
Highlights: IMTS and AMB

Gear technology, gear cutting tools, measuring technology, and automation systems
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LIEBHERR

Gear technology and automation systems



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LC 280 DC gear hobbing machine



Perfect chamfering at the right time – ChamferCut and FlexChamfer in one machine

At AMB 2024 in Stuttgart, Liebherr is proud to present the advanced LC 280 DC gear hobbing machine, equipped with an innovative chamfering device which can be used for ChamferCut and/or FlexChamfer. In this new series of gear hobbing machines, we have increased overall performance by an impressive 20%, making it possible to machine workpieces with a module of 6 mm. But that's only the start – our machines offer perfect chip removal, virtually eliminating troublesome deposits, as well as unrestricted access for setting up both machining processes.

As an innovative alternative, we present the new FlexChamfer technology, where standard end mills can be used for lightning-quick and extremely efficient gear machining. Every movement of the tool is fully and precisely NC-controlled, guaranteeing consistently high reproducibility and chamfer quality.

Visit our booth and explore the world of precision technology. Experience up-close the fascinating potential of our gear hobbing machine during our live demonstrations. We can't wait to see you there!

Highlights

- Gear hobbing and chamfering during the machining process for workpieces up to 280 mm in diameter
- Cutter head for tools of larger diameter and length
- Optimised accessibility for setting up both machining positions
- Optimised chip removal in the ChamferCut device
- Wet and dry machining possible (dry machining available with stainless steel housing)

LK 280 DC

gear skiving machine



Ready for any challenge!

The key to successful gear skiving is the robustness of the machine: a solid machine bed and rigid workpiece spindle structure easily absorb all process forces. An innovative bearing system in the machining head ensures remarkable spindle rigidity. This also means that longer tools can be used without any problems – a decisive advantage, especially for precise machining of internal gears. Furthermore, the LK is easily equipped with a steady column for workpiece clamping, yet another advantage for skiving shaft-type workpieces.

In addition to the machine, having the right tool is crucial in ensuring a stable process. As we develop and manufacture our own tools, we can design the ideal tool for any workpiece. This requires a thorough understanding of the gear skiving process.

When designing the tools, we always take the envisaged process into account. Intensive research and development and through tests on customer workpieces enable us to continuously optimise the gear skiving results. As a result, we can offer Skiving³, a complete solution encompassing the machine, tool and process.

Highlights

- Rigid machine concept
- Direct drives for the spindle and table maximise dynamic rigidity
- Integrated deburring
- Optional chamfering during the machining process
- Design and manufacturing of conical and cylindrical skiving cutters
- Process analysis and simulation for optimal cutting conditions



Customized digitalization solutions for your requirements

With a combination of data profiles, protocols and the LHWeb-Platform, Liebherr provides an infrastructure for the acquisition, transmission, storage, processing, provision and display of machine, operating and production data. In the basic app LHMachine-Info, users can see the live status of their machine tools at a glance and observe changes in real time. The LHSignalInfo app visualizes the recorded signals, taking into account all measuring points and their exact time stamp.

The LHReportInfo app enables you to improve your controlling process and increase the productivity of your system by analysing pre-prepared, continuously updated reports and statistics that help you make data-driven decisions.





Discover the future of consumption monitoring with our new LHEnergiInfo app.

This innovative application gives you a constant overview of your latest power and energy consumption data – whether it's electricity, compressed air or cooling lubricant. Track consumption over time and analyze the power consumption for each workpiece, and view energy costs and CO₂ equivalents per workpiece with just a few clicks.

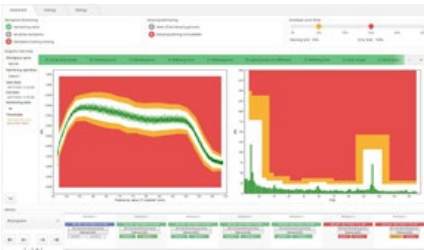
Our app not only helps you to track energy consumption in real time, but also to analyze it in detail to identify potential savings. This not only means you save costs, but it also makes a decisive contribution to sustainability. Experience new levels of transparency and optimise your processes like never before. Take a look at our new LHEnergiInfo consumption monitoring app!



Inline process monitoring with LHProcessMonitoring

The LHProcessMonitoring software from Liebherr-Verzahntechnik GmbH for inline process monitoring visualises the production process and uses the training data to determine limit values for monitoring the production process. This way, deviations that could lead to noise abnormalities can be identified. The software is optionally available as part of the LHGearTec operating and programming interface, making it a consistent continuation and expansion of our digitalisation product portfolio.

With continuous recording and transparent evaluation, the software enables the operator to optimise and stabilise the manufacturing process. Limit violations are automatically detected to prevent the affected components from entering the subsequent process. LHProcessMonitoring ensures the consistent quality of every individual gear and can be used instead of full downstream testing with a single flank check system or master gear, thus saving investment and set-up costs for comparatively little outlay.





Are you looking for a solution to ensure quality and increase productivity in gear manufacturing?

The four-axis measuring instruments of the WGT series have high-precision mechanics and electronics, which are controlled by smart and user-friendly software. They meet all accuracy requirements regarding gear measurement and comply with VDI guideline VDI/VDE 2613, group 1. In addition to the gear inspection machine options available as standard, customer-specific solutions are also available, such as adjusting the travel range on the Z-axis, longer tailstocks to accommodate long shafts, and rotary tables adapted to the payload. An automatic sensor changing system ensures uninterrupted measurement of the workpieces and also offers the highest levels of convenience for the user. The extensive software features make the machines suitable for measuring all types of gears, such as spur gears, bevel gears, worms, worm gears, shafts, gear cutting tools, and other rotationally symmetrical parts.

Highlights

- Highest precision provided by granite guides and air cushioning
- Low operating costs due to contactless guides and reliable probes as well as inexpensive spare parts
- Flexible for all types of gears
- User-friendly interface and ergonomic design
- Manufacturer-neutral GDE interface for data transmission to production machines



Design-optimized gear skiving tools

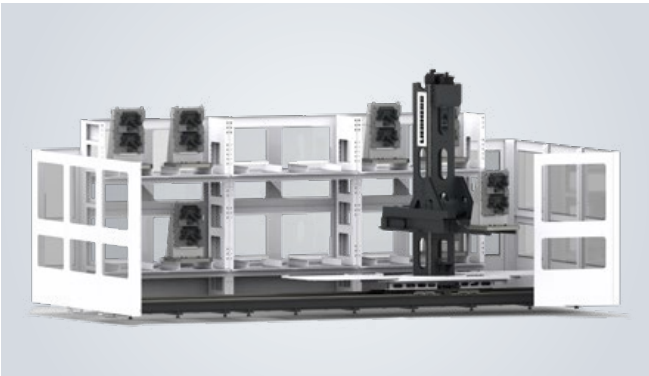
Due to its process-specific kinematics, gear skiving is a complex and demanding procedure with no margin for error. Even the slightest changes to the tool design parameters can have unwanted results. As a supplier of the complete package of technology, machinery and tools for gear skiving, and with more than 30 years of experience, Liebherr can use simulations to identify and exploit possible tolerances in the process kinematics in order to extend the tool life.

Small CBN grinding discs

25 millimeters – the size of a two-euro coin – is the diameter of the new CBN grinding discs developed by Liebherr-Verzahntechnik GmbH specifically for machining critical component geometries with low tool overrun. They can be coated with specifically selected grain for longer service life and faster grinding processes.

Highlights

- CBN (cubic crystalline boron nitride), one of the hardest grinding materials
- Suitable for the highest quality requirements
- Dressing-free, wear-resistant, heat-resistant



Pallet handling systems as a productivity booster

Liebherr pallet handling systems open the door to increased productivity, even for small batches.

Pallet handling systems handle workpieces on uniform transport pallets. This makes them the ideal automation system for one-off and small batch manufacturing, facilitating unmanned shifts through to “lights-out manufacturing” and enabling unit costs to be reduced by up to 40 percent and machine running times increased to up to 90 percent. The application and combination possibilities are diverse.

The rotary loading system provides compact automation for one or two machining centers. The modular PHS Allround can be expanded in one-meter increments and links up to four machines. This means that the front ends of the system can also be used, and attractive options such as front access for machine access without downtimes, or the double loader for even more productivity, are available. The PHS Pro has no upper limit and can automate any number of machines, also with integrated material management.

Highlights

- Three products, suitable for all requirements
- Standard automation with short delivery times as well as a flexible manufacturing system with any degree of automation
- Machine runtime up to 90%, manufacturing costs -40%



From the technology package to the turnkey robot cell

Liebherr supplies automation systems for automated raw parts input and finished parts removal in production facilities and possesses extensive system and software competence for position and object recognition with 2D and 3D camera systems.

With the LHRobotics.Vision technology package, Liebherr is making this industrial application expertise available to a broad range of users of robot integrations, to withdraw unsorted components from deep bins with process reliability. As a manufacturer of bin picking robot cells, Liebherr knows the challenges of the application and, with the aid of artificial intelligence has simplified the software so much that it can be intuitively used by anyone.

The technology packages consist of a 3D image recognition system and the LHRobotics.Vision software for object identification and selection, collision-free withdrawal of parts, and robot path planning up to the depositing point.

A special feature is the optional simulation tool LHRobotics.Vision Sim. This enables the user to test and optimize the processes in a completely virtual manner, without expensive hardware investment.

Highlights

- Scanning: Selection of suitable 3D image recognition systems from various manufacturers
- Picking: Calculation of the optimal picking position for collision-free withdrawal of parts
- Positioning: Robot path planning up to the stacking position
- Simulation: Realistic simulation of bin filling using a physics engine and virtual testing of the bin picking process

Liebherr Industrial Services



Thinking about tomorrow today?

With our cutting-edge technology and expertise, we offer a comprehensive portfolio of products and services which allow us to detect and correct problems early – both remotely or on-site. Our tailor-made approach enables us to offer solutions that are both cost-effective and perfectly adapted to your individual production needs. Place yourself in our capable and experienced hands and increase the service life of your machines while enjoying the highest levels of safety and product quality.

Highlights

- Remote Service – fast response and zero travel time
- Digital Fingerprint – cost-effective machine diagnostics
- Cost reduction through preventative maintenance
- Predictable maintenance budgets with contract option
- Liebherr Academy – learn from the pros



Notes

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