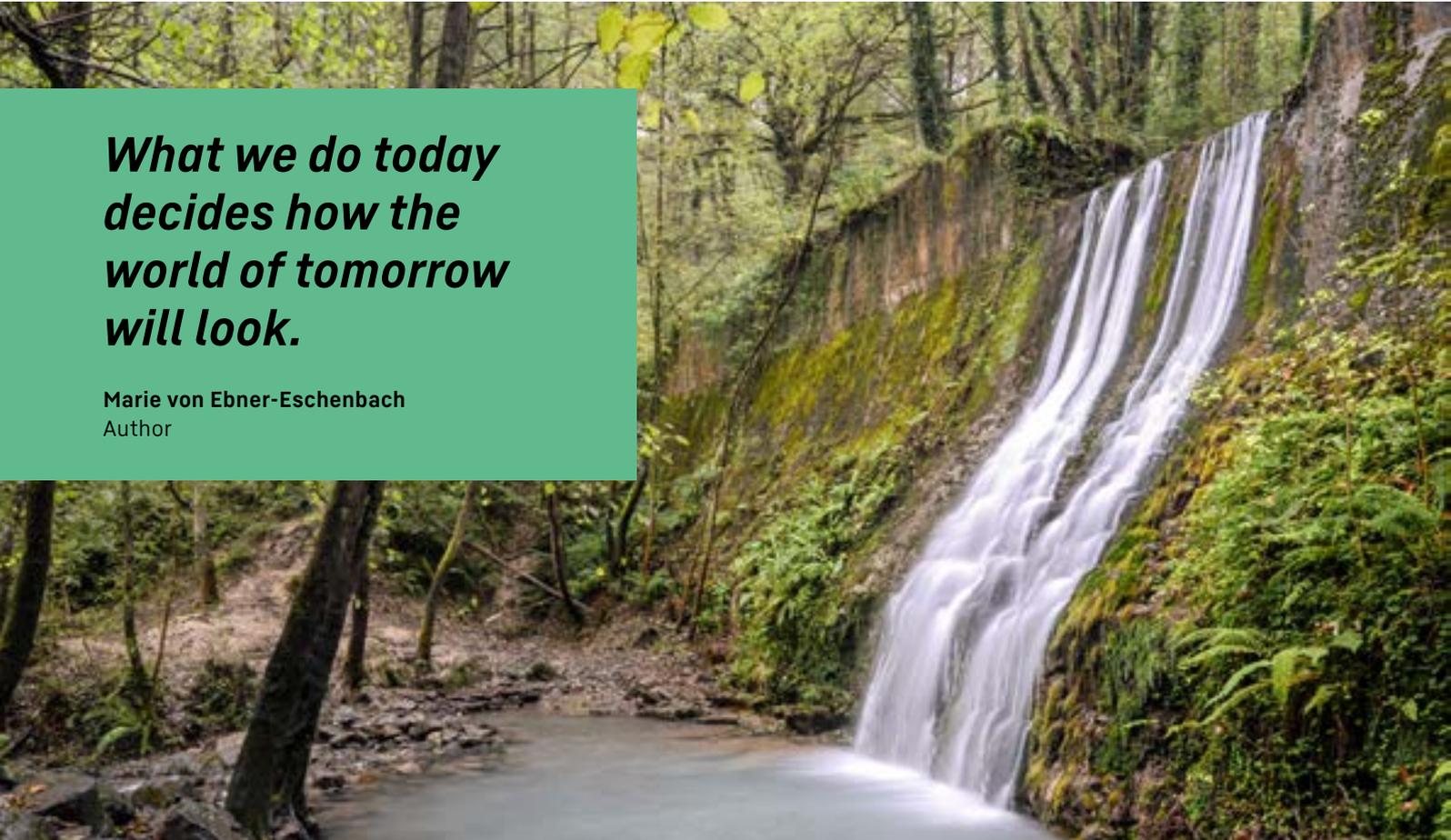
Twin viaduct constructed in the sky

Along with a large number of other Liebherr cranes, our new LTM 1650-8.1 completed a very special job on behalf of Grúas Ibarrodo in northern Spain. A bridge measuring around 160 metres in length was installed over the Bolintxu Valley near Bilbao, which was absolutely untouched by the process. The challenge was that the valley has been a nature reserve for many years.

As a result of increasing traffic levels due to the growing port of Bilbao and the fact that these problems were creating frequent traffic jams on the ageing roads of the region, the regional Basque government commissioned a new relief road as part of its “Variant Sur Metropolitana de Bilbao” Project. In the future, the traffic moving from the coast to the French border will be directed onto this motorway so as to relieve the strain on the existing road, the A8. The final section of the new relief road, the AP-8 “Supersur”, passes through a highly complex geographical area. To connect the new 1,950 metre Arnotegi Tunnel with the 620 metre Seberetxe Tunnel on the opposite side, the Supersur has to cross a deep valley.

Bolintxu Valley – a natural paradise in northern Spain
The Bolintxu Valley is one of the last natural oases near Bilbao and is a valuable ecological asset. The idyllic valley, surrounded by mountainous terrain, is a small piece of paradise – with waterfalls and a rich variety of flora including ash trees, ferns and bushes and a river meandering through the valley bottom. This is home to tadpoles, newts, dragonflies and other species typically found in the area. The protection of these animals, and above all the European bison which is threatened with extinction, was given a very high level of importance during the planning phase for the new road. The valley is a nature reserve and had to be left completely untouched so as not to jeopardise the life of the bison. So the plan was to develop an architectural design which did not require any scaffold or support columns from the valley floor.

The Bolintxu Valley – an idyllic paradise with a rich variety of flora and fauna.



***What we do today
decides how the
world of tomorrow
will look.***

Marie von Ebner-Eschenbach
Author



© Grúas Ibarrodo

The job of erecting the semi-arches was carried out by multiple Liebherr cranes working together.

Twin viaduct for major relief road with no columns

The decision was made to use a design supported only by parapets on both sides – two viaducts each measuring around 160 metres in length, which together span the valley and deliver the two-lane road for the Supersur. But in addition to protecting the flora and fauna, there were other major challenges posed by this project – coordinating the work of different contractors proved to be extremely complex. The only access route to the site was through the tunnels. However, these also had to be rebuilt and used for other logistics processes within the project. The space between the tunnel openings and the bridge parapets was also extremely limited – and was located on a steep slope. This situation meant that some stringent planning and construction requirements were imposed which required a creative approach by the client Interbiak and the consulting engineers Arenas & Asociados. To ensure that the twin viaduct could be constructed efficiently and safely despite this complex situation, an innovative solution was selected involving a high level of technical complexity. This also enabled the natural surroundings of the valley to be taken into consideration.

For the construction of the viaducts, the semi-arches first had to be assembled from individual segments in a vertical position using a crane. To achieve this, the crane had to access the site through the tunnels and the extremely constricted space available on the banks which had been excavated in the mountain – none of which posed a problem for Grúas Ibarrodo's powerful LTM 1650-8.1. "The LTM 1650-8.1 was a very good choice as VarioBase® and VarioBallast®, its lifting capacities and its boom length enable it to adapt to small spaces. All these key features were essential as a result of the limited space available at the site", explained Mikel Ibarrodo, Managing Director of Ibarrodo.

The mobile, flexible Liebherr crane with its 700 tonne lifting capacity hoisted the elements for the metal semi-arches vertically in sections from the platform to up to 70 metres into the air. The semi-arches were then slowly lowered over the Bolintxu gorge simultaneously from both sides using winches and then connected to each other in the centre.



With its long boom, the LTM 1650-8.1 reaches over the valley with heavy steel components on its hook to hoist them precisely onto the viaduct.

Bundled Liebherr crane power

The next step was to prepare the road surface. The LTM 1650-8.1 was once again required for this work. The substructure for the future road was placed in sections on the lowered, connected arch elements. Positioned on the abutments, the 8-axle crane hoisted the heavy steel segments for the road surface on to the viaducts. Initially set-up in the T3Y configuration, the power pack hoisted the 20 metre long, 7 meter wide semi-arches, which weighed in at 140 tonnes. For the centre section, composed of elements measuring 10 metres in length, 7 metres in width and weighing 35 tonnes, the crane was switched to the T5Y configuration so that it could reach to the centre of the viaduct. This meant that the boom had to operate with radii of up to 66 metres and weights of 10 tonnes to enable the heavy steel segments to be bolted into place safely. The LTM 1650-8.1 was supported throughout the job by an LTM 1300-6.1 acting as auxiliary crane. On the opposite side of the valley, another giant crane from Ibarrodo, an LTM 1750-9.1, was performing the same actions as the other two Liebherr cranes.

LTM 1650-8.1 impresses throughout

“The decision to work on this project with Liebherr was primarily due to the LTM 1650-8.1. The 700 tonne crane is an impressive package with its functionality, manoeuvrability and performance with the long boom”, said Gregorio Elguezabel Eguskiza, Project Manager at Grúas Ibarrodo. In total, the installation work for each bridge took two to three days. “The crane was very easy to operate for this type of work. It delivers a whole host of options and always performs brilliantly”, added Carlos Barandiarán Eguía, crane operator at Grúas Ibarrodo. “The LTM 1650-8.1 is the most powerful 8-axle crane on the market. Even in constricted conditions, the crane can handle high lifting capacities – and can do so with either a 54 or an 80 metre telescopic boom. In addition, a wide range of jibs can be combined with it. That sets the crane clearly above any of its rivals”, said a delighted Eguskiza.

And Mother Nature was also delighted with the powerful crane – as it meant that intervention in the protected valley could be minimised. The Supersur will be completed over the next few months and will open to traffic for the first time in mid-2023.



© Grúas Ibarrodo

Bundled Liebherr power working together in a very constricted space.

The large cranes produced fantastic performances on both sides.





ABUS 10t

Back to the roots





When every centimetre counts

The hook traverse is installed instead of the set of sheaves and the hook block.

The jib must be brilliant

Returning to the place of your birth after many years can be rather emotional. The LTC 1050-3.1, which was summoned into the ever expanding Liebherr plant in Ehingen, its birthplace, in mid-October to install overhead cranes, was singularly unimpressed by the experience, however.

It very calmly drove through the plant gate, past the shipment assembly area, where it had been given its white Scholpp signwriting and along the painting shed where it had been given its red colour. It then continued past the shed in which it had been assembled using around 20,000 individual parts two years previously. The compact special crane did not even hesitate when it drove over the crane acceptance area where it had had to hoist a load 25 percent above its specified maximum. But this was precisely its destination and the reason it had come to the plant – the installation of a 20 metre overhead crane in the workshop area of a newly erected building for superstructure testing specialists.

Things became significantly more emotional when Stephan Burkhardt, Operations Manager at crane and transport contractor Scholpp, who has been in the business for 30 years, met the installation team for Abus overhead cranes at the same location, as they had known each other and been friends for many years. The two companies have a skeleton contract for installation work in Baden-Württemberg. Christian Heese, who in the past 27 years has installed around 6,000 overhead cranes for Abus and is now primarily focused on training the younger generation, was also there.

Closer to the roof with a hook traverse

We were looking forward to talking to these two old hands in the crane and installation industries about the special challenges presented by the installation of overhead cranes. There was one point that they particularly agreed about: The jib must be brilliant! Christian Heese explains: "There is generally very little space between the installation position of the overhead crane and the roof. So every centimetre of hoisting height counts. We always use a heavy duty jib for these installation jobs."



“Liebherr always listens to suggestions from those working in the industry.”

Stephan Burkhardt
Operations Manager, SCHOLPP
Kran & Transport GmbH

Stephan Burkhardt continues: “The new assembly jib for the LTC 1050-3.1 has been significantly improved for overhead crane installation work. We are delighted that Liebherr has taken our ideas on board. The jib can be affixed quickly and is very flexible as a hook traverse can be installed rather than a set of sheaves so that the load can be hoisted further towards the roof.”

Crane operator René Reinsdorf did actually use this version for the job in the new shed for the Liebherr crane acceptance procedure: “The hook traverse enables me to reach maximum height.” The six tonne single girder overhead travelling crane was then installed smoothly. “The LTC 1050-3.1 is designed for much greater loads and the hook traverse can manage 25 tonnes”, explains Reinsdorf.

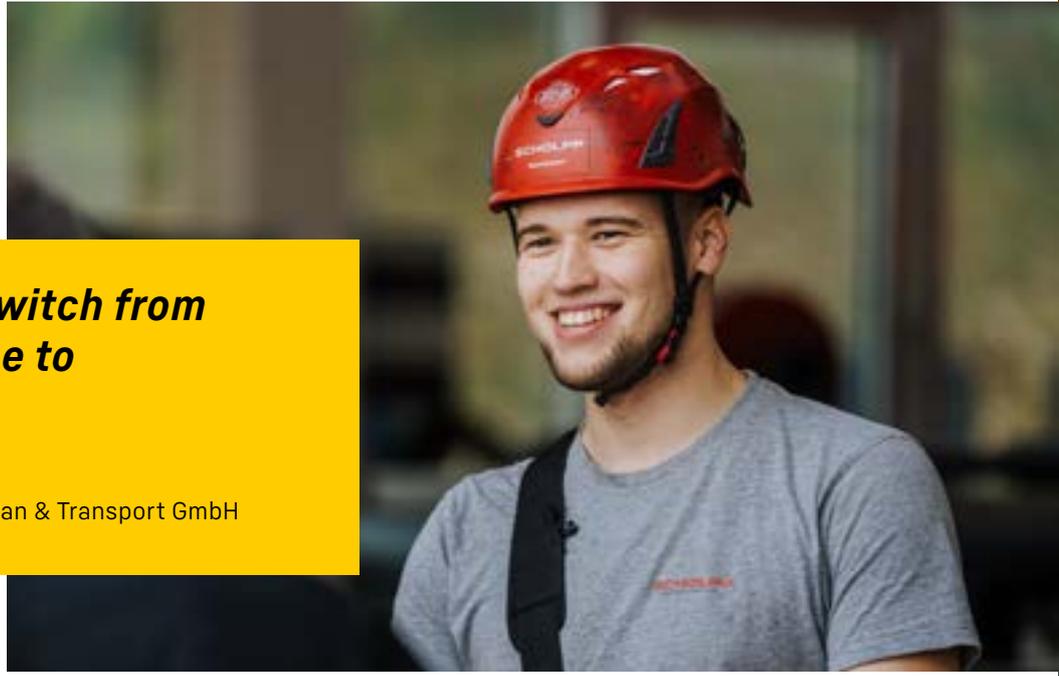
Sliding high loads

Another major requirement for a crane for working in sheds is that it can handle high telescoping lifting capacities as the boom must slide the load to the installation position. Scholpp’s LTC 1050-3.1 has a 6-piece 36 metre boom with the TELEMATIK telescoping system, which delivers high telescoping lifting capacity. However, Christian Heese actually prefers booms with the rope pull mechanism: “I simply find telescoping faster with them. You feel the benefit if you have to complete lots of hoists one after the other”.

“The telescoping speed is not massively important for installing individual overhead cranes. We find the long boom more important”, counters Stephan Burkhardt. As both pinned booms and booms with the rope pull mechanism have their own benefits, Liebherr can now supply the LTC 1050-3.1 with both systems. However, rope pull booms are limited to four telescopic sections. That is why this version of the LTC 1050-3.1 has a 31 metre telescopic boom, five metres less than the pinned TELEMATIK version. High telescoping lifting capacities can also be achieved by the rope pull boom.

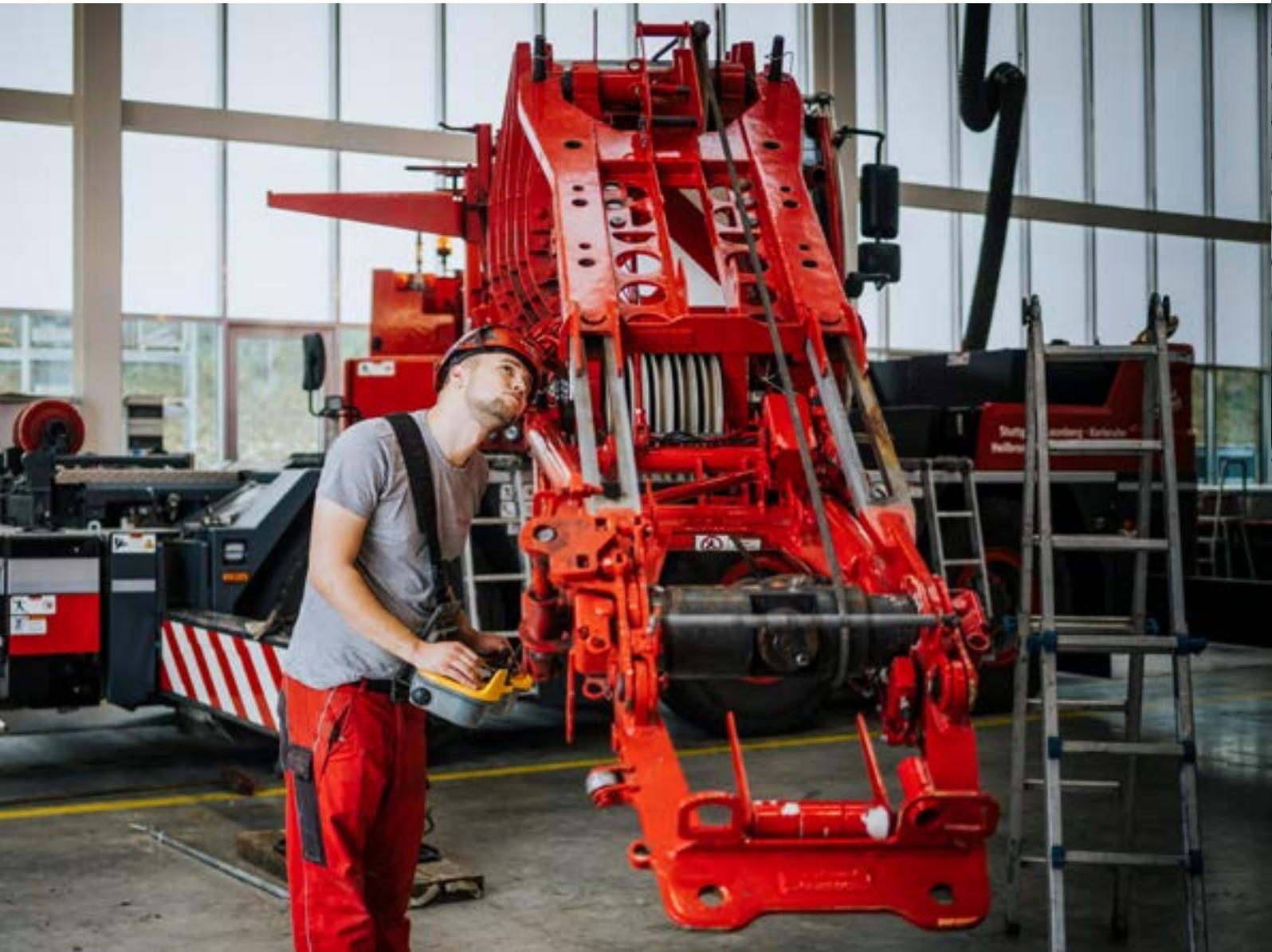
“You can easily switch from one Liebherr crane to another”

René Reinsdorf
Crane Operator at SCHOLPP Kran & Transport GmbH



Convenient

The remote control makes assembly and set-up work easier.





At eye level

The elevating cab on the LTC 1050-3.1 provides a full view of the installation site.

Good view

René Reinsdorf is in his early 20s and completed his 3-year apprenticeship at Scholpp. "I normally operate a different Liebherr crane, but switching to the LTC is straightforward because the controls on all Liebherr cranes are similar." He is particularly enthusiastic about the elevating cab on the compact 50 tonne crane. "It gets me to a height of around eight metres. Obviously from there I have a much better view of the installation situation."

"The elevating cab is fantastic", confirms Stephan Burkhardt. "As is the remote control. Scholpp buys all its cranes with remote control. We also ordered RemoteDrive for the LTC, however. It enables the crane chassis to be controlled externally and the operator can position himself anywhere that provides the best view of any problem areas."

LR 12500-1.0: The Game Changer



Max. lifting capacity
2,500 t



Max. load moment
47,300 tm



Engine power
800 kW



Main boom up to
162 m



Derrick boom
54 m



Slewing platform
ballast **320 t**



Central ballast
100 t



Derrick ballast
1,400 t

Mega crane with the ultimate boom concept

In our last edition we featured a photo of the impressively wide HighPerformanceBoom to announce the LR 12500-1.0 – the Game Changer.

So what makes a genuine “Game Changer”? It consciously enters uncharted territory. It puts an end to conventional mechanisms and replaces them. It features an innovation that changes the market. And the new Liebherr LR 12500-1.0 certainly does all of that! A uniquely wide boom and the specially designed T-shape turntable make up the centrepiece of this powerful 2,500 tonne machine. The countdown to the delivery of the first gigantic crane is running – time to present this new powerful Liebherr crawler crane in more detail.



The rules and jobs of the everyday “game” in which cranes are involved are changing – the market requirements for large crawler cranes in the petrochemicals industry and for port handling work, involving massive components for offshore applications, are on the rise. Driven by the energy revolution, particularly for handling offshore wind turbines, the components are getting continuously heavier and larger. Liebherr has accepted these challenges and reacted by designing a crawler crane whose innovations open up a whole new dimension.

Peerlessly wide boom – maximum capacity with HighPerformanceBoom

To develop a genuine game changer, the Liebherr designers had to ignore conventional methods and step into uncharted territory. The solutions to date have been a double boom like the PowerBoom or the widespread SX systems. However, the Liebherr designers chose a completely different route for the LR 12500-1.0. They developed a 7.5 metre wide powerful lattice boom which enables the LR 12500-1.0 to set new standards.

This HighPerformanceBoom gives the crane the power and stability of a PowerBoom whilst also reducing its weight. It is the key to the high lifting capacities of the powerful 2,500 tonne machine. “The next logical step after the PowerBoom and the SX boom was to develop the HighPerformanceBoom. With this development, the forces from the whole width are transferred into the slewing platform”, explains Klaus Huberle, Head of Technical Sales Crawler Cranes.

But how do you get such a wide boom into the slewing platform? What has now become a public secret is the “T shape slewing platform”, which, when viewed from above, actually looks like a giant “T”. The boom is attached to the wide front section. This is positioned on a low loader lengthways for transport. The bolted rear section is just 3.5 metres wide.

The first two LR 12500-1.0 machines off the production belt will go to Sarens and Mammoet. The crane could not appear the Bauma due to its size, but its hook block was THE highlight at the Liebherr booth..



The LR 12500-1.0 will supplement our portfolio of lattice boom cranes between the 1,350 tonne LR 11350 and the LR 13000 which has a lifting capacity of 3,000 tonnes. This powerful crawler crane has a maximum hook height of 200 metres when used with a luffing jib. Another special feature is the modular design of the boom. The length of the boom can be varied by flexible assembly of ten metre lattice type sections.

Smart solution for economical transport

Liebherr came up with something very special to enable such a wide boom to be transported economically – simply fold it up! However, this requires a sophisticated mechanism. The folded ten metre boom sections are then unfolded again on site and assembled using a special device. This stabilises the lattice type sections during the assembly process. As far as the dimensions are concerned, they were based on the container concept.

“We have had the idea before of building folding sections to create particularly wide booms. But up to now, we have not been able to do so practically. The system we use for the LR 12500-1.0 means that we have now developed a brilliant solution”, adds Huberle. “We believe that this design will change the design of crawler cranes forever. A genuine Game Changer!”

“We believe that this design will change the design of crawler cranes forever. A genuine Game Changer!”

Klaus Huberle
Head of Technical Sales Crawler Cranes



Final touchdown





Retired Transall becomes an exhibit

The skies above the barracks in Altenstadt in southern Germany can often be rather busy. After all, this Bundeswehr site, around 60 kilometres from Munich is a training centre for paratroopers, aircraft handling personnel and air carriers. The site is home to the airborne troops and air transport training centre with its own military airstrip. It is usually rather small aircraft that carry trainee paratroopers into the skies so they can jump back down. Larger aircraft can generally only be seen from a distance carrying out jumps on a mass scale. Recently, however, a large Transall C-160 transport aircraft flew directly above the heads of the soldiers. It was actually suspended from the hook of a modern Liebherr crane. The legendary transport plane has been donated to the barracks as an exhibit.



Flying legend

The Transall C-160 transport aircraft had been carrying out military and humanitarian operations by the German Air Force for a whole half century. On the ceiling in the cockpit of the aircraft there is a metal flap which indicates its age as it was used during the first few years of the aircraft's life by the navigator to bring a sextant into the cockpit to determine its precise position using the stars.



Maximum concentration

Günther Ulrich controls his crane with the military aircraft suspended from it masterfully with a calm hand. The bird's eye view from above clearly shows the restricted conditions for the temporary placement of the Transall.

The 55-year-old is extremely pleased with his powerful machine. "The LTM 1450-8.1 in many situations is actually significantly more powerful than the 500 tonne version", he adds. "Once it is up and ready, it's a fantastic crane."

Günther Ulrich has spent much of his working life in the operator cabs of mobile cranes over the last seventeen years. Since his very first crane job, which was using an LTM 1025 manufactured at the beginning of the nineties, the operator from Lower Bavaria has handled a good number of extraordinary hoists and heavy loads. And he has had several curiosities on his hook. "The Transall was an absolute highlight, however", says Ulrich enthusiastically about the job he carried out using his Liebherr machine. Together with four colleagues, he carried out this challenging job for the Bundeswehr last summer on behalf of Kran Saller GmbH based in Deggendorf. The 55-year-old military aircraft was lifted from the airstrip to near the barracks and into retirement in two extremely tricky hoists.

It was a difficult job, even for experts. The team was faced with tricky ground conditions when they arrived at the barracks the day before completing the actual crane job using a Liebherr LTM 1450-8.1 mobile crane. The 8-axle mobile crane was accompanied by two heavy transporters packed full of set-up equipment. This included the maximum possible counterweight for the crane weighing a total of 134 tonnes. High trees and a neighbouring building severely restricted the space for setting up the crane for the first hoist of the Transall from the fenced airstrip. Nevertheless, the single possible location had been identified within a short time. "Intuition", explained Günther Ulrich with a grin and gave his colleagues the nod to start work. Setting up the crane could commence.

Six months of planning

During all this time, the camouflage-coloured freighter waited patiently at the edge of the small airfield to be moved into its new home. The Transall C-160 finished its last mission with around 12,000 flying hours under its belt before making its final landing at the army airfield in Altenstadt in Bavaria in November 2021. In the future, the transport aircraft will be an exhibit at the Franz Josef Strauss Barracks. "We have been working to get to this day for six months", explained Captain Michael Gossler, whilst the mobile crane was being set up nearby. Concept, planning, European tender for the crane work. Lots of paper. But now, you could say: Mission accomplished. Almost, anyway. Then, the next morning, things could finally get underway with the last phase of the job, actually moving the Transall to the barracks.

The German Armed Forces decommissioned the last of what had been a fleet of 110 of these transport aircraft at the end of 2021. Primarily used as a cargo plane, which could land on almost any temporary airstrip, whether it be grass or beach, the Transall, which was developed in the 1960s and continued in production until 1985, only required an extremely short take-off and landing runway of around 700 metres in length. But this flying packhorse was not just used for transporting military personnel and material. Politicians also flew in it if they had to travel to conflict areas. Often, the aircraft hold was filled with aid. The cargo plane was extremely important for carrying out humanitarian missions, for example during the famine in Ethiopia almost 40 years ago as the Transall was able to open its loading ramp at the rear whilst it was still in the air and release its cargo at an altitude of just a few metres. The machine was manufactured by a Franco-German joint venture and during its period of service, which lasted



almost 50 years, it gained the reputation of being almost indestructible. The French and Turkish air forces are still using the aircraft today.

But let's go back to the barracks in Altenstadt, where the team from Saller had erected their LTM 1450-8.1 ready for action by the evening. Very early the next morning, things finally got moving. Günther Ulrich swung the specially made twelve metre yoke over the aircraft. Broad hoisting straps were placed around its fuselage and aligned precisely. The first hoist of the aircraft was an exciting moment as the forecast gross load of 34.5 tonnes with an impressive radius of 30 metres meant that the crane was operating at the limits of its load chart. But actually, after the removal of secret military technology, together with pulleys and control gear, the net weight of the machine fell into the green zone for the crane.

Precision touchdown

When the Transall was placed in its intermediate position, we saw exactly what is meant by expert skills – Günther Ulrich and the team around him moved the thirty metre cargo plane with its span of exactly forty metres between the mobile crane and the neighbouring building before placing it on the ground. The gap between the nose of the aircraft and the wall of the building was less than 60 centimetres. What a touchdown!

A few hours later, after the mobile crane had been repositioned, the second “flight” of the C-160 to its planned final resting place was then a matter of routine. One of the wings had to be moved away from surrounding trees with the powerful support of several soldiers on the retaining ropes, but after a very short time, its landing gear had been successfully positioned on the prepared concrete plinths and the decommissioned military aircraft was in position. After a long, varied operational life, the Transall had finally been retired.



Precision work

The historic military transporter must be manoeuvred with millimetre precision for threading the landing gear into specially made metal frames.



On the Steinbock's back

The military forklift manufactured by Steinbock is not just extremely practical for handling heavy goods. It provided these three soldiers from the airborne troop training centre in Altenstadt with a great view of proceedings.

Heavy? No problem!





The LTM 1120-4.1 has found a special place in crane fans' hearts in just two years

“There’s nothing more on 4!” That was the slogan when we launched our LTM 1120-4.1 mobile crane. The most powerful mobile crane on four axles and equipped with the longest telescopic boom in this crane class, we started supplying the first of these newly developed machines to our partners all over the world at the end of 2020. Today, two years later, these superlatives still apply. And the fan base of this small Liebherr crane has reached an impressive size. We visited three of these powerful compact machines on various sites. And we listened to crane operators and dispatchers.

Whether it is setting up construction cranes in Europe or erecting mobile phone masts in the USA – more and more of these jobs are now being completed by our LTM 1120-4.1. And this is hardly surprising as the lightweight mobile crane, with its weight on the road of just 48 tonnes delivers more power than any other mobile

crane on four axles. In addition, its impressive 66 metre length makes its telescopic boom the longest in this crane class. When fully raised, the highly flexible Liebherr crane delivers outstanding lifting capacity values and easily beats many 5-axle cranes in this respect.

Off-road

The only way for this LTM 1120-4.1 from ADW to get to the site was on non-compacted tracks. Not a problem because the 8x6 drive and the four independently steering axles deliver outstanding off-road capability.



“Also brilliant due to its off-road capability”

Stefan Grosshaus

Dispatch Manager at ADW Autodienst West Ganske GmbH

Purely Liebherr fleet

“As the dispatcher, I use the machine in very different and flexible ways. In addition, all our operators can use the LTM 1120-4.1 because we only have Liebherr mobile and mobile construction cranes”, explains Stefan Grosshaus.



One person who is extremely pleased with the overall concept of the LTM 1120-4.1 is Stefan Grosshaus. He is the Dispatch Manager at ADW Autodienst West Ganske GmbH in Maintal in the state of Hesse near Frankfurt am Main, part of the Hüffermann Group. We meet him on the bank of a small lake a few kilometres from the company's headquarters. This was actually more down to chance because a couple of drivers were unavailable so the dispatcher had to get behind the wheel of a truck personally to drive the ballast required for his crane, which was scheduled to place an eleven tonne suction excavator into the water. Part of the access route was non-compacted and consisted of narrow field tracks. “Its off-road capability is just another reason why I find this crane so great”, says Grosshaus. “Its 8x6 drive and four individually steering axles mean that we can drive the vehicle over difficult

terrain and over non-compacted ground. A five-axle crane would have been much more difficult to get here.”

Grosshaus regards the benefits relating to easier road licences due to the small number of axles and low weight of just 48 tonnes in road mode as another positive about his LTM 1120-4.1. “As it is a 4-axle vehicle, it has a permanent permit in all the areas that are important to us. The crane and its extreme lifting capacity due to its great ballasting actually enables us to do just about everything. In addition to erecting tower cranes, the machine has also proved to be very efficient and economical for structural steelwork. As a result of the length of its boom, it can serve a large radius from a single position so we do not have to continually move it. That saves a great deal of time, of course.”



Clever and customer-friendly

With just four axles and a road weight of 48 tonnes, permits for the LTM 1120-4.1 can be obtained with far fewer complications in most countries than for larger machines. A maximum of 29 tonnes of ballast is transported separately to the site where the mobile crane then fits the counterweight on itself.



Endless distances

Long, steep gradients are a challenge to Wasel's LTM 1120-4.1 as it travels through the opencast mine.

An LTM 1120-4.1 operated by crane and heavy haulage contractor Wasel has a very special environment in which to prove its worth. The small Liebherr crane is often to be seen on the enormous site of the Hambach opencast mine, the largest lignite mine in Europe, located between Cologne and the Dutch border. "The important feature for us is the long boom on the LTM 1120-4.1", says Christopher Neuhaus, Department Manager at Wasel. "That means that we often don't have to attach an additional folding

jib to carry out the repair and maintenance work on the large machinery and high system components". Many of the roads on the desert-like site of the opencast mine are not asphalted and the crane vehicles have to overcome gradients of up to fifteen percent. "Our crane is also very impressive when driven off the road. We go up the mountains, we come down the mountains and we always get to where we are needed."

"We go up the mountains. We come down the mountains."

Christopher Neuhaus
Department Manager at Wasel GmbH

Sends his cranes down a mine
Christopher Neuhaus also provides services at Hambach opencast mine for Wasel GmbH. The white and blue Liebherr cranes operated by the Bergheim-based company can be found all over this gigantic lignite mine.



***“You can drive
it almost anywhere.”***

Paul Rifert

Crane Operator at Hüffermann Krandienst
GmbH

“Short break” for a portrait

Paul Rifert with his LTM 1120-4.1
erecting a Liebherr tower crane in
Bremen.



There are now approx. 300 of our four-axle power pack on building sites throughout the world. Hüffermann Krandienst GmbH, based in Wildeshausen in Lower Saxony alone has three LTM 1120-4.1 cranes in its impressive crane fleet. Because Hüffermann is also an important Liebherr partner in the construction crane rental sector, the erection and dismantling of top-slewing cranes is also very much part of the everyday life of this mobile crane. “We can erect construction cranes with hook heights of up to 50 metres easily using the 120 tonner”, says Christoph Riess, Tower Cranes Department Manager at Hüffermann.

Paul Rifert has been operating one of his employer’s LTM 1120-4.1 cranes since March 2020. We arranged to meet the experienced crane operator at an enormous construction site in Bremen, where he has travelled to erect a construction crane. He must erect a Liebherr 172 EC-B flat-top crane with an overall height of around 45 metres. A matter of a few hours for Rifert, his nimble crane and the experienced team from Hüffermann. The heaviest parts are the turntable and the enormous 43 metre main boom of the construction crane which must be pre-assembled on the ground. Paul Rifert’s task is to position gross loads of up to nine tonnes precisely at a great height following the instructions issued by the engineers. Not a problem for the experienced operator and his sensitive crane control.

In addition to erecting construction cranes, Rifert and his mobile crane can often be found in refineries, where there is very little space available. But Rifert has found that between the petrochemical plants he and his LTM 1120-4.1 are very flexible. “The enormous boom length means I hardly ever need to attach a jib to the boom. And as a result of the machine’s compact design, I can get it almost anywhere. And VarioBase® as well as VarioBallast® are also extremely useful in tightly packed chemical plants. As far as I am concerned, the crane is simply fantastic!”



In focus

Fully focused

That also applies to this Buckner LR 11350 in the United States, shown here fully set up for its next job.

Photograph: Wayne Hackfeld, Crane Technician, Buckner



Site visit in the digital world



MyLiebherr presented at Bauma – and online!

A site visit in the digital world? Sounds odd, but it was made possible at Bauma. And you will also be able to dive into our MyLiebherr online world at future shows. We will be delighted to show you all the new features and functions – but will also collect you at the entrance, in other words as you login to the MyLiebherr portal.

There are lots of large things at Bauma – cranes, construction machines, visitor numbers and also the consumption of pretzel, weisswurst and beer. But we also detected a great deal of interest from lots of people in a very small area of our stand – our MyLiebherr pavilion for mobile and crawler cranes. Our seven experts were kept very busy. Many of you took the opportunity to enjoy a live demonstration of our MyLiebherr portal at the event. And of course, that also provided an opportunity to ask questions or to create your own profile and one for your company including all your machines.

The place to come with any questions

“It was important to us to be the place to come with any questions, to discuss the system with our customers and portal users and perhaps also to provide an opportunity to overcome any reservations against using digital portals like MyLiebherr with all its applications”, says Stephan Schrade, Head of Digital Products & Services in Ehingen. “That enabled us to remove fears at a stroke whilst at the same time making access to MyLiebherr easier – or, in some discussions with customers who already had a good deal of knowledge, to provide additional knowledge and demonstrate and explain new functions or new applications actually in MyLiebherr”. “It also enabled us to demonstrate our new Performance application in MyLiebherr”, says Sarah Weidenbacher from the same department. “This application will be available in MyLiebherr before the end of 2023. It provides crane contractors with a live view of lots of crane parameters such as the site, fuel consumption or what function the crane is currently performing. But it also displays secondary data, such as wind speeds and the temperature at the site. This gives the crane operator, the dispatcher, the workshop manager and the owner some important information online without having to phone the crane operator.”



Product Manager Wolfgang Boos provides an insight into the applications for Performance and Job Planning.

Wolfgang Boos, Product Manager for Digital Products at Liebherr in Ehingen, continues:

“With the Performance application, not only have we attempted to simply display these data, but also to provide sensible evaluations using the data. The discussions we held with many of our customers in Munich proved extremely interesting and revealing for this purpose. We are already providing some of the analysis features free of charge in the basic licence which we are planning to prepare over the next few months. We will then add more features as we build on the application. We regard the Performance application as a really powerful tool for making crane operations significantly more economical and easier in the future. And in short, that is also the feedback we are getting from many customers after the Bauma week in Munich.”



Michaela Gogeissl, Sarah Weidenbacher and Stephan Schrade from the MyLiebherr team of experts.

Much more than just data

But our MyLiebherr team in Munich were not just interested in crane data and new applications. Many existing parts of MyLiebherr are being continuously revised, improved and expanded. “We are delighted to explain these MyLiebherr modules to anybody who is interested”, says Michaela Gogeissl from the Training Department in Ehingen. “Whether it is the CraneFinder, Crane Planner 2.0 or our LICCON job planner, these tools are extremely important for planning a crane job and are an integral part of MyLiebherr. But our training courses, such as the digital mobile crane operators licence, are also available there. That’s why it is always great for us to find out which sections our customers are interested in. And also which topics we can then explain to them during our conversation.

Many of them have questions relating to job planning using Crane Planner 2.0 and during our conversation we also discuss the parts shop and the licence for e-learning courses. In other words, MyLiebherr delivers a great deal of added value which we are keen to explain in detail.” MyLiebherr is essentially an online portal that is self-explanatory and similar to the systems used by many banks, insurance companies and other websites. “We have seen, however, that many of our customers are keen to use the opportunity to view specific functions in the system. That is why we will continue to offer this facility at future trade shows, but also during training courses at our global training centres or, where possible, at our customers’ own sites”, adds Stephan Schrade.



Gerrit van Hove going about his everyday work with MyLiebherr.

In action

Many of our customers are already using MyLiebherr for their everyday work. That quickly became apparent when we talked to people at Bauma. “We have been using MyLiebherr since 2017 – we use it several times a day”, says Gerrit van Hove, Spare Parts Manager at Sarens NV in Belgium. “We mainly use the spare parts catalogue with the ordering facility as it shows us part availability and prices so that we don’t have to wait for quotations. But we also regularly use many of the other applications that have been added during the last few months. We frequently use Sales Order Tracking, in other words the possibility to check our purchase orders, return delivery notes or document exchange. The licence and service application is also used often when we require new licences or services. I have been at Sarens now for more than 25 years and have a great deal of contact with the Liebherr customer service team. MyLiebherr is a great help for making things faster and simpler”. Andreas Steinnagel, Workshop Manager at Hüffermann Krandienst GmbH in Wildeshausen has a similar outlook. MyLiebherr has been in regular use there since 2019. “The clarity of MyLiebherr is very helpful for us as you can find all the applications quickly and easily.



First order the spare parts online, then install them on site – Andreas Steinnagel during a site call-out.

We regularly use the spare parts catalogues and the ordering form as well as the electronic invoicing application and the component lists. In my role as Workshop Manager I am responsible for spare parts, troubleshooting our machines and rectifying breakdown faults, so MyLiebherr and its functions are a massive help to me in my everyday work.”

Both of them took the opportunity in Munich to view the latest functions in MyLiebherr – including the Performance application. “Fortunately, I had the opportunity at Bauma to have a look at the new telematics application and have it explained to me. The great thing about it is that you can view the cranes’ operating data straight away, including the set-up configuration. That will really help us to provide our operators with instructions for rectifying problems by telephone. And it also means I can prepare for breakdown work better in the future”, adds Steinnagel. “I did not have a great deal of time”, says van Hove. “So I was really delighted that the experts on the MyLiebherr team were kind enough to give me a personal presentation of the new Performance application after Bauma.” And our experts will continue to do so over the next few months – at trade shows or at your own office.

Find out more about MyLiebherr here:
www.myliebherr.com



It all started with rough terrain cranes



Liebherr mobile cranes in Poland – a four-decade partnership

Dear Readers, shall we take a short trip through time? Then let's go back almost 40 years and take a look at our neighbour, Poland. At that time the People's Republic was one of what was known in the West as an "Eastern Bloc" country under the control of the Soviet Union. The large coal-fired power stations in the country at the time were searching for efficient machines to handle the crane work at their rapidly growing opencast mines and for material handling at the ports on the Baltic Sea coast. They required powerful hoisting tools for the increasing volume of goods being handled and to ensure that ever heavier components could be handled economically at the terminals. After a long search, the state-owned companies finally found what they were looking for at Ehingen. The initial negotiations were held in 1984 for an initial order of two Liebherr rough terrain cranes, marking the start of a long-lasting, solid and continuing partnership. We paid a visit to some of our Polish partners.

The negotiations at the time were followed by extremely quick action. The LTL 1060 cranes which had been ordered were driven off the ship in the port of Gdansk in the summer of the following year. The two twin-axle power packs were destined for the lignite power plant at Bełchatów in the centre of Poland. These powerful machines proved to be only the start of a business relationship which rapidly expanded. Around a year later, over a dozen of the slightly smaller LTL 1030 rough terrain cranes left our plant to travel to the East. They were shipped to the port in Gdansk where they were used for handling work.

Whilst a total of around 40 Liebherr cranes at state companies delivered all the lifting power they needed at the time, today, a good thirty years later, there are around 1,200 cranes bearing the Liebherr logo and operated by over one hundred customers throughout the country. They are looked after from the site in Ruda Śląska, the location of our sales and service company, Liebherr-Polska sp. z o.o. This company covers all Liebherr divisions within the country. Almost all the repairs to Liebherr mobile and crawler cranes can be carried out in the spacious sheds at its service and repair centre, around three hours drive south-west of the capital Warsaw.



A new arrival

This scene is from a yard of one of our customers based to the south of Poznań. At the centre of a really colourful mixed fleet of used cranes you can see the first new mobile crane purchased by Binkowski. Company owner Przemysław Binkowski purchased his brand new LTM 1230-5.1 to complete orders in wind farms and for jobs at a prefabricated concrete component plant in Poznań.



Increasing interest: MK models widely welcomed

Here we can see an MK 80 working on a new kilometre-long viaduct in the south-west of the country.



Fast and furious

Jarek Stańczyk speeds around the handling terminals at the Port of Szczecin in his powerful LRT 1090-2.1 rough terrain crane. His Liebherr crane often has stone blocks weighing up to 30 tonnes hanging from its hook.

From used crane to new machine

A few years ago we were primarily delivering used cranes to Poland, but today our customers are increasingly placing orders for new mobile and crawler cranes. We regard the trend towards new machines and the obviously massive confidence of our partners in Liebherr products as strong signals. It is not just the flourishing economy, but also the decisive focus of the country on its policy to massively expand its renewable energy industry (thousands of wind turbines are planned) which have triggered the boom in new cranes. And we have also played our part in ensuring that this partnership is so successful. Our customers benefit from the rapid, competent support of our service engineers, the extremely good and quick availability of spare parts and, of course, the service centre in the south of the country. Find out more about the wide-ranging support that we provide for our partners on page 80.

“If there are ever any problems on site with our machines, Liebherr is always there quickly and efficiently”, says Michał Sobolewski, Site Manager at by far the largest Polish crane contractor, Lewandowska. We meet him at a brand new wind farm site not far from the small town of Żnin, around 200 kilometres west of Warsaw. “Over the next few months we plan to erect 27 Vestas wind turbines with hub heights of 120 metres”, continues Sobolewski.

The trend we mentioned above towards new machines is clear to see during our visit to the future wind farm. Two brand new mobile cranes are in action handling wind turbine components. An LTM 1250-5.1 is unloading rotor blades and tower segments whilst a few kilometres away, a brand new LTM 1300-6.2 is hoisting heavy nacelles off a truck. The impressive Lewandowska crane fleet includes the most powerful cranes in the country, namely an LR 1750/2 crawler crane and several LG 1750 models. Almost all of the around 60 mobile and crawler cranes at the company's five sites bear our logo.

Replacement after 30 years

During our tour of Poland, we also paid a visit to a really special model of one of “our” cranes. For this purpose, we travelled to Lower Silesia, where Poland's borders meet both the Czech Republic and Germany. In fact, the Turów opencast mine there operated by energy company PGE GiEK, has the 40,000th mobile crane ever produced at our plant. We delivered the LRT 1100-2.1 to this opencast mine which extends over an area of around 25 square kilometres just over two years ago. Since then, the all-wheel powered machine has been successfully fighting through the difficult terrain in the mine which is over 200 metres deep.

Brings power to difficult terrain
The LRT 1100-2.1 with its 50 metre telescopic boom delivers the high lifting capacities required above all for hoisting the heavy components of massive coal excavators.



When we arrived at the crane's location after passing slag heaps and heaps of topsoil and travelling for several kilometres, the powerful two-axle crane had half of one of the smaller seam-breaking bucket wheels from a lignite excavator on its hook weighing nine tonnes. We also saw lots of mobile cranes from EHINGEN helping with maintenance work and repairs on the colossal machines and the apparently countless and endless conveyor belts. The off-road special crane with its powerful boom is, of course, the crane of choice for heavy components and on difficult terrain. "This robust rough terrain crane is almost indestructible", the crane operators on site tell us. "What's more, it can telescope its boom even with a load on it. That option is extremely important for us when we are working on the largest machines here." We also discovered that the LRT 1100-2.1 had replaced an old Liebherr rough terrain crane, which had been doing the same job in the massive hole for more than 30 years and ultimately had completed around 20,000 operating hours.

"Seven granite blocks in twenty minutes"

Logistics company DB has also recently purchased some new lifting equipment for the Port of Szczecin. One of the jobs at the port of this traditional Hanseatic city on the border with Germany and linked to the Baltic Sea by the Szczecin Lagoon is handling massive stone blocks made of granite. There are several modern Liebherr LRT 1090-2.1 rough terrain cranes in action around the terminals. One of these white and grey giants, which speed through the long aisles between hundreds of massive stone cubes, is operated by Jarek Stańczyk. With his four-strong team, the young man loads the waiting trucks with these heavy cubes at a remarkable speed or hoist the stones

arriving by ship off roll trailers. Initially he has no time for our questions or a quick portrait photo. We will have to wait until his lunch break. But even then, taking a quick snapshot in front of his crane, he tells us briefly and with no little pride that he is able to load seven of the heavyweight blocks with his machine in just twenty minutes. "As long as I don't have to do move the crane." With that he jumps into the car in which his colleagues are already waiting for him impatiently because they are hungry. And off they go to lunch.

Dariusz Szklar, Manager of the Technical Department at DB Port Szczecin manages to find a little more time for us. "Although we also load prefabricated concrete components and other piece goods, we actually mainly handle these heavy granite blocks using our efficient Liebherr machines. That means, of course, that we need powerful machines because the biggest of them weigh in at 30 tonnes", he adds. "We purchased our first rough terrain crane around five years ago and now use three of these LRT 1090-2.1 cranes for handling work. The cranes are fantastic, first of all as far as user-friendliness is concerned and secondly also in terms of the efficiency. If we need to hoist cocoa beans into a warehouse at a great height or load granite onto trucks – they have a great radius and also fantastic visibility for the operators due to the tilting cab. The machines also deliver speed and great stability. So as far as I am concerned they are just brilliant."

Such massive praise at the end of great journey is a delight to hear, of course. And we thank you for it. Or even better, in your own language: Dziękuję.



... follow-up!

We can now look at a history stretching back almost forty years of Liebherr in Poland, a near neighbour to our home country. One of the people who provided us with information and further insight into activities there is Marcell Bednarek. A graduate engineer, he is a member of the management team at Liebherr's sales and service company in Poland (Liebherr-Polska sp. z o.o.) as well as being its Sales and Marketing Director. He is also an old hand as he has been working for Liebherr in Poland for more than 35 years. We also asked Bogdan Majek some questions. He is a young colleague who told us about the everyday practice of a mobile crane service engineer.



Mr Bednarek, how does the market for mobile and crawler cranes currently look from your point of view as the Managing Director of Liebherr-Polska?

Marcell Bednarek: The Polish market is developing really very dynamically as far as we are concerned. The country is one of the most important markets in Europe for our group. As far as mobile and crawler cranes are concerned, we are experiencing ever increasing interest in new machines. Above all, customers with a good credit rating are deciding more and more to purchase new cranes after a long period in the past where they were mainly interested in second-hand. During the last year, we have sold more new cranes than used machines to our partners in Poland for the first time.

What is a typical crane contracting company in Poland like?

First of all, our range of customers is extremely varied. There are lots of private companies providing services in the market. These include many small companies that operate between a few and several dozen cranes. Our largest partners have a complete portfolio of mobile cranes and in some cases also have crawler cranes with a lifting capacity of 1,600 tonnes. Traditionally, the large lignite mines have been our customers for decades. As have the ports in the north of the country. They were also among our first business partners in Poland as the first large shipment of 14 rough terrain cranes from Ehingen was delivered to Gdansk in the 1980s. These were LTL 1030 machines for handling piece goods.



Marceli Bednarek, Managing Director at Liebherr-Polska sp. z o.o.



Bogdan Majek, Service Engineer at Liebherr-Polska sp. z o.o.

What support can our customers and partners in Poland expect from Liebherr?

Our greatest strength, and one which benefits our customers, is the outstanding service organisation run by Liebherr-Polska. We have sites close to Warsaw, in Gdansk and in Poznan. And, of course, we have our main outlet in Ruda Śląska, in the south of Poland. In our enormous assembly shed which has two gantry cranes, the larger of which has a lifting capacity of twenty tonnes, we are able to carry out lots of repair work in perfect conditions. More recently, we have also been able to offer our customers' crane operators the facility to send live pictures for error diagnostics from the site to our service centre so that we can provide them with help more quickly and directly. In addition, our service vehicles have a full set of tools, including special tools for troubleshooting work on Liebherr machines and cranes. We also provide our customers with the fastest possible support in terms of the delivery of spare parts by giving them extremely short lead times.

Mr Majek, how quickly can you, a service engineer, get to our customers on site if they have a problem with a crane?

That depends, of course, on exactly where the crane is located. My ten colleagues in the mobile service team and I are located all over Poland. I am responsible for the districts of Wielkopolskie, Pomorskie, Lubelskie and Dolnośląskie in north-west Poland. Generally, from the time that the problem is reported, we get to the customer within one to three days. The urgency of the situation also plays a major role of course.

And what if things are really urgent?

Then, of course, we try to do everything possible to provide our customers with fast support. Most of the spare parts required are available from stock. That means that we can get a spare part to the crane within one day. In extremely important and urgent cases, we have even sent parts by taxi from the Liebherr warehouse in Berlin direct to the site. That enables us to complete repair work within a few hours, extremely quickly in other words.



Chuff, chuff, chuff, the railway...



Around 200 wagons with crane equipment leave Ehingen Station every year.

Road, rail and sea – our cranes make their way from Ehingen to Erdenet, for example, by a whole range of different routes. It may sound a bit run of the mill, but in reality not only is it 8,400 km away, a journey that takes six weeks, but also requires intricate planning, short term adjustments and a good deal of sensitivity about geopolitical and climate issues. For all these reasons, shipping cranes by rail has been a reliable, sustainable and climate-friendly option for us for decades. And because of this, in this edition – after the voyage by ship in the last UpLoad, we decided to take you on a rail journey. All aboard!

The whole thing starts several times a week at around 4 pm at Ehingen Station. Its location is only around 2,500 metres from our plant, and after Deutsche Bahn's loading manager has done his work, checking that the load in the wagons does not exceed the maximum of 56 tonnes, our goods set off on their journey to Kiel, Lübeck, Rostock, Hamburg, Bremerhaven and Antwerp. All the equipment for a mobile crane occupies between one and three wagons and it travels in first class all the way. The basic machine is actually driven to the ports because the loading dimensions for railway wagons in Western Europe are simply not big enough to accommodate it.

Cranes to the CIS countries are shipped through the port of Kiel to Klaipeda in Lithuania where they are loaded onto wide-gauge wagons. It takes experienced engineers around a week to remove the counterweight plates, folding jib, small parts and sometimes even the wheels. They also provide support to the loading personnel for lashing the components safely and properly using strong steel cables. Once again, everything has to be checked by the loading manager before it can get underway.



“During rail transport, there are some enormous forces and vibrations”, explains Jens Bachmann. He is the Crane Shipment Team Manager at Liebherr and is responsible for transporting telescopic cranes, mainly to countries outside the EU. “We have been sending many of our cranes by rail to our customers for decades. Initially, it was done to save costs as a railway wagon can hold as much as two and a half trucks. Today, however, this method is also an ecological one, which is why it is being used more and more. A railway wagon causes around 60 percent less CO₂ emissions than a lorry and that includes transporting components to the railway station.” The loading area is another positive for Jens Bachmann as he can load 18.6 metres (rather than 13.6) on a railway wagon from Ehingen.

“Although the journey takes a little longer, the procedure is simpler!” adds his colleague Melanie Spomer, who is a Crane Shipment Executive, who deals with the CIS states, Saudi Arabia, the UAE, Oman and Qatar among others. She is also acutely aware of the challenges posed by global heavy haulage. “When they are being shunted, the wagons really crash to each other, even though the German wagons have springs that buffer most of the forces. Nevertheless, we always pack everything really well for the long journey from Klaipeda. Small parts such as windscreen wipers and headlights are placed in wooden crates, which also protects them from theft. We secure painted, non-packed components on pallets. Our control system, the most sensitive part of a crane, is pretty much insensitive to being shaken around for days because it has very good protection from vibration.”



Melanie Spomer and Jens Bachmann provide insight into the shipment of cranes by rail.

“For days” is really not an exaggeration. One of Melanie Spomer’s customers is the Erdenet Mining Corporation, which is based in Erdenet, which we mentioned at the start. Although the name begins with an E, it is a long way from Central Europe like Ehingen, as it is actually in the least densely populated country in the world – Mongolia. It is 400 km from there to Lake Baikal, 1,400 km to Beijing and over 8,400 km to Ehingen, if you consider distances in crane routes. “The whole route takes around six weeks and can be described pretty quickly”, says Melanie Spomer. “The basic machine is driven to the port in Kiel where it meets up with the equipment which is shipped to the port station by rail. Both then travel on a ferry to Klaipeda in Lithuania, where they are met by our engineers. They then load the goods onto the wide-gauge wagons and send them to Erdenet, which is 6,618 km from Klaipeda. It takes 23 days before the engineers there receive the crane.”

Hopefully undamaged. “The biggest challenge is actually handing the crane over to the customer undamaged after over 8,000 km, lots of access by various parties and the complicated dismantling and assembly procedure. But planning the route through war and crisis zones also takes a bit of time!” Currently the company is also having to deal with sanctions and transit regulations. “There are always new rules that we have to observe. We have had to study the facility to transport equipment through Russia just as much as asking whether we should transport it by ship to Mongolia via China”, adds Jens Bachmann. This was one of the alternatives that was dismissed, along with diverting around Russia via Georgia and Kazakhstan. “We therefore continuously adapt ourselves and our routes to suit new situations and circumstances and we always have to be open to alternatives.” Ultimately there is often a choice between a route subject to current uncertainty and a diversion, which increases the risk of damage due to the fact that everything has to be unloaded and reloaded multiple times.



However, all these imponderables have not resulted in the company looking anywhere other than at the rail option – from Echingen Station to the ports, a trip covered by around 200 wagons from the plant every year. Almost exactly the same number arrive at the freight track separated from the passenger traffic every year for the mobile and crawler crane manufacturer – normally filled with heavy material such as sheet steel from Austria, Sweden and Saxony-Anhalt.

And even though the wagons may crash noisily into each other occasionally whilst they are being shunted – Liebherr’s rail transport policy reduces the number of trucks that the residents have to put up with by around 700 per year – together with all those emissions. And that actually equates to around 300 tonnes of CO₂ equivalent per year, the same level of emissions generated by around 200 commuters per year for their daily drive to a workplace 20 kilometres from home.



This LTM 1110-5.1 is on the 6,600 kilometre journey to Mongolia on a wide gauge wagon.

Why new oil for the superstructure gearboxes

When we think about advances in crane construction, the first thing that comes to mind is longer booms, higher lifting capacities or more modern crane controls. But at Liebherr we also work continuously on improvements which are often invisible at first glance. Our objectives include higher quality, a longer service life, economy and greater comfort for you, the crane contractors and operators.

Currently we are looking at changing the gearbox oil for superstructure drive units. What we mean by this is the pump distributor gear, the slewing gear and the hoist winches as well as the travel drives on crawler cranes. Since a lot of departments must be involved to make such a massive project a success (design, documentation, purchasing, work preparation, production, testing, customer service and gearbox and oil suppliers), we asked representatives of some of these groups to explain.

Modern and ready for the future

The new oil bears the name Liebherr Syntogear Plus 220 and replaces the existing Liebherr Gear PG 220. The new oil is more modern and ready for the future. It is a fully synthetic high performance PAO-based gearbox oil.

Polyalphaolefin fluids are synthetic hydrocarbons which are designed to provide outstanding lubrication over a wide range of temperatures.

The oil is even suitable for cranes in countries with extremely low temperatures down to minus 40 degrees. That means that we can use the same oil for all temperature ranges throughout the world, which in turn means that we will not have to change any oil before delivery.

Liebherr Syntogear Plus 220 also delivers more positive features. It is more compatible with seals and paint and is less hygroscopic, which means it absorbs less water or water vapour from the ambient area.



On the finished crane

In addition to the crane documentation, crane contractors can identify gearboxes with the new Liebherr Syntogear Plus 220 oil by special stickers.

Background



On the assembly line

Information signs ensure that the correct gearbox oil is placed in the gearbox during the production process.

Around one half of crane models already switched

Such a massive change involving so many crane models requires a great deal of planning. We have tested that the new oil is not harmful to our drive units here at the plant and this has also been confirmed by external laboratories. The switch must be well documented and traceability must be guaranteed. That is also important for our customer service teams and crane contractors.

Everybody concerned must be provided with all the information they need to ensure that the right oil is placed in the vehicles. In fact, we receive many components from suppliers already filled. During the shipment assembly,

the levels undergo a final check and are topped up with oil if necessary. We identify gearboxes which contain the new oil by information signs so that we can ensure that the correct oil is placed in the components throughout the entire production process.

Currently around half of our crane models are being supplied with the new gearbox oil. More models will follow gradually. It is also possible to switch cranes that have already been delivered to the new oil. But one thing you must take care not to do is to mix the different oil types. Contact our Customer Service. The team there will be able to provide you with instructions for switching to the new oil.

Teamwork

We checked with representatives from several of the departments involved: (from left to right:) Patrick Strohm (Testing), Markus Bendt (Design), Christian Brunner (Production), Gerald Geisselhart (Design), Markus Kolb (Design), Manuel Letzgus (Production).



Liebherr cranes take the lead role





Movie star, movie star...

A great film, great courage and great cranes. That is how we could describe the filming completed by crane rental contractor BKL Baukran Logistik GmbH in Frankfurt am Main. The result is fantastic – as found by the jury of the German Business Film Prize, which awarded the new BKL film a place on the podium.

Our cranes often appear in film productions. From “Die Hard” with Bruce Willis to the Tatort detective series on German television. Sometimes they are minor characters, sometimes just background equipment. Having a crane as the main star, on the other hand, is a fairly rare event. BKL decided to change all this by producing a new image film. The aim of it was to present a new corporate film at Bauma. “We did not just want to do a typical company presentation. We wanted to appeal to a wider audience with exciting action and spectacular images in cinema quality”, explains Veronika Leger, Marketing Director at BKL.

Sleepwalking at an altitude of 55 metres

Everybody likes a good night’s sleep in a peaceful, safe and sound bed. This is exactly where the film starts. Crane rental contractors like BKL have to operate with maximum safety and reliability, to ensure that customers can sleep easy. Putting that into pictures as a complete story – that was the challenge. The search for a location was particularly difficult – a hotel-type building with modern architecture, a high balcony and above all a suitable set-up area for large cranes. The cranes had to hoist two steel girders into the air over which a stuntman completes a sleepwalk in safety – demonstrating how he can sleep soundly. The next hurdle was convincing one of the possible hotels that it was a good idea. The company struck gold in Frankfurt. “A good deal of preparation was required to enable the stunt to take place safely at an altitude of around 55 metres”, adds Leger.

Cranes and operators – in front of and behind the camera

Of course, the highlights from the BKL fleet also had to feature in the film. They had to be modern and impressive. In other words, they had to be large cranes featuring the latest technology. So two LTM 1450-8.1 cranes set up with a hook height of around 65 metres played the leading roles, together with a MK 140 mobile construction crane with a 45 degree boom angle acting as the lighting and safety crane. For the operators, the instruction was to act with maximum safety, extreme concentration and lots of fingertip control, in other words the same as any other crane job. But they also needed lots of patience because multiple shots from different perspectives were required on the set. This was where the operators, cranes and film team produced outstanding performances – and the stuntman was on a completely different level. The lighting conditions were also important as there was a very limited time before twilight. “We had to decide every week whether we actually wanted to film. That meant everyone concerned had to hold their nerve because in addition to the wind, the weather also had to be perfect for this job. At the same time, the cranes were also required elsewhere. That meant the whole thing was very complex for the crane dispatch team”, continues Leger. In technical terms, the whole thing was fairly simple. The very first rehearsal was successful. The stunt team were able to fit the safety attachments perfectly so that the sleepwalker could continue with no obstacles. And the steel girders on the cranes were wide enough and stayed still as the



A look down: two LTM 1450-8.1 cranes and an MK 140 are set up for the filming work and the road has been partly closed for the weekend.



“Its special story and spectacular images not only place BKL in the focus, but mainly direct the spotlight on the performance of the people in the industry.”

Veronika Leger
Marketing Manager at BKL

stuntman walked over them. Everybody was satisfied. But the difference between the rehearsal and the take was massive. As a result of the time restrictions placed on road closures, all the shots had to be in the can between Saturday midday on Sunday evening. For the stuntman himself, in addition to the altitude the icy temperatures in the dark on steel girders were very challenging, particularly as he was not allowed to shiver in his role as a sleepwalker and was only allowed to look straight ahead.

Much more than an image film and prizewinner

In the film, the crane operators react quickly, deliberately and ensure a happy ending with their fingertip control – just like in their everyday jobs. But the unusual story itself was something new for the industry. Great images, jangling nerves and entertainment were also designed to place the operators and their performance in the spotlight, however.

“The mobile crane operators took centre stage in the film. Particularly now, when lots of new regulations are making working with heavy loads, cranes and logistics even more complex, it is important to show what the industry literally moves every day. The film was also supposed to be a bit of public relations for the industry”, says Jörg Hegestweiler, Managing Director at BKL. The jury for the German Business Film Prize, which is awarded every year by the Federal Ministry for Economic Affairs and Climate Action, was also delighted when they presented the award to the film in October 2022. And we hope that all these moving pictures perhaps also may create a little more understanding for the significance of crane work in the construction sector, which is so important to our societies.



Interested?
Watch the film:



4° Celsius, twilight – the first rehearsals are underway. The safety ropes were retouched later.

EN 13000

A few years ago, when all the crane manufacturers in Europe had to remove the key switch to bypass the overload system, the subject of the EN 13000 standard was suddenly on everybody's lips. All our load charts stated that they had been calculated on the basis of EN 13000. So what exactly is EN 13000 and how does this standard affect our crane design work? Head of Design Bernd Boos, who himself actively plays a part in writing standards, explains the situation.

Standard compliance

Declaration of conformity in the new design with the latest machine tag: CE mark plus UK CA for the United Kingdom.





“The EN 13000 standard specifies in detail the basic requirements of the Machinery Directive.”

Bernd Boos

Head of Design Telescopic Cranes

Product safety in Europe is regulated by a wide range of directives. These directives are implemented as laws in the member countries of the European Union, making them mandatory. The directive which particularly affects us as a crane manufacturer is the Machinery Directive 2006/42/EC. This defines the basic requirements for the safety of machines, starting, for example, with hand-held drills and extending right up to our mobile cranes.

A specific section of this directive deals with the hazards resulting from hoisting processes and formulates the special requirements for everything to do with hoisting work. Even in this section, the requirements are formulated in very general terms as it covers all hoisting gear, for example, a manual chain hoist with a lifting capacity of 750 kilograms up to a crawler crane with a lifting capacity of 3,000 tonnes.

To flesh out these general requirements to suit specific products, they are formulated in European product standards. For us as a mobile crane manufacturer, the relevant standard is EN 13000. When a European standard is harmonised, in other words when it is officially published in the Official Gazette of the European Union, conformity is assumed by the application of the standard. In other words, if the EN 13000 product standard is used, we as a manufacturer may assume that we are complying with the Machinery Directive and therefore the law. We confirm compliance with European directives with the CE mark on the machine tag and the EU declaration of conformity which forms part of the crane documentation. In addition to the Machinery Directive, we also use the CE sign to confirm compliance with noise emissions and the Radio Equipment Directive.

EN 13000 was first published in 2004. All products from the Liebherr plant in Ehingen, in other words LTM, LTR, LTC, LTF, LRT, LR and LG cranes, are covered by this product standard. MK cranes for which we supply the chassis, on the other hand, are covered by the tower crane standard EN 14439.

The current version of the standard is EN 13000:2010+A1:2014. The basis of this version was published in 2010 and has been in force since 2012. One of the aspects of the 2010 version was the ban on the key switch in the LMB from the cab, in other words the situation that we know today. The amendment dated 2014 (A1:2014) then also added the outrigger width monitor in the form of warning.

Both the Machinery Directive and EN 13000 are currently undergoing revision. The publication of the new Machinery Directive, which we expect in short term and will also result in a regulation, which will place new requirements on us as a manufacturer. These requirements will then have to be fleshed out in detail in the next version of EN 13000 for mobile cranes. Some of the requirements from this version have already been implemented at Liebherr, for example the identification of counterweights on telescopic cranes, the outrigger width monitor with a shutdown facility and the support force monitor.

At Liebherr-Werk Ehingen GmbH, we play an active role in creating the EN 13000 product standard. Whilst I work on the standard committee as a whole, some of my colleagues work in the structural engineering and crane control expert groups.



Four steps for a better tomorrow

Sustainability and climate change are hot topics at the moment. It is now more important than ever to develop greener drive concepts for vehicles to reduce CO₂ emissions, for example.

So what can we at Liebherr do to ensure that our Liebherr crawler cranes operate more sustainably and with greater green credentials? How can we use less fuel, reduce CO₂ emissions and also save costs?

This is what we are working on at Ehingen, cooperating with our own group engine manufacturer in Bulle. Together we are attempting to gradually develop innovations and make improvements to help make our operations both greener and also more economical. This is a particular challenge for our gigantic crawler cranes with lifting capacities of up to 3,000 tonnes. Energy efficiency requires a new approach. Taking all the relevant aspects into account, the concept of the electric drive unit is simply not suitable for us at the current time on our heavy duty crawler cranes. So we have found other ways to reduce fuel consumption by around 20% and also reduce CO₂ emissions by almost 90% during crane operations using various measures on crawler cranes. We can now explain in more detail how we have managed it.



1 FFE 30 hydraulic oil
We have had a special hydraulic oil developed for our cranes which has some very special properties – FFE 30 hydraulic oil. It is thinner than conventional hydraulic oil types due to its low viscosity. That also means it develops less resistance in the lines during crane operation, which reduces energy consumption. Nevertheless, it features outstanding lubrication properties. The volume of fuel savings depends on several factors, such as radiator control and temperature. The warmer it is, the less fuel is required. In general, the savings are around 5% during normal crane operation compared to cranes which use alternative hydraulic oil types.

We have been using this outstanding hydraulic oil as standard in our crawler cranes above 500 tonnes for around ten years. So our special high quality hydraulic oil, with each crane containing around 1,000 to 1,500 litres, helps our customers to reduce fuel consumption – good for the environment and for their wallets.



2

APU (Additional Power Unit)

The APU (additional power unit) we have developed is an investment that makes sense as in addition to the air conditioning compressor, this unit can also power the hydraulic oil preheating system without having to start the main crane engine. In addition, the LICCON control system can remain active as the alternator on the additional power unit maintains the crane battery charge. If the ignition for the APU is set to ready, the additional power unit will start automatically, generating 11 kW, as soon as the crane engine's stop button is pressed. This saves up to 15% of fuel during normal site operation and also reduces emissions.

Furthermore, the crane engine idles less, which reduces the frequency with which the emission system has to be cleaned. This procedure requires a certain operating temperature and the appropriate fuel to get the engine to that temperature. Furthermore, it means that the crane engine has fewer operating hours, which reduces the frequency of maintenance work and also increases its resale value.

Our ECOmode, which is currently being tested, is another improvement. When ECOmode is active and other conditions are also satisfied, the crane engine is automatically shut down during lengthy interruptions in crane operations, which reduces fuel consumption even further.

All these financial and green benefits make the optional APU a very worthwhile investment. It is available for our LR 1500, LR 1700-1.0, LR 1800-1.0 and LR 11000 cranes. It is actually standard on our larger crawler cranes. We should also point out that it can be retrofitted. If you are interested, contact your Liebherr service partner.



3

HVO ready

Naturally, all our crawler cranes are also HVO ready and fuelled with HVO on delivery. HVO stands for hydrogenated vegetable oil. It is a fuel that works like diesel, but it is not a fossil fuel and is in fact purely vegetable in nature made of food waste, vegetable fat or vegetable waste. HVO is climate-neutral both in terms of its manufacture and use as long as it is made exclusively of regenerative energy sources. This must be ensured by HVO manufacturers and suppliers and excluding the use of foodstuffs is particularly important to Liebherr.

During the production process, the vegetable oil is converted into hydrocarbons in a catalytic reaction by adding hydrogen. This can then be used as a fuel to drive an internal combustion engine and reduces CO₂ emissions during crane operation by up to 90%. The main benefit is that the function of the diesel engine is unchanged – it is simply greener.

HVO can be used flexibly as a pure fuel or mixed with fossil diesel in any ratio for use in conventional internal combustion engines. That means that even older Liebherr engines can be powered on an essentially climate-neutral basis. No modifications are required to the crane itself. In addition to reducing CO₂, soot particle emissions are also reduced, particularly from vehicles without a diesel particulate filter, as are emissions of nitrogen oxides. HVO also delivers good compatibility with all engine components, very good resistance to low temperatures and reduces consumption of AdBlue.

4

Improved load lowering with a closed circuit

Another thing we are working on to reduce fuel consumption is improved load lowering with a closed circuit.

To ensure adequate speeds for lowering loads, to date the process has resulted in the automatic activation of additional braking pumps. The braking energy resulting from this process generates a great deal of heat in the hydraulic oil. Active cooling is therefore required to enable a reasonable temperature level to be maintained, which requires additional fuel consumption. The aim of the improvement is to generate the braking energy by different means without heating the hydraulic oil. Our initial tests have been very promising. We will describe how it works and what effect it has in more detail in a future edition of UpLoad.

Berg Repair Centre – what's new? What's different?



LIEBHERR

A large, light-colored industrial building with the name 'LIEBHERR' in bold, black, sans-serif capital letters on its upper left side. The building is viewed through a chain-link fence in the foreground. The sun is low in the sky, creating a bright, hazy glow and lens flare effects. The sky is filled with soft, wispy clouds. In the background, another smaller industrial building with several windows is visible. A white vehicle is partially visible on the right side of the image.



Bernd Rechtsteiner, Andreas Leicht and Harald Hummel (left to right) talking to UpLoad Editors, Wolfgang Beringer and Carmen Kley.

It's not just cars, cranes also require a regular check-up to ensure that everything is still in perfect condition and works smoothly. Now and again, something jams or ageing machines are given a well-deserved general refurbishment before they make their way to a new owner. We have been carrying out this service, repair and maintenance work of all kinds for mobile and crawler cranes at our repair centre in Ehingen for 40 years. As the number of cranes we sell rises, the number of machines that require specialist maintenance, repair or refurbishment work for resale naturally increases as well. This meant that our repair department had reached the limits of what it could do. It was time for a new, significantly larger repair centre.

And after being under construction for around a year, it is now complete – our repair centre in Ehingen-Berg.

What's new? What's different? And what are the benefits for our customers as a result?

That is exactly what we talked to our Berg Repair Centre Manager, Andreas Leicht, our Used Cranes Manager, Bernd Rechtsteiner and our Service Department Manager, Harald Hummel.

What was the reason for relocating the repair centre from the main plant to Ehingen-Berg?

Andreas Leicht: We have significantly more space available at our new repair centre in Ehingen-Berg. Previously, when we handled around 200 customer and used machines per year, we were working at the limit. Now, however, we can also accept emergency repair work at short notice. That means massive benefits for our customers, as we can get their cranes up and running again quickly.

Harald Hummel: It means that the Service Department is now generally more flexible and more targeted. The previous location of the repair centre at the main plant will be used to build a new spare parts warehouse. That will increase the availability of spare parts massively.

Bernd Rechtsteiner: It also means that we can now repair large cranes without any problems. We now have the space and manpower to provide the capacity we need. The large test yard immediately next to the repair centre is another major factor in this respect.

Andreas Leicht: One of the major benefits is that despite us being in a new location, we are only five kilometres away, which means we are really still very close to our main plant in Ehingen. We will be receiving material from there every day. Also, our experts from the design and production departments can be consulted quickly if we have any questions. That creates perfect conditions for us – even if we are facing complex repair work. Another benefit for our customers is the short distance from the road straight into the workshop. They no longer have to drive all round the massive plant to get to the repair centre.



The repair centre at the Ehingen-Berg site.

How did the relocation go?

Andreas Leicht: Very well. Overall, the relocation phase lasted around three months. We were able to maintain operations during this time, despite all the challenges we faced. Naturally we moved all our experienced personnel with us to Ehingen-Berg, so capacity can now gradually be increased at the new site due to the infrastructure.

How well equipped is the new repair centre?

Andreas Leicht: Our new repair centre is even better equipped than the old one. Thanks to our new structural steelwork area with two straightening plates, we can now also carry out major structural steelwork repairs. Our boom test rigs and the special angled cranes enable us to repair and refurbish telescopic booms from cranes extending right up to our LTM 11200-9.1.

Harald Hummel: We also have the facility to weld large equipment and lattice sections in almost identical conditions as we use in our production plant. That's a very special feature.

Andreas Leicht: Safety will also be improved due to the greater space. The workstations have been designed to comply with the latest ergonomic findings. For example, this includes personal lifting trucks for working safely and ergonomically at all heights within the assembly pits. We also have a TÜV-certified testing area with a brake test rig, steering play tester and a headlight adjustment area.

That means we can comply with every single statutory requirement.

Outside the repair area, the new site also has an office block, training and meeting rooms, a canteen and a lounge area for our customers.

In addition to repairs, crane maintenance is another major segment for the repair centre. Are there any new features in this area?

Harald Hummel: We have established a special service area in the shed for maintenance work. The installation of a filling and disposal facility means that we have state of the art equipment that complies with the very latest environmental regulations. It also means that we can accept maintenance work at short notice for our customers without them having to arrange appointments months in advance.

Andreas Leicht: We have already had customers who, after carrying out a job, for example at Legoland in Günzberg or at the Stuttgart Volksfest, have called in here on their way back to base. That saves our customers time and money, maintains the value of their cranes and also protects the environment.

How does the new repair centre affect the repair process?

Andreas Leicht: In general, we decide where a crane should be taken for repair on the basis of capacity, the complexity of the damage and the size of the crane. Some cranes require repairs which aren't technically possible at other sites or require a really large volume capacity and resources. These are now brought from all over the world to us at Ehingen-Berg, even though our focus here is on customers in Europe.

And some cranes are also repaired outside Ehingen...

Harald Hummel: That's true, we have two other time-tested repair and service sites in Germany at Oberhausen and Alt-Bork.

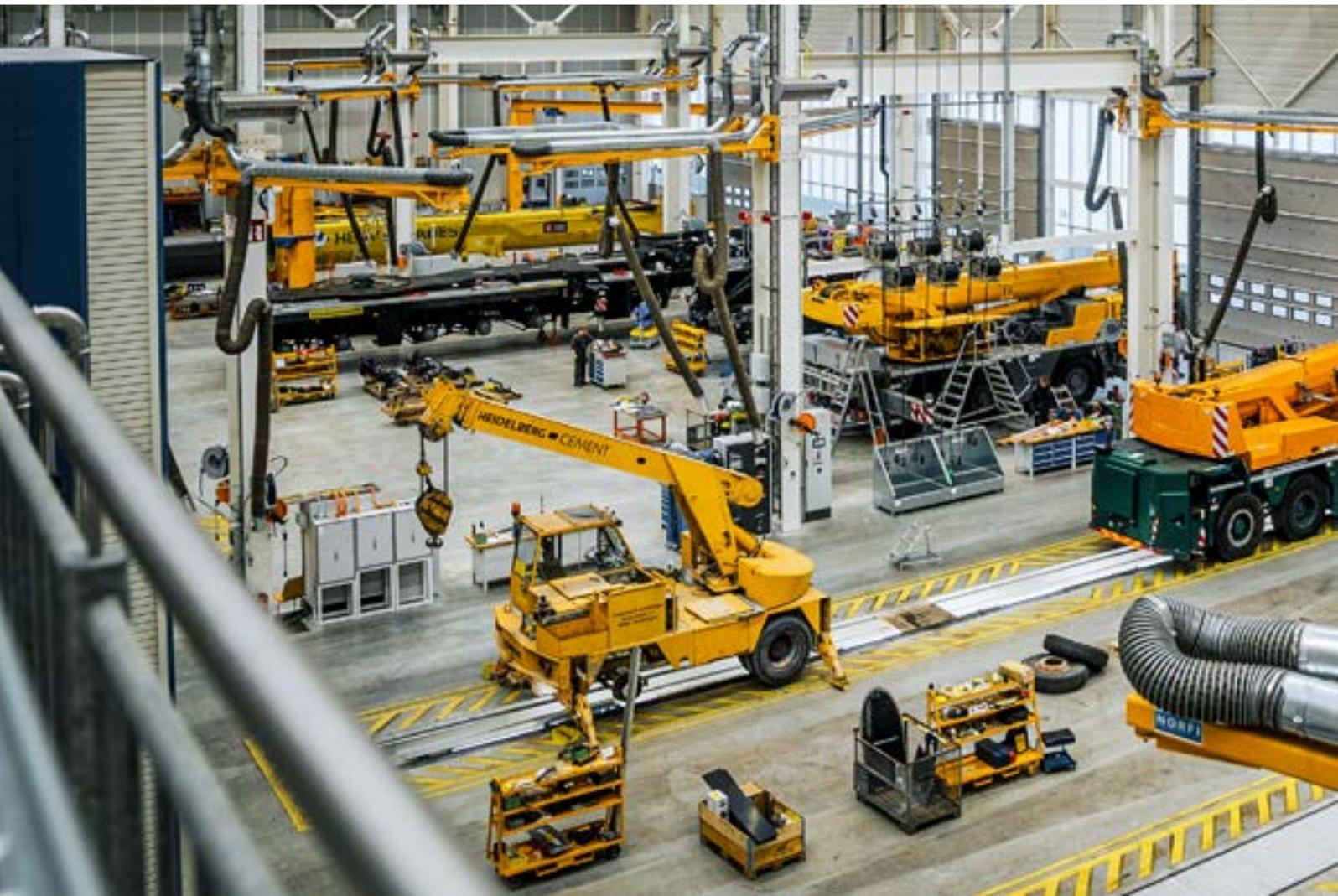
We also have service outlets all over the world. We have a presence in all our main markets, for example in the USA, where we recently opened another repair workshop in Newport News – and we are still striving to improve our global service.

Andreas Leicht: It's not always necessary to deliver the complete crane for repair. After initial assessment and inspection by our specialists on site, sometimes we are able to repair just specific components and parts.

Bernd Rechtsteiner: Since early summer, we have also had 20,000 square metres of storage space very close to the port in Bremerhaven where we can store part-exchanged large cranes or parts of them temporarily. When we resell them, we ship them directly from there. That helps to prevent "crane tourism", which relieves the strain from both the roads and the environment. And it also means that we have reduced transport costs for our customers.

Another new feature is the internal restructuring of the repair centre from Production to Customer Service within the Sales Department. How did this come about?

Harald Hummel: At Customer Service, we have a direct line to our customers. That makes the repair process significantly easier and faster for everybody concerned by reducing the number of internal interfaces.



For repair work after accidents, too, it is a massive benefit that the repair centre is now actually part of sales. Our crane experts can provide our customers with extensive advice. The preparation of reports often takes a great deal of time during which the cranes have to be stored. We can now take our time without obstructing production processes.

Bernd Rechtsteiner: It also means that the customer has time to talk to us and decide whether the crane should be repaired or whether he would prefer to use it as part-exchange. If the customer buys a new Liebherr crane, we then take care of all the procedures with the insurance company. That is naturally the most convenient option for the customer.

The used crane market is another important segment for Liebherr. How does the new repair centre affect it?

Bernd Rechtsteiner: We are the largest used crane dealer in the world with 250 to 300 units annually. We are observing a trend that is moving significantly towards large cranes being used in part-exchange.

Over the last ten years, we have bought, refurbished and resold more than 130 large machines. And by that, I mean telescopic cranes over 750 tonnes and lattice boom cranes of 350 tonnes and over. At the same time, we have had to increase our manpower for repairs by 24%. That also meant that we had reached the limit of what the old repair shed could offer. The new repair centre will deliver major relief in this respect.

Used cranes open up completely new markets for us. Used machines are quickly available and also cost less than new cranes. Quality, lower prices and immediate availability as well as sustainability are some major arguments in favour of buying a used crane.

The first three large cranes we accepted in part-exchange have already been refurbished at the same time at the new repair centre and delivered to new customers. These cranes will mainly be used in Brazil, Australia and the USA in the wind industry.

And we plan to significantly expand this segment in the future. And for that reason, we'd like to appeal to our customers: Contact us, regardless of whether you want to send us a damaged crane for repair, refurbishment or a used crane in part-exchange.



 **7.3 ha**
Area

 **120,000 m²**
Shed: 200 x 60 x 24 m

 **135 kWp**
Photovoltaic system and roof greening

 **64 employees**

 **Around 220**
Customer and used cranes per year

Find out about the wind forecast



Prompt action
Lower the boom
as long as you can
do so safely.

The energy generated by wind is good for the climate revolution, but often makes life difficult for crane operators. They have to take a series of factors into account to prevent accidents, particularly when handling loads with large surface areas. Our tip today looks at a subject which is sadly often underestimated – the effects of wind when the crane is not even operating or at least does not have a load on its hook. Christof Maichel, a Trainer at our Echingen Training Centre explains what to look out for.

My tip can be summed up in a single sentence. Never leave the crane cab without first finding out what the wind speed is doing. This may sound slightly excessive but it is enormously important because mobile and crawler cranes provide the wind with large surface areas to attack even without a load. Even with lattice booms, their surface areas may be several hundred square metres.

Digital assistants

There are some great apps which provide fast access to the local wind speed forecasts, including “Windfinder” and “Windy”. One very important point to remember is that the gusting speeds are absolutely vital. These values are also shown in the apps.



“Always make sure you are aware of the expected wind speed. That will enable you to avoid dangerous situations.”

Christof Maichel
Technical Trainer

The next thing you must do is look at the crane documentation for the “Out of service wind” (wab) values in the wind speed tables. These tables contain the maximum gusting speeds for a range of configurations. The main factors in this respect are the boom lengths (HA/HI), main boom angle (WHA) and auxiliary boom angle (WHI). In addition, the total ballast (OWB) and the hook block (HKFL) must be set up as shown in the wab table.

The wind speed (VWMAX) shown in the wab table indicates that the crane system can be affected by this wind over the full 360°. The basis for this is that according to this table, the centre of gravity of the entire crane system should be as central and as low as possible.

As an aside, when you leave the crane, you must make sure that there is no load on the hook. And there is another important point – it is the wind speed at the boom head that counts, not at an altitude of 10 metres, which is what most wind speed apps quote. The conversion factor for different altitudes is shown in our brochure entitled “Influence of wind during crane operation”.

Avoid the worst case scenario

If the forecast wind gust speed exceeds the maximum, the boom must be lowered. But, of course, you must ask whether that can actually be done safely. We have erection and take-down charts (aat) for this purpose, showing the maximum wind speeds for all cases.

If these are currently exceeded and if the wind forecast shows that things may calm down briefly, you should position the boom with its back to the wind by pressing the “slewing gear release” pedal. In some situations, this is the best action a crane operator can take to turn his boom system into the wind (back wind). Only if it is in this position will our load moment limiter (LMB) be able to calculate and display the additional stresses.

If, however, the wind continues to strengthen and the boom cannot then be lowered, the worst case scenario comes into play – get out of the crane and cordon off a wide area around it. Personnel safety takes absolute priority.

But you should not let things get that far – find out about the expected wind speeds early on. And lower the boom sufficiently early as well, as safety always comes first.

Find out more:
Brochure entitled
“Influence of wind
during crane operation“



The world with Liebherr

An overall view:

Bauma sees many of our product segments come together. It provides insights into technologies which are impressive when combined.



Innovative without blinkers

We live in transformative times, characterised by climate change, the shift away from fossil fuels and rapidly advancing digitisation. The innovations and drive systems that will lead into the future are a matter of concern for politicians, scientists and researchers – and especially for the manufacturers of construction machines. Jürgen Appel, head of technology coordination at Liebherr-International AG, on a technology-open approach, bundled competences and the not-always-easy search for the right solutions for different applications.



Jürgen Appel
Head of technology coordination
Liebherr-International AG

Mr Appel, we are living in unusual times, which today are often described as VUCA: Volatility, Uncertainty, Complexity and Ambiguity. How do you experience this at Liebherr and what challenges does this pose for technological development?

VUCA is impacting many areas of technological development. Climate change, digitisation and the globalisation of production and supply chains are defining the guidelines. Under these changed conditions, Liebherr's task is to modernise the drives of its construction machines in such a way that they produce significantly less CO₂ – across the entire product life cycle. At the same time, we have to keep pace with ever new legislative and regulatory requirements when it comes to selecting the right drives for the most diverse application scenarios of our machines.

What does this mean for the overall view of technology?

We definitely have to define them much more broadly than in the past. Just think of the digitisation of machines and their processes. Today, construction machines no longer only perform physical work, but also produce a large amount of data that makes life easier for users, but can also be used for further technological development and

process optimisation. In addition, the data obtained also pave the way for completely new business models for our customers. All this shows that the development of construction machines and technologies today requires far more than just conventional engineering. It is more about bundling different competences and achieving a new level of quality in terms of development.

What does that mean, exactly?

Whereas in the past the focus was clearly on the product during development, today it is also a question of including environmental aspects and thinking about existing possibilities and impossibilities from the outset. It makes no sense, for example, to develop alternative drives based on renewable energies without taking into account their availability and the development of a corresponding infrastructure. In the end, our machines should also actually be able to work for our customers.

Why is attention only being shifted to alternative drives now? The fact that they would be in demand against the backdrop of climate change and the finite nature of fossil fuels is not an entirely new or surprising realisation.

This has mainly to do with the fact that fuel, above all diesel, was available everywhere as a means of propulsion and that engine technology was continuously developed with a view to reducing pollutants. Nevertheless, Liebherr has been working on alternative drive concepts for a long time and has various machines in its portfolio that are also powered purely from the mains. In the meantime, the political and legislative assessments, exacerbated by the supply bottlenecks in the wake of the war in Ukraine, have changed fundamentally. The end of fossil fuels is a done deal. In order to quickly arrive at independent and feasible alternatives in this scenario, we at Liebherr see this as confirmation of our efforts to continue not simply relying on just one factor, such as electric mobility, but looking at several different solutions in parallel.

How does Liebherr go about this?

Looking at sustainable CO₂-free or at least CO₂-neutral drives, there will not be a single, one-size-fits-all concept for every application covered by construction machines. A compact wheel loader in horticulture simply has different requirements than a 100-tonne crawler excavator for mining at 5,000 metres in the Andes. In other words, a whole host of very different competences are required to develop drive concepts.

Where do these competencies come from?

At Liebherr, we are very broadly positioned across our various product segments. The Liebherr family wanted to bundle this practical knowledge accumulated over many decades, create synergies and enable springboard innovations, when three years ago it brought together various future and development projects of its product segments in specially created, centrally coordinated groups of experts in its newly created Corporate Technology central unit.

How does such cooperation between experts from the different product segments work? Do they enjoy sharing and discussing their ideas?

There are no reservations at all. On the contrary. We were soon able to identify experts, who now meet regularly across all segments and exchange views on the upcoming future topics in a very intensive and motivated manner. It is in the nature of things that the individual product segments arrive at various solutions for different customers on similar topics, such as new digitally driven business models. The earthmoving product segment sets its priorities

differently to our crane experts. However, if there are overarching issues, such as the equipment and use of battery-electric drives, it makes sense to bring together the individual competences available to us in each case. We have created our own competence centres at Liebherr for this purpose, such as the one in Biberach for batteries or the “Liebherr Digital Development Center” in Ulm.

And what do the product segments have to say about this form of centralisation?

They are aware of the advantages that result from this strategy for the company as a whole, but also directly for themselves. After all, the product segments are and will remain responsible for their respective products at Liebherr. They simply know the needs of their customers and target markets best. Thus, the bundling of cross-divisional competences is not at all about centrally prescribing which products are to be manufactured and how they should look. Rather, the competence centres start where a product segment reaches the limits of its expertise and wants to open up new possibilities for action in dialogue with others who are already further advanced at this point.

Can you give an example of this?

There are many examples on the technological side, such as batteries and charging infrastructure or in the broad field of hydrogen drives. The transfer of expertise at Liebherr has recently been particularly intensive and extremely successful on the regulatory side. Brexit had been hanging over the economic partners as a sword of Damocles since the 2016 vote, but when the time came on 1 January 2021, there was great uncertainty on both sides as to which rules would apply to whom and what would have to be observed administratively in the exchange of goods and commodities.

How were you able to meet this challenge at Liebherr?

All of our sites that supply equipment or components to the UK were faced with the question of which administrative and customs requirements had to be fulfilled overnight for the movement of goods when Brexit came into force. Because there was a lot of uncertainty and confusion on both sides of the border, we very soon set up an expert group. Together with lawyers, customs experts and logistics specialists, the expert group developed a company-wide Brexit guide within a short period of time, which now applies to all our sites. This means that not every single Liebherr subsidiary doing business with the UK has to clarify each time with experts what information has to be on the type plate according to the new regulations or what the obligatory “UK Declaration of Conformity” has to contain. This highly practical service has been very well received within the company.

How does such a concerted approach affect the development of alternative drives?

Before evaluating alternative drives, we first wanted to clarify the overall carbon footprint of construction machines. To this end, in collaboration with the economic advisor Frontier Economics we recently conducted a comprehensive life cycle analysis of the greenhouse gas emissions generated by typical construction machines. One and the same machine was equipped with different drive solutions and examined. This results showed that there is no superior, standard solution for selecting the right climate-neutral drives to be installed in construction machines. Again: Many roads lead to Rome. This is both confirmation and encouragement for the technology-open approach that Liebherr has chosen, in order to reduce emissions as efficiently as possible, depending on the machine and application, in an absolutely tailored and functional way.

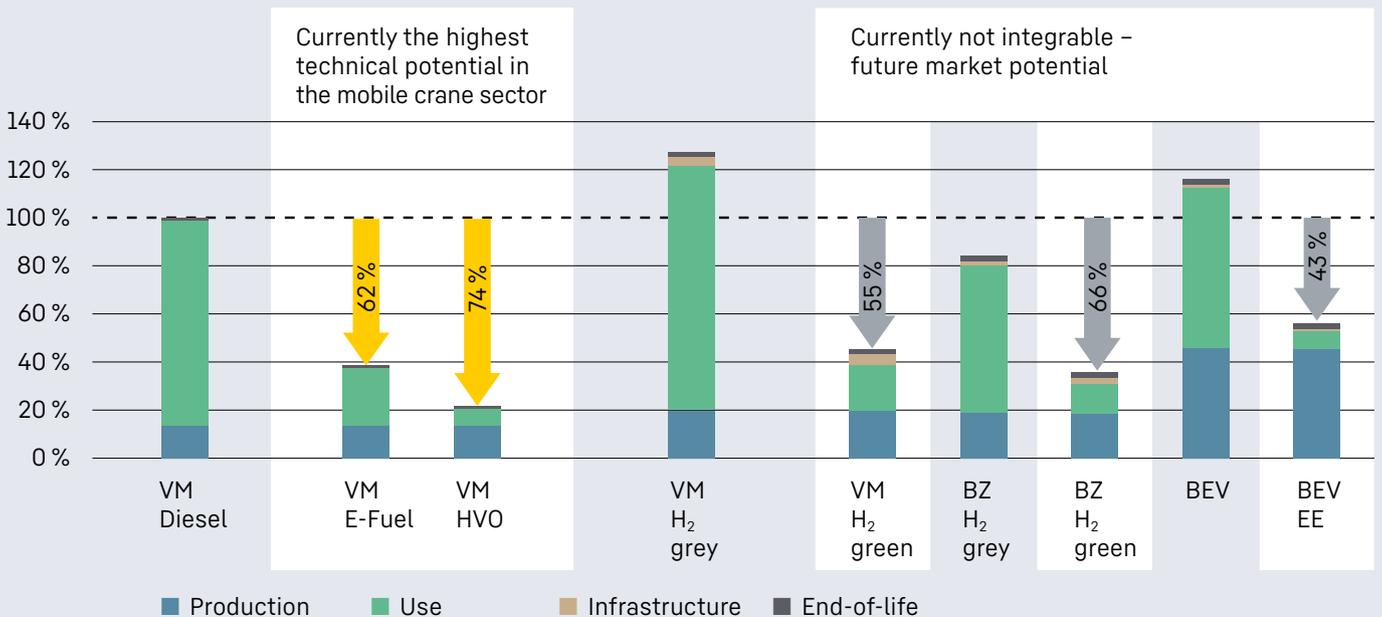
What does this mean for Liebherr’s culture of innovation?

Real innovation is not simply a box-ticking exercise. The study provides impressive evidence of this fact. At Liebherr, we have always been committed to open-ended research and development with a clear focus on the performance and cost-effectiveness of our machines. If necessary, we also involve partners who, for example as start-ups, are a little more agile and quicker than a large, globally operating group and can thus often contribute exciting impulses that lead to new solutions.

After all the experiences we have had so far: What do you personally think about a technology-open approach?

The Frontier Economics study proves how little sense it makes to align engineering with political or perhaps even ideological guidelines. Innovations must serve the user and not the other way round. That’s Liebherr-like. We will only achieve the targeted and necessary CO₂ reductions with a holistic view of the entire life cycle of a machine. This is not possible with technological blinkers. Instead, we need to focus on the fact that sustainable and climate-relevant innovations must ultimately be technologically representable in such a way that the customer can also work with them. I find it incredibly exciting and rewarding for everyone involved that there is not only one way to reach the goal.

Comparison of CO₂ emissions by various types of power units (using the LTM 1160-5.2 as an example)



VM = Internal combustion engine, BZ = Fuel cell and electric motor, BEV = Battery and electric motor, EE = Electricity from renewable sources



CO₂-free drive in off-road use

Construction sites at high altitudes, dusty air, strong shocks and vibrations push electrically powered construction machines and cranes to their limits. This is where hydrogen internal combustion engines (ICE) make it possible to work without CO₂ and achieve goals in line with the EU's commitment to global climate action under the Paris Agreement – even for heavy-duty applications. At Bauma 2022, Liebherr's latest hydrogen engine celebrated its world premiere in the R 9XX H₂ crawler excavator.

Hydrogen is a very special type of fuel: It is the most abundant chemical element in the universe, with a high energy density and is therefore a great hope on the road to reducing global carbon emissions. It is definitely worth a closer look. And that's exactly what the engine development team at Liebherr-Components is doing in the Swiss town of Bulle. At Test Bench 54 for diesel and H₂ engines, the team led by Dr Bouzid Seba, head of combustion engine pre-development, has carried out its latest project. It is a hydrogen ICE with direct H₂ injection, installed onto the

test platform and connected to a tangle of cables, strings and hoses, which continuously send data on operating conditions, emissions and performance to the control station.

Hydrogen from renewable energy sources has long been seen as a beacon of hope for a climate-friendly, CO₂-neutral energy supply. "Again and again, hydrogen seemed to be on the verge of a breakthrough as an infinite source of energy, only to disappear again into oblivion," explains Dr Seba.

However, the tables have turned in the meantime, which has led to a reassessment in the politics and especially in the construction machinery market. "Wherever batteries or fuel cells reach their limits, hydrogen ICEs can be the solution. This is primarily the case in applications where the engine is exposed to strong vibrations or where there is a lot of dust and dirt. This mainly concerns mobile construction machinery like crawler excavators, but also heavy-duty vehicles."

The engine engineering team in Bulle is currently examining different injection and combustion technologies for hydrogen ICEs. Liebherr's decades of experience with diesel and gas engines boost the development: The mechanics, crankshafts, bearings and turbochargers do not have to be developed from scratch, a fact that greatly shortens the time prior to intensive field testing.

This becomes particularly obvious in the latest cooperation between Liebherr Machines Bulle SA and Liebherr-France SAS in Colmar for the development of the R 9XX H₂, a 50-tonne crawler excavator equipped with the hydrogen ICE. Henrik Weitze, project manager at Liebherr-France SAS, has worked closely with Dr Seba's team for many years. Weitze sees the newly designed hydrogen ICE for the R 9XX H₂ as predestined for use on construction

sites at extremely high temperatures or under shocks and in particularly dust-intensive environments typical of earthmoving or quarries. "Like all our crawler excavators, the R 9XX H₂ with its alternative drive meets the highest quality standards under extreme conditions," explains Weitze. Keeping this in mind, the engineering team in Colmar designed the machine taking the latest, future-oriented crawler excavator Generation 8 as the basis. "The overall performance is in no way inferior to the diesel version, be it power output, engine dynamics or response during dynamic load changes," explains Henrik Weitze. The only difference is the refuelling process, special infrared communication between the excavator and the filling station makes it both fast and safe.

The hydrogen ICE developed for the R 9XX H₂ in Bulle is based on port fuel injection (PFI). "The accuracy and quantity of hydrogen injection is an essential requirement for heavy-duty ICEs," explains Dr Seba. "To align the performance of a H₂-engine to that of a diesel engine, the system has to be able to guarantee the different requirements in terms of flow and injection accuracy. Hydrogen gas has a low density, which requires large valve cross-sections in the injector. We were able to combine different components to control pressure and flow rates."





“The overall performance is in no way inferior to the diesel version, be it power output, engine dynamics or response during dynamic load changes.”

Henrik Weitze
Project manager

Dr Bouzid Seba (left) and
Henrik Weitze (right)

Following PFI, direct H₂ injection developed by Liebherr will be tested in terms of performance in particularly dynamic heavy-duty applications. “During our tests, we aim to gather large quantities of input data from the operating conditions of the H₂ engine,” explains Dr Seba. On four monitors, the developers can follow the engine performance in real time and make adjustments and optimisations simultaneously. Thanks to digitalisation, the speed of development is significantly higher today than even a few years ago. “Before the engine even gets to the test bench, we can use simulations to evaluate it under different operating conditions and incorporate their effects into the engine architecture right away.”

Henrik Weitze thinks that Liebherr is on the right track towards making a relevant contribution to the climate goals. The “Green Deal”, with which the EU wishes to become climate-neutral by 2050, is also setting the course for the development team. As early as 2030, CO₂ emissions are to be reduced by at least 55 per cent as compared to 1990. Weitze is convinced: “That’s a tight deadline, but we will make it. Until then, it is important to never lose sight of the goal, even when things get tough along the way.” The engineering team in Bulle intends to start with the serial production of the H₂ engine by 2025.

With the flow

Liebherr is testing a battery-powered wheel loader for its suitability for everyday use on an organic farm with a permanent camping site attached at the Wolfgangsee lake. Its technology and range of applications excite local people and animals alike.

The sun was shining brightly on this Wednesday morning in August. It bathes the mountains and meadows of the Salzkammergut district in its warm light, making the Wolfgangsee lake sparkle a Caribbean turquoise. On the south bank, in Farchen, there is a large farm that welcomes its visitors with a lime green sign: "Seegut EISL. Sheep's cheese. Camping."

Geraniums spill out of the flower boxes on the magnificent 500-year-old courtyard building. In front of the door, a small rooster with a loud voice is pecking away among the chickens. Nearby, a flock of sheep is grazing happily in the pasture. Towards the shore, there are a few caravans on a small campsite. The first early risers are greeting the morning. Almost unnoticed, a yellow wheel loader rolls along the gravel path with green cuttings in its shovel – with the whisper of an electric vehicle, as if it simply doesn't want to disturb the lavish beauty of this idyllic nature and landscape.

The Eisl family is committed to ensuring that this picture perfect idyll can still be experienced tomorrow. For Sepp Eisl, sustainable agriculture, the strict use of renewable energies and the responsible use of natural resources are an essential part of generational responsibility. The family, now in its 22nd generation, has been farming here since 1490. And doing so in such a way that the farm will continue to feed the generations to come. "Our aim is to be grandchild-friendly. So my wife and I changed our farm from traditional dairy farming with cattle to sheep farming back in the 1980s," explains Sepp Eisl. A bold step for a family with seven children.

"Dairy products from sheep were difficult to market at that time. We took the risk anyway, swam massively against the tide and were successful," the farmer continues. At the same time, his eyes light up. Sepp Eisl likes to think about things in wider contexts and developed his "grandchild-friendly" concepts from this principle. Word soon spread. In 1997, Sepp Eisl received a call to the Salzburg provincial government, where he assumed responsibility as a provincial councillor – among other things for agriculture – for 16 years. "But there came a point when I just wanted to be a farmer again," he says.

"Just a farmer" sounds very much like an understatement coming from Sepp Eisl, though. Because today, Seegut Eisl is a model company in terms of sustainability. Organic farming with more than 120 of its own sheep, its own renewable energy production with a photovoltaic installation of more than 1,000 square metres and a system for local heating with wood chips and solar thermal energy, which, in addition to the farm and the campsite, also





supplies the whole neighbourhood with hot water and domestic heating. In the meantime, all family and company vehicles are powered by electric drive systems – against the tide no longer. “Under your own power” is the motto on the farm estate today.

In front of the yard building, where the Seegut’s vans and cars are charged with green electricity at the chargers, the bright yellow work unit that is causing quite a stir at the yard is also “filling up”: a battery-electric wheel loader from Liebherr’s compact wheel loader segment. For almost three years, Seegut Eisl has been regularly participating in stages of a long-term test operation with a new, emission-free wheel loader drive concept that Liebherr is developing at its Bischofshofen plant. “The electric wheel loader perfectly suits our way of sheep dairy farming and the sustainable running of the campsite. Being able to carry out the work in the stables and on the campsite quietly and without any exhaust fumes is a real milestone,” Sepp Eisl adds. “And with no loss of performance compared to a diesel vehicle. On the contrary. The electric wheel loader has surprisingly high pulling power and playfully light, extremely sensitive controls for outstanding versatility in terms of application. Everyone likes working with it. This machine will definitely be part of our company in the future,” says Eisl.

Everyday life on the farm, with all its farm and production buildings, requires a high level of agility and dynamism from the working machines. “For us, everything on the farm revolves around quality. That’s where the multi-functional all-rounder scores. The electric wheel loader doesn’t need to warm up. The full performance capacity is available immediately, as soon as it starts,” Eisl explains. The compact lithium-ion battery supplies power both to the drive and to the working and steering hydraulics. “We manage with just one battery pack because on the farm, unlike in continuous use on a construction site, we can always quickly recharge during work breaks.”





Sepp Eisl is happy to contribute such practical experience to the gradual further development of the system. “During the field test, we set up a hotline to the Liebherr developers and technicians in Bischofshofen. If there are any questions or problems, the experts are here immediately,” says Eisl. “We know and appreciate each other.” He particularly likes the fact that “his” electric wheel loader has been developed from practical knowledge for practical use and refined step by step in this relationship of mutual trust. “We definitely want to be among the first when the electric wheel loader goes into series production and sales are launched about a year after the first major public presentation at Bauma.”

The success of the battery-electric wheel loader is already certain for Sepp Eisl. This is guaranteed by the tried and tested features of Liebherr stereo loaders: the clear layout of the cab, the extremely manoeuvrable stereo steering with articulated pendulum joint and steered rear axle, as well as the the powerful lift mast, which can be used to move large loads and work with various attachments in the yard. Another factor is also of vital importance for Sepp Eisl: “For many children, including my grandchildren, our farm is like a big adventure playground. So I’m glad that Liebherr also attaches such great importance to safety. On the wheel loader we’re testing, this is evident, for example, in the good visibility from the operator’s cab and the reversing camera.”

The operator’s cab of the electric wheel loader offers a surprising degree of clarity, simple operation and comfort. The operator’s seat, accelerator and brake pedals, steering wheel, a few switches, a touch display and a joystick – that’s all. “After a brief introduction, almost all of our 20 employees can operate the electric wheel loader,” says Sepp Eisl. “This is a real advantage for our jobs on the farm and campsite.” The key to the simple, intuitive control of the wheel loader also lies in the software. “The touchscreen gives operators all the information they need for the tasks at hand, and they can operate the mast and attachment with the joystick very quickly, easily, sensitively and precisely. You don’t have to be a digital expert to do that,” the 58-year-old adds with a grin. “I belong to a generation that is better with mechanics. I want to be able to use and apply digital support, but I don’t need to understand it down to the finest detail.”



“The electric wheel loader has surprisingly high pulling power and smoothly running, extremely sensitive controls for absolute application versatility.”

Sepp Eisl

Farmer and owner of Seegut Eisl

But now he has to get going. In the parking bay in front of the new farm shop, he wants to process another shovel of fine gravel. The wooden pavilion is nearing completion. The farm shop is part of the latest expansion stage of the Seegut. The shop is completely self-service, offering classic Seegut products such as sheep's cheese rolls, yoghurt, curd cheese and fruit whey, but also organic meat, oils and spices contributed by other farms in the area. And above all Eisl ice cream, with which the Seegut has been sweetening the summer for some time.

On a whim, Sepp Eisl reports, he added his own sheep's milk ice cream to the cheese production in 2017. “My son took an immediate liking to our experiments, did the relevant training and put out an exciting range.” In addition to classics such as vanilla, strawberry and chocolate, the range includes artisan ice cream creations such as blueberry & rosemary, curd dumplings or coconut & physalis – and they have been very well received. The Eisl ice cream business is flourishing. In Salzburg's old town, the Eisls now run Austria's first organic sheep's milk ice cream parlour. Customers include top restaurants and, using a sophisticated delivery system, online customers from all over Austria.

The ice cream is also a big seller in the farm shop. Some of the customers come from far away, so the small parking bay in front of the entrance also needs to look inviting. Sepp Eisl carefully tips the gravel out of the shovel and spreads it on the parking strip. Again and again, cyclists cross his path. Many of them are amazed at the surprisingly quiet and emission-free working machine on the side of the road and give an appreciative thumbs up. In no time at all, the parking bay is completely covered with gravel. The customers are now welcome to come. Sepp Eisl quickly puts up a small flag and sets up the board with today's specials. “Welcome to 'Cloud 9'”. How lovely, just like this sunny day in August, at this very special place full of energy at lake Wolfgangsee.



Towards climate neutrality with HVO

Mobile cranes are a key player in climate change reversal, for example when building wind power plants or adapting infrastructure. With HVO fuel as a diesel alternative, they can also make their own contribution to climate neutrality, as the largest mobile crane rental company in the UK, Ainscough Crane Hire, has now impressively demonstrated.



Peter Gibbs
Chief executive officer
Ainscough Crane Hire Limited

When it comes to his conviction, Peter Gibbs can be very persistent. "That won't work, it's uneconomical and just a fanciful hope of some free spirits ..." There was no lack of reservation and scepticism when, as CEO of the largest independent mobile crane hire company in the UK, he took a radical decision a year ago to convert the entire fleet of more than 400 mobile cranes to a green alternative to diesel. By adopting Hydro-treated Vegetable Oil (HVO),

made from vegetable waste and utilised in much the same way as traditional diesel, Ainscough took a step into the unknown for the crane hire industry.

"The move away from fossil fuels is unavoidable for the energy transition. Legislators have already set the course for this, both nationally and internationally. 'With proof of delivery to reduce CO₂ now required, customers are placing more and more value on sustainability. The question therefore arises as to which technology path is most suitable for achieving the climate goals,' explains Gibbs. "We didn't want to wait and see what would happen, but rather find a solution that suits us, our tasks and our cranes. We don't see climate protection as a restriction, but rather as an opportunity for our company, our employees and our customers."

For Ainscough, HVO is the clear interim solution – a fuel that works like diesel, but uses purely vegetable energy from food waste, vegetable fats or vegetable waste instead of fossil energy. In the production process, the vegetable oil obtained is converted into hydrocarbons in a

catalytic reaction with the addition of hydrogen, which can power an internal combustion engine and reduce CO₂ emissions by around 90 per cent. "The big advantage: diesel engines continue to function as before – but in a more climate-friendly way," explains Peter Gibbs. No adjustments are required on the crane. It is important that the infrastructure for the supply of HVO is built.

Alongside Liebherr's trials, Ainscough conducted an operational trial of HVO in 2021, says Gibbs. "Following the success of this trial and in alignment with our values, in 2021 we decided to be demonstrably the first climate-neutral company in our industry by October 2023. This required us to take a holistic approach to the transition from the outset, converting our nationwide network of 30 sites with over 400 cranes and the UK's largest heavy transport fleet to HVO." This was completed for all operational equipment within the three months running up to April 2022.

Ainscough was helped by the fact that its fleet consists only of Liebherr mobile cranes. The two companies have worked together closely since as early as 2006. That's how Peter Gibbs knew he would have a "reliable and proactive partner" in Liebherr regarding all the technical and infrastructural adjustments associated with HVO. And vice versa, says the tech-savvy CEO: "Our 70 Ainscough engineers have long since also become proven Liebherr experts with comprehensive system knowledge. This immediately brings a safe, reliable, high-quality and environmentally friendly service offering to our customers."

As very heavy equipment, mobile cranes are amongst the highest CO₂ emitters on a construction site. The dimensions of such a crane alone make this obvious. The LTM 1230-5.1, the latest addition to the Ainscough fleet, has five axles, a 75-metre telescopic arm and a lifting capacity of up to 230 tonnes. It, too, now runs on HVO.



“Liebherr has always been very proactive and cooperative in identifying and developing solutions to reduce emissions, for example in single-engine technology, tyre pressure monitoring or the display of operating conditions on the LICCON monitor. When switching to HVO, it really helped us that Liebherr had already tested this fuel extensively and was able to contribute very meaningful documentation for our decision-making process. Liebherr played a real pioneering role here and made a difference,” says Gibbs.

“Another decisive factor for the success of our game-changing project was Liebherr’s readiness to get involved in the cooperation and invest time and money themselves to get the HVO solutions ready for the market. Liebherr is very much in line with our own corporate values, making it the partner of choice.”

The availability and production capacities of HVO are still limited, and there is always concern that biofuels will unintentionally begin competing with food if not only vegetable waste is used. Currently there are no UK-based refineries. “We source the fuel from a dedicated ‘Green HVO’ supplier who guarantees via independent auditing that we only use HVO from renewable sources,” Gibbs emphasises. On this basis, Ainscough has now converted all its crane and truck filling stations from diesel to HVO, creating an HVO network of 30 sites – the first in the UK. This also arouses interest among customers.

“We have already had enquiries as to whether and how our UK HVO network could also cover their other fuel needs in the future.”

For Peter Gibbs, all this is both a confirmation and a demand for Ainscough to always be one step ahead. It’s fitting that the first major goal was achieved ahead of schedule. “In April 2022, the company were proud to announce a 96 per cent reduction (year on year) in CO₂ through HVO and some additional measures which, combined with a small compensation package, has enabled us to become the first national crane business in the world to achieve a 100 per cent carbon-neutral run rate. Persistence has paid off and is future-proofing our business.”



Striking the right tone

No exhaust fumes and only little noise on the construction site: More and more crawler cranes and deep foundation machines from Nenzing are being made available as unplugged versions. That means they can be used wirelessly with a battery – and that with the same power as with a conventional drive. Michael Flecker, head of sales crawler cranes, and Sascha Bechter, head of sales deep foundation machines and material handling equipment, know why both types of drive complement each other perfectly and why each has its own justification.

“Five unplugged machines are as loud as one diesel-powered machine.”

Michael Flecker
Head of sales crawler cranes

It might be said that Michael Flecker grew up with Liebherr crawler cranes. At the very least, they have had a massive influence on his professional life. He first came into contact with crawler cranes in 2005 when he started his career at Liebherr as an international fitter – and has remained loyal to them ever since. Since April 2022, the Vorarlberg native has been head of sales crawler cranes in Nenzing.

Flecker has previously seen a lot of the world and was, among other things, customer service manager at Liebherr USA in Houston for several

years. There he helped to build up the crawler crane segment and continuously developed it with feedback from customers. He was also up close when the first unplugged crawler cranes came onto the market at the end of 2020. The Liebherr unplugged machines were launched in 2019 with the LB 16 unplugged drilling rig –

the world’s first battery-powered drilling rig.

There are now a total of nine models coming from Nenzing that are also available as unplugged versions.

“Demand for electric construction machines is particularly high among customers in northern Europe – led by the Scandinavian countries and Great Britain, which are pioneers in the field of zero emissions,” Flecker explains. In the meantime, Liebherr unplugged machines are available in many other countries, for instance Germany, France and the USA. Cities such as

Oslo, for example, have clearly defined climate targets. By 2030, CO₂ emissions there are to be reduced by 95 per cent compared with 2009 levels. This means that as early as 2025, only emission-free construction machinery will be used in urban areas.

A clear advantage of the unplugged series is that the battery-powered units do not cause CO₂ emissions on the construction site. In addition, they are very quiet and therefore ideal for urban areas – an advantage for both residents and construction site workers. “Five unplugged machines are as loud as one diesel-powered machine,” Flecker explains. The battery-powered machines achieve the same performance as the diesel versions and are identical in their operation. Another advantage of Liebherr products is the complete package of drive concept and machine, because unlike its competitors, Liebherr offers both from a single source.

The unplugged series also strikes the right tone with new customers. “Many customers choose our battery-powered machines because they believe in the technology and want to be the first to use it in their market,” explains Flecker. “In some countries, this is actually a distinct competitive advantage.”

However, even though unplugged construction machines have many advantages, they are not best suited for every use or application. That’s why all unplugged units in Nenzing remain available with conventional drives. “Together with the customer, we decide individually which drive technology is right for the customer, the construction site and the application,” adds Sascha Bechter, head of



Sascha Bechter (left) and Michael Flecker (right)



“Together with the customer, we decide individually which drive technology is right for the customer, the construction site and the application.”

Sascha Bechter

Head of sales deep foundation machines and material handling equipment

sales deep foundation machines and material handling equipment. The 48-year-old is a true Liebherr veteran. He started his career at Liebherr more than 30 years ago as an operational electrician in Nenzing, before being drawn to Liebherr’s international companies for many years. Whether in the USA, Great Britain, Italy or Singapore: “I have never worked for any company other than Liebherr,” says Bechter.

That’s why he knows Liebherr construction machines and their applications in the field particularly well – and can judge which drive type suits which customer. Construction sites in rural or remote areas, for example, are typical applications where conventional drives are more suitable. This is because these places do not usually have the infrastructure needed for electric machines. Diesel-powered machines are sometimes also more suitable in the early stages

of a construction project or for short-term assignments, because the necessary charging infrastructure for the electric motors is often not available when a construction site is first set up. Flecker and Bechter agree that all types of drive have their justification. That’s why Liebherr takes an approach that is open to technology, where every customer gets what is best suited to them and their construction site.

2019

With the LB 16 unplugged, Liebherr introduces the world’s first large drilling rig with a battery-electric drive.

2020

World premiere: Liebherr launches the first battery-powered crawler cranes, the LR 1200.1 unplugged and LR 1250.1 unplugged.

2022

Another product area from Nenzing is electrified with the LRH 200 unplugged and LRH 100.1 unplugged piling rigs.

Giants under power

When it comes to reducing CO₂ emissions, the mining giants are also joining in. With their own power supply concept, Liebherr's heaviest mining trucks are now driving ahead with full electric power to reduce fuel consumption and lower emissions.



Standing in front of Liebherr's gigantic T 284 dump truck makes you feel tiny. This giant is eight metres high and can transport an impressive up to 375 tonnes of material. In Panama, the mining company First Quantum Minerals has as many as 38 of them in use. Here's the twist: these ultra-class giants are literally connected to the electrical network. With the help of Liebherr's innovative Trolley Assist System, they can drive without using diesel under certain conditions. The Trolley Assist System uses onboard pantographs to connect the trucks' drive system to overhead power lines on uphill haulage segments. These overhead lines stretch across the ramps between the digging and dumping zones. This not only saves fuel and reduces CO₂ emissions – the electric drive also increases productivity and thus the operating result.

The Liebherr Trolley Assist System is already in use in several mines around the world and the results are impressive. The example of the T 284 mining trucks shows that the loaded trucks go uphill at 25 kilometres per hour thanks to electrification which is almost two times faster than the standard version. Above all, the main goal of the Trolley Assist System is convincingly achieved: fuel consumption on the trolley segment can be decreased by up to 90 per cent.

“Currently direct electrification offers the greatest potential for reducing greenhouse gas emissions. It can also be achieved the fastest. For this reason, we have focused on the grid electrification of our entire range of dump trucks and excavators,” explains Oliver Weiss, executive vice president R&D of Liebherr-Mining Equipment SAS. That is why Liebherr

Mining now offers a complete portfolio of low-CO₂ solutions for its fleet as part of its Zero Emission Program. In addition to the Trolley Assist System for mining trucks, all mining truck and excavator types are available with electric drive, with Liebherr also having developed its own cable reeler system for excavators. The electrification of Liebherr's entire mining range has been tested in practice and the results show a significant reduction in greenhouse gas emissions.

Fortescue Metals Group, a globally active mining company, recently announced a partnership with Liebherr. This partnership will see Liebherr integrate the zero emission drive systems developed by Fortescue Future Industries and Williams Advanced Engineering into the T 264 mining truck.

After a two-year joint development period, the climate-friendly giants will be ready for series production and delivery. Fortescue also sees the partnership as an important basis for achieving net zero emissions in its own company by 2030.

Oliver Weiss explains: “This project provides us with an excellent opportunity to accelerate the integration of alternative drive systems into our mining machines powered by clean energy. This supports our vision and strategy to offer zero emission machines with the most suitable drive technologies in the future. Along the way, we will support our customers in choosing the technology options from our wide range of products that are most suitable to them.”



Oliver Weiss
Executive Vice President R&D
Liebherr-Mining Equipment SAS

One of these technology options includes reducing greenhouse gas emissions by running combustion engines on renewable fuels. Thus, the drive with Hydrotreated Vegetable Oil (HVO) is now also available for

most of Liebherr Mining's machines. Liebherr is working on the modularity of its large combustion engines for alternative fuels. Hydrogen, ammonia and methanol combustion processes are under development and will only be offered in series production depending on market demand.

Liebherr is also working on further climate-friendly developments for the mining industry with strategic partnerships. The cooperation with ENGIE is intended to improve the understanding of the entire energy value chain (well to wheel) of green hydrogen and the derivative fuels based on it in order to propose customers the best suited solution for their application to be able to advise customers about infrastructure requirements to set up Trolley systems, Liebherr is also working together with different Trolley infrastructure providers.

These partnerships are crucial to achieve zero emissions in the future. "We will offer proven solutions for all our mining machines that work completely without fossil fuels by 2030 at the latest," Oliver Weiss announces. "We are looking into ways of equipping our mining excavators, trucks, and dozers with various drive technologies. Depending on the type of machine and the application, this could include battery drive modules, H₂ fuel cell drive modules, or combustion engines with several other renewable fuel solutions."

Liebherr Mining aims to be able to make some of these innovations available to the wider industry as early as 2026. The heavyweights in the demanding mining industry will remain an exciting and spectacular topic, with further important milestones paving the way towards a sustainable future.



Construction site electricity from the powerbank

Electricity is becoming mobile. To work on construction sites without generating unwanted emissions, Liebherr uses the Liduro Power Port (LPO) to deploy the energy source exactly there where it is needed. This innovation is opening up entirely new perspectives for sustainable electrification on construction sites.

Navigating your way through an unknown city with your mobile phone is a fine thing. You don't need a city map and it's a good way to reliably avoid any traffic jams – at least as long as your battery holds out. When the battery sign lights up bright red, you really appreciate being able to recharge it quickly with your powerbank and thus reach your destination on schedule.

This type of forward-looking energy management is also increasingly becoming the focus of companies that plan and operate construction sites. This is particularly the case when it comes to “local zero emissions”, which legislators and society are increasingly demanding for building projects in inner-city or ecologically sensitive areas. The electrification of the drive systems of even the heaviest construction machines such as crawler excavators, concrete mixers or mobile cranes is technologically well advanced. Whether and to what extent such all-electric or hybrid devices can be used depends, however, on a secure and, above all, continuous supply of energy. But electricity and power grids are not always available everywhere, for

example when building bridges, tunnels or on construction sites in more rural areas, such as when erecting wind farms far away from housing developments.

“Electricity is needed everywhere and at all times on an emission-free construction site: for mobile or fast-erecting cranes, for excavators or wheel loaders and also for on-site lighting or the computers and refrigerators in the construction site container,” says Ulrich Geier, head of the electrical drive and control technology business unit in Biberach. Together with Claus von Reibnitz, managing director of Liebherr-Elektronik GmbH in Lindau, he has helped drive the development of the LPO energy storage system over the past two years. “However, because not all construction sites have a corresponding power supply and high-performance lines, we at Liebherr decided to look for our own ways of transporting electricity in high energy density to construction sites ourselves.” Thus, machines with different power ranges and load peaks can be supplied with mobile power directly on-site with the LPO – or an existing power grid with too little capacity can also be supplemented.

When using fully electric or hybrid construction machines and their accompanying infrastructure, high load peaks and/or prolonged periods of very low power demand are common – such as for lighting or powering small pieces of equipment. “The mobile energy storage system supplies the required power at any time according to demand and without surplus, i.e. with an optimal price-performance ratio,” explains Ulrich Geier. Compared to a diesel generator, which also requires fuel when no consumers are connected, the LPO delivers power with a significantly higher level of efficiency – especially at low loads – and without idle phases.



Claus von Reibnitz
Managing director
Liebherr-Elektronik GmbH

Ulrich Geier
Manager electrical drive and
control technology
Liebherr-Components Biberach
GmbH

The MK 140 mobile construction crane achieves dimensions in terms of energy density that were previously only possible for equipment in higher axle classes, making the MK 140 the perfect reference crane when it comes to electrical power supply and energy management.



Available as of 2024

“The series product will be available as of 2024 in various power ranges with up to 130 kilowatts / kilowatts per hour,” Claus von Reibnitz announces. LPOs can then be charged with 3 kilowatts (single-phase) up to 22 kilowatts (three-phase, AC) and deliver power to consumers via multiple, simultaneously usable connections – graded from 16 (single-/three-phase) to 125 amperes (three-phase). The advantage for users: when connected to a mains supply, the LPO can be charged and discharged simultaneously. Energy and status can be monitored via the local control system and also via a digital app available for smartphones and tablets.

“Ease of use was just as important to us as the ability to transport the energy storage units without complications,” Ulrich Geier emphasises. “Charging must be able to be done intuitively, without the need for specially trained electricians on-site.” The user-friendly “plug & play” design of the LPO was feasible because at Liebherr nearly all competences within the company could be combined and perfectly complemented one another during development, including the switchgear, power electronics, converters, equipment, plant construction and service.

“In order to utilise as many synergies and existing proven components as possible, the LPO is based on lithium-ion technology, which is also predominantly used throughout the Liebherr Group,” explains Claus von Reibnitz. “At the Liebherr Battery Competence Center, we developed the LI-ION battery system to great maturity. It has already proven itself in countless variants at both Liebherr and its customers. Being able to build on this at any time has proved to be a great advantage when developing the LPO”.

The presentation of the LPO demonstrator, Claus von Reibnitz and Ulrich Geier emphasise, is not the finale, but an important interim stage of development. “We are not there yet. The feedback from the market will continue to guide us towards series production.”

Perfect reference crane for electrical energy management

An MK 140 gets into position on Liebherr’s test site in Biberach. Liebherr’s mobile construction crane, a compact 5-axle model, is powered electrically when the crane is being operated. With its load capacity and boom length, the MK 140 has achieved dimensions in terms of performance that were previously only possible for equipment in higher axle classes. Due to its overall electrical concept, it can be operated with an integrated diesel generator or with external power and is therefore able to spontaneously call up its power as required during on-site use. This makes the MK 140 the perfect reference crane when it comes to electrical power supply and energy management.

On the test site, the crane has just placed a futuristic-looking 2.50-metre-long, 1.25-metre-wide and almost one-metre-high box near it. The 1.7-tonne, Lego-like Liebherr machine bears the inscription “LPO 80”. After a while, the crane operator drives up and plugs in the 63-ampere power cable to the side of the mobile construction crane, which can now be operated locally and with zero emissions. The LPO 80 energy storage system tested in Biberach was designed and developed by Liebherr’s electronics experts in Lindau together with their colleagues from the systems engineering department in Biberach. As a result, a mobile demonstration model was built in just 12 months in cooperation with Sigg Fahrzeugbau GmbH from Bad Wurzach and made its first public appearance at Bauma 2022.

Liebherr Shop



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NEW in the shop!

Liebherr LTM 1110-5.2

The first LTM 1110-5.2 cranes will soon be leaving our production plant in Ehingen – and just in time, this 1:50 scale model is now available in our shop.

With full detail, the unmistakable look of the new LICCON3 style with Liebherr designer paintwork from model manufacturer Conrad, in time-honoured zinc with plastic components.