



MAGNETIC BEARING TECHNOLOGY

When run-of-the-mill bearings can no longer meet increasing demands, LCM takes things one step further. With tailor-made magnetic bearings from a single source, we guarantee a product offering key benefits – such as a long service life, lower maintenance costs and higher speeds.

YOUR BENEFITS:

Mechanical bearings can frequently no longer keep up with more demanding requirements. Wear and maintenance costs are too high, while torque and constructed space are limited. Magnetic bearings, on the other hand, offer a significantly longer service life, are not prone to wear and can also be used in a vacuum and at high rotational speeds. LCM will support you as a qualified partner in developing your magnetic bearing drive system. Since magnetic bearing systems are complex structures comprising electromagnetic and mechanical dependencies, we use our MagOpt optimisation tool, developed in-house, to identify all key parameters.

Understanding rotordynamic effects is a core part of this. Instead of unnecessarily reinforcing systems, making them more convoluted and costly, we carry out rotordynamic analyses and simulations, building the results into the optimisation. What is more, we can compensate for unbalances and operate through critical frequencies. This is especially vital when it comes to high-speed rotors. In parallel to this, LCM has experience in the field of energy-efficient magnetic bearings and bearingless motors (motors with an integrated magnetic bearing), as well as in implementing modern hardware solutions in power electronics.





OUR EXPERTISE INCLUDES:

- Complete solutions from a single source for groundbreaking magnetic bearing systems
- A seamless service from concept design to production
- Optimisation of constructed space and costs, reduction of losses, maximisation of torque and material selection for active components using the MagOpt optimisation tool
- Understanding of rotordynamics thanks to years of experience in vibration analysis using Campbell diagrams, in-house methods and video animations
- Vibration dampening and unbalance compensation in existing systems and optimal design of new systems
- Development of highly-efficient magnetic bearings with permanently magnetic preload and bearingless motors
- Development of tailor-made power electronics
- Software development with X2C open source software

CURRENT REFERENCES:

Our knowledge and expertise in magnetic bearing technology can be demonstrated by the numerous projects that we have undertaken for customers in a wide variety of sectors. This is just a small selection of our references:

- Design and optimisation of active and passive magnetic bearings
- Active magnetic bearings with permanently magnetic preload (efficiency optimisation)
- Magnetic bearing high-speed drives
- Bearingless motors
- Bearingless high-speed motor for micro-compressors
- Bearingless torque motors
- Digital position sensors for magnetic bearing drive systems

