The Liebherr Group is one of the largest construction equipment manufacturers in the world. Liebherr's high-value products and services enjoy a high reputation in many other fields. The wide range includes domestic appliances, aerospace and transportation systems, machine tools and maritime cranes.

Exceptional Customer Benefit

Every product line provides a complete range of models in many different versions. With both their technical excellence and acknowledged quality, Liebherr products offer a maximum of customer benefits in practical application.

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To provide consistent, top quality products, Liebherr attaches great importance to each product area, its components and core technologies. Important modules and components are developed and manufactured in-house, for instance the entire drive and control technology for construction equipment.

Worldwide and Independent

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www.liebherr.com
Your Partner for Helicopter Programmes from S up to XXL

1. Flight Control and Actuation Systems
Liebherr-Aerospace develops, produces and supports since over thirty years flight control systems and actuation including hydraulic supplies and offers solutions tailored to customers’ needs in both, the civil and military sector.

2. Air Management Systems
Liebherr-Aerospace is the European leader in helicopter air management systems and develops, delivers and supports air conditioning, heating and ventilation. Liebherr-Aerospace is a single integrator for all air systems and looks at an experience of over fifty years.

3. Landing Gear Systems
Liebherr-Aerospace has a wide range of experience in the development, manufacture and maintenance of landing gear systems for military and civil helicopters.

4. Gearboxes
Liebherr-Aerospace has extensive development and manufacturing experience in gearbox- and gear transmission-applications.

5. Research and Technology
Liebherr-Aerospace’s research and technology activities are one of the most prominent in Europe in all of its product fields. Examples include fly-by-wire and fly-by-light system solutions, smart actuators, vapour cycle systems and crashworthy landing gear.

6. Customer Service
Liebherr-Aerospace offers comprehensive support throughout the product lifecycle empowering the customers to maximize technical and economical utilization of the products.
NH90 Fly-By-Wire Flight Actuation Control Computer

NH90 Main Rotor Actuator

NH90 Tail Rotor Actuator
Liebherr-Aerospace has great experience in the development, manufacturing and integration of innovative actuation systems for flight controls including the related system electronics and hydraulic supplies for all types of helicopters from S up to XXL.

Liebherr-Aerospace flight control and actuation systems and components are for example on board of:

- AgustaWestland: AW149
- Eurocopter: BK117, BO105, Dauphin Grande Vitesse, EC135, EC145, LUH, Tiger, X4
- NHIndustries: NH90

For helicopter flight controls Liebherr-Aerospace offers solutions from conventional hydro-mechanical actuators up to full fly-by-wire actuation systems.

**Hydraulic Supply**

Liebherr-Aerospace develops and manufactures custom-tailored hydraulic system components such as hydraulic pumps/motors, manifolds, filter package units and reservoirs.
Liebherr-Aerospace develops, produces and supports vapour cycle air conditioning systems and air cycle air management systems for helicopters from S to XXL, including bleed air, heating, cooling, distribution and temperature control.

The air cycle and vapour cycle cooling systems of Liebherr-Aerospace are designed with a modular or split possibility. Main features of these state-of-the-art systems are low weight and compactness for a reliable performance. The wide range of mature products from valves to cooling units, fans, high pressure bleed components, low pressure components, controllers and panels allow the systems to cope with a wide range of cooling and heating requirements. High technology test facilities ensure the systems’ validation and qualification according to the latest regulations.

The knowledge of Liebherr-Aerospace is recognized and used by various helicopter manufacturers. With more than fifty years of experience in the field of air systems Liebherr-Aerospace stands for a long term relationship with its customers.

Liebherr-Aerospace air systems and components are for example on board of:

- **AgustaWestland**: AW109, AW139, AW149, AW169, AW189, T129
- **Eurocopter**: Dauphin Grande Vitesse, EC120, EC130, EC175, EC225/725, NH90, Super Puma, Tiger
- **Hindustan Aeronautics**: ALH
- **Korean Aerospace Industries**: KHP

Super Puma Air Conditioning Unit  AW139 Dual Compressor Assembly  AW189 High Pressure Vapour Cycle Unit
AW139 Landing Gear Control Panel  Complete Landing Gear System of AW139
Liebherr-Aerospace offers innovative integrated landing gear systems including nose wheel steering systems, control electronics, cockpit panels and braking systems for civil and military helicopters from S to XXL.

Liebherr-Aerospace landing gear systems and components are for example on board of:

- AgustaWestland AW139, AW149, AW189
- Eurocopter Tiger

Liebherr-Aerospace has extensive experience in participations in joint team developments with customers and has become a partner for integrated functions.
4 Gearboxes

Liebherr-Aerospace has exclusive development and manufacturing capabilities for aerospace gearbox- and transmission gear-applications in a spectrum from high torques to high speeds.

Complex gear components for a wide range of helicopter main rotor gearboxes, tail rotor gearboxes and intermediate gearboxes are manufactured.

Liebherr-Aerospace develops and manufactures also complete auxiliary power unit gearboxes and accessory gearboxes for different applications.

Liebherr-Aerospace gearboxes or gear components are for example on board of:

Eurocopter  AS350/355, BK117, BO105, EC135, EC145, Tiger
NHI      NH90
With the NH90 helicopter program Liebherr-Aerospace introduced the first full authority fly-by wire flight control system which entered the stage of series production.

Flight control system developed by Liebherr progressed even further into a “fly-by-light” – system installed in the ACT-FHS technology test bed based on an EC135 and operated by the German national research centre DLR.

The introduction of a computer based flight control system is a major step towards the reduction of the crew workload and contributes via the integrated automatic monitoring of the flight envelope significantly to the safety of the vehicle. The next generation of systems will lead to an “all electric” solution including cockpit controls and actuation reducing the number of complex mechanical elements and hydraulic systems required. This reduction in complexity will be another quantum leap with respect to superior robustness and reliability. In addition, Liebherr is working on technologies that will further reduce operating costs like lightweight composite landing gear parts and electro-mechanical landing gear actuation.

Improving safety of operation is not only limited to flight control system design activities but is a major driver of all R&T activities at Liebherr-Aerospace. The development of a prototype of a crashworthy nose landing gear is another example of advanced technology development in the area of passive system performance improvements.

Last but not least providing high tech solutions for high performance gears, gearboxes and transmission components is one of Liebherr-Aerospace’s core businesses and requires to closely monitor the latest achievements in advanced materials as well as nanotechnology coatings.
Dedicated and Qualified Personnel

EC135 Main Rotor Actuator
Liebherr-Aerospace provides reliable maintenance services structured around quality, price and lead time to offer its customers the best operating conditions.

The close relationship between Liebherr-Aerospace and its customers ensures transfer of in-depth knowledge about components and systems which allows the operator to exploit the maximum dispatch reliability with the products.

Dedicated and highly qualified Liebherr-Aerospace personnel support the customers anytime, anywhere in the world with the latest equipment available and strictly to OEM standards.

Backed by OEM extensive design and trouble shooting experience, Liebherr-Aerospace continuously improves design, repairs and re-work methods to reduce turnaround time and costs.
Liebherr-Aerospace and Transportation Systems in General

System Supplier for the Aviation Industry
Liebherr-Aerospace is a world-wide approved system and equipment supplier and integrator for the aerospace industry in the field of flight control / actuation systems, air systems and landing gear systems. It participates in various civil and military aircraft programmes as well as in research and technology developments.

The range includes: commercial transport aircraft, military transport aircraft, business jets, regional aircraft, fighter aircraft, military trainer aircraft, civil and military helicopters.

Stations Worldwide
The four Original Equipment Manufacturer sites for Liebherr aviation systems are located in Lindenberg (Germany), Toulouse (France), Nizhny Novgorod (Russia) and Guaratinguetá (Brazil).
Liebherr-Aerospace offers worldwide service, with the above mentioned OEM sites and further offices in Saline, (Michigan, USA), Wichita (Kansas, USA), Seattle (Washington, USA), Montreal (Canada), São José dos Campos (Brazil), Hamburg (Germany), Moscow (Russia), Dubai (UAE), Singapore and Shanghai (PR China). Liebherr-Aerospace has a joint venture in Changsha province (PR China).

System Supplier for the Railway Industry
Liebherr-Transportation Systems develops and integrates air conditioning systems, control technology and hydraulic actuation systems for rail vehicles. Liebherr-Transportation Systems has many years of experience in the design and manufacture of these technologies.

The range of vehicles includes: high speed-, long distance- and regional-trains as well as light rail- and metro-trains.

Stations Worldwide
The production facilities are located in Korneuburg, near Vienna (Austria) and in Radinovo (Bulgaria). Alongside its own sales and service offices in Korneuburg, Mannheim (Germany), Sunderland (United Kingdom) and Paris (France), the company has a joint venture in Zhejiang province (PR China). Liebherr-Transportation Systems also benefits from the worldwide locations of the Group’s Aerospace Companies.
Development – Production – Series

System Solutions
Liebherr-Aerospace and Transportation Systems offer complete system solutions and components according to the individual needs of aircraft and rail vehicles manufacturers and operators. With the certified disciplines of development, production, qualification, integration and customer services, Liebherr-Aerospace and Transportation Systems combine innovative practices and high modularity to fully fit the customers’ requirements.

For Aerospace
Air Management Systems:
- Integrated Air Management Systems
- Air Conditioning Systems
- Vapor Cycle Systems
- Engine Bleed Air Systems
- Cabin Pressure Control Systems
- Ventilation Control Systems
- Wing Anti Ice Systems
- Hydraulic Cooling Systems
- Supplemental Cooling Systems
- Cabin Interiors Systems
- Pods Cooling
- Electronics

Flight Control/Actuation Systems:
- Integrated Flight Control Systems
- Primary Flight Control Systems
- High Lift Systems
- Hydraulic System Components
- Electronics

Landing Gear Systems:
- Integrated Landing Gear Systems
- Nose Landing Gear Systems
- Main Landing Gear Systems
- Landing Gear Sub Systems
- Electronics

Gearboxes:
- High Torque, High Power to Weight Ratio Geared Rotary Actuators
- Transmission Gearboxes
- Helicopter Main and Tail Gearboxes
- Auxiliary Power Unit Gearboxes
- Engine Accessories Gearboxes

For Rail Vehicles
Air Conditioning Systems:
- Vapour Cycle
- Air Cycle
- CO2
- Electronics

Hydraulic Actuation Systems:
- Buckling Angle Control
- Running Gear
- Anti-Buckling Systems
- Dampers
- Actuation Systems
- Suspension Systems
- Electronics

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The Liebherr Group of Companies

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